

THE LATE CHALCOLITHIC POTTERY ASSEMBLAGE FROM KHIRBAT EL-'UMDAN, BET SHEMESH

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INTRODUCTION

A small, but discrete assemblage of Late Chalcolithic¹ pottery (n = 473; Table 1; Figs. 1–6)² was collected during the excavation at Khirbat el-'Umdan (see Be'eri, this volume). These include fragments of small, wheel-finished bowls, cornets, medium- and large-sized bowls, pedestalled bowls, large thick-walled bowls, spouted vessels, large open basins, holemouth cooking and storage jars, necked jars with or without a pronounced rim, pithoi,

Table 1. Breakdown of the Pottery Assemblage

Type	N	%	Fig.
Small, wheel-finished bowls	52	11	1:1–5
Cornets	23	4.9	1:6–13
Medium-sized bowls	37	7.8	1:14–17
Large-sized bowls	25	5.3	1:18–23
Pedestalled bowls	6	1.3	1:24, 25
Large, thick-walled bowls	43	9.1	2:1–9
Spouted vessels	2	0.4	2:10, 11
Large, open basins	56	11.8	3:1–9
Holemouth cooking and storage jars	28	5.9	4:1–6
Necked jars	41	8.7	4:7–15
Necked jars with pronounced rim	11	2.3	4:16–24
Pithoi	17	3.6	5:1–6
Large kraters	8	1.7	5:7–12; 6:1, 2
External handles	43	9.1	6:3–6
Churn handles	26	5.5	6:7, 8
Varia	3	0.6	6:9, 10
<i>Total</i>	<i>473</i>	<i>100</i>	

¹ For a definition of the term Late Chalcolithic as used by the authors, cf. Brink 2013:53.

² No records were kept of the numbers of the discarded body sherds.

large kraters, churns, external handles (internal handles are absent from the assemblage) and varia, including a fragment of a clay animal figurine, a potsherd reworked as a stopper, and a ceramic biconic loomweight. All the vessels' bases are flat; none of them were string-cut or basketry-impressed.

THE POTTERY ASSEMBLAGE

The ceramic assemblage comprises 51.6 % of open vessel shapes, and as such, it compares well, both in morphology and composition, with other Late Chalcolithic assemblages. In the absence of relevant final excavation reports of contemporary nearby sites in this part of the southern Shephelah, the present assemblage is briefly compared with the well-published Late Chalcolithic pottery corpora assembled from the northern Negev site of Gerar (Gilead and Goren 1995) and three Be'er Sheva' Valley sites (Bir Safadi, Abu Maṭar and Wadi Zumeili; Commenge-Pellerin 1987; 1990), conveniently summarized by Garfinkel (1999: Tables 19–21).

Vessel Morphology and Numerical Composition

Open vessels predominate in this pottery assemblage (Table 1), as is the case with the four above-mentioned sites, albeit in lower quantities (51.6%) in comparison to Gerar (69%) and the three Be'er Sheva' Valley sites (58.3–64.0%; Garfinkel 1999: Tables 20–21).

Small, wheel-shaped bowls are dominant, whereas pedestalled bowls are rare at all five sites. A major, possibly chronologically significant difference is observed in the quantity of cornets retrieved: whereas cornets are abundant in Bet Shemesh (4.9%),³ and especially in Gerar (14.07%), these are near-absent in the Be'er Sheva' sites (<0.5%). A similar phenomenon was observed concerning the amounts of large basins—only very few of those found in Bet Shemesh have an indented rim, perhaps a chronological indicator. While basins are almost equally represented in the assemblages of Bet Shemesh (11%) and Gerar (12.31%), comparable vessels appear in significantly lower amounts in the Be'er Sheva' sites (2.7–5.5%). As the same vessel type(s) appear both in the earlier and later phases of the Late Chalcolithic period, this difference seems to be functional rather than chronological.

The closed vessels make up 36.8% of the total assemblage.⁴ While holemouth jars are more numerous than necked jars in the four southern sites, the situation in Bet Shemesh is the reverse, with only 5.9% of holemouth jars, and 16.3% necked jars (ranging from small jars to pithoi). Only two holemouth and two necked jars display finger-indented rims (Fig. 5:8, 9 and Fig. 5:1 respectively).

³ But for two (e.g., Fig. 1:13), all cornets uncovered at Bet Shemesh have a long base (Fig. 1:6–12).

⁴ All external handles (9.1%) are included in this count; excluded from both open and closed vessel counts are flat bases (11%).

