

Kyzyl Gul – The Relicts of an Abandoned Village in Kugitang Piedmont (South Uzbekistan)

Anna Augustinová – Petr Mach – Petra Cejnarová

ABSTRACT

The relicts of an abandoned village were discovered during an archaeological field survey in the autumn expedition of 2017. During the following season (2018) we focused on the detailed survey and documentation of the site. A systematic field survey was conducted there, which was based on the collection of finds that are visible on the surface. In the selected part of the site we recorded the visible relicts by total station, sorted and analysed them. We identified 22 linear features, 16 circular/square features and we marked 4 spots which show the area behind the features. Among the finds the Early Middle Age predominantly prevail, nevertheless, finds belonging to the Bronze Age, Late Kushan Period, High Middle Age, Late Middle Age, and Pre-Modern Period were also collected.

KEYWORDS

Abandoned village; surface survey; landscape archaeology; Central Asia; Early Middle Age.

INTRODUCTION

During September 2018 we focused on the detailed documentation of the defunct village of Kyzyl Gul (Paskhurt Basin, South Uzbekistan) that was discovered during the field season 2017 (AUGUSTINOVÁ *et al.* 2017, 139–159). After the discovery of the site, we proceeded to analyze the satellite imagery to gain a rough idea of the layout of the site. The results were consequently (in the following season 2018) compared with the situation in the terrain and supplemented with a systematic surface survey with detailed measurements of the features visible in the terrain. The project of the Institute of Classical Archaeology, Charles University in Prague in cooperation with Termez State University (represented by Sh. Shaydullaev) was led by Anna Augustinová (Institute of Classical Archaeology, Charles University in Prague) in collaboration with Petr Mach (Institute of Archaeology, Charles University) and Petra Cejnarová (Institute of Classical Archaeology, Charles University). Besides the authors, Ladislav Damašek (Institute of Archaeology, Charles University) was highly involved in the processing (redrawing, describing, classifying) of the pottery finds. The evaluation of the collected finds was carried out in collaboration with Shapulat Shaydullaev (Termez State University in Termez, Uzbekistan) and with Ladislav Stančo (Institute of Classical Archaeology, Charles University).



Fig. 1: Panoramic view of the site of Kyzyl Gul from the north-west (photo by P. Mach).

LOCATION AND ENVIRONMENTAL CONDITIONS

The study site, Kyzyl Gul, is situated in the south-western tip of the Paskhurt Basin, 3.6 km from the centre of the village of Goz, on the right side of the road connecting the village of Goz with the villages of Aktash and Charvag. The most dominant feature – the remains of an old construction, probably a mosque¹ (E 66°42'03.0" / N 37°36'23.9") – are visible from this road (**Fig. 1**).

The site lies at an approximate altitude of 650 m.a.s.l. in the slightly descending steppe belt that runs from the ridge of the Kugitang Mountains. To the south, the Pyshtykara ridge (elevated 150 m above the steppe belt) creates a natural border between the Paskhurt Basin and the Sherabad Oasis in the lowland.

The border between Uzbekistan and Turkmenistan runs along the ridge of the Kugitang Mountains (approx. 14.8 km to the north-west of the site). It is also possible to cross the border approx. 16.6 km to the south of the site between the ridges of the Kugitang Mountains and the Pyshtykara Range.² The lowland in the Sherabad Oasis can be reached through the gorge of Goz Dagana (*dagana* = Uzb. 'mountain pass'), located to the south-east of the village of Goz, which lies between two ridges – Pyshtykara (to the south) and Karachagyl (to the north).

The site of Kyzyl Gul has a very low density of vegetation with two types of plants represented by *Artemisia diffusa* and by *Salsola stockii* (SENIKOV *et al.* 2016, 110).

Nowadays, the nearest water supply is situated in the village of Goz represented as a no name spring near the prominent tomb of Suleyman Ota (E 66°43'37.2" / N 37°37'24.3"; AUGUSTINOVÁ *et al.* 2017, 149). In its vicinity and also in the direction towards Kyzyl Gul there are highly visible remains of karezes³ (underground water systems of canals) (**Fig. 2**) represented by a line of circular holes. It corresponds with the oral tradition that Goz (3.6 km to the N-E of Kyzyl Gul) and Aktash (5.2 km to the S-W of Kyzyl Gul) belonged to a past group of villages in the Kugitang Piedmont called Karezat, i.e. participating in shared water management by means of karezes (KARMYSHEVA 1976, 50). Nevertheless, it is not possible to date these underground tunnels and even though they might be an Ancient/Middle Age construction (e.g. SALA 2003, 3), a later (e.g. Pre-Modern) origin cannot be excluded. Furthermore, their course does not run directly through the Kyzyl Gul site but past the site.

Directly at the site we detected the remains of surface water canals with several branches. They are recognisable on the satellite imagery and we complemented the whole extent with the GPS capturing in the terrain (**Pl. 1/1**). During the surface survey there were probably also some objects recorded that could have served as water reservoirs (KG_obj009).

-
- 1 The wooden remains of the building have not yet been analysed in detail. Preliminarily we consider the remains of the building to be an old mosque. This assumption is based on its wooden construction, which is not typical for the common houses in the region, as well as on its dominant placement on the elevated spot. The place is also designated as 'mosque' in local tradition. Nevertheless, a closer thorough observation of the architecture of the feature will be necessary.
 - 2 It is important to note that this description is based on the natural topography, though such a passage would not be currently possible due to the political situation.
 - 3 More about karezes in the Paskhurt Basin region in: AUGUSTINOVÁ *et al.* 2015, 274–275; AUGUSTINOVÁ *et al.* 2017, 140, 147–149.



Fig. 2: The remains of karezes near the village Goz and the site Kyzyl Gul (map by A. Augustinová).

RESULTS OF THE PRELIMINARY SURVEY IN 2017

The preliminary survey of the area took place in autumn 2017 (AUGUSTINOVÁ *et al.* 2017, 149–152). There should be distinguished two areas with a concentration of ceramic material – the area „A“ with the visible remains of the defunct village (Fig. 3 – A) that covers an area of ca. 10.1 ha and the area „B“ (Fig. 3 – B) to the north-east of the first one includes two tepas (KuPi_072, KuPi_073) and their hinterland that covers an area of ca. 22.2 ha. The density of finds is approximately twofold in the area „A“ (ca. 0.01 frg./m²) than the area „B“ (ca. 0.005 frg./m²).

The main cluster of the finds (area „A“) was detected in the area with visible surface relicts of the village and the scatter spreads in the north-east direction (KuPi_071). In total 95 ceramic fragments were collected. They are mostly dated to the Early Middle Ages (5th–6th c. – 57 frgs.) followed by the High Middle Ages (10th–12th c. – 23 frgs.). The other periods were represented only rarely by individual specimens (Late Bronze Age – 1 frg., Late Kushan Period – 2 frgs., Late Middle Age – 3 frgs., Pre-Modern Period – 4 frgs.).

In the north-east direction from the defunct village two more sites were detected (area „B“; tepas KuPi_072, KuPi_073), which probably do not belong to the relicts of the village, but from a wider perspective, they are still part of this study microregion. In total 174 ceramic fragments were collected. KuPi_072, a small oval shaped teпа contained 89 ceramic fragments dated mostly to the High Middle Ages (12th c. – 33 frgs.), but there are also finds dated to the Early Middle Ages (5th–6th c. – 12 frgs.) and even to the Bronze Age (12 frgs.). Two fragments were dated to the Early Iron Age (1 frg.) and to the Greco-Bactrian Period (1 frg.), but considering the solitude of the finds dated to these two periods, no conclusions based on them can

be drawn. KuPi_073, consisting of a tepa itself and of an adjacent flat platform contained 85 fragments of pottery dated mostly to the High Middle Ages Period (12th c. – 25 frags.). Several fragments belong to the Pre-Modern Period (9 frags.), to the Early Middle Ages (5th–6th c. – 4 frags.), to the Bronze Age (4 frags.), to the Late Kushan Period (2 frags.), and to the Late Middle Ages (17th c. – 2 frags.).

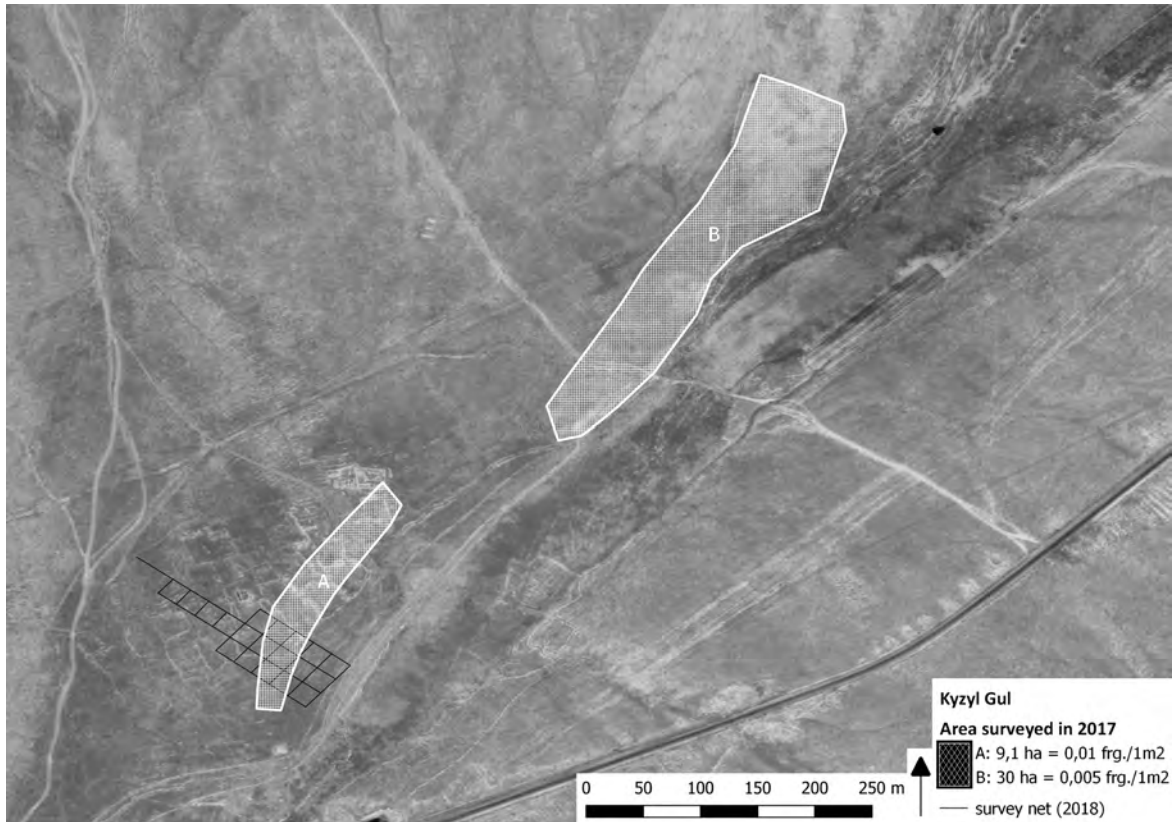


Fig. 3: Areas surveyed during the season 2017 (A – Kyzyl Gul; B – two tepas and their hinterland) and area surveyed in the net during season 2018 (map by A. Augustinová).

