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Preliminary report on conservation and studies of the archaeological textiles from TT 23 (season 2018)

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The Centre for Egyptological Studies of the Russian Academy of Sciences (CES RAS) has carried out the 10th season of archaeological and conservation works in the tomb of Thay (TT 23) in January — February 2018. During this season about 300 textiles were studied and conserved in accordance with a previously elaborated methodology. The majority of items are fragments of linen and bandages. Ropes and basketry are also present, though they are much less numerous. Archaeological textiles come from the tomb itself or from the debris of previous excavations. The date of the finds depends on the date of the tomb itself, its separate parts (rooms, shafts etc) and the textiles' technical features.

Keywords: archaeological textiles, tomb of Thay, Luxor, bandages, shrouds.

1. General information

The Centre for Egyptological Studies of the Russian Academy of Sciences (CES RAS) carried out the 10th season of archaeological and conservation works at the tomb of Thay (TT 23) in January — February 2018. This tomb is situated on the western slope of El-Khoha, in the area called Sheikh abd el-Qurna on the western side of ancient Thebes¹. The owner of the tomb, Thay, held a high position of the 'royal scribe of correspondence of the Lord of the Two Lands' under the rule of the 19th dynasty pharaoh Merenptah. Archaeological and architectural survey of the tomb showed that the original structure of TT 23 had changed throughout ancient history². For instance, already in the Ramesside period another tomb

¹ For details see: Ivanov 2012; 2015.

² Ivanov 2012: 159.

(Tomb North 2) with an entrance from the courtyard of Thay's sepulture was built. In the Third Intermediate and Late Periods numerous new shafts and side-rooms were constructed in TT 23³ and mummies of new owners occupied their dwellings supposed to be eternal. Therefore, the tomb was in use from the Ramesside to Roman times. Moreover it remained open in medieval and modern periods. In 1904–1905 the tomb was excavated by Sir R. Mond. During the excavations some 'archaeological garbage' (including numerous textiles) was transferred within the tomb. As a result the fabrics do not have a precise archaeological context or date. Nevertheless it is important to study rich textile material found in this and similar tombs in order to develop a relative chronology of finds from TT 23 and to enlarge our knowledge on Egyptian textile technologies and techniques.

The main goal of the season 2018 was to study previously discovered textiles and conduct field conservation of the most important items. As a result more than 300 samples were studied, and about 100 items were restored. The study was done according to a methodology that was elaborated during previous seasons⁴.

2. Textile filed studies

After several seasons a system for registration, description, conservation and storage of textile finds was developed⁵. Generally, work with textiles is carried out in several stages:

1. *Selection of items for studies*. Fragments of textiles, ropes and basketry discovered in the course of cleaning the tomb are distributed between plastic boxes; each of those has its context number. A textile complex from one location receives one context number. All content of each box is grouped into several categories by visual examination of the textiles' features. Three main categories are registered: 1) shrouds and bandages including fragments of sewn re-used items (clothing and furnishing), textiles without certain functions; 2) fragments of textiles and complete textile items of the grave kit (bags for natron, fragments of painted cartonnages, so-called Osirian shrouds and painted shrouds, bandages with various representations and hieroglyphic texts); 3) basketry: fragments of mats, baskets, sandals and ropes. After that the textiles inside each category are divided into different groups. Textiles with similar technical features (also by visual examination) are conditionally considered fragments of one item. The question of criteria for choosing items for detailed studies is one of the most important and depends on several factors: historical importance of an object, whether it comes from the precise context or not, whether it has any diagnostic features (starting/finishing border, selvages, fringes, self-bends, open-work, any type of decoration, traces of repair, ink marks, etc.). Fragments of clothing like loincloths or tunics are extremely rare and obviously should be studied and described.

2. *Numbering*. A textile specialist gives its own number to each item that was selected for storage and description.

3. After that conservators (in our case specially trained textile specialists) start *field conservation of the most important textiles*.

³ Ivanov 2012: 159.

⁴ See: Орфинская, Толмачева 2016.

⁵ See an adaptation of this system to conditions and pe-

culiarities of textiles studies at the Deir al-Banat necropolis in: Tolmacheva 2017.