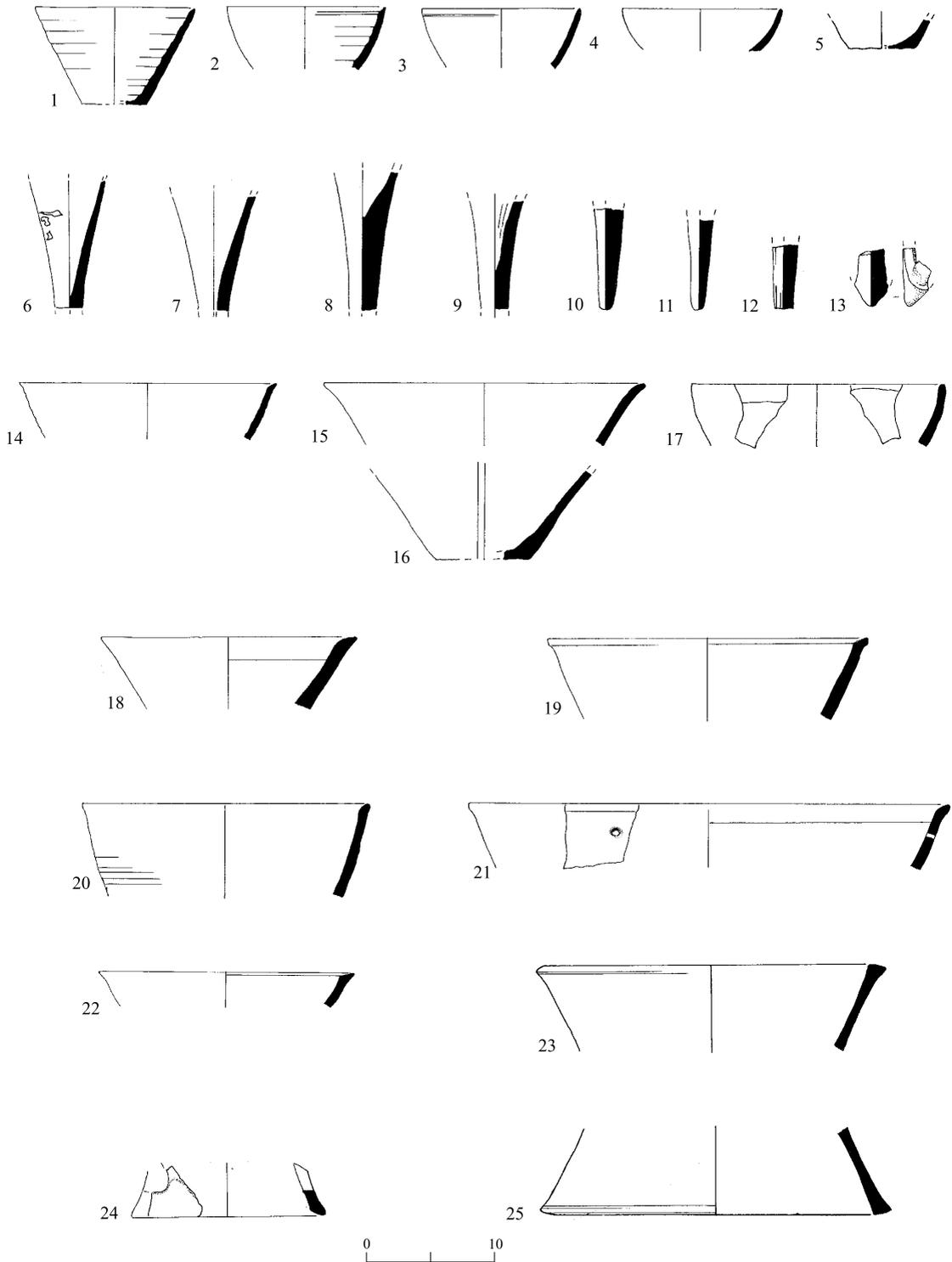


Fig. 1. Small wheel-finished bowls (1-5); cornets (6-13); medium-sized bowls (14-17); large bowls with diagonally flattened rim/flaring wall (18-23); bowls on fenestrated pedestal (24, 25).

◀ Fig. 1

Fig.	Locus	Basket	Description	Remarks
1	111	1062/1	Slightly incurved rim/flaring wall; intact in profile	Coiling visible on int. and ext. surface; yellow-creamish surface with small gray grits; cream-ware?
2	100	1000/11	Incurved rim/wall	Coiling and striations indicating turning device visible on int.; cream white surface with small gray grits; cream-ware?
3	100	1000/14	Incurved rim/wall	Coiling visible on int. and striations indicating use of a turning device visible around rim ext.; cream white surface with small gray grits; cream-ware?
4	117	1064	Slightly incurved rim/flaring wall	Cream white surface with small gray grits; cream-ware?
5	113	1028/6	Base/wall	
6	117	1064/3	Medial, elongated	Light brown surface with many small dark (chert?) grits; traces of red paint on ext.; well-fired
7	111	1062/4	Medial, elongated	Light brown surface with many small dark (chert?) grits
8	99	1061/12	Medial, elongated	Light brown surface with many small dark (chert?) grits
9	113	1035/13	Medial, elongated	Light brown surface with many small dark (chert?) grits
10	111	1062	Terminal, elongated base	Light brown surface with many small dark (chert?) grits; vertical scrape marks around base
11	99	1063/20	Terminal, elongated base	Light brown surface with many small dark (chert?) grits; vertical scrape marks around base
12	117	1064/48	Elongated, non terminal base	Light brown surface with many small dark (chert?) grits; vertical scrape marks around base; thin-sectioned
13	111	1023/16	Terminal, short base	Light brown surface
14	117	1077	Slightly incurved rim/flaring wall	Light brown surface with many small gray grits; broad red-painted band around ext. rim; coiling visible on ext.
15	111	1023/1	Slightly everted/flaring wall belonging to base/wall	Plain, cream white surface with few small dark grits (chert?); cream ware? very eroded/abraded ext.
16	111	1023/2	Flat base/flaring wall belonging to bowl	Plain, cream white surface with few small dark grits (chert?); cream ware? very eroded/abraded ext.
17	99	1061/2	Tapering rim/slightly incurved wall	Buff-orange to cream white plain surface; red-painted rim; large dark (chert?) grits visible in section/break
18	100	1000/21	Diagonally flattened rim/flaring wall	Plain, buff orange surface with many small white grits; red-painted band around rim
19	103	1004/10	Diagonally flattened rim/flaring wall fragment	Plain, buff orange surface with many small white grits

Fig. 1 (cont.).

Fig.	Locus	Basket	Description	Remarks
20	100	1007/1	Diagonally flattened rim/flaring wall	Light brown, plain surface with many small and large dark (chert?) grits
21	117	1064/17	Diagonally flattened rim/flaring wall with unilaterally drilled hole (from the outside in)	Plain, buff orange surface with many small white grits; traces of red paint on int. and ext. rim
22	111	1023/13	Diagonally flattened rim/flaring wall	Light brown, plain surface with dark (chert?) grits; traces of red paint on rim
23	111	1062	Flattened, protruding rim/flaring wall	Plain, light brown, surface with many small and fewer coarse, dark (chert?) grits
24	113	1041/11	Ring stand with fenestration/wall	
25	100	1013/1 conjoins with 1013/1	Diagonally flattened rim/flaring wall	Plain, cream white surface with many small white grits; traces of red paint on rim and around rim

Churns constitute 5.5% of the assemblage, comparable in frequency to the number of churns found in Gerar (4.88%), but significantly lower than those of Bir Safadi (14%) and Abu Maṭar (13.7%). At this point of research, it is impossible to ascertain whether this difference is chronological (Gerar, and most likely also Bet Shemesh, predating the latter two sites; see below).