THE RESEARCH OF DEFUNCT VILLAGES

The research of defunct villages does not have such a tradition in Central Asia as it does in Europe, and that is why the methods used are based on European – mainly Czech – works with adaptation to the local conditions (ČERNÝ 1979; ČAPEK 2011, 227–248; ČAPEK – MALINA – RYTÍŘ 2013, 183–205; KLÍR 2008; KUNA – TOMÁŠEK 2004, 237–274; MALINA 2010, 33–43; UNGER – ŠEDO – KNÁPEK 2017, 225–231; VAŘEKA *et al.* 2011, 319–342).

While researching in Europe we can interconnect the archaeological evidence with the testimony of historical and archive sources, in our study area we have to rely only on the archaeological sources.

On the other hand, the advantage of the study area is that there is almost no vegetation, while the European sites are often overgrown with dense vegetation. While in forested areas it is necessary to use the LiDAR images (e.g. GOJDA – JOHN – STRAKOVÁ 2011, 680–698; ČAPEK – MENŠÍK 2013, 99–110) for the remote sensing of the Earth's surface, which are attained by airborne laser scanning, in our study area the relicts are highly visible on the satellite imagery.

The term used in European archaeology – abandoned/defunct/deserted village – could be questionable in our case because we have no further information about the history of the study area and it could be marked simply as *site*. Nevertheless, because of the visible relicts in the terrain evocative of the layout of the site and because of the probable rural character of the place, we adhere to the term *abandoned/defunct/deserted village*.

METHOD AND RESEARCH QUESTIONS

The research was composed of several successive parts and strove to answer the series of questions listed below. After the discovery of the site and its basic surface survey in September 2017, came the first step – an evaluation of the collected finds and gained data. The next step was an analysis of the satellite imagery and an evaluation of the visible parts of the defunct village. Following this, a field survey was carried out, during which we: (1) geodetically documented the relicts in the selected part of the site, (2) described the relicts in detail, sketched and photographically documented them, (3) systematically collected the finds on the surface – (3a) in the survey net, (3b) in the area of the documented relicts, (4) measured using a GPS device the well-marked relicts in the area outside of the selected geodetically measured part, (5) evaluated the finds and gained data.



Fig. 4: The survey of Kyzyl Gul by total station by P. Cejnarová and P. Mach. On the right a prominent tomb (KG_obj005), in the middle the remains of the mosque (KG_obj016). Photo by A. Augustinová.

The timeframe for the research was limited and we tried to gather as much data as possible to answer the following research questions which we had asked in advance.

- (1) What is the extent of the defunct village?
- (2) In which period did the studied site cease to be used?
- (3) Are the visible relicts of the village connectable to the collected surface finds?
- (4) What do the visible relicts represent?

The methodology of our 2018 field survey is based on the works of Czech authors who have been dealing with the investigation of defunct villages on a long-term basis (ČERNÝ 1979; KLÍR 2008; KUNA – TOMÁŠEK 2004, 237–274), which was adapted to the local conditions and possibilities.⁴

MAP SOURCES

We used three types of satellite imagery – CORONA, Google Earth Satellite Imagery, and World Imagery (ESRI). The only available topographic map for this area (the Soviet Military topographic map created in 1983 at a scale 1:100 000) was not sufficient for the aims of the research.

The CORONA program was originally a USA military intelligence project between 1960–1972, where the first satellite capture of the Earth surface was conducted. The photographs – originally classified as top secret – were declassified on February 22, 1995 (FLOWER, 2009, 422–426) and afterwards started to be used plentifully in archaeology (e.g. PHILIP *et al.* 2002, 109–118; GHEYLE *et al.* 2003; CASANA – COTHERN 2008, 732–749; STANČO 2019). For our study area we used CORONA photograph as KH-4 B, taken during the CORONA mission 1112 on November 18, 1970, which provides imagery with a resolution ranging between 2–8 m. As can be seen on the map (Pl. 1/2 – D), the resolution was not sufficient for our aims and even the changes in the landscape were not very visible in such a narrowly defined space as the site of Kyzyl Gul was.

For our study we were best served by high-resolution images and their combination allowed the best survey of the area. The Google Maps' satellite view (Image 2019 DigitalGlobe) and World Imagery are the aerial/satellite imagery whose resolution differs in different parts of the world. For our study area the resolution is 0.65 m. With Google Maps, we can moreover compare the imagery carried out in 2005 (created on 10th July 2005; Pl. 1/2 – A) and in 2013 (created on 21th May 2013; Pl. 1/2 – B). The recognition of the surface relicts in Kyzyl Gul was realized in combination with World Imagery (Pl. 1/2 – C) and Google Maps (Pl. 1/2 – A, B).

SURVEY OF THE SATELLITE IMAGES

As the first step of the detailed survey of the abandoned village we analysed the satellite images. Based on them, we tried to trace the layout of the defunct village and draw a preliminary ground plan that we could afterwards compare with the situation in the terrain. This step could only be carried out in a period in which vegetation was absent in the area, allowing it to be observed from the satellite images.

We created several descriptive categories to express the distinctness of the presumed features. Two categories (analogical to categories used during the field survey) were determined:

4 We would like to thank Tomáš Klír (Institute of Archaeology, Charles University, Prague) for providing useful advice before the survey.

linear features (SAT_line) and features other than with a linear character (SAT_obj). Each category has three levels (L1–L3) of clarity (**Pl. 1/1**).

SAT_line-L1: highly recognizable course of the linear feature, clearly visible bends and disruptions of the line

SAT_line-L2: less recognizable, often seems to be a vague continuation of SAT_line-L1 but less visible up to almost disappearing

SAT_line-L3: poorly recognizable, probably inner division of the areas

SAT_obj-L1: completely distinct outlines

SAT_obj-L2: less distinct features with unclear outlines

SAT_obj-L3: unclear scrum of features

We recognized 82 features (L1: 9, L2: 14, L3: 59) and 94 lines (L1: 33, L2: 22, L3: 39). The map output (**Pl. 1/1**) has been complemented by the features detected in the terrain (with the accuracy of a GPS device in a mobile application), which nevertheless did not bring much new information.

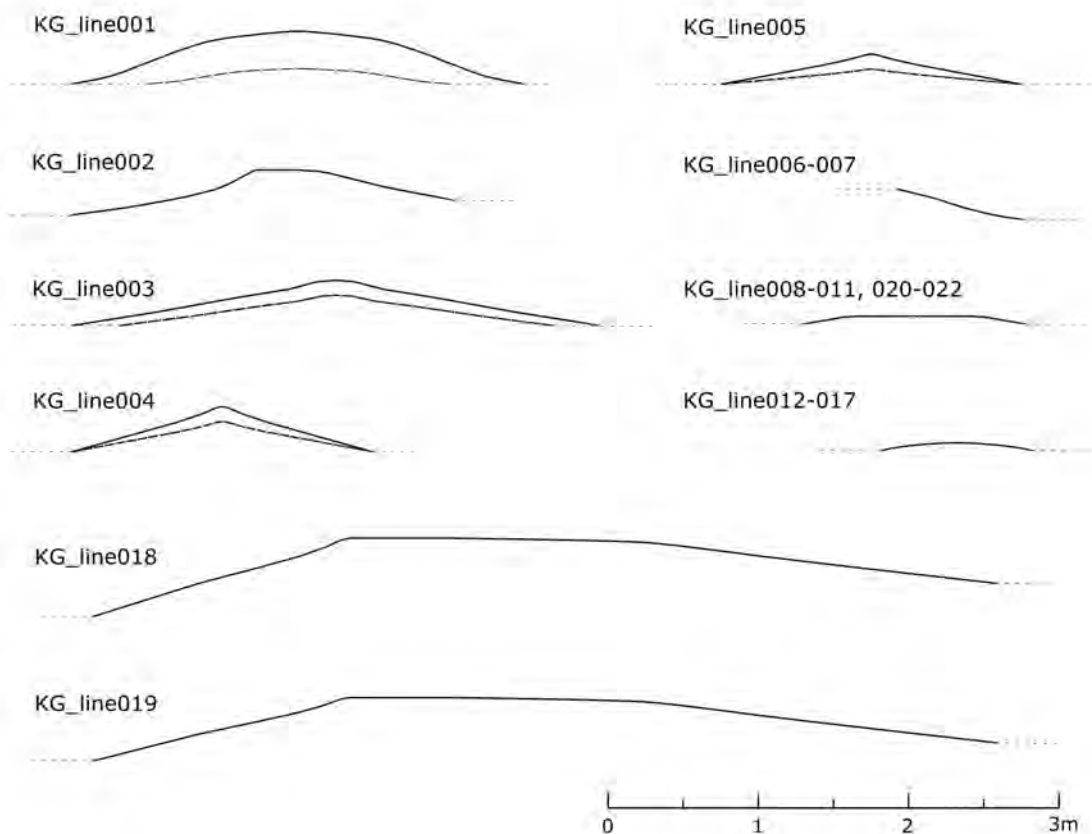


Fig. 5: Features (lines) documented during the surface survey in Kyzyl Gul (drawing by A. Augustinová).

