

Glass finds from Beit Ras/Capitolias (Jordan)

Mariusz Burdajewicz

Institute of Archaeology, University of Warsaw

Abstract: This paper discusses glass finds from the Polish excavations at Beit Ras, ancient Capitolias. During two seasons (2015–2016) of fieldwork a relatively large amount of glass fragments was unearthed in the two main excavated areas. The material is from contexts dated to the late Roman through early Islamic periods, spanning a time from the 4th to roughly the 8th century AD. The assemblage includes mainly tableware like bowls, plates, drinking vessels, and also a significant amount of raw-glass chunks. Apart from glass material coming from the excavated squares, a selection of items from the survey in 2014 completes the corpora of glass coming from the ancient settlement.

Keywords: Decapolis, Capitolias, Beit Ras, Roman glass, Byzantine glass, Umayyad glass, glass chunks

Remains of ancient Capitolias, one of the cities of the Regio Decapolitana, lie today in northwestern Jordan, on the outskirts and within the extensively built-up area of the modern village of Beit Ras, situated approximately 10 km to the north of modern Irbid. Excavations in one of a few places still accessible for fieldwork were conducted recently by a team from the Polish Centre of Mediterranean Archaeology University of Warsaw, under the direction of Prof. Jolanta Młynarczyk (on the excavations, see Młynarczyk 2017, in this volume).

Apart from various architectural structures, pottery, and other small finds, the excavations brought to light several hundred glass fragments. From this group

161 objects were registered during the two seasons of excavations in 2015 and 2016. The best preserved objects from the excavated areas, along with a selection of glass finds collected during the survey in 2014, illustrate this report.

In general, the finds date from the late Roman and, for the most part, from the Byzantine and Umayyad periods (late 4th through the mid-8th century). However, a few fragments may be dated tentatively to the second half of the 8th century (early Abbasid period). As for the repertoire of glass types, it is relatively limited and includes mainly table vessels, like bottles, drinking vessels (cups/beakers/goblets) and bowls. A few fragments, possibly

belonging to oil lamps, were also found [Table 1] alongside numerous raw-glass chunks.

The finds represent well-known types of glass vessels, with parallels coming from a large area of the Roman-period Decapolis and the provinces of *Palaestina Prima*, *Secunda* and *Tertia*, which were successively replaced by the Byzantine Diocese of the East, and the territory of Bilad el-Sham (after the Muslim conquests in the first half of the 7th century).

Dating of the glass finds as proposed in this paper is based both on associated pottery finds from specific stratigraphical/chronological contexts and on published comparanda, first and foremost from the sites located within the Decapolis area and, whenever appropriate, also from other more distant sites and regions. All dates are AD.

Table 1. Overview of glass types from the excavated areas

Type	Overall fragment count	Estimated vessel equivalents
Bottles/jugs	36	27
Bowls/plates	4	4
Bowls	29	28
Drinking vessels	32	30
Drinking vessels: bases and stems	20	20
Bowls/lamps	6	6
Miscellanea: jar and lid	2	2
Various vessel parts: handles, trails	12	–
Unspecified bases and rims	14	–
Unspecified fragments	6	–
Total	161	117

AREA 1-S AND 1-S(W)

Architectural remains and other finds clearly confirm the industrial character of this part of the site. Throughout the Byzantine and later periods, the northern part of the ancient town was destined specifically for crafts like wine-pressing, kitchen activity, possibly also glass and pottery production in the near vicinity.

The glass finds were classified according to their morphological features, from closed to open shapes.

CLOSED SHAPES:

BOTTLES/JUGS/JUGLETS

This is one of the largest groups of vessels retrieved from the site, but the glass is heavily fragmented with the rim and neck shards too small for a secure and justified

identification of the form based on complete vessels from elsewhere. The time span for the use of the vessel types attested at the site is very broad, from Roman up to Byzantine and early Islamic. The chronological context of the associated pottery types narrows the dating to the 5th/6th–8th centuries.

Fragments Nos 1–3 [Fig. 1] belong either to bottles or jugs with slightly thickened, rounded or in-folded rims, and shallow funnel mouths sharply tapering down to cylindrical necks. In the case of other fragments, namely Nos 4–18 [see Fig. 1], the broad rims gradually slope down to the shoulders. No. 14 is apparently part of a jug with an attached broad handle rising above the rim [see Fig. 1]. A good

parallel to it is the jug from the Umayyad period from Beth Shean (Hadad 2005: Pl. 20:382).

The funnel-shaped mouths can be associated with many variations of the body (globular, cylindrical, pear-shaped) and base shapes (flat, concave). Such a diverse family of closed shapes constitutes a hallmark of mass production of glass vessels during the Byzantine, Umayyad and later periods. Some of them were plain, others decorated with horizontal threads wrapped below the rim, around the mouths and/or necks [see *Fig. 1:5,6,11,16*].

The vessels with funnel-shaped mouth correspond to Dussart Type BX flacons (1998: 18–19, 128–158). Numerous parallels can be cited from: the Umayyad house at Bosra (Wilson and Sa'd 1984: Fig. 568), Amman (Dussart 1998: 128–158), Jerash (Kehrberg 1986: Fig. 9:11, 32, 33, 43, 44; Meyer 1988: 202, Fig. 9:O–S), 'Ain ez-Zara/Callirrhoe (Dussart 1997: Pl. 27:4–6, 13–15), Hammat Gader (Cohen 1997: 419–425, Pls VI, VII:1–6), Beth Shean, Byzantine and Umayyad periods (Hadad 2006: Fig. 19.3:34, 38–45; 2005: Pls 7:114–124, 132–138; 8:157–164), and Khirbat el-Ni'ana (Gorin-Rosen and Katsnelson 2007: 98–103, Figs 11–13, and further parallels therein).

A fragment of an upright in-folded and thickened rim [see *Fig. 1:17*] preserves also the upper part of a cylindrical, narrow neck. It is dated, by its context, to the 6th/7th century. Parallels can be found in Cave 1071 at Horbat Qastra, late 6th–7th centuries (Gorin-Rosen 2013: Fig. 25:16), and at Burial Caves 1 and 2 at Khirbat el-Shubeika, 6th century (Gorin-Rosen 2002a: 297–298, Fig. 6:43; 306–307, Fig. 2:9, and references therein).

Vessel No. 19 [see *Fig. 1*] is characterized by a narrow and tapering neck and a simple, slightly thickened rim, beneath which there are several horizontal threads.

Of interest is an incomplete bottle found in the earth fill between the wall of a wine press and a “wall” cut in bedrock (see Młynarczyk 2017, in this volume). The vessel [see *Fig. 1:20*] is characterized by an unevenly flattened rim bent out, up and in. A long cylindrical neck tapers slightly downward. Convex shoulder indicates a globular body. It is made of light green glass. The pottery associated with the wine press is in general mixed and dates from the Byzantine and Umayyad period. The vessel can be classified beyond doubt as belonging to a group of bottles very typical during the 7th–8th and 9th centuries (Pollak 2007: 121), which, apart from a flattened rim and slanting neck, had a squat or globular body and a slightly concave base. Two intact bottles of this kind were found in a destruction context related to the AD 749 earthquake in the atrium of the North-West Church at Sussita, as part of an assemblage of various artifacts, including a hoard of Umayyad coins (Burdajewicz 2006: 128–129, Figs 1:6, 7; 3:A, B; in press b). Other exact parallels are known from the late Byzantine and/or Umayyad contexts at Kursi (Barag 1983: Fig. 9:5, 6), Hammat Gader (Cohen 1997: Pl. IX:1–5), Umayyad–Abbasid period at Tiberias (Lester 2004: 182–184, Fig. 7.7:75–80, 85; Hadad 2008: Pl. 5.5:71, 72), Beth-Shean (Hadad 2005: Nos 182–194, Pls 9–11), Horbat 'Illin (Upper) (Katsnelson 2012: 53*, Fig. 2:20–23), Khirbat 'Adasa (Gorin-Rosen 2008: 126, Fig. 2:10, 11), and Ramla (Pollak 2007: 121, Fig. 10:61, 62).

Fragments of two bases made of light bluish glass, one flat and one concave, complete the picture of finds associated with

the bottles [see *Fig. 1:21, 22*]. They were found in a late 6th–early 7th century pottery context. Both items represent common

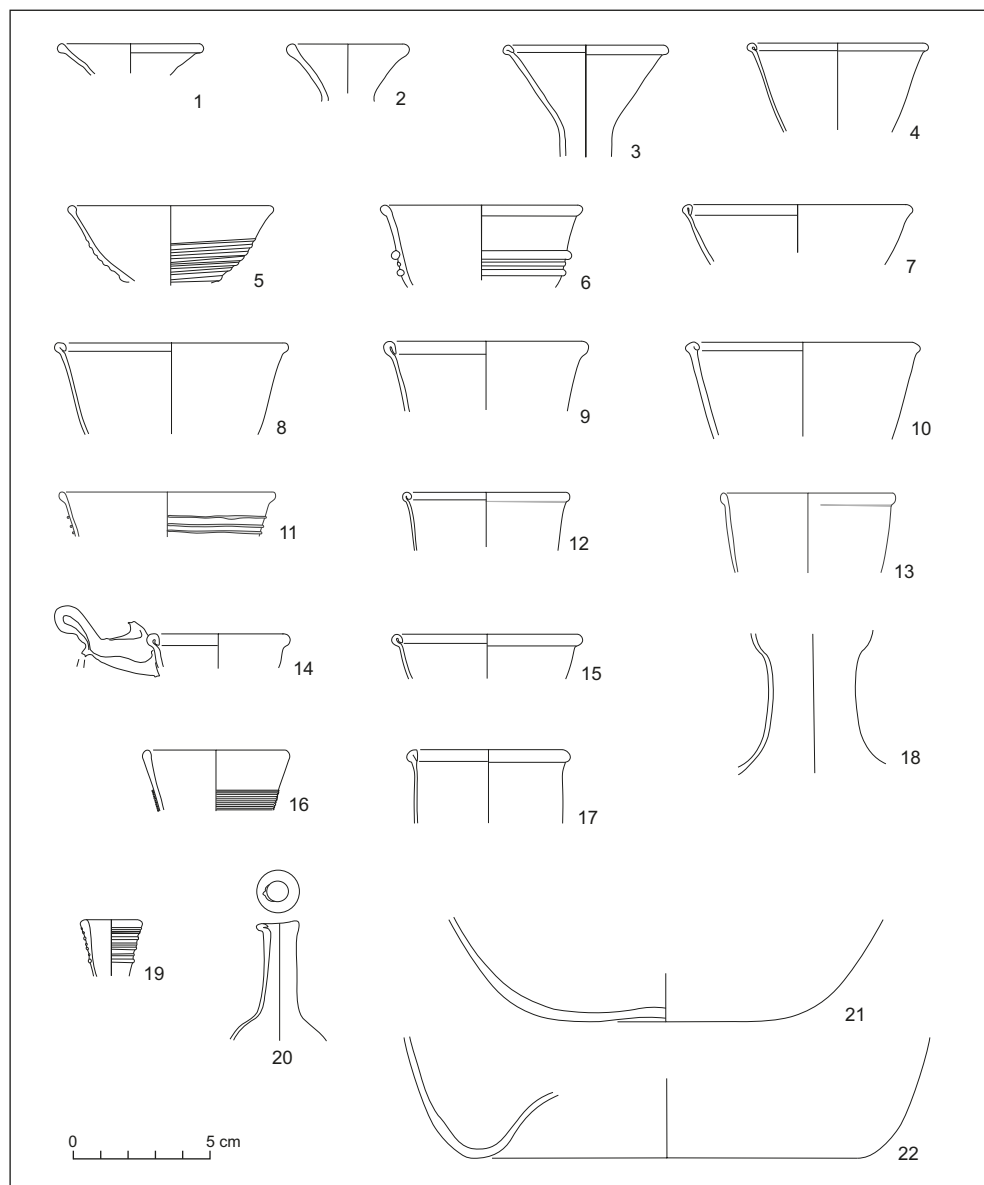


Fig. 1. Bottles

(PCMA Beit Ras Project/drawing and digitizing D. Mazanek and M. Burdajewicz)

types of bases well known throughout the Mediterranean since the Roman period, thus an attempt to look for references to similar finds would serve no purpose.