The less common indented pierced lugs and plain “pseudo” lug handles⁵ appear side by side in all the above-mentioned sites but one (cf. Gerar: Gilead and Goren 1995: Fig. 4.19:10, 13, 15; Bir Safadi: Commenge-Pellerin 1990: Figs. 51:2–4; 52:3; Abu Maṭar: Commenge-Pellerin 1987: Figs. 35:1, 2; 36:4, 5).

The solid, clay animal figurine (Fig. 6:9) is notable as not many such items have been recovered from Late Chalcolithic settlement contexts. Clay stoppers made from reworked potsherds (Fig. 6:11) are common throughout this period, as well as in later periods, as are biconic loomweights (Fig. 6:10).

⁵ For a brief description/definition of “pseudo” lug handles, see Garfinkel 1999:269, Sub 4 (false pierced handles).

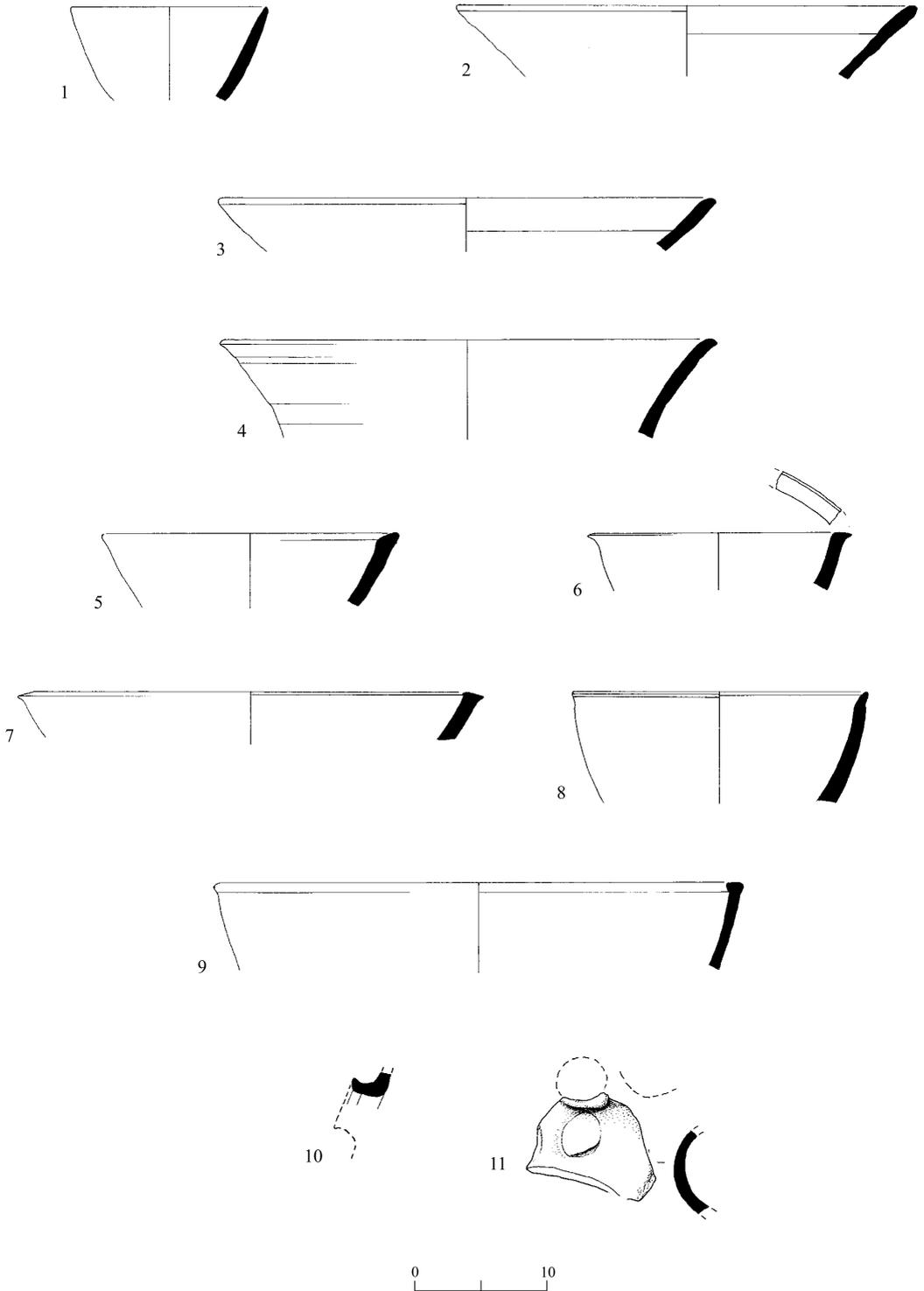


Fig. 2. Large, thick-walled bowls (1-9); spouted bowls (10, 11).

◀ Fig. 2

Fig.	Locus	Basket	Description	Remarks
1	100	1000/4	Tapering rim/flaring wall	Plain, buff orange surface with many small white grits
2	117	1064/11	Thick-walled, rounded rim/flaring wall	Plain, cream white surface with many small and few large-sized dark grits (chert?); red-painted rim and traces of red paint on int. rim
3	117	1077	Rounded rim/flaring wall (2 conjoining pieces)	Plain, buff-orange surface with many dark (chert?) grits; red-painted rim and broad, red-painted band around int. rim; traces of coiling visible on int.
4	100	1007/5	Everted rim/flaring wall	Light brown, plain surface with many small, dark (chert?) grits
5	117	1064/25	Slightly incurved, diagonally flattened rim/wall	Plain, cream white surface with many small and few large sized dark grits (chert?); red-painted rim
6	117	1064/1	Flattened, everted rim/flaring wall	Plain, buff orange surface with many small white grits; traces of red paint on rim
7	113	1041/1	Flattened, slightly incurved rim/wall	Light brown, plain surface with small, dark (chert?) grits
8	113	1041/4	Flattened, slightly protruding rim/incurved wall	Light brown, plain surface with small, dark (chert?) grits; traces of red paint on rim
9	104	1010/5	Tapering, everted rim/rounded wall	Buff-orange, plain surface with many, dark (chert?) and fewer white (calcite?) grits; traces of red paint on rim
10	113	1041/11		
11	113	1039/14		