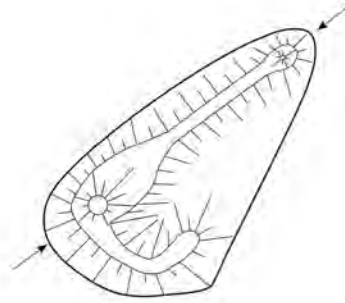
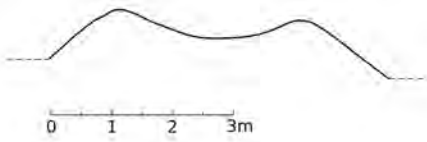
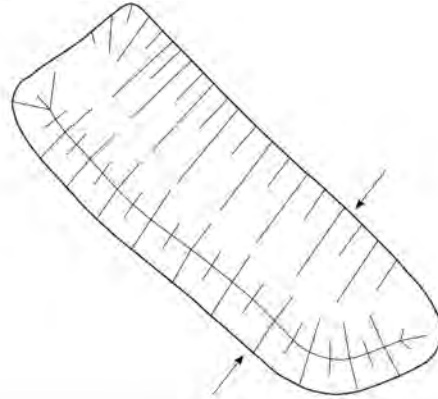
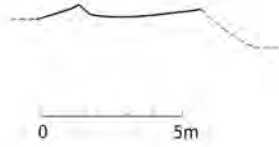
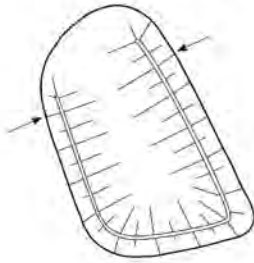
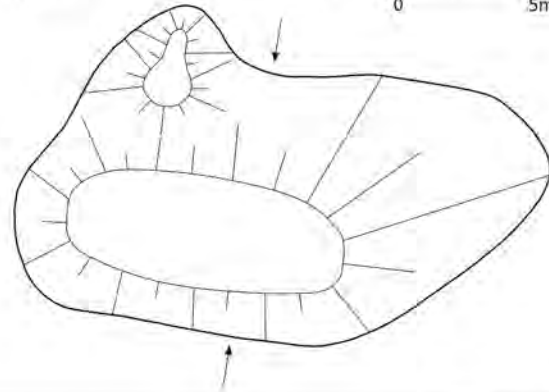
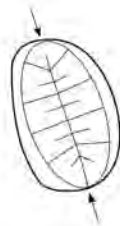
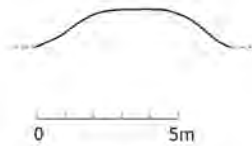
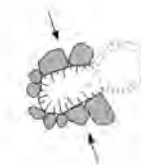
KG_obj001**KG_obj002****KG_obj003****KG_obj004****KG_obj005****KG_obj006**

Fig. 6: Features (objects) documented during the surface survey in Kyzyl Gul (drawing by A. Augustinová).

CAPTURING OF DATA IN THE TERRAIN

SURFACE SURVEY OF THE VISIBLE RELICTS

For the capture of the data in the researched area we used a total station Trimble M3 with geodetic GPS Topcon-GRS. This measurement was complemented by the less accurate recording of features in the surroundings of the main surveyed area by a GPS device (mobile phone – Xiaomi Redmi 4X using the android app Locus Map).

The recorded features were sorted into three groups: linear shapes (KG_line001-022), features with other than a linear character (KG_object001-016) and landmarks representing an open area among the lines and features (KG_spot001-004) (Pl. 1/3).

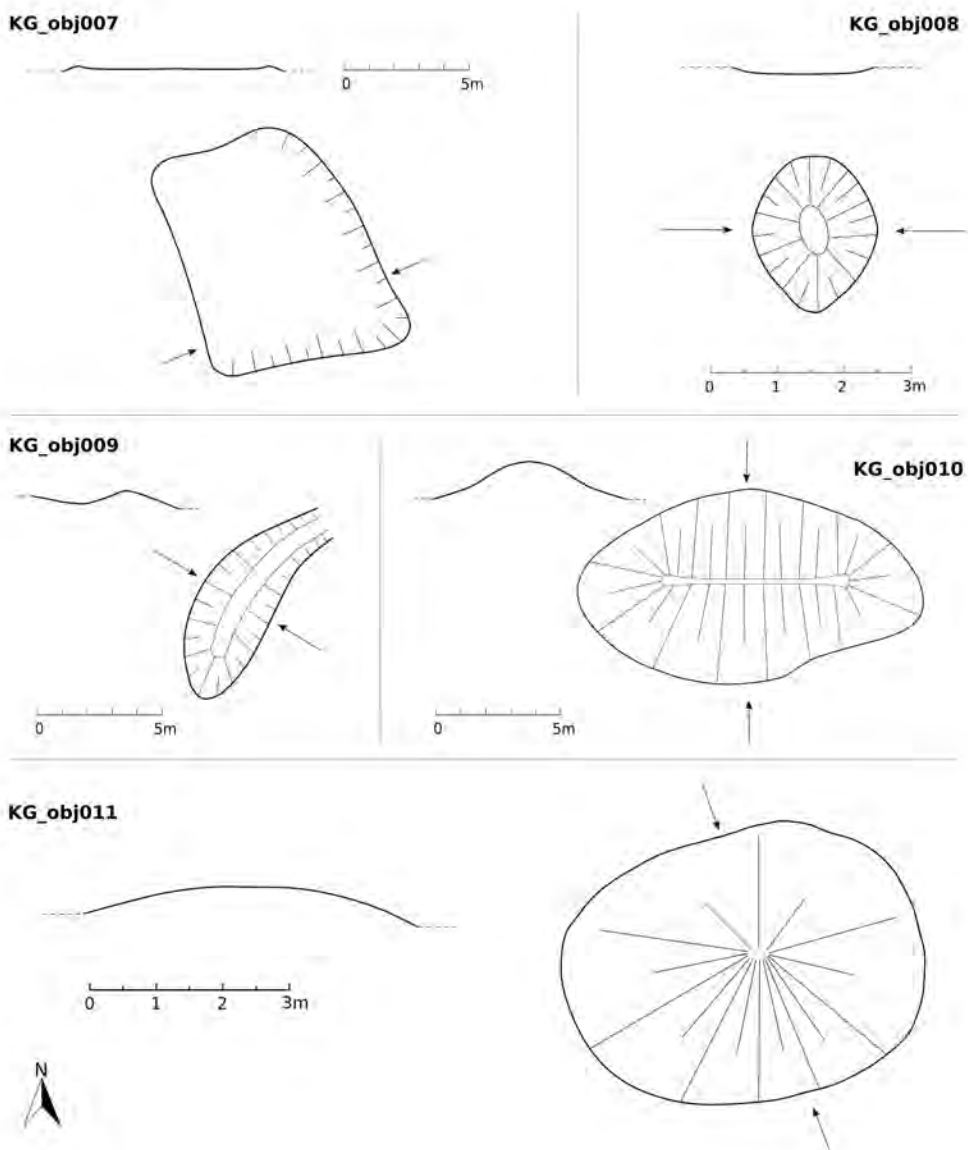


Fig. 7: Features (objects) documented during the surface survey in Kyzyl Gul (drawing by A. Augustinová).

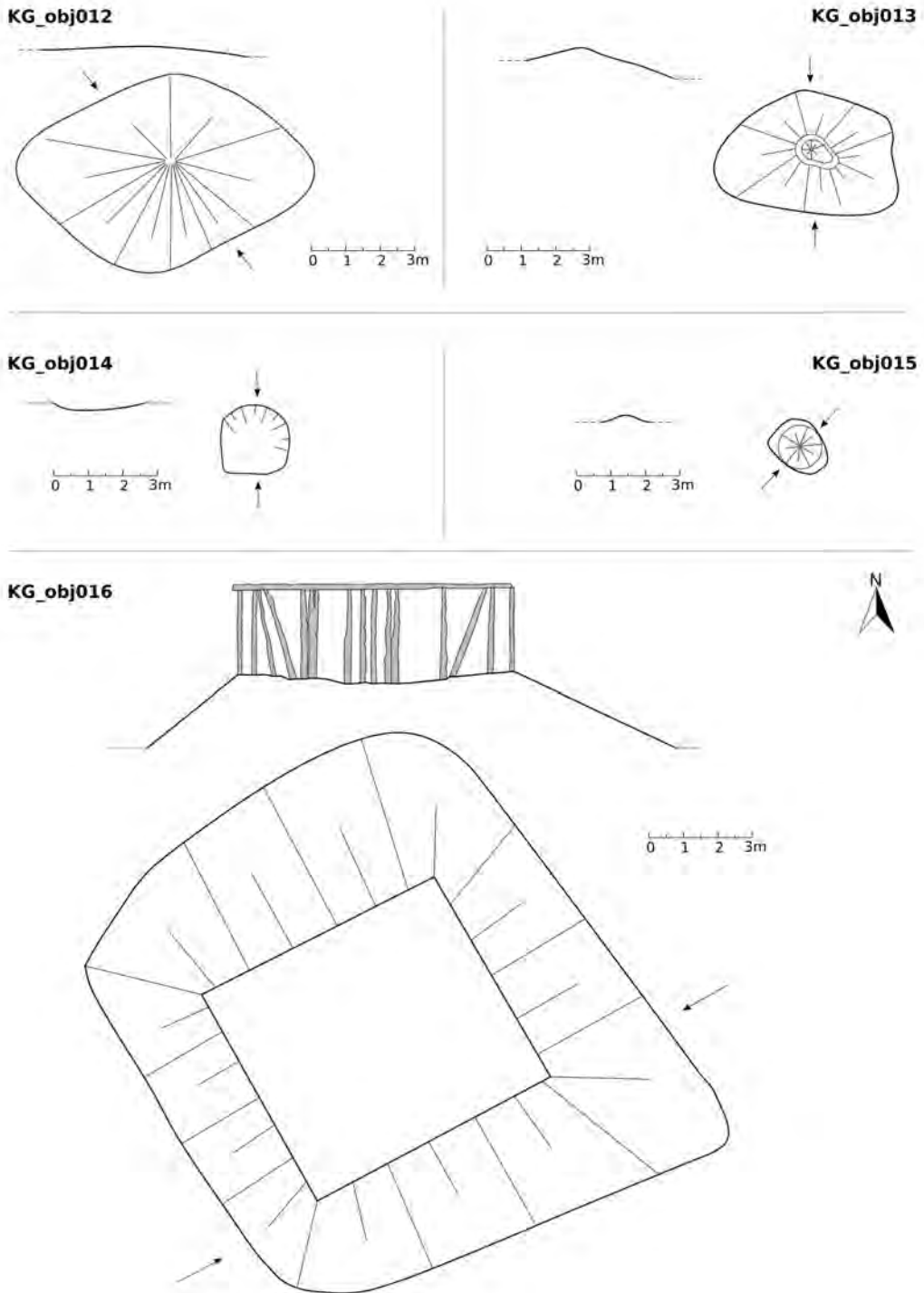


Fig. 8: Features (objects) documented during the surface survey in Kyzyl Gul (drawing by A. Augustinová).

The features were measured at several points marked on the significant spots of the features. Points were spaced 1 meter apart on average, based on the individual form of the feature.

