

# THE 2019 AUSTRIAN AL JUMAYL PROJECT: PRELIMINARY REPORT

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## Introduction to the Site (BH)

The archaeological campaign in Al Jumayl was conducted between 5<sup>th</sup> August and the 1<sup>st</sup> of September 2019, by the team of the University of Vienna. It was directed by Basema Hamarneh, with the active participation of 9 students. The DoA representative for the project was Mohammad Saqr, 6 local workers were employed in different phases of the excavation.

Al Jumayl (JADIS 2309007; MEGA Jordan 2728)<sup>1</sup>, lies 35km to the south west of Mādabā on the road to DHībān, and about 3,5km to the West of the UNESCO World Heritage site of Umm Ar Raṣās<sup>2</sup>. In the Byzantine period it was part of Provincia Arabia, falling under the ecclesiastical jurisdiction of the Bishop of Mādabā (Piccirillo 2005: 378-382).

Despite the considerable extension of the archaeological remains (150×200m), Al Jumayl has received only limited attention by scholars, mostly passing by on their way to al-Lahūn or to Umm Ar Raṣās. Among the earliest notes of western travelers on Al Jumayl, are the brief mentions of (Tristram 1874: 165; Vailhé 1896: 232; Brünnow and von Domaszewski 1904: 72; Musil 1907/08: 110, 246). In 1933, Nelson Glueck gave a short description of the ruins and reported a large number of Iron Age (including decorated Moabite), Nabataean, Roman and Byzantine sherds. He also pointed out that the area had a great agricultural potential in ancient times, having fenced fields extending towards Umm Ar Raṣās (Glueck 1934: 36-37). In 1936 Savignac, identified a Chapel in the western

side of the village (Savignac 1936: 242). An important contribution to the knowledge of the area was given by the excavations of Umm Ar Raṣās by Piccirillo (Piccirillo and Alliata 1994). Additional information, with a reconsideration of Glueck's early notes, was provided by a survey of Chang-Ho and 'Attiyat in 1996 (Chang-Ho and 'Attiyat 1997: 118-119) but no excavations have been attempted to date.

Scholarly opinion suggests identifying Al Jumayl with Beth Gamul mentioned in the Bible (according to Jeremiah 48: 23). The Old Testament narrative associates the Town, to other ten in the Moabite Plateau<sup>3</sup>. Although the name of the site in the Byzantine epoch is still unknown, it cannot be ruled out that the village may have maintained its ancient name modified to suite modern Arabic phonetic<sup>4</sup>.

The rapid agricultural and urban development of the area surrounding Umm Ar Raṣās, deemed it necessary to launch an intensive field investigation project at Al Jumayl, in order to document as much as possible of the elements related to the built environment, its surrounding landscape, and investigate how a peripheral rural settlement functioned in late antiquity.

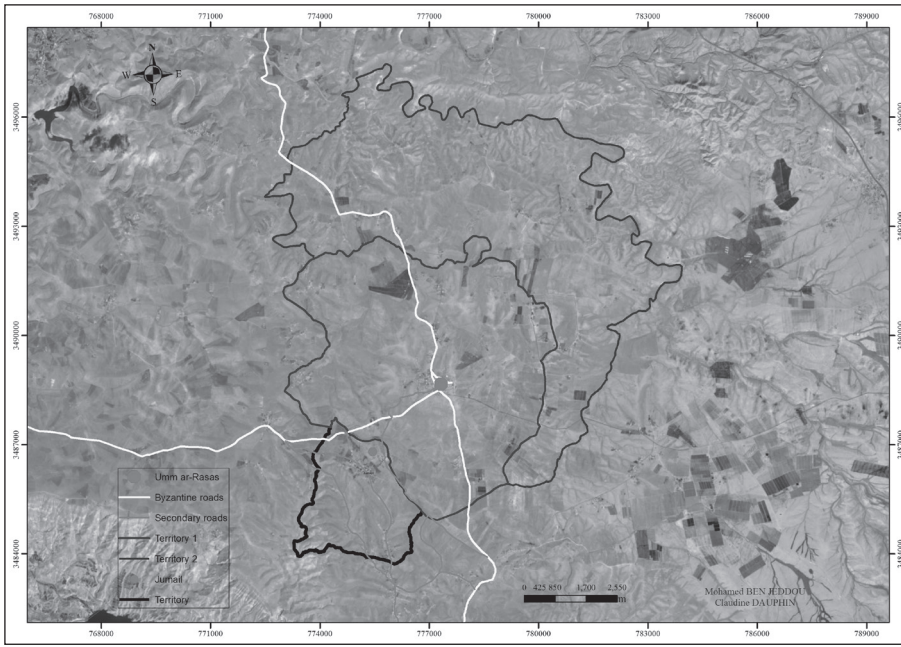
Preliminary reconstruction of the main features was made by combining data from 1953 aerial photographs taken by

1. The main coordinates are: 3589980E / 3148364N; UTM Zone 36; UTME 7748 and UTMN 34879.

2. <https://whc.unesco.org/en/list/1093/>.

3. The plateau is about 910m above the level of the Mediterranean, or 1,300m above the Dead Sea level, rising gradually from north to south. Al Jumayl lies near DHībān, Aro'er, Lahun and Mefa'at, all important Iron Age Towns (Benedettucci 2017: 9-17).

4. This is the case for example of biblical Heshbon- Byzantine Esbous - modern Hisbān; Medaba - Byzantine and modern Mādabā; and Dhibon - modern DHībān which was the main city of the Moabite kingdom.



1. The area of Al Jumayl and of Umm Ar Raṣās according to a preliminary reconstruction from aerial photographs (by C. Dauphin and M. Ben Jeddou © IKA).

Huntingdon Aerofilms, with satellite imagery; these were compared to the Jordanian Air Force photographic coverage of the Umm Ar Raṣās-Al Jumayl area in 1970. The images were corrected for terrain and optical distortion, followed by the composition of an accurate “orthophotographic” mosaic, produced using computer software<sup>5</sup>. The recorded elements enabled to create data sets for more specific archaeological interpretations and provided the necessary elements to define the investigation field of research.

This resulted in the identification of a vast area of a fringed landscape that covers around 1ha, and actually stretches from Umm Ar Raṣās to Al Jumayl (Fig. 1), connected or shared by the two settlements. The densely exploited anthropogenic environment, argues strongly for the existence of a centrally managed system (tentatively State - Church institution-private landowners). A possible involvement of different types of landownership reflects the primary role played by the agriculture in local and regional economy (micro and macro circuits) and will be addressed in further detail in our project.

### The Excavation (BH and ML)

The purpose of the first campaign was to study the topographic setting of the habitat, its

5. The preliminary study of the aerial photographs was made by Cl. Dauphin and M. Ben Jeddou.

infrastructures and acquire information on the stratigraphic development of selected areas of the site. This approach will allow to program further research, specifically on the function of the rural settlement, its main features and its productive landscape in late antiquity. The in-depth investigation focused on two areas the first to the South-West of the hill edge (main *tall*), and the second on the summit of the *tall* itself (Fig. 2).

### Complex 1 Section I

The first excavation trench is situated to the west side of the central hill (*tall*), it stands roughly at the centre of the densely build-up area of the village. It develops to the South of a large house consisting of a courtyard surrounded by, at least three rooms, of which only the north-eastern side was excavated. The whole complex was covered by a consistent structural collapse, that included wall stones, roof slabs, a broken architrave decorated with a cross and smaller stones.

The sector, measures 6.70×5.30m, stands on the southern side of a large wall running east-west, traceable on the surface, which stops immediately at the foot of the *tall*. On the south side, it was delimited by a parallel irregular wall made of stones of different forms probably coming from other buildings. A third wall running north-south formed its western





2. Aerial photo of Al Jumayl with the excavated areas (APAAME-20081005-DLK-0036. Photographer: D.L. Kennedy, courtesy of APAAME)

limit, allowing to identify the sector as a proper rectangular room (**Fig. 3**).

The walls 1a and 2 consisted of well-dressed stones, organized in regular rows. While fairly different are the building technique of wall n. 9, and the one row division wall in the middle of Section I (lowest *strata* US5), both have been randomly assembled with spolia (coming mostly from other buildings). The lack of a structural scheme in wall n. 9, is seen in the re-employment of various building material, as for example a threshold stone, as well as the lack of a foundation trench suggest that it was added in a later period (see below for the wall analysis).

The excavation of Section I included the removal of the collapsed stones pertaining to the upper layers of wall and possibly of the roof, mixed with modern material. Very few pottery sherds dated to the Mamluk and Byzantine periods mixed with plastic bags and greyish loose soil were the major characteristic of this large and uniform deposit (of US 0-1-2). In correspondence to the wall running north-south some remains of human bones were found. The loose soil and the thick deposit of collapsed stones showed no specific material but rather modern waste.

Under the structural collapse greyish dark soil mixed with limited charcoal and traces of two fireplaces (US 3 and US 4) yielded, among other pottery finds, an Ayyubid glazed sherds that can be dated to the 12<sup>th</sup>-13<sup>th</sup> century (see

pottery section). The remnant part showed mainly Mamluk pottery (16 sherds) none of them diagnostic. Other sherds dated to the Byzantine period (4, with one diagnostic) and Umayyad (2 not diagnostic) were also among the finds.

The room was divided into two sectors by a narrow line of stones of one row, supposedly added to separate the area of the fire places from a second part of the same space probably used for other purposes, as traces of ashes in the north-eastern, and eastern limits of the trench were found. The following *stratum* US 05 is the floor of the room, it was made of hard white/greyish plaster with few stones that remained in the bottom of the floor. The plaster was spread at the same level of the foundation trench of the Byzantine North wall (wall n. 2). The plastering was possibly added to achieve a smooth surface, which was not possible owing the irregular



3. Excavated section I (© IKA).

surface of the bedrock seen in the south corner.

The pottery consisted of Mamluk sherds (9, 2 diagnostic), Byzantine (16, 1 diagnostic) and Umayyad (12, none of which was diagnostic). The removal of small parts of the plaster showed hard reddish/brown soil with traces of ashes in the north-eastern, and eastern limits of the trench, which forms the floor level with parts of the bed rock visible near the southern wall.

### Interpretation

The excavated sector bears witness to the requalification process of an open space. The area that was chosen to build the room, is set on the external side of a house, and was probably part of an internal courtyard, or simply a passage within settlement during the Byzantine and in the early Islamic periods. However, when the area was reoccupied in the Ayyubid/Mamluk period, as suggested by the pottery assemblages collected in the lower *strata*, it was transformed to a room closing part of the court/passage. This is confirmed by the pressed soil of the ground level in proximity of the wall in which the Byzantine sherds were found. The latter were very small (mostly smaller than 2cm). The perpendicular walls of the room were built against the existing Byzantine wall to the north, which consists of at least five rows of well-dressed stones running east-west, while the parallel south wall (wall n. 1a) and the connecting wall to the west (wall n. 9) have a less accurate fabric made of reused stones of differ-

ent shapes and forms, incorporating a significant number of *spolia*. The eastern part was not excavated due to the vicinity of the *tall*, and the large collapsed stones that once formed the outer walls of the fortification built on it. Thus, it is hypothetically suggested that an entrance may have been practiced from that side. The room was used as living space during the Mamluk period as results from the pottery deposits, the two fire places and the plastered floor. Its functions were probably related to other buildings on the site that still require identification.