4. The next stage is *photographing and photomicrographing textile items*.

5. The last stage of the fieldwork is *a technical description of the textiles in a field diary*. Normally it provides the following data: textile size, technique of weaving, thread count, raw material, type and colour of yarns, spun/twist direction, diameter of yarns; tightness of spin, weaving peculiarities (borders, selvages, fringes, open-work, self-bands, decorations, marks), decoration of the textile after weaving (embroidery, sewing/tailoring, type of seam, sewing thread), etc. Special attention is paid to description of darning or patching. For tunics and other clothing the description includes sketches or layouts of possible reconstructions.

6. Carrying out of *such analysis as is available in the field laboratory*.

3. Field conservation treatment

Most of textiles from TT 23 are either bandages or fragments of unidentified objects. They are in a poor or average state of preservation, often covered with dust and filth. A procedure of textile conservation treatment had been initially developed by a group of conservators leaded by N. P. Sinitzina (Moscow Grabar Art-Conservation Center) for work with textiles from the Deir al-Banat necropolis and then was adapted to 'local conditions' by the author of this article⁶. It includes the following steps:

1. Primary treatment of textile objects: disinfecting with 'preventol', sampling, describing the state of preservation, etc.

2. Surface cleaning of objects with a soft brush. Selection of a method for further conservation treatment: dry cleaning without application of water solutions or mixed application with water solutions.

3. Dry cleaning is carried out with a brush or scalpel. It is highly recommended to use a microscope or a magnifying glass while working.

4. The water cleaning is conducted with Polyethylene glycol 400⁷ solution in water (3 %) or with distilled water only (preferably). Water is sprayed or applied with a brush upon textile surface in order to moisten it and remove deformations. Excess water is removed via applying of filter paper.

5. Air drying.

6. Preparation for storage. Generally, conservators make of cardboard⁸ an artificial support, than glue a new linen or cotton undyed textile to it (glue is applied on the reverse side of the cardboard). An acid-free tissue paper is glued from one edge to this textile-covered support (also from the reverse side) to protect the object that will be laid on this support. Then we put an object on this support (under the tissue paper) and pack it in special cardboard boxes.

⁶ For details see: Tolmacheva 2017.

⁷ Polyethylene glycol (PEG) is a polyether compound having many applications from industrial manufacturing to medicine. PEG is also known as polyethylene oxide (PEO) or polyoxyethylene (POE).

⁸ An acid-free cardboard is certainly preferable, but under field circumstances we use available materials.

4. Textile studies in the season 2018

4.1. Groups and functions of textiles

The list of registered textile objects from TT 23 currently includes about 2000 items of different groups and categories. About 300 of them were studied and conserved during this season. The majority of them are fragments of linen and bandages. Ropes and basketry are also represented, although to a much lesser extent. Archaeological textiles come from the tomb itself and from debris of previous excavations. Dating of textile finds depends on the age of the tomb itself, its separate parts (rooms, shafts, etc.) and textiles' technical features.

Linen bandages and shrouds are the most typical textiles in the tomb. Generally speaking, a bandage is a narrow rectangular linen strip with two long torn sides. Usually a cloth intended for bandage production was torn into strips along its warp ends (fig. 1). The width of the bandages varies from 2 cm (narrow bandages) to 18–20 cm (broad ones) (fig. 2).

Fragments of shrouds are also of different quality and size (fig. 3). One of fragments studied this year has complete loom width (2008-09/0074/001; 158–160 cm).

This category includes secondary-used fabrics, e. g. partly torn to bandages and shrouds items of clothing and furnishing, the original form of which can be reconstructed. Among textiles of this kind studied in 2018 a fragment of a tunic's hem (2008-09/0027/016) should be mentioned. This tunic was sewn in Ancient Egyptian manner, i. e. warps of the finished item were vertically oriented (fig. 4). A fragment of this tunic's side seam has been preserved. The hem is fringed. Other examples of secondary-used clothing are a fragment of a tunic with a side seam 2008-09/0074/42 (fig. 5) and remains of a side seam of the tunic 2008-09/0074/09 (fig. 6).

Regretfully, the poor state of preservation of the fabrics from TT 23 often makes it difficult to definitely distinguish between re-used ones and grave goods, which, due to their specific functions, form a separate category of archaeological textiles. Functions of rather large textile fragments that could equally be funerary shrouds and grave goods are also a matter for discussion.