Fig. 3 ▶

Fig.	Locus	Basket	Description	Remarks
1	99	1061/7	Rounded, externally slightly flattened rim/flaring wall	Plain, cream white surface with many small and few large sized dark grits (chert?)
2	114	1063	Rounded, everted rim/flaring wall	Buff-orange to cream white plain surface with many small, dark (chert?) grits
3	103	1023/1	Tapering, finger-indented and slightly everted rim/flaring wall	Plain, light brown, surface with many small and fewer large, dark (chert?) grits
4	103	1034/8	Diagonally flattened rim/flaring wall	Plain, light brown, surface with many coarse dark (chert?) grits
5	111	1062	Thickened and diagonally flattened rim/flaring wall	Plain, light brown, surface with coarse, dark (chert?) grits
6	112	1097	Thickened, flattened rim/flaring wall	Plain, light brown, surface with many small and large, dark (chert?) grits
7	112	1037	Protruding rim/flaring wall	Plain, cream white surface with many small and fewer large sized dark grits (chert?); thin-sectioned
8	114	1063	Protruding rim/flaring wall	Plain, light brown surface with many small and fewer large sized dark grits (chert?); traces of red paint on the rim
9	112	1066/8	Thickened, flattened, protruding rim/flaring wall	Plain, light brown, surface with many small and fewer large, dark (chert?) grits

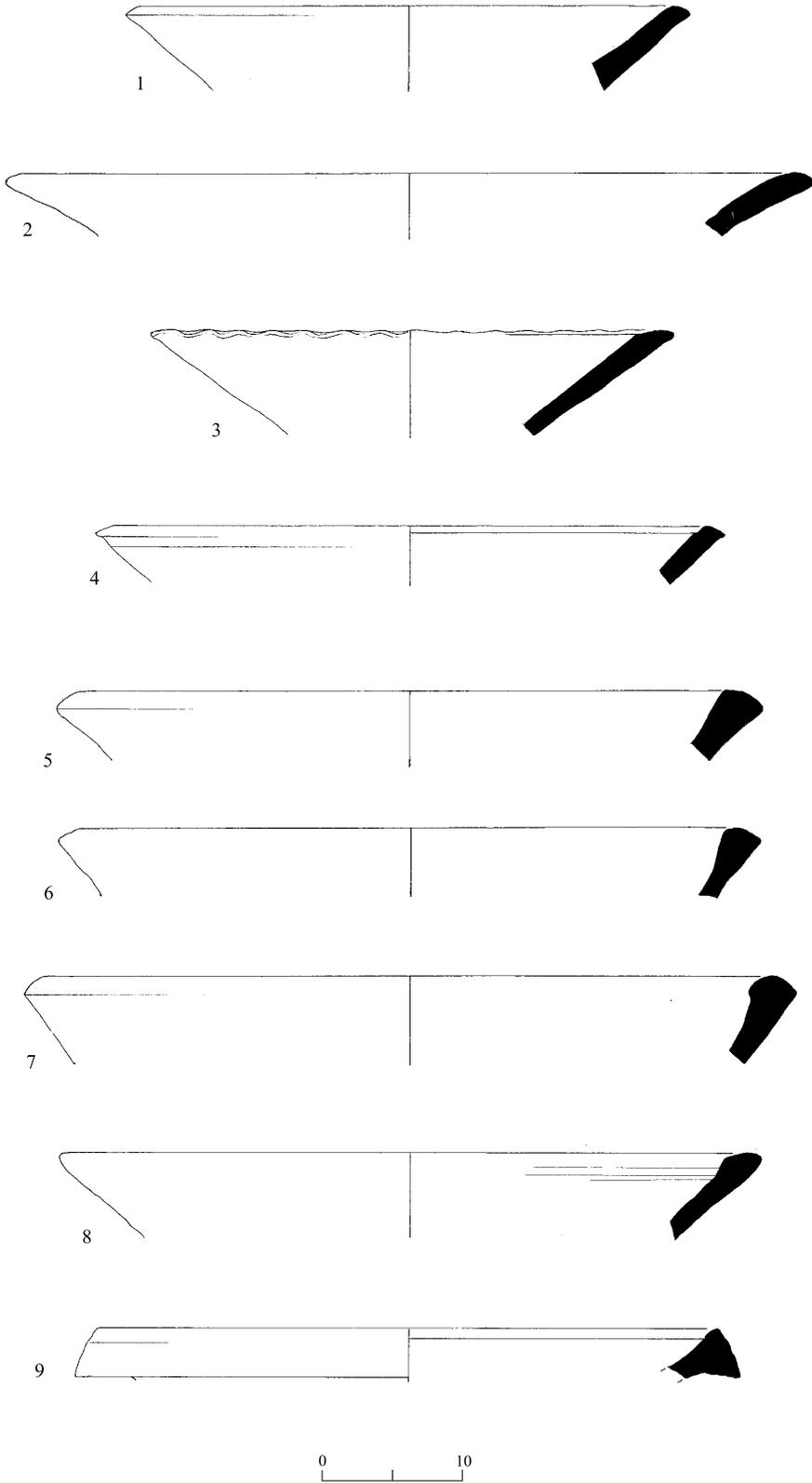


Fig. 3. Large, thick-walled open basins.

