

WHITE-ON-RED PAINTED POTTERY IN THE EARLY NEOLITHIC: A COMPARATIVE ANALYSIS

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(Abstract)

Painted pottery plays a significant role in explaining early farming communities. The remarkable styles of white-on-red painted pottery can be considered one of the most well-known characteristics in the Early Neolithic Balkans. This preliminary study attempts to clarify the picture, comparing white-on-red painted pottery between sites in the Balkans, the Aegean and Western Anatolia. Correspondence analysis and distribution maps are used to explore regional and interregional connections.

Introduction

The research of interactions between Anatolia and the Balkans in the period from the late 7th to the mid-6th millennium BC was rather incomplete until recently. Especially studies from Anatolia were missing. However, new studies on early-farming communities led to major progress exploring parallel developments and mutual influences between the two regions. Among other features, these early-farming groups are strongly connected with the first appearance of pottery in the Neolithic material assemblages. It is well-known that the concept of a “Neolithic Package” has been a long-term discussion for explaining the development of early farming communities. It is not the intention of this paper to discuss the origins of “Neolithic Package” concept¹, but it is worth noting that in the last two decades, new models for the adoption of farming and the Neolithic way of life have been promoted and helped to understand the process of Neolithization².

Since the concept of a “Monochrome Pottery Horizon”³, which is connected to the initial stage of pottery production, was introduced, it is heavily discussed⁴. New discoveries of Early Neolithic sites with well-defined sequences and different chronological schemes, reject the idea of a continuous

development of Monochrome wares followed by painted pottery⁵.

Painted pottery in the Balkans plays a significant role in defining the phases of the development in the Early Neolithic (hereafter EN). This process only becomes more meaningful and understandable if it is evaluated together with the earliest pottery in the Aegean and Western Anatolia. Within this context the phenomenon of “white-on-red” painted pottery (hereafter WRPP) is one of the most highlighted, but also highly controversial debated characteristic of pottery-producing communities in the Balkans, as well as in Anatolia and the Aegean.

The appearance of WRPP and its impact are still widely discussed. Although white paint contributes only to a small degree to the total amount of the pottery assemblage, it has its own characteristic style with a distinct geographical and chronological location. The geographical distribution is broadly associated with Eastern Albania, the Central Balkans, Macedonia, the Struma River Valley, Northern Bulgaria, the Thracian Valley, the Thessalian Plain and Western Anatolia.

Due to the focus of the excavations and the quality of the publications, many settlements provided only limited information about the found ceramics, making it difficult to understand the material culture. Still within the publications,

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¹ Hodder 1990; Whittle 1996; Zvelebil 1998; Perlès 2001; Perlès 2005; Özdoğan 2011; Özdoğan 2013.

² Çilingiroğlu 2005; Reingruber-Thissen 2005.

³ Milošević 1959.

⁴ K. Todorova-Vajsov 1993; Vajsov 1998

⁵ Stefanova 1996; Lichardus-Itten et alii 2002; Krauss 2011; Reingruber 2011; Reingruber 2017.

painted pottery is often better represented than unpainted ceramics and therefore the research situation slightly better. Nevertheless in discussions about the importance of pottery, unpainted/undecorated ceramics should not be forgotten.

This paper discusses WRPP from EN sites in the Balkans, Western Anatolia and the Aegean. Different combinations of decoration styles are classified and interpreted based on their chronological and geographic distribution. The presented analyses offer new insights in regional peculiarities and interactive relations of EN pottery.

Geographic Region and Chronology

The distribution area of the phenomenon of WRPP in the period from the end of the 7th to the middle of the 6th millennium BC covers regions in Anatolia, the Balkans and the Aegean. Due to the huge extension of the area, some limitations had to be made for this paper, which mainly focuses on modern day Bulgaria, Greece, Western Macedonia and Western Anatolia (Pl. I).

On the Aegean islands the number of the EN settlements is extremely low⁶, so most studied settlements are from mainland Greece. Almost all sites are situated in the eastern part of Greece and the majority of the sites are in Thessaly. At Achilleion, one of the earliest Neolithic sites in this study, WRPP first appeared around 6200 calBC⁷.

In the last two decades archaeological investigations in Western Macedonia have significantly increased and allow us to discuss on a larger scale⁸. According to recent works on absolute dates, the beginning of WRPP in Western Macedonia had to be pushed back and started earlier. Based on charred seeds from Mavropigi-Filotsairi, the oldest absolute samples date c. 6300–6200 calBC⁹.

For Western Anatolia, recent paleogenetic studies¹⁰ and new research of archaeological sites¹¹ provided an updated distribution pattern of EN settlements and suggested new links between Anatolia and the Balkans. The oldest white painted pottery found in Central-West Anatolia was exposed in Çukuriçi Höyük VIII¹² and was dated 6200–5970 calBC¹³. Additionally the ongoing excavations

in Uğurlu (Gökçeada island) uncovered a building, where WRPP was found with a proposed age around 6100 BC¹⁴.

In Bulgaria, the study mainly focuses on the data from early phases of Struma River Valley, Sofia Plateau, Thracian Plain and Northeast of Bulgaria. Pottery from Kovachevo (Ia), in Struma River Valley, is assigned as the oldest pottery from the region and the neighboring areas. Charred cereal seeds from level Ia dated to 6200–6050 calBC¹⁵.