### Building on the Tall

#### Section II and III

The second trench was opened on the summit of the *tall*, which forms the highest point of village. The area presents a complex stratigraphy of buildings, as a large rectangular fortification oriented north-south, which measures around 8.5×8.5m, of which two thick walls to the north and to the south can be seen. This in turn, was built over an earlier round structure, possibly around 9m in diameter (**Fig. 4**). The excavation focused on understanding the construction phases of the structure on the summit, and its relation to the excavated area in Complex 1. Directly on the top of the *tall* the remains of a mosaic pavement made of white *tesserae* with some small red stones forming a simple geometric motive were found, conserved only under a secondary wall running north-south. (**Fig. 5**).



4. Top view of the area of the tall  
(© IKA).



The excavation was enlarged to include an area delimited by two walls, one large to the south and a smaller one to the north. The limit in the west was a fallen arch found *in situ*. The first stratigraphic unit consisted of structural collapse (bigger stones located closer to the walls while the rubble in the middle of the section mainly consisted of smaller elements). It showed ashlar stones mixed with greyish-brown loose soil, with orange soil along the walls. The collapse contained few oil-shale fragments that probably formed part of some sort of decorative elements, yet all the examples found were too small to detect any possible function. The removal of the collapse showed a *stratum* (US-02) containing mainly mosaic *tesserae* (of different shapes, sizes and colours as grey, red, white, blue, green, yellow), and parts of mosaic bed, within a dry-granulose soil and pottery fragments (mostly Byzantine, few diagnostic).

US-02 included also at the same level US-03 consisting of brownish-yellow soil with small traces of greyish-black ash. US-04, is a smaller structural collapse limited to the central part of the room, and US-05, showed a fireplace partly covered by US-04. The last *stratum* showed a compact plastered floor, possibly the remains of the mosaic bed. It contained a large number of Byzantine pottery sherds (20, 3 diagnostic), Umayyad (10), Mamluk (7) and one diagnostic Nabataean sherd. The *stratum* was detected in correspondence to the collapse of the arch that formed the limit of the excavated area to the west.

A second trench (Section III) (Fig. 6) was opened between the two northern walls, the large Byzantine one and a smaller one, probably Mamluk. The area was of 1.23×1.56m. The section reflected a similar stratigraphic sequence as in Section II, yet in the last *stratum*, which was US-05, the Byzantine wall was constructed over an oblique older wall (US-06) that may have functioned either as a foundation for the Byzantine wall or as part of another earlier building on the summit of the *tall* that has not been detected yet. Pottery in correspondence to the foundation pit was found; mainly Byzantine pottery (11, 2 diagnostic) and one Nabataean diagnostic sherd.

### Interpretation

The limited extension of the excavated area does not allow a thorough identification of the purposes and extension of the building on the summit of the *tall*. It may have formed a functional space in the Byzantine period considering the limited remains of the mosaic floor and the Byzantine pottery found there. However, the space was probably reused or adapted for other purposes in the Mamluk period. The privileged position on the summit may have played an important role in this requalification.

### Coins and Metal Objects (ML)

Six coins were found during the excavations in Section I, II and III; five heavily eroded and damaged, and thus difficult to classify, while one bronze coin showed a better state of preservation. The coin, J19-5/I, with traces of damage and erosion on its edges and both sides,



5. Excavated section II and III (© IKA).



6. Section III, US 05 (© IKA).

especially on the obverse. However, allowing to see profile, head, neck and shoulders in the center of the coin. Neither attributes, nor structural dividing lines can be seen (Fig. 7).

The reverse shows the letter “M” at the center with star on the left. This number sign dated back to a monetary reform in 498, under Anastasius I, symbolizes 40 nummi equal to 1 Follis (Hahn 1973: 23). The *officina* mark “CON,” reading “Constantinople,” refers to the place of minting (Hahn 1973: 16). The bad conservation does not allow to determine a minting date, however the monetary reform of Anastasius I, considered as *terminus post quem*. A second term can be considered the monetary reform of Justinian I in 537 AD (*Novella* 47), the embossing on the revers was changed from 538/539 onwards, adding instead “ANNO” next to the number sign downwards on the left side, together with the year of reign on the right side (Hahn 1973: 58; Grierson 1999: 18-19). Thus the coin can be dated tentatively between 498 and 537 AD (corresponding to the regnal years of Anastasius I, Justin and Justinian I).

Further metal finds in the three Sections are limited to several heavily eroded lumps of copper and bronze, in different sizes; a bronze nail, a modern ring and two circular metal objects - one possibly a very small ring.

### Architectural Decorations (ML)

Two architectural objects were discovered during the campaign of 2019. The first was found during the survey of the site, the second in the excavation.

The first is a block of local stone measures about 60×22cm and was reused in the entrance area of Complex 1. (Fig. 8) The surface of the block shows traces of tool marks on all sides, except the fractured edge. The breaking line in the lower part is irregular and does not show any signs of artificial influence. While the upper part and the right side seem to be (mostly) intact. The form of the stone and the lack of specific carving of the back side suggests it was used in architecture.

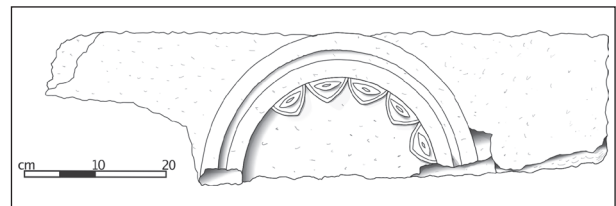
The front side shows a semicircular arch divided in three sections. The two outer convex stripes are highlighted by an inner concave one, lining the internal semicircle there are five triangular elements, each decorated with a

dotted elongated oval shaped motive. The area within the semicircular structure is deepened forming a niche. Niches are very prominent decorative features throughout time and regions, examples can be found inside and outside of buildings in Jarash, and in the churches of the *Aedicula* and *St. Paul* in Umm Ar Raṣās (Michel 2001: 383, 397, fig. 375). In particular several are used in the side isles of churches, probably as permanent storage shelves of small objects.

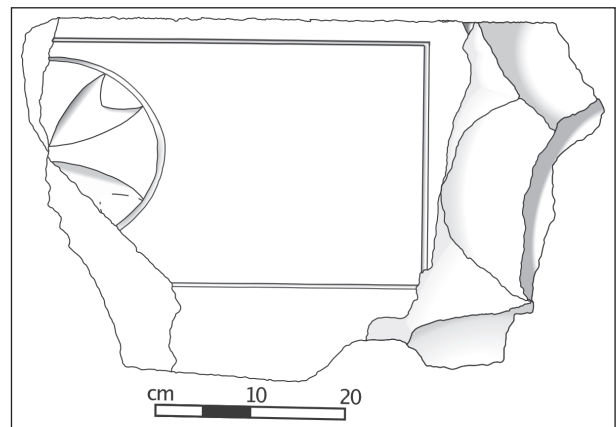
The second architectural element was found during excavation of Complex 1-Section I (Fig. 9). It is made from local stone and measures about 45×30cm. The piece has a smooth top edge and is broken on all other sides due to possible reuse in the wall masonry. The backside shows traces of tools and is roughly worked, while the front is flat with some incised decorations. Three concave outlines, forming part of a rectangle can be seen close to the upper, right and lower edge.



7. Coin, J19-5/I, dated between 489 and 537. (© IKA).



8. Niche stone J19-stone-C1 (© IKA).



9. Architrave stone J19-stone-SI (© IKA).



On the left side another element is partly preserved within these outlines. The element consists of an incised concave circle and a partly preserved cross with rounded lines. Formerly this piece might have belonged to an architrave, very common in local context on entrances, several examples were found *in situ* especially at Umm Ar Raṣās.

### Architecture and Building Structures (EG, FE)

The site shows a great variety of well-preserved structures that allow a good overview of various building techniques as in other sites in Jordan with still standing all stone buildings (Gilento 2015; Anastasio *et al.* 2016; Marino and Coli 2020). However, most of the buildings around the *tall* are covered by the collapses, building sections closer to modern settlement areas in the north and southwest are reused for agricultural purposes (*e.g.* as goat sheds or pastoral fields). In the following description focus will be laid on masonry found in the three trenches (Section I-III) as preliminary determination of building phases was possible through the archaeological excavation only. All trenches showed stone-walled buildings, that were not excavated in their entity during the campaign. For all building structures on the *tall* and the adjoined quarters, ashlar stones were used and set together in dry masonry technique (Marino and Coil 2008: 74-76). No binding mortar between individual blocks was identified. So far, only local building material was used for the masonry; probably coming from a stone quarry located north to Cistern 6 (Arce 2007: 503; Parenti 2012: 194). On top of the *tall* a large building complex was identified. Due to debris covering large parts of the structures the exact dimensions of the walls could not be recorded properly.

#### Masonry in Section I

The western trench concentrated on a trapezoidal room of a larger building complex. The eastern line of the trench did not run along the eastern wall but formed a cross-section of the whole room (see **Fig. 3**). The height of the excavated walls reaches the maximum height of 2 meters. The three walls (the north wall, the east wall and the south wall) of the uncovered

part were not plastered and roughly set against each other. The north and south walls show the best state of preservation. The stones used for the wall have irregular cut surfaces, with the result of having a rectangular shape, but not being smoothed. The walls show two outer faces and an inner core consisting of cobble stones.

The northern wall, which delimits Section I, consists of roughly hewn limestone blocks, which form a stable structure. Only the lowest course shows a regularity in the structure. The large ashlar were laid on bed-rock. Since the surface of the rock was not sufficiently smooth, small depths were filled with fine lime chipping. Only in the filled pits could a binder of air lime be found. The cuboid blocks of the lowest row were laid at regular intervals to each other. The head joints were filled with the same fine lime chipping and fixed with a measure of lime binder. The width of all four almost completely preserved courses is irregular. However, the north wall - in comparison to the south and west wall - can be considered the most valuable in terms of quality (**Fig. 10**).

A later wall was built in on the western side of the trench. This wall did not differ much in shape from the northern wall, also constructed using large limestone blocks; between the bigger blocks measuring approximately  $0.8 \times 0.5 \times 0.5$  m, smaller irregularly sized stones were placed to support the whole construction (Parenti 2012: 193). The original entrance to the room was not identified. An opening about 1 m wide in the middle of the western wall indicates that



10. Section I, US 06 - wall 2 and 9. (© IKA).

the entrance was once located exactly at this place. Across the entire section, there was an artificial demarcation obtained by a one level wall in the west-east direction, probably used for functional reasons as remains of a fireplace was identified in the northern area.

