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CHAPTER 9

Quantitative Analysis of Sherds from Rujm Salim

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Introduction

An initial research goal of the Madaba Plains Project (MPP) was to determine the nature of the relationship between Tall al-ʿUmayri and its hinterland. One question concerned the manner in which ancient people managed to obtain sufficient food to survive. It was considered that nothing “shaped their daily routines and material culture more than the quest for food” (LaBianca 1989: 23). The “food system” was instrumental in the research design developed for the MPP at ʿUmayri and Hisban. The concept of a food system involved the “construction of water works, villages, and terraces; the introduction of markets and roads in rural areas; and arrangements for storing, preserving, preparing, and serving food as ultimately interconnected” (Geraty *et al.* 1989: 5). Accordingly, the relationship between ʿUmayri and its hinterland of villages, farms, grazing lands, and agricultural fields ideally would be examined together as part of a single system.

In order to address the connection between the tell and neighboring sites another major component of the MPP was required—a survey of adjacent neighboring communities. One task of the hinterland survey was to collect information relevant for learning what the area surrounding ʿUmayri looked like during the successive periods of settlement at the site. Another issue concerned what type of activities were relegated to sites at some distance from the tell. To address these issues, the MPP survey team began to map the 5-km radius around Tall al-ʿUmayri (Boling 1989; Christopherson *URL*;

Cole 1989; LaBianca 1989; 1991; Younker 1991a and 1991b). Pottery collected at the sites was examined and assigned an archaeological date by Larry Herr daily during the excavation season. Following the initial season of the survey, a long-term goal was to excavate selected hinterland sites, such as Rujm Salim during the 1987 season.

The study presented here addresses the central question regarding the relationship between the tell and its surroundings by comparing and contrasting pottery excavated at ʿUmayri and the hinterland site of Rujm Salim. Examination of the excavated pottery could inform on whether or not people had carried out similar activities at the tell and smaller sites. It addresses the question of whether or not, based on the surviving material culture, smaller sites were the locale of industrial or manufacturing operations, such as working with leathers, ceramics, fabrics, or processing foods. Evidence of these types of activities at individual hinterland sites might emerge in the presence of more thick-walled vats, basins, cookware, or jars to process, preserve, or store foods than at ʿUmayri. Or did people at the central site carry out these types of activities? Was there an overlap in the functions of sites regardless of their size and location? Other questions address how similar the non-utilitarian pottery was at ʿUmayri and at a rural settlement. Were there more decorated or finer thin-walled pots at ʿUmayri than elsewhere? How did the cookware compare at sites of different locations, sizes, and types?

Quantitative Analysis of Sherds from Rujm Salim

To address the questions related to interactions between the tell and a hinterland site, Iron IIC–Persian sherds excavated in 1984 and 1987 at ‘Umayri (Strata 7–5) were compared with pottery excavated at Rujm Salim in 1987. At both sites the quantitative analysis involved all excavated body sherds and diagnostic pieces from specific loci. The sherds were counted, weighed, and categorized according to pot shape, clay fabric, wall thickness, and surface treatment. Another strategy to compare the pottery, and the sources of fired pottery from the two sites, involved petrographic analysis (London, Plint, and Smith 1991). The results show both similarities and differences in Iron IIC–Persian pottery from the tell and the agricultural complex at Rujm Salim.

Rujm Salim

Rujm Salim was discovered during the 1984 site survey directed by Robert Boling, who designated it as Site 34, but named it “el-Buneiyat South,” and described it as a “tower” (Boling 1989: 149–50). Later, Younker redefined it as a large agricultural complex, or estate (Younker 1991a and 1991b). The survey and excavation teams identified a “megalithic” foundation, ca. 9.0 by 9.5 m in size. Nearby were two cisterns, a large vat, cupholes ground into the bedrock, two wine presses, a perimeter wall, a small cave, and multiple quarries. The agricultural complex was one of several within the 5-km radius of Tall al-‘Umayri (Younker 1991a: 338). In July of 1987, a tent, tractor, and family, whose permanent residence was at Kh. es-Suq, were located near the site. They informed us of the site’s name, Rujm Salim. Recent scavenging of the region for sherds and other finds cannot be ruled out, although a fragment of a basalt vessel was identified in the survey (Boling 1989: 150).