4.2. The raw material

Since flax was the main raw material in Ancient Egyptian textile industry, it is not surprising that, just like on many other Egyptian archaeological sites, the vast majority (around 96%) of fabrics from TT 23 is linen.



Fig. 1. Bandages with warp blue and red stripes (2008-09/0027/044)



Fig. 2. Bandages (2008-09/0027/005)

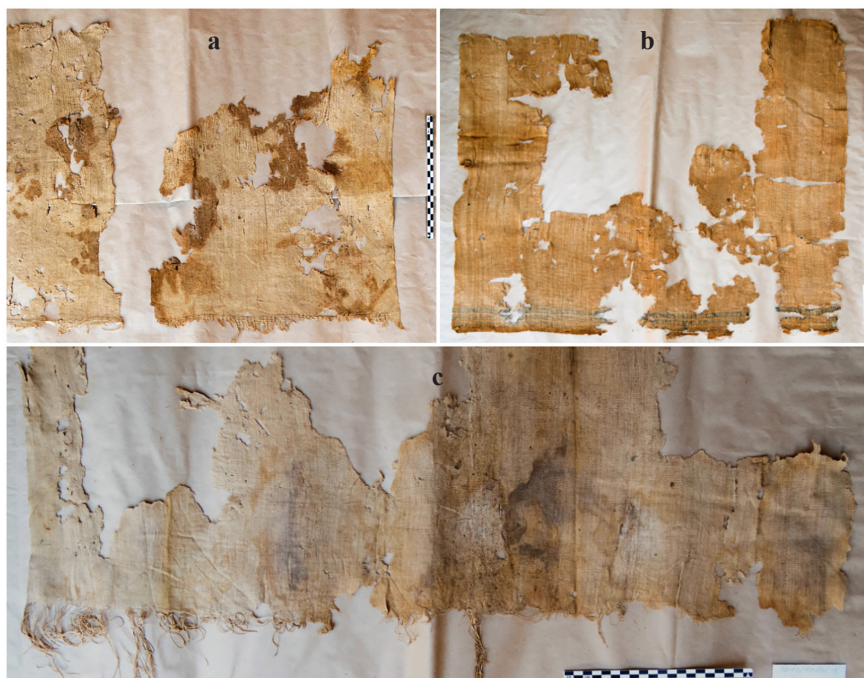


Fig. 3. Fragments of different shrouds:
a — 2008-09/0027/006; b — 2008-09/0027/004; c — 2008-09/0027/015



Fig. 4. The lower part of a fringed linen tunic with a side seam (2008-09/0027/016)



Fig. 5. Fragment of the side seam
and the sleeve trimming (2008-09/0074/42)



Fig. 6. Fragment of the side seam of a tunic
sewn of textiles with blue warp stripes (2008-09/0074/09)

4.3. Technological features

1. All linen textiles from the tomb have S-twist, and the threads are formed from two, three and more very thin strands, which sometimes merge together and sometimes stay separate without any twisting. This peculiarity called splicing (fig. 7) is mentioned in numerous textile studies and could be considered one of typical features of Ancient Egyptian weaving.



Fig. 7. Splicing (after: Wild, Wild 2014: 73, fig. 3)

2. All linen textiles are woven in warp-faced tabby weave. Examples of balanced weave are rare. The majority of textiles have the warp count of 25–35 yarns per 1 cm and average yarn diameter of about 0.2–0.5 mm for warps and 0.3–0.5 mm for wefts. The ratio of wefts to warps is 1 to 2. A small group out of all bandages and shrouds are woven in basket weave (2:2). This type of weave is an extended tabby weave, where yarns are used in parallel pairs rather than single (fig. 8).

3. Any textile cut from the loom has a starting and a finishing border and two selvages. There is no complete loom cloths among more than 2000 textiles found in the tomb.