Database and Comparative Analysis

In order to generate a comparable data sample, a database was set up. This was made to ensure data integrity and to provide the base for further statistical analyses. The sampled data was recorded from monographs, articles and field reports. Due to the large geographic area, the long history of research and different traditions for the publication of material, the quality of the gathered information was extremely heterogenous. Therefore, entries in the database could only be recorded as presence/absence data. For each layer, general and stratigraphic information, as well as detailed descriptions of decorated ceramic forms and painted motifs were collected. 24 categories were reviewed for the parameter “*vessel forms*” and 12 categories for the parameter “*decoration motifs*” (Pl. II). For this study the database includes entries for 45 layers from 34 sites.

Rather than comparing pottery traits among distant regions in the first place, correlations between geographically nearby regions were explored. Multivariate and explorative statistical analyses were used to visualize patterns of similarity and dissimilarity.

The seriation matrix (Pl. III) shows the densities of 12 decoration types sorted by regions. The size of the squares show the densities of sites in the region, where the specific motif was documented. If the cell is fully black, every site of the region has that specific type of decoration. If the cell is empty, there is no representation in the region. Although some regions are represented by only one site (Eastern Marmara –Aktopraklık), in most of the regions at least three sites are located. While the majority of types are distributed quite wide, few motifs appear only in some regions. For example, in Western Marmara and regions in modern day Bulgaria, almost every decoration type was

⁶ Perlès 2001, 877:118.

⁷ Thissen 2005.

⁸ Urem-Kotsou et alii 2017; Bonga 2019.

⁹ Bonga 2019, 162–163; 2020, 50, fig. 3.

¹⁰ Hofmanová et alii 2016; Hofmanová et alii 2016; Mathieson et alii 2018.

¹¹ Horejs et alii 2015; Özdoğan, E. 2015; Reingruber et alii 2017; de Groot 2019; Horejs 2017.

¹² Galik-Horejs 2011, 87.

¹³ Horejs 2017, fig. 1.5.

¹⁴ Erdoğu-Derici 2019.

¹⁵ Lichardus-Itten et alii 2002, 122–23; Thissen-Reingruber 2017, 138–39.

recorded, while in neighboring regions only specific types appeared, but in higher densities.

Checker board and ladder motifs are absent in most of the regions in Anatolia, Thessaly and Western Macedonia, while being a common element in Struma River Valley and Northeastern Bulgaria. Net/Grid motifs are dominant mainly in modern day Bulgaria and the Marmara region, while they are missing in other recorded areas. Such distributions could be interpreted as a local pattern and might hint to hidden networks.

Correspondence analysis¹⁶, was used to detect patterns in the distribution of the decoration types and vessel forms. Similarities and dissimilarities between the regions/sites can be explored using multivariate analysis. Especially, in cases where non-standardised data is analysed, meaningful patterns can be extracted¹⁷. Here, correspondence analysis was carried out using the open source program Past, version 4.01¹⁸.

In total, 34 units (sites/layers) and 23 variables (11 forms/12 motifs) were analysed using presence/absence (1/0) data of decoration elements and the vessel forms. Every site or type with less than 5 representations had to be eliminated. Therefore, some sites are not part of the interpretation. For example, Central-West Anatolia has been excluded, due to a low number of representative variables.

Pl. IV shows the first principal axis (18.78% explanation) on the x -axis and the second principle axis (12.84% explanation) on the y -axis, but only units (sites) are drawn. On this graph, 4 different geographical patterns, which mainly present regional differences, can be detected. The positive part of the x -axis and the negative part of the y -axis show sites from Northern Thrace and the Sofia Basin (Cluster 3). The biggest cluster (Cluster 2) is mainly located in the central part, as well as the negative part of the y - and x -axes of the graph. Struma River Valley, Northeastern Bulgaria, Western Macedonia and Thessaly are concentrated in this diverse cluster. Two smaller groups are on top of the bigger clusters. South-western Anatolian sites (Lake District) correspond to the pattern on the left side of the graph (Cluster 1). The last cluster represents sites from Western Marmara and Thessaly, which are on the right side of the graph (Cluster 4).

Pl. V shows the variables (forms/decoration types) and the units (sites) coloured by region. The forms of the ceramics are on the first (x) axis

and the second (y) axis seems to represent the motifs. The positive part of the y -axis represents basic bands motifs, which are mainly dominant in cluster 1 (South-western Anatolia) and 4 (Western Marmara and Thessaly). The different positions of the clusters are caused by different variations of bowl types. The second cluster, which is located mainly in the centre and the lower left part of the graph, represented sites in Western Macedonia, Thessaly, Struma River Valley and Northeastern Bulgaria. The concentration is dominated by different types of bowls, jars with funnel neck and dish/plates, as well as curvy/wavy bands and the ladder motif. This cluster includes the oldest sites in the analysis, which might indicate a chronological pattern. The points in the right lower quadrant of the graph belong to cluster 3, which represents the region of Northern Thrace and the Sofia Basin. A combination of dots, spirals, net/grid and some band motifs can be observed. The vessel forms are dominated by tulip-shaped vessels, cups and deep bowls. The differences between the clusters 3 and 4 and the first two clusters (1 and 2) are visible on the first axis. While, tulip-shaped vessels and bowls with funnel neck with white paint are only seen in Northern Thrace and Sofia Basin, bowls with straight sides, simple bowls and bowls with “S” profile are dominant at sites in Struma River Valley.

