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Early Bronze Age Textile Imprints from Tall Bderi and Tall Mozan, Northern Mesopotamia/Syria

Introduction

Cuneiform tablets from the Ebla deriving from the third millennium BC document that the production of textiles was a highly developed craft in Mesopotamian civilisation in this period (Barber 1991, 166). As true textiles are rarely preserved in Mesopotamian excavations, it is more often the imprints that are left to us that convey information about techniques, yarns and quality of objects from the ancient world. The most fortunate finds are those precise imprints which enhance greatly the possibility of determining original fibres in the manufacture of the textile. The following article is an overview of the examination of textile imprints found at two excavation sites in northern Mesopotamia/Syria (Fig. 1). At Tall Bderi, imprints were found on vessel fragments that were made of gypsum. The imprinted textiles were used to build up and stabilise the gypsum during their production. At Tall Mozan most of the textile imprints were visible on the backs of clay imprints but also found as bitumen imprints and on the bases of a pottery vessels. For the textile imprints found in clay, textiles were used to cover trade goods, which were sealed with clay and secured with cylinder seals. The bitumen imprint was from a floor mat and was found near a fireplace. The floor mat was coated with bitumen for fire protection. Textile imprints on the bases of pottery vessels are often from the mats on which the vessels were stored during the production process during air drying and before burning (Crowfoot 1938, 3-11; Shamir and Baginski 1993, 9-10; Tufnell 1958, 72). In all cases a wide range of textile techniques

and quality levels were exhibited. Investigation and documentation of these imprints were carried out as part of Ulrike Rothenhäusler's studies at the State Academy of Art and Design, Stuttgart, Germany in the Faculty of Object Conservation. Antoinette Rast-Eicher, of Archeotex, Enneda, Switzerland, conducted analysis of fibres imprints under the scanning electron microscope (SEM).

All textile imprints and their casts were examined under microscopic magnification (5-10x) and the criteria considered included dimension and spinning direction of the yarns, thread diameter, thread count per square centimetre, textile structure, chronology, stratigraphy and state of preservation. All imprints were photographed. In cases of unclear or badly distorted images, drawings and textile reconstructions were attempted. For a more refined identification of those imprints on clay from Tall Mozan, Plasticine™ was incorporated to create a positive image of the textile.

As compared to the study of actual textiles, examination of textile imprints is limited to surface inspection. The imprint material has been known to shrink or expand during drying, however with clay or pottery significant shrinkage cannot be expected below 1000°C. Furthermore, the warp and weft of a textile could only be determined when selvages or sometimes flaws in weaving were imprinted. Of the 164 analysed imprints from both excavations, only 5 cases seemed to have evidence which allowed recognition of the warp and weft.

