

REPUBLIC OF IRAQ
MINISTRY OF CULTURE, TOURISM AND ANTIQUITIES
STATE BOARD OF ANTIQUITIES AND HERITAGE



SUMMER

A JOURNAL OF ARCHAEOLOGY IN IRAQ
AND THE ARAB WORLD
VOL. LXIII
2017



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JOURNAL OF ARCHAEOLOGY IN IRAQ

AND THE ARAB WORLD

VOL. LXIII

2017

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-2017**

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P.O. BOX : 55009

E-Mail : publication@sbah.net sumer.journal@yahoo.com www.sbah.gov.iq

Baghdad – Iraq

ISSN (BIB-ID) 2588219

Title: Sumer

Medium: Print (ta)



Republic of Iraq
Ministry of Tourism and Antiquities
State Board of Antiquities and Heritage
A Journal of Archaeology in Iraq and the Arab world
VOL. LXIII-2017

Contents of the foreign section

1-	Preface	Qais Hussein Rasheed	9
2-	Preliminary Report of the First Archaeological Campaign at Tell Zurghul/Nigin in the Dhi Qar Region, Iraq	Davide Nadali and Andrea Polcaro	11
3-	The Library of Sippar	Dr. Mohammad T. Al- Adhami	43
4-	QADIS. The Iraqi-Italian 2016 Survey Season in the South-Eastern Region of Qadisiyah	Nicolò Marchetti - Berthold Einwag - Abbas Al-Hussainy - Giampaolo Luglio - Gianni Marchesi - Adelheid Otto - Giulia Scazzosi / Elena Leoni - Marco Valeri - Federico Zaina	63
5-	A Kassite Settlement in Southern Babylonia: Investigations at Tell Khaiber 2	Stuart Campbell, Daniel Calderbank, Robert Killick and Jane Moon	93

QADIS. The Iraqi-Italian 2016 Survey Season in the South-Eastern Region of Qadisiyah

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1. The QADIS project (NM)

The QADIS survey project is a joint initiative of the Alma Mater Studiorum- University of Bologna and the State Board of Antiquities and Heritage (SBAH). The first and second field seasons took place in January and October 2016 respectively. We report here on the general survey activities and the methods employed in our first two seasons, with four more detailed analyses devoted to the intensive researches carried out at four sites, Tell Umm el-Fugas, Fara/Šuruppak, Tell Dlehim (perhaps ancient Tummal) and Tell Drehem/ Puzrish-Dagan. The survey area (Fig. 1) follows the administrative borders of the region of Qadisiyah to the south and east (including part of the Delmej basin), to the west the highway No. 1 and to the north it stops around the town of Afak.⁽¹⁾

In our area, surface surveys have been carried out in 1902 at Fara (Andrae 1903), in 1925-1926 and in 1968 in an area larger than our

own (Dougherty 1926; Al-Shukri 1974), between 1968 and 1975 Adams' survey developed on the ground (Adams 1981; the southern fringe of the QADIS area is covered by Adams and Nissen 1972), while in 1973 some work inside Fara (Martin 1988, 113-117) and in 1988 a very brief scientific visit at Tell Dlehim took also place. As for the excavations, Fara was dug by several different research teams in 1900, 1902-1903 and 1931.

(Hilprecht 1903; Heinrich 1931, also reporting on the soundings at Abu Hatab/Kisurra; Martin 1988). Between 1903 and 1905 Adab was extensively excavated (Wilson 2012), as well as Ishan Bahriyat/Isin between 1973 and 1989 (Hrouda 1992), while in 1977 a single season was carried out at Umm al-Hafriyat (Gibson 1977/78). After both the second and third Gulf War, in extremely difficult conditions for the management and preservation of the archaeological heritage (see

especially Emberling and Hanson 2008 on the looting peak which occurred between 2003 and 2007), the State Board of Antiquities and Heritage carried out several regular or emergency excavations at the sites of Tell Dhuhaiya, Bismaya/Adab (Al-Doori *et al.* 2001-2002), Tell Mirza, Tell Ruejeh and Tell Delmej 1-2 in the Delmej Basin, Tell al-Akhader, Tell Abu Edan, Tell el-'Arris (along the Afak-Budayr road) and Tell Drehem/Puzrish-Dagan (Al-Mutawalli and Shalkham 2014). The main aims of the QADIS project are to produce a new understanding of a multi-layered historical landscape through cutting-edge documentation techniques, to plot – with the greatest possible detail – urban plans from visible surface remains coupled with their fine chronological attribution through systematic collections of surface materials (which also define the functional interpretation of the urban sectors), to connect epigraphical sources with settlement patterns, to map the landscape of silted channels also studying its historical development and, in general, to check and update the bulk of Adams' seminal results through an integrated survey methodology.

2. Mapping the Area: Sources and Methods (EL GL MV FZ)

The combined use of different spatial datasets including historical satellite imagery (Corona)⁽²⁾, free-access online platforms (Google Earth Pro and Bing Maps Tiles System) and past archaeological surveys into a GIS software has been largely recognized in the last years as crucial for approaching archaeological researches at any scale (Hritz 2010: 189-190; Pournelle 2003; Wilkinson 2003). For our project we started from the 1960s-1970s survey by R. Mc. Adams (1981)⁽³⁾, which still represents the most systematic attempt to map and determine the development of ancient sites and landscapes in Mesopotamia. Adams' maps were first georeferenced in UTM 38 N Zone through GIS software by using the best possible features as reference points, and then integrated within Google Earth Pro, Bing Maps and Corona satellite imagery. Sites were first positioned according to the newly georeferenced Adams' maps and then the possible shifts in sites' location were corrected through photo-interpretation from satellite imagery (Fig. 1). This step also allowed obtaining a basic digital library, which has been used as a

starting point for the identification of new sites and paleochannels.

Both historical satellite imagery and free-access online platforms provided a valuable support for the identification of “new anomalies” on the ground ⁽⁴⁾ (e.g. sites or paleochannels). In some cases, Adams’ maps provided a good starting point for identifying new anomalies possibly interpreted as archaeological sites. Indeed, several sites have been recognized where the map made by Adams (1981: 364) showed a confluence of paleochannels in an empty area (empty spots). This is the case of Tell Meya'h - Qd 005⁽⁵⁾ (Fig. 2), a site situated at the confluence of nine paleochannels identified by Adams and confirmed by the analysis of satellite imagery. Another case is the site of Tell Gharnugh - Qd 009 (Fig. 2), located at the very confluence of five paleochannels (only three of which are still visible today) and now partially submerged by the artificial water reservoir of Delmej.

High-res imagery also played a key-role in the identification of the archaeological evidence. To this aim, Bing Maps Tiles System provided the most accurate type of online free-access data, allowing not only to rectify Adams’ sites but also to discover new

anomalies, potentially associated to archaeological sites or paleochannels. This was particularly clear for the latter, many of which were not previously identified by Adams, or just sketchily traced on his map. One possible explanation for such discrepancy is the intense agricultural activity over the last forty years, which have profoundly changed the landscape. In any case, ground reconnaissance was always necessary to confirm the presence of those anomalies and their interpretation.

Google Earth Pro satellite imagery has become popular in the last ten years (Ur 2006) for archaeological research. However, due to its low-res imagery in the Iraqi area, it has been mostly used by the QADIS team for the preliminary identification of macro anomalies, such as chromatic contrasts over large areas.

