# Textile tools from Archontiko, northern Greece

Papadopoulou, Evi; Andersson Strand, Eva; Nosch, Marie Louise Bech; Cutler, Joanne

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# Tools, Textiles and Contexts

*We dedicate this book to Betchen Barber,*
*the pioneer of the study of Aegean Bronze Age textiles.*

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# Tools, Textiles and Contexts

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*Eva Andersson Strand and Marie-Louise Nosch*

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*Front cover: clockwise: MM II Quartier Mu, Malia, Crete, map (after Poursat 1996, pl. 81), spindle whorls from Phaistos, Crete (courtesy of P. Militello), Khania, Crete, Late Bronze Age ribbon, reconstructed loom weights in TTTC experiments.*
*Back cover: Splicing (drawing: Annika Jeppsson)*

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# Chapter 6.11

# Textile tools from Archontiko, northern Greece

*Evi Papadopoulou, Eva Andersson Strand, Marie-Louise Nosch and Joanne Cutler*

Archontiko is a tell settlement, situated in northern Greece. Systematic excavation at the site has brought to light three successive building horizons that belong to the Early Bronze Age period. The earliest one, Phase IV, is dated to 2135–2020 BC and has yielded seven oblong post-framed houses that were destroyed by a fire incident which produced rich archaeological deposits often containing contexts of closed finds (Papaefthymiou-Papanthimou *et al.* 2003; Papadopoulou *et al.* 2010; Papanthimou and Papadopoulou in press). House interiors were equipped with various types of clay features, namely storage bins and thermal structures, that were preserved in good condition (Papaefthymiou *et al.* 2007). Phase IV strata were uncovered over an area of 220 $m^2$ and yielded 160 artifacts related to textile production. Spindle whorls, loom weights and rounded sherds constitute the basic textile tool categories.

*Fig. 6.11.1. House A (from west). Detail of its interior. A group of clay storage bins and some thermal structures characterise its fixed equipment (photo: Papanthimou and Pilali 2003, 26–27).*

The tools recorded in the TTTC database originate from a Phase IV building, House A, and constitute a closed assemblage representative of domestic textile production at EBA Archontiko (Fig. 6.11.1)

Although only partially excavated, House A yielded a total of 33 textile tools, namely 27 loom weights and six spindle whorls that were collected from a surface area of *c.* 23 $m^2$ (Fig. 6.11.2).

## Spindle whorls and spinning

The six recorded spindle whorls from House A (four conical, one flattened biconical and one cylindrical) vary in weight from 25 g to 68 g, indicating that the Archontiko spinners could have spun different types of yarn by choosing

different whorls (Figs. 6.11.3 and 6.11.4). The yarn, according to the results of the spinning tests, would generally be quite thick, however (see chapters 2 and 4.1).

## Loom weights and weaving

Twenty-six of the recorded loom weights from House A are pyramidal truncated in shape and are made of clay (17 are made of fired clay, five of unfired clay and four are unspecified) (Fig. 6.11.5). There is, however, one example that is a naturally perforated irregular pebble. Twenty-three of the loom weights had a recordable weight and thickness; their weight varies from 154 g to 1179 g and their thickness varies from 4.1 cm to 8.8 cm (Fig. 6.11.6).

Twelve loom weights (11 clay weights and the naturally perforated pebble) were found near a clay storage bin at the eastern end of the house (Trench ID-Y). The weight of the clay loom weights varies from 220 g to 337 g and the thickness from 4.1 cm to 5.8 cm (Fig. 6.11.4) These loom weights could all be used in the same setup, with thread needing *c.* 15–20 g tension. Used in a tabby weave with thread requiring *c.* 15 g tension, the resulting fabric would have *c.* 6–9 warp threads per centimetre; with thread needing *c.* 20 g tension, the thread count would be *c.* 4–7 threads per centimetre (Fig. 6.11.7). However, in a balanced weave the finished textile would have been open, and it is therefore likely that the textile would have been weft faced. These loom weights could also have been used for producing different types of twills, with a resulting denser fabric (approximately double the thread count of a tabby weave). Even this fabric would have been quite open if balanced, and it is likely that the textile would have been slightly weft faced. If this group of loom weights was used in the same tabby setup, with six loom weights in the front row and six loom weights in the back row, the width of the