Each of the features was documented in detail by photography, a description, and by sketch. The description is summarized in the tables for each type of feature (lines – **Tab. 1**, features – **Tab. 2**) and for the area among the features (spots – **Tab. 3**). The drawings of the documented relicts can be seen in **Fig. 5** (lines), **Fig. 6–8** (objects) and the placement of the feature layouts on the satellite imagery (**Fig. 9**).

Data post-processing

During post-processing we used a vector module *v.generalized* in the GRASS GIS by use of the graphical interface of QGIS. To achieve the best results, as the generalization algorithm we used the combination of the Hermite interpolation and Chaikin's algorithm. The algorithm creates a new polygon with the smoothest corners by cutting the corners of the original one (JOY 1999, 1–2). It calculates a more accurate shape of the measured features and the distortion of the real shape is minimal.

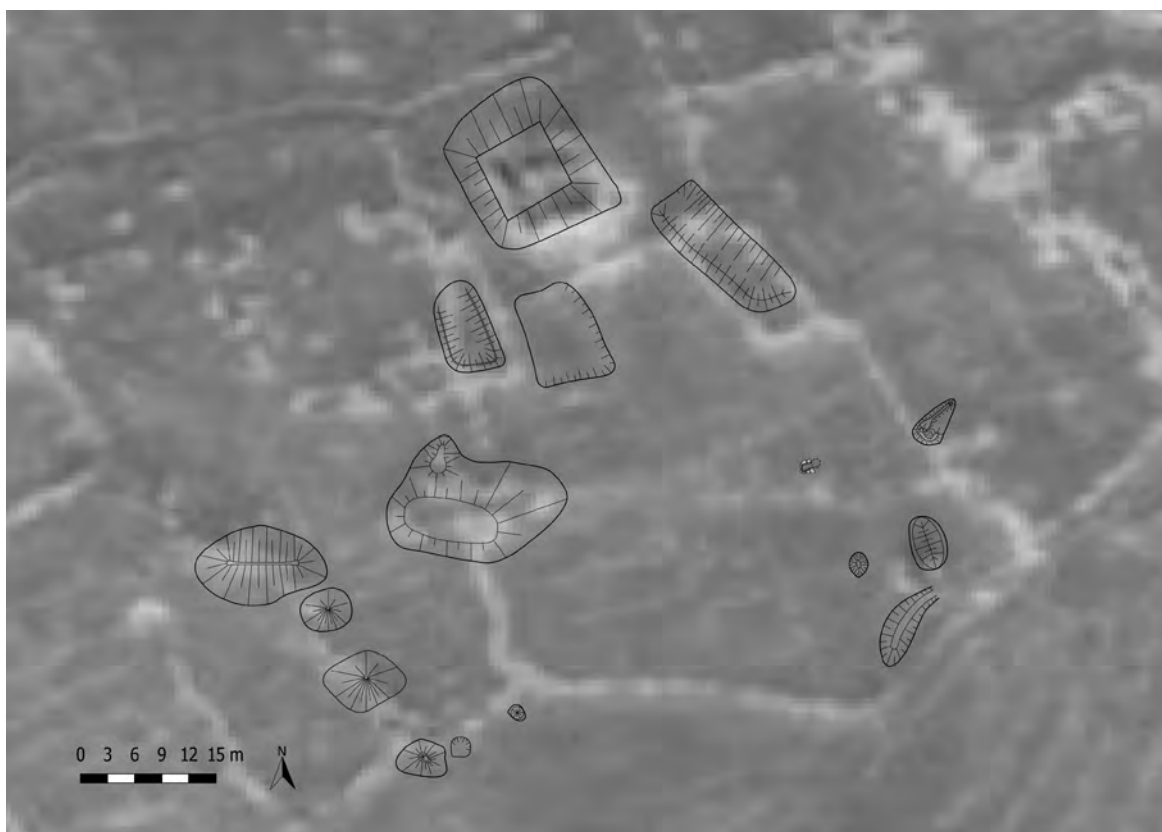


Fig. 9: Placement of the feature layout on the satellite imagery (map by A. Augustinová).

SYSTEMATIC SURFACE SURVEY

The next part of the field survey was a systematic collection of the surface finds. It was undertaken in two steps. Firstly, the survey was carried out in the demarcated square net, where the pickers walked along the circumference of the squares. In the second step, all the material found inside the demarcated squares was collected and assigned to features visible on the surface (line/object/spot). The purpose of the second step was to collect all the finds visible on the surface and get a representative sample from the whole study area. The positions of finds were recorded in relation to the area of the measured features and spots.

Surface survey in the net

The usual method used for the surface survey is based on the collection of finds inside the squares and on the consequent evaluation of the finds as a complete set bounded by the area of the square (KUNA 2004, 305–350; TUŠLOVÁ 2012, 15–21; TUŠLOVÁ 2019). It is suitable for extensive areas, where the exact spot of a find does not play such a significant role. For our intentions another method appears to be better suited – a surface survey along the lines of a square net. This method was inspired by the surface survey of a Medieval metallurgical centre in the Czech-Moravian Highlands (HRUBÝ *et al.*, in print).⁵ It allows one to capture the exact placement of finds, which is necessary in a much smaller area without a large quantity of finds, as was the case of the studied site and there is no space distortion during the evaluation of finds in contrast to the surface survey inside the polygons.

We delimited 19 squares (20×20 m) with a line stretching to the north-west, which covered an area of 7,600 m² (+ 40 m along the line to the north-west). The survey was realized by walking in lines on the circumference of the delimited squares. The picker walked along the lines two times and observed a strip of 2 m (1 m on both sides of the line). Each find was recorded by total station and registered in evidence as a unique find (**Pl. 1/4**).

During the surface survey in the net we collected 72 ceramic fragments (17 were not possible to date, 1 frg. belongs to the Bronze Age, 2 frgs. belong to the Kushano-Sasanian Period, 41 frgs. to the Early Middle Ages, 3 frgs. to the High Middle Ages, 2 frgs. to the Late Middle Ages and 6 frgs. to the Pre-Modern Period), (**Figs. 10–11**).

Surface survey inside the measured features

In the area that was not covered by the survey in the net, a surface survey inside the measured features was conducted in order to cover the whole researched area.

In total, 68 pottery fragments were collected (3 frgs. were not possible to date, 6 frgs. belonged to the Bronze Age, 3 frgs. to the Late Kushan Period, 39 frgs. to the Early Middle Ages, 2 frgs. to the High Middle Ages, 1 frg. to the Late Middle Ages and 14 frgs. to the Pre-Modern Period). Analogically to the survey in the net the predominant number of finds came from the Early Middle Ages.

5 I would like to thank Matěj Kmošek, who brought me towards the idea of using the mentioned method during our survey and explained its principles to me.

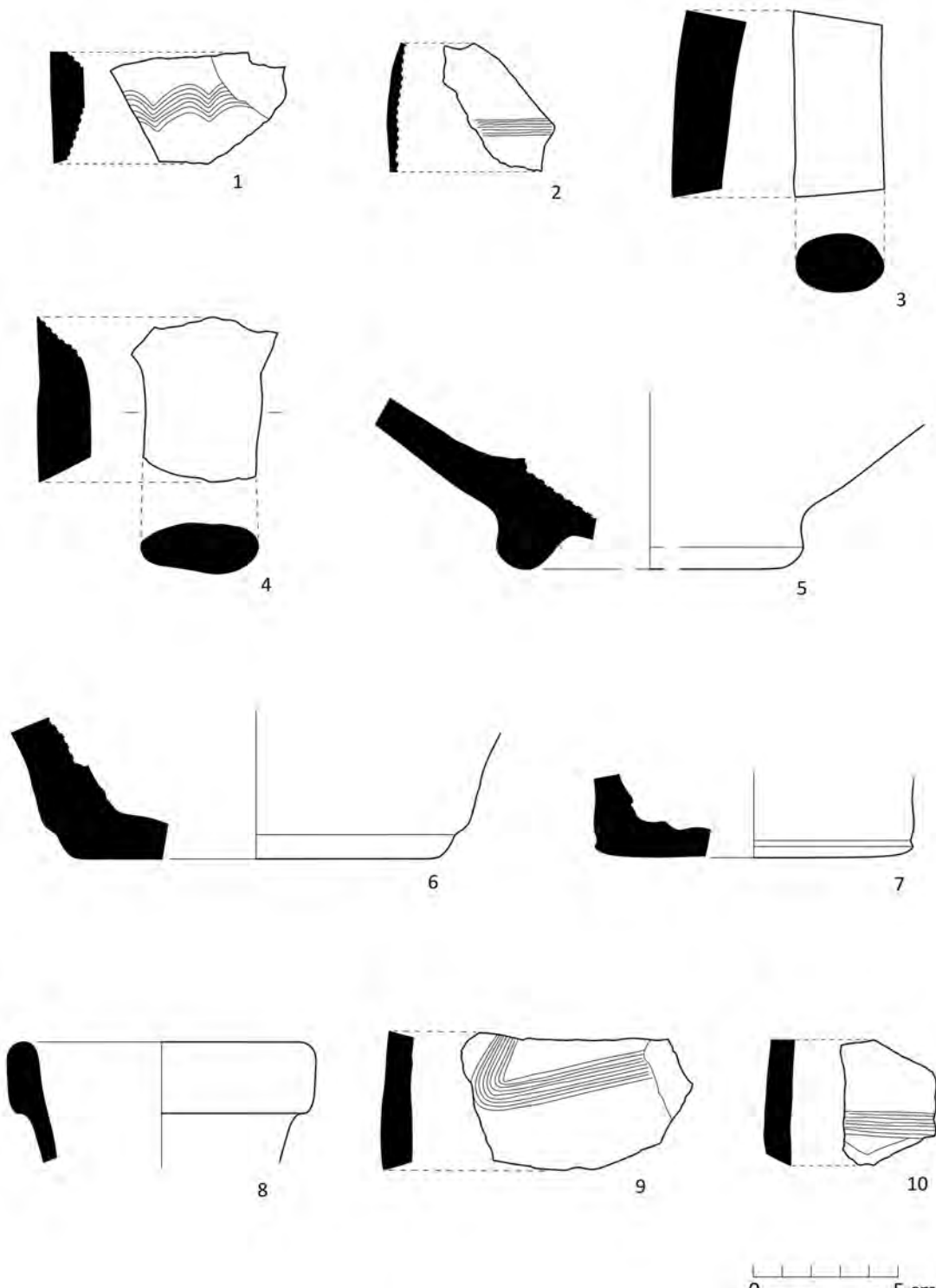


Fig. 10: Pottery fragments from the surface survey in Kyzyl Gul. Findspot and dating: 1-10 - Survey net; 1-7 - Early Middle Ages (5th-6th c.), 8-10 - High Middle Ages (12th c.). Drawing by L. Damašek and P. Mach.

