

A POTTERY WORKSHOP AT AḤIHUḌ AND ITS RELATIONSHIP TO THE JAR INDUSTRY IN THE NORTHEASTERN ZEVLUN VALLEY AND WESTERN GALILEE DURING THE ROMAN PERIOD

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INTRODUCTION

The site (map ref. 216069/757196) is situated on a chalk hill, along the eastern edge of the Zevulun Valley, in the northwestern part of Moshav Aḥihud (Fig. 1). The southern end of the site was damaged on a number of occasions by modern earthworks, which cut a vertical section, approximately 4 m high and 60 m long. Ancient building remains and large clusters of pottery sherds that were visible in this section prompted salvage excavations.

Two seasons of excavations were conducted at the site on behalf of the Israel Antiquities Authority.¹ The first, in April 2002, was on land belonging to the Ma'uda family farm; two areas, A and B, totaling c. 62 sq m, were excavated along the edge of the vertical section mentioned above (Plans 1, 2). The second excavation season took place in July 2004, following the laying of a water pipe in the settlement; an area that covered over 25 sq m (Area C) was opened c. 25 m northeast of Area A (Plans 1, 3). For a complete list of the walls and loci of all three areas, see Appendix 1.

ARCHITECTURAL REMAINS

Two strata were discerned. Earlier Stratum II yielded the corner of a structure and a wall fragment. In Stratum I, pottery kilns were discovered, as well as a pottery production waste dump.

Stratum II

Area A (Plan 2).— The southwestern corner of a building constructed on bedrock was exposed.

The two walls forming the corner (W13 and W14; Plan 2: Section 1–1) are built of two rows of large and partially worked stones, arranged as headers and stretchers, with a fill of small stones between them. The margins of the outer face of the stones are drafted (Fig. 2). Abutting the southwestern face of W13 was a crushed chalk floor (L18, L21/L22), laid on brown

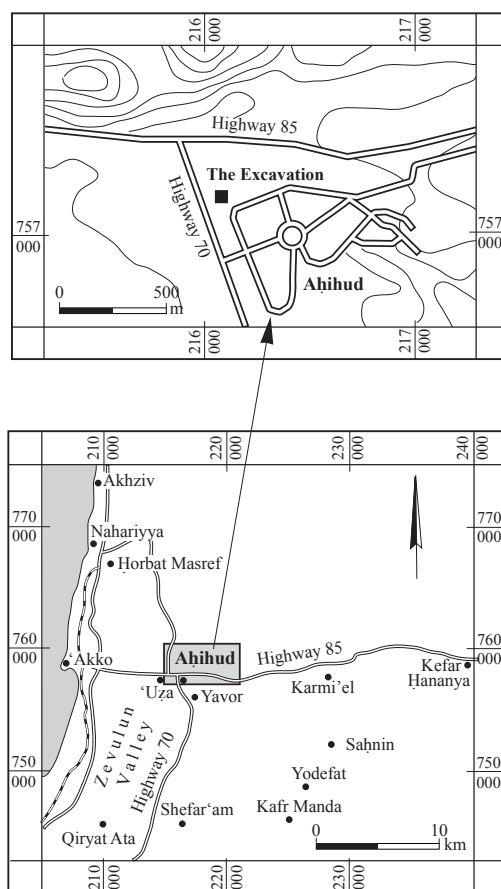
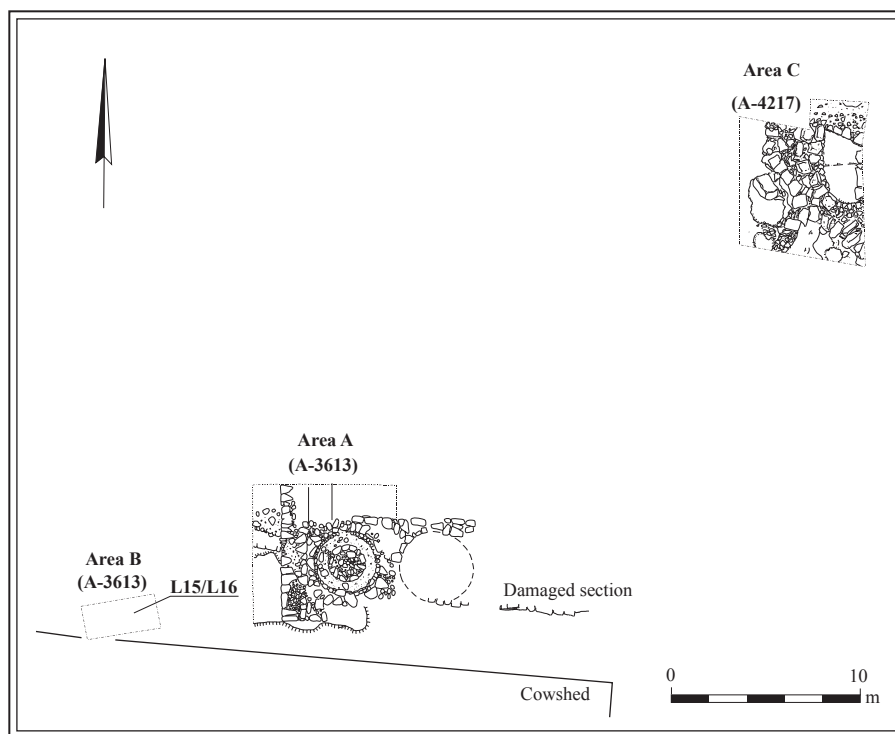


Fig. 1. Map with inset showing location of site.



Plan 1. The excavation areas.

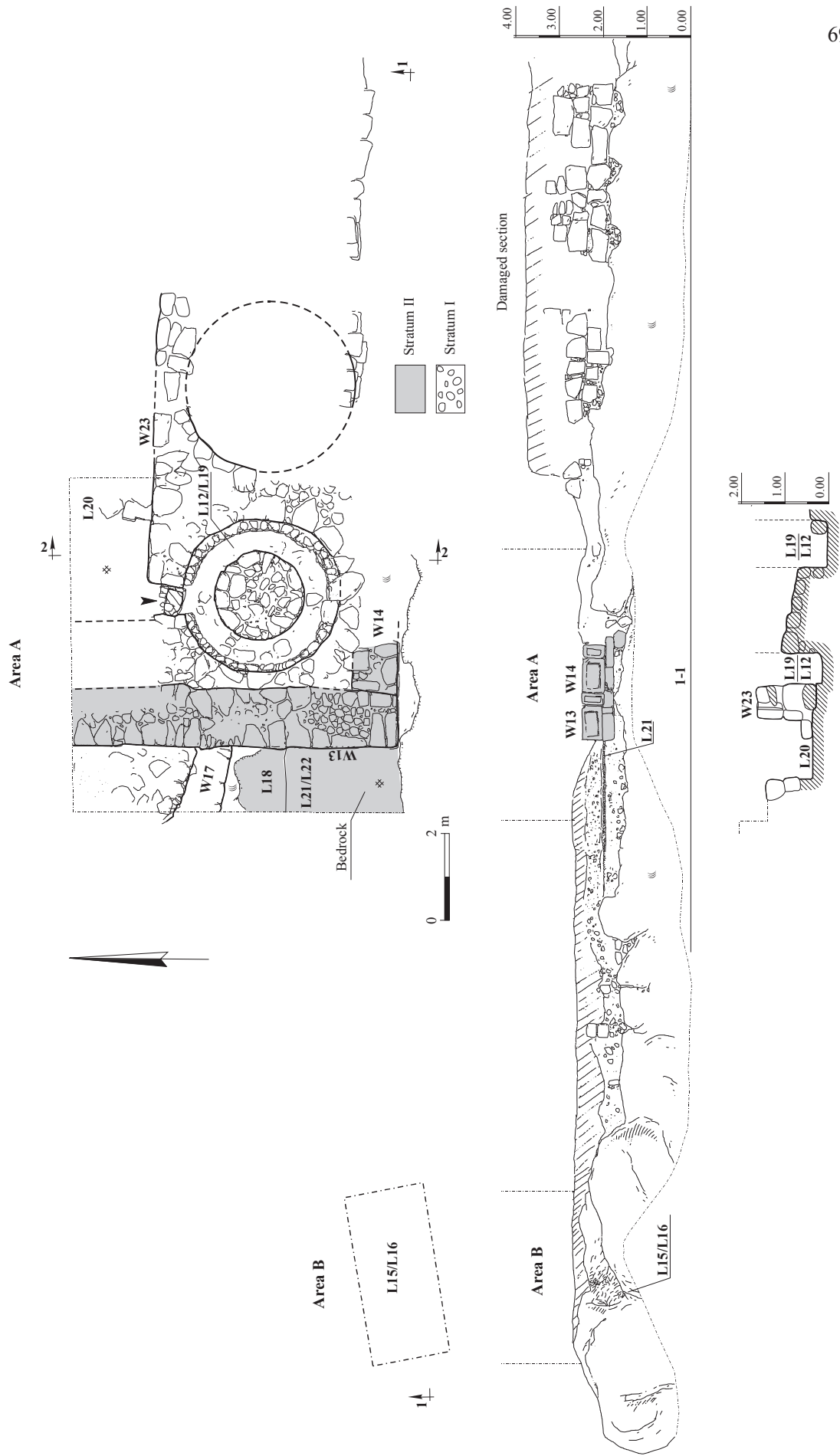


Fig. 2. Stratum II, Area A, the southwestern corner of the building, looking north.

virgin soil. Wall 14 was partially destroyed when a kiln was constructed in the subsequent stratum (see below, Stratum I).

Area C (Plan 3).— In the northeastern corner of Area C, a section of a wall (W108) was

exposed, constructed of large dressed stones laid directly on bedrock. Its attribution to the earlier phase is based on its being in secondary use as the support of the northern end of the combustion chamber of the pottery kiln of the later phase (see below, Stratum I; L109/110).



Plan 2. Areas A and B, plan and sections.

