



Københavns Universitet



Introduction to the CTR database

Andersson Strand, Eva; Nosch, Marie Louise Bech

Published in:

Tools, Textiles and Contexts: Investigating Textile Production in the Aegean and Eastern Mediterranean Bronze Age

Publication date:

2015

Document version

Publisher's PDF, also known as Version of record

Citation for published version (APA):

Andersson Strand, E., & Nosch, M. L. B. (2015). Introduction to the CTR database. In E. Andersson Strand, & M-L. Nosch (Eds.), *Tools, Textiles and Contexts: Investigating Textile Production in the Aegean and Eastern Mediterranean Bronze Age* (pp. 145-152). Oxbow Books.

This pdf of *Tools, Textiles and Contexts* belongs to the publishers Oxbow Books and it is their copyright.

As author you are licenced to make up to 50 offprints from it, but beyond that you may not publish it on the World Wide Web until three years from publication (October 2018), unless the site is a limited access intranet (password protected). If you have queries about this please contact the editorial department at Oxbow Books (editorial@oxbowbooks.com).

TOOLS, TEXTILES AND CONTEXTS

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

AN OFFPRINT FROM
ANCIENT TEXTILES SERIES VOL. 21

TOOLS, TEXTILES AND CONTEXTS

Investigating Textile Production in the Aegean
and Eastern Mediterranean Bronze Age

Hardcover Edition: ISBN 978-1-84217-472-2

Digital Edition: ISBN 978-1-78297-051-4

edited by

Eva Andersson Strand and Marie-Louise Nosch
with the editorial and analytical assistance of Joanne Cutler



© Oxbow Books 2015
Oxford & Philadelphia
www.oxbowbooks.com

Published in the United Kingdom in 2015 by
OXBOW BOOKS
10 Hythe Bridge Street, Oxford OX1 2EW

and in the United States by
OXBOW BOOKS
908 Darby Road, Havertown, PA 19083

© Oxbow Books and the individual authors 2015

Hardcover Edition: ISBN 978-1-84217-472-2
Digital Edition: ISBN 978-1-78297-051-4

A CIP record for this book is available from the British Library

Library of Congress Cataloging-in-Publication Data

Tools, textiles and contexts : textile production in the Aegean and Eastern Mediterranean Bronze Age / edited by Eva Andersson Strand and Marie-Louise Nosch.

pages cm. -- (Ancient textiles series; vol. 21)

Includes bibliographical references.

ISBN 978-1-84217-472-2 (hardback)

1. Bronze age--Middle East. 2. Textile fabrics, Prehistoric--Middle East. 3. Neolithic period--Middle East. 4. Bronze age--Aegean Islands (Greece and Turkey) 5. Neolithic period--Aegean Islands (Greece and Turkey) 6. Middle East--Antiquities. 7. Aegean Islands (Greece and Turkey)--Antiquities. I. Strand, Eva B. Andersson, editor. II. Nosch, Marie-Louise, editor.

GN778.32.N4T66 2015

939.4--dc23

2015027222

All rights reserved. No part of this book may be reproduced or transmitted in any form or by any means, electronic or mechanical including photocopying, recording or by any information storage and retrieval system, without permission from the publisher in writing.

Printed in Malta by Melita Press Ltd

For a complete list of Oxbow titles, please contact:

UNITED KINGDOM

Oxbow Books

Telephone (01865) 241249, Fax (01865) 794449

Email: oxbow@oxbowbooks.com

www.oxbowbooks.com

UNITED STATES OF AMERICA

Oxbow Books

Telephone (800) 791-9354, Fax (610) 853-9146

Email: queries@casemateacademic.com

www.casemateacademic.com/oxbow

Oxbow Books is part of the Casemate Group

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)