BOWLS/PLATES

A bowl fragment No. 1 (from top soil) is characterized by a double fold placed below a rounded, flaring rim [*Fig. 2:1*]. Such deep bowls are known from the early Roman period up to the early 5th century. They correspond to Dussart type BI. 4213a22 (1998: 67, Pl. 6). A fragment of a parallel bowl unearthed at 'Ain ez-Zara/Callirrhoe is firmly dated to the 2nd century by its position in the stratigraphy of the site (Dussart 1997: 97, Pl. 22:7). The Sanctuary of Zeus in Jerash yielded a double-fold rim, dated by the context to the 5th–6th centuries (Dussart 1998: 67, Pl. 6:23). A similar rim comes from the mid-2nd/3rd to 4th century context in Beirut Souk 2 (Jennings 2006: 76, Fig. 4.8:1). Other close parallels are published from Meiron, late 4th century (Meyers, Strange, and Meyers 1981: Pl. 9.10:6), Khirbat el-Ni'ana, 4th century (Gorin-Rosen and Katsnelson 2007: 82, Fig. 3:3,4), Khirbet el-Shubeika, 5th century (Gorin-Rosen 2002a: Fig. 1:2) and from an unstratified context in the Migdal Ashqelon tomb (Katsnelson 1999: 67*, Fig. 1:1).

Fragment No. 2 belongs to a bowl featuring an upright broad tubular collar, formed by folding the rim out and down with its edge folded up [*Fig. 2:2*]. It was found in a context dated to the 6th/7th century. Fragment No. 3, from topsoil, represents undoubtedly the same type of bowl [*Fig. 2:3*]. Various types of bases were associated with such bowls, usually pushed-in ones (Israeli 2008: 376, No. 76; Weinberg and Goldstein 1988: 47–48,

Fig. 4-7). These bowls correspond to Isings Form 118 (1957: 148), Barag Type 2.16 (1970: Pl. 31), and Dussart Type BII.311 (1998: 75, 251). According to Odile Dussart (1998: 75), these bowls were common in the middle of the 4th century, with a possible continuation into the 8th century.

Parallels are known from Jerash, Ain el-Zara, Amman (Dussart 1998: 75, Pl. 11:2–10), 'Iraq al-Amir (Dussart 1991: 299, Fig. 36:1–3), Paneas (Gorin-Rosen and Jackson-Tal 2008: 83, Fig. 5.2:5), Kisra (Stern 1997: 106, Fig. 1:6), Jalame, the second half of the 4th century (Weinberg and Goldstein 1988: 47–49, Fig. 4-7), Meiron Strata IV and V (Meyers, Strange, and Meyers 1981: Figs 9.10:15, 16; 11:1–4), Hammat Gader (Cohen 1997: 400, Pls 10–12), Tiberias (Amitai-Preiss 2004: 178, Fig. 11.1:3), Flavia Neapolis, area of the hippodrome, 1st–5th centuries (Sarig 2009: Pl. 41:8), Tell Tanninim (Pollak 2006: 158–159, Fig. 128). Other parallels come from Beirut, mid-2nd/3rd to 4th centuries (Jennings 2006: 75, Fig. 4.7:3, 4) and Athens, late 3rd to 4th centuries (Weinberg and Stern 2009: 143, Nos 309, 310, Fig. 18, and further parallels therein). Complete bowls were found, among others, in Tyre, dated to the mid-2nd to 4th century (Harden 1949: 151–152, Fig. 1:7) and at Beth-Shean (Hayes 1975: 120, No. 468).

Small fragment No. 4 [*Fig. 2:4*] probably belongs to a vessel with a horizontal pinched rim, a type of bowl which is discussed in more detail in the next section of this paper (Areas 3-N and 2-N).

A characteristic feature of bowls Nos 5–10 is a rim folded outwards, down and flattened, ranging in diameter between about 22 cm and 26 cm [*Fig. 2:5–8*]. The

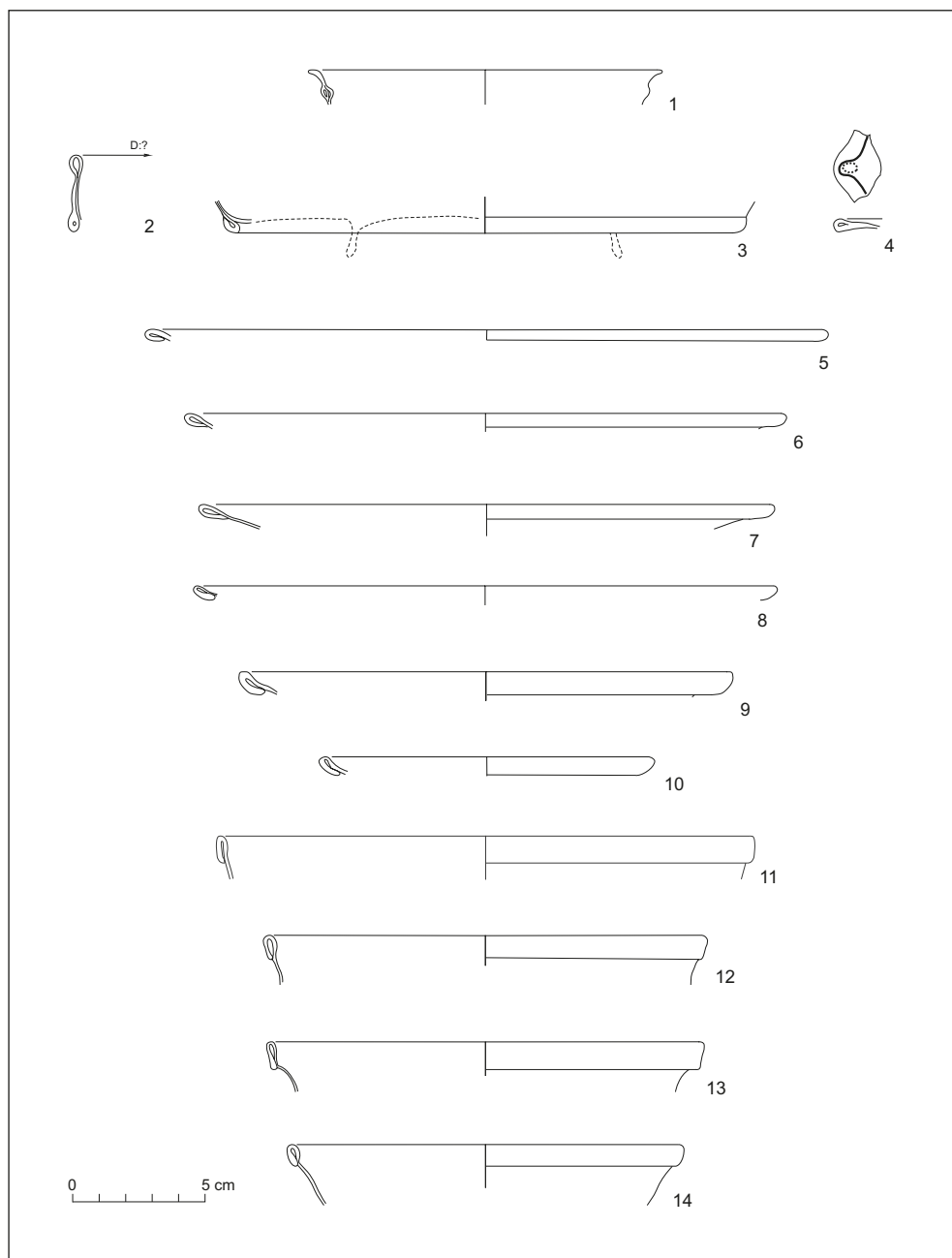


Fig. 2. Bowls/plates
(PCMA Beit Ras Project/drawing and digitizing D. Mazanek and M. Burdajewicz)

associated ceramic material is dated to the 6th–8th centuries. These rims belong to a large group of bowls widespread in the Eastern Mediterranean. They can vary considerably in size and form of the body, thickness of walls, and type of base. Bowls Nos 5–8 with a diameter between roughly 22 cm and 26 cm may represent shallow

bowls or plates. Nos 9–10 with rim below 20 cm were probably deep vessels.

Some parallels can be cited from Beth Shean, the Byzantine–Umayyad periods (Hadad 2005: Pl. 3:51–71; 2006: Fig. 19.1:11–14), Sussita/Hippos, the Byzantine–Umayyad periods (Burdajewicz 2006: 133, Fig. 1-30; 2011: Figs 2-B:26–

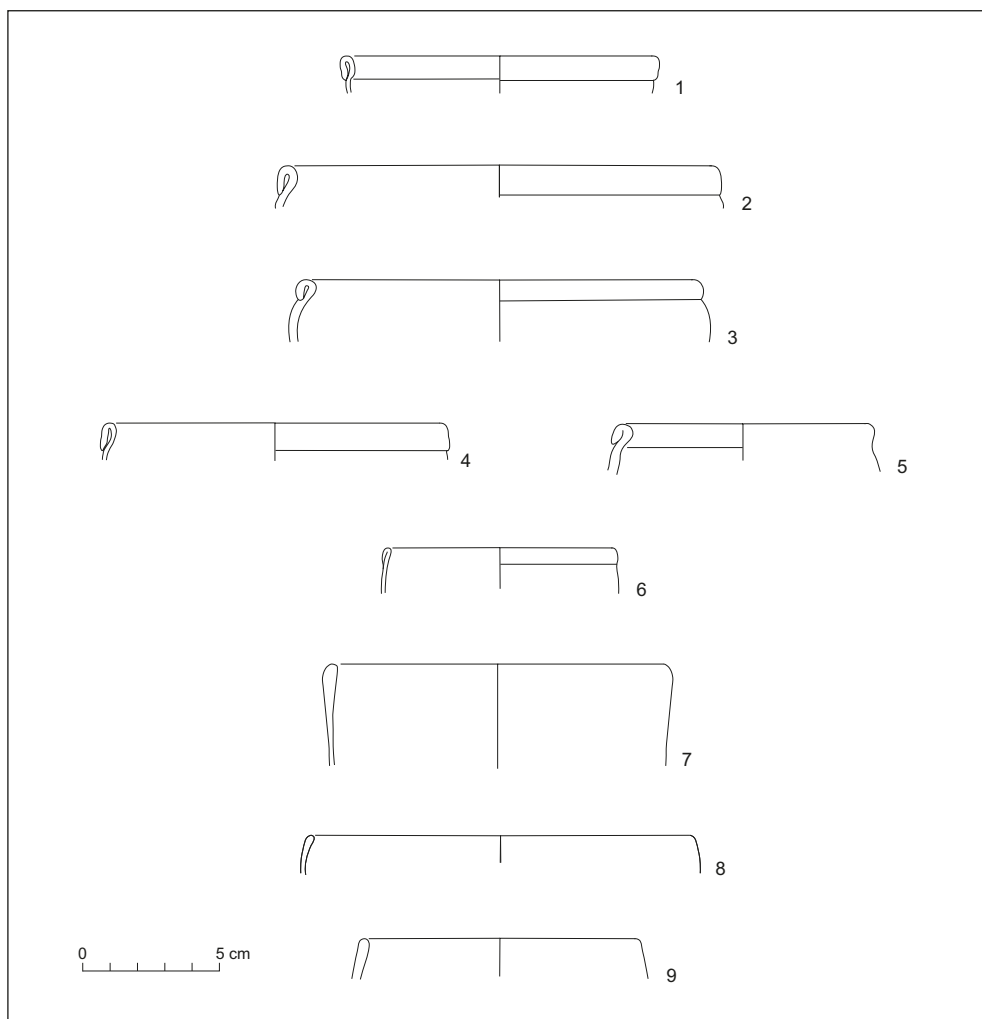


Fig. 3. Bowls and alleged lamps
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28; 4:8, 10; in press b), Jalame, the second half of the 4th century (Weinberg and Goldstein 1988: 41–44, Fig. 4-3), and Hammat Gader, end of the Roman period (Cohen 1997: 396–398, Pl. I:1–3). They were also common in Cyprus, around the 3rd–4th centuries (Vessberg 1956: 132, Fig. 42:10–13, Type II α) and at Karanis in Egypt (Harden 1936: Pl. XI:1–29).