During the 1987 MPP excavation season Lorita Hubbard directed a small team of excavators at the site. They uncovered three strata with pottery dating to Iron IIC–Persian (Stratum 4), Hellenistic (Stratum 3), and Late Roman–Byzantine (Stratum 2) in five excavated squares. Stratum 1 was composed of post-occupational sediments. The Iron IIC–Persian pottery examined for this study came from Squares 1–4 (see Chapter 8 in this volume for a full report of the excavations). Square 5 was excavated only at the very end of the season. In deposits under Stratum 2, Surface 01:11

produced the largest number of diagnostic sherds (n=25) and body sherds (n=180). A wine press was dated to Stratum 3 and another to Stratum 4.

Our study was done during the 1987 season, but also included stored diagnostics from the 1984 season of excavations at ‘Umayri. A total of 6,730 sherds from the Iron IIC–Persian periods were excavated at Rujm Salim (counting those included in later deposits), compared with 18,296 counted and weighed from ‘Umayri. The ‘Umayri sampling process involved sherds from more limited contexts. They were taken from loci in 15 squares that had only Iron IIC–Persian sherds from Field A (Squares 7K40, 7K41, and 7K50 from the 1984 season; and 7K60, 7K61, 7K70, and 7K71 from the 1987 season), Field B (Squares 7J88, 7J89, and 7K90 from the 1984 season; and 7K80, 7K81, and 7K90 from the 1987 season), and Field F (6L99 and 7L09 from the 1987 season) (for the results in these fields see the field reports in *MPP 1* and *MPP 2*). The large scale excavations at ‘Umayri resulted in a far heftier sample size than was available for the single season of excavation at Rujm Salim, which, at only three excavation units operating together, was roughly equivalent to the volume of one small field on the tell.

Method

To compare and contrast sherds from each site we weighed and counted all sherds according to physical and morphological features. Wall thickness, ware types, pot types, and surface treatment defined each category. Our five categories included: thick-walled, normal, cookware, decorated, and fine ware. The majority (75%) of the sherds, based on wall thickness, belonged to the normal group (under 1.5 cm thick), while thick-walled sherds measured over 1.5 cm in cross section. A division of the sherds according to fabric type involved separating cookware from all others. Handles and bases were assessed according to fabric and primarily belonged to the normal group except for some cooking pot handles.

The designation of “decorated” pottery included sherds with a visible surface treatment. For the Stratum 4 wares, burnishing predominated, although it was often difficult to identify such treatment. “Fine” wares, burnished or not, referred to perceptibly thin-walled sherds.

Sherd Categories according to Weight at Rujm Salim and Tall al-‘Umayri

Site	Pottery Categories Based on Sherd Thickness, Type, and Surface Treatment							Diagnostics
	Thick	Normal	Cookware	Decorated	Fine	Total Kg	Total Sherds	
‘Umayri	109.7	425.84	19.06	15.18	1.06	570.84	18,296	2011
% of total weight	19.22%	74.60%	3.33%	2.66%	0.19%	100.00%		11%
Rujm Salim	64.18	196.7	3.56	0.83	0.06	265.33	6720	387
% of total weight	24.19%	74.13%	1.34%	0.31%	0.02%	100.00%		5.82%
Ratios	0.585	0.462	0.187	0.055	0.057	0.465	0.367	0.192

Figure 9.1. Rujm Salim Sherds: Table of sherd categories according to weight at Rujm Salim and Tall al-‘Umayri.