CONTENTS

Introduction.....	vii
Chapter 1 Research history	
1.1 An introduction to the investigation of archaeological textile tools.....	1
<i>Lorenz Rahmstorf</i>	
1.2 An introduction to experimental archaeology and textile research.....	25
<i>Linda Olofsson</i>	
Chapter 2 The basics of textile tools and textile technology – from fibre to fabric.....	39
<i>Eva Andersson Strand</i>	
Chapter 3 Survey of archaeological textile remains from the Aegean and Eastern Mediterranean area	61
<i>Irene Skals, Susan Möller-Wiering and Marie-Louise Nosch</i>	
Chapter 4 The TTTC experiments	
4.1 Experimental testing of Bronze Age textile tools	75
<i>Linda Olofsson, Eva Andersson Strand and Marie-Louise Nosch</i>	
4.2 External examination of spinning and weaving samples.....	101
<i>Susan Möller-Wiering</i>	
4.3 Test of loom weights and 2/2 twill weaving	119
<i>Linda Olofsson and Marie-Louise Nosch</i>	
4.4 Weaving with crescent shaped loom weights. An investigation of a special kind of loom weight	127
<i>Agnete Wisti Lassen</i>	
4.5 From tools to textiles, concluding remarks.....	139
<i>Eva Andersson Strand</i>	
Chapter 5 The TTTC database	
5.1 Introduction to the CTR database.....	145
<i>Eva Andersson Strand and Marie-Louise Nosch</i>	
5.2 Mathematical analysis of the spindle whorl and loom weight data in the CTR database.....	153
<i>Richard Firth</i>	

Chapter 6 Textile tools in contexts

6.1	Textile tools and textile production – studies of selected Bronze Age sites: introduction.....	191
	<i>Eva Andersson Strand, Marie-Louise Nosch and Joanne Cutler</i>	
6.2	Textile tools from Khania, Crete, Greece.....	197
	<i>Maria Bruun-Lundgren†, Eva Andersson Strand and Birgitta P. Hallager</i>	
6.3	Textile tools from Ayia Triada, Crete, Greece.....	207
	<i>Pietro Militello, Eva Andersson Strand, Marie-Louise Nosch and Joanne Cutler</i>	
6.4	Textile tools from Phaistos, Crete, Greece.....	215
	<i>Pietro Militello, Eva Andersson Strand, Marie-Louise Nosch and Joanne Cutler</i>	
6.5	Textile tools from Quartier Mu, Malia, Crete, Greece.....	229
	<i>Jean-Claude Poursat, Françoise Rougemont, Joanne Cutler, Eva Andersson Strand and Marie-Louise Nosch</i>	
6.6	Textile tools from Akrotiri, Thera, Greece.....	243
	<i>Iris Tzachili, Stella Spantidaki, Eva Andersson Strand, Marie-Louise Nosch and Joanne Cutler</i>	
6.7	Textile tools from Midea, mainland Greece.....	247
	<i>Katie Demakopoulou, Ioannis Fappas, Eva Andersson Strand, Marie-Louise Nosch and Joanne Cutler</i>	
6.8	Textile production at Mycenae, mainland Greece.....	253
	<i>Iphiyenia Tournaitou, Eva Andersson Strand, Marie-Louise Nosch and Joanne Cutler</i>	
6.9	Textile tools from Tiryns, mainland Greece.....	267
	<i>Lorenz Rahmstorf, Małgorzata Siennicka, Eva Andersson Strand, Marie-Louise Nosch and Joanne Cutler</i>	
6.10	Textile tools from Thebes, mainland Greece.....	279
	<i>Maria Emanuela Alberti, Vassilis Aravantinos, Ioannis Fappas, Athina Papadaki, Françoise Rougemont, Eva Andersson Strand, Marie-Louise Nosch and Joanne Cutler</i>	
6.11	Textile tools from Archontiko, northern Greece.....	293
	<i>Evi Papadopoulou, Eva Andersson Strand, Marie-Louise Nosch and Joanne Cutler</i>	
6.12	Textile tools from Sitagroi, northern Greece.....	299
	<i>Ernestine S. Elster, Eva Andersson Strand, Marie-Louise Nosch and Joanne Cutler</i>	
6.13	Textile tools from Troia, western Anatolia.....	309
	<i>Marta Guzowska, Ralf Becks, Eva Andersson Strand, Joanne Cutler and Marie-Louise Nosch</i>	
6.14	Textile tools from Apliki, Cyprus.....	329
	<i>Joanna S. Smith, Joanne Cutler, Eva Andersson Strand and Marie-Louise Nosch</i>	
6.15	Textile tools from Kition, Cyprus.....	337
	<i>Joanna S. Smith, Joanne Cutler, Eva Andersson Strand and Marie-Louise Nosch</i>	
6.16	Textile tools from Tel Kabri, Israel.....	347
	<i>Assaf Yasur-Landau, Nurith Gosben, Eva Andersson Strand, Marie-Louise Nosch and Joanne Cutler</i>	