This differentiation is also visible in the position of “checker board” and “ladder”. The motif “Checker board” is isolated from the other variables. The density matrix (Pl. III) indicates that the checker board motif is dominantly used at sites in Northern Thrace and Dzhulyunitsa-Smardesh in Northeastern Bulgaria. Ladder motifs appear only in Western Macedonia (Neo Nikomedeia), in Struma River Valley (Kovachevo and Dobrinishte) and in Northeastern Bulgaria (Dzhulyunitsa). Combining the forms and motifs, it is possible to detect regional patterns. Considering that presence/absence data was used, it is interesting to observe the diverse quality of the results.

Discussion and Conclusion

The role of the Balkans in the spread of the Neolithization, has been discussed since Gordon Childe¹⁹, who described the Anatolia as a bridge between Near East and Europe. Even until the 1960's some researchers predicted that no Neolithic sites would be identified in Anatolia due

¹⁶ Greenacre 1984; Greenacre 1993.

¹⁷ Müller-Zimmermann 1997; Furholt 2016.

¹⁸ Hammer et alii 2001.

¹⁹ Childe 1925; 1929.

to the environmental conditions²⁰. In the early 1960's D. French²¹ carried out one of the first surveys in Western Anatolia convinced to find a connection between Anatolia and Thessaly. Until the late 1980's, French's ideas dominated the debates. Since then, studies on the Neolithic in Anatolia have enormously increased. The area started to play a major role in the research of the spread of farming in the Balkans. Researches like J. Mellaart²², M. Garašanin²³, I. G. Georgiev²⁴, C. Lichter²⁵, C. Perlès²⁶, H. Todorova²⁷, M. Grebska-Kulowa-Kulow²⁸, R. Duru²⁹, M. Özdoğan³⁰ and V. Nikolov³¹ have discussed the "Neolithic way of life" in Anatolia, the Balkans and the Aegean.

Based on the new approaches and studies in the recent decades, archaeologists have suggested different ideas for the appearance/spreading of Neolithic communities and the distribution of material culture in the Balkans, the Aegean and Western Anatolia³². Researchers focusing on Western Anatolia, mainly described the distribution from the inner part of the mainland to the west, using models such as leap-frog colonization or frontier mobility^{33 34}. Newly discovered sites in Western Macedonia and recent studies in Thessaly represented evidence for maritime networks of early Neolithic communities³⁵.

Even though there are still gaps, the examination of WRPP has become more intensive in recent years. Stefanova³⁶ and Krauss³⁷ summed up and addressed the discussions of a monochrome vs painted pottery horizons. Based on investigations in Western Macedonia and Thessaly, Washburn³⁸,

Urem-Kotsou *et alii*³⁹ and Bonga⁴⁰ re-evaluated the pottery assemblages in the region. While in Bulgarian literature almost every publication includes a section on WRPP, Nikolov⁴¹, Lichardus-Itten *et alii*⁴², Dzhhanfezova *et alii*⁴³, Salanova⁴⁴, Dzhhanfezova *et alii*⁴⁵ and Grebska-Kulow-Zidarov⁴⁶ specifically discussed the phenomenon in more details. Stojanovski⁴⁷ published an elaborated discussion for the Balkan Peninsula. He re-evaluated the distribution of WRPP in the region and brought a clearer overview to the topic. In a comparable study, Yurtsever-Beyazıt⁴⁸ examined a detail comparison of WRPP in Southwestern Anatolia (Lake District) and the neighbouring areas.

While different papers set up and work with site – or region – specific typologies, it is often impossible to combine these typologies and make them accessible for interregional studies. Accordingly, this paper presents similarities and dissimilarities of WRPP based on regional and interregional relations. The results must be considered as preliminary. Because of a lack of data, the comparison of assemblages between the chosen regions is limited.

Still statistical analysis (Pl. IV–V) present mostly regional differences. The distribution of the sites also seems to have chronological meaning. Cluster 2, which covers sites from Thessaly, Western Macedonia, Struma River Valley and Northeastern Bulgaria can be interpreted as the first appearance of the phenomena in the whole region. Compared to cluster 3 (Northern Thrace and Sofia Basin), the forms of the vessels are simpler. Tulip-shaped forms and vessels with funnel neck are typologically younger. This picture is supported by current ideas about the spread of early farming communities. After the establishment of settlements in the Aegean, the valleys of Struma, Vardar and Mesta were settled and the spreading continued towards the Lower Danube and the Thracian Plain⁴⁹.

The fourth cluster mostly included sites from Western Marmara (Aşağı Pınar and Hoca Çeşme). On the one hand Aşağı Pınar is the closest to the

²⁰ Lloyd 1956.

²¹ French 1967; 1969.

²² Mellaart 1970a; 1970b.

²³ Garašanin 1982.

²⁴ Georgiev 1983.