Quantitative Analysis of Sherds from Rujm Salim

The original 'Umayri petrographic sample submitted for analysis included two sherds from Rujm Salim: a Stratum 4 cooking pot and one Stratum 3 jar (London, Plint, and Smith 1991). One goal was to determine if pottery from 'Umayri and Rujm Salim could have been made of the same clays and/or come from the same source. The second question asked if Strata 4 and 3 clients might have been part of the same trade or exchange network. The results address the original question in the research design concerning the relationship between the people who lived at the mound and hinterland sites.

Results

Sherd Weights

Rujm Salim sherds weighed a total of 265.3 kg compared with the larger sample from 'Umayri weighing 570.8 kg (fig. 9.1). This mass ratio of about 1:2 differs significantly from the number ratio. The total sherd count from Rujm Salim was 6,720 while the sample at 'Umayri contained 18,300 sherds. The number ratio is therefore about 1:3. There are many more sherds in the sample from 'Umayri, but on average they apparently are smaller than at Rujm Salim. On average a sherd weighed 39 grams at the hinterland site versus 31 grams at 'Umayri. This difference is well beyond statistical uncertainty

since the samples are sufficiently large. This might indicate an abundance of thinner walled pottery at 'Umayri, but the details of this remain unresolved based on the data collected.

The mass of each category is shown in the histogram in fig. 9.2. At both sites, based on weight, the normal sherd category predominated: 74.1% at the hinterland site and 74.6% at 'Umayri (figs. 9.3 and 9.4). Thick-walled sherds represented nearly a quarter (24.1%) of Rujm Salim sherds and slightly less (19.2%) at 'Umayri. Cookware was infrequent at both sites, but especially at the hinterland site, where it accounted for 0.31% versus 3.3% at 'Umayri. A similar relationship characterized the decorated and fine wares, which amounted to under 0.35% at Rujm Salim and 2.7% at the tell. Fine wares were a fraction of one percent at both sites (figs. 9.1–4). Iron IIC–Persian pottery excavated after the first two seasons at 'Umayri likely contained larger percentages of cookware and fine ware than was retrieved during the first season of excavation. If so, the larger numbers could magnify the differences between the ceramic assemblages at both sites.

Sherd Counts and Diagnostic Pieces of Pottery

We calculated the frequencies of diagnostic forms (rims, bases, handles, accessory parts, applied embellishments, etc.)