Chapter 7	Summary of results and conclusions.....	351
	<i>Eva Andersson Strand and Marie-Louise Nosch</i>	

Appendices

	Appendix A: Textile remains in the Eastern Mediterranean area: Neolithic and Chalcolithic.....	385
	Appendix B: Textile remains in the Eastern Mediterranean area: Bronze Age.....	392
	Acknowledgements.....	402

CHAPTER 5.1

Introduction to the CTR database

Eva Andersson Strand and Marie-Louise Nosch

One of the main objectives of the TTTC research programme has been to record textile tools from several types of sites within our target area and date: the Aegean and the Eastern Mediterranean area in the Bronze Age. It has also been important to be able to compare tools in and between different contexts, sites and areas.

The challenge in this research programme has been that the recording of tools and contexts were done by not one person, but by a number of collaborators. In the past, the manner in which textile tools have been recorded has often been specific to a given archaeological site, making comparisons between sites difficult. It has also often been the case that just one or two of a tool's measurable dimensions have been documented; for example, only the height and diameter of loom weights, or only the diameter of spindle whorls, etc. To avoid the problem of different methods of recording, a textile tool database was designed in Microsoft Access 2003, based on earlier textile tool databases (e.g. Andersson 1999; Andersson 2003).¹ Forms were created for different types of tools: *loom weights*, *spindle whorls*, *needles* (Fig. 5.1.1), *spinning bowls* and *shuttles* (Fig. 5.1.2). In order to record tools of uncertain use that might be textile tools, a form for *other textile tools* was included. Each

form contains data fields that are specific to the function and morphology of a particular tool class, which makes it possible to record each tool type's dimensions; for example, weight and diameter on the spindle whorls and weight and thickness on the loom weights. Data fields such as *site*, *context*, *absolute date*, *relative date* etc. are the same in all forms (Fig. 5.1.3). Finally, a database manual was written in order to facilitate the work of our collaborators.

The original weight of incomplete loom weights, spindle whorls and 'other' textile tools was calculated where possible. In general, it is the *maximum* diameter, height, width and thickness that is recorded.

Textile tools are commonly recorded by type (see chapter 1). In the TTTC research programme it was important that all textile tools were recorded according to the same typology. To achieve this, we chose to use a typology principally based on only basic types of textile tools, and tables of illustrations of these different tool types were included in the database manual (Figs. 5.1.4 and 5.1.5). It should additionally be noted that, even when working with only basic textile tool shapes, some degree of subjectivity will always remain in the classification of textile tool assemblages. There is therefore inevitably some overlap between

Individual data fields for loom weights	Individual data fields for spindle whorls	Individual data fields for needles
Type	Type	Maximum length (mm)
Weight (g)	Weight (g)	Maximum thickness (mm)
Weight if not complete (g)	Weight if not complete (g)	Thickness at mid-shaft (mm)
Calculated weight (g)	Calculated weight (g)	Shape of head
Maximum height/diameter (mm)	Maximum diameter (mm)	Eye size (mm)
Maximum thickness (mm)	Maximum height (mm)	
Maximum width (mm)	Maximum hole diameter (mm)	
Number of holes	Hole shape	
Position of hole(s)	Surface treatment	
Maximum hole diameter range (mm)		
Groove		
Surface treatment		
Use wear		
Use wear description		

Fig. 5.1.1. Individual data fields for loom weights, spindle whorls and needles, used for recording the textile tools for all the sites.