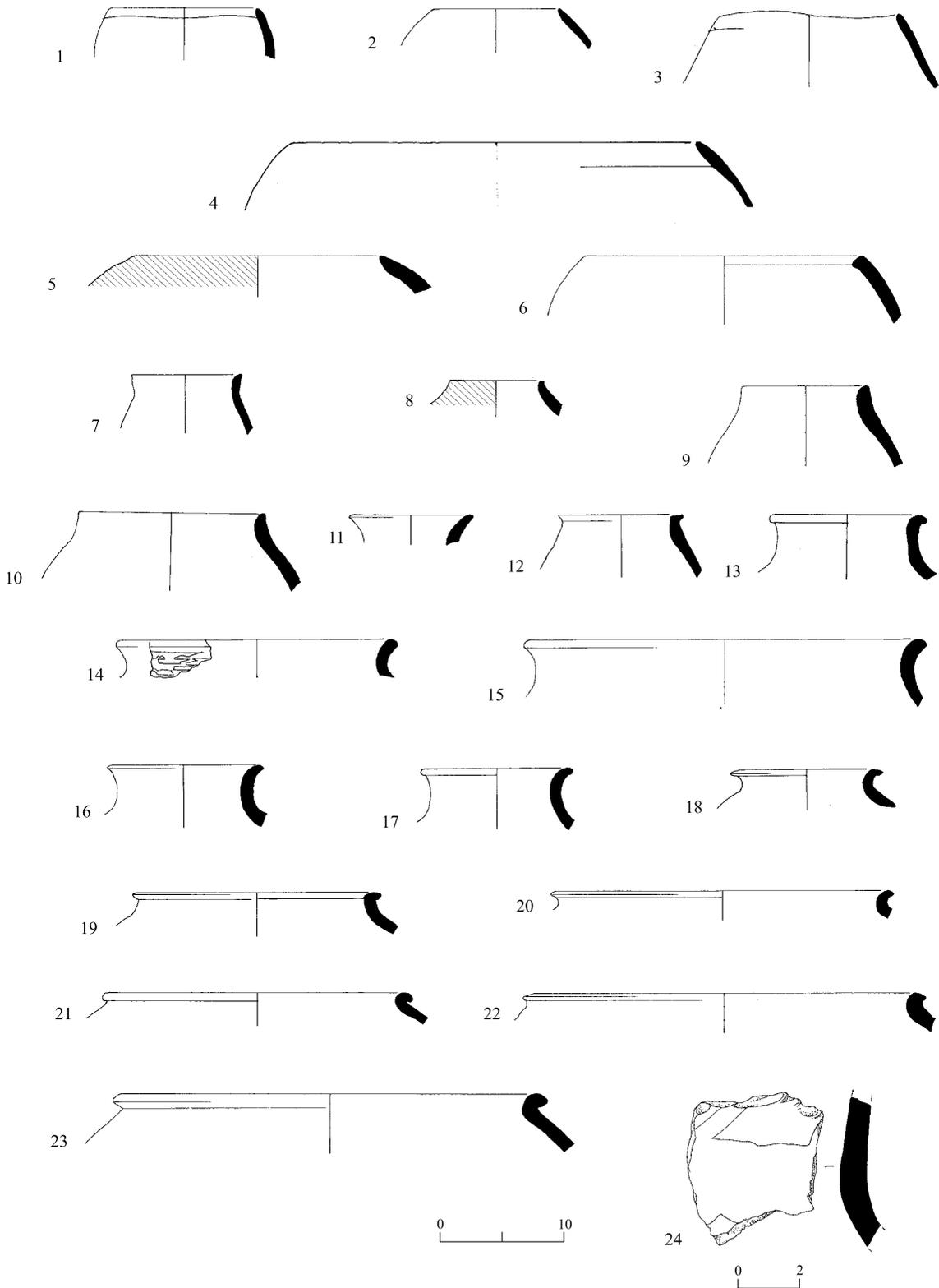


Fig. 4. Holemouth cooking and storage jars (1-6); small, medium and large-sized necked jars (7-15); short and tall-necked jars with pronounced ("profiled") rims (16-24).

◀ Fig. 4

Fig.	Locus	Basket	Description	Remarks
1	117	1064/17	Tapering, slightly asymmetric rim/wall	Sooted outside; inside buff-orange with many small and coarse dark (chert?), and few white (calcite?) grits; some mica(?)
2	100	1007/3	Tapering, slightly thickened rim/curved wall	Soot inside and outside; plain, buff orange surface; many small and coarse white (calcite?) grits
3	117	1064/11	Tapering rim/wall	Red-painted ext.; break: light brown throughout with many small and few large dark (chert?) grits
4	100	1000/24	Flattened rim/wall	Many small dark (chert?) grits
5	117	1077	Tapering rim, curved wall	Plain, buff orange surface with some dark grits; red-painted rim
6	100	1000/3	Tapering rim, curved wall	Plain, orange surface with small, white (calcite?) grits
7	99	1061/7	Tapering, out folded rim/neck/shoulder	Plain, orange surface; many coarse white (calcite?) grits
8	117	1064/46	Tapering, slightly everted rim/wall	Red-painted ext.; plain, light-brown int.; small dark (chert?) grits
9	100	1002	Rounded, slightly everted rim/neck/shoulder	Traces of red paint around rim ext.; plain, light brown surface with small dark (chert?) and few white (calcite?) grits
10	111	1062	Rounded, everted rim/neck/shoulder	Plain, light brown surface with small and few coarse dark (chert?) grits
11	114	1063	Rounded, out-folded rim/neck	Red-painted ext.; int. plain, light brown surface with few dark (chert?) and white (calcite?) grits
12	103	1004	Flattened, everted rim/neck/shoulder	Plain, light brown surface with small and coarse dark (chert?) and few white (calcite?) grits
12	117	1064/42	Rounded, everted rim/neck/shoulder	Plain, light brown surface with small and coarse dark (chert?) grits
14	113	1035/12	Rounded, everted rim/neck/shoulder	Traces of red paint ext.; plain, cream-white int. with many small and coarse dark (chert?) grits
15	100	1000/31		Plain, light brown surface with small and coarse dark (chert?) and white (calcite?) grits
16	111	1023/4	Slightly tapering, out folded rim/neck/shoulder	Plain, cream-white surface with many small and coarse dark (chert?) grits
17	113	1035/8	Rounded, everted rim/neck/shoulder	Plain, cream-white surface with many small and fewer coarse dark (chert?) grits; some mica(?)
18	103	1004/11	Tapering, everted, overhanging rim/neck/shoulder	Plain, buff orange surface with many small dark (chert?) and white (calcite?) grits
19	100	1013/20	Tapering, sharply everted and overhanging rim/neck/shoulder	Plain, light brown surface with small and coarse dark (chert?) grits

Fig. 4 (cont.).