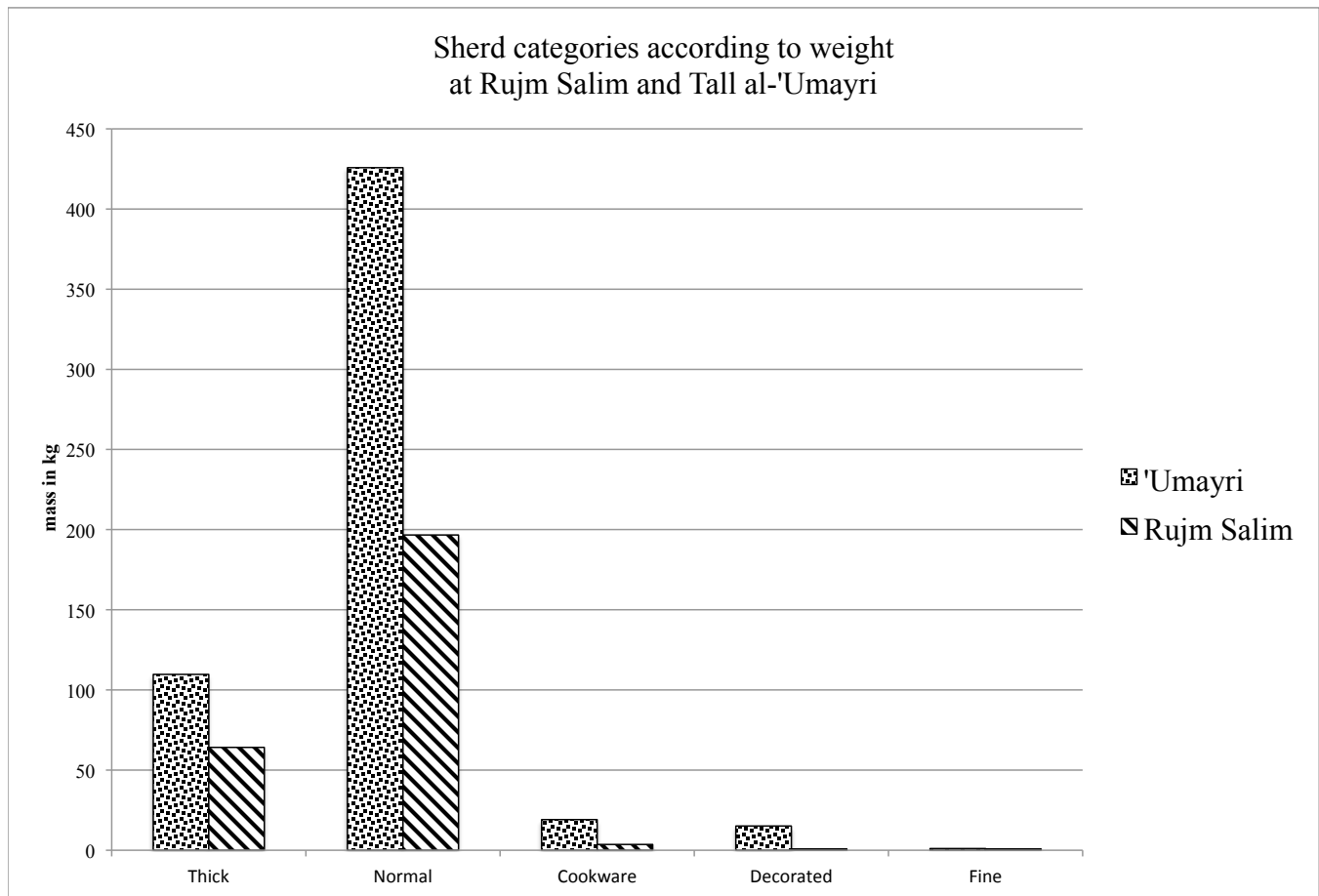


Figure 9.2. Rujm Salim Sherds: Sherd categories according to weight at Rujm Salim and Tall al-'Umayri.