Corona satellite images have been also a valuable tool for geo-rectification and sites detection.⁽⁶⁾

For our case study, they have been particularly useful, since they were taken between the 1960s and 1970s at the same time as Adams was conducting his surface survey, thus recording the same landscape that was visible to the surveyors.⁽⁷⁾

The integrated use of different satellite images provided numerous insights and revealed unexpected anomalies, possibly interpretable as structures or paleochannels which necessitated validation in the field (Fig. 3).⁽⁸⁾ Consequently a detailed mapping of sites showing visible structures and paleochannels, was carried out by the QADIS survey project using drones. For the QADIS project we used a DJI Phantom 3 and DJI Phantom 4 Pro drones to verify the nature of anomalies previously detected through satellite imagery. To do so high-res photos with a 3-4 cm per pixel resolution were taken at elevations between 70 and 140 m. This kind of images allowed obtaining detailed orthophotos of the area under analysis together with the DEM, which have been georeferenced in a UTM grid by using at least 3 points taken with the combined use of a differential, kinematic GPS and a total station. This integrated methodology has been successfully applied to selected case studies of different size and terrain morphology. During the 2016 season, 10 sites extending for about 840 ha in total have been documented with drones in 15 days. An important element to be considered when designing the research

methodology is the variation of soil color and seasonality of vegetation. So far, thanks to the flight tests carried out in winter (January 2016) and fall (October 2016), we could observe different structural evidence and isolate multiple variables affecting the interpretation of ancient structures, including precipitation, soil moisture, salinization degree, sands movements and percentage of vegetation.⁽⁹⁾

3. The 2016 Survey Area

(AA GS FZ)

The 2016 campaign focused on the NE part of the survey area: this area extends from Tell Drehem and the Delmej reservoir to the N-NW until Bismaya/Adab and Tell Jidir/Karkar to the SE (Fig. 1) and includes sites previously recorded by the US expedition (Adams 1981; Adams and Nissen 1972). The initial analysis of satellite images revealed the presence of 17 anomalies in this area possibly interpreted as new sites.

The specific aims of the 2016-2017 survey campaign consisted in:

- 1) To newly document Ur III sites. As a result, 18 sites, where Adams identified an Ur III occupation, were visited. Among those, only one site (Adams 1981: no. 1003) did not provide any material

(neither Ur III nor from any other period), raising doubts about its interpretation as a site. All the others were confirmed as settled during at least that period.⁽¹⁰⁾

2) To carry out intensive material collection at those sites where UAV's images revealed the presence of ancient buildings, thus to understand their chronology and functional articulation. To this aim, intensive survey was carried out at the sites of Tell Drehem/Puzrish-Dagan (Qd 015; Adams 1981: nos. 1000-1001), Tell Dlehim/Tummal (Qd 038; Adams 1981: no. 1237), Umm al-Fugas (Qd 026; Adams 1981: no. 1096), Fara/Shuruppak (Qd 039), Tell el-Laham (Qd 035; Adams 1981: nos. 1230-1231) and Tell Jidr/Karkara (Qd 013; Adams, Nissen 1972: no. 004; Marchesi forthcoming). For each site we created a three-tier topographic system consisting of sectors, squares and buckets. Sectors delimit large areas characterized by a common terrain morphology, while smaller morphological features, such as cultivated field bound by channels, as well as smaller mounds within the larger sector have been identified as squares. Within each square, there are one or more pottery buckets, corresponding to grids measuring 50x50m to 100x100 m, in

accordance to other methodologies applied at neighbouring sites (Stone and Zimansky 2004: 44), thus allowing site to site comparisons.⁽¹¹⁾

3) To understand the nature of the anomalies identified through satellite imagery. All the 17 anomalies identified through satellite imagery have been visited during the 2016 season. Among them, 12 provided surface materials and in a few cases traces of structures, while 5 anomalies did not present any archaeological evidence. The latter were registered as "Non sites" and their limits drawn taking GPS points, in order to avoid future researches to misidentify them as sites through remote sensing alone.

4) To check Adams' (1981) identifications of paleochannels by using satellite images including Google Earth, Bing and in few cases ortophotos taken by drones. As a result, on the one hand we found that paleochannels previously identified by Adams were sometimes no longer visible, while on the other new paleochannels could be detected from satellite images. This pattern can be interpreted in the light of the increase of the ever intensifying agricultural activities in the area since the 1960s.

5) Looting at the main sites has been systematically recorded, while minor sites were also visited and photographed in sample batches. Recent satellite imagery (especially Bing Maps) also provided further information on the impact of looting at each site. A preliminary analysis suggested that sites were looted regardless of their size or period of occupation, thus confirming what has been already noted by E. Stone (2008: 137).

4. Ceramic Assemblages and Chronology (FZ)

The study of pre-Classical central and southern Mesopotamian pottery is still somewhat underdeveloped. During the last two decades, the halt to field activities and the resulting focus on neighbouring regions of the Near East, affected our understanding of the development of the ceramic horizons, especially for the earlier periods. Such situation raised a number of issues concerning both chronology and the functional interpretation of ceramic assemblages. A short overview is provided here on some relevant questions that should be considered in a future perspective of pottery studies.

A first problem regards the identification of chronological markers within the early Central

and Southern Mesopotamian assemblages. Adams' work (Adams 1981: 94-129, 170-174, 228-241; Adams and Nissen 1972: 97-104) already provided a basic chronological framework by integrating the study of the pottery assemblage and other classes of finds, also in the light of previous excavations. However, new data available through recent studies make necessary an updated analysis of the ceramic corpus from at least the Uruk until the Neo Babylonian/Achaemenid period. A way to tackle this issue has been recently proposed by J.A. Armstrong and H. Gasche (2014) for the 2nd millennium BC⁽¹²⁾ pottery assemblage from Central and Southern Mesopotamia.⁽¹³⁾ Despite the limited number of properly excavated sites available,⁽¹⁴⁾ the authors provided a substantial step forward in the study of the pottery from this period which remains the best known.⁽¹⁵⁾ Other periods generally rely upon few ceramic markers, which are confirmed by recent excavations. Among them, 'Ubaid occupation can be generally recognized through painted pottery, while bevelled rim bowls associated with jars with incurved spouts define the Middle and Late Uruk periods, whereas the identification of the

3rd millennium BC phase is based on the presence of solid-footed goblets, lugged jars and reserved slip (Early Dynastic I), stemmed dishes and up-right handled jars (Early Dynastic III). As a result, any chronological attribution based on a small sample cannot be reliably considered as informative. A second problem concerns the collimation of the data from Adams' survey (1981) with those from the new QADIS project. Such discrepancy is bi-univocal, including evidence found by Adams and not documented during the recent work of the Iraqi-Italian expedition and vice-versa. In the first case, it is particularly surprising the paucity of Middle Uruk or Jemdet Nasr pottery in sites deemed to have had a relevant occupation dating to those periods. Indeed, although, according to Adams (1981: 272, 277) this should be the main period of occupation at Tell Umm al-Fugas (Qd 026; Adams no. 1096) and a major one at Tell Dlehim (Qd 038; Adams no. 1237), but only a handful of sherds dating to such periods were recognized and collected at both sites. This raises an important question on the degree of confidence for the identification of the Uruk and Jemdet Nasr phases when classical pottery

markers (i.e. beveled rim bowls, painted pottery, jars with curved spouts etc.) are missing. Fabrics do not provide a relevant support in this regards, as well. Indeed, a preliminary analysis revealed that the majority of common shapes fabrics are slightly gritty, while large generally hand-made storage wares also include traces of chaff. Fabric colours, coded through the Munsell soil color chart, can be divided into three main groups: Pale Brown (10YR), Reddish (2.5YR, 5YR) and Olive Yellow or Olive Brown (2.5Y, 5Y), the majority of which, on the basis of parallels with Adams (1981: 301-322) as well as with some key sites of different periods (Matthews 1992; Moon 1987; McMahon 2006; Armstrong and Gasche 2014), show a wide chronological range. The last fabric group is certainly the most popular within the QADIS survey pottery assemblage.

Additional phases of occupation were however also newly documented by the Iraqi-Italian expedition at several sites, such as Tell Drehem/Puzrish-Dagan and Tell Dlehim/Tummal. Such discrepancy may be due to the methodology of collecting materials at the sites. Whether in fact the presence of Uruk pottery close to the ziqqurat of Tell

Drehem/Puzrish-Dagan can be interpreted as a missed identification of those fragments in an almost certainly surveyed area, in the case of green glazed pottery fragments dating to the Parthian period from a more peripheral sector (sector Af, see below) we are probably dealing with a lack of investigation for this area by the US expedition.

5. Epigraphic materials and historical notes (GM)

The epigraphic yield of the first and second seasons of the QADIS project consists of 31 stamped brick inscriptions, 1 tablet fragment, and 1 potsherd containing a capacity notation. A list and a brief description of these materials, arranged by sites, is offered below.

The most remarkable find is of course a brick of Ur-Namma from Tell Jidr with a dedication to the god Ishkur (JD.16.O.227), which confirms the identification of Tell Jidr with ancient Karkara (Marchesi forthcoming). The latter toponym was known from cuneiform sources as the name of the main cult center of the Sumerian storm-god. This inscribed artifact also allowed us to identify the location of the temple of Ishkur in Karkara, the *é-ud-gal-gal(-la)*, “House of the Great Storms” (George 1993: 152

no. 1130), which was evidently built (or rebuilt) by Ur-Namma. From the area of the temple also comes a small fragment of an administrative tablet dating from the Ur III period (JD.16.O.226). The portion of text that is preserved deals with earthwork (*saḥar si-ga*).