Peculiarities of weaving of starting and finishing borders could tell scholars a lot about the loom itself and a way of weaving traditional for a certain culture. According to B. Kemp and G. Vogelsang-Eastwood, for Ancient Egyptians the following method of loom wrapping was typical: ‘Instead of being passed around the beam the wrap is passed around a strengthened border made of yarn which remains permanently incorporated within the cloth and is itself tied to the breast beam (cloth beam) during weaving’⁹. So, a starting border was constructed of several multi-stranded cords (fig. 9A). G. Vogelsang-Eastwood also mentioned a tendency for the warp yarns to lie along these heading cords in irregular clusters, which are considered a clue to how the cords were secured to the cloth beam¹⁰. Textile finds from TT 23

⁹ Kemp, Vogelsang-Eastwood 2001: 117.

¹⁰ For more details see: Kemp, Vogelsang-Eastwood 2001: 118.



Fig. 8. Basket weaving WS 0040/0012

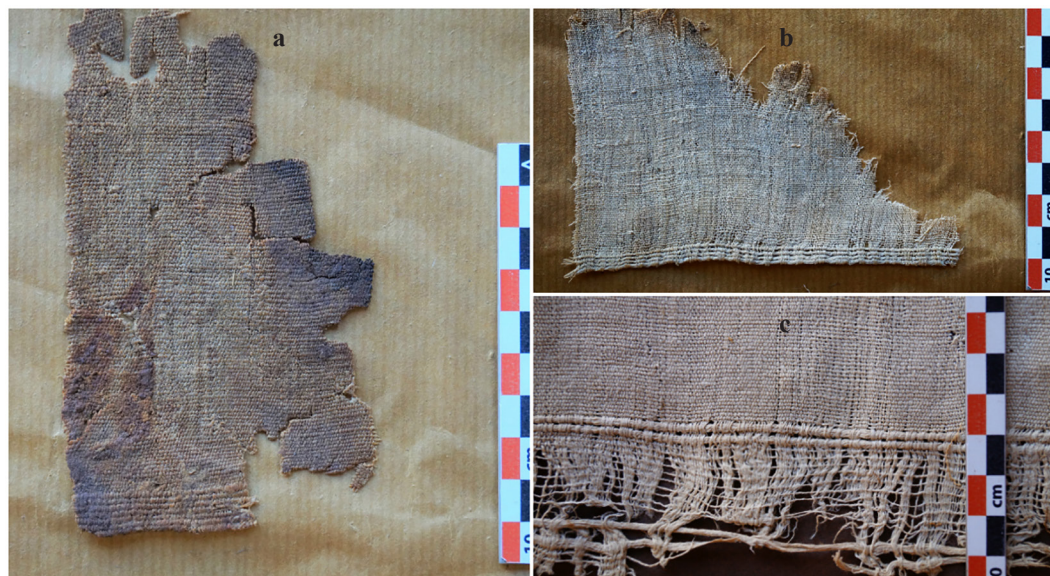


Fig. 9A. Different samples of simple starting borders:
a — 2006/0049/330; b — 2006/0049/333; c — 08-09/0074/023

show the same tendency which looks like a general rule in Ancient Egyptian weaving. Photos on the figs 9A and B and samples from the tomb illustrate different ways of weaving and decorating the starting border.

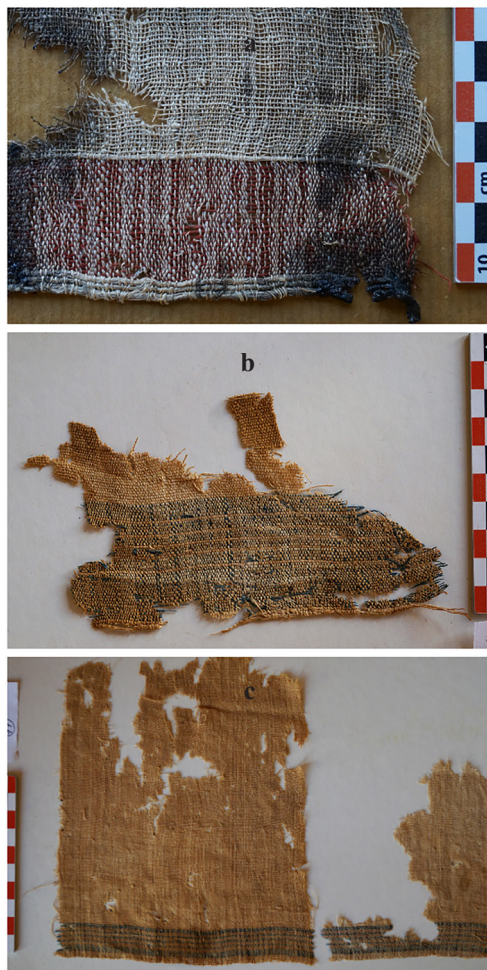


Fig. 9B. Variants of decoration of the starting border:
a — 2006/0049/348; b — 2008-09/0074/010; c — 08-09/0074/011