Individual data fields for other textile tools	Individual data fields for spinning bowls	Individual data fields for shuttles
Weight (g)	Material	Maximum length (mm)
Weight if not complete (g)	Rim diameter (mm)	Minimum length (mm)
Calculated weight (g)	Base diameter (mm)	Maximum width
Maximum length (mm)	Maximum thickness (mm)	Minimum width
Minimum length (mm)	Maximum height (mm)	Maximum thickness (mm)
Maximum thickness (mm)	Number of handles	Opening
Minimum thickness (mm)	Thickness of handles	
Maximum diameter (mm)		
Minimum diameter (mm)		
Maximum height (mm)		
Minimum height (mm)		

Fig. 5.1.2. Individual data fields for “other” textile tools, spinning bowls and shuttles, used for recording the textile tools for all the sites.

Common data fields in all forms		
Find ID		Find category
Context ID		Number
Photo ID		Preservation status
Pictures		Material
Site		Material analysis
Region		Material description
Site type	settlement, farmhouse, villa, palace, citadel, necropolis, other	Object description
Context type	workshop, household, tomb, other	Production quality
Context description		Remarks
Context date: absolute		Comments
Context date: relative		Bibliography
Object date		Storage place

Fig. 5.1.3. Common data fields in all forms in the database.




















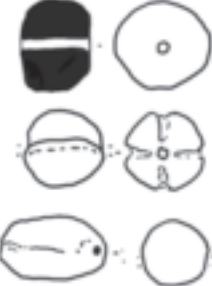
	discoid rounded (width and height similar)		hemispherical	 crescent	
	discoid elliptical (height considerably larger than width)		cylindrical: standard (axis length similar to width)	 biconical	
	discoid tabulated			long (axis length considerably larger than width)	 pyramidal
	semi-discoid		short (axis length considerably shorter than width)	 pyramidal truncated	
	flat trapezoidal		conical	 torus	
	flat rectangular		conical truncated	 cube	
	spool			spherical rounded (regular sphere) spherical ovoid (axis length larger than width)	

Fig. 5.1.4. Loom weight types (drawings after Evely 2000; Dabney 1996; Starmose Nielsen 1999; Barber 1991).

certain shape categories; for example, between torus and cylindrical short loom weights. However, the accompanying description in the database and photograph/drawing of a given tool generally make it possible to identify such discrepancies.

Once the textile tools from the sites included in the programme had been recorded, the individual databases were sent to CTR and all the data were processed as part of the TTTC research programme. Material from 24 sites was recorded by the collaborators (Fig. 5.1.6). In order to assess how published textile tools could be included in the overall discussion, material from another nine sites was recorded in the database from publications.

A total of 8725 textile tools, that is, 3896 loom weights, 3994 spindle whorls, 124 needles, 21 shuttles, 17 spinning bowls and 673 ‘other’ textile tools (Fig. 5.1.7) were registered in the database. The loom weights and the

spindle whorls constitute the two major classes of objects.

Of the 3896 loom weights, 1643 are complete, 624 have small fragments missing, while the remaining 1629 are incomplete. In the spindle whorl category, 2353 of the total 3994 spindle whorls are completely preserved, 692 whorls have small fragments missing and the remaining 949 are incomplete (Fig. 5.1.8).

Altogether, 2263 of the total number of loom weights have a complete/estimated weight recorded. Of these, 2031 also have a recorded preserved thickness (Fig. 5.1.9).

For the calculations of how a given loom weight would function in various loom setups, it is only possible to work with the loom weights that have both a weight and thickness recorded. In the majority of cases, these make up only a small proportion of the total number of tools from a context, site or region (Fig. 5.1.10). It has been important to take this into account

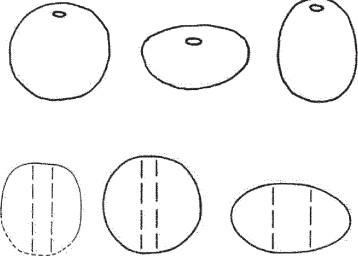
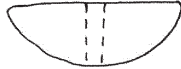
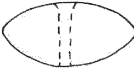