In addition, two bricks with inscriptions of rulers of the so-called Lagash II dynasty (Gudea and his son, Ur-Ningirsu II) were also found in Jidr (JD.16.O.216, JD.16.O.218). These somewhat unexpected finds rise the issue of the re-use of building material in antiquity. According to their inscriptions, the two bricks in question were meant to be used for temples located in the Lagashite cities of Tello/Girsu and Surghul/Nigen. It is conceivable that these bricks were originally set there, and then, after those cities had been abandoned and fallen into ruins, they were removed, transported to Tell Jidr, and re-used.

Nothing particularly significant has been found at the other sites that have been surveyed. The inscribed bricks from Tell Dlehim and Tell el-Laham did not provide elements that support the proposed identifications of them with ancient Tummal (Steinkeller 2001: 66-71) and Larak (id. 2005),

respectively. However, these epigraphic finds confirm the Ur III occupation of the sites in question. List of epigraphic finds by site:

-*Tell Drehem* (Qd 015; Adams no. 1000-1001; ancient Esagdana/Puzrish-Dagan): 13 bricks (DR.16.O.3, DR.16.O.5-6, DR.16.O.181-182, DR.16.O.184-190, DR.16.O.192) and 1 inscribed potsherd with a capacity notation (DR.16.O.167). All the bricks bear the standard brick inscription of Amar-Zuena (“Amar-Sin”) (Frayne 1997: 245-247 Amar-Suena 1). Most of these bricks were found in an area cut by a modern irrigation channel in the South-West of the site. Only two bricks come from the area of ziggurat. The deity to whom this cult complex was dedicated has not yet been identified. Strangely enough, no Drehem text seems to mention the temple in question, which must have been a major cult center (see below § 8).

-*Tell Dlehim* (Qd 038; Adams no. 1237; ancient Tummal?): 4 bricks (DL.16.O.1-2, DL.16.O.4, DL.16.O.193) with the standard brick inscription of Amar-Zuena (see above, under Drehem). Apart from a single brick that comes from the area of the oval temple (presumably the temple of the goddess Ninlil), all of them were used to build a drain, perhaps part

of the libation place (ki-a-nag) of Ur-Namma (the building of this complex is the only construction work that Amar-Zuena appears to have carried out in Tummal, according to the written sources; see Steinkeller 2015, 158 with n. 81).

-*Tell el-Laham* (Qd 035; Adams no. 1230-1231; ancient Larak?): 2 bricks of Ur-Namma (QD16.O.183, QD16.O.221). Same inscription as Frayne 2008: 59-61 Ur-Nammu 24.

-*Tell Semeh* (Qd 036; Adams site no. 1235; unidentified): 6 bricks of Nebuchadnezzar II (QD.16.O.180, QD.16.O.191, QD.16.O.222-225).

-*Tell Jidr* (Qd 013; Adams no. 004; ancient Karkara): See above.

-*Qd 022* (Adams no. 1069; unidentified): 1 brick of Amar-Zuena (QD.16.O.219), standard inscription (see above sub Drehem).

-*Tell ed-Desim* (Qd 023; Adams site 1071; unidentified): 2 bricks of Amar-Zuena (QD.16.O.217, QD.16.O.220), standard inscription (see above sub Drehem).

7. Tell Umm el-Fugas: topography and materials (NM)

Two shallow mounds (the one to the east called by us A and that to the west B) are the only elevated area of the otherwise almost flat

site of Tell Umm el-Fugas (Qd026; Adams 1981: no. 1096; UTM coordinates: 38R 53412.62 m E, 3543442,24 m N), measuring ca. 900 x 400 m and being at least 30 hectares large. The site is cut along its north-eastern side by a deep canal, although it seems that it extends not much beyond that limit (Fig. 4). The pottery surface scatter is amazingly homogeneous, all dating from ED I. The south-eastern quadrant of the site gave scarce pottery materials, an indication that surface erosion was particularly severe there. Traces of buildings were already evident at ground level, which was amply confirmed through aerial topographical reconnaissance (note that the interpretation by Stone 2014: fig. 7 right, based on satellite imagery, is mostly not an accurate one). A notable variability affects the color of walls on the surface, in a given sector walls being light color and the fillings of the spaces in between dark, while in an adjacent area the opposite could be true. This seems to depend from the slope of the terrain and by the degree of water absorption of the ground. The clearest traces for reading the urban pattern are those to the south-east, while to the north-west the reading is complicated by a regular grid of

square traces which are probably the remains of a late antique, medieval or even early modern irrigation system. The town plan shows small houses laid along narrow and non-rectilinear streets, with larger compounds organized around courtyards (Fig. 4). In fact on Mound A the density of built space is striking, with little or no empty areas in between: of course, the possibility that we are here dealing with multiple, diverse eroded layers showing simultaneously on the surface should be considered, but overall it seems a sufficiently accurate representation of the urban outlook of a city from the very beginning of the ED period. The road system, a regular enough grid oriented NW-SE, singles out elongated rectangular blocks of houses which mostly seem to have abandoned the tripartite scheme. Numerous Late Uruk and Jemdet Nasr sherds have only been found in the area at the north-eastern foot of Mound A, as well as along the southern side of the eastern levees along Mound A, while farther east we collected from the the levees pottery materials which can be dated to ED II, seemingly, with one single (!) Ur III sherd representing later periods. Throughout the site homogeneous ED I pottery has been collected,

nowhere more abundant than on Mound A, due to some intense, though superficial looting. A selection of sherds from Mound A is illustrated in Fig. 5, with conical bowls (Fig. 5: 1-4, 6) and solid-footed globlets (SFG; Fig. 5: 5, 7-9) being the most widespread shapes. Among closed shapes, medium-sized jars with slightly flaring necks and banded rim are the most characteristic ones (Fig. 5: 12-13), although jars with simple everted (Fig. 5: 10-11) and expanded rim (Fig. 5: 14) are attested too, larger shapes being less widespread (Fig. 5: 15). Cooking ware is known in small percentages (most of the fragments may belong to pots with four rim-tabs), as well as storage ware.

8. Tell Fara/Šuruppak: topography and materials (BE, AO)

Tell Fara/Šuruppak (Qd 039; UTM coordinates 548553.43 m E, 3515934.58 m N) was continuously inhabited in the third millennium BC, after which the settlement declined and was abandoned around 1800 BC. Approximately 1000 cuneiform tablets were found in the “houses” during the regular excavations. Beside those, hundreds of sealings with seal impressions were found. Both find classes are so

characteristic, that the relevant period ED IIIa was tagged the “Fara-period”.

The site of Fara was first investigated between 1902 and 1903 by the Deutsche Orient-Gesellschaft, DOG under the direction of W. Andrae (Andrae 1903; Heinrich 1931). Further excavations at the site were conducted by Erich Schmidt of the University of Pennsylvania in early 1931 (Schmidt 1931). Field researches were restricted to a few squares, with the deep cut in area DE 38/39 revealing part of the general stratigraphy of the site, from the Jemdet Nasr to the Early Dynastic III period (Martin 1988: 20-26). More research at the site was carried out by H. Martin, in the frame of her PhD research on Fara, through a three day surface survey of the site in May 1973 (Martin 1983; 1988).

Tell Fara is one of the largest mounds in the survey area, approximately 220 ha large and quite shallow, with a maximum height of 10 m above plain level. Two ancient riverbeds are running to the west and the east of the site. Satellite images had already revealed the heavy looting of the main mound with thousands of deep holes. All the material from there dates from the 3rd millennium, while a few Old

Babylonian sherds are attested only on a separate mound to the south-west.

The LMU team newly investigated the site by means of a systematic survey collection. To this aim, two areas have been selected: area A in the northeastern Lower Town, and area B in the eastern shallow mound (Fig. 6).

Area A1, a 10 m wide and 370 m long strip, starts at the lower edge of the main mound and continues well beyond the modern earth road until the modern canal (Fig. 6). The strip is divided into squares, 10 m by 10 m. The nature of Area A became quite clear: masses of pottery slags, fragments of overfired pots, partly melted together, overfired plano-convex bricks, mixed with black ashy material cover the whole Area A. This testifies to pottery production on a large scale, especially in the Northern half of Area A1, close to the supposed ancient riverbed.