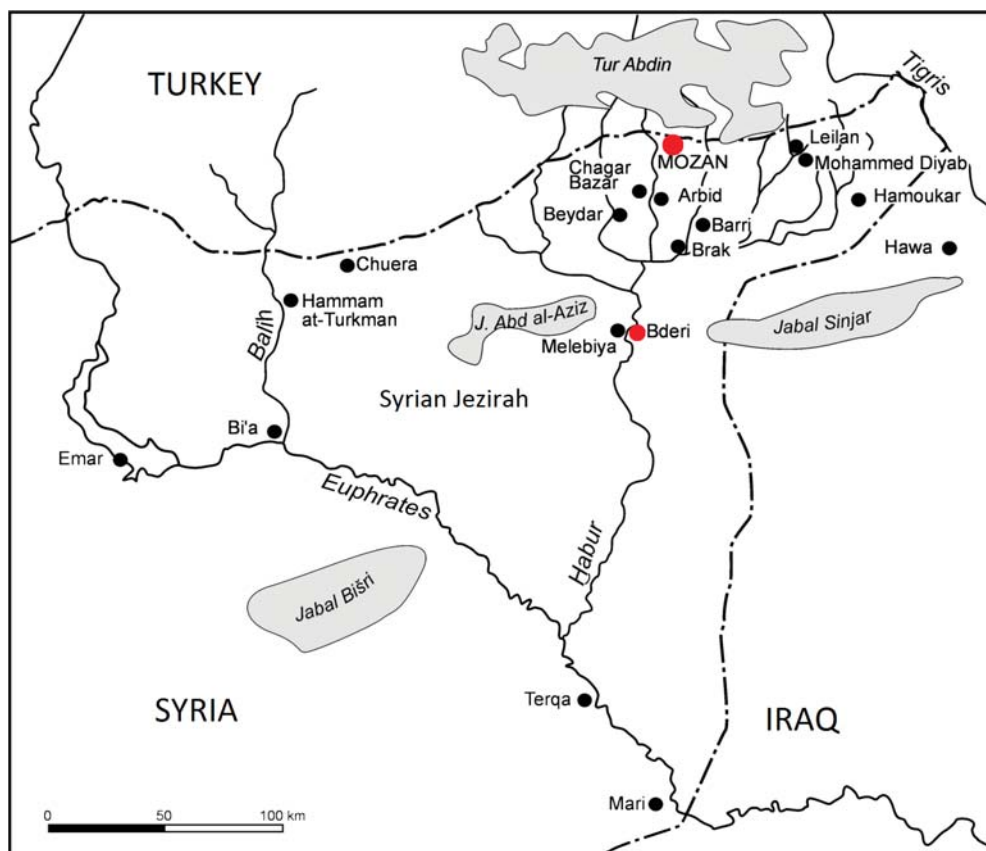


Fig. 1. Location of the two excavation sites in North Mesopotamia/Syria (After Bianchi *et al.* 2014, S. 2 Abb. 1).

The gypsum imprints from Tall Bderi

During the 1985-1990 excavations at Tall Bderi under the local direction of Peter Pfälzner, numerous gypsum fragments with textile imprints were found (Pfälzner 1990, 212-221; Pfälzner, 1993, 49-62; Pfälzner 1994, 244-247, 250-255, 273-274, 282-284). In the summer of 1998, to retrieve optimum information from the textiles, 72 of the gypsum fragments were cast with gypsum after isolation using talc. These casts were brought to the University of Tübingen, Germany, and examined in 2001 by Ulrike Rothenhäusler. The cast pieces have an average size of 7.5 x 6.0 centimetres (maximum size 10.3 cm, minimum size 3.5 cm). While the original fragments exposed the negative imprint of the textiles, the casts now gave the positive image.

The textiles seemed to have been used in the production of gypsum vessels and helped to build up and strengthen the vessels. Gypsum was also used for the insulation of basketry (Kingery *et al.* 1988, 219-244). At Tall Bderi, three kinds of gypsum vessels were found: storage vessels, bowls and discs, which were used as vessel covers. The large storage vessels have on average a height of 80cm and a width of 50 cm; the sherds found belonging to it were 3-4 cm thick.

The bowls, with round, oval or nearly rectangular diameters, showed an average height of 10-30 cm, a width from 30-50 cm and sherd thicknesses of 2-4 cm.

Textile techniques used in Tall Bderi

Basketry techniques were recognised on 24 imprints, with the following identifications: coiled ware (n=1), stake-frame basketry (n=8), plain weave 2/1 (n=12), twill weave 6/6 (n=2), and twining (n=1). Most basketry techniques were found only on the gypsum discs (vessel covers). The stake-frame basketry constitutes an exception, the gypsum being used to tighten the basketry.

Two different types of weave could be determined from the textile imprints: one group was a plain weave (= 17); the second group (n=19) a more complicated identification as one system was not visible. In total, three different techniques were given as possibilities: rep-like plain weave, plain weave 2/1, and twining. The woven textiles were used in the manufacture of gypsum vessels (n=29), bowls (n=5) as well as a disc.

The following selection shows the variety of the textile imprints from Tall Bderi:



Fig. 2. Imprint BD 89/2745/204-1FS 890 from Tall Bderi (© Ulrike Rothenhäusler).



Fig. 3. Imprint BD 89/2745/170-2 FS 725 from Tall Bderi (© Ulrike Rothenhäusler).

1. BD 89/2745/204-1 FS 890 (Fig. 2)

Size: 7.3 x 7.3 cm

Textile structure: twill weave 6/6

Thread: zS/zS, diameter: 5/5 mm

Thread count: 10/10 threads in 4 cm

Used as a gypsum disc

Date: EJ IIIb (2400-2200 BC)

2. BD 89/2745/170-2 FS 725 (Fig. 3)

Size: 7.6 x 5.4 cm

Textile structure: plain weave 2/1

Thread: zS/zS, diameter: 12/20 mm

Thread count: 8/3 threads in 4 cm

Imprint on a gypsum disc

Date: EJ IIIb (2400-2200 BC)