Fig.	Locus	Basket	Description	Remarks
20	103	1015/5	Round, everted, overhanging rim/neck	Plain buff-orange surface; very few, small dark grits
21	111	1062	Round, everted, overhanging rim/neck/shoulder	Plain, light brown surface with coarse dark (chert?) grits
22	99	1061/15	Slightly tapering, out folded rim/neck/shoulder	Plain, light brown surface with small and coarse dark (chert?) grits
23	114	1063	Slightly tapering, out folded rim/neck/shoulder	Plain, light brown surface with small and coarse dark (chert?) grits
24	117	1064/10		Plain, buff-orange surface with small and coarse dark (chert?) grits; red-painted design on ext.

Fig. 5 ▶

Fig.	Locus	Basket	Description	Remarks
1	114	1063	Finger-indented, overhanging everted rim/neck/shoulder	Plain, orange surface; many coarse dark (chert?) and white (calcite?) grits
2	114	1063	Tapering, out-folded rim/neck	Plain, light brown surface with small and coarse dark (chert?) and white (calcite?) grits
3	111	1062	Round, everted rim, neck/shoulder	Traces of red paint ext.; plain, light brown surface with dark (chert?) and few white (calcite?) grits
4	111	1062	Round, everted rim, neck/shoulder	Traces of red paint on shoulder ext.; plain, light brown surface with many small dark (chert?) and few white (calcite?) grits
5	111	1062	Tapering, everted rim, neck/shoulder	Traces of red paint on ext.; plain, buff-orange surface with many dark (chert?) and fewer white (calcite?) grits
6	113	1041/7	Rounded, everted rim/neck	Plain, light brown surface with many small and coarse dark (chert?) grits
7	100	1002/3	Flattened and protruding rim/curved wall	Plain, light brown surface with many dark (chert?) and few white (calcite?) grits
8	100	1000/16	Flattened, finger-indented rim/ wall	Soot on ext. plain, light brown surface with many coarse dark (chert?) grits
9	100	1002/1	Flattened, finger-indented, inclining rim/ curved wall	Plain, light brown surface with many small dark (chert?) and few white (calcite?) grits
10	99	1062/6	Flattened, guttered, overhanging rim/wall	Plain, light brown surface with many small and coarse dark (chert?) grits
11	104	1036/12	Flattened rim/curved wall	Plain, orange surface with many dark (chert?) and less white (calcite?) grits
12	111	1062	Diagonally flattened, thickened rim/wall	Plain, light brown surface with dark (chert?) and white (calcite?) grits

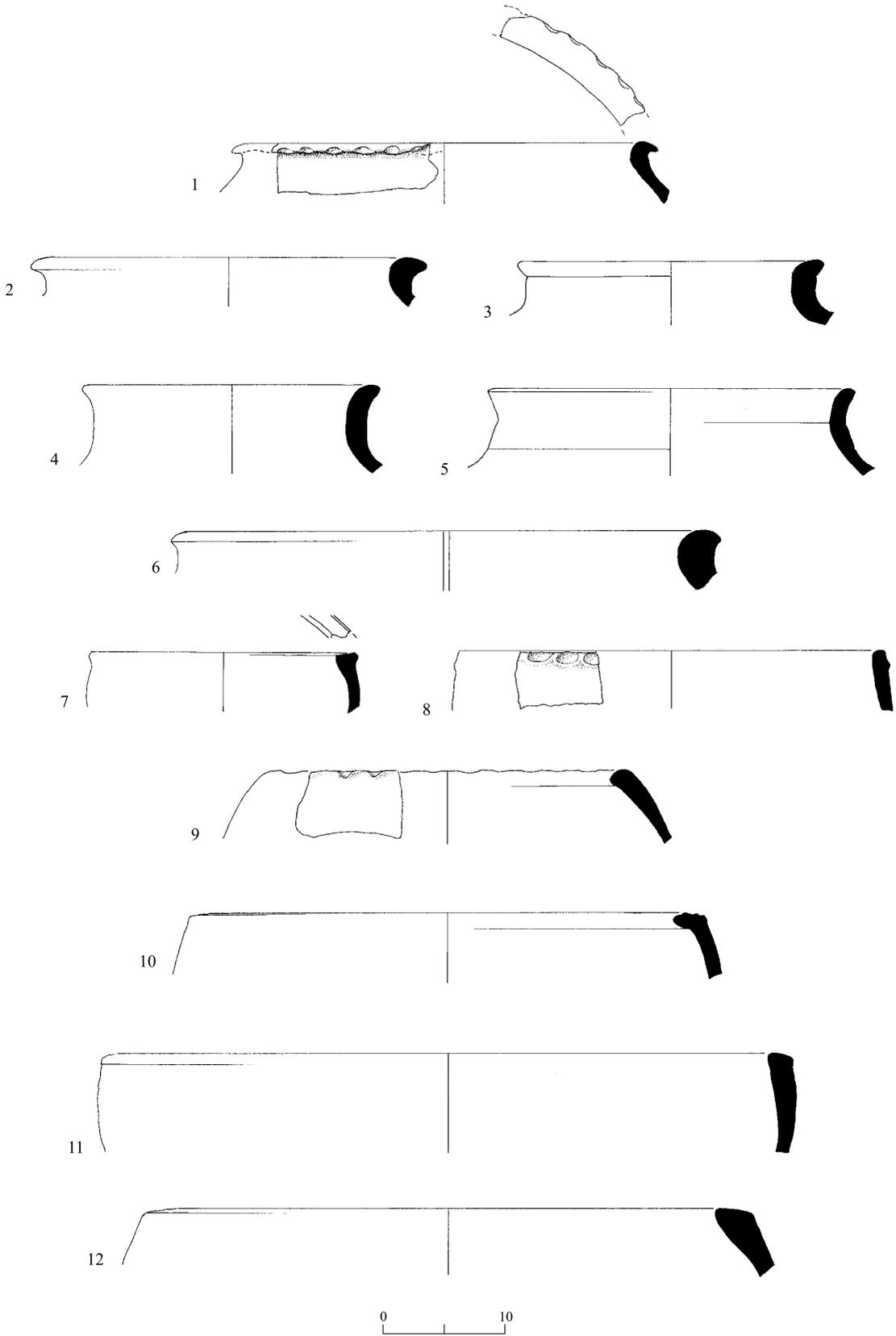


Fig. 5. Pithoi.