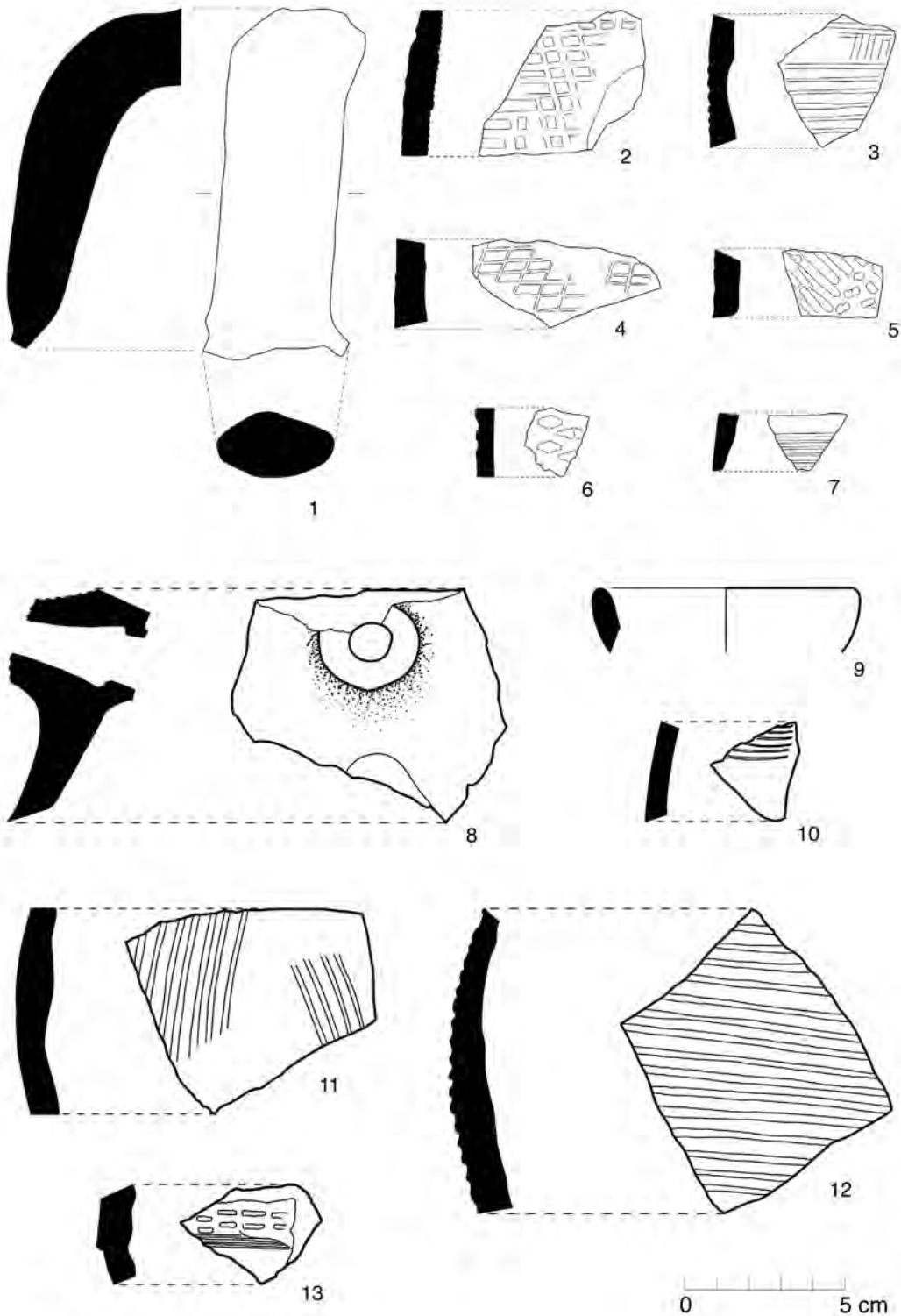


Fig. 11: Pottery fragments from the surface survey in Kyzyl Gul. Findspots and dating: 1-7 - Survey net: 1 - Late Middle Ages (17th c.), 2-6 - Pre-Modern (18th-19th c.), 7 - undated/not classified; 8 - Line (KG_line019), Early Middle Ages (5th-6th c.); 9-13 - Line (KG_line001): 9 - Early Middle Ages (5th-6th c.), 10 - High Middle Ages (12th c.), 11-13 - Pre-Modern (18th-19th c.). Drawing by L. Damašek, P. Mach, P. Cejnarová, and M. Mrva.

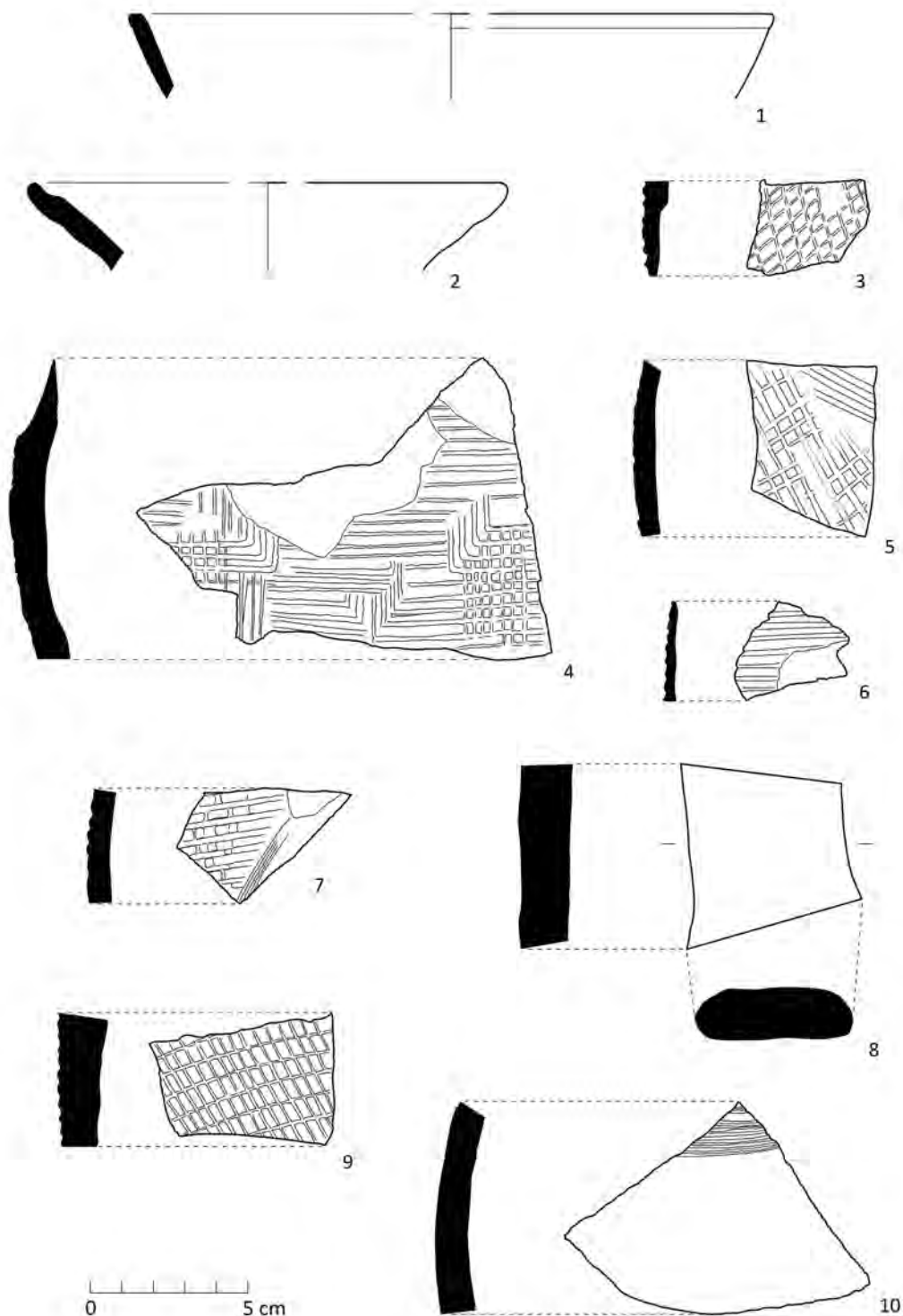


Fig. 12: Pottery fragments from the surface survey in Kyzyl Gul. Findspots and dating: 1-7 - Features (1, 4, 6 - KG_obj001; 2 - KG_obj010; 3, 7 - KG_obj003; 5 - KG_obj004): 1 - Late Kushan Period (3th-4th c.), 2 - Late Middle Ages (17th c.), 3-7 - Pre-Modern (18th-19th c.); 8-10 - Spots (8 - KG_spot001, 9 - KG_spot003, 10 - KG_spot004): 8, 9 - Early Middle Ages (5th-6th c.), 10 - High Middle Ages (12th c.). Drawing by L. Damašek, P. Mach, P. Mach, and M. Mrva.

EVALUATION OF THE SURVEY

One of the goals of the research was to find out what – in terms of the topography of the site – we could deduce only from the satellite imagery for which the site is highly visible thanks to the absence of vegetation, and, to learn what kind of additional information the terrain survey could bring us.

The evaluation of the satellite imagery allowed us to see the site as a whole and we could map it in its entirety, but not in detail. It brings us the basic layout of the features and their basic character. It appears that most of the features on the satellite imagery correspond with the survey which mapped the complete layout of the village conducted with a GPS device (tourist/mobile app; several additional parts can be seen in **Pl. 1/1**). Some of the features are moreover more easily recognizable on the satellite imagery than in the terrain, where their spatial relation to other features cannot be seen, but there is only a tangle of undefined walls visible.

The survey in the field could – due to the limited time available – cover only a selected part of the site but it provides us with more precise results of measurement, brought very accurate data, and – of course – enriched the available data with the collected surface finds, which is the only means of establishing the proper dating of the site. Moreover, the detailed on-site exploration of each feature provided an exact idea of their appearance, which could be decisive for their correct interpretation.