Fragments Nos 11–14 [Fig. 2:11–14] represent variants of the same (general) type of bowls with out-folded rims. Flattened rims, upright instead of horizontal or diagonal, are folded outwards and downwards. These bowls were deeper and, judging by the preserved parts of their walls, had convex or conical body profile. Similar bowls were excavated in the burial cave at Hurfeish dated to the 3rd century (Gorin-Rosen 2002b: Fig. 7). Parallel rims are known from the 5th–7th century tomb at Ashqelon, where they were attributed to big suspended bowl-lamps (Katsnelson 1999: 78*, Fig. 5:1–3). The items from Beit Ras pertain to stratigraphical contexts yielding pottery finds from the 6th/7th century through the Umayyad period.

A few rims may possibly be related to lamps. One of them is an out-folded flattened rim with a small section of tapering wall preserved [Fig. 3:1]. It can represent a bowl-lamp type originally provided with three suspension vertical handles (for metal chains) attached to the rim and the body. We may assume that also fragment No. 6 [Fig. 3:6], with very flat out-folded rim, was used as a suspended bowl-lamp. It is associated with a pottery context dated to the 7th–8th century, whereas No. 1 belongs to a 6th–7th century assemblage.

A small group of bowls includes vessels characterized by a convex profile of relatively thick walls, indicating a globular

body. They have out-folded tubular, incurved rims [see Fig. 3:2–5]. Such bowls, dated in general to the Byzantine and Umayyad periods, are known from Amman and Jerash; they correspond to Dussart's Type BVII.11 (1998: 88–89, Pl. 16).

Vessel No. 7 [Fig. 3:7] is a simple bowl with a vertical rounded and thickened rim. Nos 8–9 [Fig. 3:8–9] have rounded, incurving rims. These three vessels are somewhat difficult to classify, but their profiles seem to be typical of bowls dated to the Umayyad and possibly early Abbasid period (see Gorin-Rosen and Katsnelson 2005: Figs 3:108; 4:30).

DRINKING VESSELS: CUPS/

BEAKERS/GOBLET/WINE GLASS

Drinking vessels are difficult to assign to a specific type. Usually a beaker/cup is defined as a vessel that has a flat bottom, while a goblet has a stem and a base. However, both beakers/cups and goblets may share a body profile, especially at the rim. Therefore, as long as we are dealing with small fragments of rims and walls, precise classification is in most cases almost impossible. Since most of the bases discovered in Beit Ras are stemmed bases, we assume that also most of the rims must belong to goblets rather than to beakers/cups. It cannot be excluded, however, that some of the simple rims, particularly of a small diameter, may actually represent closed forms, like jugs, bottles or flasks.

Fragments Nos 1–6 [Fig. 4:1–6] are characterized by flaring, rounded and, in some cases, slightly thickened rims. They belong to a large family of drinking vessels, which used to be classified as stemmed goblets, or wineglasses. There is a wide range of possible body profiles, including conical, cylindrical, and bell-shaped,

vessels with concave walls, as well as several variants of rims (simple, rounded), stems (hollow, solid, knobbed), and bases (pushed-in, tubular ring, flat disk or slightly concave disk). A great number of such vessels was found at various sites throughout the Byzantine and Umayyad periods. Here reference is made to just a few parallels from the Umayyad house at Bosra (Wilson and Sa'd 1984: Fig. 553), Pella (Smith and Day 1989: Pl. 60:9), Jerash (Kehrberg 1986: 375, Fig. 9:25–28; Meyer 1988: Fig. 10:V, X–Z), Amman (Dussart 1998: 114, Pl. 26:BVIII.332; 27–33 with

further parallels therein), Hammat Gader (Cohen 1997: 405–407, Pl. III:1–4), Beth Shean (Hadad 2005: Pl. 21:400–411), and Horbat Castra (Gorin-Rosen 2013: 99, Fig. 24:7). Examples securely dated to the first half of the 8th century were also found at Sussita/Hippos (Burdajewicz 2011: 38, Fig. 9; 2006: 129–130, Figs 1:12, 13, 15; 5). Another parallel example comes from the Umayyad glass assemblage unearthed at Ramla and well-dated within this period to after AD 712–715 (Gorin-Rosen 2010: 221, Pl. 10.2:5). Outside Palestine, similar stemmed goblets are known, among others,

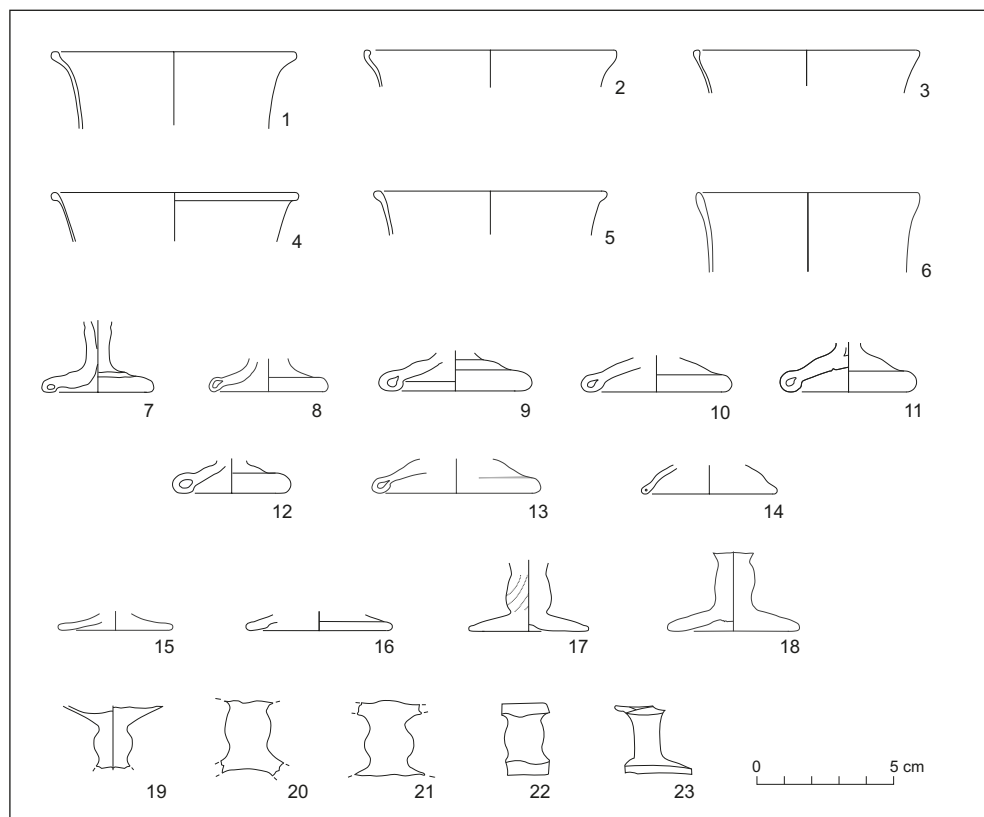


Fig. 4. Drinking vessels

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from Beirut in Phoenicia (Jennings 2006: Figs 1.6–1.9), Karanis in Egypt (Harden 1936: Pl. XVI:479–484) and Sardis in Lydia (von Saldern 1980: 53–60). They correspond to Isings Form 111 (1957: 139–140) and Dussart type BVIII.3321 (1998: 114, Pl. 26).

Bases of stemmed goblets vary from hollow tubular base rings (Nos 7–14) to solid and flat, sometimes with concave centers (Nos 15–18), while the stems vary from hollow or solid plain cylindrical (Nos 7, 23) to solid knobbed stems (Nos 17–22) [see *Fig. 4*]. Stratigraphical and chronological sequences observed at some sites in Palestine would suggest that solid bases gradually replaced hollow ring bases in the course of the 6th and 7th centuries (Winter 2015: 219).

All the variants of body profiles, stems and bases were common during the Byzantine and Umayyad periods in

Syria, Palestine, and the entire Eastern Mediterranean region in general, and can appear in various combinations (see von Saldern 1980: 53).

Another distinctive group of vessels is characterized by relatively thin walls and plain, slightly thickened and incurving rims [*Fig. 5*]. Rims of this type and with a diameter larger than 10 cm are usually associated with bowls, while rims with smaller diameter are usually attributed to beakers with flat (sometimes slightly concave) and thickened base. Such drinking vessels were typical of the late Byzantine and Umayyad periods (Gorin-Rosen 2016: 46; Dussart 1998: 106) and many examples of them have been excavated at various sites on both sides of the Jordan River: Pella (O’Hea 1992: 259, *Fig. 10*), Jerash (Meyer 1988: *Fig. 11:V*), Iraq al-Amir (Dussart 1991: *Fig. 37:21*), Sussita/Hippus (Burdajewicz in press b),

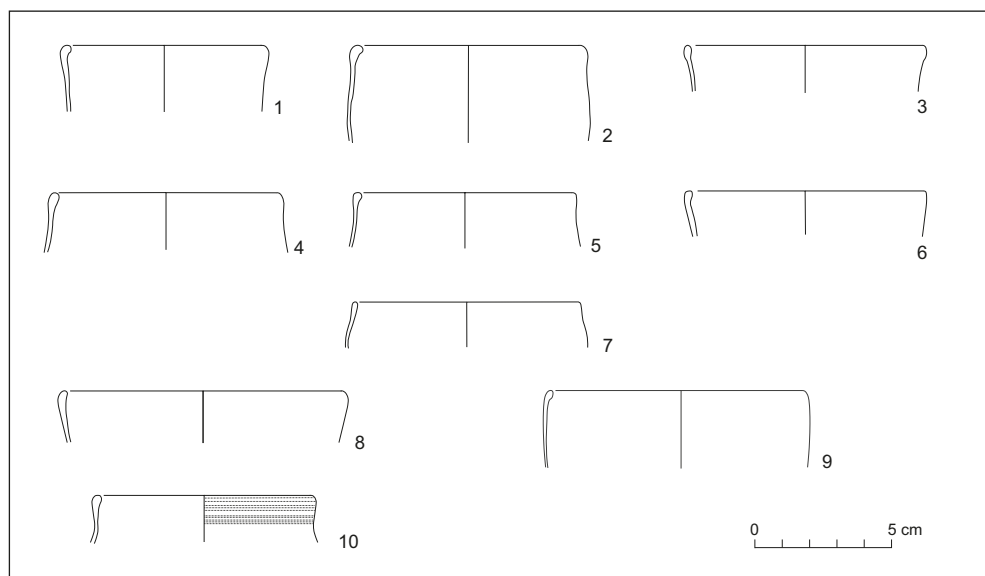


Fig. 5. Drinking vessels

(PCMA Beit Ras Project/drawing and digitizing D. Mazanek and M. Burdajewicz)

Khirbat al-Karak (Delougaz and Haines 1960: Pl. 59:14), Beth Shean (Hadad 2005: Pl. 1:14, 15, 25, 26), Ramla (Gorin-Rosen 2016: 46, Fig. 2:8–16), and Caesarea Maritima (Israeli 2008: Nos 155, 158).