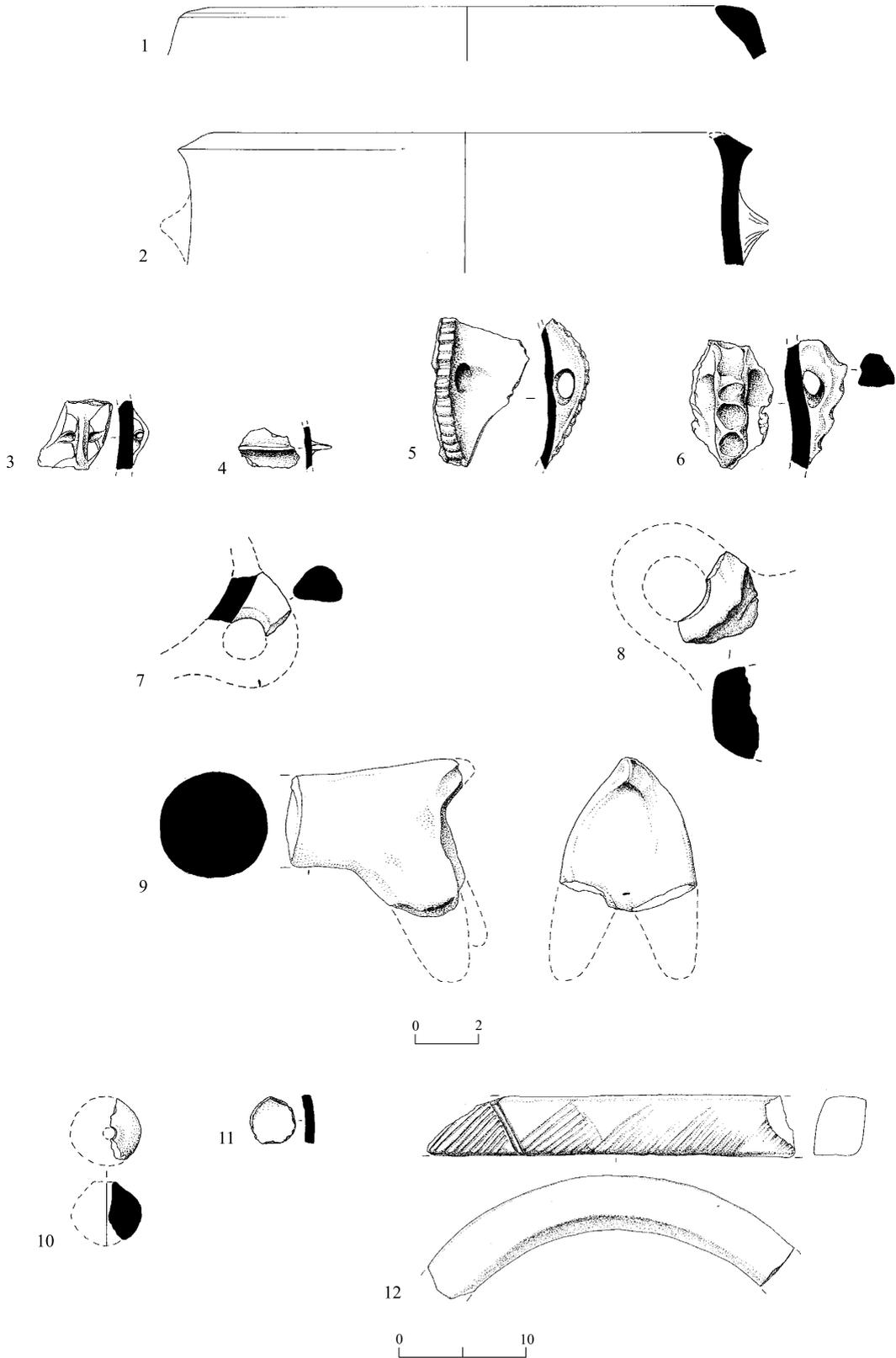


Fig. 6. Kraters (1-3); handles (4-6); churns (7, 8); animal figurine (9); loomweight (10); stopper (11); base of a pedestalled basalt bowl (12).

◀ Fig. 6

Fig.	Locus	Basket	Description	Remarks
1	111	1062	Diagonally flattened, thickened rim/wall	Plain, light brown surface with dark (chert?) and white (calcite?) grits
2	111	1062	Diagonally flattened and slightly protruding rim/wall with knob handle	Cream white plain surface; many small and coarse dark (chert?) grits
3	117	1064/2		Red-painted; buff-orange surface with many small and few coarse dark (chert?) grits
4	103	1034/15		Soot outside
5	103	1004/1		Plain, buff-orange surface with many coarse dark (chert?) and white (calcite?) grits
6	100	1000/17		Plain, buff-orange surface with many coarse dark (chert?) and white (calcite?) grits
7	111	1062		
8	99	1061		
9	111	1059	Hinder part of quadruped	Plain, buff-orange surface with many small and coarse dark (chert?) grits
10	117	1054	The vertical perforation is not all through	Locally sooted ext.; plain, light-brown surface with some dark (chert?) grits
11	100	1000/13	Rounded, re-used body sherd	Plain, light brown surface with small and few coarse dark (chert?) grits
12	?	?	Dense basalt	Incised chevrons on ext. of the ring stand

Petrography⁶

The pottery was studied petrographically to determine whether it too, as the metallurgical finds, testifies to long-distance exchange relations practiced by the inhabitants of the site (see Vassal, Brink and Ben-Josef, this volume).