*Fig. 6.11.2. Textile tools from House A, EBA, Phase IV, by type and context.*

| | Spindle whorl | Loom weight | Total |
|---|---|---|---|
| **Trench IG, House A** | 4 | 8 | **12** |
| **Trench IG-ID, House A** | | 1 | **1** |
| **Trench IG-P, House A** | 2 | 2 | **4** |
| **Trench ID, House A** | | 4 | **4** |
| **Trench ID-Y, House A** | | 12 | **12** |
| **Total** | **6** | **27** | **33** |

*Fig. 6.11.3. Spindle whorls, EBA, Phase IV, House A (photo: courtesy of E. Papadopoulou).*

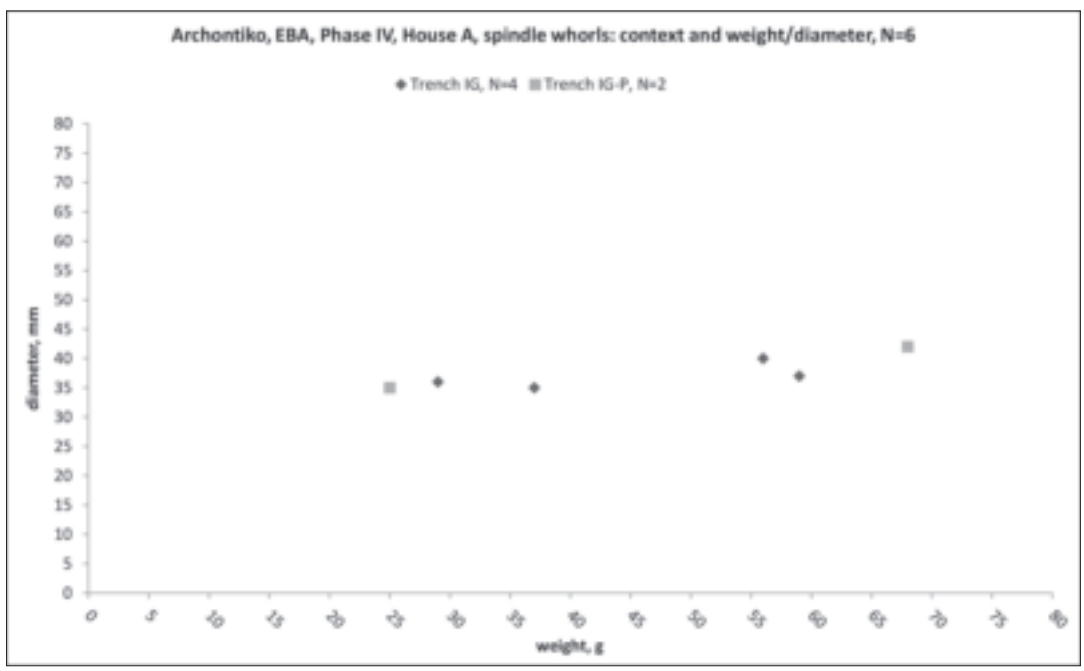


*Fig. 6.11.4. Spindle whorls, EBA, Phase IV, House A: context and weight/diameter.*

fabric would have been *c.* 26.5 cm, which has to be considered as a narrow fabric. If producing a twill fabric with four rows of loom weights, the width would be only *c.* 13.2 cm.

A group of eight loom weights was recovered near the centre of the house (Trench IG). They have a heavier weight and larger thickness than the loom weights from Trench ID-Y (Fig. 6.11.6). Seven of the loom weights vary in weight from 468 g to 600 g and have a thickness of 5.5–6.3 cm. The eighth loom weight weighs 1134 g and is 8.3 cm thick, and would not have functioned optimally with the other weights in the same loom setup. The seven loom weights would all function with thread needing *c.* 20 g to 50 g tension (Fig. 6.11.8). In a tabby weave with thread requiring *c.* 20 g tension, the warp thread count would be *c.* 8–11 threads per centimetre, whereas with thread needing *c.* 50 g tension the thread count would be *c.* 3–4 threads per centimetre (in a twill the thread count would be approximately double). In both a tabby and a twill weave, the fabrics could have been quite balanced. The total thickness of the loom weights is 41.3 cm. In a tabby setup with eight loom weights with a similar weight and thickness (four in the front row and four in the back row), the width of the fabric would be a minimum of 23.6 cm, which has to be considered as a narrow fabric. The heavier loom weight weighing 1134 g could only function with yarn needing *c.* 40 g tension or more; the four loom weights from Trench ID, located at the east part of the house would also only work well with thread requiring *c.* 40 g tension or more.