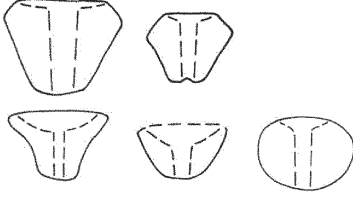
	<p>spherical</p>		<p>convex</p>
	<p>lenticular</p>		<p>conical</p>
	<p>biconical</p>		<p>cylindrical</p>
	<p>concave conical</p>		<p>discoid</p>
	<p>various shapes with hollow top</p>		

Fig. 5.1.5. Spindle whorl types (drawings after Beck 1928; Carington Smith 1992 and Gleba 2008).

Northern Greece	Mainland Greece	Crete	Aegean Islands	Western Anatolia	Central and Eastern Anatolia	Cyprus
Sitagroi	Tiryns	Khania	Ayia Irini	Troia	Karahüyük	Apliki
Archontiko	Midea	Ayia Triada	Akrotiri	Miletos	Arslantepe	Kition
	Asine	Phaistos			Beycesultan	
	Berbati	Pseira			Demircihüyük	
	Dendra	Kommos				
	Thebes	Mochlos				
	Mycenae	Malia				
	Nichoria	Myrtos				
		Knossos				

Fig. 5.1.6. The sites included in the research programme. The sites from which published materials were recorded are in boldface.

when calculating the weight range of the loom weights from each site/context. The weight range of the incomplete tools has therefore also been assessed in order to identify any object with a partial weight that indicates that its weight, if complete, would fall outside the weight range of the tools with complete/estimated weights.

For the calculations of what types of thread a given spindle whorl would be suitable for spinning, it is necessary to work with the spindle whorls which have a recorded weight and diameter. Of the 3994 spindle whorls registered in the database, 2819 spindle whorls (71%) have both weight and diameter recorded (Fig. 5.1.11). It should be noted that the reason that there are no spindle whorls with recorded weight and diameter from, for example, the Aegean islands, is not the lack of whorls, but a lack of recorded necessary data (Fig. 5.1.12).

For sites recorded by the collaborators, a technical textile tool report was written based solely on the information gathered from the textile tools, and giving the results of the analyses of the tools' dimensions, material and find contexts. In the processing of the data, all functional parameters were assessed, *i.e.* the parameters that affect textile production (based on the results of the experiments and on existing knowledge). The results for different periods and for different contexts within the site were also compared. Finally, a short summary was included on the interpretation of the textile production at the specific site based on the recordings, on the analyses of the material in the database, and on the site contexts.

Although tools from a large number of Bronze Age sites in the Aegean and Eastern

Textile Tools	Number
Loom weights	3896
Spindle whorls	3994
Needles	124
Other textile tools	673
Shuttles	21
Spinning bowls	17
Total	8725

Fig. 5.1.7. Number and type of textile tools. NB the number and type of tools are the tools recorded in the database. In the processing of the data, some tools were excluded as textile tools and some spindle whorls were reclassified as loom weights and vice versa.

Mediterranean have been included in the TTTC programme, it has of course not been possible to include data for every site from which textile tools have been recovered in this area. The sites analysed cover a wide time span and geographical area, with some areas/periods within the Bronze Age being much better represented in the database than others. Therefore, the results of the analyses cannot provide a wholly representative insight into textile production in this region during the Bronze Age.

Furthermore, in many cases it has not been possible to record all the tools from a site. For example, not all tools from Tiryns and Troia are included in the database. This makes it impossible to assess how representative the tools are from a given site, since the tools not recorded could change the overall conclusions.

Many of the tools have been recovered from mixed contexts or do not have a secure date. This has considerably reduced the number of tools which it has been possible to work with in terms of assessing textile production during a particular period or within a particular building at a specific site.

Fig. 5.1.8. Number of tools and preservation status.

	Loom weights	Spindle whorls
Complete	1643	2353
Small fragments missing	624	692
Rest	1629	949
Total	3896	3994

Fig. 5.1.9. Number of loom weights with a complete or estimated weight, and the number that also has a preserved thickness.