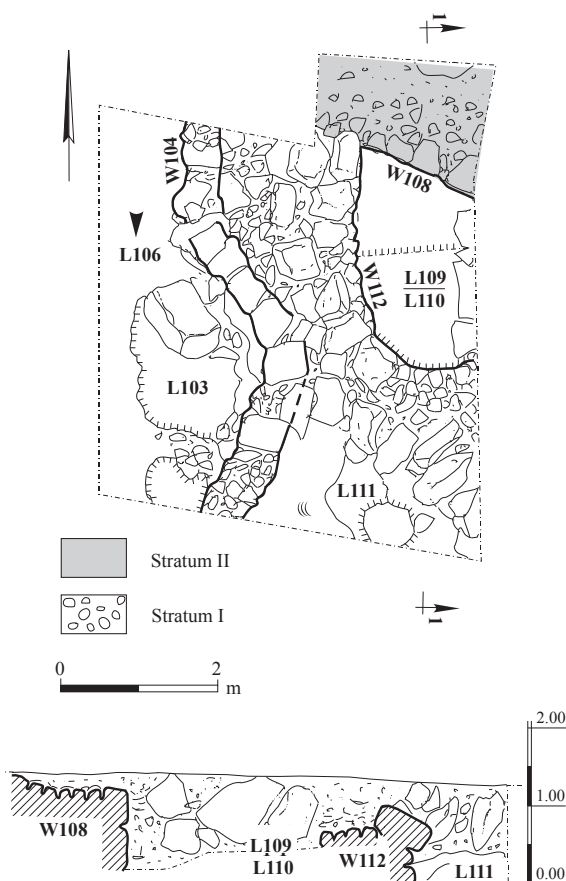


Fig. 3. Stratum II, Area A, the southwestern corner of the building and the Stratum I kiln that was built into it, looking east.

Stratum I

Area A (Plan 2).— Two pottery kilns were built inside the southwestern corner of the Stratum II building, partially damaging—and therefore later than—W14. The entire circumference of the foundation of the western kiln was exposed to a height of c. 0.7 m (Figs. 3, 4). It included a round combustion chamber (diam. 3.5–3.7 m) with a smooth bedrock floor (L12, L19) and a central, stone-built column (diam. c. 2 m) that would have supported the floor of the firing chamber (Plan 2: Section 2–2). The combustion chamber's opening, through which fuel was inserted, was preserved in its entirety on the northern side of the kiln. The facade of the kiln, facing north, was built of large, roughly hewn stones abutting a wall (W23), in front of which was a smoothed-bedrock floor (L20). Large quantities of sherds were found in the combustion chamber, as well as on the floor in front of the kiln. Among them were a number of distorted sherds that were over-fired wasters, resulting from the pottery production process. A small part of another kiln, whose diameter could be reconstructed as c. 4 m, was uncovered to the east of this kiln and in fact, the two were built as a single unit (Fig. 3).

Abutting W13 on the west is W17, which consisted of two courses laid on bedrock; its date remains unclear.



Plan 3. Area C, plan and section.

Area B (Plan 2).— In Area B, at the western end of the vertical section that cut through the site (c. 10 m southwest of the two kilns in Area A), a pile of pottery wasters, similar to those found to the north of the western kiln, was found in a natural depression in the bedrock (L15, L16; Fig. 5; Plan 2: Section 1–1). These sherds were most likely refuse dumped from the kilns; most of the pottery samples analyzed in the present report originated from these loci.

Area C (Plan 3).— The foundations of two additional combustion chambers (L103, L110) were discovered in Area C, approximately 25 m to the northeast of the kilns in Area A (Plans 1, 3). As in Area A, these two barely preserved kilns were constructed as a single unit (W104



Fig. 4. Stratum I, Area A, the western kiln: the combustion chamber, looking north; note the opening to the combustion chamber and the column in its center that supported the floor of the firing chamber.



Fig. 5. Area B, refuse pit containing debris from the workshop, looking north.

and W112). In one of the kilns (L103), the northern opening of the combustion chamber was identified (L106; Plan 3).

POTTERY

A total of 1038 rim sherds, recovered from all areas of the excavation, were counted and sorted according to vessel type (Table 1). The types included tableware (bowls, kraters), cooking vessels (pots, saucepans) and storage vessels (jars, amphora). In addition, jar lids, antiliya jars, stands and other types (*varia*), were recognized. During the excavation, it was difficult to clearly distinguish pottery assemblages that could be securely attributed to either stratum, and thus, the assignment of the vessel types to two distinct chronological phases was based mainly on comparisons to other sites. As the number of sherds attributed to Stratum II is very small, the counted corpus presented in Table 1 comprises mostly sherds from Stratum I.

Pottery restoration was not possible because most of the finds originated from the workshop debris of over-fired wasters.

Thirty-eight sherds were selected for subsection to petrological provenience analysis, resulting in the identification of four main petrological groups and a small group of *varia* (Tables 2–6).

Stratum II (Fig. 6)

The pottery attributed to Stratum II belongs to the early phase of the settlement, dated to the beginning of the Roman period.

Bowl Type A (Fig. 6:1).— Such incurved bowls have a thickened rim with two grooves on its top. These vessels resemble the Type 1B bowls from Kefar H̄ananya (Adan-Bayewitz 1993:91–97), where they date from the beginning of the second until the mid-third centuries CE.

Cooking Pots (Fig. 6:2).— The Type A cooking pots have a simple rim with an interior groove. They resemble the Type 4A cooking pots

Table 1. The Quantitative Distribution of the Vessels

Vessel Type	N	%
Bowl Type A	9	0.90
Bowl Type B	2	0.20
Bowl Type C	1	0.10
Bowl Type D	6	0.60
Bowl Type E	5	0.50
Bowl Type F	1	0.10
Krater Type A	8	0.80
Krater Type B	4	0.40
Krater Type C	3	0.30
Krater Type D	3	0.30
Saucepan	10	0.95
Cooking pot Type A	3	0.30
Cooking pot Type B	1	0.10
Cooking pot Type C	7	0.70
Cooking pot Type D	2	0.20
Shih̄in-type jar	5	0.50
Yavor-type jar	146	14.00
Ah̄ihud-type jar	494	47.50
‘Uza Jar Type 1a	26	2.50
‘Uza Jar Type 1b	164	15.80
Amphora	1	0.10
Jar lids Types A and B	82	7.90
Jar lid Type C	1	0.10
Jar lid with knob	11	1.00
Antiliya jar	31	3.00
Stand	5	0.50
Varia	7	0.65
<i>Total</i>	<i>1038</i>	<i>100.00</i>

that were produced in the workshop at Kefar H̄ananya (Adan-Bayewitz 1993:124–125), where they date from the mid-first century BCE until the mid-first century CE.

The petrological analysis (Table 2: Group 1A, see below) indicates that the fabric of these cooking pots is the same as that of the Type 4a cooking pots made in the Kefar H̄ananya workshop.

Shih̄in-Type Jars (Fig. 6:3, 4).²— Jars of this type have an everted rim with a stepped interior.

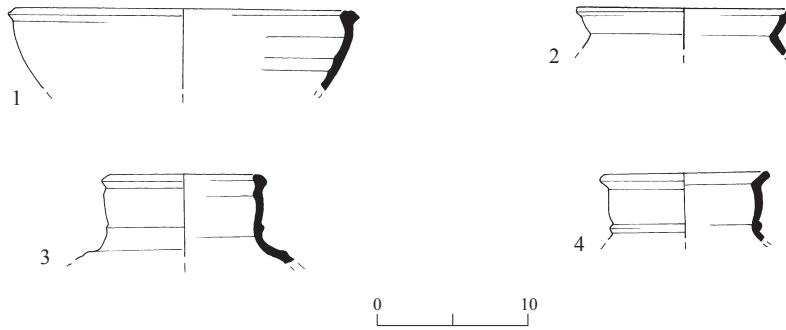


Fig. 6. Stratum II pottery.

No.	Vessel Type	Locus	Basket	Petrologic Group
1	Bowl Type A	18	112	1A
2	Cooking pot Type A	16	123/1	1A
3	Shiḥin-type jar	18	109	4B
4	Shiḥin-type jar	22	128	3B

The neck is short, with a ridge at its base. The walls are thinner and more delicate than walls of similar jars dated to a later period (the Yavor-type jar, see below). Such jars, known as ‘barrel jars’ (a common shape in the Galilee in the Roman and Byzantine periods), have two loop handles with a single ridge in their center, attached to the ribbed shoulder of the vessel. They are frequently decorated with a single or double white line painted around the middle of the jar (in the area that is usually not ribbed). The base of the vessel is usually rounded and ribbed.

The name of these jars in the present study stems from their typological similarity to jars most likely manufactured in the workshop at Shiḥin (see n. 3), in the central Galilee, near Zippori, where they are dated to the beginning of the Roman period (Adan-Bayewitz and Wieder 1992: Fig. 3). Jars of this type are also known from Capernaum (Loffreda 1974: Pl. 1.1), where they are also dated to the beginning of the Roman period, from 63 BCE until 135 CE. In addition, jars of this type were unearthed in the early Roman pottery workshop at Yodefat (Avshalom-Gorni, personal observation).

The petrological analysis showed that the fabric of these jars bears similarity to the fabric

of jars found in the pottery workshop at Yodefat (Table 5: Group 4; see n. 8) and visual similarity to the fabric of jars found in the pottery workshop at Shiḥin (Table 4: Group 3B).

Stratum I (Figs. 7–9)

The pottery vessels attributed to Stratum I represent the later phase of the settlement, dated from the Middle to Late Roman periods. Most of these vessels are associated with the pottery workshop debris found mainly in the pile of wasters in Area B (Plan 2; L15, L16); the assemblage includes bowls, kraters, cooking vessels, jugs, jars, jar lids, amphorae, antiliya jars and stands, as well as varia.

Bowls (Fig. 7:1–5)

Five types of bowls were discerned in Stratum I.