The southern wall of Section I consists of the same rock material as the northern wall. The limestone blocks were probably used from the nearby quarries for most of the building complexes—an efficient method often found in the region (Arce 2007: 503). The lower part of the wall consists of much smaller, roughly hewn stones, which have an approximate size of 20×20×20cm. The surface of the limestone blocks appears flat, but on closer examination it becomes clear that the corners of the limestone blocks are slightly irregular. The distribution of the stones is not subject to a fixed scheme. The connecting points are much closer than in the case of the northern wall, probably for this reason we find less filling material in the form of lime splinters within the joints. Remarkable is the fact that for the upper rows—at the height of about one meter—larger stone blocks were used. These rows are made of dry masonry.

#### *Masonry in Section II and III*

Various wall units were documented, one separated the trench into roughly two parts and suggest at least three occupation phases for the building on top of the *tall*. The structures differ in building technique as well as in the material used, and thickness of the walls. On top of the *tall* Section II and III were delimited on three sides (north, east and south) by masonry structures and on one side (west) by collapse of the building. (See Fig. 5)

The first phase is visible on the northern side of the trench in Section III, where at a depth of about 0.8m the so far oldest wall segment (US-06) was unearthed. It was found under the north eastern corner of the apparently more recent and has a different orientation. Roughly worked stones were used for this structure and set together in a dry masonry manner. (See Fig. 6)

The second phase is marked by the big rectangular building with thicker outer walls visible on the southern and north-eastern parts of the hilltop. Their inner surfaces form

the southern boundary for Section II and the northern end for Section III. Due to the heavy collapse of the structures the exact dimensions of the walls were only partly documented. The thicker walls on the southern and northern side were built with roughly worked ashlar blocks fit into the wall as dry masonry. The constructions show irregular blocks of different size, fit together irregularly in two adjoining rows and smaller stones in between functioning as wedges. While the upper layer of the wall consisted of larger building blocks the lower part was constructed with smaller cobble stones embedded into earth. This foundation was recognizable beneath the thicker wall south of Section II as well as the one north to Section III (See Fig. 6). The structures from this phase are dated to the Byzantine period as large quantities of pottery in combination with the remains of a mosaic floor (US-02) allowed this conclusion.

A third phase is attested by a thin wall inside of the building running north-south, which divided the interior space into a larger and a smaller part. In the eastern part of Section II, remains of floor paving decorated with mosaics was found preserved under this single row wall constructed with regular ashlar blocks. Unfortunately, the mosaic floor was badly preserved, and the blocks of this later construction were set directly on the mosaic without any foundation trench.

A second wall, presumably belonging to the same phase, separates Section II and III and meets the other wall in a right angle (Fig. 11).

#### **The Pottery**

All pottery assemblages collected in the excavation areas were recorded according to the stratigraphic *loci*, the diagnostic fragments (rim, handle, and base) were selected and classified according to shape, fabric, firing technique and decoration. The vessel functions were considered as an important criterion to establish typologies in circulation in the area. The main identified vessels in the excavation included table ware divided in open forms (such as plates, bowl, dishes, cups) and closed forms (as amphorae, jugs and juglets); cooking ware (as casseroles and cooking pots), and coarse ware as basins. The chronological span was determined by parallels with documented



forms in published excavations especially from undisturbed stratigraphic contexts.

*Surface Strata (TL and AH)*

Surface finds in correspondence of the first excavated area included Nabataean, Late Roman, Byzantine, Umayyad and Mamluk pottery. Eighteen diagnostic sherds were selected, six of them Byzantine, seven Umayyad and five Mamluk.

*Nabataean and Late Roman (Fig. 12)*

The plates n. J19-00/0-18 and J19-00/0-19 exhibit an orange and red clay colour respectively, they represent a local imitation of oriental Sigillata A with good parallels found in the excavation of the Bajali complex in Mādabā (Acconci and Gabrieli 1994: 442, fig. 26. 5; Id. fig. 428.39). The fine plate J19-00/0-20 has a beige slip on its exterior surface, is light reddish on the interior and has grey, white and black inclusions and could be dated to the second half of the 2<sup>nd</sup> century (Acconci and Gabrieli 1994: 494-495, fig. 52.4). Two sherds J19-00/UK-1a and J19-00/UK-1b are parts of a plate with a thickened and slightly out-turned lip. The vessel is shaped following a convex line and the walls are very fine. The plate displays a uniformly red color on both the interior and exterior and black hand painting on the interior of a fringed palm-leaf. The vessel is typical of Nabataean fine ware which has good parallels in the area of Jordan and in the Negev (Schmid 1995: 646, fig. 10), and also at ‘En Tamar in Palestine (Erickson-Gini 2016: 59, fig. 10; 11).

*Byzantine Pottery (Fig. 13)*

The ring-base of a juglet J19-00/0-16 shows a light orange (interior and exterior colour), and an orange fabric. The basin J19-00/0-22 displays an incised wavy decoration on beige slip exterior as well as a fingerprint. The interior surface is reddish-brown and the fabric contains white and dark inclusions. Parallels may be found in Umm Ar Raṣās (See Alliata 1991: 394, fig. 16.1).

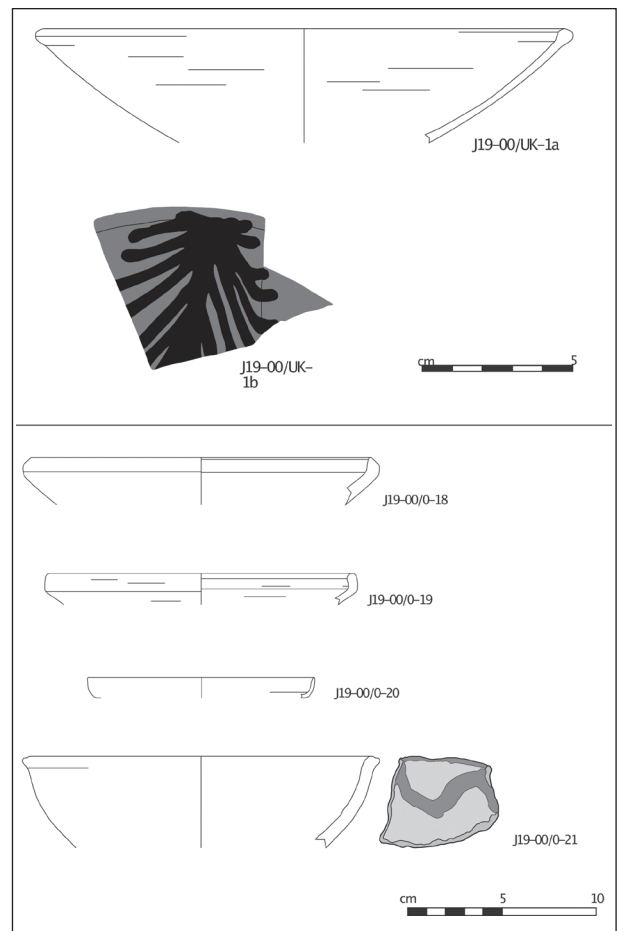
The cooking pot n. J19-00/0-14 with an out-curved neck is a bifacial reddish sherd with a dark red fabric containing small black inclusions, it may represent a transitional form between the Byzantine and Umayyad periods

common ware (Gerber 2016: 162, fig. 32.372).

Concluding the Byzantine surface finds, the body-fragment of an oil lamp J19-00/0-15 displays decoration of the type decorated with a palmette motive in relief, the typology is also referred to as candlestick lamp (Magness 1993: 173-174; Pappalardo 2007: 563-566), a black slip on its outer surface and an otherwise reddish colour on the interior and in the fabric.



11. Section II, US 02 - north wall/separation to section III. (© IKA).



12. Pottery, surface Strata - US 00 (© IKA).

*Umayyad Pottery (See Figs. 12-14)*

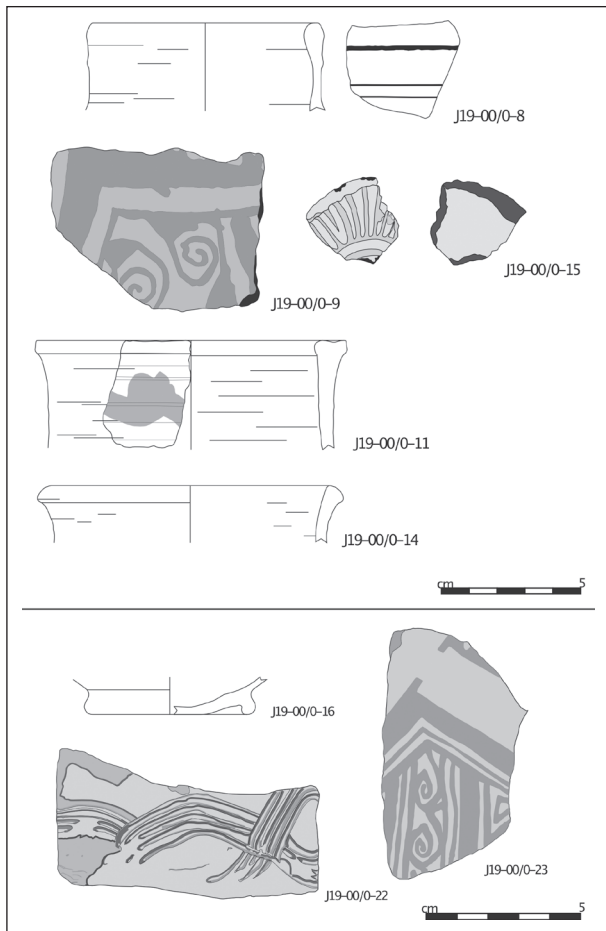
The Umayyad pieces consist of predominantly closed forms, *i.e.* jugs or small *amphorae* as J19-00/0-1, J19-00/0-5, J19-00/0-7, J19-00/0-8, J19-00/0-11, and one cup/bowl J19-00/0-21. The amphora J19-00/0-1 is of light orange colour and features painted decoration on its exterior. The amphora J19-00/0-5 has a beige slip with a light brownish hand painted decoration showing concentric circles, with dark reddish-brown fabric and interior (Sanmori and Pappalardo 1997: 420, n. 2). The amphora fragment n. J19-00/0-7 shows a dark orange hand painted decoration on an orange-red coloured surface (Alliata 1992: 245, fig. 12, 1). N. J19-00/0-8 is a rim of an amphora with a light brown slip, a light grey interior and a grey fabric (Alliata 1991: 407, fig. 23, 2). A common typology in the area is the amphora rim n. J19-00/0-11, it exhibits a grey ground colour with a painted decoration in red, a beige interior and a brownish fabric (Acconci and Gabrieli 1994: 481, fig. 64.9). The hemispherical cup/

bowl J19-00/0-21 has a brownish-orange exterior with continuous dark-reddish wavy painting along the rim and on the beige coloured interior. The fabric is dotted with dark grey and white inclusions (Alliata 1992: 246, fig. 12.18).