## Summary

The number of tools from Archontiko presented in this chapter is small, but the 33 objects recorded reveal a considerable diversity in the textile production. The same picture also emerges from the study of the textile toolkits

*Fig. 6.11.5. Pyramidal loom weights, EBA, Phase IV, House A (Trench ID-Y) (photo: courtesy of E. Papadopoulou).*


*Fig. 6.11.6. Loom weights, EBA, Phase IV, House A: context and weight/thickness.*

*Fig. 6.11.7. Loom weights, EBA, Phase IV, House A, Trench ID-Y: weight tension/ number of threads per cm in a tabby. The total number of analysed loom weights is 11.*

| Warp thr/cm | 10 g N=9 | 15 g, N=11 | 20 g, N=11 | 25 g, N=9 | 30 g, N=6 | 35 g, N=1 |
|---|---|---|---|---|---|---|
| **3 thr** | | | | | | |
| **4 thr** | | | 1 | 3 | 5 | 1 |
| **5 thr** | | | 4 | 5 | 1 | |
| **6 thr** | | 1 | 3 | 1 | | |
| **7 thr** | | 5 | 3 | | | |
| **8 thr** | | 3 | | | | |
| **9 thr** | 1 | 2 | | | | |
| **10 thr** | 1 | | | | | |
| **11 thr** | 3 | | | | | |
| **12 thr** | 3 | | | | | |
| **13 thr** | 1 | | | | | |

| Warp thr/cm | 20 g, N=7 | 25 g, N=7 | 30 g, N=7 | 35 g, N=7 | 40 g, N=7 | 45 g, N=7 | 50 g, N=7 | 55 g, N=2 | 60 g, N=2 |
|---|---|---|---|---|---|---|---|---|---|
| **3 thr** | | | | | | | 3 | | 1 |
| **4 thr** | | | | | 3 | 6 | 4 | 2 | 1 |
| **5 thr** | | | 2 | 5 | 4 | 1 | | | |
| **6 thr** | | 2 | 4 | 2 | | | | | |
| **7 thr** | | 2 | 1 | | | | | | |
| **8 thr** | 3 | 2 | | | | | | | |
| **9 thr** | 1 | 1 | | | | | | | |
| **10 thr** | 2 | | | | | | | | |
| **11 thr** | 1 | | | | | | | | |

*Fig. 6.11.8. Loom weights, EBA, Phase IV, House A, Trench IG: weight tension/ number of threads per cm in a tabby. The total number of analysed loom weights is seven.*

recovered from other contemporaneous houses belonging to Phase IV as well as from the two successive EBA Phases II and III (Papadopoulou 2012; 2002, unpublished). The yarns produced with the spindle whorls would have been suitable for several types of fabrics, as suggested by the analyses of the loom weights.

For example, the thread spun with the whorls weighing 55 g or more would have probably functioned very well in the weaves with the heavy loom weights weighing more than 900 g. The result would have been a coarse textile with few but thick threads per centimetre. The spindle whorls weighing between 25–40 g would have been optimal for producing yarn that needed *c.* 20 g tension or more on the loom.

The majority of the tools are considered to have been made in a good production quality. The majority of the loom weights (except for the stone weight) are of the same type regarding shape. As far as the material and the surface treatment there is some diversity, since the light group consists of fired and polished weights, whereas the other two categories are mainly made of unfired clay and are burnished. Four of the six spindle whorls were of the same type and shape. This fact does not seem coincidental, and suggests considerable knowledge of how to produce textiles in an optimal way.

The textile production in Archontiko appears to have been well developed. The spinners and weavers knew how different types of tools affected the final products and also the tools themselves were well made. The analysis of the spindle whorls demonstrates that the spinners spun different types of yarn; the variation within the loom weights and the variation within the spindle whorls indicate that the people of Archontiko produced many different types of textiles with both thin and thick threads and in balanced, open and/or weft faced weaves.

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