Bowl Type B (Fig. 7:1).— Such open bowls have a flat, everted rim and a carinated shoulder. These bowls are similar to Type 3B bowls at Kefar Ḥananya (Adan-Bayewitz 1993:119–124), where they are dated from the beginning of the second century until the end of the fourth century CE.

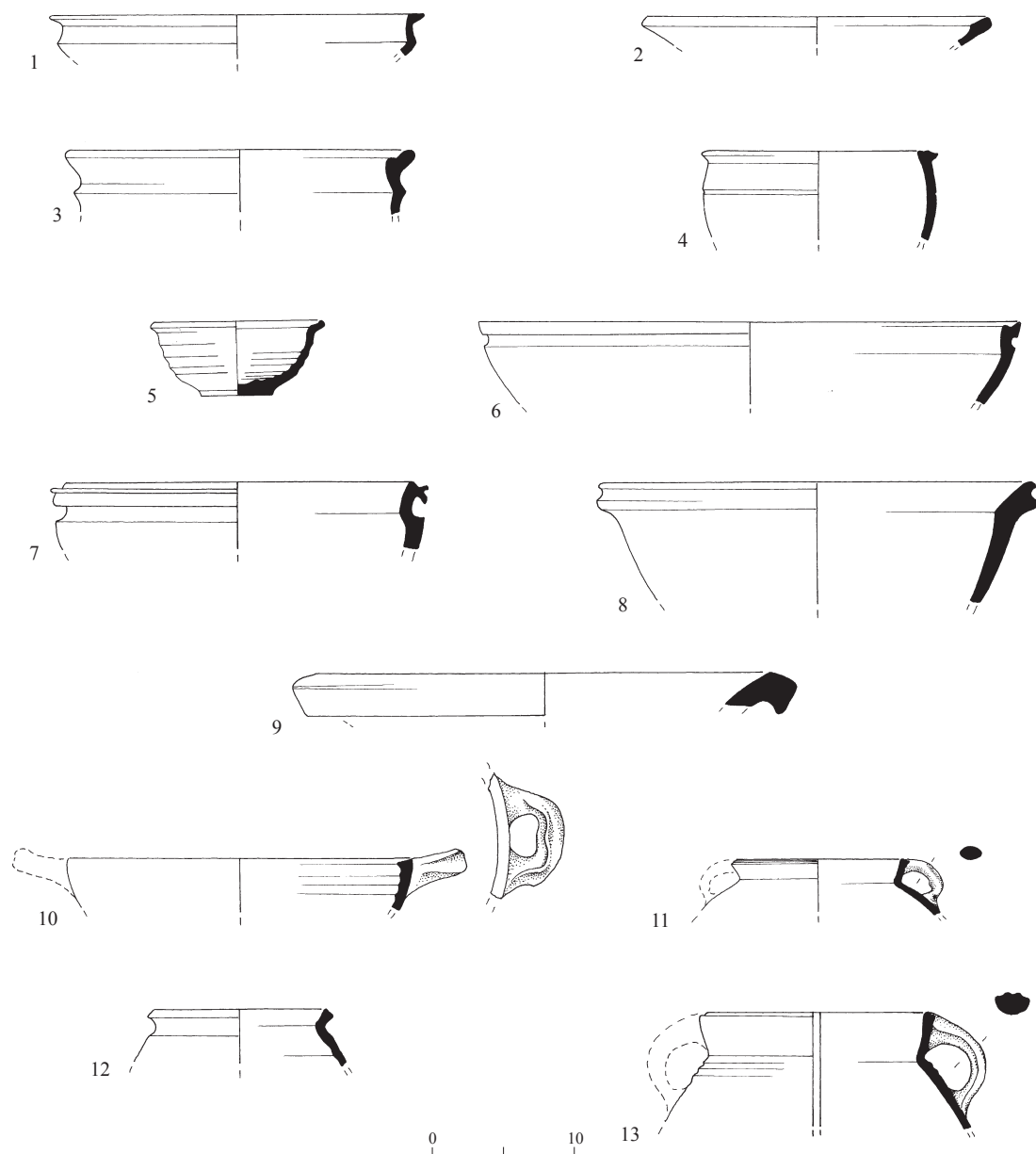


Fig. 7. Stratum I pottery: bowls, kraters and cooking vessels.

Bowl Type C (Fig. 7:2).— Open bowls of this type have a rounded rim with a thickened interior and a rectangular cross-section. These vessels are similar to Type 1E bowls at Kefar H̄ananya (Adan-Bayewitz 1993:103–109), where they are dated from the mid-third century until the beginning of the fifth century CE.

Bowl Type D (Fig. 7:3).— These bowls have a flat, thickened everted rim with a grooved interior. Below the rim exterior is a prominent ridge.

Bowl Type E (Fig. 7:4).— These deep bowls have a flat, string-cut rim with a thin groove below its exterior. It is unclear whether this

◀ Fig. 7

No.	Vessel Type	Locus	Basket	Petrologic Group
1	Bowl Type B	16	111/6	1A
2	Bowl Type C	20	122	1A
3	Bowl Type D	20	117/5	3A
4	Bowl Type E	16	125/1	4A
5	Bowl Type F	100	1000	-
6	Krater Type A	16	106/1	2B
7	Krater Type B	16	125/2	3B
8	Krater Type C	16	106/3	Basalt and carbonate
9	Krater Type D	18	120	Iddingsite inclusions
10	Saucepan	20	117/4	2A
11	Cooking pot Type B	100	1002/2	-
12	Cooking pot Type C	20	117/2	2A
13	Cooking pot Type D	20	117/6	2A

vessel was indeed used as a bowl or perhaps as a lid.

Bowl Type F (Fig. 7:5).— These bowls have a thickened everted rim with a grooved interior, thick walls with shallow ribbing and a flat, string-cut base.

Kraters (Fig. 7:6–9)

Four types of kraters were discerned.

Krater Type A (Fig. 7:6).— Such kraters have a flat inverted rim with a grooved interior. Below the rim exterior is a deep groove. Similar, but undated vessels are known from Jalame (Johnson 1988:174–175, Fig. 7-25:410–413). Díez Fernández (1983:178, Type T21.5) dates these vessels to the beginning of the fourth century CE.

Krater Type B (Fig. 7:7).— These kraters have a flat everted rim with a grooved edge and a deep wide groove below the rim exterior. They are similar to kraters that were presumably manufactured in the workshop at Shiḥin and dated to the Middle Roman period (Adan-Bayewitz and Wieder 1992: Fig. 3). Vessels of this type are dated at Capernaum to the Middle Roman period, between 135–300 CE (Loffreda

1974: Fig. 6), and at Jalame, to the mid-fourth century CE (Johnson 1988:182–183, Fig. 7-30).

Krater Type C (Fig. 7:8).— Open kraters of this type have an everted stepped rim. Similar vessels are known from Jalame (Johnson 1988:176–177, Fig. 7-26), where they occur later than 383 CE.

Krater Type D (Fig. 7:9).— These kraters have an everted squared rim. Similar vessels are known from Jalame (Johnson 1988:183–184, Fig. 7-31), where they are dated to the second half of the fourth century CE.

Saucepans (Fig. 7:10)

The saucepans have an inverted cut rim, a ribbed body and two horizontal handles attached directly to the rim. These vessels are first known at the end of the third century CE and continue to appear throughout the eighth and ninth centuries CE (Magnez 1993:211–212, Casserole Form 1).

Cooking Pots (Fig. 7:11–13)

Three types of cooking pots were discerned.

Cooking Pot Type B (Fig. 7:11).— These cooking pots have a flat everted rim with two

Fig. 8 ▶

No.	Vessel	Locus	Basket	Petrologic Group
1	Yavor-type jar	16	111/7	2B
2	Yavor-type jar	16	111/2	4A
3	Yavor-type jar	15	105	3B
4	Aḥihud-type jar	16	111/3	4B
5	Aḥihud-type jar	16	111/1	3A
6	Aḥihud-type jar	16	106/2	3A
7	‘Uza Type 1a jar	16	123	3A
8	‘Uza Type 1a jar	16	111/5	4A
9	‘Uza Type 1a jar	20	127	2B
10	‘Uza Type 1b jar	10	114/2	3A
11	‘Uza Type 1b jar	10	114/1	4B
12	Jar handle	16	00/3	1B
13	Jar handle	16	00/2	3B
14	Storage jar	102	1006/4	-
15	Storage jar	16	00/1	1B

grooves on top. The neck is short and vertical and the handle extends from the rim to a rounded shoulder. These vessels are similar to Type 4C cooking pots manufactured at Kefar Ḥananya, dated there from the early second to the mid-fourth centuries CE (Adan-Bayewitz 1993:128–130).

Cooking Pot Type C (Fig. 7:12).— These cooking pots have an everted rim with a ridge on the exterior. Similar vessels are known from Jalame (Johnson 1988:189–190, Fig. 7-35:534, 535, 541), where they are dated to 351–383 CE.

Cooking Pot Type D (Fig. 7:13).— Cooking pots of this type have a rounded rim with a groove on the exterior. The neck is high and two handles extend from the rim to a sloping shoulder. These vessels are similar in form and fabric to vessels that were manufactured in the workshop at Ḥorbat ‘Uza (Stratum 8), where they are dated to 340–410 CE (Avshalom-Gorni 2009a:40–45). Their form also resembles that of Type 4E cooking pots manufactured at Kefar Ḥananya (Adan-Bayewitz 1993:132–

135), where they are dated from the beginning of the fourth century until the beginning of the fifth century CE.

Barrel Jars (Fig. 8)

Four types of barrel jars, which are typologically similar to the early jar of the Shihin type described above, were discerned based on rim shape. In addition, sherds of these jars that could not be typologically assigned were found (Fig. 8:12–15).

Yavor-Type Jars (Fig. 8:1–3).— These jars have a stepped rim that resembles that of the earlier Shihin type, but they are larger, have thicker walls and are more carelessly fashioned. Such jars were found at the site of Yavor in a concentration of production waste, which was considered to represent a pottery workshop (Idan Shaked, pers. comm.; see below). They are similar to jars from Capernaum (Loffreda 1974: Pl. 1:2), where they are dated to the Middle and Late Roman periods, from 135–450 CE.