²⁵ Lichter 2002.

²⁶ Perlès 2001.

²⁷ H. Todorova 2003.

²⁸ Grebska-Kulowa – Kulow 2007.

²⁹ Duru 1989; 2012.

³⁰ Özdoğan 1999; 2013.

³¹ Nikolov 2017.

³² Krauss *et alii* 2014; Krauss *et alii* 2018; Özdoğan, E. 2015; Furlong 2016; Furlong 2018; Ivanova *et alii* 2018; de Groot 2019.

³³ For definitions of these models see Zvelebil 2001.

³⁴ Çilingiroğlu 2005; Brami-Heyd 2011; Çilingiroğlu-Çakırlar 2013; Horejs *et alii* 2015; Horejs 2017.

³⁵ Reingruber 2011; Reingruber 2017; Urem-Kotsou *et alii* 2014.

³⁶ Stefanova 1996.

³⁷ Krauss 2011.

³⁸ Washburn 1984.

³⁹ Urem-Kotsou *et alii* 2014.

⁴⁰ Bonga 2019; 2020.

⁴¹ Nikolov 2002.

⁴² Lichardus-Itten *et alii* 2002.

⁴³ Dzhhanfezova *et alii* 2014.

⁴⁴ Salanova 2019.

⁴⁵ Dzhhanfezova *et alii* 2020.

⁴⁶ Grebska-Kulow – Zidarov 2021.

⁴⁷ Stojanovski 2017.

⁴⁸ Yurtsever-Beyazıt 2019.

⁴⁹ Ivanova *et alii* 2018.

cluster 3. Tulip-shaped were found at the site, but none of them were painted with white color. Nevertheless, the appearance of tulip-shaped vessels and the specific set of motifs of white paint indicate a strong connection with sites in the Thracian Plain. On the other hand at Hoca Çeşme no tulip-shaped vessels were found. While both settlements share common characteristics with Northern Thrace, local differences are also noticeable⁵⁰. At the site of Uğurlu, early dates indicate that the tradition of WRPP was influenced by the Aegean. This interpretation is questioned by Erdoğan-Derici⁵¹, who assigned the WRPP to Karanovo I tradition.

The first cluster (Southwestern Anatolia) is harder to interpret due to the low number of sherds and limited set of motifs. The forms and decorations, consisting of simple band motifs might indicate an influence from early sites of the Aegean as well as sites from Struma River Valley and Northeastern Bulgaria.

On Central-West Anatolian sites only few sherds with motifs of WRPP were found and the region had to be excluded from the general analysis. Level VIII in Çukuriçi dated to 6200–5970 calBC⁵² and few painted sherds with dot motifs were uncovered in this level⁵³. Regarding the analogies in decorative styles of the assemblages, dot is a typical motif in Bulgaria and exists almost in every site (Pl. III). This motif was also found in Hacilar I in Southwestern Anatolia and the level dated to 6100–5600 calBC⁵⁴. In Ege Gübre III excavators observed one WRPP sherd with a motif, which could be interpreted as dots with diagonal lines⁵⁵. Sites in Thessaly and Western Macedonia show very few examples of dot motif.

Another region of interest for the distribution of WRPP is Eastern Marmara. Sites in the region are generally connected to Fikirtepe material and painted pottery is absent⁵⁶. Could this absence be interpreted as a deliberate decision of the settling groups? Or does it indicate the absence of a network? It is not within the scope of this paper to address these questions, but the gap in the distribution of WRPP certainly carries some meaning and is hopefully further investigated. In whole

Eastern Marmara, only at Aktopraklık sherds with WRPP were uncovered⁵⁷. Even if only 3 sherds were found, all of them are decorated with the net/grid motif. The motif is present at EN Bulgarian sites, but absent in regions further south.

The pattern of distributions of motifs on a regional scale carries some information. Different layouts of patterns of decorations could be interpreted as a result of adoption or adaptation⁵⁸. Curvy and linear motifs are usually well represented, but there are some exceptions. While curvy motifs are missing in Thessaly, Central-West Anatolia and Marmara region, linear patterns are dominant. In before recent excavations of Uğurlu on the island of Gökçeada, 4 WRPP sherds were found. One of them was interpreted as “cult table” by the excavators⁵⁹. This piece is unique and it combines the form of a “cult table”, which is mainly dominant in Fikirtepe material with white paint, which is absent in Fikirtepe group. Although there are no radiocarbon dates from this layer, stratigraphic information suggest an age around 6100 BC⁶⁰. Compared to WRPP in Northern Thrace, white paint is applied in Uğurlu much earlier, but corresponds with contemporaneous sites in Northeastern Bulgaria, Struma River Valley, Western Macedonia and Thessaly.

Within the regions so far examined, the motifs of the WRPP are quite diverse and complex. While shapes appear more frequently, motifs such as checkerboard and ladder are less common. Considering the low quantities of material, numerous comparisons have been made in recent years. Accordingly, WRPP became one of the main elements to describe interregional connections. However, it is difficult to understand the spreading and its social dynamics only based on one material class. Also it should not be ignored that white paint might have developed independently in some regions. Adoptions and adaptations, as well as individual choices certainly played a role, but are hard to track. While the discussion of WRPP and network is still active, local communities and their regional connections deserve more attention.