Bowl No. 10 [Fig. 5:10] is decorated with applied and fused-in trails from the lip downward. Their dark yellowish-green color contrasts with the light blue color of the walls. Goblets with similar decoration on the rim have been found in a 5th–7th century tomb at Ashqelon (Katsnelson 1999: 70, 80, Fig. 2:9–11). Parallels from the end of the Byzantine and Umayyad periods are found at Horbat 'Illin (Upper) (Katsnelson 2012: 49*, Fig. 2:8), Khirbat 'Adasa (Gorin-Rosen 2008: Fig. 2:3), and from the 8th–9th century context at Ramla (Pollak 2007: 110, Fig. 6:31). At Tel Tanninim such decorated goblets were found in a locus dated from the Byzantine to the Abbasid periods (Pollak 2006: 174, 190, Figs 137, 147).

MISCELLANEA

A single example of what appears to be a glass lid [Fig. 6:1] was found in a 6th–7th century context. It is of domed shape with a slightly rounded section at the top and a wide flange (edge not preserved). It may belong to a large group of domed glass lids corresponding to Isings Form 66a (1957: 85) and Vessberg Type II (1956: 173). Somewhat similar lids, dated to a period from the 3rd to the mid-4th century, were found in Hanita Tomb XV (Barag 1978: 31–32, Fig. 15:68, 69, and further parallels therein). Another fragment of a possible lid was found in the Sanctuary of Lot at Deir 'Ain 'Abata (O'Hea 2012: 310–311, Fig. 687).

Numerous lids of various kinds, probably from the 3rd century, are known

from Cyprus (Vessberg 1956: 172–173). A similar domed lid with a button, of Italian provenance, is in the glass collection of the Louvre (Arveiller-Dulong and Nenna 2005: 179, No. 515, Pl. 35).

Fragment No. 3 was found in a 6th–7th century context and may belong to a bowl-lamp [Fig. 6:3]. A similar rim classified as a *polycandelon* lamp is reported from the church on the Roman–Byzantine terrace at Gadara (Keller 2015: Fig. XVI.3:46–49). Another possibility is that it belongs to a goblet with a knobbed stem, with comparable examples known from the Sanctuary of Lot at Deir 'Ain 'Abata (O'Hea 2012: 302, Fig. 609) and the church of St. John the Baptist in Samaria (Crowfoot 1957: Fig. 99:4). However, this kind of rim can also be associated with ovoid or globular goblets with flat solid base (see Arveiller-Dulong and Nenna 2005: 40, No. 23, Pl. 4).

Fragment No. 4 is probably part of a beaker characterized by a cylindrical body with straight wall tapering toward the bottom [Fig. 6:4]. A thread appears in its upper part, above which the wall begins to flare. This type generally has a rounded rim and a very thick flat base, like No. 5 [Fig. 6:5]. A beaker with a similar profile of the wall and a horizontal thread was found in the Roman Baths at Hammat Gader (Cohen 1997: 410, Pl. III:18, identified as a cup). It seems that this type made its appearance in the late Roman period. A large quantity of such vessels, dated to the second half of the 4th century, was found in the glass workshops at Jalame (Weinberg and Goldstein 1988: 60–61, Fig. 4-23). The type continued in the 6th century as well, for example at Sussita/Hippos (Burdajewicz in press a).

Fragment No. 6 [Fig. 6:6] comes from the lower part of a mold-blown flask, characterized by a long tapering body decorated with seven uneven flutes, and slightly concave base; the glass is colorless with a bluish tinge. It was found in a fill below Floor V, the date of which was established as most probably in the first half of the 7th century. An almost identical fragmentary flask, dated to the Abbasid period, was found at Beth Shean (Youth Hostel); however, the dating of the

Abbasid glass assemblage from this specific site was based mainly on parallels from other sites (Katsnelson 2014: 45*–46*, Fig. 11:9).

A bowl characterized by an up-right cracked-off rim and an S-shaped body profile [see Fig. 6:7] can be classified as a hanging lamp. It was found in a context related to the 6th–7th centuries. This type of vessel was very popular during the 4th and 5th centuries, but was continued also in the 7th century. Bowls of this shape,

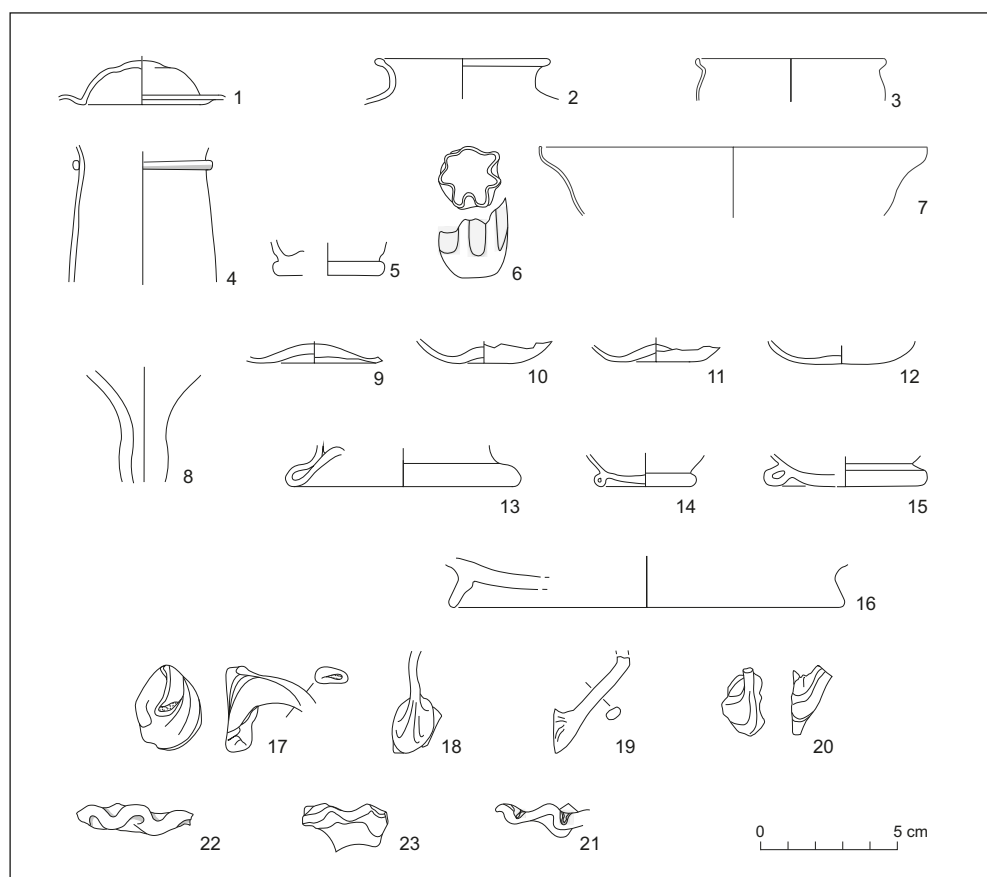


Fig. 6. *Miscellanea*

(PCMA Beit Ras Project/drawing and digitizing D. Mazanek and M. Burdajewicz)

either with cracked-off or rounded rim, could be used equally as oil lamps, hence the fragment of a vessel dated to the 5th–7th century, found in the Northern Church at Rehovot-in-the-Negev (Patrich 1988: 139, Fig. 14:32), was identified as such. The closest parallels to the shape are to be found among plain bowls dated to the Byzantine and Umayyad periods at Beth Shean (Hadad 2006: Fig. 19.1:3; 2005: Pls 1:4; 2:34–36). A deep bowl with a similarly shaped rim, found in Khirbat el-Ni'ana (Gorin-Rosen and Katsnelson 2007: 84, Fig. 4:2) is dated to the late Roman–early Byzantine periods. An example from Tiberias is broadly dated to the Umayyad and Abbasid–Fatimid periods (Hadad 2008: Fig. 5.1:13). An earlier example of a comparable bowl comes from a mid-3rd century context in the Athenian agora (Weinberg and Stern 2009: 100, No. 214, Fig. 15 and Pl. 20).

Numerous examples of such vessels were found, among others, in Beirut. They could be placed in metal rings and suspended on three chains (Jennings 2006: 92–95, Figs 5.8:2; 5.9:12, 15–19).

A likely example of a *polycandelon* lamp was found in the earliest context related to a floor dated to the 6th century. It is a fragmentarily preserved bowl with convex wall and sloping hollow stem [see Fig. 6:8]. Alongside three-handled suspended bowl-lamps [see Fig. 10:1], stemmed lamps were in common use during the Byzantine and Umayyad periods. While bowls had usually convex walls and simple upright or flaring rounded rims, stems were more differentiated. They were either short or long, hollow or solid. Solid stems could be either smooth or multi-knobbed. Examples of stemmed lamps, dated to the Byzantine and Umayyad periods, have

been published from many sites, for example Gadara (Keller 2015: Fig. XVI.2:42–40), Gerasa, Amman (Dussart 1998: 86–88, types BVI.211–BVI.23), Hammat Gader (Cohen 1997: 403–404, Pl. II:16: 16–22), Sussita/Hippos (Burdajewicz 2011: 32–33, Figs 2-B:32–38; 4:13, 14, 26; 5:7, 13, 26, 27), and Beth Shean (Hadad 2005: Pl. 22:424–442).

Stemmed lamps were placed in the openings of metal chandeliers, that is multiple-lamp holders known as *polycandela*, *palamai*, *stephanitai* (Bouras 1982: 480). Such devices were equipped with three chains and suspended vertically from the ceilings. Many such lighting devices were found in churches, synagogues and other buildings, for example, the Bishop Marianos Church at Jerash (Gawlikowski and Musa 1986: 153, Figs 9–10), North-Western Church at Sussita/Hippos (Burdajewicz 2011: 36, Fig. 8), and the synagogue at Beth Shean (Zori 1967: Fig. 11.5). Another way of using stemmed lamps was to place them in metal holders attached to the wall (Hadad 2003: 194).

Four bases with slightly concave centers [Fig. 6:9–12] represent a common type and can belong to small bottles/jugs/juglets or goblets. No. 13 [Fig. 6:13] is a relatively high pushed-in, hollow ring base, typical of bowls during the late Roman and Byzantine periods (Gorin-Rosen and Katsnelson 2007: 86–88, Fig. 6). Two other specimens represent pushed-in ring bases [Fig. 6:14, 15]. No. 16 is a single example of low, solid ring base [Fig. 6:16], a type which appears during the late Roman and Byzantine periods.