	Weight	Weight and thickness
Loom weights	2263	2031

Fig. 5.1.10. Loom weights with recorded weights and thicknesses, by region.

	Loom weights
Mainland Greece	107
Northern Greece	44
Aegean Islands	23
Crete	1136
Cyprus	97
Western Anatolia	404
Central and Eastern Anatolia	177
Levant	43
Total	2031

Fig. 5.1.11. Number of spindle whorls with a complete or estimated weight, and the number that also has a preserved diameter.

	Weight	Weight and diameter
Spindle whorls	2849	2819

Fig. 5.1.12. Spindle whorls with recorded weight and diameter, by region.

	Spindle whorls
Mainland Greece	578
Northern Greece	101
Aegean Islands	0
Crete	419
Cyprus	10
Western Anatolia	1548
Central and Eastern Anatolia	73
Levant	90
Total	2819

However, these problems are not related to the database, they are rather related to the nature of the material itself. The database greatly facilitates the sorting of the information it contains; for example, to pick out a particular tool type, context and time period within a given site. It also makes it easy to compare different time periods within a particular

building or given site as a whole. Even if the material cannot be taken as representative for the Aegean and Eastern Mediterranean Bronze Age, the tools recorded have provided a lot of new information on textile production. The strength of this research is that one can give an interpretation of how every single tool (with all functional dimensions recorded) could have functioned, and what type of production it was best suited for. Furthermore, in those cases where the tools are from good contexts, it is possible to discuss the textile production in this given context.

Therefore, in this publication we have focused on the evidence for the nature of textile production at given sites. The potential in this is that, as new material becomes available, it will be possible to integrate this with the existing results in order to build a much broader picture of Bronze Age textile production in the Aegean and Eastern Mediterranean. Whilst we cannot exclude the possibility that other types of textiles were also produced, the detailed information that the individual tools from the various sites can provide on textile production opens up new perspectives on what types of textiles were produced in this region during this period. This new information now makes it possible to include textile production in wider discussions concerning Bronze Age societies.

Note

- 1 We thank Birgitta Piltz Williams, Margarita Gleba, Marta Guzowska, Anne Batzer, Joanne Cutler and Linda Olofsson (former Mårtensson) for the collaborative work in the creation of the CTR database.

Bibliography

- Andersson, E. (1999) *The Common Thread: Textile Production During the Late Iron Age–Viking Age*. Lund. Institute of Archaeology, University of Lund.
- Andersson, E. (2003) *Tools for Textile Production from Birka and Hedeby: Excavations in the Black Earth 1990–1995*, Stockholm. Birka Project for Riksantikvarieämbetet.
- Barber, E. J. W. (1991) *Prehistoric Textiles: The Development of Cloth in the Neolithic and Bronze Ages with Special Reference to the Aegean*. Princeton. Princeton University Press.
- Beck, H. (1928) *Classification and Nomenclature of Beads and Pendants, Communicated to the Society of Antiquaries*. Oxford. John Johnson.
- Carington Smith, J. (1992) Spinning and weaving equipment, in Macdonald, W. A. and Wilkie, N. C. (eds), *Excavations at Nichoria in Southwestern Greece*.

2. *The Bronze Age Occupation*, 674–711. Minneapolis. University of Minnesota Press.
- Dabney, M. K. (1996) Ceramic loomweights and spindle whorls, in Shaw, J. W. and Shaw, M. C. (eds), *Kommos I. The Kommos Region and Houses of the Minoan Town. Part 2. The Minoan Hilltop and Hillside Houses*, 244–262. Princeton. Princeton University Press.
- Evely, D. (2000) *Minoan Crafts: Tools and Techniques. An Introduction*. Göteborg, Paul Åström.
- Gleba, M. (2008) *Textile Production in Pre-Roman Italy*. Ancient Textiles Series 4. Oxford. Oxbow Books.
- Stærmose Nielsen, K.-H. (1999) *Kirkes væv: opstadsvævens historie og nutidige brug*. Lejre. Historisk-Arkæologisk Forsøgscenter.