Aḥihud-Type Jars (Fig. 8:4–6).— These jars have a rounded rim, which is thickened on the exterior

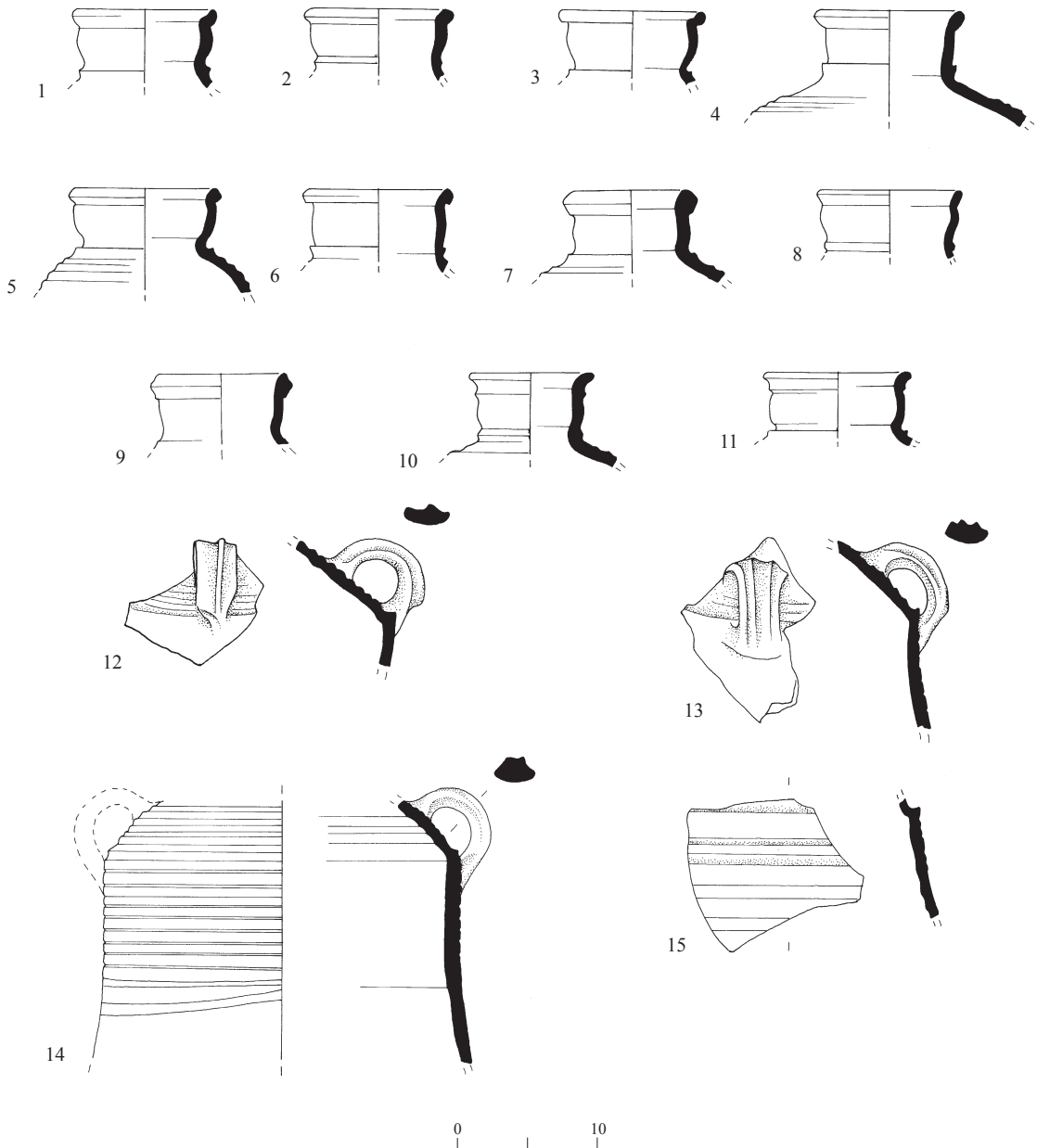


Fig. 8. Stratum I pottery: storage jars.

and has a ridge at the base of the neck. They are among the most common jars at Aḥihud. Similar vessels are known from the workshop in Ḥorbat ‘Uza Stratum 9 (Avshalom-Gorni 2009a:52–53, Type SJ.1aII), where they are dated to the beginning of the fourth century CE.

‘Uza Type 1a Jars (Fig. 8:7–9).— These jars have a rounded rim and a rounded ridge on the neck exterior. The base of the neck is also ridged. Similar vessels are known from the workshop in Ḥorbat ‘Uza Strata 8 and 9 (Avshalom-Gorni 2009a:52–53, Type SJ.1a),

where they are dated from the mid-fourth until the mid-fifth centuries CE.

‘Uza Type 1b Jars (Fig. 8:10, 11).— The jars are characterized by an out-folded rim, creating a ridge, with another ridge slightly below the rim and a third ridge at the base of the neck. This type is similar to the Ahihud-type jar (see above), but is larger and more carelessly fabricated. Such jars were produced in small amounts in the workshop of Ḥorbat ‘Uza Strata 7 and 8 (Avshalom-Gorni 2009a:52–53, Type SJ.1b), where they date to the beginning of the fourth century CE. When the workshop of Ḥorbat ‘Uza Stratum 8 was in operation, from the mid-fourth until the beginning of the fifth centuries CE, this type of jar was its principal product. Similar vessels are known from Capernaum (Loffreda 1974: Pl. 1:3), where they date to the Middle and Late Roman periods, from 135–450 CE.

Barrel-Jar Handles and Body Sherds (Fig. 8:12–15).— Along with the diagnostic rim and neck sherds were several handles and body sherds that could not be assigned to specific barrel-jar types. There are two common types of handles on the barrel jars discussed above (based on comparison with complete vessels elsewhere): Handle Type A (Fig. 8:12), with a single ridge in its center, and Handle Type B (Fig. 8:13, 14), with two ridges. At Ḥorbat ‘Uza, Handle Types A and B are associated with low-necked and high-necked barrel jars respectively (Avshalom-Gorni 2009a:52–57). The body sherd with the Type B handle in Fig. 8:14 and an additional body sherd (Fig. 8:15) had one or two white painted stripes below the handle.

Jar Lids (Fig. 9:1–7)

Three types of lids were discerned. The first two are known as bell lids (Johnson 1988:220–221, Fig. 7-55), with a deep body and a knob handle: Type A (Fig. 9:1, 2), which has a cut rim that

sometimes slants inward, and Type B (Fig. 9:3, 4), which has a flat thickened rim. Two rimless fragments (Fig. 9:5, 6) most probably belonged to bell lids, too. The third type represented here, Type C (Fig. 9:7), differs somewhat from the typical bell shape; it is unusually small and shallow, with a rounded rim. In general, two types of handles are common for bell lids: narrow and flat on top (Fig. 9:6) or narrow with a solid rounded knob on top (sometimes with a pinched hole), similar to that found on Type C (Fig. 9:7). Some of the bell lids are without handles (i.e., Fig. 9:5).

Lids similar to Types A and B were manufactured in the workshops of Strata 8 and 9 at Ḥorbat ‘Uza, from the beginning of the fourth until the mid-fifth centuries CE (Avshalom-Gorni 2009a:56–60).

Amphora (Fig. 9:8)

Only one amphora was found. It has a tapering rim and an elongated handle attached just below the rim and extending down to the shoulder. The handle has two ridges and narrow grooves on both sides. Similar vessels are known from the Stratum 9 workshop at Ḥorbat ‘Uza (Avshalom-Gorni 2009a:47–51), dating to the beginning of the fourth century CE, and from Jalame (Johnson 1988:209, 211, Fig. 7-49).

Antiliya Jars (Fig. 9:9, 10)

The antiliya jars have a rounded everted rim and a ribbed body. Similar vessels are known from the workshops in Ḥorbat ‘Uza Strata 9 and 8, dating from the beginning of the fourth until the mid-fifth centuries CE (Avshalom-Gorni 2009a:47–51).

Stands (Fig. 9:11)

The stands found at Ahihud have a rounded everted rim. Similar stands are known from the workshops at Ḥorbat ‘Uza, where they are dated from the beginning of the fourth until the mid-fifth centuries CE (Avshalom-Gorni 2009a:63–66).