3. BD 86/2945/546-1, FS 178 (Fig.4)

Size: 8.3 x 7.0 cm

Textile structure: plain weave

Thread: s/s, diameter: 0.5-1/1-2 mm

Thread count: 7/4 threads in 1 cm

Imprint on a fragment of a storage vessel

Date: EJ IV (2300-2100 BC)

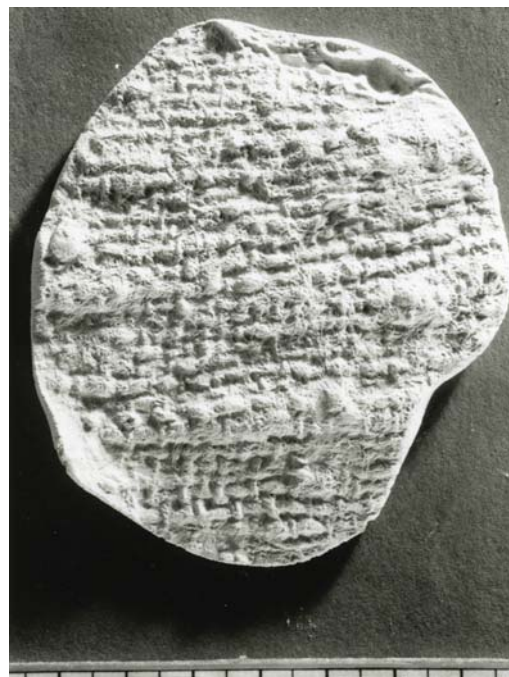


Fig. 4. Imprint BD 86/2945/546-1, FS 178 from Tall Bderi (© Ulrike Rothenhäusler).



Fig. 5. Imprint BD 86/2941/066-1 from Tall Bderi (© Ulrike Rothenhäusler).

4. BD 86/2941/066-1 (Fig. 5)

Size: 8.4 x 4.4 cm

Textile structure: rep-like plain weave

Thread: s/?, diameter: 0.5-0.7/1.5 mm

Thread count: 23/5 threads in 1 cm

Imprint on a fragment of a storage vessel

Date: EJ II-IIIa, (2850-2400 BC)

5. BD 88/2745/077-6, FS 480 (Fig. 6)

Size: 6.5 x 5.9 cm

Textile structure: rep-like plain weave

Thread: s/s, diameter: 0.3-0.5/0.7-1.2 mm

Thread count: 6/17 threads in 1 cm

Imprint on a fragment of a storage vessel

Date: EJ IIIb (2400-2200 BC)



Fig. 6. Imprint BD 88/2745/077-6, FS:480 from Tall Bderi (© Ulrike Rothenhäusler).

Dating

The textile imprints in gypsum were excavated from nearly all stratigraphic layers and dated from between 2850 and 2100 BC (Early Jezirah (EJ) II – Early Jezirah IV). The number of the imprints and the range of techniques have a tendency to increase from the early to the more recent stratigraphic layers. The stake-frame form of basketry appears to be the earliest technique and dates from between 2850 and 2400 BC. Also from this time period there is a textile imprint of a plain weave with one hidden system. The earlier stratigraphic layers hold more of the basketry imprints while fabrics of a finer quality register more often in the recent layers. The largest quantities of imprints as well as the greatest variety of techniques were found in the period from 2500 to 2250 BC (EJ IIIb).



Fig. 7. Illustration of the front side of a sealing (© Universität Tübingen, Projekt Tall Mozan, Photo: K. Wita).

Clay, ceramic and bitumen imprints from Tall Mozan

The examined imprints were excavated in the upper city of Tall Mozan/Urkish, Syria, in the years 1998-2001 during excavations undertaken by the Deutsche Orient Gesellschaft under the direction of Peter Pfälzner and Heike Dohmann-Pfälzner, University of Tübingen (Bianchi *et al.* 2014; Dohmann-Pfälzner and Pfälzner 2001, 2002). Textile imprints were found on 92 clay seals, on one fragment of a pottery vessel base and in bitumen.

Research on the seals and seal impressions of northern Mesopotamia has a long tradition. The fronts of the clay imprints show an impressive wealth of seal illustrations (Fig. 7). Not only are the fronts of the seals with their excellent illustrations, but the backs are also very interesting as they show a variety of features according to their use. Seals were used to seal doors and to protect the contents of pottery vessels and other containers. The vessels were often covered

with textiles and closed with threads. To secure the contents, clumps of pliant loam were applied to the textile and threads and afterwards sealed with cylinder seals. Because pottery vessels, other trade goods and doors could be sealed, we also find wood, leather, felt or straw on clay imprints, all of them materials that are usually not preserved in archaeological contexts (Otto 2004).