⁵⁰ Özdoğan 1998; 2013.

⁵¹ Derici-Erdoğan 2019, 651–52.

⁵² Horejs 2017, fig. 1.5.

⁵³ Galik-Horejs 2011, 87.

⁵⁴ Mellaart 1970a, 93.

⁵⁵ Ozan 2012, 263, fig. 8.

⁵⁶ For introduction of Fikirtepe Culture see Özdoğan 1979; Özdoğan 1999; Özdoğan 2007; Özdoğan 2013.

⁵⁷ Ala 2016, pl. 41.

⁵⁸ Dzhafvezova *et alii* 2020 interpreted the terms adoption (received tradition) and adaptation (innovative decision) based on the pottery assemblage of Ilindensti (Struma River Valley).

⁵⁹ Derici 2018

⁶⁰ Derici 2018, tab. 4; Derici-Erdoğan 2019

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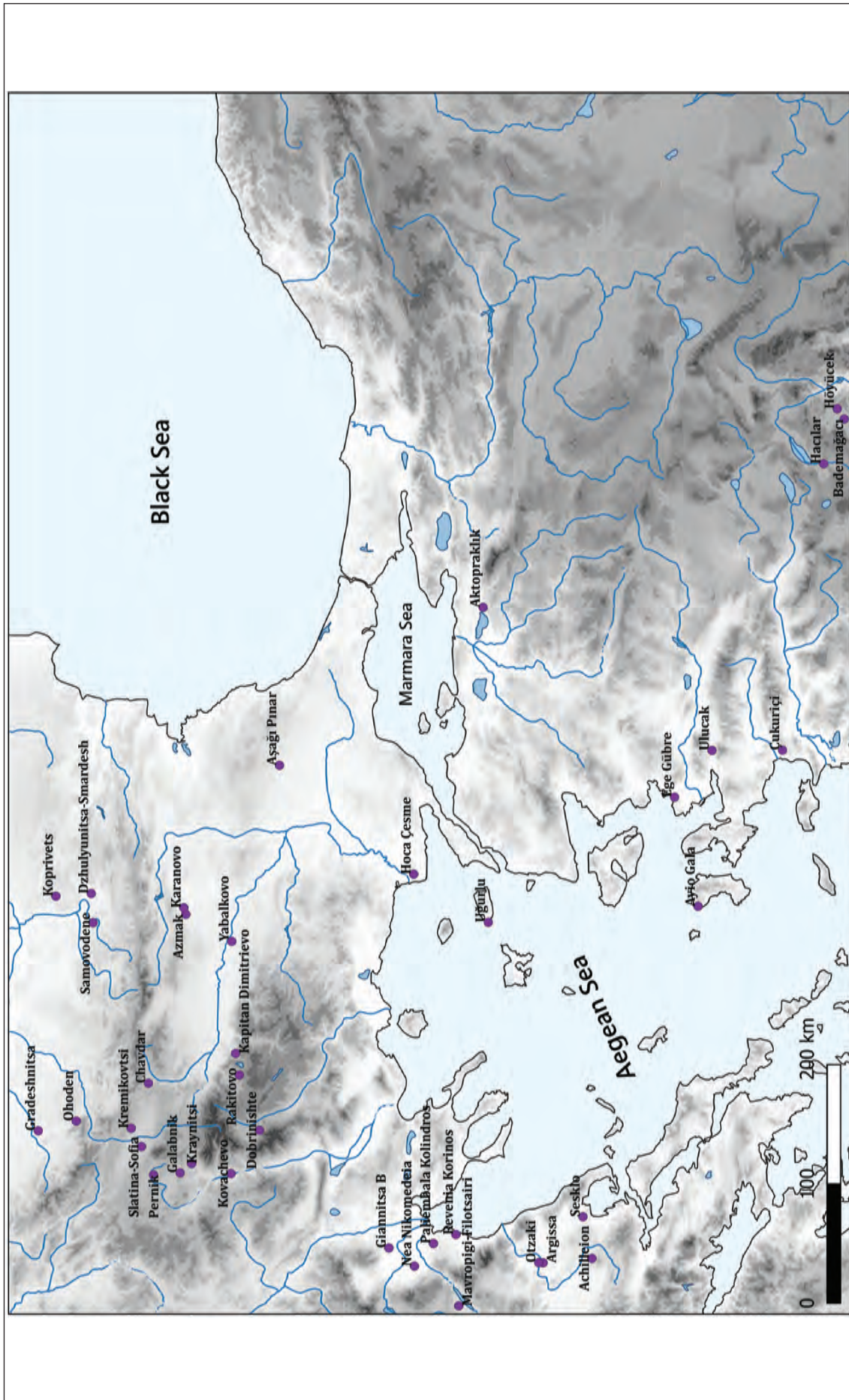
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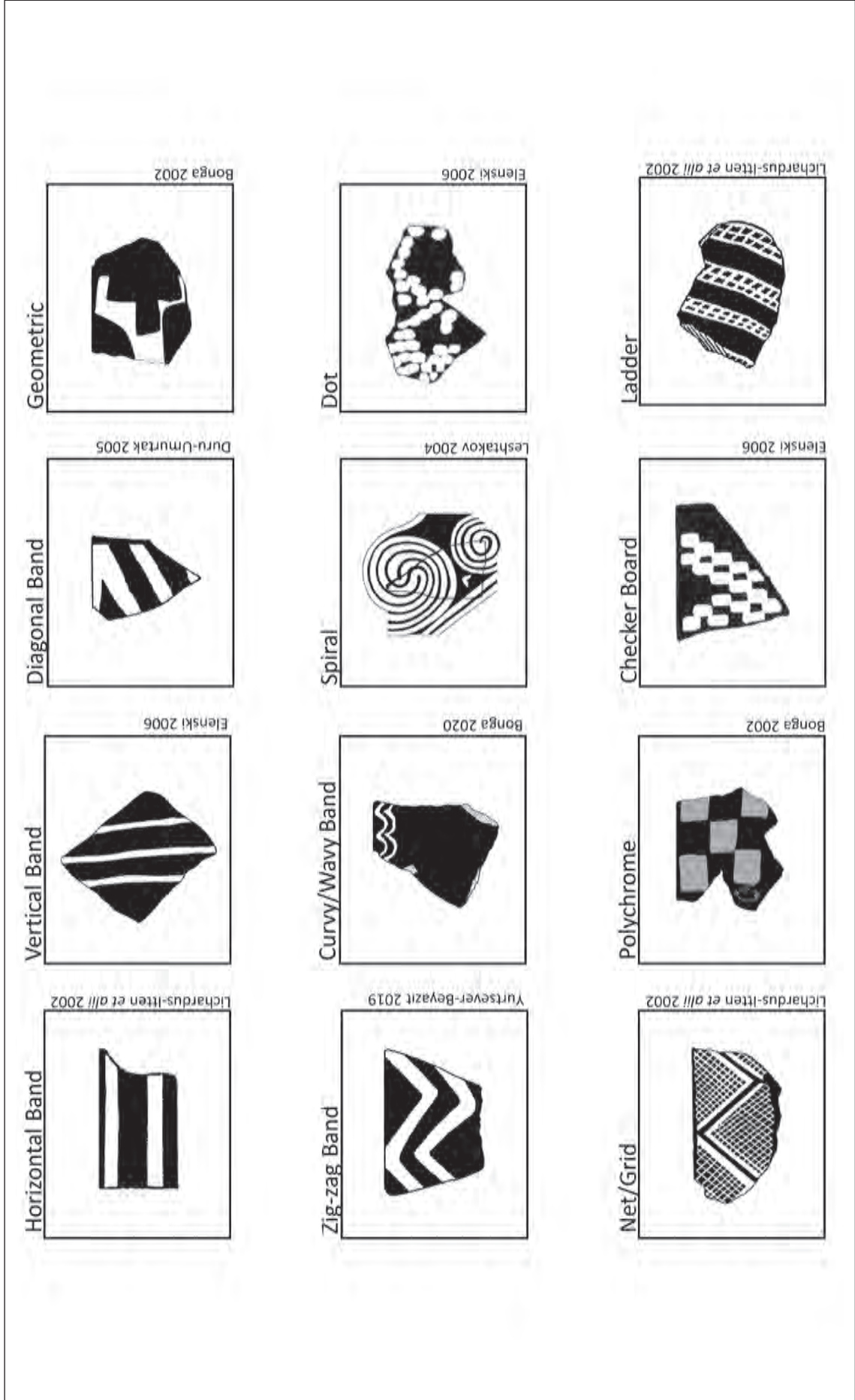
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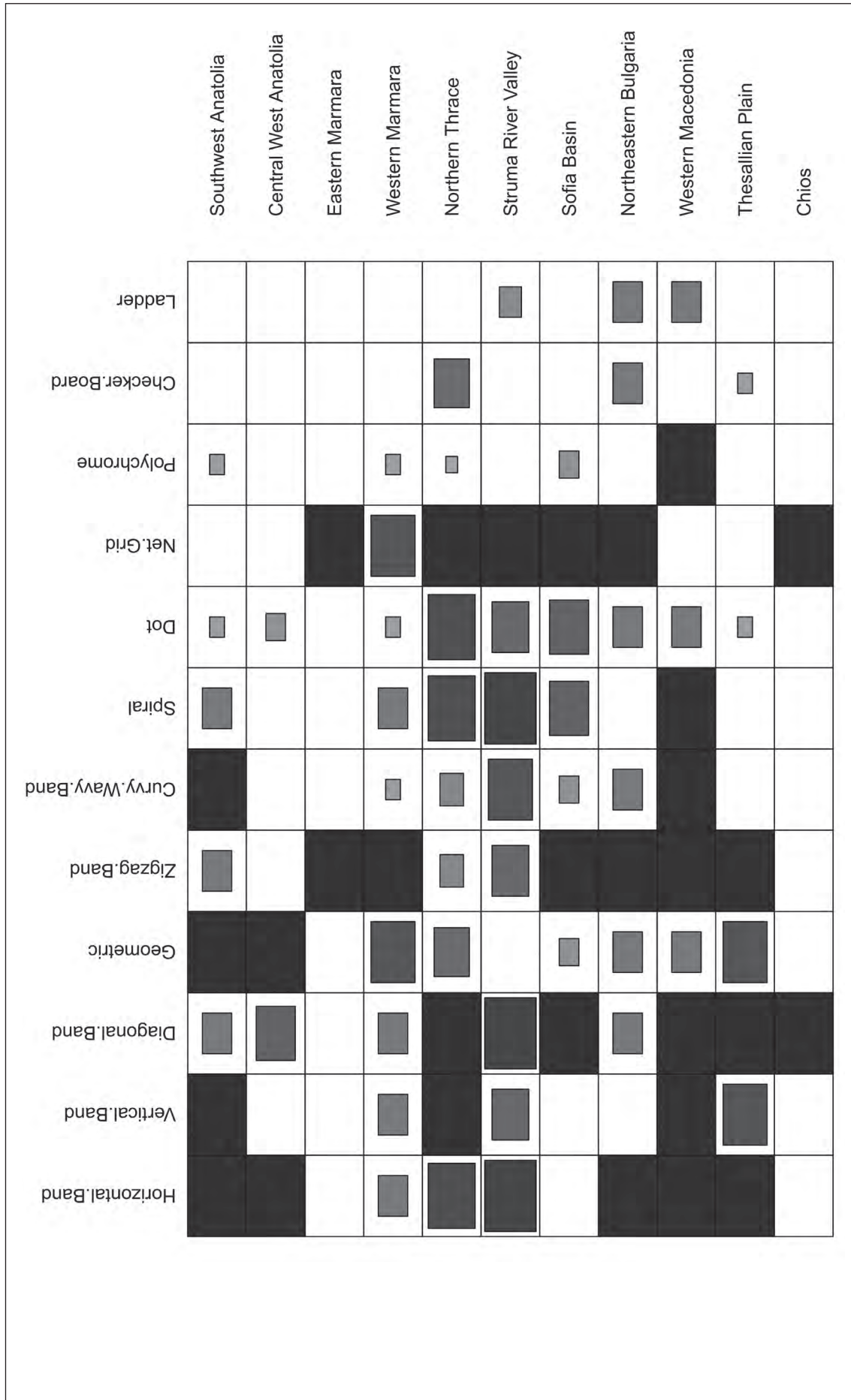
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Pl. I: Map of the Early Neolithic sites with white-on-red painted pottery mentioned in the text