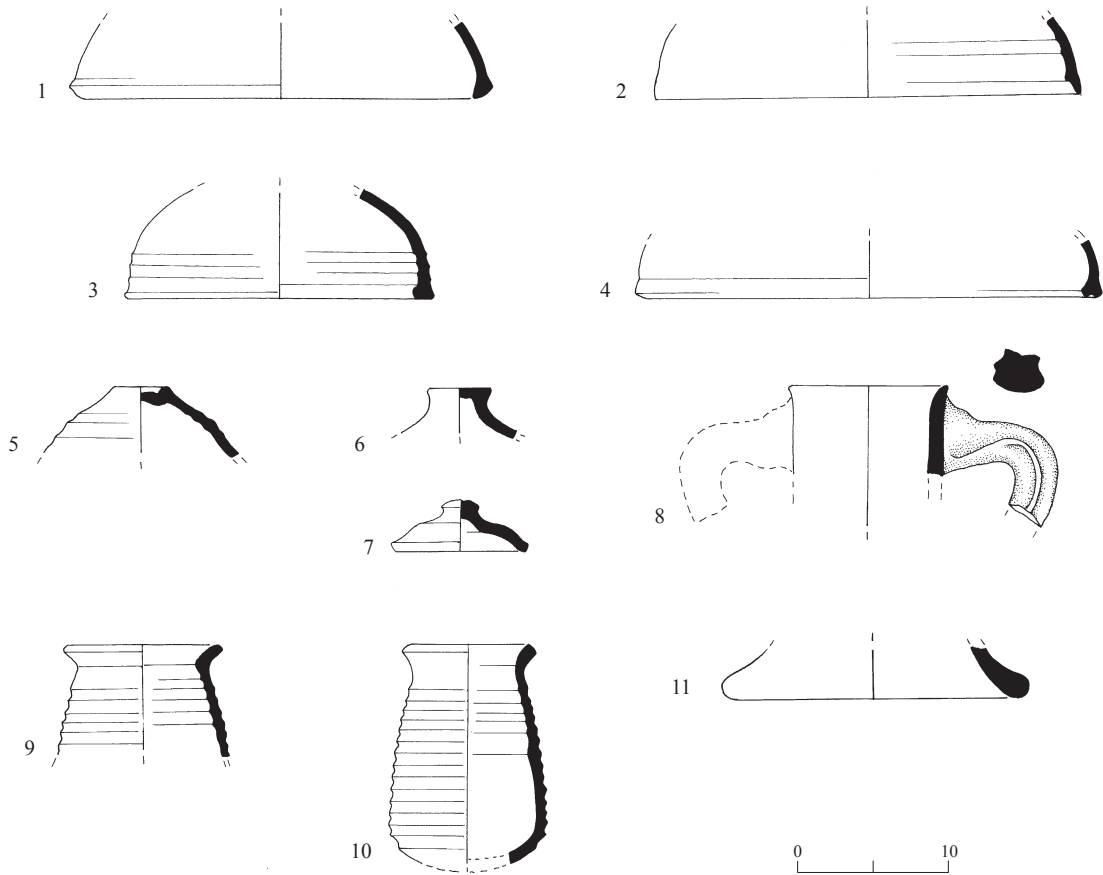


Fig. 9. Stratum I pottery: miscellaneous.

No.	Vessel	Locus	Basket	Petrologic Group
1	Lid Type A	16	125	4A
2	Lid Type A	16	125/3	3B
3	Lid Type B	16	106	1B
4	Lid Type B	20	117/1	3A
5	Lid	16	111/4	1B
6	Lid	20	117/3	1B
7	Lid Type C	102	1006/2	-
8	Amphora	15	105/1	Fabric similar to pottery from Horbat 'Uza, Horbat Masref and Akhziv workshops
9	Antiliya jar	20	117	4B
10	Antiliya jar	102	1006/3	-
11	Stand	16	123/2	Light-colored, non-homogeneous clay with quartz sand and dark inclusions

Ceramic Chronology

Stratum II

The earliest pottery was mostly found in Area A in L18 and L21/22 (Plan 2) and in Area C in L111 (Plan 3), dating Stratum II to the beginning of the Roman period (50 BCE–135 CE). Small quantities of similar sherds were also found in the depression in the bedrock containing pottery workshop waste debris in Area B (L15, L16; Plans 1, 2); their presence in this later context is apparently residual.

Stratum I

Some of the vessel types ascribed to Stratum I are found elsewhere in assemblages that appear before the fourth century CE, among them Krater Types A and B, and jars of the Yavor type; all types continue until the fifth century CE. Other vessels, including saucepans, Cooking Pot Types B and C, jars of the Aḥihud type, jar lids, the amphora and the antiliya jars, all appear in assemblages dated to the beginning of the fourth century CE. Thus, the general date assigned to Stratum I is between 135 and 450 CE.

The date of the jars of 'Uza Type 1a, examples of which were found at Ḥorbat 'Uza in assemblages that began in the mid-fourth century CE (Avshalom-Gorni 2009a:52–61), may be lowered to the beginning of the fourth century CE, based on their presence in the Stratum I pottery assemblage at Aḥihud.

PETROLOGICAL ANALYSIS

Of the 43 items selected for illustration (Figs. 6–9), 38 were chosen for provenience analysis (four samples from Stratum II and the rest from Stratum I). The aim of the study was to group the vessels according to their fabrics and to determine which kinds of tempers and clay were used in preparing the paste. The samples were chosen for further analysis based on the visual observation of the fabrics of all the pottery found at the site. No petrographic thin sections were made. The petrological analysis

entailed the examination of the fabrics under the binocular microscope at magnifications from $\times 20$ to $\times 40$, with the aid of 5% dilute hydrochloric acid and a steel needle. Firing temperature was roughly estimated according to the presence of carbonate component in the temper and matrix. Description of the mineral composition of the examined pottery is given below.

The Results

The present study shows that the sample can be divided into four main petrological groups, according to the different tempering materials. Four vessels, however, do not belong to any of these groups and are different from each other as well; these are defined as *varia*.

Group 1: Terra Rossa and Ferruginous Ooliths (Table 2)

This type of fabric is easily distinguished, even by the naked eye. It was studied by Adan-Bayewitz and Wieder, who defined it as “Kefar Ḥananya ware” (Adan-Bayewitz 1993:199; Wieder, Adan-Bayewitz and Asaro 1994:312–314; Wieder and Adan-Bayewitz 1999:332–334), while Berlin and Rautman defined it as “Galilean cook ware” (Berlin 1997:91–92, 113–114; Rautman 1997:226–227). The fabric contains ferruginous ooliths, which are a characteristic feature of the Lower Cretaceous formations of the region. Notably, the source of raw materials closest to the site is *terra rossa* soil that developed atop outcrops of Lower Cretaceous carbonate rocks at nearby Kefar Ḥananya Junction (Sneh, Bartov and Rosensaft 1998). Thus, the most probable provenience for these vessels was the pottery workshops of Kefar Ḥananya. Group 1 is divided into two subgroups:

Subgroup 1A.— This subgroup includes three bowls and one cooking pot, which have a levigated, fine and well-fired orange-brown fabric. Firing temperature is estimated at not higher than 750°C. A large quantity of silty

Table 2. Pottery Assigned to Petrologic Group 1 (Kefar Ḥananya)

Vessel	Locus	Basket	Fig.	Petrologic Subgroup
Bowl Type A	18	112	6:1	IA
Bowl Type B	16	111/6	7:1	IA
Bowl Type C	20	122	7:2	IA
Cooking pot Type A	16	123/1	6:2	IA
Storage jar handle	16	00/3	8:12	IB
Storage jar body sherd	16	00/1	8:15	IB
Lid Type B	16	106	9:3	IB
Lid	16	111/4	9:5	IB
Lid with knob	20	117/3	9:6	IB

quartz can be seen in the matrix. Ferruginous oolites, quartz and carbonate inclusions, 0.2–0.5 mm in diameter, are sporadically present. One of the vessels (Fig. 7:1) has more carbonate inclusions than the others.

Subgroup 1B.— This subgroup includes two storage jars and three lids that are very similar to Subgroup 1A, but their fabric is coarser (i.e., less carefully prepared). Sand-sized material includes ferruginous oolites and limestone grits.

Group 2: Terra Rossa and Sand (Table 3)

This group was divided into two subgroups, the difference between them being the source of the sand that was used as temper. The six samples forming this group are characterized by a yellowish brown silty matrix. Firing temperature is estimated at about 750°C. Fine quartz or quartz-carbonate sand was added to the paste as tempering material in quantities of 12% to 17% of its volume. The raw material used for these vessels was most likely *terra rossa* soil, to which some sea sand was added. The *terra rossa* soil is characteristic of the upper reaches of the hilly area of the western Galilee, and can be found about 1.5 km to the east of the site (Ravikovitch 1969). The temper was either quartz sea sand (prevalent on the shore

to the south of ‘Akko) or quartz-calcareous sea sand (prevalent on the shore to the north of ‘Akko). Both types of sea sand could be gathered at a distance of 8–10 km to the west of the site, well within the possible range of transportation to Aḥihud of raw materials for pottery manufacture.

Although the same kind of soil that was used to make the pottery of Group 1 was used here as well, the material originated in another location, not on top of the Lower Cretaceous formations. Moreover, it was treated differently, being less well-levigated than the clay in Group 1.

A similar, but not identical paste composition was used by potters in the Ḥorbat ‘Uẓa and Ḥorbat Masref pottery workshops (Yuval Goren, pers. comm.; Anastasia Shapiro, personal observation). Thus, these vessels could have been manufactured at the Aḥihud workshop, using the same raw materials that were used in the workshops at Ḥorbat ‘Uẓa.

Subgroup 2A.— This subgroup includes three cooking vessels of fabric containing larger quantities (~17%) of quartz sand temper, which was presumably gathered at the seashore south of ‘Akko.

Subgroup 2B.— This subgroup includes one krater and two storage jars tempered by

Table 3. Pottery Assigned to Petrologic Group 2 (Local)

Vessel	Locus	Basket	Fig.	Petrologic Subgroup
Krater Type A	16	106/1	7:6	2B
Saucepan	20	117/4	7:10	2A
Cooking pot Type C	20	117/2	7:12	2A
Cooking pot Type D	20	117/6	7:13	2A
Yavor-type jar	16	111/7	8:1	2B
‘Uza Type 1a jar	20	127	8:9	2B

Table 4. Pottery Assigned to Petrologic Group 3 (Local)

Vessel	Locus	Basket	Fig.	Petrologic Subgroup
Bowl Type D	20	117/5	7:3	3A
Krater Type B	16	125/2	7:7	3B
Shihin-type jar	22	128	6:4	3B
Yavor-type jar	15	105	8:3	3B
Ahitud-type jar	16	111/1	8:5	3A
Ahitud-type jar	16	106/2	8:6	3A
‘Uza Type 1a jar	16	123	8:7	3A
‘Uza Type 1b jar	10	114/2	8:10	3A
Storage-jar handle	16	00/2	8:13	3B
Lid Type B	20	117/1	9:4	3A
Lid Type A	16	125/3	9:2	3B

quartz-calcareous sand, which was presumably gathered at the seashore north of ‘Akko.

Group 3: Terra Rossa and Carbonate Material (Table 4)

The 11 samples comprising this group are characterized by a yellowish brown matrix that seems to be of the same origin as that of Group 2 (i.e., *terra rossa* soil), although it is less levigated. To this soil, a considerable amount of carbonate material was added. The carbonate fragments are poorly sorted, with a size variation from silt to 0.4 mm. In some of the samples, these fragments form layers within the matrix and compose 5–10% of the volume of the sherd.