A few fragments of handles have also been retrieved [Fig. 6:17–20]. They belong to various types of small closed vessels, like

juglets and possibly also suspended bowl-lamps.

Three fragments [Fig. 6:21–23] represent decorative elements, namely the thick, wavy trails once wound around the mouth or tall funnel necks of bottles. Bottles with such embellishment were found in contexts dated to the Umayyad period at Khirbet el-Kerak (Delougaz and Haines 1960: 49, Pl. 59:27, 29), Hammat Gader (Cohen 1997: 425–426, Pls VII:1; VIII:16, 17), Beth Shean (Winter 2011: 349, Fig. 12.1:18–20; Katsnelson 2014: 38*, Fig. 7:7, 8), and the first quarter of the 8th century at Pella (Smith and Day 1989: 114–115, Pl. 56:3).

The lower part of a small bottle [Fig. 7] is of particular importance being a very rare type of vessel. Its very thick, greenish blue walls are decorated with uneven deep blue bosses or disks applied around the body. It was found in a stratigraphical context connected with the destruction caused by the quake of AD 749.

The best, almost completely preserved example of this type of vessel was found at Horbat 'Illin (Upper) on a hilltop in the Judean Shephelah, in the settlement dated from the end of the Byzantine period (6th–7th centuries) until the end of the early Islamic period (10th century) (Katsnelson 2012: 55, Fig. 3:32). It has a short cylindrical neck, two small looped handles on the shoulders, a cylindrical body divided into two by a horizontal constriction, and a flat base. The bottle, 5.6 cm high, is decorated with 14 applied bosses. The stratigraphic context of the bottle seems to indicate its date around the mid-8th century (Weksler-Bdolah 2012).

Another partly preserved bottle of this type was found in an unspecified chronological context on the western slope of the tell at Beth Shean (Fitzgerald 1931: 42, Pl. XXXIX:15). Five fragments from the early Islamic period are reported also from the city of Beth Shean, near Valley Street (Hadad 2005: 43, Pl. 41:852, 853). A fragment of a square bottle with similar decoration was found in Nazareth; the context was not clear, but an early Islamic date was assigned on stylistic grounds (Alexandre 2012: 89–90, Fig. 4.2). A similar globular bottle with bosses, dated to the 8th century and of unknown provenance (Eastern Mediterranean), is part of the Eliahu Dobkin Collection in the Israel Museum (Israeli 2003: 336, No. 436).

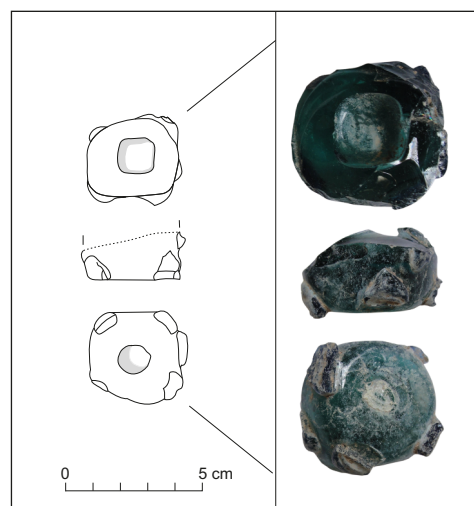


Fig. 7. Bottle: three views – top, side, bottom (PCMA Beit Ras Project/drawing and digitizing D. Mazanek; photos M. Burdajewicz)

AREAS 3-N AND 2-N

A section of the northern fortification wall of the city was exposed in this trench. Its construction in Roman times was established based on the pottery finds from the lowermost excavated layer. In terms of quantity, the glass finds from this area were relatively few in comparison to the previously discussed assemblage, but it is also true that the city wall was the largest singular architectural element filling the trench, leaving very little occupation layers to be explored around it.

Three fragments of closed shapes were found in the trench. One is a fragment of a funnel-shaped mouth decorated with a single trail beneath it [Fig. 8:1]. This item belonged probably to a bottle or a juglet, of a type common in the late Roman and

Byzantine periods, found for example at Beth Shean (Winter 2011: 357, Fig. 12.4:4). No. 2 [Fig. 8:2] is characterized by a simple, thickened and rounded rim and probably cylindrical neck, perhaps similar to a piece from the trench in Area 1-S and 1-S(W) [Fig. 1:17]. Still another type, probably a small globular or elliptical bottle, is represented by No. 3 [Fig. 8:3]. It has a short, very narrow cylindrical neck flaring toward the shoulders, and a simple rounded rim.

Of greatest interest is a fragment belonging to a bowl with a wide pinched horizontal rim shaped like a scallop shell [Fig. 8:4]. The pottery context in which it was found links it to the 5th century. This bowl represents a rather uncommon

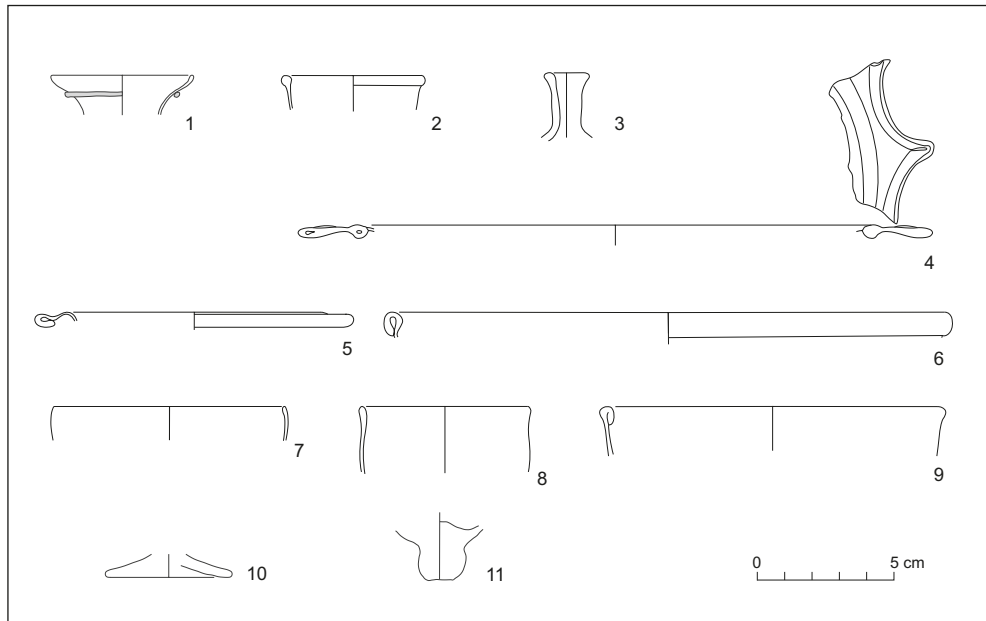


Fig. 8. Glass finds from Areas 3-N and 2-N
(PCMA Beit Ras report/drawing and digitizing D. Mazanek and M. Burdajewicz)

type, and a very small number of parallels have been published thus far. A similar fragment (probably with a polygonal rim) was unearthed in a 5th century context in Sussita/Hippos (Burdajewicz in press a). Another close parallel from a Byzantine monastery at Khirbet el-Suyyagh is dated to the late Byzantine/early Umayyad period (Taxel 2009: 145, Fig. 1:1). Such rims were unearthed also in the late Roman fort at Yotvata (Swan 2015: 148–149, Fig. 3.1:15) and in En-Gedi strata II–III from the late Roman–Byzantine period (Jackson-Tal 2007: 483, Pl. 6:1, and additional parallels therein). Similar examples are known also from the late 4th–early 5th century glass assemblage in Beirut (Jennings 2006: 77, Fig. 4.9:1), Karanis in Egypt, dated to the 4th–5th centuries (Harden 1936: Pl. XIV:259), Ayios Philon in Cyprus, Roman period (du Plat Taylor and Megaw 1981: Fig. 46:7), and the mid-4th and mid-5th century deposit from the Palatine in Rome (Sternini 2001: 26, Fig. 8:51, 52).

Another small fragment of a pinched rim representing probably the same kind of vessel comes also from the top soil in Area 1-S and 1-S(W) [see *Fig. 2:4*].

Rim fragment No. 5 [*Fig. 8:5*] was found in an occupation layer dated to the 2nd–3rd centuries, corresponding in date to a similar bowl of Dussart Type BI. 1311 from the Amman citadel (1998: 58–59, Pl. 3:24).

Fragment No. 6 is part of a folded outward tubular and slightly incurved rim of a rather large bowl with a diameter of roughly 20–21 cm [*Fig. 8:6*]. The fragment is too small to ascertain the shape of the

vessel, but the wall seems to have sloped inward. The bowl could be either shallow or deep. This type of bowl seems to have made its appearance in the 3rd century and continued to be in use into the 5th century. It was common in Syria–Palaestina; some parallels can be cited from Jalame (Weinberg and Goldestein 1988: 41–43, Fig. 4-3:14–19), Khirbet el-Ni'ana (Gorin-Rosen and Katsnelson 2007: 79–80, Fig. 2:1–3), and Ramat Hanadiv (Cohen 2000: 166–168, Pl. I:5 and further discussion therein).

Identification of two fragments is uncertain. No. 7 represents a drinking vessel with slightly incurved rim, while No. 8 possibly belongs to a bottle or a small goblet [*Fig. 8:7,8*].

A fragment of a shallow or deep bowl, No. 9, has an in-folded vertical rim, slightly out-turned [*Fig. 8:9*]. It resembles bowls from Bosra, Gadara and Jerash, representing Dussart Type BI. 4222b2 (1998: Pl. 70), dated generally to the late 6th–8th century.

No. 10 is a small fragment of a solid base pertaining to stemmed goblet (or wine-glass), a common type already mentioned above [*Fig. 8:10*].

No. 11 [*Fig. 8:11*], a short rounded solid-stem with a small fragment of flaring walls, made of dark amber glass, was found in the top soil of the trench. It belongs to a lamp of rather uncommon type in the Syria–Palaestina region. Very similar knob bases of lamps, although in different fabric (natural green or nearly colorless glass) are known from Beirut, where they are dated to the 5th and 6th centuries (Jennings 2006: 147–148, Fig. 6.20:8, 9).