From the textile imprints found at Tall Mozan the following basketry techniques could be identified: coiled basketry, stake-frame basketry, twill weave 2/2, twill weave 4/4, twill weave 6/6 and simple linking. Of the woven textiles the techniques are plain weave, plain weave 2/1, plain weave 2/2 and rep-like plain weave. As was the case with the imprints from Tall Bderi, the latter technique cannot be precisely determined, although it could possibly be a plain weave 2/1 or twining.



An idea of the variety and quality of textiles in use can be given from the following examples:

1. MZ01C2-i2973 (Fig. 8)

Size: 3.1 x 2.9 cm

Textile structure: coiled basketry

Thread: ?/? , diameter: 2/8 mm

Thread count: 9/3 threads in 1 cm

Date: EJ IIIb (2400-2200 BC)

2. MZ01C2-i2677 (Fig. 9)

Size: 3.0 x 3.1 cm

Textile structure: simple linking

Thread: zS, diameter: 2.5-3.0 mm

Date: EJ IIIa (2600-2400 BC)

3. MZ01C2-i3056 (Fig. 10)

Size: 2.4 x 1.9 cm

Textile structure: plain weave

Thread: s/s, diameter: 0.6-0.8/0.6-0.8 mm

Thread count: 4/4 threads in 1 cm

Date: EJ IIIa-V (2600-2000 BC)

4. MZ01C2-i3055 (Fig. 11)

Size: 1.8 x 1.9 cm

Textile structure: rep-like plain weave,

Thread: s/? , diameter: 0.05-0.1/≤ 0.6 mm

Thread count: 96/9 threads in 1 cm

Date: EJ IIIa-V (2600-2000 BC)

5. MZ01C2-i2073 (Fig. 12)

Size: 4.1 x 1.9 cm

Textile structure: plain weave 2/2

Thread: s/s, diameter: 0.1-0.2/0.2 mm

Thread count: 66/15 threads in 1 cm

Date: EJ IIIa-V (2600-2000 BC)

6. MZ01C2-i3019 (Fig. 13)

Size: 1.4 x 1.6 cm

Textile structure: plain weave 2/1

Thread: s/s, diameter: 0.3-0.6/1.2-1.5 mm

Thread count: 16/6 threads in 1 cm

Date: EJ IIIa-V (2600-2400 BC)

7. MZ01C2-i1348 (Fig. 14)

Size: 2.0 x 1.6 cm

Textile structure: plain weave

Thread: s/s, diameter: 0.5-0.6/2.0-2.5 mm

Thread count: 18/3 threads in 1 cm

Date: OJ I (1900-1800 BC)

Random: Twining

Tread: z, diameter: 1.2 mm



Fig. 8. Imprint MZ01C2-i2973 from Tall Mozan
(© Universität Tübingen, Projekt Tall Mozan, Photo: K. Wita).



Fig. 9. Imprint MZ01C2-i2677 from Tall Mozan
(© Universität Tübingen, Projekt Tall Mozan, Photo: K. Wita).



Fig. 10. Imprint MZ01C2-i3056 from Tall Mozan
(© Universität Tübingen, Projekt Tall Mozan, Photo: K. Wita).



Fig. 11. Imprint MZ01C2-i3055 from Tall Mozan (© Universität Tübingen, Projekt Tall Mozan, Photo: K. Wita).



Fig. 14. Imprint MZ01C2-i1348 from Tall Mozan (© Universität Tübingen, Projekt Tall Mozan, Photo: K. Wita).



Fig. 12. Imprint MZ01C2-i2073 from Tall Mozan (© Universität Tübingen, Projekt Tall Mozan, Photo: K. Wita).



Fig. 13. Imprint MZ01C2-i3019 from Tall Mozan (© Universität Tübingen, Projekt Tall Mozan, Photo: K. Wita).

Dating

The 92 textile imprints date from 2600 BC until the late medieval or even modern period. The majority of imprints (n=28) were dated to between 2600 and 2400 BC with another 12 being classified as from 2400-2300 BC. Most of the techniques identified are in evidence until 2600-2400 BC, the exception being the coiled basketry, which could be dated to 2400-2300 BC and the twill weave 2/2 dating from 2300 to 2100 BC.