Finishing weaving, Egyptian craftsmen cut and secured warps with a special thread. Most often a finishing boarder was decorated with a fringe (fig. 10). However some finds studied in 2018 allow us to assume that a fringe could be a feature of not only finishing boarders. In some cases weavers could attach a fringe to the starting boarder of a textile in order to decorate it. This can be seen on various scarves, belts and along tunics' hems.



Fig. 10. Finishing border: a — 2006/0049/347; b — 2006/0049/403; c — 2006/0049/350

For selvages the following options are registered:

A. Simple selvages, which can be divided into simple as such and simple warp-faced. Selvages of this kind feature a rare decoration for Ancient Egyptian textiles — blue and red stripes made by adding colour warp threads.

B. Warp-faced selvages with a weft fringe (fig. 11). This way of decorating a selvage was typical for the Egyptian weaving since the most ancient times. B. Kemp and G. Vogelsang-Eastwood provide different variants of these fringes as well as a reconstruction of a textile with fringed selvages, which was done by methods of experiment archaeology¹¹.

4. Self-bands were a feature of Egyptian weaving since the most ancient times as well, and in TT 23 they are also present (fig. 12). Rows of self-bands (2–3 in each row)

¹¹ For more details see: Kemp, Vogelsang-Eastwood 2001: 121–133.

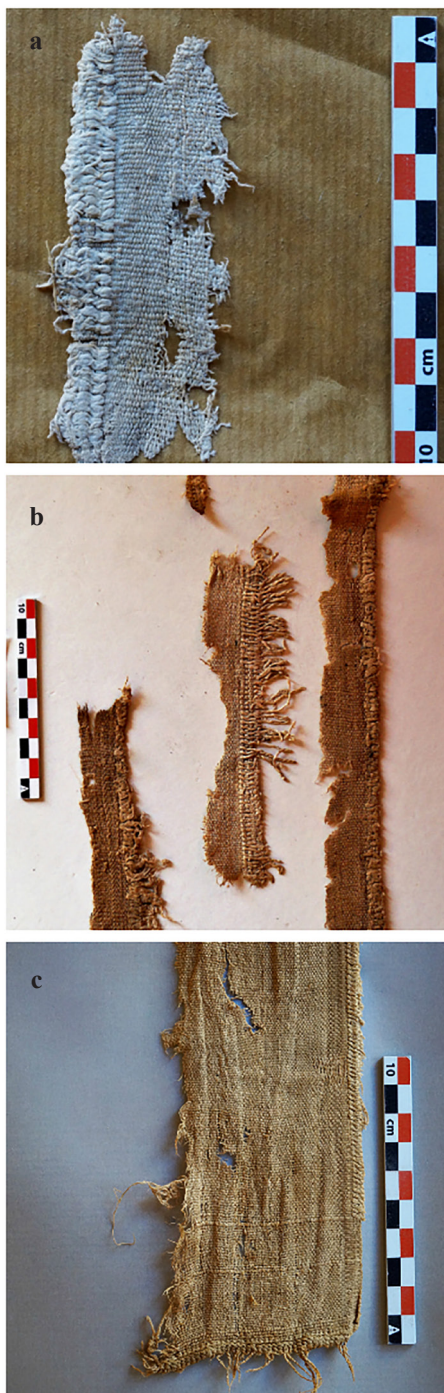


Fig. 11. Samples of fringed selvages:
a — 2006/0049/309; b — 2009/0074/002; c — WS0040/0146/001



Fig. 12. Samples of textiles with self-bends: a — 2006/0049/311; b — 2008-09/0074/023; c — 2008-09/0027/004

were usually added alternating with rows of regular tabby (1:1) while weaving starting and finishing boarders. Besides being a decoration, self-bands also had a practical function — they could be used in order to secure the boarders and prevent possible deformation on selvages.