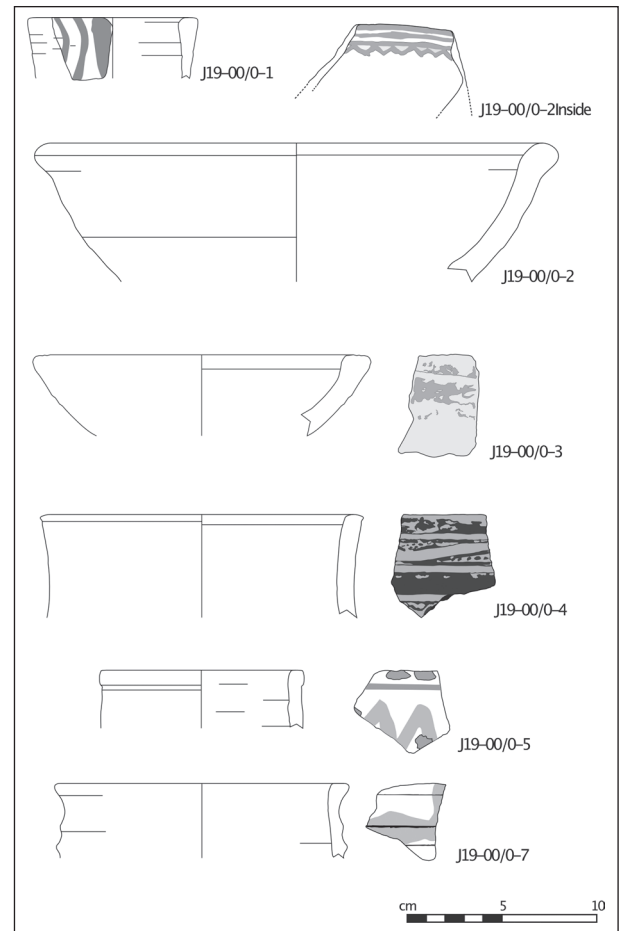
*Mamluk Pottery (Figs. 13, 14)*

The Mamluk pottery comprises of two open forms J19-00/0-2, J19-00/0-3, one closed form J19-00/0-4 and two body sherds J19-00/0-9, J19-00/0-23, they find parallels in the pottery discovered at Nitil (Hamarnah 2006: 449, fig. 22. 1). The bowl J19-00/0-2 shows a beige exterior with slightly visible traces of brownish hand painting, while the inside is orange-red with reddish-brown hand painting along the outside and inside surface of the rim. The bowl J19-00/0-3 is depicted with dark brownish geometric pattern applied with free brush strokes on both the exterior and the interior. The fabric contains dark inclusions and air pockets.

The jug/small amphora J19-00/0-4 is decorated with black hand painting on either



13. pottery, surface Strata - US 00 (© IKA).



14. Pottery, surface Strata - US 00 (© IKA).



**Table 1:** Distribution of the *Sherds* in Complex I - Section I.

Trench I	Nabataean	Byzantine	Umayyad	Ayyubid	Mamluk
US 00	-	178	68	-	58
US 01	-	12	11	-	13
US 02	-	3	1	-	-
US 03	-	18	4	1	22
US 04	-	16	12	-	9

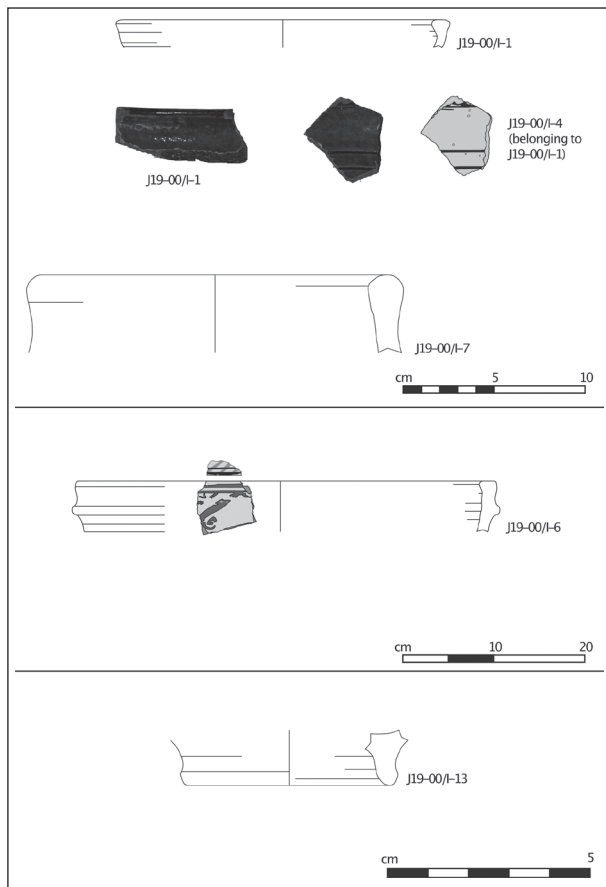
side. The two body sherds J19-00/0-9 and J19-00/0-23 are painted with decorative ornaments in black. Parallels can be found in handmade decorated vessels typical for Ayyubid-Mamluk period pottery (Petersen 2017: 69, Fig. 4).

**The Pottery of Complex 1 - Section 1 (CH and DS)**

The excavation yielded pottery (Table 1), *tesserae*, small metal objects, glass beads and few glass fragments none of which diagnostic. The diagnostic sherds are presented in stratigraphic and chronological order.

*Byzantine Pottery*

**US 0 (Fig. 15)**



15. Pottery, Section I - US 00 (© IKA).

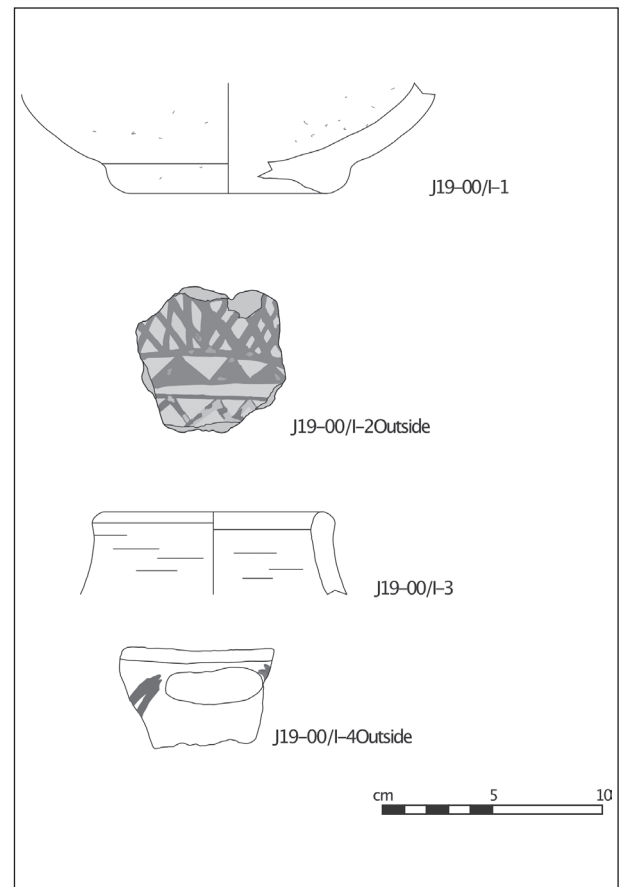
Amphora/jug J19-00/I-13 has a circular base with red and grey fabric. A similar form was attested at Nitil (Hamarneh 2006: 425 Fig. 1.11).

**US 1 (Fig. 16)**

The jug n. J19-01/I-3, has a thickened lip and profile, uniformly reddish (color and fabric), well fired, the rim inflection is inverted, the fabric attests to a good firing process (Alliata 1991: 405, fig. 22.6).

**US 3 (Fig. 17)**

Two bag-amphoras J19-03/I-7 and J19-03/I-8, show ribbed external profile. J19-03/I-7 features a grey slip on the outside and has a light orange tone on the inside. The fabric is grey and features dark inclusions. J19-03/I-8 also has a grey slip on the outside and a brownish orange



16. Pottery, Section I - US 01 (© IKA).

one on the inside, the fabric has white inclusions with air bubbles (Alliata 1991: 388, fig. 12.1).

J19-03/I-5 is a cooking pot, dark grey on the outside and greyish brown on the inside. The lip profile is slightly angled, and the rim profile is thickened. It is similar to a sherd found in Complex II, J19-01/II-8. There are also similarities to a fragment found in Jarash with a grey core and a diagonal tool-made pattern on the outside. It was dated to the Byzantine or early Umayyad period (Lichtenberger *et al.* 2018: 93, fig. 81).

The Casserole n. J19-03/I-2, has a slightly out-curved neck, slightly thickened rim with rounded lip, ribbing on the shoulder and internal ribbing. Its cream-colored slip and the darkish pink fabric. The typology is well attested in several sites in Jordan as in Mādabā (Acconci and Gabrieli 1994: 460, fig. 31.46); in Barsinia (El-Khoury 2014: 316, fig. 3); in Abu Matar in the Negev (Holmqvist 2019: 170 fig. AM015-017), as well as in Jabal Hārūn near Petra (Holmqvist 2019: 52, fig. 5.13. JH023).

The plate no. J19-03/I-4 is bright orange on the inside and brownish orange on the outside. The lip is thickened, and the rim is straight and has an inverted offset. There are parallels to pottery found at Bayt Rās (Mlynarczyk 2018: 186, fig. 6).

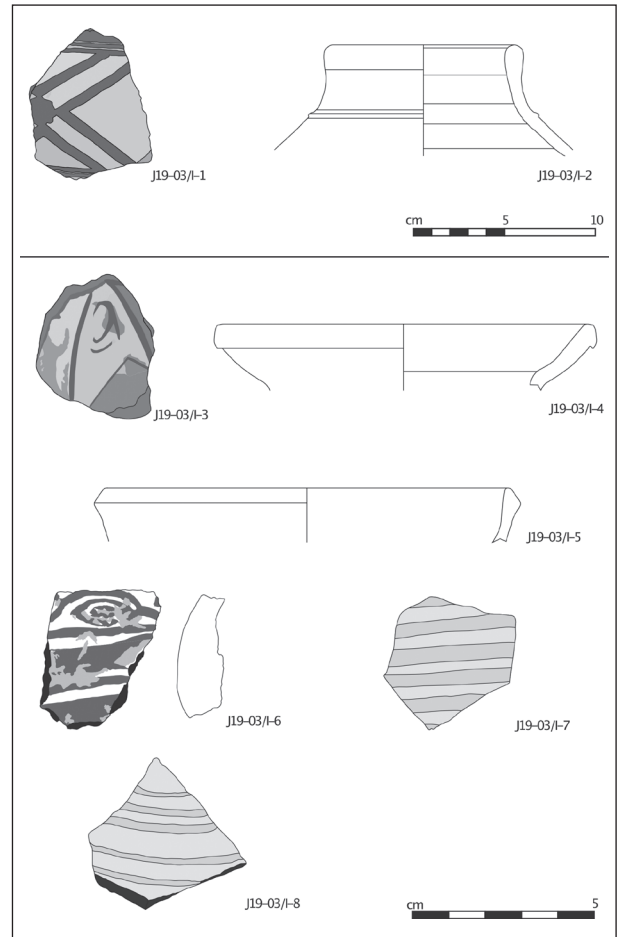
**US 4 (Fig. 18)**

The jug J19-04/I-3 can be attributed to the Byzantine period as it features a typical dark reddish color and dark grey fabric. It has a slightly out-curved lip. This sherd has some parallels to one found at Nitil (Hamarnah 2006: 425, fig. 1.8).