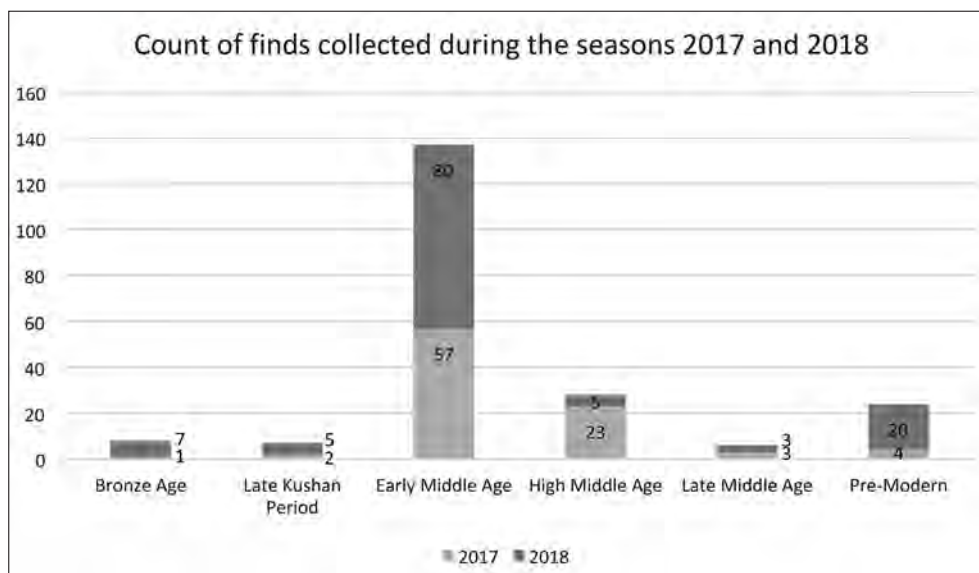


Fig. 13: Number of finds collected during the seasons 2017 and 2018 at Kyzyl Gul.

EVALUATION OF THE FINDS

Among the finds collected during the survey (2017, 2018) there were only pottery fragments. In total, we have collected 247 ceramic fragments during our survey in the area of the defunct village (95 frgs. in the season 2017, and 152 frgs. in the season 2018; **Fig. 13**). As can be seen in the graph (**Fig. 14**), the unambiguously most frequently represented material in the site belongs to the Early Middle Ages (65 % of finds). The High Middle Ages (14 %) is represented by a similar quantity to the Pre-Modern Period (11 %). The other periods are represented

rather rarely, i.e. by individual pottery fragments only – Bronze Age (4 %), Late Middle Ages (3 %) and Late Kushan Period (3 %). Nevertheless, the High Middle Ages finds scatter as well as the Pre-Modern ones are not situated in the central area of the village but rather to the south-east (**Pl. 1/4**).

The presence of the Bronze Age ceramic fragments could be caused by the transfer of the fragments from the nearby site of KuPi_072, equally the pottery of the High Middle Ages might have spread from the sites of KuPi_072 and KuPi_073.

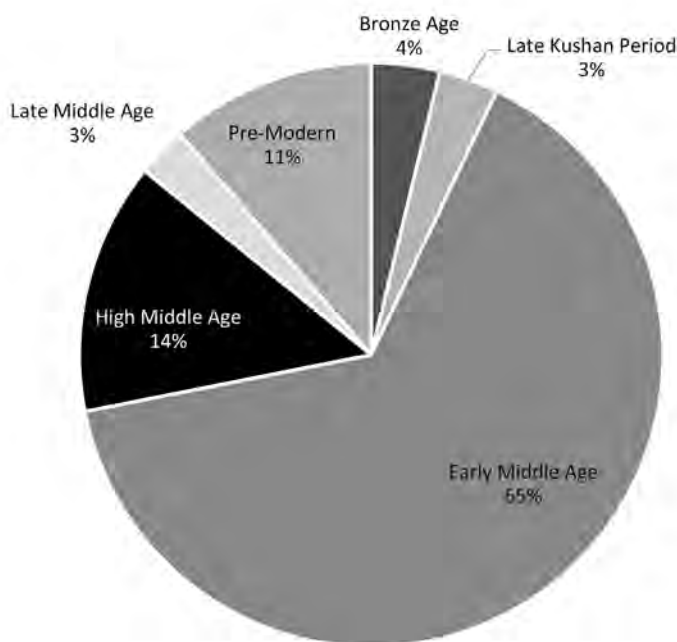


Fig. 14: Percentage representation of individual periods of finds collected at Kyzyl Gul.

CONCLUSION

In the summer of 2018, a surface survey was conducted at the site of Kyzyl Gul based on the detailed position/spatial measurement of the visible relicts in the terrain and on the collection of finds scattered across the surface. During the field survey a selected part of the site was studied in detail and on the north-west part of the survey area the density of finds descends to zero (**Pl. 1/4** – zone to the north-west of the points BC, AC).

The high visibility of terrain structures makes one think that the site represents a residue from the not too distant past. Among the finds, however, ceramic fragments belonging to the Early Middle Ages (5th–6th century) strongly predominate, while the later periods, such as the High- and Late Middle Ages, as well as Pre-Modern Period are not that numerous (**Pl. 1/4**, **Fig. 14**). However, the remains of the mosque, which is the most significant component and visual focus of the site (**Fig. 4**), is not likely to be connected with the Early Medieval phase of the site, since the Islam religion spread into Central Asia only during the 8th century, when Arab campaigns from the Near East conquered this area (ARSHAVSKAYA *et al.* 1982, 24–26). Despite the presence of a prominent tomb (KG_obj005) and the mosque, it does not seem likely that the area was used as a burial ground. Although the area between the prominent tomb

and mosque indicates a site of division (KG_spot001) there is nothing apparently reminiscent of a burial ground (soil/stone mounds, stone oval/square structure visible on the surface).

Therefore, we are still not able to clearly answer the question whether the finds collected on the surface can be linked with the relicts visible on the surface. Further research is necessary to clarify this issue.

Searching for analogies for the above described site is very difficult and accordingly also the interpretation of the relicts is complicated. As was mentioned at the beginning of this work, the surface survey of the relicts does not have a tradition in Central Asia and all research of archaeological sites are realized by their excavations. As for the Early Medieval Period, the research has so far been focused mainly on larger sites.

The most common type of settlement in rural areas were isolated homesteads, small castles, and castles with an adjacent built-up area surrounded by a wall, such as Kuyev Kurgan near Zartepa (ANNAEV 1988, 12–13, 74) or Babatepa and other sites in its hinterland (NEMTSEVA 1989, 132–162). We can also consider the relation between Kyzyl Gul and two sites (KuPi_072 and KuPi_073) to the north-east.

This report summarizes the data collected during the research and their interpretation and a thorough evaluation in the broader context of similar sites will consequently be prepared.

ACKNOWLEDGMENTS

The work was supported by the European Regional Development Fund-Project „Creativity and Adaptability as Conditions of the Success of Europe in an Interrelated World“ (No. CZ.02.1.01/0.0/0.0/16_019/0000734).

Relict ID	Date, author (acronym)	No. of spots	Type	Length (m)	Width (m)	Height (m)	Layout description	Feature description	Surface shape	Orientation	Neighboring area	Drawing
KG_line001	21.09.18 PM-AA	19	linear	76	2-3	0.1-0.35	twice curved	concave slightly falling sides	bulging	N-S (16m), W-E (38m), SW-NE (22m)	runs from KG_obj004 and defines the area KG_spot001 on the west and south side	Fig. 5
KG_line002	21.09.18 PM-AA	3	linear	8	2.5-3	0.2-0.3	once curved	convex to plane slightly falling sides, the upper part of feature is plane caused by erosion	bulging	N-S (3m), SE-NW (5m)	follows up the KG_line001 and ends in KG_obj001	Fig. 5
KG_line003	21.09.18 PM-AA	3	linear	5	3-3.5	0.2-0.3	straight	convex to plane slightly falling sides	bulging	SE-NW	runs from KG_obj001 in the direction of KG_obj002	Fig. 5

Relict ID	Date, author (acronym)	No. of spots	Type	Length (m)	Width (m)	Height (m)	Layout description	Feature description	Surface shape	Orientation	Neighboring area	Drawing
KG_line004	21.09.18 PM-AA	3	linear	8.3	2	0.2-0.3	slightly curved from the SW to the NE	convex slightly falling sides	bulging	SW-NE	continuation of the KG_line005	Fig. 5
KG_line005	21.09.18 PM-AA	2	linear	4.2	2	0.1-0.2	straight	convex slightly falling sides	bulging	SW-NE	continuation of the KG_line004	Fig. 5
KG_line006	22.09.18 PM-PC-AA	8	linear	35.5	×	0.2	straight	borderline among two areas - north lying is 0.2 m above the south lying	stair	W-E	borderline among two areas - KG_spot001 and KG_spot002	Fig. 5
KG_line007	22.09.18 PM-PC-AA	6	linear	22	×	0.2	straight	borderline among two areas - north-west lying is 0.2 m above the south-east lying	stair	SW-NE	borderline among two areas - KG_spot002 and KG_spot003	Fig. 5
KG_line008	22.09.18 PM-PC-AA	4	linear	12	1.5	0.05	once curved	flat top (w.1m) of the line with slightly falling sides	bulging	NW-SE (4m), W-E (8m)	the inner division of the area KG_spot002	Fig. 5
KG_line009	22.09.18 PM-PC-AA	4	linear	9.5	1.5	0.05	once curved	flat top (w.1m) of the line with slightly falling sides	bulging	W-E (7m), S-N (2.5m)	the inner division of the area KG_spot003	Fig. 5
KG_line010	22.09.18 PM-PC-AA	4	linear	11	1.5	0.05	straight	flat top (w.1m) of the line with slightly falling sides	bulging	W-E	the inner division of the area KG_spot003	Fig. 5
KG_line011	22.09.18 PM-PC-AA	2	linear	1.5	1.5	0.05	straight	flat top (w.1m) of the line with slightly falling sides	bulging	N-S	the inner division of the area KG_spot003, neighbours with KG_obj007	Fig. 5