The southern half of Area A1 seems to have been a stone working area: numerous cores of flint stone, flakes and finished chipped stone tools, bits of semiprecious stone, finished beads and other objects including hundreds of toothed sickle blades dating from Jemdet Nasr to ED IIIb.

The eastern shallow mound (Area B), which is situated east of the main tell, had been investigated by three East–West trenches in 1902/03, but no architectural structures have been published so far. It was chosen as the second survey area, in order to reveal the nature of this seemingly separate settlement enlargement. Survey Area B1, 60 m wide and 140 m long, was placed between two of the 1902/3 sections by Andrae, which were 70 m set apart from each other. Most of the material attests to the domestic use of the area: many stone tools, especially ground stones, saddle mills and grinders from basalt were found.

9. Tell Dlehim/Tummal (?):

Topography and materials (NM, FZ)

There is a certain agreement that Tell Dlehim (Qd 038; Adams 1981: no. 1237; UTM coordinates 38R 538576.63 m E, 3540338.62 m N) can be associated with the ancient city of Tummal (Steinkeller 2001; Yoshikawa 1989), one of the main centres of the Ur III period (see also Marchesi above).

The site covers about 35 ha and is characterized to the south-west by a high and steep summit, most probably representing the remains of a terrace (Adams 1981: 277; our survey shows that it is mostly

made of mudbricks). To the southeast and northeast there are two shallow but extended mounds. A large paleochannel, probably contemporary with the main phase of occupation at the site, cuts the site east-west: it is clearly visible both from the satellite imagery and on the ground.

A reconstruction of the site extension is partially affected by modern canals to the west and east together with the presence of cultivated fields encroaching the site. The area surveyed during the 2016 campaign was substantially larger than Adams', an additional settlement being present to the north-east next to a Shiite shrine, whence come Old Babylonian materials.

Satellite images integrated with new high-res pictures acquired from drones allowed to read the urban plan of the site (Fig. 7): the terrace is surrounded by an oval enclosure (seemingly encompassing an older, smaller one), thus probably being a temple of the kind of the Tell 'Ubaid one which had two main phases too (Heinrich 1982: 116-117, fig. 164). The city walls are well visible to the south and west of the terrace and they perhaps continue also to the north along what was the possible harbour of the town by the main canal. The city area to

the south-east shows remains of regularly laid out buildings but their reading is not comparable to those from the north-east sector, where we can clearly see the residential units along the streets and some larger buildings to the north.

The site was divided into four main sectors (A to D, anticlockwise starting from the SE). Each sector has been divided in sub-sectors and when necessary in squares: six sub-sectors in sector A (Aa to Af), seven sub-sectors in sector B (Ba to Bg), four sub-sectors in sector C (Ca to Cd), five sub-sectors in sector D (Da to De).

About 4838 pottery sherds have been collected from the intensive survey of the site. Among those, 450 have been selected, described, drawn and photographed. A small quantity of Middle-Late Uruk sherds have been preliminarily identified in sector De. The great majority of profiles collected during the intensive survey of Tell Dlehim can be assigned to the Late Early Dynastic/Akkadian, Ur III and Isin-Larsa periods. The repertoire consists of both hallmarks and less common shapes, the former including small bowls with string-cut base, sides with high carination, and simple, vertical concave rim (Fig. 8: 1-4),

densely distributed throughout the site. Another typical Ur III shape is the bowl with convex base, curved sides, thick walls and thickened, outwardly bevelled rim (Fig. 8: 5), while few specimens of large bowls with inturned thick rim made be ascribed to a wider chronological range (Fig. 8: 6). Closed profiles generally belong to an Ur III tradition. Among others, there are jars with band rims and vertically or flaring neck (Fig. 8: 7-8, 11) (Armstrong and Gasche 2014: 70, pls. 127: 4-10, 128: 3-12, type 270C₃) medium-sized jars with narrow shoulder, vertical neck and outwardly thickened rim (Fig. 8: 9; cf. Armstrong and Gasche 2014: 42, pl. 68, type 105B₂) and small jars with double out-turned rim (Fig. 8: 10). Moreover, many fragments of large storage jars with outwardly thick rim and applied ropes have been found on the surface (Fig. 8: 12).

The pottery assemblage from Tell Dlehem also includes some sherds, suggesting that at least a part of the site (in sectors A, B and D) was also occupied during the first half of the 2nd millennium BC as suggested by Adams (1981: 277-278). Sparse evidence of a middle-late 2nd millennium BC settlement are restricted to mound B in line with Adams (1981: 269)

identification.

Scattered Parthian pottery sherds (green glazed ware) have been found in sectors De, Da and Bc. Adams (1981: 278) already found a handful of sherds close to this area, suggesting a presence of this period on the summit of this mound.

10. Tell Drehem/Puzrish-Dagan: topography and materials (NM, FZ)

Tell Drehem, ancient Puzrish-Dagan (Qd 015; Adams 1981: nos. 1000 and 1001; UTM coordinates 38S 527617.28 m E, 3546997.20 m N) is recognized as a major centre during the Ur III period in the region (Sigrist 1992). Its importance is revealed by the more than 13,000 Ur III tablets stemming from this site (mostly from illicit excavations), which allow us to understand its economic role as a specialized centre for managing herds and flocks (Sigrist 1992).

According to Adams (1981: 269), the site that can be securely identified as Puzrish-Dagan is no. 1001, which extends for about 15 ha, although an additional 10.5 ha can be added if we attach to it also site no. 1000 to the west. Site no. 1001 consists of a high mound, which are the remains of an ancient ziqqurat since it is made of mudbricks, surrounded by a

lower town only slightly raising above the surrounding fields. Site no. 1000 is characterized by a shallow mound of an irregular shape and a lower town mostly extending to the north-east. Several modern channels cut the site, the southern and northern fringes of which being further partially covered by cultivated fields. Looting affects to a limited extent only the western mound.

Excavations were conducted by an Iraqi expedition in 2002, focusing on site no. 1001 (al-Mutawalli and Shalkham 2014). Two main areas were investigated, one at the north-western foot of the ziqqurat of the ziggurat (which was also probed), while a second one was approximately 160 m to the north-west, both revealing mud brick structures dating to the Ur III period, which reconnect well with the observable surface remains (Fig. 9). From our survey, the town appears to have had a line of city walls to the south-east, a regular grid and it seems to have developed longitudinally along a major canal to the west, to have been crossed by a minor east-west canal and to possibly have had a harbour to the north-east, in an as yet unsurveyed area. A monumental temple complex seems to have been present to the south and south-east of the

ziqqurat: it may have had a shape similar to the sacred precincts of Tell al-Rimah and Tell Senkereh/Larsa, in which a wide axial cella was set against one of the sides of the ziqqurat itself (Heinrich 1982: figs. 291, 298).

The area surveyed during the 2016 campaign includes the two mounds identified by Adams. For the intensive survey of the site, the two mounds were labelled sector A (Adams 1981: no. 1001) and sector B (Adams 1981: no. 1000). Both sectors, where further divided into sub-sectors and squares according the morphology of the terrain. Sector A was divided into six sub-sectors (Aa to Af) and 50 squares, while sector B due its plain morphology was divided into four sub-sectors (Ba to Bd) and 16 squares. Although a standard dimension of 80x80 m was established, variations in shape and dimensions occurred according to presence of substantial morphological variations.

During the intensive survey every pottery sherd and small find has been collected from each square. About 5477 pottery sherds have been collected from the intensive survey of sectors A and B. Among those, 479 have been selected, described, drawn and photographed.