The pottery was first studied with a magnifying glass (up to $\times 10$). These observations suggested a quite homogeneous fabric with small variations; therefore, a sample of twelve vessels was chosen for petrographic analysis (Table 2). The selected vessels include small wheel-fashioned bowls (Fig. 1:2, 5), medium- and large-sized bowls (Fig. 1:17, 20), a pedestalled bowl (Fig. 1:24), cornets (Fig. 1:6, 12), a holemouth jar (Fig. 4:2), necked jars (Fig. 4:18, 20), a basin (Fig. 3:7) and a pithos (Fig. 5:1).

An assessment of the geological setting of the site and its surroundings was conducted to determine local or non-local productions and to identify the provenance of the raw material. The site is located on chalk and marls of the Paleocene Taqiye Formation. Its immediate area is characterized by chalk, chert and marl rocks from the Paleocene to Eocene ages (Sneh 2009). Calcrete units commonly overlie the chalky rocks in this area (Buchbinder 1969:1).

⁶ The petrographic study was conducted in 2014.

Table 2. Inventory and Results of the Petrographic Analysis

No.	Type	Locus	Basket	Fig.	Petrographic Group
1	Bowl	99	1061/2	1:17	A
2	Bowl	100	1007/1	1:20	A
3	Bowl, wheel-made	100	1000/11	1:2	A
4	Jar	103	1015/5	4:20	A
5	Basin	112	1037	3:7	A
6	Bowl, wheel-made	113	1028/6	1:5	A
7	Bowl	113	1041/1	1:24	A
8	Cornet	117	1064/3	1:6	A
9	Cornet	117	1064/48	1:12	A
10	Jar	103	1004/11	4:18	B
11	Pithos	114	1063	5:1	B
12	Holemouth jar	100	1007/3	4:2	C

Results

The samples were divided into three petrographic groups (A–C; Table 2).

Group A (n = 9).— The raw material of this group is characterized by a calcareous matrix, rich in silt to sand-sized discrete Paleogene foraminifera. The sand-sized non-plastic components appear in variable quantities. For example, in bowl Nos. 2 and 3 they are c. 3%, while in other samples, e.g., No. 9, they are very common (c. 30%). The non-plastic components are usually rounded and coarse (up to 2 mm) and include calcrete, tufa, quartz geodes, chert, shell fragments, dolomite and a few fine quartz grains.

The Paleogene foraminifera suit well the Taqiye marl Formation, which widely outcrops in the Shephelah. The calcrete and the chert fragments are also present in the local geology. The quartz geods and the dolomite were probably eroded from the Turonian and/or Cenomanian formations that outcrop in the Judean Mountains to the east of the site. Thus, it seems that the non-plastic components were collected from the alluvial beds of one of the Shephelah wadis and were intentionally added to the paste in various quantities.

Group B (n = 2).— The raw material of this group is characterized by a calcareous clay with silty quartz grains. The inclusions are similar to those observed in Group A, indicating that they were collected in the same area and were added to a different clay type. This raw material is identified as soil.

Group C (n = 1).— This group is characterized by a clayey matrix with a strong optical orientation and argillaceous pellets. The non-plastic components are characterized by

badly sorted crushed calcite and a few rhombohedral dolomite crystals. This raw material is identified as the clay of the Moza Formation, which outcrops east of the site, along the Judean Mountains.

DISCUSSION AND CONCLUSION

The raw materials of the pottery assemblage indicate a local manufacture within the borders of the Shephelah and the nearby Judean Mountains to its east.

Absolute and Relative Chronology

Four carbonized olive stones collected at the site were submitted for ^{14}C analyses, yielding a date between 4540 and 4445 cal. BCE (see Boaretto, in Be'eri, this volume). These readings corroborate the general ascription of the pottery assemblage to the Late Chalcolithic period (see n. 1).

With a time span as wide as 180 years, we would like to place this site more specifically within the Late Chalcolithic in terms of relative chronology. This is facilitated *inter alia* by the recent recognition of two distinct phases of the Late Chalcolithic in two sites at Modi'in: "the Deep Deposits" and "the Plateau" (Brink 2011; 2013). The earlier phase, revealed in Strata 6–5 at "the Deep Deposits" site, is labeled LC1a–b and the later, in Stratum 4, is labeled LC2. The LC1 phase can be correlated with the Ghassulian Chalcolithic sequence exposed in Strata F–A at the eponymous site, whereas LC2 is a post-Ghassulian phase within the Late Chalcolithic period (Brink 2013:53–55). The LC1b strata in "the Deep Deposits" slightly postdate the LC1a strata uncovered in the nearby site of "the Plateau" (Brink and Kaniyas 2010; cf. Brink 2013:48, Table 1). This sub-phasing is mainly based on a higher occurrence of cornets and an absence of combed ware at "the Plateau". One of the present authors has argued elsewhere (Brink 2013:55) that external combing of vessels is one of a small set of characteristics typifying the LC1 phase, which he had cautiously suggested to be a Shephalite facies of the Late Chalcolithic (Brink 2013:58–59).

The temper composition of the Bet Shemesh vessels (see above; Figs. 1–6) is identical to that of the LC1a vessels at other sites in the Shephelah, e.g., "the Plateau" and "the Deep Deposits", and Horbat Nevalat (Brink and Lazar 2019); however, combed ware is (still?) absent from the Bet Shemesh assemblage, as it is from the LC1a phase at "the Plateau". At Bet Shemesh, the small, bell-shaped bowls/cups, characteristic of both the LC1a (in lesser quantities) and LC1b (in larger quantities) phases at early Modi'in (Roux, Brink and Shalev 2013:70–71), are absent. This might indicate that the LC1a phase at Bet Shemesh slightly predates the LC1a deposits on "the Plateau". Provided that corroborating data might turn up in future excavations in the area, we might be able to distinguish between an earlier (LC1a1) and a later (LC1a2) LC1a phase in the Shephelah.

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