This indicates that these finely ground fragments were deliberately added to the paste as temper. A few samples also contain small amounts of quartz grains of fine sand size (0.3–0.4 mm).

Based on the mineralogical composition, vessels of Group 3 are considered to be of local provenience, because the *terra rossa* soil can be found in close proximity of the site (Ravikovitch 1969), and the calcareous material could be gathered at a streambed; the Hīlazon stream, running westward toward the Mediterranean Sea, is closest to the site on its south.

This group can be divided into two subgroups on the basis of the firing temperature.

Table 5. Pottery Assigned to Petrologic Group 4 (Local)

Vessel	Locus	Basket	Fig.	Petrologic Subgroup
Bowl Type E	16	125/1	7:4	4A
Shihin-type jar	18	107	6:3	4B
Aḥihud-type jar	16	111/2	8:2	4A
Aḥihud-type jar	16	111/3	8:4	4B
‘Uza Type 1a jar	16	111/5	8:8	4A
‘Uza Type 1b jar	10	114/1	8:11	4B
Lid Type A	16	125	9:1	4A
Antiliya jar	20	117	9:9	4B

Subgroup 3A.— This subgroup includes four storage jars, one lid and one bowl, which were fired at about 700–750°C.

Subgroup 3B.— This subgroup includes three storage jars, one lid and one krater, all of which are characterized by a thick gray core and relatively thin edges in the cross-section. This indicates that these vessels were fired for a short time at a relatively high temperature (750–800°C) and in a reducing atmosphere. This fabric is visually similar to the pottery from Shihin, suggesting the use of a similar technology.

The vessels assigned to Subgroup 3B can be considered an attempt to copy the technology of the Shihin pottery workshop, which is characterized by a higher-fired hard fabric with a thick gray core (Wieder and Adan-Bayewitz 1999:337). A high degree of similarity was also noted between the samples discussed here and the material from the pottery kilns at Ḥorbat ‘Uza (Anastasia Shapiro, personal observation). Thus, as for Group 2, the same sources of raw materials could have been used here.

Group 4: Non-Homogeneous Clay and Terra Rossa Pellets (Table 5)

Eight samples form Group 4, which is characterized by a non-homogeneous clayey-calcareous matrix containing silty quartz, with

small amounts of carbonate and rarely, quartz, both of sand size, and many round and oval pellets ranging from silt-size to sand-size. They are of reddish color and have a distinct silty texture. Sometimes the pellets are dark gray to black, possibly the result of a high firing temperature (~750–800°C) in a reducing atmosphere. The most probable source of raw material for these vessels is rendzina soil, providing the non-ferruginous clay, to which dry *terra rossa* soil was added to improve its quality.

These characteristics match the Yodefāt group of pottery described by Wieder and Adan-Bayewitz (1999:338–339). Because the Aḥihud samples come from the excavation of pottery kilns, and because the rendzina soil is common in the Aḥihud vicinity, it is probable that the vessels were manufactured at Aḥihud, using the same raw material recipe as the potters from Yodefāt. The similarity is due to the same raw materials being available in proximity to both sites. In addition, some degree of similarity between the Aḥihud samples and some of the vessels from the pottery kilns at Ḥorbat ‘Uza was noted (Anastasia Shapiro, personal observation), indicating that the same raw materials were used by potters of both these workshops as well.

This group, like Group 3, was divided into two subgroups on the basis of firing temperature.

Table 6. Fabric Varia

Vessel	Locus	Basket	Fig.	Petrologic Affinities/Provenience
Krater Type C	16	106/3	7:8	Basalt and carbonate
Krater Type D	18	120	7:9	Same as clay sarcophagi fabric (Shapiro 1997)
Amphora	15	105/1	9:8	Fabric similar to pottery from Horbat 'Uza, Horbat Masref and Akhziv workshops
Stand	16	123/2	9:11	Light-colored, non-homogeneous clay with quartz sand and dark inclusions

Subgroup 4a.— This subgroup includes two storage jars, one bowl and one lid, with an estimated firing temperature of about 750°C.

Subgroup 4b.— This subgroup includes three storage jars and one antiliya jar, which show clear signs of vitrification, indicating that the firing temperature reached at least 800°C.

Vessels of Miscellaneous Fabrics

Four of the analyzed samples had fabric compositions that differed from the four defined petrological groups, as well as from each other (Table 6).

The krater (Fig. 7:8) has a light brown matrix, containing abundant silt-size carbonate, little silty quartz, and rare rounded dark silt-sized grits, which seem to be basalt. Sand-sized material in the sherd is represented by a small amount (c. 1–2 to every 0.4 cm²) of rounded carbonate and basalt grains, of an average size of 1 mm. There are also some basalt and carbonate fragments whose size falls between silt and sand. Firing temperature is estimated at 700–750°C, due to the softness of the carbonate material.

The source of the raw materials for this sample is an area where both basalt and limestone are exposed and drained by water flow, causing the rounded sand-sized grains. This would suggest a provenience in a broad area that includes the southern Golan Heights, the Poriyya hills and the Korazim Plateau (Sneh, Bartov and Rosensaft 1998).

The second krater (Fig. 7:9) has a rather hard, light yellowish brown matrix and its firing

temperature is estimated at close to 800°C. The paste contains abundant reddish brown and brown subrounded inclusions and rare white (carbonate) inclusions. Visually, the sample is similar to the material of Roman clay sarcophagi and to kraters found at Tel Dover. Petrographic examination of the latter suggested Cyprus or Turkey (Antaliya Bay) as their possible place of origin (Shapiro 1997:1–5).

The amphora (Fig. 9:8) has a light brown calcareous matrix, fired at a relatively high temperature, estimated close to 750°C. The paste contains fine, (mostly) well-sorted quartz sand of about 0.1–0.2 mm in size, which comprise about 12–15% of the volume of the sherd. The visual appearance and petrological composition of the sherd matches the ceramic evidence from pottery workshops at Horbat 'Uza (Avshalom-Gorni 2009a:47–51)³ and Horbat Masref (Frankel and Getzov 1997:70–71, 72*),⁴ as well as the fabric of vessels unearthed during different excavations at Akhziv (Avshalom-Gorni 2006; Syon 1999:7–8).⁵ It is possible that the amphora was manufactured at one of these sites.

The stand (Fig. 9:11) has a very light yellowish gray matrix, which at a magnification of ×40 appears to be rather non-homogeneous. It consists of a mixture of some light gray and light yellowish brown calcareous materials with abundant silty quartz and many dark brown to black silt-sized grits. The paste appears also to contain fine (mostly 0.1 mm) gray quartz sand that comprises about 17–20% of the volume of the sherd. The quartz in this sherd has a different appearance than that in the amphora

(Fig. 9:8) described above. Rare dark rounded inclusions of about 1.0–1.5 mm present in the sherd seem to be mud-balls of some dark clay. The possible provenience for this stand can be broadly said to be somewhere in the Galilee.

The Provenience of the Aḥihud Pottery

The two double kiln structures attributed to Stratum I at Aḥihud were apparently part of a pottery workshop, as supported by the fact that many of the associated sherds were wasters. It is thus assumed that the pottery recovered from this context was mostly workshop debris. The petrological analysis, along with a typological count of 1038 sherds, mostly from this stratum (Table 1), were aimed at clarifying which vessels were produced in this workshop and which were made elsewhere and brought to the site.

This analysis showed that the sampled pottery may be divided into four main fabric groups and a small group of varia, as described above (Tables 2–6). A combination of the quantitative and petrological analyses allows us to divide the finds into three main groups of origin: vessels produced at the site, vessels which were either manufactured at the site or brought there, and vessels produced outside the site.

Vessels Produced at the Site

This category includes vessels that were found at the site in large quantities and were made of locally available raw materials; it definitely pertains to Group 4, and possibly to Groups 2 and 3 as well.

From a quantitative standpoint (Table 1), the expertise of this workshop lay in the production of four types of barrel jars: the Yavor type, the Aḥihud type and 'Uza Types 1a and 1b. Other common types probably were jar lids and antiliya jars. From a petrological standpoint, the same types of these jars were found to be made of different fabrics. The fabrics of the Yavor-type jars belong to petrological Subgroups 2B, 3B and 4B (Tables

3–5). The fabrics of the Aḥihud-type jars belong to petrological Subgroups 3A and 4B (Tables 4, 5). The fabrics of the 'Uza Type 1a jars belong to petrological Subgroups 2B, 3A and 4A (Tables 3–5) and the fabric of the 'Uza Type 1b jars belong to petrological Subgroups 3A and 4B (Tables 4, 5). The antiliya jar belongs to petrological Subgroup 4B (Table 4), i.e., of local manufacture. The lids are of different fabrics, some of which could have been manufactured at Aḥihud (Fig. 9:1, 2, 4).

The barrel-jar types, as well as the antiliya jars, whose petrological affinities are similar to those manufactured at Yodefat (Group 4; Table 5), were definitely not produced there because they postdate the destruction of Yodefat which took place in 67 CE; at Aḥihud these jar types date from the beginning of the fourth century CE. It seems that the potters working in Aḥihud used raw materials and fabric recipes similar to those used by the potters during an earlier period at Yodefat.

Vessels Either Manufactured at Aḥihud or Brought to the Site

This group consists of several vessels whose petrological data cannot unequivocally ascertain whether or not they were produced at the site, as well as a very small number of vessels that are of types known from neighboring workshops, but are made of material that was available to the potters at Aḥihud. In general, the pottery types ascribed to petrological Groups 2 and 3 may belong to this category, although the quantitative aspect should be kept in mind.