A preliminary analysis suggested an earlier occupation at the site during the Middle Uruk period in the area of the ziqqurat. This evidence was not previously recognized by Adams which indicated the late 3rd millennium BC as the earliest and main occupation at Puzrish Dagan (1981: 269). It is certain that the most flourishing period is the Ur III as confirmed by the overwhelming majority of sherds dating to this period from both sectors. Typical Ur III shapes include small bowls with string-cut base, sides with high carination, and simple, vertical concave rim (Fig. 10: 1-4). This type is popular in Central and Southern Mesopotamia during from the Ur III to the Isin-Larsa periods (Armstrong and Gasche 2014: 26-27, pls. 33-34, type 20E₁). A similar trend has been also observed for other bowls with upwardly turned rim, string-cut base and flaring sides (Fig. 10: 5) (Armstrong and Gasche 2014: 25, pl. 32, type 20C₁), while less diagnostic are the out-turned rim bowls (Fig. 10: 6). Closed shapes include typical Ur III storage jars with outwardly thick rim and applied ropes are also attested (Fig. 10: 7), small jars with out-turned thick rim (Fig. 10: 8) and medium-sized jars with ring base,

applied horizontal ridged on the shoulder and outwardly thickened and bevelled rims (Fig. 10: 9). The latter is attested from the early Ur III period onwards both in the southern and northern alluvium (Armstrong and Gasche 2014: 66-67, pl. 113, type 255A₂). Another diagnostic type is the jar with ring base, vertical neck and outwardly bevelled rim (Fig. 10: 10). The first example of this type appear as far as the late Ur III period, reaching its highest frequency during the early Isin-Larsa period (Armstrong and Gasche 2014: 66, pls. 111-112, type 250B₂). The pottery assemblage from Tell Drehem also includes large storage bowls with thickened rim and shallow grooves (Fig. 10: 11). Scattered evidence of middle-late 2nd millennium BC occupation is mostly restricted to mound B in line with Adams (1981: 269) identification, while another previously unrecognized period at the site is the Partho-Sasanian one. The occupation dating to this period seems to be restricted to the northern edge of sector A as suggested by the presence of some greenish glazed pottery sherds.

1) The friendly and unfailing cooperation of the Chairman, Qais Rasheed, and the other Colleagues at

the State Board of Antiquities and Heritage in Baghdad are here gratefully acknowledged. Funding for the two survey seasons was provided by the Alma Mater Studiorum – University of Bologna, the Italian Ministry of Foreign Affairs (DGPS directorate – 6th Office) and the European Horizon 2020 JPI CH Project “HeAT,” while the Ludwig Maximilian University of Munich (LMU) contributed to the second season. We are very grateful to the diplomatic personnel of the Italian Embassy in Baghdad and the local Authorities and the many friends in Diwaniyah and Afak for their warm reception and constant support. In addition to the authors, the following members took part to the second survey season: Valentina Gallerani, Christoph Fink, Hardy Maass, Basim Jabbar, Ahmed Abbas, Haider La'ebi, Ahmed Kareem, Ahmed Ali, Ali Feles, Haneen Taher, Munna Maki. Google Earth Pro and Bing Maps are registered trademarks. The authors for each paragraph have been here identified by their initials. The findings presented here were analyzed in the frame of the European Union funded project "EDUU- Education and Cultural Heritage Enhancement for Social Cohesion in Iraq" (EuropAid CSO-LA/2016/382-631).

Orthorectified declassified Corona satellite images have been retrieved from <http://corona.cast.uark.edu/>. Additional declassified Corona satellite images have been downloaded from <https://earthexplorer.usgs.gov>.

3) Additional data can be also found in Al-Shukri 1974.

4) For this step of the analysis we also integrated 1980s-1990s 1:100.000 Soviet topographic military maps (for other case studies from the Near East see Bitelli, Mandanici, Mantellini, Marchetti, Vittuari 2013) and Garmin® GPS satellite photos which in several parts of the survey area provided higher quality imagery.

5) All Adams' sites as well as the new sites surveyed by the QADIS project have been newly labeled with “Qd” followed by a progressive number (e.g. 001, 002, 003 etc.).

6) For the methodological application and history of the use of declassified Corona Spy Satellite photographs see Ur 2013.

7) KLM Aerocargo photographs taken between October 1961 and October 1962.

8) Similar evidence have been already noted by E. Stone (2014) using Digital Globe high-res images.

9) At Tell Drehem, while pre-field remote sensing analysis performed by the Iraqi-Italian team using Corona, Bing and Google Earth images provided only some hints on the urban layout of the ancient city, drone flights carried out during the first season, allowed us to detect detailed traces of walls on the basis of both the alignment of the bushes and the main lines left by the salinization of the soil (Fig. 9).

10) In some cases only a preliminary dating can be provided here, as the pottery assemblage is still under study.

11) This three-tier methodology remained identical for each investigated site, but the number of squares and buckets and their size can vary according to the site dimensions.

12) According to Armstrong and Gasche (2014: 1) a revised chronology of the Ur III period should be also included in the discussion on the 2nd millennium B C.

13) The area generally known as Central and Southern Mesopotamia has been divided by Armstrong and Gasche (2014: 1-2) into four main region: Northern Alluvial Plain (NAP), Southern Alluvial Plain (SAP), Middle Euphrates and Diyala Basin.

14) For a review of the key stratigraphic sequences see Armstrong and Gasche 2014: 7-12.

15) However, the analysis carried out by Nissen (Adams and Nissen 1972: 105-204) for Ubaid to Early Dynastic I pottery from the Heartland of Cities survey is still of great importance.

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Captions of Figures

1- QADIS survey area.

2- Adams' empty spots and the identification of new sites through paleochannels convergence.

3- Identification of ancient structures using high-res UAV's (drone) photos.

4- Topographic map of Tell Umm al-Fugas (Qd 026; Adams 1981: no. 1096), and the ancient structures identified through the UAV's flight.

5- Early Dynastic I pottery assemblage from Tell Umm el-Fugas (Qd 026; Adams 1981: no. 1096).

6- Orthophoto of Fara/Shuruppak (Qd 039), with marked D.O.G. excavation trenches and the 2016 intensive survey areas.

7- Topographic map of Tell Dlehim, perhaps ancient Tummal (Qd 038;

Adams 1981: no. 1237), and the ancient structures identified through the UAV's flight.

8- Ur III pottery assemblage from Tell Dlehim/ Tummal (Qd 038; Adams 1981: no. 1237).

9- Topographic map of Tell Drehem/ Puzrish - Dagan (Qd 015; Adams 1981: nos. 1000-1001), and the ancient structures identified through the UAV's flight.

10- Ur III pottery assemblage from Tell Drehem/ Puzrish - Dagan (Qd 015; Adams 1981: nos. 1000-1001).