Relict ID	Date, author (acronym)	No. of spots	Type	Length (m)	Width (m)	Height (m)	Layout description	Feature description	Surface shape	Orientation	Neighboring area	Drawing
KG_line012	22.09.18 PM-PC-AA	15	linear	48.7	1	0.05	branched line, the main line (N-S) with one long branch (on the east side) and three shorter branches (two on the west, one on the east)	concave shape	bulging	N-S (main line -21m), E-W (branch -4.5m), W-E (branch 15.2m), E-W (branch 5.5 m), W-E (branch 2.5m)	the inner division of the area KG_spot001	Fig. 5
KG_line013	22.09.18 PM-PC-AA	4	linear	8	1	0.05	once curved	convex shape with one less distinct branch runs from the line curve	bulging	SE-NW(3.5m), E-W (4.5m)	the inner division of the area KG_spot001	Fig. 5
KG_line014	22.09.18 PM-PC-AA	9	linear	33.8	1	0.05	branched line, the main line (N-S) with one short branch (on the west side) and two longer branches (one on the west, one on the east)	concave shape	bulging	N-S (main line-14.5m), E-W (branch -1.3m), E-W (branch -9m), W-E (branch 9m)	the inner division of the area KG_spot001	Fig. 5
KG_line015	22.09.18 PM-PC-AA	2	linear	5.6	1	0.05	straight, indistinct	concave shape	bulging	W-E (main line -12.5m -3m on the east are less distinct), S-N (branch -4.5m)	the inner division of the area KG_spot001	Fig. 5
KG_line016	22.09.18 PM-PC-AA	5	linear	16.7	1	0.05	branched line, the main line (W-E) with one branch (on the north side), line continues on the east side less distinct at a length 2.8 m in the NE direction	concave shape	bulging	W-E (main line 9.4m), S-N (branch 4.5m)	the inner division of the area KG_spot001	Fig. 5
KG_line017	22.09.18 PM-PC-AA	3	linear	5.3	1	0.05	once curved	concave shape	bulging	S-N (3.5m), W-E (1.8m)	the inner division of the area KG_spot001	Fig. 5

Relict ID	Date, author (acronym)	No. of spots	Type	Length (m)	Width (m)	Height (m)	Layout description	Feature description	Surface shape	Orientation	Neighboring area	Drawing
KG_lineo18	22.09.18 PC-AA	7	linear	24.5	6	0.3-0.5	straight	Slightly concave on the east and convex on the west, slightly falling sides, the upper part of feature is plane caused by erosion	bulging	NW-SE	line between objects KG_objo10 and KG_objo13, the objects KG_objo11 and KG_objo12 lie on this line	Fig. 5
KG_lineo19	22.09.18 PC-AA	4	linear	8.5	6	0.3-0.4	straight	concave on the north side and convex on the south side, slightly falling sides, the upper part of feature is plane caused by erosion	bulging	SW-NE	runs from KG_objo14 in the NE direction to the KG_lineo01, the object KG_objo15 lies on this line	Fig. 5
KG_lineo20	22.09.18 PC-AA	2	linear	6.2	1.5	0.05	straight	concave shape	bulging	SW-NE	the inner division of the area KG_spot004	Fig. 5
KG_lineo21	22.09.18 PC-AA	4	linear	17.7	1.5	0.05	line runs in the shape of unfinished rectangle with sides 7×3.7 m and with a missing west side	concave shape	bulging	SW-NE (7m), NW-SE (3.7m), NE-SW (7m)	the inner division of the area KG_spot004	Fig. 5
KG_lineo22	22.09.18 PC-AA	9	linear	20.4	1.5	0.05	line runs in shape of unfinished rectangle with branches	concave shape	bulging	SW-NE (5m), NW-SE (4.7m), NE-SW (3.7m), SE-NW (3m), SW-NE (2 branches from west side-2m)	the inner division of the area KG_spot004	Fig. 5

Tab. 1: The detailed description of the features – lines – documented in Kyzyl Gul.

Relict ID	Date, author (acronym)	No. of spots	Type	Length (m)	Width (m)	Height (m)	Area (m ²)	Layout description	Surface shape	Orientation	Neighboring area	Drawing
KG_obj001	21.09.18 PM-AA	4	not-linear	6.3	3.4	0.9-1.3	15.1	unfinished rectangle open to the east, in the NW and NE corners are hummocks	bulging	SW-NE	KG_line002 adjacent on S, KG_line003 adjacent on N	Fig. 6
KG_obj002	21.09.18 PM-AA	10	not-linear	18.3	6.6	0.5-1.5	122.5	rectangular layout, highly visible, circumference formed by linear unbroken hump (most marked on the SW - h. 0.4m), inner space slightly sloping to the SW	bulging	SE-NW	the mosque on the NW, similar to KG_obj003	Fig. 6
KG_obj003	21.09.18 PM-AA	5	not-linear	10.6	5.7	0.2-0.6	28.9	rectangular layout, circumference formed by linear hump on W, S, E and less marked on N, inner space is flat, object is elevated above the surrounding terrain	bulging	SE-NW	the mosque on the NE, similar to KG_obj002	Fig. 6
KG_obj004	22.09.18 PM-PC-AA	16	not-linear	16.6	12	1.1	207.6	oval layout hummock with spur spreads to N, rugged surface, top flat is slightly sunken	bulging	W-E	KG_line001 adjacent on S, KG_line006 (the border line between KG_spot001 and 002) adjacent on E	Fig. 6
KG_obj005	22.09.18 PM-PC-AA	8	not-linear	6.7	6.5	1.2	33.6	oval layout hummock, surface covered by stones (up to 20 cm), surrounded by an old fence	bulging	SW-NE	isolated	Fig. 6
KG_obj006	22.09.18 PM-PC-AA	5	not-linear	1.4	1.4	0.2	1	a small ring composed of (6 stones up to 30 cm and 5 stones up to 10 cm) embedded in clay, disruption - one stone (on the N) removed and the inner area dug out	bulging	circular	isolated	Fig. 6
KG_obj007	22.09.18 PM-PC-AA	10	not-linear	12.1	7.8	0.2	92.5	rectangular layout, circumference formed by less visible linear hump, flat inner area with no marked lowering	bulging	SE-NW	in the NW corner of KG_spot003, on W in vicinity of KG_obj003	Fig. 7

Relict ID	Date, author (acronym)	No. of spots	Type	Length (m)	Width (m)	Height (m)	Area (m ²)	Layout description	Surface shape	Orientation	Neighboring area	Drawing
KG_obj008	22.09.18 PM-PC-AA	12	not-linear	3.3	2.1	0.1	3.9	oval depression with flat bottom	sunken	S-N	isolated	Fig. 7
KG_obj009	22.09.18 PM-PC-AA	16	not-linear	10.7	3.8	0.3-0.7	24.5	oval slightly curved to the E depression with U-shaped bottom, open on the E and continues as a canal	sunken	SW-NE	KG_line001 adjoins on the SE, the object continues on the E as canal	Fig. 7
KG_obj010	22.09.18 PC-AA	9	not-linear	12.8	9.7	1.5	105.7	oval layout hummock	bulging	W-E	KG_line018 adjacent, similar to KG_obj004 situated 8m to the E	Fig. 7
KG_obj011	22.09.18 PC-AA	6	not-linear	5.3	5	0.4-0.6	24.7	oval layout hummock	bulging	W-E	similar to KG_obj012, lies on KG_line018	Fig. 7
KG_obj012	22.09.18 PC-AA	8	not-linear	7	5.9	0.1-0.3	45.7	oval layout hummock	bulging	W-E	similar to KG_obj011, lies on KG_line018	Fig. 8
KG_obj013	22.09.18 PC-AA	7	not-linear	4.7	4.3	0.4-0.9	20.5	oval layout hummock	bulging	W-E	KG_line018 adjacent on N, KG_obj014 adjacent on E	Fig. 8
KG_obj014	22.09.18 PC-AA	5	not-linear	2.8	2.6	0.2	4.6	circular depression, open to the E	sunken	circular	KG_obj013 adjacent on W, KG_line019 adjacent on NE	Fig. 8
KG_obj015	22.09.18 PC-AA	5	not-linear	2.1	1.4	0.2	2.6	oval layout hummock	bulging	SE-NW	similar to KG_obj011 and KG_obj012, lies on KG_line019	Fig. 8
KG_obj016	22.09.18 PC-AA	7	not-linear	8.4	8.4	5.1	188.5	square wooden remains (h. 2.9m) of old mosque on the hummock (h. 2.2m)	bulging	SW-NE	lines KG_line004 and KG_line005 on the S side	Fig. 8

Tab. 2: The detailed description of the features - objects - documented in Kyzyl Gul.

Relict ID	Date, author (acronym)	Type	Area (m ²)	Layout	Demaration	Description
KG_spot001	22.09.18 PM-PC-AA	area	1279	pentagonal	bordered by KG_line001 on the W, S, SE, by KG_line002 on the E, by KG_line006 on the N, by KG_obj004 on the NW corner	probably area with dominant prominent tomb in SE corner, with no visible remains of ordinary graves, in the E part of area near the prominent tomb are two sunken objects – one (KG_obj009) probably served as a water tank because it's adjusted to the water canal, W and central part is covered by low less visible steady lines (KG_line012-016)
KG_spot002	22.09.18 PM-PC-AA	area	288	triangular	bordered by KG_line006 on S, by KG_obj001 and KG_line003 on E, by KG_line007 on NW	triangular area 0.2m above the south lying area KG_spot001
KG_spot003	22.09.18 PM-PC-AA	area	837	rugged	bordered by KG_line006 and KG_line007 on S, by KG_obj002 on NE, by KG_line004 and KG_line005 on N, by KG_obj003 and KG_obj004 on W	rugged area 0.4 m above KG_spot001
KG_spot004	22.09.18 PM-PC-AA	area	426	trapezoidal	bordered by KG_line018 with objects KG_obj011 and KG_obj012 on W, by KG_obj013 in SW corner, by KG_line019 on SE, by KG_line001 on E, by KG_obj004 on NE corner and by KG_obj010 on NW corner	trapezoid area covered by less visible steady lines (KG_line020-022)

Tab. 3: The detailed description of the areas - spots - among the features in Kyzyl Gul.