Quantitative Analysis of Sherds from Rujm Salim

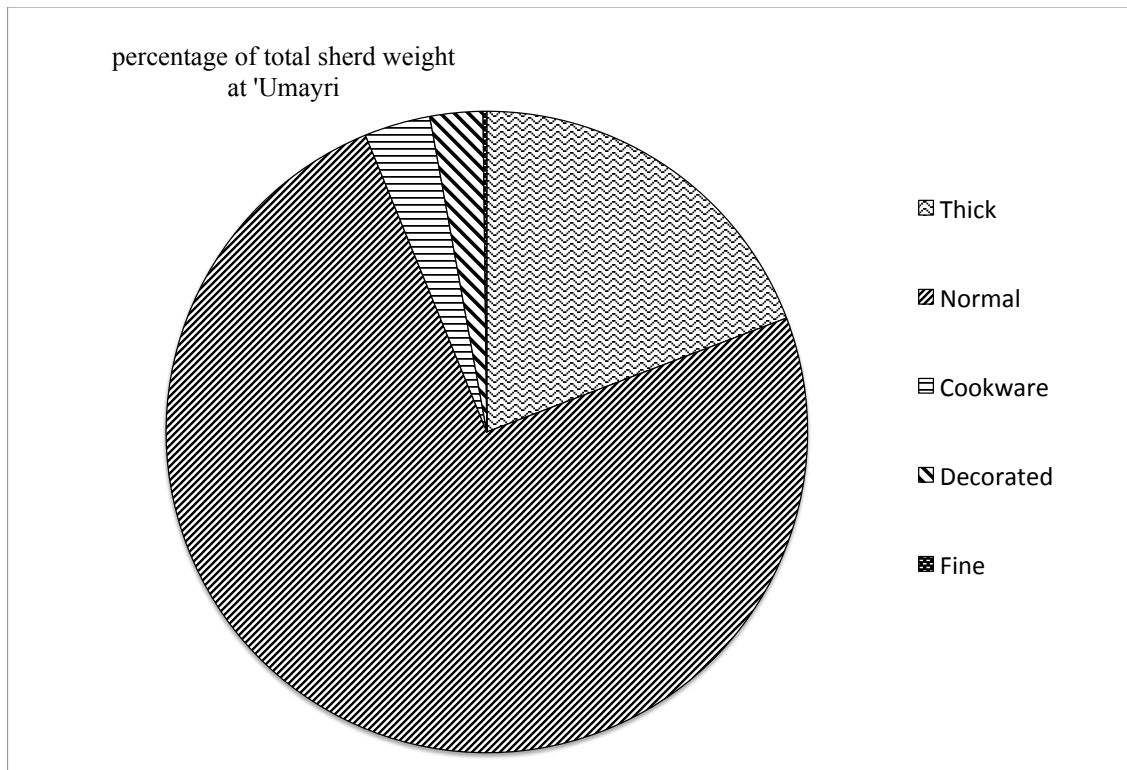


Figure 9.3. Rujm Salim Sherds: Percentage of total sherd weight at Tall al-'Umayri according to five categories: thick, normal, cookware, decorated, and fine wares.