Among the vessels included under this definition are Bowl Type D, ascribed to petrological Subgroup 3A (Fig. 7:3; Table 4), Krater Type A, ascribed to petrological Subgroup 2B (Fig. 7:6; Table 3), and Krater Type B, ascribed to petrological Subgroup 3B (Fig. 7:7; Table 4). The latter two are made of fabrics that are considered local and it is most likely that they were produced at the site. The saucepans (Fig. 7:10) comprise only 1% of the vessels at the site, but they are fashioned from

the same material as the cooking pots of Types C and D (Fig. 7:12, 13), which were most likely made at Aḥihud (Table 3, petrological Subgroup 2A). These could have been made at the site, but their fabric resembles the raw material used by the potters in the workshop at Ḥorbat 'Uẓa, where they occur in large quantities (Avshalom-Gorni 2009a), making that a potential provenience as well.

Vessels Produced Outside the Site

These are vessels whose fabrics are unequivocally not characteristic of the site and its vicinity. Since most of them were found in small quantities, they were probably brought to the site privately and sporadically, and did not arrive as a result of commercial trade.

This category includes all the vessels ascribed to Petrological Group 1 (Table 2): Bowl Types A, B and C (Figs. 6:1; 7:1, 2), Cooking Pot Type A (Fig. 6:2) and some of the storage jars (Fig. 8:12, 15) and lids (Fig. 9:3, 5, 6). They are similar in form and fabric to the vessels produced in the workshop at Kefar Ḥananya (Adan-Bayewitz 1993), and could have been manufactured at that site or elsewhere in the vicinity, but not at Aḥihud.

The four miscellaneous samples (Table 6) also originated elsewhere. The only amphora found during the excavation (Fig. 9:8) can be attributed to the industry that produced large quantities of such vessels in the pottery workshop of Ḥorbat 'Uẓa (Avshalom-Gorni 2009a:46–51).

Two kraters (Fig. 7:8, 9) have fabrics entirely different from the raw materials available at Aḥihud in particular and the western Galilee in general. One of them (Fig. 7:8) could have originated in an area characterized by basalt outcrops, such as Bet She'an or the Golan Heights, while the other (Fig. 7:9) might have been an import from Turkey or Cyprus (Shapiro 1997).

The fabric of the stand (Fig. 9:11) differs from all the others mentioned above; the presence of dark mineral inclusions suggests that it was an import.

THE JAR INDUSTRY FROM NEIGHBORING WORKSHOPS IN THE NORTHEASTERN ZEVULUN VALLEY AND THE WESTERN GALILEE

In the Galilee, there is a tradition of storage-jar production, whose roots go back to the Iron Age (Lehmann 2001) and perhaps even earlier. This differs from the coastal tradition, which specialized in the production of amphorae for sea trade, using a different technology. The typical Galilean jars were manufactured for land transportation and have a distinct and well-known shape: a barrel-shaped ribbed body with two loop handles on the shoulder and a rounded bottom.

During the long period in which they were used, these jars were produced according to the same, well-known technique, which included two stages. First, the rim was formed on the wheel, along with half of the vessel down to the middle of the body. Following an initial period of drying, the vessel was inverted on its rim and was placed again on the wheel, whereupon the bottom part of the jar and the base were fabricated (Franken and Kalsbeek 1975; Landsgraf 1980: Fig. 13a).

The workshop at Aḥihud joins three other known pottery workshops in the northeastern Zevulun Valley and western Galilee (Fig. 1), which specialized in the manufacture of barrel jars during the Roman and Byzantine periods (mid-first century BCE–mid-seventh century CE). One of these workshops was excavated at Yodefāt (Adan-Bayewitz and Aviam 1997:155), where three kilns were exposed on the southern shoulder of the ridge, within the city wall. An accumulation of manufacturing wasters from the workshops was excavated outside the city wall, not far from the kilns. These workshops date to the beginning of the Roman period, from the middle of the first century BCE until the year 67 CE, when Yodefāt was destroyed. Two types of barrel jars were produced in this workshop: the Yodefāt type with a ribbed neck and the Shihin type with a stepped rim (Avshalom-Gorni, personal observation). The same Shihin-type jar was found in the

Aḥihud pottery workshop and was assigned to Stratum II and to petrological Group 3B (Table 4; Fig. 6:4), while the Yodefāt-type jar is absent in the Aḥihud pottery collection.

A second workshop was identified at the Yavor junction during a survey conducted by Idan Shaked (pers. comm.). It is represented by a cluster of manufacturing wasters that indicated the presence of a pottery industry, although the facilities themselves were not found. Two types of barrel jars were discerned among the waster debris: the Shihin type and a jar defined as the Yavor type, which has a stepped rim similar to the former jar, but is dated later by both Shaked (pers. comm.) and Avshalom-Gorni. Instrumental mineralogical research to determine provenience carried out by Adan-Bayewitz and others revealed a great similarity in the raw material of the jars that were produced at Yavor and the vessels that were made at Shihin (Adan-Bayewitz et al. 2002:364). Jars of the Yavor type were found in the Aḥihud workshop and were assigned to Stratum I and to petrological Groups 2B (Fig. 8:1) and 3A (Fig. 8:2).

The third workshop is located at Ḥorbat ‘Uẓa (Ben-Tor 1966; Avshalom-Gorni 2009b; Getzov 2009), where the remains of a pottery industry were discerned in three well-dated strata: Stratum 9 (310–330 CE), Stratum 8 (340–410 CE) and Stratum 7 (410–430 CE). The excavations uncovered production facilities, including a number of kilns (three excavated), a levigation pool and a surface where the clay was kneaded, as well as clusters of raw material. A number of storage-jar types were manufactured at Ḥorbat ‘Uẓa (Avshalom-Gorni 2009a:52–57), and two of these types were found in the Aḥihud workshop (Fig. 8:7, 10), as detailed above (see also below and Fig. 10).

A typological analysis of the shape of the rim and neck of the barrel jars produced in these four pottery workshops enables us to distinguish nine general types of rims and necks (Fig. 10; Table 7). It should be noted that the names of the jar types presented in this figure

refer to the sites where the jars were found and not necessarily to the site where they were produced (see Table 7 and n. 3), aside from the Ḥorbat ‘Uẓa jar types (Fig. 10:7–15), which are the terms used in the publication of the jars made at this site (Avshalom-Gorni 2009a).

The Yodefāt-type jar (Fig. 10:1) is a continuation of the Hellenistic jar tradition known in Galilee. This type was present in the workshop at Yodefāt, where it dates from the beginning of the first century BCE until the mid-first century CE (Adan-Bayewitz and Aviam 1997: Pl. 12:14, 15). As noted above, it was not found in the Aḥihud workshop.

The Shihin-type jar (Fig. 10:2, 3, 3a), found in the excavation of the pottery workshop at Shihin, was most likely produced at that site (Adan-Bayewitz and Wieder 1992:196, Fig. 5:5). However, the frequent occurrence of the same rim shape in the Yodefāt and Yavor workshops indicates that this type was produced there as well. It was also probably made at the Aḥihud workshop.

The Yavor-type jar (Fig. 10:4, 5) was produced in the workshops at Aḥihud and Yavor, although the evidence for the latter comes from concentrations of wasters rather than actual excavated kilns.

The Aḥihud-type jar (Fig. 10:6, 6a) was produced in the workshop at Aḥihud and in the Stratum 9 workshop at Ḥorbat ‘Uẓa.

The ‘Uẓa Type A jar (Fig. 10:7, 9, 9a = Avshalom-Gorni 2009a:53, Type SJ.1a) was produced in the Strata 8 and 9 workshops at Ḥorbat ‘Uẓa and in the Aḥihud workshop. The ‘Uẓa Type B jar (Fig. 10:8, 11, 11a = Avshalom-Gorni 2009a: Type SJ.1b) was produced in the workshops of Strata 7 and 8 at Ḥorbat ‘Uẓa and in the Aḥihud workshop. Three types of jars were made in the Ḥorbat ‘Uẓa workshops, but were not found at Aḥihud: ‘Uẓa Type SJ.1c jar (Fig. 10:10, 12) was produced only in Strata 8 and 9; ‘Uẓa Type SJ.1d jar (Fig. 10:13, 14) was produced only in Strata 7 and 8; and ‘Uẓa Type 2b jar (Fig. 10:15) was produced only in Stratum 7 (for a description of these types, see Avshalom-Gorni 2009a).