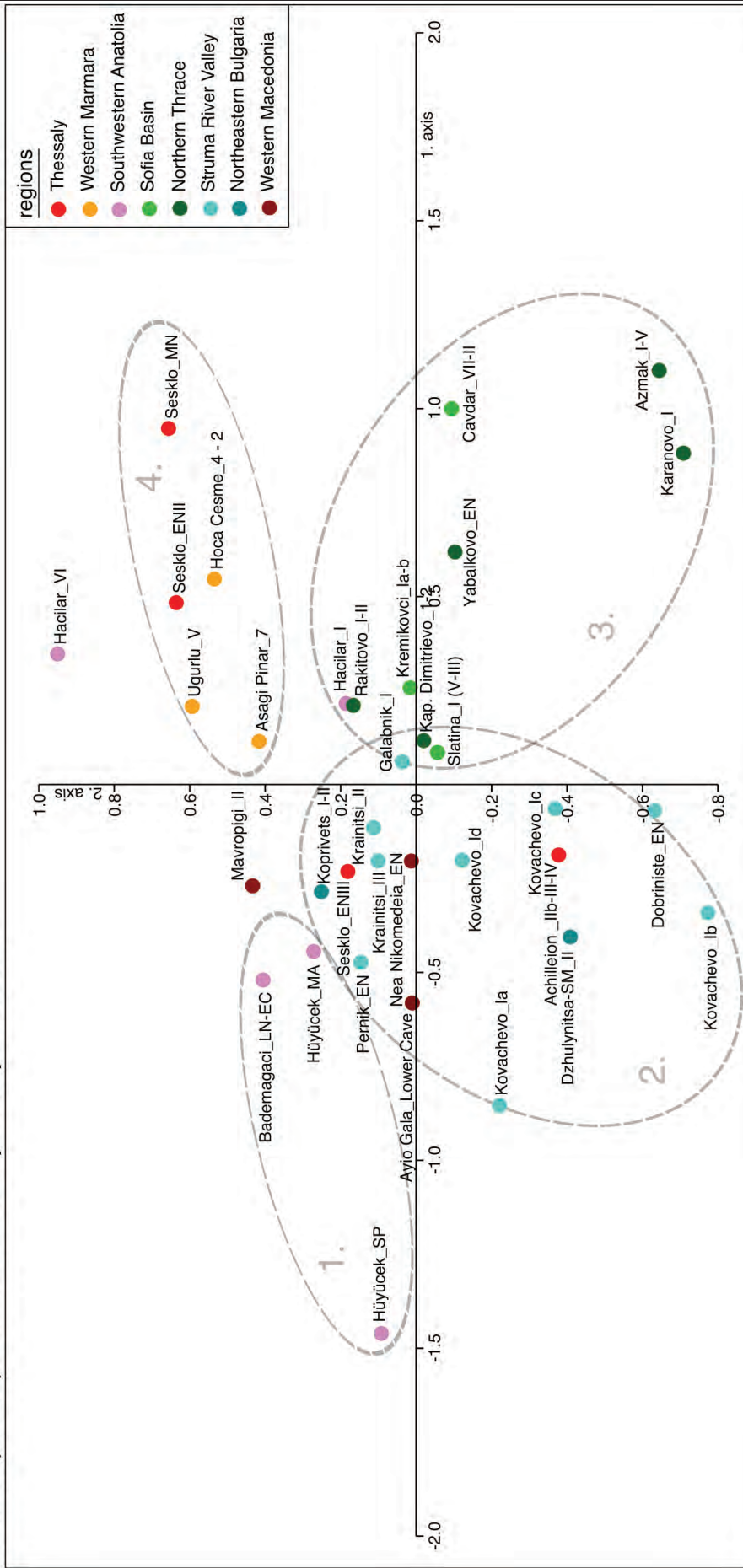


Pl. II: Types of “decoration motifs” observed on white-on-red painted pottery



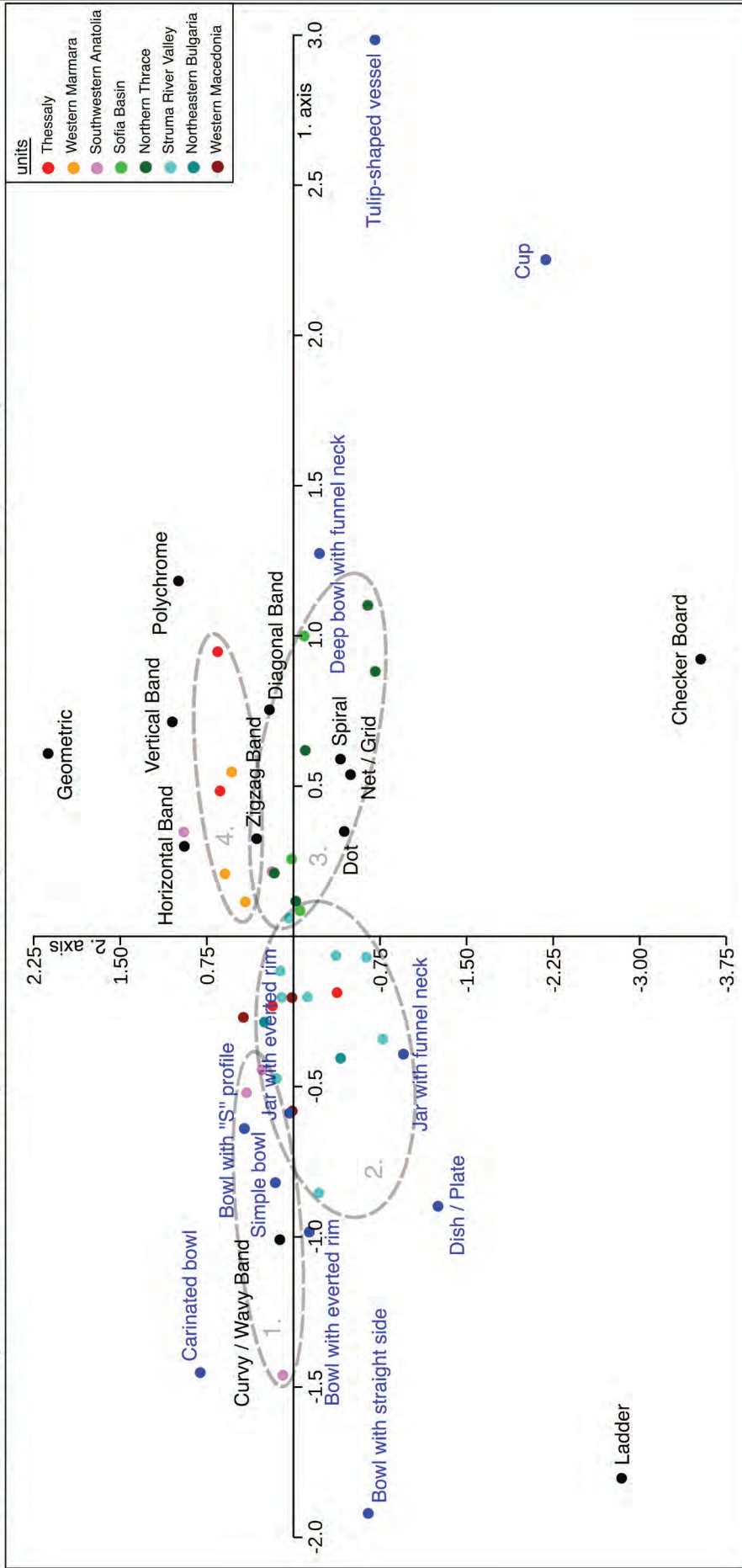
Pl. III: Seriation matrix with densities of motifs sorted by regions

Units (sites) on 1. and 2. principal axes



Pl. IV: Sites on 1. and 2. principal axes of the correspondence analysis

Variables (motifs / forms) and units (sites) on 1. and 2. principal axes



Pl. V: Sites and variables (motifs/forms) on 1. and 2. principal axes of the correspondence analysis