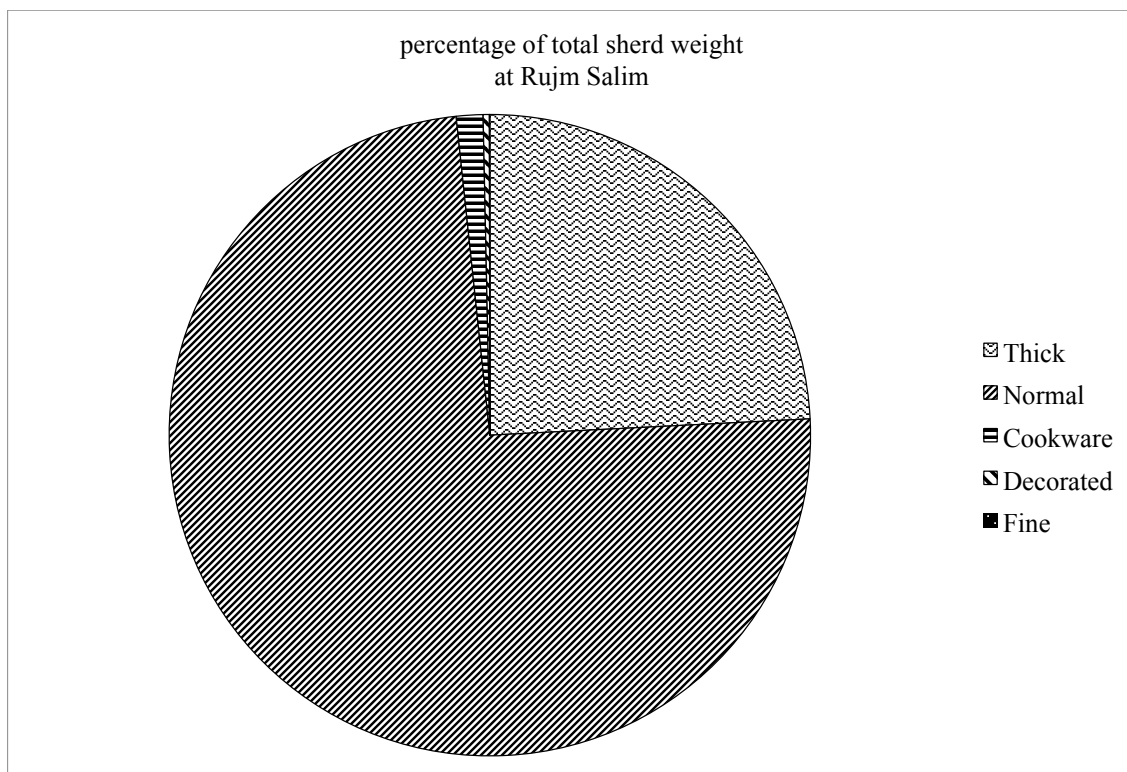


Figure 9.4. Rujm Salim Sherds: Percentage of total sherd weight at Rujm Salim according to five categories: thick, normal, cookware, decorated, and fine wares.

Quantitative Analysis of Sherds from Rujm Salim

apart from the body sherds excavated at each site. At ʿUmayri diagnostic sherds accounted for 11% (or 2,011 sherds) of the 18,296 sherds in the study. For Rujm Salim, the percentage of diagnostic sherds counted was 5.8%, or only half that of ʿUmayri.

Petrographic Analysis

The Strata 4 and 3 sherds excavated at Rujm Salim have mineralogical matches with pottery excavated at ʿUmayri as noted earlier (London, Plint, and Smith 1991: 438). The Stratum 4 cooking pot from Rujm Salim fits into petrographic Group 2 together with Iron Age IIC–Persian pottery excavated at ʿUmayri. Group 2 sherds have quartz as their primary non-plastic inclusion. The Iron Age II–Persian ʿUmayri pottery that was assigned to Group 2 included a double ring burnished bowl of high quality (London, Plint, and Smith 1991: Fig. 23.1.12) and a large utilitarian vessel, both of which were likely local products of the Madaba Plains region. Several centers of production were proposed for the ʿUmayri burnished bowls (London, Plint, and Smith 1991: 437). Two burnished bowls excavated at ʿUmayri were assigned to other ware groups. In a subsequent analysis, a larger sample of burnished bowls from ʿUmayri and Hisban were submitted for

chemical instrumental neutron activation analysis (Glascock and Neff 2012). Mineralogical testing revealed the existence of multiple production locations for black-burnished pottery known as “Ammonite” ware (London and Shuster 2012: 730–31; 738).

Two additional members of ʿUmayri Group 2 included a large utilitarian container (London, Plint, and Smith 1991; Fig. 23.1.18) and a modern storage jar. The utilitarian container was probably too large and cumbersome to bring from elsewhere and therefore represented a local product. Clay is plentiful in the ʿUmayri region. Also part of Group 2 was the wheel-thrown store jar made in 1987 by traditional potters at Zizia, not far from ʿUmayri (London, Plint, and Smith 1991: 434; London and Sinclair 1991).

The Hellenistic storage jar from Rujm Salim was assigned to petrographic ʿUmayri Group 5, along with another jar of the same date from hinterland Site 23. In the same group were two Iron IIC–Persian storage jars excavated at ʿUmayri. The jars have an estimated height of 80 cm and were not easily transportable. Accordingly, the mineralogical composition of both of the Rujm Salim sherds analyzed by petrographic analysis resembled sherds from ʿUmayri.