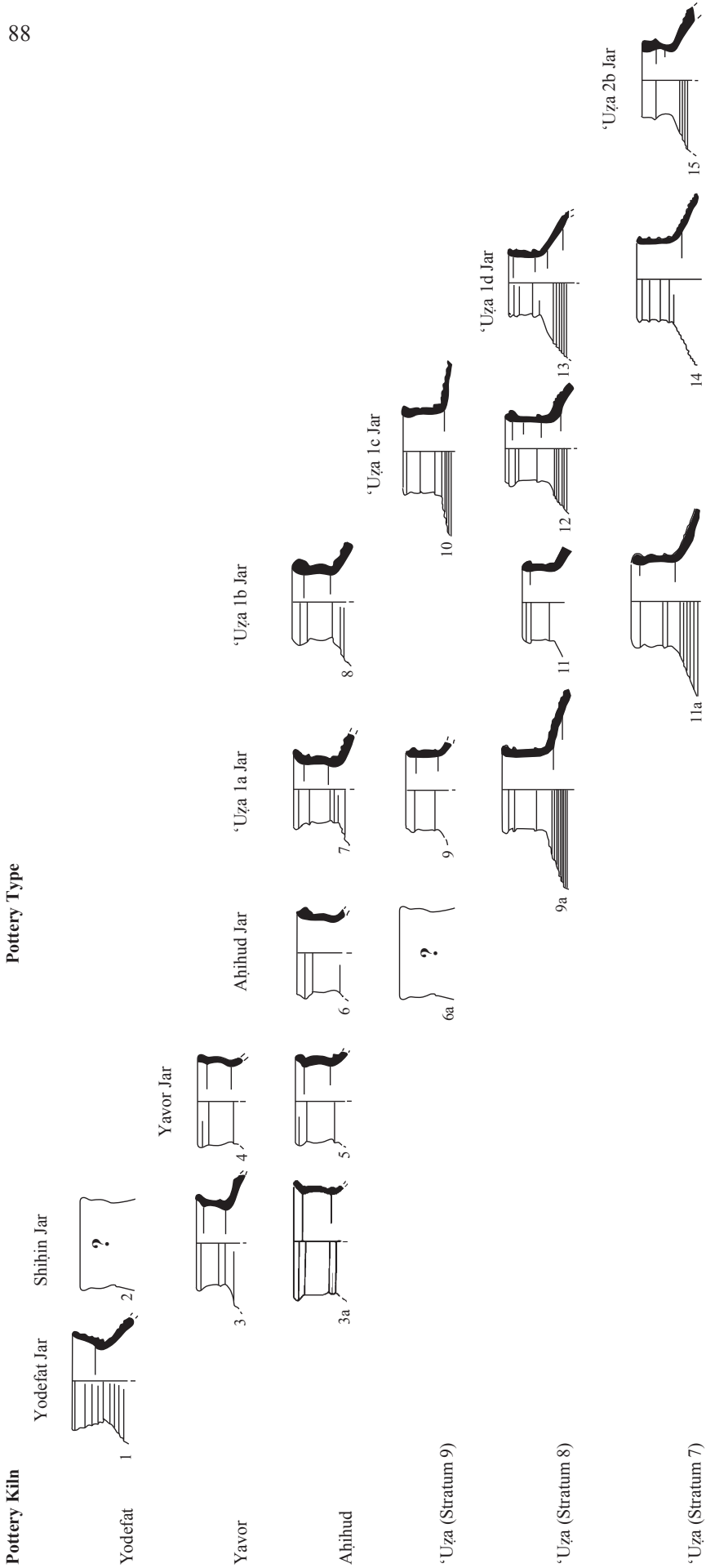


Fig. 10. Distribution of jar types in four workshops in the northeastern Zevulun Valley and the western Galilee.

Table 7. Source of the Examples Illustrated in Fig. 10

No.	Jar Type	Source of Example		
		Findspot	Locus	Reg. No.
1	Yodefāt	Yodefāt, pottery workshop	P3.006 ⁱ	P3.46
2	Shihīn ⁱⁱ	Yodefāt, pottery workshop	K15.005	K15.30
3	Shihīn	Yavor, pottery waste pile	1673/2558 ⁱⁱⁱ	18/1
3a	Shihīn	Aḥihud, pottery waste pile	22	128
4	Yavor	Yavor, pottery waste pile	1673/2558	18/2
5	Yavor	Aḥihud, pottery workshop	16	111/7
6	Aḥihud	Aḥihud, pottery workshop	10	114/1
6a	Aḥihud ⁱⁱ	‘Uza (Stratum 9), pottery waste pile	151	1293
7	‘Uza Type Sj.1a ^{iv}	Aḥihud, pottery workshop	16	123
8	‘Uza Type Sj.1b	Aḥihud, pottery workshop	10	114/2
9	‘Uza Type Sj.1a	‘Uza (Stratum 9) ^v	150	1280
9a	‘Uza Type Sj.1a	‘Uza (Stratum 8)	336	3319
10	‘Uza Type Sj.1c	‘Uza (Stratum 9)	156	1371
11	‘Uza Type Sj.1b	‘Uza (Stratum 8)	150	1253
11a	‘Uza Type Sj.1b	‘Uza (Stratum 7)	354	3926
12	‘Uza Type Sj.1c	‘Uza (Stratum 8)	336	3319
13	‘Uza Type Sj.1d	‘Uza (Stratum 8)	317	3103
14	‘Uza Type Sj.1d	‘Uza (Stratum 7)	141	1280
15	‘Uza Type Sj.2b	‘Uza (Stratum 7)	354	3400

ⁱ Nos. 1, 2 are locus/registration numbers from the Yodefāt excavation.

ⁱⁱ Not drawn, shown here as contour.

ⁱⁱⁱ Nos. 3, 4 are coordinates of the surveyed square (NE), Old Israel Grid.

^{iv} Horbat ‘Uza storage jar typology from Avshalom-Gorni 2009.

^v Strata 7–9 at Horbat ‘Uza are pottery workshops (Getzov 2009:7–18).

The data from the four workshops discussed here allows us to trace the development of the barrel jar in the northeastern Zevulun Valley and the western Galilee from the beginning of the Roman period until the middle of the Byzantine period.⁶ In the middle of the first century BCE, the variety of jar types was small, including only two types: the Yodefāt jar, which is the continuation of the Hellenistic tradition, and the Shihīn jar. As time went by and barrel jars became more common, there were increasingly more types of such jars being made. The main typological difference between them is the rim and neck shape, which is one of the most sensitive indicators of the workshop’s

production style. It is thus notable that the same rim and neck shapes were produced simultaneously in more than one of the workshops discussed here (Fig. 10; Table 7), implying that no single workshop specialized only in the production of one specific type of jar. On the other hand, it seems that the Yodefāt jar and some of the Horbat ‘Uza jar types were made only at those venues. In light of this situation—wherein pottery workshops tended to produce a variety of vessels (and from a variety of local fabrics) and an identical jar could be produced in several contemporary workshops—only detailed mineralogical and archaeometric analyses, as suggested by Wieder

and Adan-Bayewitz (1999), can identify the exact origin of ceramic vessels uncovered outside a specific ceramic workshop context. For example, vessels identical in shape and fabric to those manufactured at Kefar Ḥananya (Adan-Bayewitz 1993: Pls. 3A, 4A) were found inside a contemporaneous kiln at Yodefāt (Adan-Bayewitz and Aviam 1997: Fig. 12:11–13). The authors of the present report have confirmed, on the basis of petrographic and archaeometric analysis, that these Kefar Ḥananya-type vessels were indeed manufactured at the workshop of Yodefāt (Shapiro, unpublished report).⁷

In addition to the resemblance of rim and neck shapes found at three of the four known workshops in the region under discussion (Fig. 10), a jar type whose rim was fashioned in a similar manner was produced at the same time in other workshops. For example, a jar produced in the workshop at Naḥf (Vitto 1986:453) is similar to the ‘Uḏa Type A jars that were made at Ḥorbat ‘Uḏa (Avshalom-Gorni 2009a:53) and at Aḥihud.⁸

Together with the similarity of rim and neck shapes between various workshops, features like the white-painted decorations on the body of the jars (Fig. 8:14, 15) and the handles should be mentioned. The precise details of the design of the jar may be considered a commonly understood marker in the communication maintained between the manufacturer and the consumer.

About one kilometer southeast of the site of Aḥihud are the remains of the village of Birweh, where several salvage excavations were conducted (Cohen 2007; 2008; Porat and Getzov 2010), exposing remains ranging from the Roman period until the modern era. These excavations unearthed evidence of olive oil and wine production on a regional or even a state-wide level, dated from the Late Roman to the Byzantine periods (Cohen 2008; Porat and Getzov 2010). This fact enhances the feasibility of the location of a pottery workshop manufacturing the barrel jars in proximity to the facilities producing the liquids to be stored and transported in these containers.

APPENDIX 1. LIST OF LOCI AND WALLS

Locus/Wall	Area	Description
L10	A	Topsoil of the entire area
L11	B	Topsoil above depression in bedrock containing workshop debris, western part of the area
L12	A	Top of the combustion chamber
W13	A	Wall
W14	A	Wall
L15	B	Eastern pocket of workshop debris in depression in bedrock
L16	B	Western pocket of workshop debris in bedrock
W17	A	Wall
L18	A	West of W13, crumbly soil and remains of a crushed chalk floor
L19	A	Kiln's combustion chamber
L20	A	Debris in front of combustion chamber
L21	A	West of W13, below crushed chalk floor
L22	A	West of W13, north of L21
W23	A	Wall

Locus/Wall	Area	Description
L100	C	Topsoil in the entire area
L101	C	Western kiln; soil with ashes and pottery sherds
L102	C	Southeastern corner of the area; light brown soil
L103	C	Western kiln, beaten-earth layer, possibly a floor
W104	C	Wall of the western kiln
L105	C	Gray soil underneath collapse
L106	C	Gray soil and sherds in southwestern corner
W108	C	Wall
L109	C	Eastern kiln, beaten-earth layer, possibly a floor
L110	C	Brick foundation under beaten-earth layer
L111	C	Cleaning bedrock in southeastern corner of the area
W112	C	Wall
L113	C	Topsoil—extension of the area to the northeast

NOTES

¹ The excavations (Permit Nos. A-3613, A-4217) were directed by Dina Avshalom-Gorni, with the assistance of Howard Smithline (field photography), Viatcheslav Pirskey and Avraham Hajian (surveying, first and second season respectively), Anastasia Shapiro (GPS), Yossi Yaakobi (administration), Danny Syon (numismatics), Hagit Tahan-Rosen (pottery drawing) and Natalia Zak (drafting).

² In the present study, the names proposed for the jar types found at Aḥihud were given according to sites where pottery kilns producing these types of jars were first uncovered. However, this does not imply that this jar type was manufactured only at that site.

³ Petrographic thin sections examined by Yuval Goren (unpublished).

⁴ Petrographic thin sections examined by the author (unpublished).

⁵ Petrographic thin sections examined by the author (unpublished).

⁶ Jars of this type first appeared in the Galilee at the beginning of the Hellenistic period and continued

until the beginning of the Roman period (Loffreda 1974:63, Type F1, Pl. 16:5, 6). These will be not dealt with in this article.

⁷ The author (Shapiro) prepared and examined a large number of thin sections for the Yodefath excavations, including vessels from the kiln. The report of that study (Summary of the Comparative Petrographic Analysis of Hellenistic and Roman Pottery: Technologic and Petrographic Study of Soil Samples from Southern Galilee) was completed in 2003, but never published. It is referenced here with the kind permission of the excavator, Mordechai Aviam.

⁸ This phenomenon is also known in the production of amphorae: in the Stratum 9 workshop at Horbat 'Uza, some amphorae (i.e., our Fig. 9:8) resembled those manufactured in other workshops along the coast of the western Galilee.

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