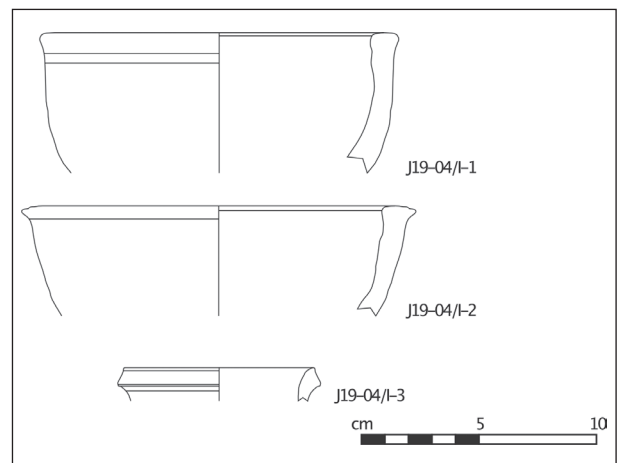
*Ayyubid and Mamluk Pottery*

The pottery finds consist of a large amount of open vessel forms, such as bowls, plates, or cooking pots; they range from simple coarse ware to geometrically painted and glazed tableware. The closed-form vessels are mostly simple storage jars, with a wide range of manufacturing and decoration styles that are well attested in the area of Transjordan (Brown 1992: 170-171; Peterson 2017: 68), mostly hand-made vessels, as opposed to the mostly wheel-thrown pottery from the Byzantine and Umayyad periods (Hendrix *et al.* 1996: 289-290; Brown 1992: 174). This change

of manufacturing mode can be dated to the eleventh century, when potters in the area of current Jordan gradually favored hand-making pottery to the kick wheel (Brown 1992: 175). The quality of these vessels, especially regarding the poor preparation and firing of the clay (often only sun-dried), indicates that they were intended for personal use rather than for



17. Pottery, Section I - US 03 (© IKA).



18. Pottery, Section I - US 04 (© IKA).



trade. They were either slipped and/or painted vessels or plain and unpainted. The painted decoration consisted mostly of simple lines and dashes of red slip which was developed into a more complex geometric style in the twelfth century (Milwright 2010: 155). These manufacturing and decoration styles rapidly spread through the Levant and became rather localized (Milwright 2010: 156; Gabrieli *et al.* 2014: 194).

#### US0 (See Fig. 15)

An example for a wheel-thrown vessel with geometric painting is a bowl or basin J19-00/I-6 with a large diameter of 44.5cm. This vessel form has parallels in Nitil, it shows a cream-colored slip and dark green hand painting in a swirl-like pattern (Hamarneh 2006: 451, fig. 25.6-8). This is also known on large bowls in *Ṭabaqat Faḥl* (Walmsley 2008: 33, fig. 12.16-18) and Tall *Ḥisbān* (Walker 2017: 516, fig. 33, plate 5.t). One of the few closed-form Mamluk vessels is a storage jar J19-00/I-7 with a thickened lip and slightly in-curved neck. It features a beige slip and orange hand painting. Parallels in the vessel form come from KHirbat Arindela in southern Jordan (Walmsley and Grey 2001: 160-161, fig. 12.1, 3) as well as Yoqne'am in Palestine (Ben-Tor and Portugali 1996: 148, fig. XIII.113).

#### US 1 (See Fig. 16)

Among the handmade vessels from Al Jumayl is the base (J19-01/I-1) of a plain hand-made bowl with a concave profile and thick walls. It shows a beige slip on the exterior and a reddish-brown clay color on the interior. The clay which was tempered with organic matter showing a dark grey fabric. The shape of the body can be assumed to be globular, as suggested by parallels in *Ṭabaqat Faḥl* (McPhillips and Walmsley 2007: 140 Fig. 11.2).

J19-01/I-2 shows the body of a handmade vessel. Notable is the dark orange hand-painted geometrical pattern of irregular thin lines and triangles which is well attested in ash Shawbak (Brown 1988: 236 fig. 11.1, 4, 7; Walmsley 2008: 30) and Nitil (Hamarneh 2006: 427 fig. 2.9).

A Mamluk-dated fragment (J19-01/I-4) showing dark red hand painting can be compared to similar vessels from ash Shawbak in southern Jordan (Brown 1988: 236 Fig. 11.1,

4, 7).

#### US3 (See Fig. 17)

A body fragment from another hand-made vessel J19-03/I-1 has a dark cream slip with a reddish-brown painted geometrical pattern which is similar to vessels from Nitil (Hamarneh 2006: 427 fig. 2.10) and Yoqne'am (Avisar and Stern 2005: 114, fig. 47.9). Parallels also come from Baniyas and Bet She'an (Avisar and Stern 2005: 114, fig. 47; 116 II.4.4.1 no. 4, 5). J19-03/I-6 features a cream-colored slip and reddish-brown painting of irregular lines and swirl-like shapes. This kind of decoration can be found in numerous examples from Jarash (Lichtenberger *et al.* 2018: 77-78, fig. 26); Tall *Ḥisbān* (Walker *et al.* 2017: 517, fig. 35.6.y-z.), *Ṭabaqat Faḥl* (Walmsley 2008: 33, fig. 12.16-17) and Yoqne'am (Ben-Tor and Portugali 1996: 170, fig. XIII.154.2, 6).

#### US 4 (Fig. 18)

Two handmade vessels discovered in US04, are in many ways similar to each other. The first J19-04/I-1, is a biconical bowl, with thickened lip and a slightly out-curving inflection. The exterior of the bowl displays a light brown clay, a beige slip, and reddish-brown hand painting on the exterior. Similarly, shaped bowls which can be dated to the Late Ayyubid and Mamluk periods are known in Jarash (Lichtenberger *et al.* 2018: 77-78, fig. 24) as well as in Nitil (Hamarneh 2006: 447, fig. 18.2). The second, slightly larger biconical bowl J19-04/I-2 with angular out-curving lip, has parallels in the bowls from Nitil (Hamarneh 2006: 451, fig. 25.6). It features a light brown slip inside and out and a reddish-brown hand painting on the exterior.

#### *Glazed Pottery*

Also typical for the Ayyubid and Mamluk periods and documented at the site of Al Jumayl is pottery with either monochrome or polychrome glazing; green or yellow glaze is known as the most common color (Brown 1992: 221). The sherd J19-03/I-3, found in Complex I, shows white slip and yellow, brown and green glazing in a geometric pattern (See **Fig. 17**). It can be dated to the Late Ayyubid or early Mamluk period (12<sup>th</sup>-13<sup>th</sup> century).

Six fragments of the same bowl four rims: J19-00/I-1, J19-00/I-2, J19-00/I-3, J19-00/I-3a

and two body sherds J19-00/I-4, J19-00/I-5 were found in the same context. The rims show a thickened and slightly squared in-curving lip profile. One of the body fragments J19-00/I-4 (See **Fig. 15**) features two parallel incisions that decorated the inner part of the bowl. The fabric has a dark grey color with white inclusions. On the interior there are traces of white slip underneath dark green glazing.

Similar green-glazed wheel-thrown vessels were found in Pella -*Ṭabaqat Faḥl* (Walmsley 2008: 34, fig. 13.6-7), Yoqne'am, Ramla and Jerusalem (Ben-Tor *et al.* 1996: 102 fig. XIII.39; Avissar and Stern 2005: 15, fig. 5.7-10), as well as in KHirbat Din'Ila (Stern 2014: 85, fig. 7.8) and possibly in Ghawr Aṣ Sāfi. Based on these comparisons, this bowl can be dated to the second half of the fourteenth or the early fifteenth century (Walmsley 2008: 32; Peterson 2017: 70).

### The Pottery of the Tall Building - Section II and III (AH, TL)

The Area that encompasses trenches II and III lies on the summit of the *tall*, topped by a sequence of structures dated to various periods. The excavated area is situated in the eastern limit of a rectangular building. The area showed some remains of mosaic floor of roughly half a square meter, which was comprised of mostly white mosaic *tesserae*, while red ones formed a geometric pattern. The orientation of the pattern suggested, that it would have continued to some extent westwards. Plenty of mosaic *tesserae* of various colours were found within the adjacent trenches II and III, remains of a destroyed floor could be seen to the west, within a pit made by illegal digging. The excavated area was split into the trenches II and III, because of a thin separating wall that has been built in at a later stage of the building's occupation-time.

#### Glazed Pottery (Fig. 19)

The sherd J19-00/0-32 was found on the surface of the *tall*, exhibits a turquoise blue glaze on the interior and on exterior and was identified as belonging to an early Islamic vessel, which might have been an open form, a plate or bowl, possibly table ware. The Typology of glaze may point to an import from the Islamic provinces of Iraq. A jug with similar glaze was found at the excava-

tion of Umm al-Walīd, with a possible date the 8<sup>th</sup>-9<sup>th</sup> century (Bujard and Joguín 1994: 142, fig. 29-30). Two fragments of the same typology were signalled among the finds of the Peacocks chapel at Umm Ar Raṣāṣ (Pappalardo 2002: 409).

### Section II

The southern trench II, which also showed some remains of fire places, might have been in use for a longer time, which is suggested by the broad range of pottery originating from different periods.

In addition to the surface finds (US 00) six *strata* (US 01-06) could be identified. They showed a mix of Nabataean, roman, byzantine, as well as Umayyad and mamluk sherds. The heterogeneous character of trench II is represented in chart II below.

The total amount of 362 sherds were collected, with 28 diagnostic sherds. The majority is byzantine ranging between the 6<sup>th</sup> to the 8<sup>th</sup>-9<sup>th</sup> century (**Table 2**).