SURVEY 2014

The corpora of glass finds from Beit Ras can be supplemented with items collected during the 2014 survey of an area 120 m long by 40 m wide, extending directly west of the Roman theater. Most of the finds

(which totaled 50), came from Squares 4-6 N and 3-4 S (see Młynarczyk 2017: Fig. 1, in this volume). They represent all the types already discussed above and add to the group of closed vessels, either bottles

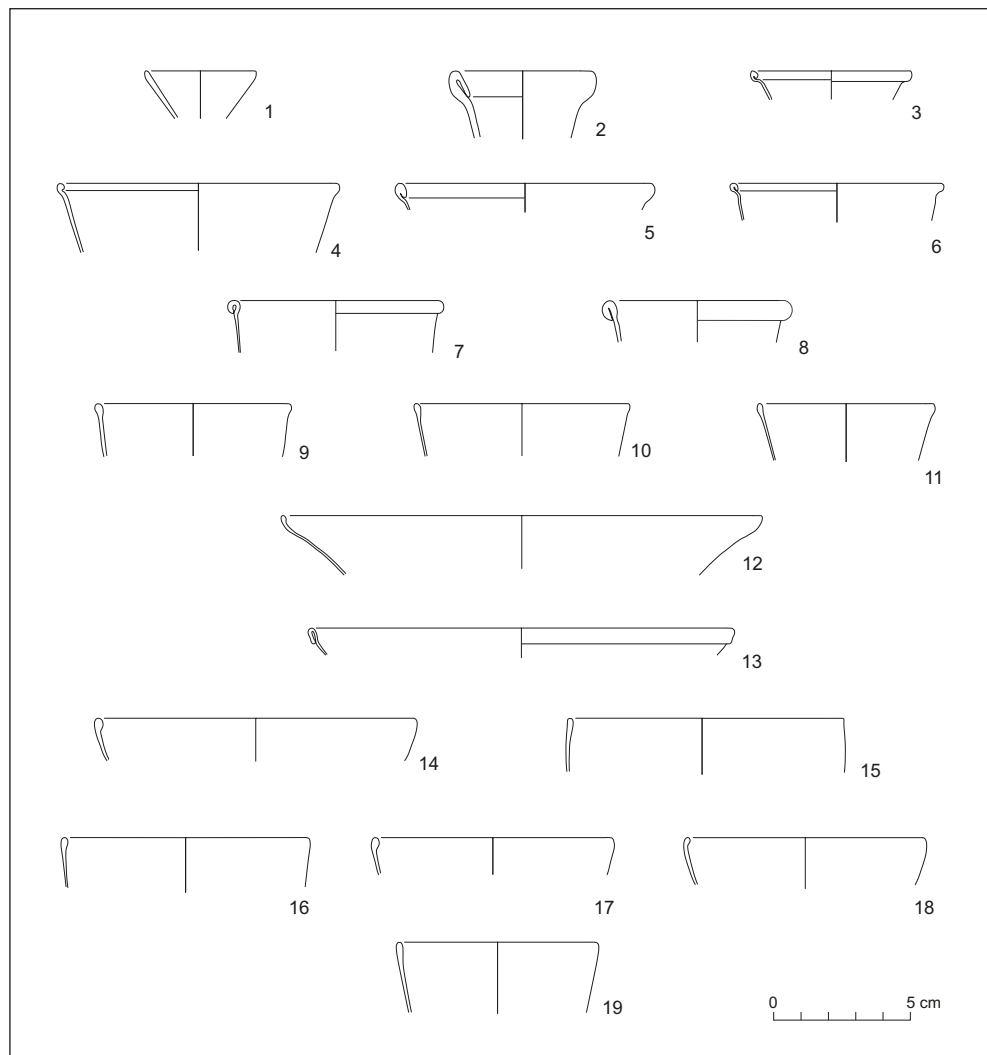


Fig. 9. Glass finds from the survey in 2014
(PCMA Beit Ras Project/drawing and digitizing M. Burdajewicz)

or jugs with funnel shaped mouths and simple, in-folded or outward folded rims [Fig. 9:1–11].

Fragment No. 12 [Fig. 9:12] is a middle-sized, shallow or deep bowl with an in-curving, rounded and slightly thickened rim, very thin wall and blowing spirals. Its shape and light green fabric would indicate a date in the 2nd–3rd centuries. Similar bowls were found in the 2nd–3rd century assemblage from Tomb 13 at Pella (McNicoll, Smith, and Hennessy 1982: 84–85, Pl. 133:1) and the area of the Severan Theatre at Beth Shan (Winter 2015: 207, Fig. 5.1:1). It may have served as a lamp (see discussion above).

A common type of bowl with out-folded rim is represented by No. 13 [Fig. 9:13]. Nos 14–19 [see Fig. 9] belong either to bowls or goblets with incurved

and rounded rims, comparable to vessels from Area 1-S and 1-S(W) [see Fig. 5].

No. 20 [Fig. 10:20] is the best preserved fragment of a suspended bowl-lamp with outward-folded flattened rim and three vertical handles. No. 21 belongs possibly to the same type of bowl-lamps [Fig. 10:21]. Such suspension bowl-lamps made their appearance first in the 5th century and were, alongside the stemmed bowl-shaped lamps, the most frequent type of lighting devices throughout the Byzantine and Umayyad periods and even later on (Gorin-Rosen and Winter 2010: 172–175). Among the many parallels one may refer to the following examples: Jerash (Meyer 1988: 205, Figs 11:N–Q; 12:P, Q), Hammat Gader (Cohen 1997: 402–403, Pl. II:13–15), Sussita/Hippus (Burdajewicz 2011: 33–35, Figs 2-B:31;

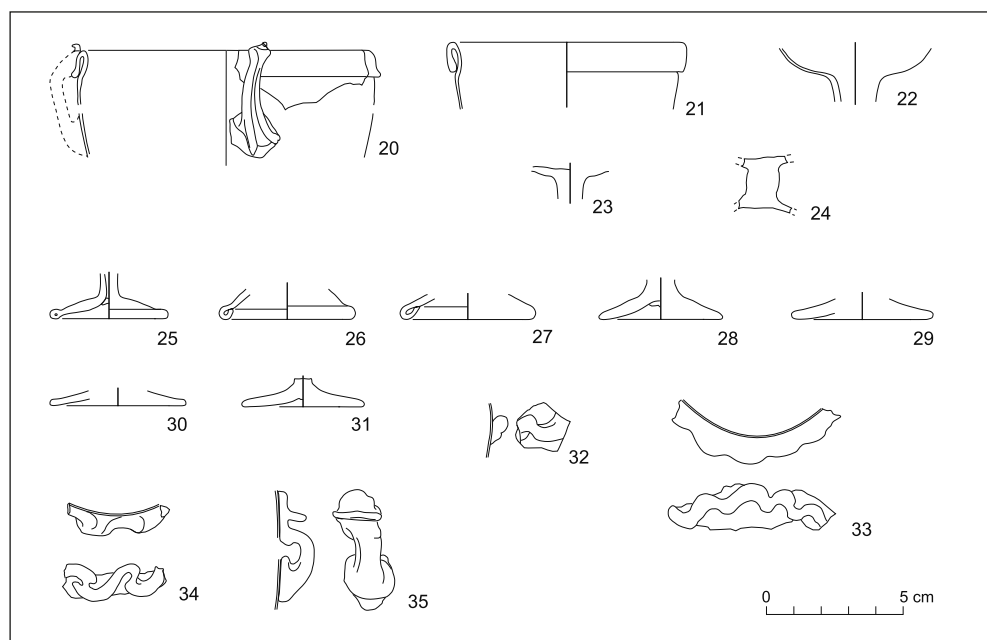


Fig. 10. Glass finds from the survey in 2014
(PCMA Beit Ras Project/drawing and digitizing M. Burdajewicz)

5:29), and Beth Shean (Hadad 2005: Pl. 22:413–422). Such lamps belong to Dussart Type BVI.1221 (1998: 82–85 and with further parallels therein).

A fragment of a hollow stem and convex wall [Fig. 10:22] may belong either to the *polycandelon* type of lamp discussed above or to a funnel (see, for example, Arveiller-Dulong and Nenna 2005: 44, No. 37, Pl. 7).

Stem No. 23 pertained either to a stemmed bowl-lamp or a stemmed goblet such as No. 24 [Fig. 10:23,24], but its extremely fragmentary state of preservation does not

allow for a precise identification. Stemmed goblets are represented also by relatively numerous bases, both tubular and solid flat [Fig. 10:25–31].

Several fragments of applied wavy trail decoration belonging to bottles were also found [see Fig. 10:32–34].

A rod handle belonging probably to a jug has a thumb-rest pinched in the upper part [see Fig. 10:35]. A handle of identical shape, but almost twice as large has been published as part of the Abbasid glass assemblage from Ramla (Gorin-Rosen and Katsnelson 2005: 103, Fig. 1:6).

GLASS CHUNKS

Several dozen pieces of raw glass were collected during the survey [Fig. 11] and in the excavation [Fig. 12]. Their total weight was about 3 kg. The most numerous are small and middle-sized pieces (up to

5 cm) of translucent bright green, bluish-green and bluish glass. Another sort of raw material is represented by fragments of cakes comprising yellow and olive-green glass of uneven consistency. Several stones

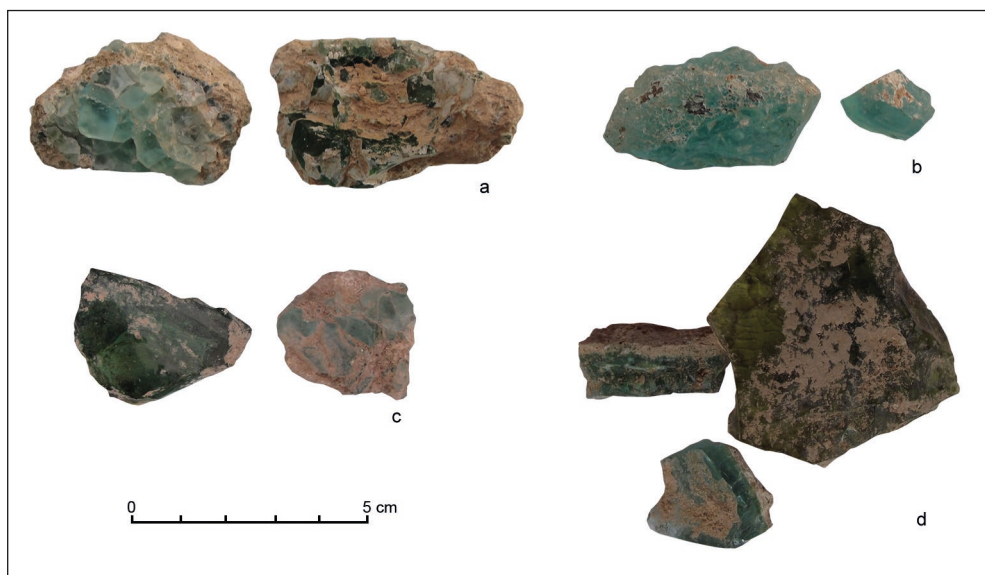


Fig. 11. Chunks of raw glass: a – Sq.6-S; b – Sq.4-S; c – Sq.6-N; d – Sq.5-W (PCMA Beit Ras Project/photos M. Burdajewicz)

amalgamated with small chunks of glass remains were also found. They may be part of glass furnace debris.