Fibre analyses

Six samples of fibre imprints were examined using a scanning electron microscope (SEM). Unfortunately, clay as an imprint material is not precise enough to show the characteristic surface of a wool fibre (Fig. 15). With a measurable diameter and evidence of rounded fibres, however, the samples of imprint MZ 01C2-i3080 and imprint MZ00C2-i1644 appeared to be similar to wool fibres. Imprint MZ 01C2-i3080 dates between 2400 and 2100 BC (EJ IIIb-IV) and imprint MZ00C2-i1644 between 2000 and 1800 BC (Old Jezira I). Fibres from the string on imprint MZ01C2-i1751 show evidence of bast fibres. There is a diameter of 40-100 micron, much thicker than it would be for the fibres of linen or hemp (these normally being 10-15 micron thick) (Fig. 16). The fibres of the three other imprints could not be identified.

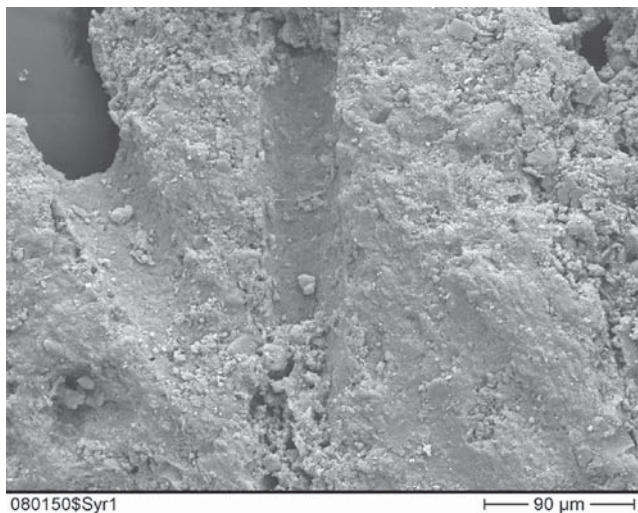


Fig. 15. Imprint MZ00C2-i1644 from Tall Mozan. Because of the rounded fibre imprint and a diameter of 60-70 micron this is most likely a wool fibre (analysis and picture ©Archeotex, Enneda, Photo: A. Rast-Eicher).

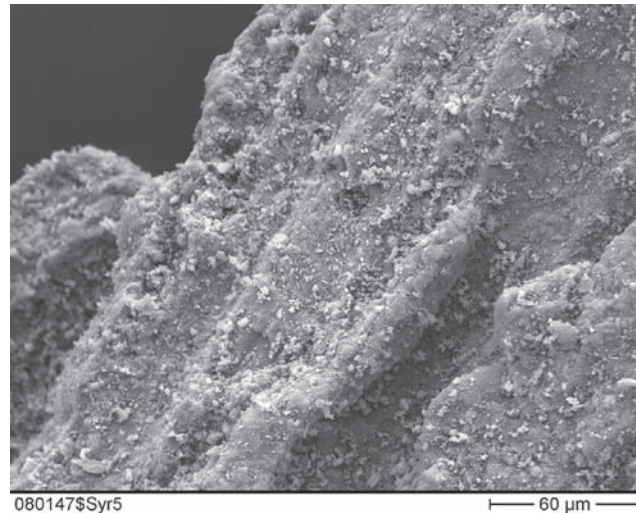


Fig. 16. Fibres from the string on imprint MZ01C2-i1751 from Tall Mozan show in the SEM nodes which is evidence of bast fibres. The fibres have a diameter of 40-100 micron (analysis and picture ©Archeotex, Enneda, Photo: A. Rast-Eicher).

Conclusion

The textile impressions discussed here are a selection from the 164 impressions identified at two excavation sites. The analysis of the complete material, which was done during the studies of Ulrike Rothenhäusler, shows more variations in textile technique and more details like flaws in weaving and textile borders. The work described here demonstrates how productive collaboration between an archaeologist and a textile specialist can be. As clay seals are common finds at excavation sites in Mesopotamia, the identification of textiles and other organic impressions on the backs of them is a topic with huge potential for further illuminating research.

Acknowledgements

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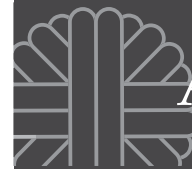
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