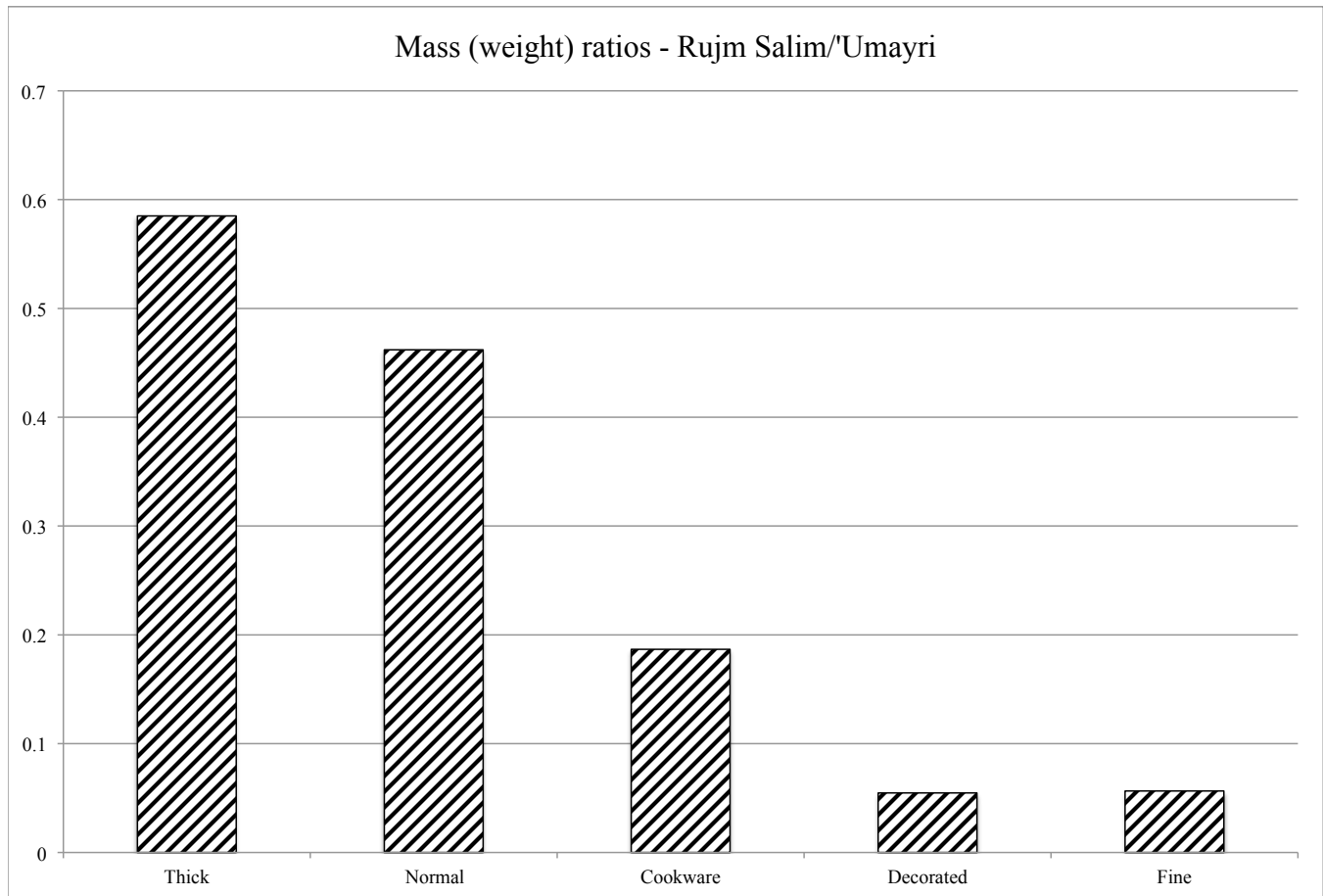


Figure 9.5. Rujm Salim Sherds: Mass (weight) ratios for Rujm Salim and ʿUmayri.

Discussion

Analysis of the weights, counts, and mineralogical composition of sherds from ʿUmayri and hinterland site Rujm Salim, reveal similarities and differences. The weight of normal sherds represents almost 75% of the totals at both sites. The thick-walled sherds at Rujm Salim amount to 25% of that sample versus only 20% at ʿUmayri. This difference could imply the presence of a greater number of large utilitarian containers at an agricultural site than found at the tell site. Decorated fine wares and cookware were minimally more abundant in weight at the tell than at Rujm Salim, each not exceeding 5% of the total at ʿUmayri, while at the hinterland site these categories of pots represented one percent or less.