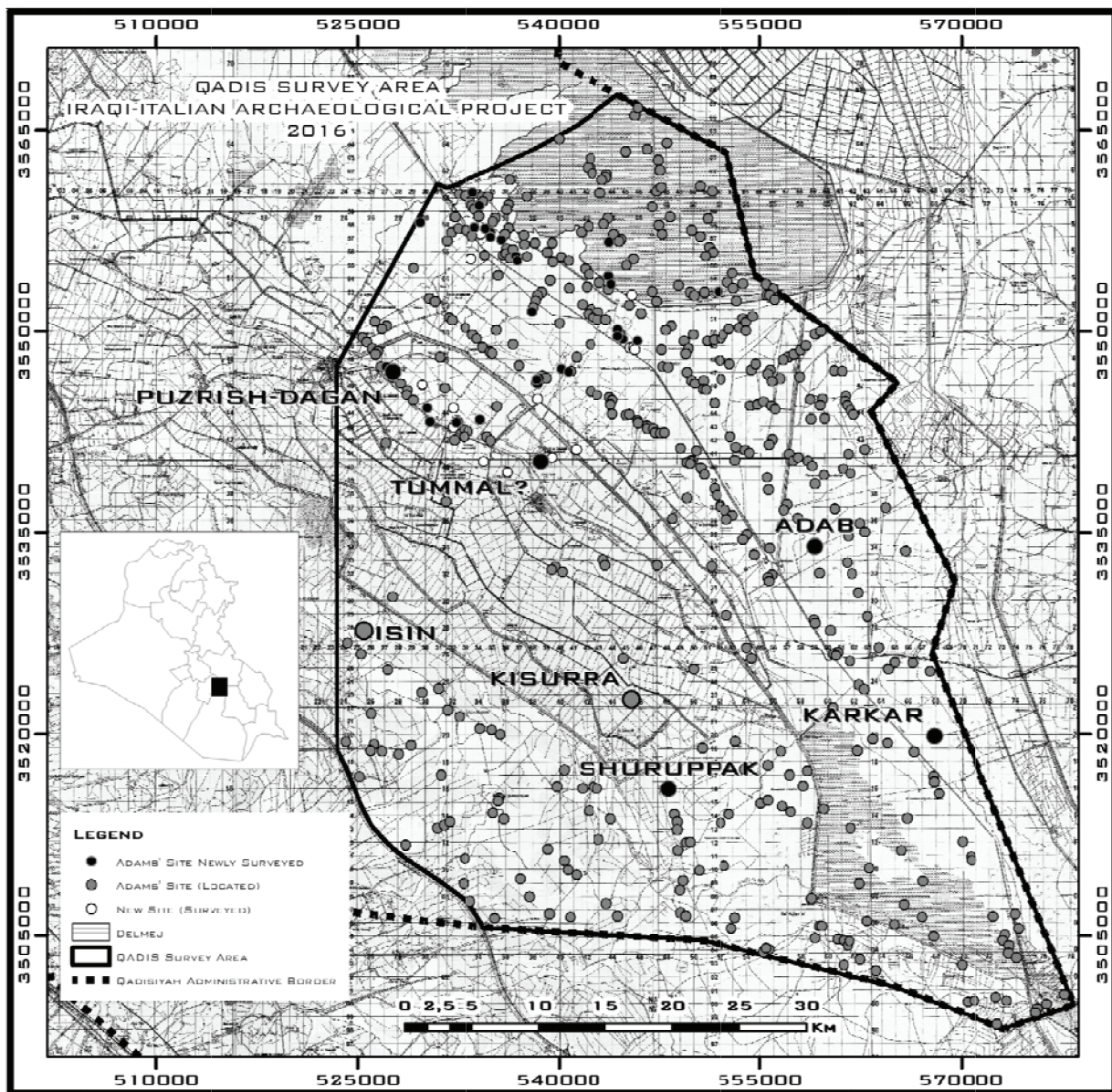


Fig. 1

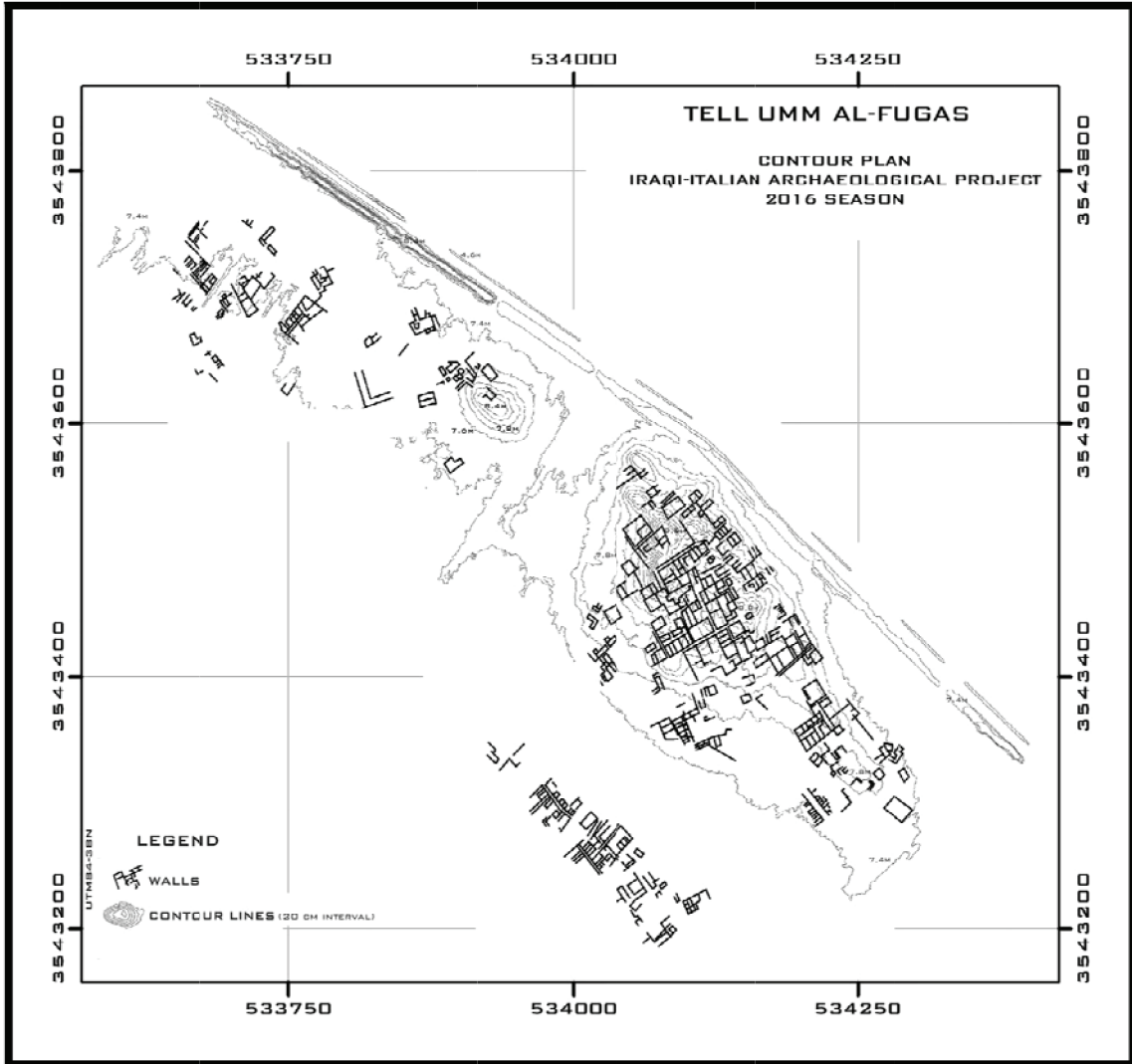


Fig. 4