#### Nabataean Pottery

##### US 2 (Fig. 20)

Two diagnostic sherds belonging to open forms, probably bowls. J19-02/II-11 features a thin rim with white slip at the top of the exterior while the lower area is reddish-brown. The interior has a uniform dark reddish-brown slip and the fabric is orange (Acconci and Gabrielle 1994: 442, fig. 26.5). J19-02/II-13 shows orange-brownish painting on the rim of the otherwise brown exterior. Its fabric is brown as well and it has a light brown interior (Acconci and Gabrieli 1994: 427, fig. 18.48, 446, 28.31).

#### Late Roman Pottery

##### US 2 (Fig. 20)

The bowl J19-02/II-14 has a sharply



19. Glazed blue Pottery, J19-00/0-32 (© IKA).



**Table 2:** Distribution of the sherds in Section II.

Trench II	Nabataean	Roman	Byzantine	Umayyad	Mamluk
US 00	-	-	129	16	1
US 01	-	-	26	2	-
US 02	2	1	71	16	13
US 03	-	-	7	5	7
US 04	-	-	20	3	-
US 05	-	-	-	-	9
US 06	1	-	20	10	7

out-curved neck, orange colour, which has a light reddish slip on the exterior, while the interior and the core of the fabric tend to be greyish, two similar but not identical bowls were found in the excavations of Mt Nebo (Bagatti 1985: 268, fig. 13.13 and 269, fig. 14.1).

Much similar form is the shallow bowl n. J19-02/II-12 with a slightly outstretched lip, it shows a light brown slip on the exterior that is slightly chipped of at the rim. The interior is covered with a dark brown slip, while the fabric is orange with white and black inclusions. The colour, form and fabric of the bowl find good parallel in the fragment coming from the north wing in the monastery of Mt Nebo (Bagatti 1985: 266, fig. 11.9).

### Byzantine Pottery

#### US 0 (Fig. 21)

Among the thirteen diagnostic sherds selected is a small omphalos base J19-00/II-6 probably of a jug (Alliata 1991: 387, fig. 11.11; Acconci and Gabrieli 1994: 501, fig. 56.52/56.53). The sherd shows a well fired reddish fabric. Its exterior is reddish brown.

#### US 1 (Fig. 22)

The lower part of the body of small amphora J19-01/II-1 is red on the exterior with a light brown slip and a dark-grey fabric (Alliata 1991: 394, fig. 16.8). The amphora with B-carinated, grooved external profile J19-01/II-5 shows completely orange fabric with black and grey inclusions (Acconci and Gabrieli 1994: 502, Tav. 57.2).

The small bowl J19-01/II-2 shows a rounded slightly curved lip, with reddish-brown surface, and a very fine-grained fabric (Acconci and Gabrieli 1994: 437, fig. 23.60). The bowl/plate J19-01/II-6 shows a brown surface and a dotted fabric with white and grey inclusions (Acconci and Gabrieli 1994: 439, fig. 24.3). The plate

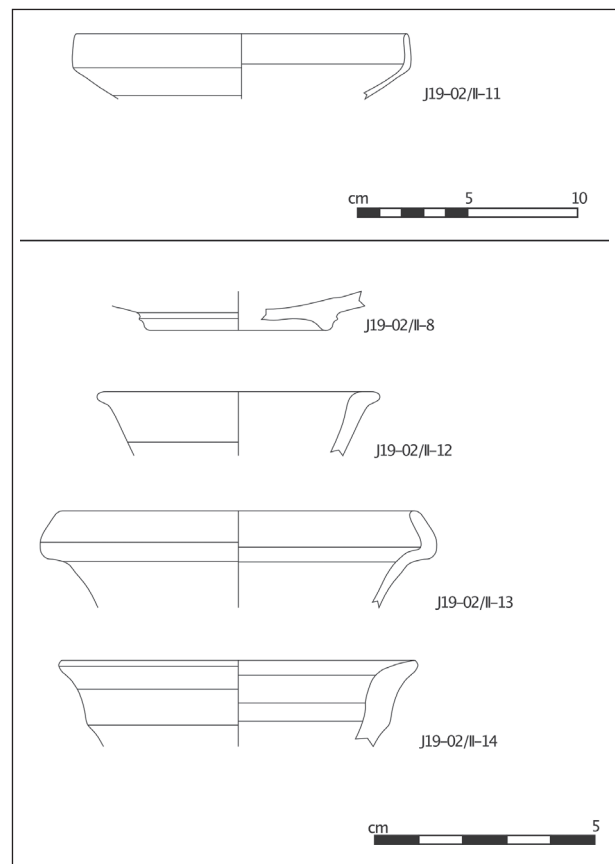
J19-01/II-8 has a grey exterior and interior colour, as well as white and grey inclusions in its fabric, (Pappalardo 2002: 412, fig. 18.8).

J19-01/II-9 is a plate characterized by a thick, flattened rim, a brownish internal and external surface and white inclusions within its fabric (Pappalardo 2003: 314, fig. 22.4; Acconci and Gabrieli 1994: 486, fig. 48.12).

#### US 2 (see Figs. 20, 23)

The jug J19-02/II-6a, has a convex rim with a reddish colour and a porous fabric with dark inclusions.

Plate fragment J19-02/II-3 has a reddish coloured exterior and interior surface, while its



20. Pottery, Section II - US 02/I (© IKA).

fabric is of good quality and exhibits some black inclusions (Kenkel and Hoss 2020: 126, pl. 1.5, fig. ETS 11.3); much similar is the base J19-02/II-8 with brick-red inside and outside surface colour, its fabric displays white and black inclusions within a generally fine fabric (Kenkel

and Hoss 2020: 124, pl. 1.4, fig. ETS 4). The base fragment J19-02/II-4 has a more rounded shape, a beige exterior and interior colour and a medium quality fabric with black inclusions.

Bowl n. J19-02/II-1 with a thickened out-curved rim displays a reddish coloured outside surface with black inclusions, a beige-orange interior surface with air bubbles, and a pink fine fabric with few inclusions (Acconci and Gabrieli 1994: 459, fig. 31.38).

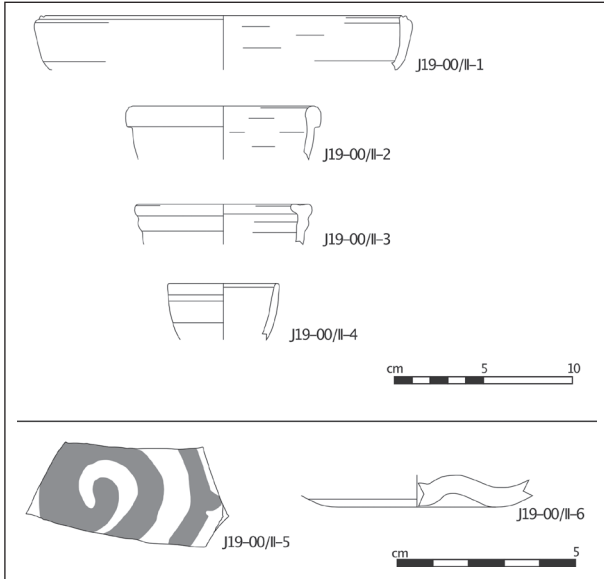
*Umayyad Pottery*

**US 0 (See Fig. 21)**

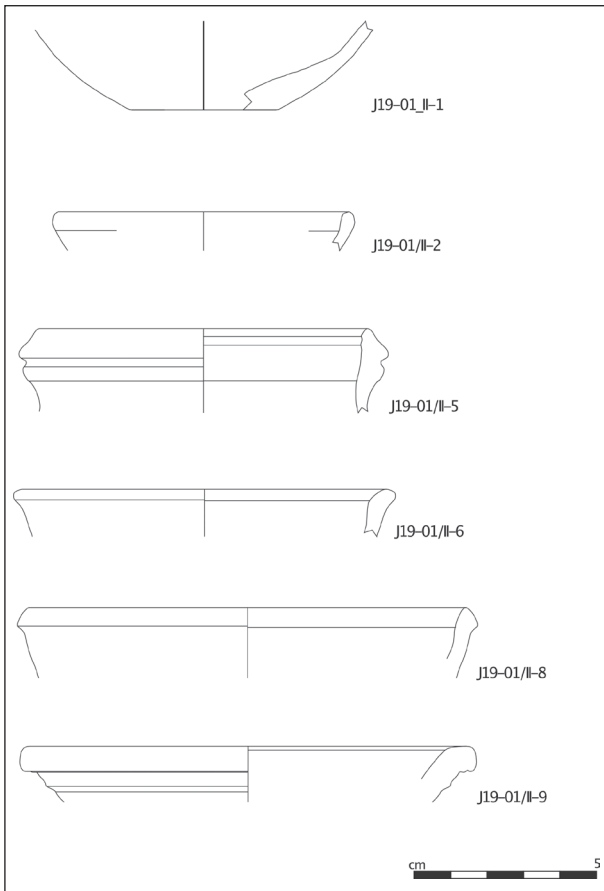
The jug/amphora fragment N. J19-00/II-5 has an external decoration of concentric circles in red added by free-brush strokes on a beige slip. The interior features a beige-pink slip. This typology is very well attested in the abandonment layers of the churches of Umm Ar Raṣās (Alliata 1991: 392, fig. 15.1; Sanmori and Pappalardo 1997: 423, fig. 15.1).

**US 2 (Fig. 23)**

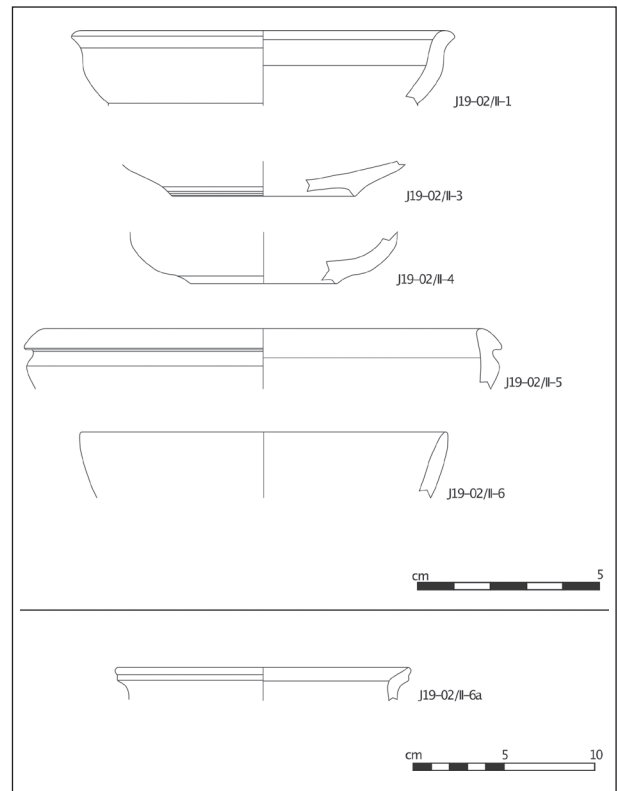
The rim of J19-02/II-5, possibly a bowl with carinated shoulder, slightly out curved neck with thickened rim; it shows external ribbing, it is covered by a dark slip and has a beige fabric with dark inclusions. Similar form was found in



21. Pottery, Section II - US 00 (© IKA).



22. Pottery, Section II - US 01 (© IKA).



23. Pottery, Section II - US 02/2 (© IKA).

the North wing of Mt Nebo monastery (Bagatti 1985: 267, fig. 12.15).