These finds significantly expand the collection of glass chunks retrieved from the nearby area of the Roman theater during the archaeological works conducted by the Irbid/Beit Ras Project and the Department of Antiquities of Jordan. Apart from the chunks, fragments of kiln and fuel ash slag were also reported (Abd-Allah 2010; Al-Shami 2005). Such evidence seems to suggest that a glass workshop or workshops were located somewhere in the close vicinity. It is not surprising, since at many sites in the

Roman-Byzantine East various kinds of evidence of both primary and secondary glass production have been found, especially in present-day Israel (Gorin-Rosen 2000). There is also significant evidence of possible local secondary glass production workshops in some other cities within the Decapolis area: at Gerasa and Pella (O’Hea 1992; Dussart 2000), Umm el-Jimal (Al-Bashaireh et al. 2016), Gadara (El-Khoury 2014), Beth Shean (Gorin-Rosen and Winter 2010: 177–178; Gorin-Rosen 2000: 59–60), Sussita/Hippos (Burdajewicz in press a). Chemical analyses of glass composition from Umm el-Jimal, Gadara and Beit Ras have revealed

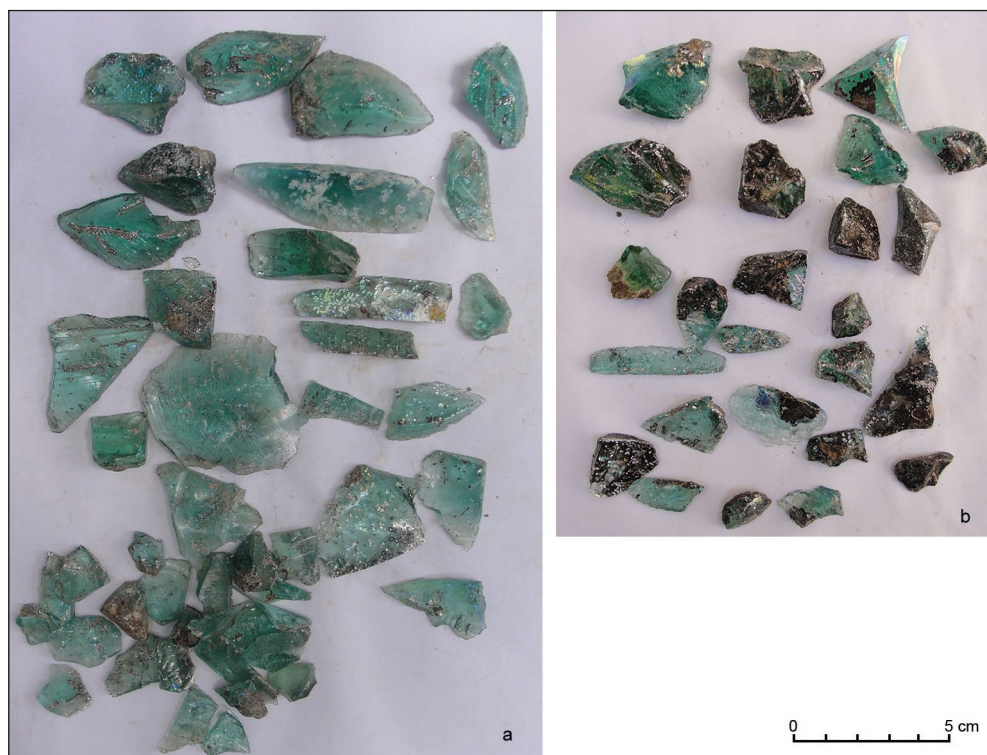


Fig. 12. Chunks of raw glass: a – B.026; b – B.027
(PCMA Beit Ras Project/photo M. Burdajewicz)

its similarity to the 'Levantine I' group of glass manufactured between the 4th and 7th centuries and to the 'Levantine II'

group produced during the early Islamic period (Al-Bashaireh et al. 2016; El-Khoury 2014; Abd-Allah 2010).

SUMMARY AND CONCLUSIONS

Most of the glass finds from the Polish excavations at Beit Ras represent common forms comparable to other assemblages from contemporary sites of the Decapolis and the Eastern Mediterranean in general. The finds from Beit Ras were used in everyday life for storing, serving and consuming food and drink. However, most of them come from an industrial context — Area 1-S and 1-S(W). This fact indicates that they should be interpreted as dumped rubbish, perhaps associated with recycled cullet.

Only a few late Roman items were retrieved, mainly from Area 3-N. It seems that the Byzantine and Umayyad periods were represented by the largest quantity and variety of types. In turn, there is no clear evidence of glass finds from the Abbasid and later periods, despite the fact that pottery finds testify to some activity at this time. This lack of glass finds could be explained by a presumed shift in the character and use of the area.

Most of the vessels were produced of light blue, light green or light bluish-green translucent glass typical of the late Roman, Byzantine and Umayyad periods. The homogeneity of the fabric suggests that they were probably produced in a local workshop. The large quantities of chunk glass indicate that vessels were indeed being manufactured in the vicinity. This assumption is not surprising in view of the growing evidence for secondary glassmaking in several cities of the region

during the Byzantine and Umayyad periods. However, some of the vessels, for example, Nos 4 and 11 [see *Fig. 8:4,11*], show a fabric apparently distinct from the rest of the glass material from Beit Ras, and thus we cannot exclude that they were imported.

Although the quantity of glass finds from Beit Ras would appear relatively small in comparison with other sites, its significance lies in the fact that this is the first published glass assemblage excavated in this particular city and thus contributes significantly to a general picture of glass use and production in this region.

ACKNOWLEDGMENTS

The present paper is a revised and updated version of a preliminary report submitted to the *Annual of the Department of Antiquities of Jordan* in 2015 (Burdajewicz in press a). I would like to express my deep gratitude to Dr. Yael Gorin-Rosen from the Glass Department of the Israel Antiquities Authority for her valuable comments on some glass finds discussed in this paper.

My warm thanks go also to Dorota Mazanek, a Ph.D. candidate from The Antiquity of Southeastern Europe Research Center of the University of Warsaw, for her assistance during the fieldwork and especially for her work in documenting the glass material. I am deeply grateful to the anonymous Reviewers for a number of important remarks, which have allowed me to improve significantly the original version of my article.

Dr. Mariusz Burdajewicz
Institute of Archaeology, University of Warsaw
00-497 Warsaw, Poland, ul. Krakowskie Przedmieście 26/28
mariuszali@yahoo.fr

REFERENCES

- Abd-Allah, R. (2010). Chemical characterisation and manufacturing technology of late Roman to early Byzantine glass from Beit Ras/Capitolias, Northern Jordan. *Journal of Archaeological Science*, 37(8), 1866–1874
- Al-Bashairh, K., Al-Mustafa, S., Freestone, I.C., and Al-Housan, A.-Q. (2016). Composition of Byzantine glasses from Umm el-Jimal, northeast Jordan: Insights into glass origins and recycling. *Journal of Cultural Heritage*, 21, 809–818
- Alexandre, Y. (2012). *Mary's Well, Nazareth: The late Hellenistic to the Ottoman periods* [=IAA Reports 49]. Jerusalem: Israel Antiquities Authority
- Al-Shami, A.J. (2005). A new discovery at Bayt Rās/Capitolias – Irbid. *Annual of the Department of Antiquities of Jordan*, 49, 509–519
- Amitai-Preiss, N. (2004). Glass and metal finds. In Y. Hirschfeld, *Excavations at Tiberias, 1989–1994* [=IAA Reports 22] (pp. 177–190). Jerusalem: Israel Antiquities Authority
- Arveiller-Dulong, V. and Nenna, M.-D. (2005). *Les verres antiques du Musée du Louvre II. Vaisselle et contenants du I^{er} siècle au début du VI^e siècle après J.-C.* Paris: Musée du Louvre
- Barag, D. (1970). *Glass vessels of the Roman and Byzantine periods in Palestine* (unpubl. Ph.D. diss.). Hebrew University of Jerusalem
- Barag, D. (1978). *Hanita, tomb XV: a tomb of the Third and early fourth century CE* [=Atiqot 13]. Jerusalem: Department of Antiquities and Museums, Ministry of Education and Culture
- Barag, D. (1983). Glass vessels. In V. Tzaferis, *The excavations of Kursi-Gergesa* [=Atiqot 16] (pp. 37–38). Jerusalem: Department of Antiquities and Museums, Ministry of Education and Culture
- Bouras, L. (1982). Byzantine lighting devices. *Jahrbuch der Österreichischen Byzantinistik*, 32(3), 479–491
- Burdajewicz, M. (2006). Glass finds from the North-West Church complex. In A. Segal, J. Młynarczyk, M. Burdajewicz, M. Schuler, and M. Eisenberg, *Hippos-Sussita: Seventh season of excavations (July 2006)* (pp. 127–143). Haifa: Zinman Institute of Archaeology, University of Haifa
- Burdajewicz, M. (2011). Glass finds in archaeological context. A case study of Hippos (Sussita). *EtTrav*, 24, 21–40
- Burdajewicz, M. (in press a). Glass finds from Beit Ras, ancient Capitolias of the Decapolis. *Annual of the Department of Antiquities of Jordan*
- Burdajewicz, M. (in press b). The glass vessels of the Roman, Byzantine and Early Islamic periods. In *Hippos-Sussita of the Decapolis: The first twelve seasons of excavations 2000–2011*, II. Haifa: Zinman Institute of Archaeology, University of Haifa

- Cohen, E. (1997). Roman, Byzantine and Umayyad glass. In Y. Hirschfeld, *The Roman baths of Hammat Gader: Final report* (pp. 396–431). Jerusalem: Israel Exploration Society
- Cohen, E. (2000). Roman and Byzantine glass. In Y. Hirschfeld, *Ramat Hanadiv excavations: Final report of the 1984–1998 seasons* (pp. 166–176). Jerusalem: Israel Exploration Society
- Crowfoot, G.M. (1957). Glass. In J.W. Crowfoot, G.M. Crowfoot, and K.M. Kenyon, *The objects from Samaria* (pp. 403–422). London: Palestine Exploration Fund
- Delougaz, P. and Haines, R.C. (1960). *A Byzantine church at Khirbat al-Karak* [=OIP 85]. Chicago: University of Chicago Press
- du Plat Taylor, J. and Megaw, A.H.S. (1981). Excavations at Ayios Philon, the ancient Carpasia. Part II, the early Christian buildings. *Report of the Department of Antiquities, Cyprus*, 209–250
- Dussart, O. (1991). Les verres. In E. Will et al., *'Iraq al Amir: le château du Tobiade Hyrcan I. Texte* [=BAH 132] (pp. 299–307). Paris: Librairie orientale Paul Geuthner
- Dussart, O. (1997). Les verres. In C. Clamer, J. Magness, and O. Dussart, *Fouilles archéologiques de 'Ain Ez-Zâra/Callirrhôé: villégiature hérodiennne* [=BAH 147] (pp. 96–102). Beirut: Institut français d'archéologie du Proche-Orient
- Dussart, O. (1998). *Le verre en Jordanie et en Syrie du Sud* [=BAH 152]. Beirut: Institut français du Proche-Orient
- Dussart, O. (2000). Quelques indices d'ateliers de verriers en Jordanie et en Syrie du Sud de la fin de l'époque hellénistique à l'époque islamique. In M.-D. Nenna (ed.), *La route du verre: ateliers primaires et secondaires du second millénaire av. J.-C. au Moyen Age* [=Travaux de la Maison de l'Orient 33] (pp. 91–96). Lyon: Maison de l'Orient Méditerranéen-Jean Pouilloux
- El-Khouri, L. (2014). Glass production in the Early Byzantine period (4th–7th century) at Gadara (Umm Qais), Jordan, Area W, 2011 season of excavation. *Levant*, 46(1), 89–97
- Fitzgerald, G.M. (1931). *Beth-Shan excavations: 1921–1923, the Arab and Byzantine levels* [=Publications of the Palestine Section of the Museum of the University of Pennsylvania 3]. Philadelphia, PA: University of Pennsylvania Museum
- Gawlikowski, M. and Musa, A. (1986). The Church of Bishop Marianos. In F. Zayādīn (ed.), *Jerash Archaeological Project I. 1981–1983* (pp. 137–162). Amman: Department of Antiquities of Jordan
- Gorin-Rosen, Y. (2000). The ancient glass industry in Israel. Summary of the finds and new discoveries. In M.-D. Nenna (ed.), *La route du verre: ateliers primaires et secondaires du second millénaire av. J.-C. au Moyen Age* [=Travaux de la Maison de l'Orient 33] (pp. 49–63). Lyon: Maison de l'Orient Méditerranéen-Jean Pouilloux
- Gorin-Rosen, Y. (2002a). Excavations at Khirbet el-Shubeika 1991, 1993: the glass vessels. In Z. Gal (ed.), *Eretz Zafon: Studies in Galilean archaeology* (pp. 288–322, 186*–187*). Jerusalem: Israel Antiquities Authority [in Hebrew with English summary]
- Gorin-Rosen, Y. (2002b). The glass vessels from burial Cave D at Hurfeish. In Z. Gal (ed.), *Eretz Zafon: Studies in Galilean archaeology* (pp. 139*–166*). Jerusalem: Israel Antiquities Authority
- Gorin-Rosen, Y. (2008). The glass finds from Khirbat 'Adasa. *Atiqot*, 58, 123–134, 72*–73* [in Hebrew with English summary]
- Gorin-Rosen, Y. (2010). The Islamic glass vessels. In O. Gutfeld, *Ramla: Final report on the excavations north of the White Mosque* [=Qedem 51] (pp. 213–264). Jerusalem: Hebrew University of Jerusalem