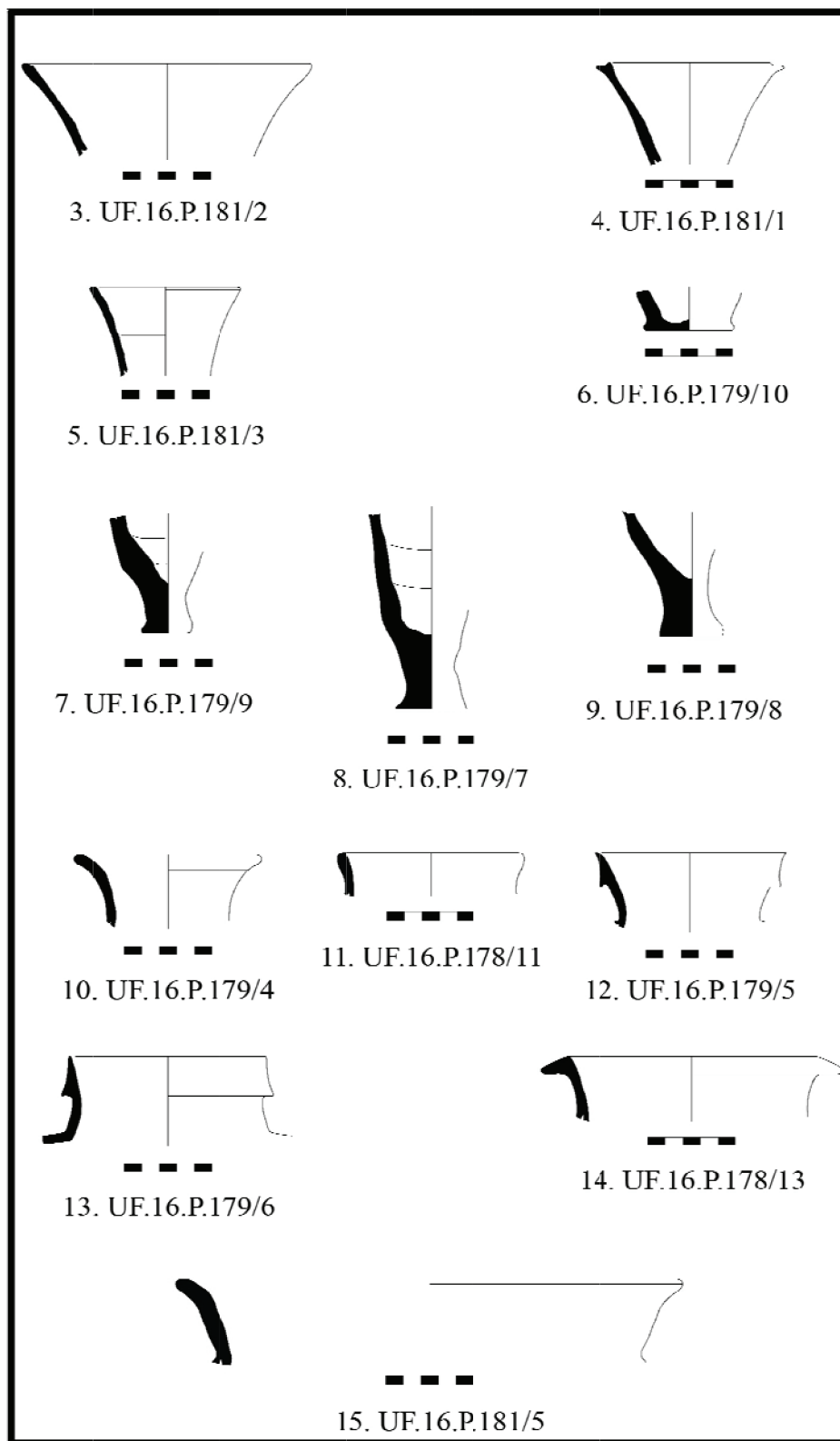


Fig. 5

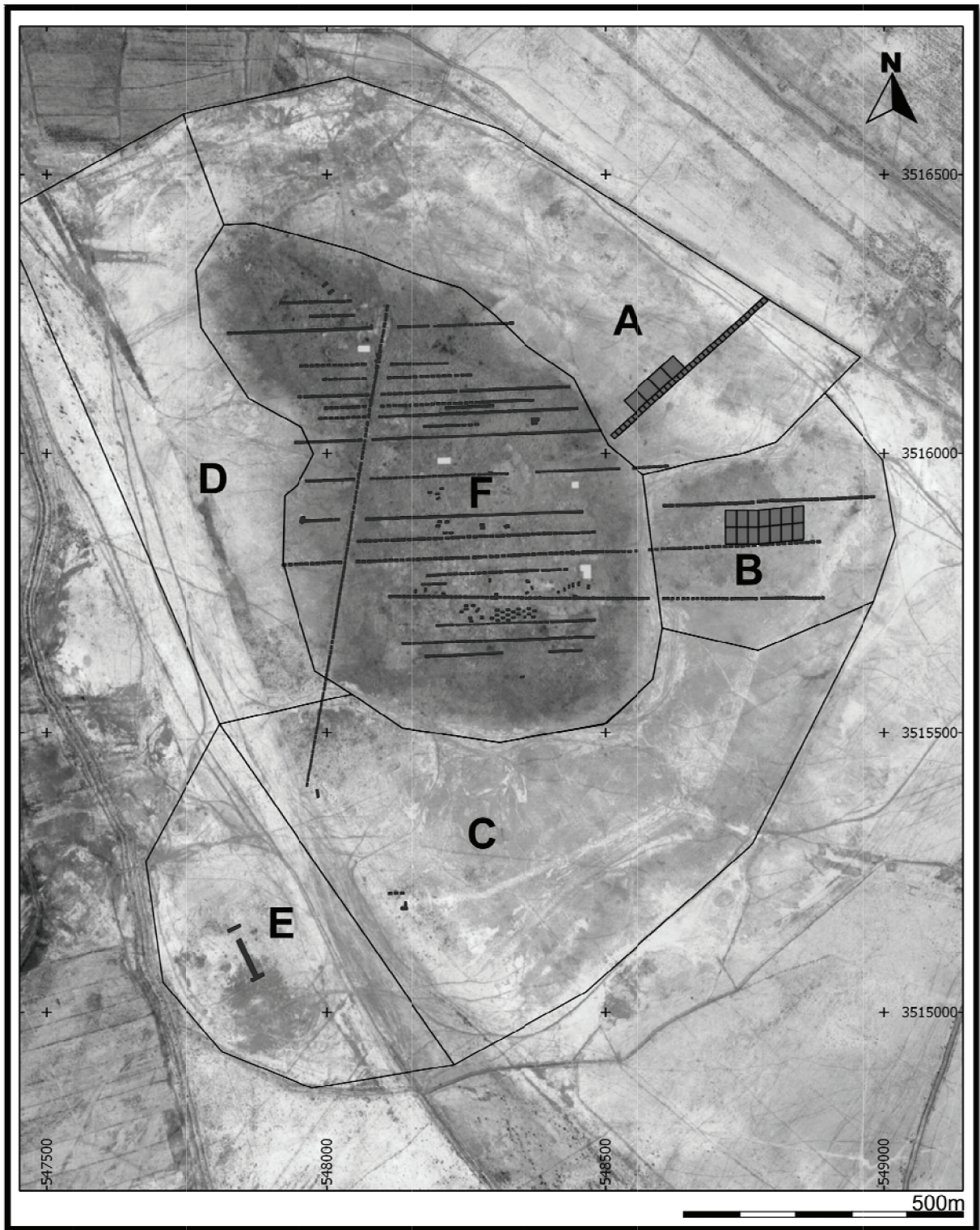


Fig. 6

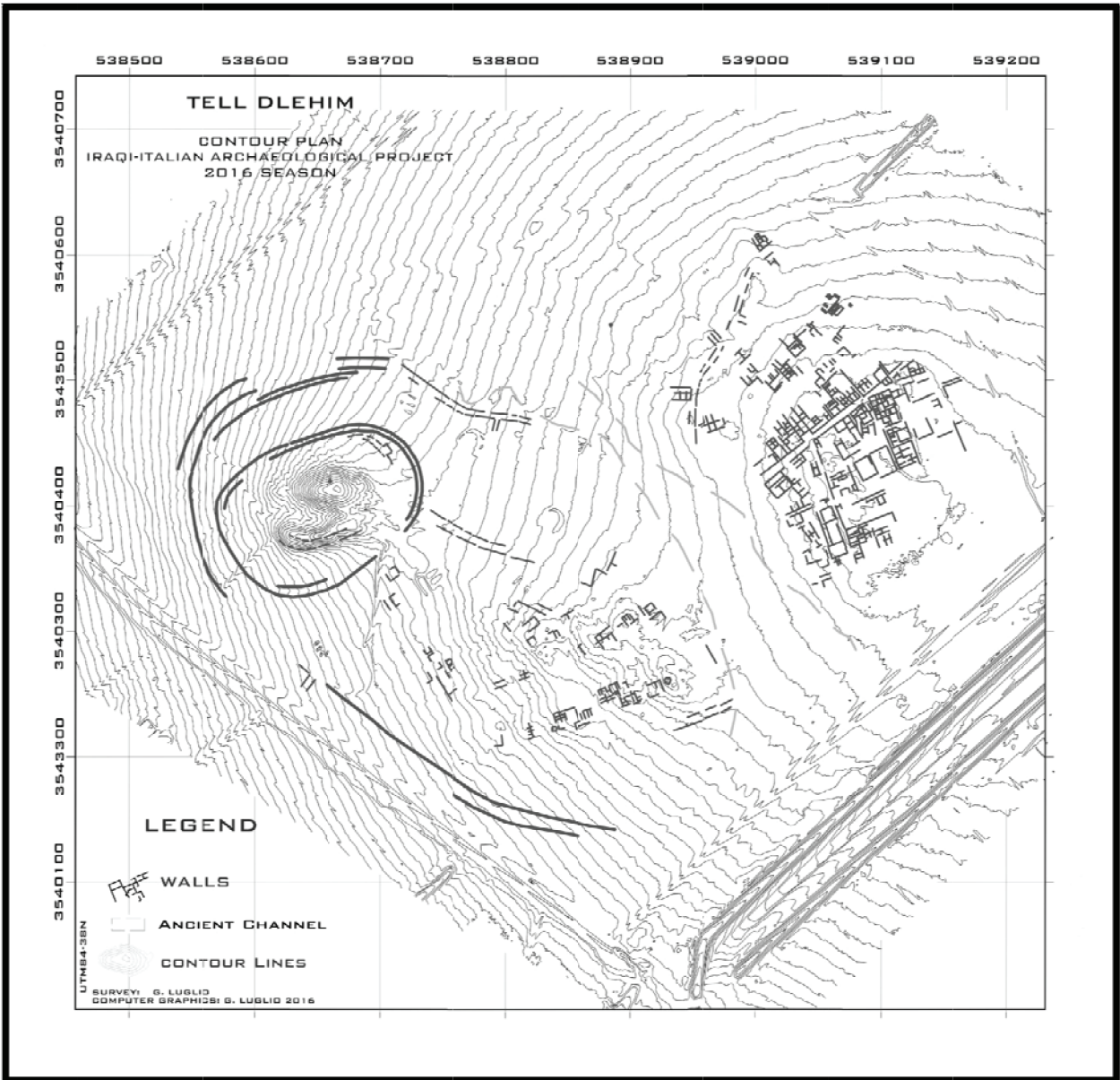