**US 3 (Fig. 24)**

J19-03/II-1 is a rim showing remains of some black traces which could be remnants of painting (Pappalardo 2003: 316, fig. 27.5). J19-03/II-2 is an amphora body sherd decorated with red circles in free brush strokes on white ground with one being very minor. The interior and fabric are both of orange-pink colour (Alliata 1991: 392, fig. 15.1; Sanmorì and Pappalardo 1997: 423, fig. 15.1).

*Late Umayyad - Early Abbasid Pottery.*

**US 0 (See FIG. 21)**

The cup J19-00/II-4 shows a smooth surface with a greyish-beige slip on the exterior, and a grey slip on the interior. The fabric is again made up of very fine material devoid of inclusions and with a reddish-grey hue (Alliata 1991: 384, fig. 10.33).

**US 2 (See FIG. 23)**

Bowl N. J19-02/II-6 exhibits a slightly pointed-rim profile with a thinned lip and was identified as late Umayyad-early Abbasid. Compatible typological parallel comes from the excavation of the courtyard of the Church of St. Paul at Umm Ar Raṣās, and may point to a local production (Pappalardo 2002: 417, fig. 23.11). The inside colour appears in a darkish pink, while on the outside a light brown slip is visible. The good quality fabric presents itself with white inclusions possibly common to the byzantine local production.

**Section III**

The smaller northern trench III is directly adjacent to the southern trench II. As already stated, these trenches are only separated by a thin built-in wall, which would not have been part of the building's original layout. It should also be mentioned, that after the last layer was excavated, some part of a non-parallel wall could be seen running underneath the so called

*“Tall-Building”*

The stratigraphic situation within trench III, shows different occupational phases compared to trench II, as may be shown best by (Table 3), with only 7 diagnostic sherds.

**Nabataean Pottery (FIG. 25)**

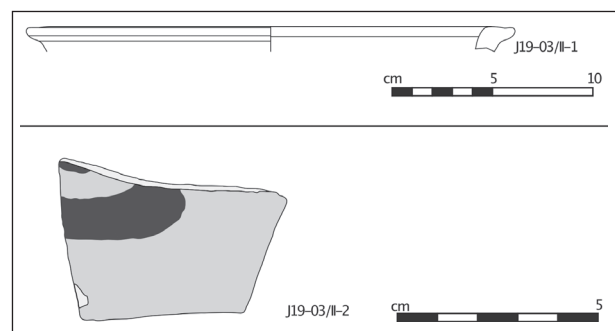
Two fragments of Nabataean fine ware were found. Plate 19-04/III-1 has a diameter of 12cm, a rounded lip, a reddish exterior and interior colour and is hand-painted on the rim and on the inside surface. The sherds fabric is beige-reddish and indicates high quality. The second J19-04/III-2, is a plate of 24cm diameter with a thinned lip. The outside and inside surface colour is reddish, whilst the good quality fabric has a dark grey colour.

*Byzantine Pottery*

**US 1 (Fig. 26)**

The jug/amphora J19-01/III- shows an out-curving rim, it displays a grey slip, while the inside is reddish-orange and the fabric greyish-beige.

The second example for an amphora/storage jar J19-01/III-2 (Fig. 26), has a rounded lip, an externally thickened and cup shaped rim profile. A black slip adorns the vessels outer surface, while the inner surface is brown and the fabric red (Pappalardo 2003: 320, fig. 26.4). Fragment n. J19-01/III-3 is a plate/bowl with cream slip and fine reddish fabric (Alliata 1991: 384, fig. 10.32).



24. Pottery, Section II - US 03 (© IKA).

**Table 3:** Distribution of the sherds in Section III.

Trench III	Nabataean	Roman	Byzantine	Umayyad	Mamluk
US 01	-	-	21	9	3
US 02	-	-	6	4	-
US 03	-	-	20	4	13
US 04	2	-	15	6	8



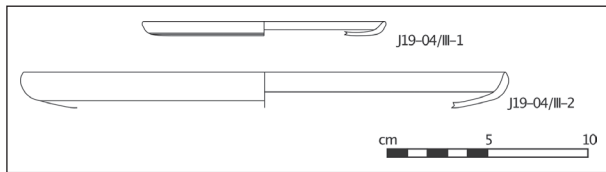
**US 2 (Fig. 27)**

Fragment n. J19-02/III-1, another fragment of an amphora with carinated shoulder, slightly out curved neck with thickened rim and external ribbing, showing a cream slip and reddish fabric (Sanmori and Pappalardo 1997: 421, fig. 14.1).

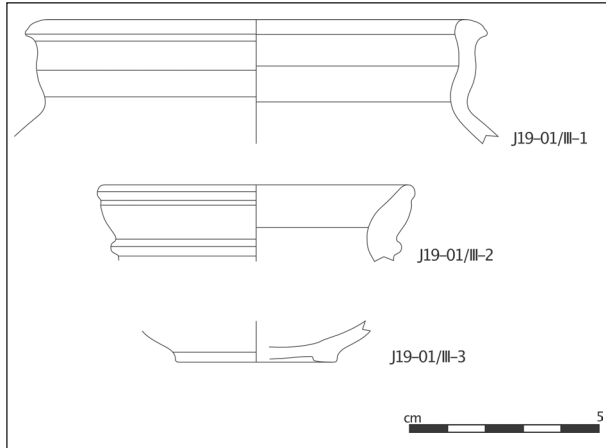
The bowl n. J19-02/III-2 shows an out curved rim, the reddish interior, and badly conserved slip (burned surface), may point to a local imitation of African red slip ware (Hayes form 93B) similar bowls/plates were found in Mādabā (Acconci and Gabrielli 1994: 504, fig. 58.40-42; Pappalardo 2002: 412, fig. 19.25).

**Cisterns of Al Jumayl (TZ, FM, EG)***General Assessment*

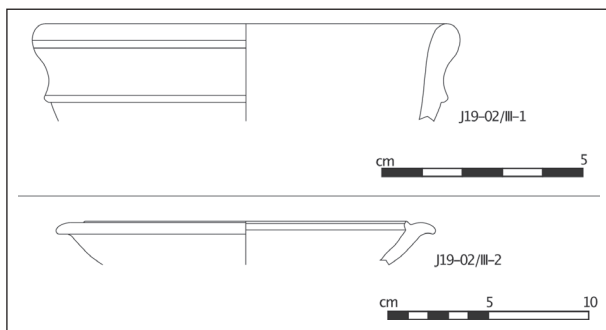
Al Jumayl is located on a rocky ridge in a region with a semiarid climate. The continental climate is



25. Pottery, Section III - US 04 (© IKA).



26. Pottery, Section III - US 01 (© IKA).



27. Pottery, Section III - US 02 (© IKA).

characterized by dry summers, and little but heavy rainfalls in winter (Abujaber 1995: 737; Tsuk 1997: 132). Similarly, to Umm Ar Raṣāṣ (Kastron Mefa‘a), the seasonal rainfall was not sufficient to provide water for the needs of the local population. Therefore, a rainwater harvesting system was implemented as part of a network that was used to store and supply water during dry periods, which is a highly important part of archaeological evidence in the region (Keilholz 2014: 27). The water management system of Al Jumayl consists of various cisterns, which are thus a critical piece of infrastructure to control seasonal variation in temperature and rainfall<sup>6</sup>.

However, as in Kastron Mefaa, the settlement of Al Jumayl did not have any-as of yet-identifiable springs; as a result, reliable rainwater storage systems were vital in supporting the health and economy of the community (Kraushaar *et al.* 2015: 369). Evidence for highly regulated water control in Nabatean and Roman-Byzantine Jordan, at sites such as Petra, Umm Al Jimāl, Yasīlah and Umm Qays, shows complex systems and “less wasteful” than later ones (Shqiarat 2008: 39). Water cisterns in the region were often carved directly into the bedrock, as the local rock is of soft limestone, and has many natural cavities that could be enlarged, or adapted, according to requirements (MacDonald *et al.* 1988: 238; Shqiarat 2008: 36). However, the main type of cisterns represented are the so-called rock-cut cisterns, which started to appear in the Nabatean period, and were used in major settlements at points where great amounts of rain water could be “naturally and artificially collected” (Evenari *et al.* 1971: 14-17, 159; Shqiarat *et al.* 2010: 210). Their walls needed to be plastered to avoid water dispersal. As the cisterns were utility structures, they were used over long time periods; this required renewal and repairs of the coating mortar (Lichtenberger *et al.* 2015: 116). The sealing mortar layer was accurately made, while later repair work was often not carried out as carefully (Brinker *et al.* 2007: 110). Due to the fact that they were periodically re-plastered, particularly during the Byzantine

6. Throughout the region, water management was of great importance, and even literary sources testify to its necessity. In the so-called *Petra Papyri*, a corpus of Ancient Greek papyrus documents from the 6<sup>th</sup> century AD, several of these discuss water management systems and regulations to draw water (Evenari *et al.* 1956: 45).

period, the cisterns often display variations of colour and material (Shqiarat *et al.* 2010: 220), especially different types of lining, either with lime, mortar or cement, which often overlie each other (Shqiarat 2008: 31). Old lining was not necessarily removed before a new layer was smeared on; however, its different materials and their chronology need to be analyzed in future campaigns. The majority of cisterns were covered in order to keep surface evaporation at bay, to prevent algae from growing, and avoiding animals falling into the water (Tsuk 1997: 132; Brinker 2007: 101). In order to retain fresh water, its circulation was regulated by blocking the openings with capstones. While covered cisterns were preferred water storages, open cisterns might have been used as “central collections point[s],” depending on their predominant location in or near settlements (Shqiarat 2008: 39). However, these open cisterns were more likely used for animal herds due to water contamination and pollution (Abu Jaber 1995: 743). It cannot be excluded, considering the vast agricultural land present, that water was also stored or collected through check dams in proximity of the *wadis* and small allotments for agricultural purposes<sup>7</sup>, as the main source of supplementary irrigation for trees during the summer seasons (Tsuk 1997: 131; Shqiarat 2008: 23, 39).

#### *Cisterns at Al Jumayl: Distribution and Form*

During the first excavation in Al Jumayl (2019), a total of eleven cisterns were documented<sup>8</sup>. The majority were located several meters from the densely built-up center, in the lowest part of the settlement; this allowed the cisterns to collect most of the water using natural slope. Four of them can be found in the north-western part of the settlement, as well as three in the south and south-east. In addition, four cisterns can be identified in the vicinity

of the central structures of the settlement. As a result, of covering almost the entire area of the habitat.