- Gorin-Rosen, Y. (2013). The glass assemblage from Cave 1071. In E.C.M. van den Brink et al., Two Roman–Byzantine subsurface features at Horbat Qastra (Castra), at the foot of Mount Carmel. *Atiqot*, 75, 98–109
- Gorin-Rosen, Y. (2016). An Umayyad glass assemblage from Ramla. *Atiqot*, 86, 41–57
- Gorin-Rosen, Y. and Jackson-Tal, R.E. (2008). Area B: the glass vessels. In V. Tzaferis and S. Israeli, *Panias I. The Roman to early Islamic periods excavations in areas A, B, E, F, G and H [=IAA Reports 37]* (pp. 81–89). Jerusalem: Israel Antiquities Authority
- Gorin-Rosen, Y. and Katsnelson, N. (2005). Glass finds from the salvage excavation at Ramla. *Atiqot*, 49, 101–114
- Gorin-Rosen, Y. and Katsnelson, N. (2007). Local glass production in the late Roman–early Byzantine periods in light of the glass finds from Khirbat el-Ni’ana. *Atiqot*, 57, 73–154
- Gorin-Rosen, Y. and Winter, T. (2010). Selected insights into Byzantine glass in the Holy Land. In J. Drauschke and D. Keller (eds), *Glass in Byzantium – production, usage, analyses: International workshop organised by the Byzantine Archaeology Mainz, 17th–18th of January 2008, Römisch-Germanisches Zentralmuseum* (pp. 165–181). Mainz: Verlag des Römisch-Germanischen Zentralmuseums
- Hadad, S. (2003). Glass lamps from the “House of the Menorot” in Area VI. In E. Mazar, *The Temple Mount excavations in Jerusalem 1968–1978 directed by Benjamin Mazar II. The Byzantine and early Islamic periods [=Qedem 43]* (pp. 191–195). Jerusalem: Institute of Archaeology, Hebrew University of Jerusalem
- Hadad, S. (2005). *Islamic glass vessels from the Hebrew University excavations at Bet Shean II [=Qedem Reports 8]*. Jerusalem: Institute of Archaeology, the Hebrew University of Jerusalem
- Hadad, S. (2006). Glass finds. In A. Mazar, *Excavations at Tel Beth-Shean, 1989–1996, I. From the Late Bronze Age IIB to the medieval period* (pp. 626–637). Jerusalem: Israel Exploration Society; The Institute of Archaeology, The Hebrew University of Jerusalem
- Hadad, S. (2008). Glass vessels. In Y. Hirschfeld and O. Gutfeld, *Tiberias: Excavations in the house of the bronzes: final report I. Architecture, stratigraphy and small finds* (pp. 167–189). Jerusalem: Institute of Archaeology, Hebrew University of Jerusalem
- Harden, D.B. (1936). *Roman glass from Karanis found by the University of Michigan Archaeological Expedition in Egypt, 1924–29*. Ann Arbor, MI: University of Michigan Press
- Harden, D.B. (1949). Tomb-groups of glass of Roman date from Syria and Palestine. *Iraq*, 11(2), 151–159
- Hayes, J.W. (1975). *Roman and pre-Roman glass in the Royal Ontario Museum: A catalogue*. Toronto: The Royal Ontario Museum
- Isings, C. (1957). *Roman glass from dated finds [=Archaeologica Traiectina 2]*. Groningen: J.B. Wolters
- Israeli, Y. (2003). *Ancient glass in the Israel Museum: The Eliahu Dobkin collection and other gifts*. Jerusalem: The Israel Museum
- Israeli, Y. (2008). The glass vessels. In J. Patrich, *Archaeological excavations at Caesarea Maritima areas CC, KK and NN: Final reports I. The objects* (pp. 369–418). Jerusalem: Israel Exploration Society

- Jackson-Tal, R.E. (2007). Glass vessels from En-Gedi. In Y. Hirschfeld, *En-Gedi excavations II. Final report (1996–2002)* (pp. 474–506). Jerusalem: Israel Exploration Society; Institute of Archaeology, Hebrew University of Jerusalem
- Jennings, S. (2006). *Vessel glass from Beirut: BEY 006, 007, and 045 [=Berytus 48–49]*. Beirut: Faculty of Arts and Sciences, American University of Beirut
- Katsnelson, N. (1999). Glass vessels from the painted tomb at Migdal Ashqelon. *’Atiqot*, 37, 67*–82*
- Katsnelson, N. (2012). The glass vessels from Horbat ‘Illin (Upper). *’Atiqot*, 71, 47*–56*
- Katsnelson, N. (2014). The glass finds from Bet She’an (Youth Hostel). *’Atiqot*, 77, 23*–57*
- Kehrberg, I. (1986). Summary report on glass. In F. Zayādīn (ed.), *Jerash Archaeological Project I. 1981–1983* (pp. 375–385). Amman: Department of Antiquities of Jordan
- Keller, D. (2015). Glass finds from Area I (1997 season). In K.J.H. Vriezen and U. Wagner-Lux (eds), *Gadara-Umm Qēs II. The twin churches on the Roman–Byzantine terrace and excavations in the streets [=Abhandlungen des Deutschen Palästinavereins 30/2]* (pp. 199–264). Wiesbaden: Harrassowitz Verlag in Kommission
- Lester, A. (2004). The glass. In D. Stacey, A. Berman, and A. Lester, *Excavations at Tiberias, 1973–1974: The early Islamic periods [=LAA Reports 21]* (pp. 167–220). Jerusalem: Israel Antiquities Authority
- McNicoll, A., Smith, R.H., and Hennessy, B. (1982). *Pella in Jordan I. An interim report on the joint University of Sydney and the College of Wooster excavations at Pella, 1979–1981*. Canberra: Australian National Gallery
- Meyer, C. (1988). Glass from the North Theater Byzantine Church, and soundings at Jerash, Jordan, 1982–1983. *BASOR Supplementary Studies*, 25, 175–222
- Meyers, E.M., Strange, J.F., and Meyers, C.L. (1981). *Excavations at ancient Meiron, Upper Galilee, Israel, 1971–72, 1974–75, 1977 [=Meiron Excavation Project 3]*. Cambridge, MA: American Schools of Oriental Research
- Młynarczyk, J. (2017). Beit Ras/Capitolias: an archaeological project 2014–2016. *PAM*, 26/1, 473–504
- O’Hea, M. (1992). The glass industry of Pella and the Decapolis. *ARAM Periodical*, 4(1–2), 253–264
- O’Hea, M. (2012). The glass. In K.D. Politis, *Sanctuary of Lot at Deir ‘Ain ‘Abata in Jordan: Excavations 1988–2003 [=American Center of Oriental Research Publications 7]* (pp. 293–315). Amman: American Center of Oriental Research
- Patrich, J. (1988). The glass vessels. In Y. Tsafir, *Excavations at Rehovot-in-the-Negev I. The Northern Church [=Qedem 25]* (pp. 132–141). Jerusalem: Institute of Archaeology, Hebrew University of Jerusalem
- Pollak, R. (2006). The glass. In R.R. Stieglitz, *Tel Tanninim: Excavations at Krokodeilon Polis, 1996–1999 [=American Schools of Oriental Research Archaeological Reports 10]* (pp. 155–193). Boston: American Schools of Oriental Research
- Pollak, R. (2007). The glass vessels. In *Excavation in Marcus Street, Ramla [=Contract Archaeology Reports. Reports and Studies of the Recanati Institute for Maritime Studies 2]* (pp. 100–133). Haifa: University of Haifa, Leon Recanati Institute for Maritime Studies

- Sarig, S. (2009). Glass vessels from Ras-el'Ein. In Y. Magen, *Flavia Neapolis: Shechem in the Roman period II* [=Judea and Samaria Publications 11] (pp. 23–37). Jerusalem: Staff Officer of Archaeology-Civil Administration of Judea and Samaria; Israel Antiquities Authority
- Smith, R.H. and Day, L.P. (1989). *Pella of the Decapolis II. Final report on the College of Wooster excavations in area IX, the civic complex, 1979–1985*. Sydney: The College of Wooster
- Stern, E.J. (1997). Burial caves at Kisra. *'Atiqot*, 33, 103–135, 17* [in Hebrew with English summary]
- Sternini, M. (2001). Reperti in vetro da un deposito tardoantico sul colle Palatino. *JGS*, 43, 21–75
- Swan, C. (2015). The glass. In G. Davies and J. Magness, *The 2003–2007 excavations in the late Roman port at Yotvata* (pp. 142–171). Winona Lake, IN: Eisenbrauns
- Taxel, I. (2009). *Khirbet es-Suyyagh: A Byzantine monastery in the Judaean Shephelah* [=Salvage Excavation Reports 6]. Tel Aviv: Emery and Claire Yass Publications in Archaeology
- Vessberg, O. (1956). Glass: typology – chronology. In O. Vessberg and A. Westholm, *The Swedish Cyprus expedition IV.3. The Hellenistic and Roman periods in Cyprus* (pp. 128–175, 193–219). Stockholm: The Swedish Cyprus expedition
- von Saldern, A. (1980). *Ancient and Byzantine glass from Sardis* [=Archaeological Exploration of Sardis Monographs 6]. Cambridge, MA: Harvard University Press
- Weinberg, G.D. and Goldstein, S.M. (1988). The glass vessels. In G.D. Weinberg, *Excavations at Jalame: Site of a glass factory in Late Roman Palestine* (pp. 38–102). Columbia, MO: University of Missouri Press
- Weinberg, G.D. and Stern, E.M. (2009). *Vessel glass* [=Athenian Agora 34]. Princeton, NJ: American School of Classical Studies at Athens
- Weksler-Bdolah, S. (2012). Horbat 'Illin (Upper): Rock-cut installations from the Late Hellenistic and Early Roman Periods, and remains of a settlement from the Byzantine and Early Islamic Periods. *'Atiqot*, 71, 13–75, 112*–116* [in Hebrew with English summary]
- Wilson, J. and Sa'd, M. (1984). The domestic material culture of Busra from the Nabataean to the Umayyad periods. *Berytus*, 32, 35–148
- Winter, T. (2011). The glass finds. In R. Bar-Nathan and W. Atrash, *Bet She'an II. Baysan, the theater pottery workshop* [=IAA Reports 48] (pp. 345–362). Jerusalem: Israel Antiquities Authority
- Winter, T. (2015). The glass finds. In G. Mazor and W. Atrash, *Bet She'an III.1. Nysa-Scythopolis: the Southern and Severan theaters. The stratigraphy and finds* [=IAA Reports 58/1] (pp. 207–227). Jerusalem: Israel Antiquities Authority
- Zori, N. (1967). The ancient synagogue at Beth-Shean. *Eretz Israel*, 8, 149–167 [in Hebrew with English summary]