5. Ancient Egyptian textiles feature a fairly limited range of decoration techniques. The most common of them supposed adding stripes of colour wefts in the beginning or end of weaving or stripes of colour warps along selvages. Among the last several options are registered (fig. 13).

6. Among the linen textiles several are stained red (e. g. 2006/0049/408 or 2006/0049/004/188, fig. 14). Most probably, this is not classical dyeing in water dyes solutions, but rather mechanical applying of a pigment on a textile's surface. Preliminary studies have shown that the paint is composed of clay-like mineral pigments, most likely ochre (iron oxid). Another way to reach red colour of a shroud was dyeing with madder (*Rubia tinctorum*). Unfortunately, we could not tell precisely how the colour of a certain textile was obtained without proper chemical analysis, which is impossible under field conditions.

7. Another way of decorating textiles, thought rather rare for the Ancient Egyptian weaving, supposed adding rows of loops along the weft. The loops could be secured with special knots or had no securing at all. A fragment of the textile 2013/0050/086 is a good illustration of the second option (fig. 15).

8. Marks that could be drawn with ink or sewn on a finished item or made in process of weaving are rather frequent on Egyptian textiles. Craftsmen usually placed them somewhere at the edge so that they do not catch an eye. Several fabrics from TT 23 feature small marks made in process of weaving.

9. Speaking of functions of textiles from TT 23, I mentioned that most of them had been re-used in the funerary context, and numerous traces of repair are an ample evidence for this (fig. 16). Complete items of sewn clothing were not found in the tomb. The material is mostly represented by items that had been intensively worn and then were torn to bandages.

Conclusions

Preliminary study of the textile material from TT 23 allowed us to draw some conclusions:

1. Archaeological textiles from the tomb are represented by items of different origin and state of preservation, having different functions and made using different weaving technologies.

2. Just like on other Ancient Egyptian sites, textiles from TT 23 are mostly linen tabby. Nevertheless several samples of wool, cotton and even silk fabrics were also registered. Even though their providence and belonging to the tomb context are the matter of discussion, further studies will help us to clarify a number of issues connecting with their dates and production technologies.

3. The textiles' technological features as well as contents of iconographical sources allow us to state that the majority of textiles found in the tomb were woven on a vertical or horizontal loom with two beams. The textiles have a starting boarder, selvages and a fringe at the finishing boarder.



Fig. 13. Samples of textiles decorated with warp blue and red stripes:
a — 2008-09/0027/044; b — 2008-09/0027/043; c — 2008-09/0074/010; d — 2006/0049/348



Fig. 14. 'Red' shroud 2006/0049/418



Fig. 15. Textile with loops (2013/0050/086)



Fig. 16. Textiles with darning:

a — 2006/0049/304; b — 2008-09/0074/017;
c — 2009-10/0037/063; d — 2013/0050/011; e — 2013/0050/0046/001; f — 2013/0050/037

4. By their functions, most textiles belong to the funerary context and are represented by bandages and shrouds used for wrapping mummified bodies of the deceased. There are a lot of re-used fabrics, i. e. fragments of clothing and furnishing torn to bandages.

5. Most textiles are made of undyed linen and have no decoration. There are cases when a textile is decorated with self-bands and (or) by adding colour warp or weft threads. Further studies including chemical analysis of dye-stuffs will allow us to judge what particular dye-stuffs were used while producing textiles from the tomb. Besides, these will probably help us to trace the change of technologies of dyeing in different historical periods.

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Предварительный отчет об исследованиях и полевой консервации археологического текстиля из гробницы ТТ 23 в Луксоре

Е. Г. Толмачева

В январе — феврале 2018 г. Центр египтологических исследований РАН провел десятый сезон археологических исследований в гробнице ТТ 23. В ходе этого сезона в соответствии с предварительно выработанной методикой было исследовано и подвергнуто полевой консервации около 300 образцов археологического текстиля. Большинство тканей составляют бинты и погребальные пелены.

Ключевые слова: археологический текстиль, гробница Чаи, Луксор, бинты, погребальные пелены.