The subterranean structures can generally be characterized by similar shapes; most display walled cistern necks constructed into the soil, and the final socket stone (*puteal*) can still be seen (Keilholz 2014: 29). Many of the cisterns show a round opening, of which only funnel-shaped holes are visible. Some of the cisterns exhibit an (almost) quadratic opening, which is framed by stones<sup>9</sup>. The openings varied between 20 and 170cm width, each lead to a shaft and a wide, sometimes pear-shaped, cavity. The shaft can be either round, or chimney-shaped and rounded at the bottom. These shapes of rock-cut cisterns are similar to the ones identified in Udruh near Petra: bottle-shaped, rectangular, circular and irregular (Shqiarat *et al.* 2010: 211). A comparison to the cisterns in the Decapolis city of Gadara made apparent that a vertical shaft is hewn into rock - an indicator for the bottle-shaped type of cistern which connects the opening and the cave (Shqiarat *et al.* 2010: 211). The interior had to be plastered with hydraulic mortar (Keilholz 2014: 29). The narrow tube-shaped entrances are mostly clad with light-brown or light-grey mortar, probably due to the concentration of charcoals<sup>10</sup>. In our specific case different types of mortar used to seal the inner rock surfaces need to be investigated with radiocarbon analysis of mortar samples, as well as the shapes and sizes of the cisterns, and will hopefully give valuable insights into their phases of use and abandonment. Whereas, various mortar types could point to different periods of use and possible repairs (Lichtenberger *et al.* 2015: 116).

Looking at the individual cisterns, their interior is broad and round, and as in Cistern 9 (C9) furnished with a stone-pillar plastered with mortar (**Fig. 28**). As in the case of the cistern at Udruh site no. 099 with a waterproof layer of mortar (Shqiarat *et al.* 2010: 216-217, fig. 6), it supports the construction of a horizontally

7. Aerial photographs allowed to identify a *wadi* terracing system. It allowed to collect runoff water for agricultural purposes. This system will be properly addressed in the next campaigns. For similar systems see (Evenari *et al.* 1958: 231-268).

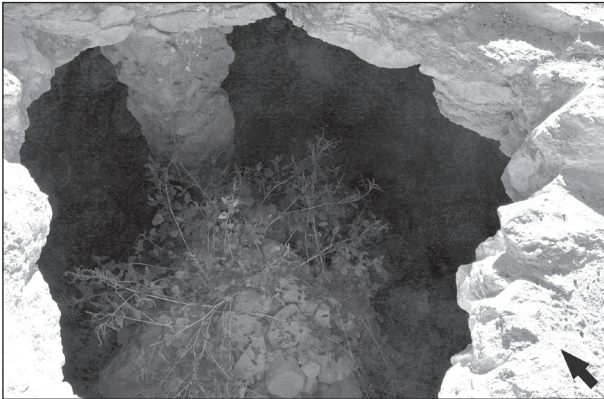
8. A higher number is expected, as there was often one cistern per household in Byzantine times (Tsuk 1997: 131). Such distribution of cisterns is much common to the area as evinced from the Moabite Stele of Mesha (around 853 BC) that mentions: “make yourselves each one a cistern in your house” (Ullendorff 1958: 197).

9. In the course of the settlement history, the surface terrain increased, and cistern necks were likely extended with stones, only proving their long usage (Keilholz 2008: 207-208).

10. Mortar with charcoal particles can frequently be seen, and lime mortar was often used for lining (Keilholz 2008: 207).

rock hewn type (Shqiarat *et al.* 2010: 211). The weak natural roof required the construction of a support pillar; these types are referred to as a so-called *qa'* or ditch, in which water contamination is highly probable (Abu Jaber 1995: 743). Moreover, the reuse of cisterns for housing or production is well-documented in the region (Abu jaber 1995: 743; Lichtenberger *et al.* 2015: 124).

Today, most of the cisterns of the site are in disuse, most are filled in with stones and modern waste. Few still store water up to 70cm (e.g. C1). The cisterns have an average depth of up to 4.7m, when measured from the opening to the deepest point. Some openings are blocked by a stone, either put there on purpose, or collapsed onto the opening. Some capstones are still preserved *in situ* (potentially C4, Fig. 29). This would point to a more recent use of the



28. C9, cistern with roof supported by pillar (© IKA).



29. C4, cistern with rectangular opening and capstone *in situ* (© IKA).

cistern's interior, which required the roof to be covered.

### *Individual Cisterns*

One water reservoir is found at Al Jumayl, located in the south-east, which was probably a disused stone quarry. Its potential use as a quarry during earlier times and to be discussed in more detail after future investigations. However, it is also similar to the case of Gerasa/Jarash, where quarries were transformed into cisterns in order to construct churches at a later time of the settlement's expansion (Hamarnah *et al.* 2013: 60). Quarries and cisterns are also located near the stylite tower at Umm Ar Raṣās, which are carved into the bedrock; moreover, the tower was constructed out of the stones extracted from the quarry later reused as a cistern (Piccirillo and Marino 1991; Al-Taher *et al.* 2016: 20-21).

Cistern C1 is located in the south of the excavation area, outside of the settlement. Its shape is reminiscent of the square settling basin with similar measurements at Udhruh (at site no. 104) built of flint blocks (Shqiarat *et al.* 2010: 217, fig. 7). The cistern is partially filled with water, as a tree is growing out of the opening, with fallen stones visible from above<sup>11</sup>. Cistern C2 is located in the north-east part of the excavation area and is only a few meters away from the *tall*. The cistern is set within the densely built habitat and is surrounded by structures to the north and west. Cisterns C3 and C4 are located in the northern area, only a few meters apart. The two utility structures are also set in a built-up area, which presumably comprised of several residential buildings. To the south of both cisterns stands a large building, which was partially uncovered during the campaign (Complex 1). Cistern C7, identified in the center of the settlement, is located in the eastern part of the excavation area, flanked by long, regular walls. Most utility harvesting structures were hewn in the south-eastern area, on a lower level and flat ground, as cisterns C1 and C5; C6 is located south-east of them and lies in the southern part of the settlement. A last group of four cisterns are located to the north-west, a part of the settlement mainly

11. Open cisterns are often filled with deposited materials, as they may have been used as a waste disposal site later on (Keilholz 2008: 208).



consisting of rocky ground. Similar to C3 and C4, cisterns C10 and C11 are located at a small distance from each other. A few meters further east, a large area with black soil may suggest the use of water for agricultural purposes. This may suggest that C10 and C11 were not used for domestic purposes, but rather for the irrigation of a limited area that necessitated additional watering during high temperatures and drought, as in other cases highlighted in Southern Jordan (Shqiarat 2008: 39). The development of this area still requires further assessment.

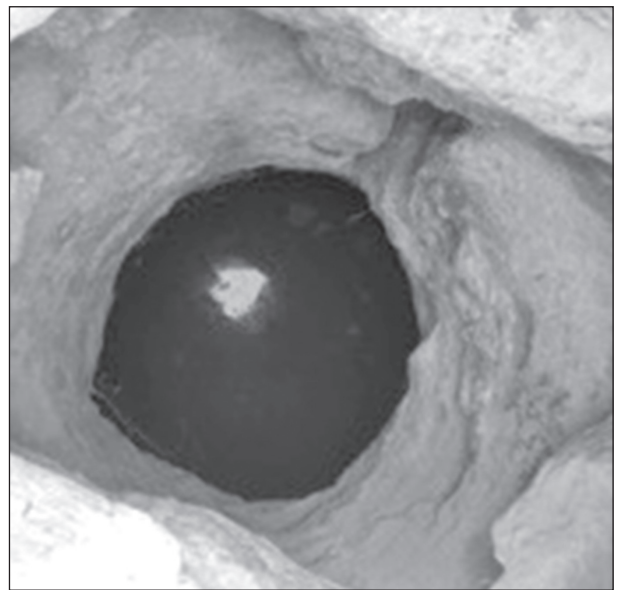
Some of the cisterns (C5, C6, C8, C11) display potentially modern material around their opening, as in the case of C11 where a big patch of mortar or cement is visible. The cisterns are mostly lined with hard white plaster, which is comparable to those in other areas, such as The High Place of Sacrifice at the top of the Al KHubthah mountain in Petra (Al-Bashaireh 2013: 333). In the case of C2, C3, C7 and C9, water channels are cut into the bedrock in the walls of the tube. These water inlets both supplied the cisterns with rainwater and also connected them to the water management system. They are mostly only detectable as small regular openings. At C3 and C7 (Fig. 30), channels plastered with mortar and with a width of *ca.* 20cm leading into the tube can well be seen slightly beneath the surface. These incised channels likely facilitated the filling of the cisterns with rainwater. Runnels are also present, which caught the water and led to a draining hole, also well documented in other sites (Oleson *et al.* 1986: 56).

Some of these cisterns are probably still in use by local farmers today (Shqiarat *et al.* 2010: 222). Many residential and potentially agricultural buildings or farmsteads have associated cisterns (Shqiarat *et al.* 2010: 214), which may be detectable in the settlement of al- Jumayl as well. For future campaigns, it cannot be ignored that the cisterns are rather small in size but numerous in quantity and at least two or even more seem to be interconnected in a network of cisterns. The different shape and usage of the rock-cut cistern types located within the densely built-up habitat, and potential agricultural areas farther away needs to be investigated in detail as they provide valuable insights to settlement patterns, and economic conditions.

## Conclusions (BH)

The origins of anthropogenic settlement at Al Jumayl should be associated with particularly suitable environmental conditions. The area had experienced relative prosperity during the Iron age, Nabataean-Late-Roman periods connected to an intensive long-distance commercial traffic, linked to the general urbanisation of towns and strongholds in the Moabite plateau. The town witnessed a substantial expansion in the Byzantine period as marked by well-developed patterns, with dense inner spatial organisation around the main hill (*tall*). The extensive area of fenced fields following *wadi* beds around the site, reflects the unparalleled expansion into marginal lands, and the intensive agricultural exploitation of the landscape. The vicinity to Umm Ar Raṣās is extremely interesting, studying closely related sites/satellite in the area have not been attempted so far and will allow a systematic mapping of the anthropogenic landscape of the region to unravel patterns in their use and reuse over time.

The archaeological research at Al Jumayl, is paying specific attention to the aspects of economic and social life below the elite level, which in many research projects remains underestimated. The pottery chronologies, essential for studying sites of this period, especially to determine the phases of use, development and abandonment show an extremely long-time span. Although the analysis



30. C7, cistern with regular round opening and plastered water channel (© IKA).

of the data collected during the first field season is still in progress, the preliminary results have shown so far, a remarkable continuity of the use of the central areas from Late Roman to the Mamluk period. Though the function of the village during the later Islamic period is still uncertain, it cannot be excluded that it served as an observation spot on the ancient road passing towards Wādī Al Mūjib, we are confident that future research will allow to deepen our knowledge on the changing human landscapes in the area.

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