One difference between the two sites was the frequency of diagnostic pieces to body sherds. At Rujm Salim, rims, bases, etc. were half as common (5.8% versus 11%) compared with finds at ʿUmayri. The presence of a smaller number of diagnostics, together with slightly more thick-walled containers at the hinterland site, could be indicative of large utilitarian containers. Their large size would have resulted in many body sherds and fewer rim sherds than regular-sized jars or other pots of normal thickness. As a result there was a tendency toward thicker, larger pot forms at Rujm Salim versus ʿUmayri.

The Rujm Salim sample contained about ten times less mass in both the very fine and decorated sherd categories compared to the ʿUmayri sample. It had roughly five times less mass in the cooking pot category. The Rujm Salim assemblage is significantly richer in the thick sherd category. For the latter the ratio is 0.585 compared to 0.465 for the combined total sample mass (figs. 9.1 and 9.5). The mass histogram features are consistent with the perceived differences in function and size of the two archaeological sites.

The results of the petrographic analysis were tentative because they relied on two sherds only. Nevertheless, the mineralogical composition of both the Iron IIC–Persian cooking pot and the Hellenistic jar had parallels among sherds excavated at ʿUmayri.

Our findings addressed the initial questions of the research design devised for the Madaba Plains Project by comparing the material culture of Tall al-ʿUmayri and a hinterland site. How similar or dissimilar were the sherds and types of pottery found at each site? Does the pottery inform on activities that took place at one site but not at the other?

At both sites, normal ware predominated. The brief excavation at Rujm Salim provided tentative evidence of the presence and use of a larger percentage of thick-walled pottery than at ʿUmayri. Accordingly, evidence of industrial activity or large scale processing of foods or other products was

potentially identified, in addition to the post-Iron IIC–Persian era wine presses. It is feasible that food processing or other work activities were carried out in the large open spaces surrounding the main building. Nothing that was portable, related to those activities, left traces on the surface.

Within the site, the Stratum 4 wine press might have necessitated large jars or vats to process grapes. After pressing, the juice could have been stored on site in ceramic fermentation containers. Alternatively, it was transported immediately to other locations where it fermented and aged. A tell mound offered the possibility to store wine in underground locations where it could be kept cool and in a dark environment, thereby avoiding the heat of the open and unprotected setting of Rujm Salim. Transportation in animal hides to the mound or elsewhere would have been the most effective mechanism to move the juice. The skins were impervious, lighter in weight than clay jars, unbreakable, and convenient for animals to carry. Animal hides can be lined with pitch or a natural tree resin, as was done in Cyprus in the 18th and 19th centuries. Grapes were crushed into juice in village presses that were constructed close to where they grew in the Troodos Mountains and foothills. The juice was either fermented in the village or sent to merchants in the port city of Larnaca. They transferred the wine into large clay jars, known as *pitharia*. The wine fermented in the clay jars for at least a year, in the city or in the village, before it was sold (Mariti [1772] 1984: 65–67). It is feasible that fresh wine juice squeezed at the hinterland site was transferred in part or in total to Tall al-ʿUmayri where it was stored in large jars and fermented. Or it could have been collected at Rujm Salim and immediately redirected to a larger site where it fermented until ready for use. Alternatively, a portion of the grape juice might have stayed in jars at the rural site where it was fermented in nearby caves (fig. 8.5 in this volume).

If ʿUmayri was a collection and redistribution center for the Madaba Plains region, a portion of the wine produced in the hinterland could have passed through the site before it was sent to its final destination in animal skins. The dearth of capacious jars at both ʿUmayri and Rujm Salim could imply that raw grape juice was distributed in animal skins and then fermented at a distance from where the grapes were harvested.

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