Fig. 7

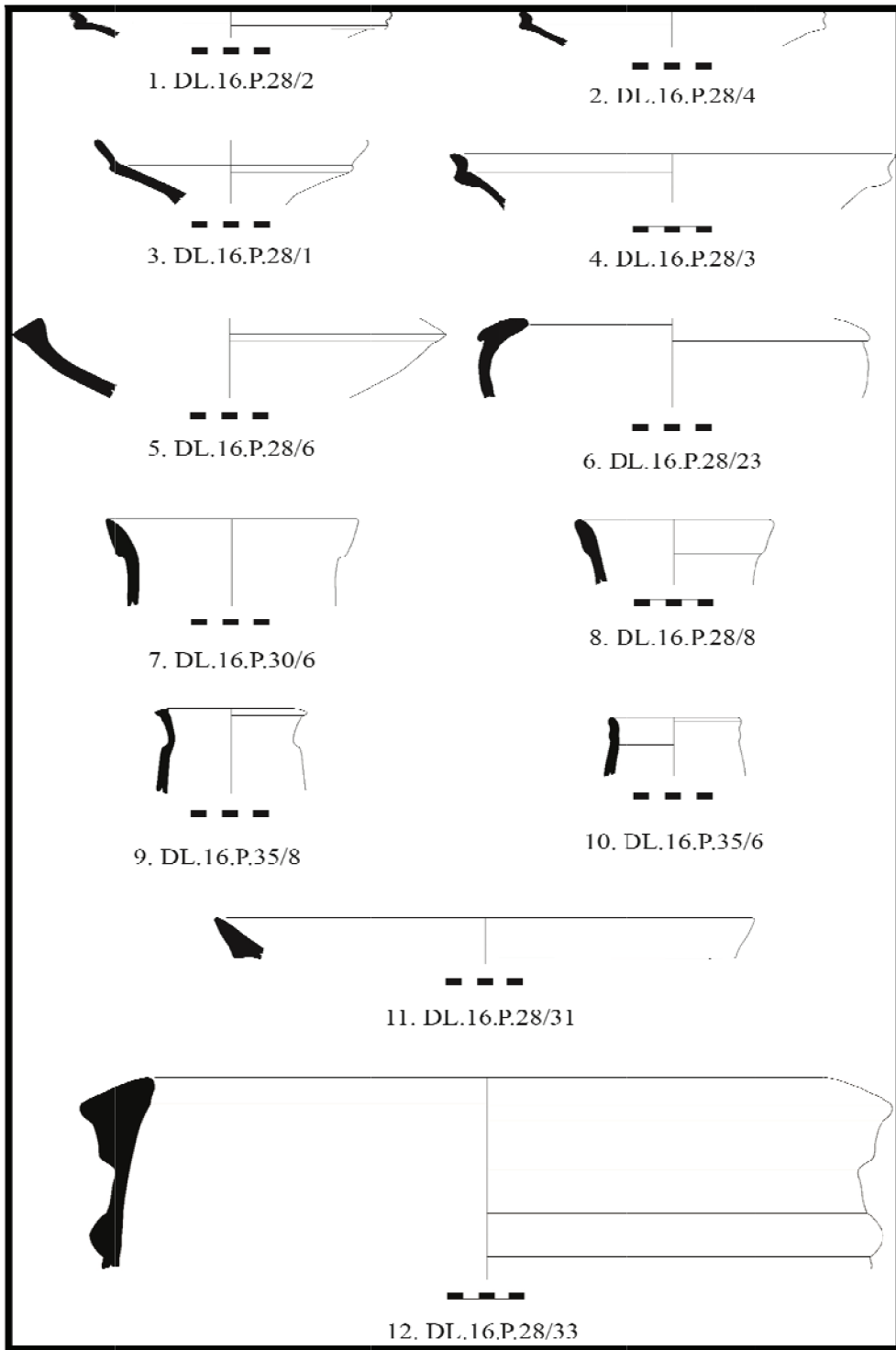


Fig. 8

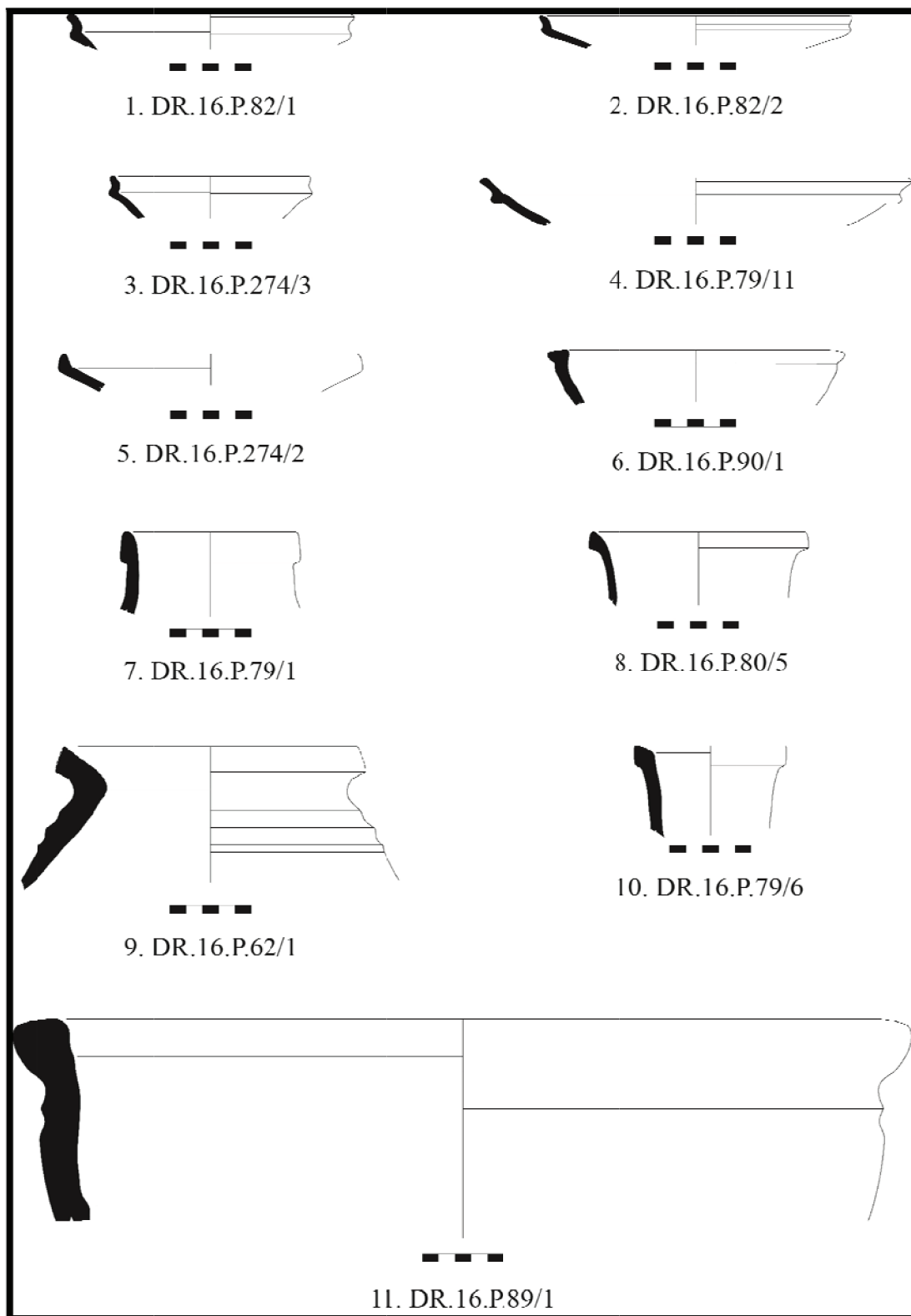


Fig. 10