BIBLIOGRAPHY

- ANNAEV 1988 = Аннаев, Т.: *Раннесредневековые поселения северного тохаристана*. Ташкент.
- AUGUSTINOVÁ *et al.* 2015 = Augustinová, A. – Stančo, L. – Shaydullaev, Sh. – Mrva, M. 2015: Archaeological Survey in the Micro Oasis of Zarabag (South Uzbekistan), Preliminary Report for the Season 2015. *Studia Hercynia* XIX/1–2, 262–281.
- AUGUSTINOVÁ *et al.* 2017 = Augustinová, A. – Stančo, L. – Damašek, L. – Khamidov, O. – Kolmačka, T. – Shaydullaev, Sh. 2017: Archaeological Survey in the Oases of Maydon and Goz in the Piedmont of the Kugitang Mountains (South Uzbekistan) – Preliminary report for season 2017. *Studia Hercynia* XXI/2, 139–159.
- ARSHAVSKAJA *et al.* 1982 = Аршавская, З.А. – Ртвеладзе, Е.В. – Хакимов, З.А.: *Средневековые памятники Сурхандарьи*. Ташкент.
- CASANA, J. – COTHREN, J. 2008: Stereo analysis, DEM extraction and orthorectification of CORONA satellite imagery: archaeological applications from the Near East. *Antiquity* 82, 732–749.
- ČAPEK, L. – MENŠÍK, P. 2013: Letecké laserové skenování a jeho využití ke studiu archeologických nemovitých památek v lesním komplexu Bezinský na katastru obce Rataje (okr. Tábor) [Airborne Laser Scanning

- and its use for the study of archaeological features in the forested complex of Bezinský in Rataje cadastral area (Tábor region)]. In: M. Gojda – J. John *et al.* (eds.): *Archeologie a letecké laserové skenování krajiny*. Plzeň, 99–110.
- ČAPEK, L. 2011: Dvě zaniklé středověké vesnice ve Velechvínském polesí, okr. České Budějovice [Zwei verschwundene mittelalterliche Dörfer im Velechvínér Wald, Kr. České Budějovice]. *Archeologické výzkumy v jižních Čechách* 24, 227–248.
- ČAPEK, L. – MALINA, O. – RYTÍŘ, L. 2013: Jenišovice (okr. Písek). Výzkum zaniklé středověké vesnice na základě prostorové distribuce keramiky [Jenišovice (Kr. Písek). Erforschung eines untergegangenen mittelalterlichen Dorfes mit Hilfe von Oberflächenprospektionen]. *Archeologické výzkumy v jižních Čechách* 26, 183–205.
- ČERNÝ, E. 1979: *Zaniklé středověké osady a jejich plužiny. Metodika historickogeografického výzkumu v oblasti Dražanské vrchoviny*. Praha.
- FLOWER, M. 2009: Military photos help archaeologists – Corona mission declassified. *Spaceflight* 51, 422–426.
- GHEYLE *et al.* 2003 = Gheyle, W. – Trommelmans, R. – Bourgeois, J. – Goossens, R. – Bourgeois, I. – de Wulf, A. – Willems, T.: Evaluating CORONA. A case study in the Altai Republic (South Siberia). *Antiquity* 77, 391–403.
- GOJDA, M. – JOHN, J. – STRAKOVÁ, L. 2011: Archeologický průzkum krajiny pomocí leteckého laserového skenování. Dosavadní průběh a výsledky prvního českého projektu [Archaeological survey of landscape by means of airborne laser scanning. Interim report upon the first Czech project]. *Archeologické rozhledy* LXIII, 680–698.
- HRUBÝ *et al.*, v tisku = Hrubý, P. – Kmošek, M. – Košťál, M. – Malý, K. – Milo, P. – Těsnohlídek, J.: Metalurgická infrastruktura středověkého důlního centra Buchberg na Českomoravské vrchovině: k poznání produkce kovů ve státě posledních Přemyslovců. *Archeologické rozhledy*.
- JOY, K.I. 1999: Chaikin's Algorithms for Curves, On-Line Geometric Modelling Notes. Davis.
- KARMYSHOVA 1976 = Кармышева, Б.Х.: *Очерки этнической истории южных районов Таджикистана и Узбекистана*. Москва.
- KLÍR, T. 2008: *Osídlení zemědělsky marginálních půd v mladším středověku a raném novověku* [The settlements and agriculture of the margins in the later middle age and early new age]. Doctoral thesis defended at the Institute of Archaeology, Faculty of Arts, Charles University, on September 17th, 2008. Prague.
- KUNA, M. 2004: Povrchový sběr. In: M. Kuna (ed.): *Nedestruktivní archeologie – teorie, metody a cíle* [Non-destructive archaeology – theory, methods and goals]. Praha.
- KUNA, M. – TOMÁŠEK, M. 2004: Povrchový výzkum reliéfních tvarů. In: M. Kuna (ed.): *Nedestruktivní archeologie – teorie, metody a cíle* [Non-destructive archaeology – theory, methods and goals]. Praha.
- MALINA, O. 2010: Samostatně stojící kostel jako doklad transformace osídlení. Možnosti archeologie a GIS [Alleinstehende Kirche als Beweis der geänderten Besiedlung. Möglichkeiten der Archäologie und der GIS-Methode]. *Svorník* 1, 33–43.
- НЕМТСЕВА 1989 = Немцева, Н.В.: Ранне феодальная усадьба и замок у городища Бабатепе на юге Узбекистана. In: Г.А. Пугаченкова (ed.): *Античные и раннесредневековые древности Южного Узбекистана. В свете новых открытий Узбекстанской искусствоведческой экспедиции*. Ташкент, 132–162.
- PHILIP *et al.* 2002 = Philip, G. – Donoghue, D. – Beck, A. – Galiatsatos, N. 2002: CORONA satellite photography. An archaeological application from the Middle East. *Antiquity* 76, 109–118.
- SALA, R. 2003: *Underground water galleries in Middle East and Central Asia. Survey of historical documents and archaeological studies*. Almaty.
- SENIKOV *et al.* 2016 = Senikov, A.N. – Komiljon, Sh.T. – Khassanov, F.O. – Beshko, N.Yu. 2016: The Flora of Uzbekistan Project. *Phytotaxa* 282/2, 107–118.
- STANČO, L. 2019: Extensive surface survey. In: L. Stančo – P. Tušlová (eds.): *Sherabad Oasis. Tracing Historical Landscape in Southern Uzbekistan*. Praha, 21–30.
- TUŠLOVÁ, P. 2012: Systematic Field Survey in the Sherabad District, Report of the 2011 Season. *Studia Hercynia* XVI, 15–21.

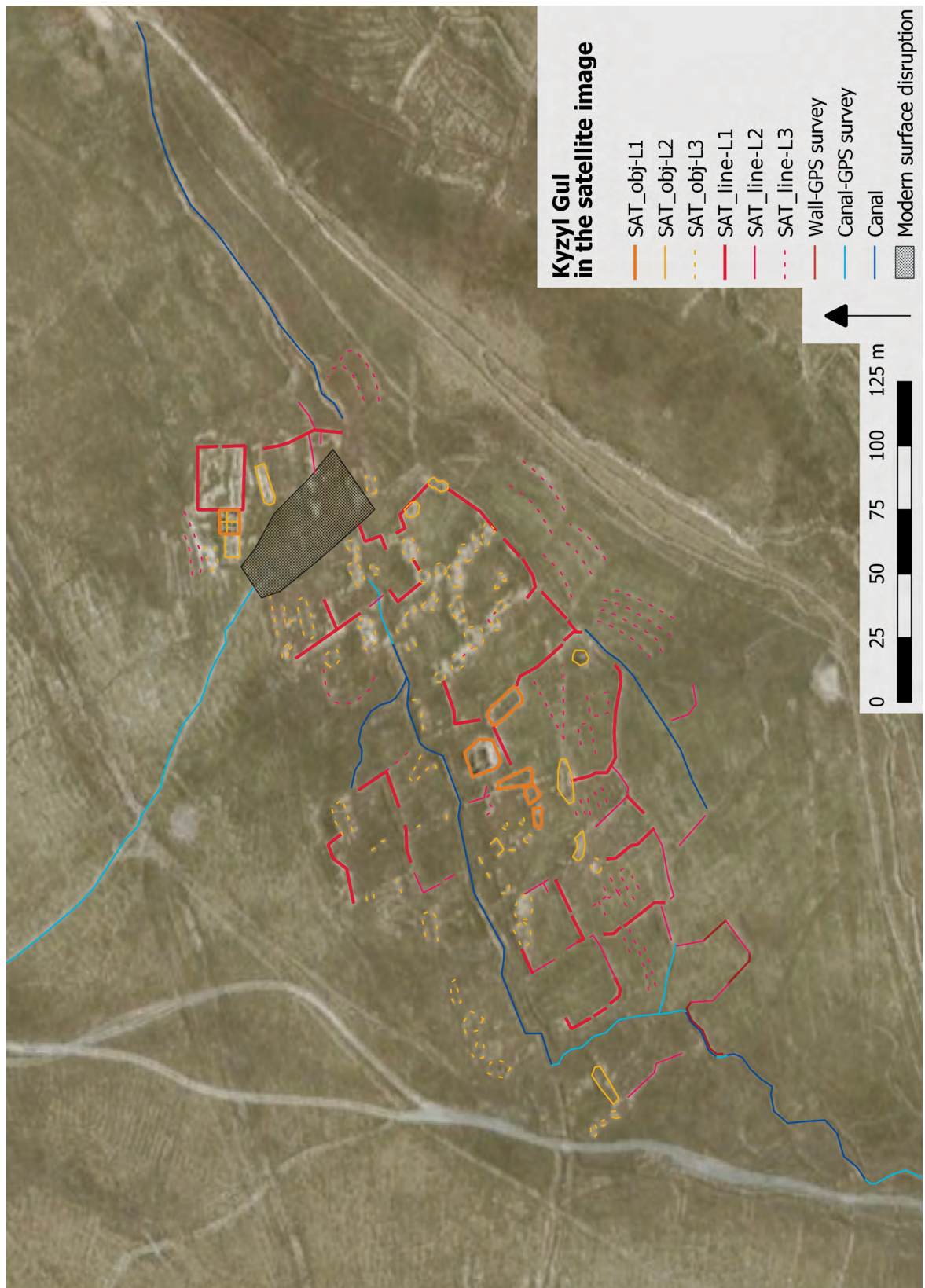
- TUŠLOVÁ, P. 2019: Intensive surface survey. In: L. Stančo – P. Tušlová (eds.): *Sherabad Oasis. Tracing Historical Landscape in Southern Uzbekistan*. Praha, 31–94.
- UNGER, J. – ŠEDO, O. – KNÁPEK, R. 2017: Zaniklá ves Bohumilice u Dolních Dunajovic (k ú. Horní Věstonice) [Das untergegangene Dorf Bohumilitz (Bohumilice) bei Untertannowitz (Dolní Dunajovice), Katastralgemeinde Oberwisternitz (Horní Věstonice)]. *Jižní Morava – vlastivědný časopis* 53/56, 225–231.
- VAREKA *et al.* 2011 = Vařeka, P. – Holata, L. – Rožmberský, P. – Schejbalová, Z. 2011: Středověké osídlení Rokycanska a problematika zaniklých vsí [The mediaeval settlement of the Rokycansko region and the issue of deserted villages]. *Archaeologica historica* 36/2, 319–342.
- https://grasswiki.osgeo.org/wiki/V.generalize_tutorial

Anna Augustinová**Petra Cejnarová**

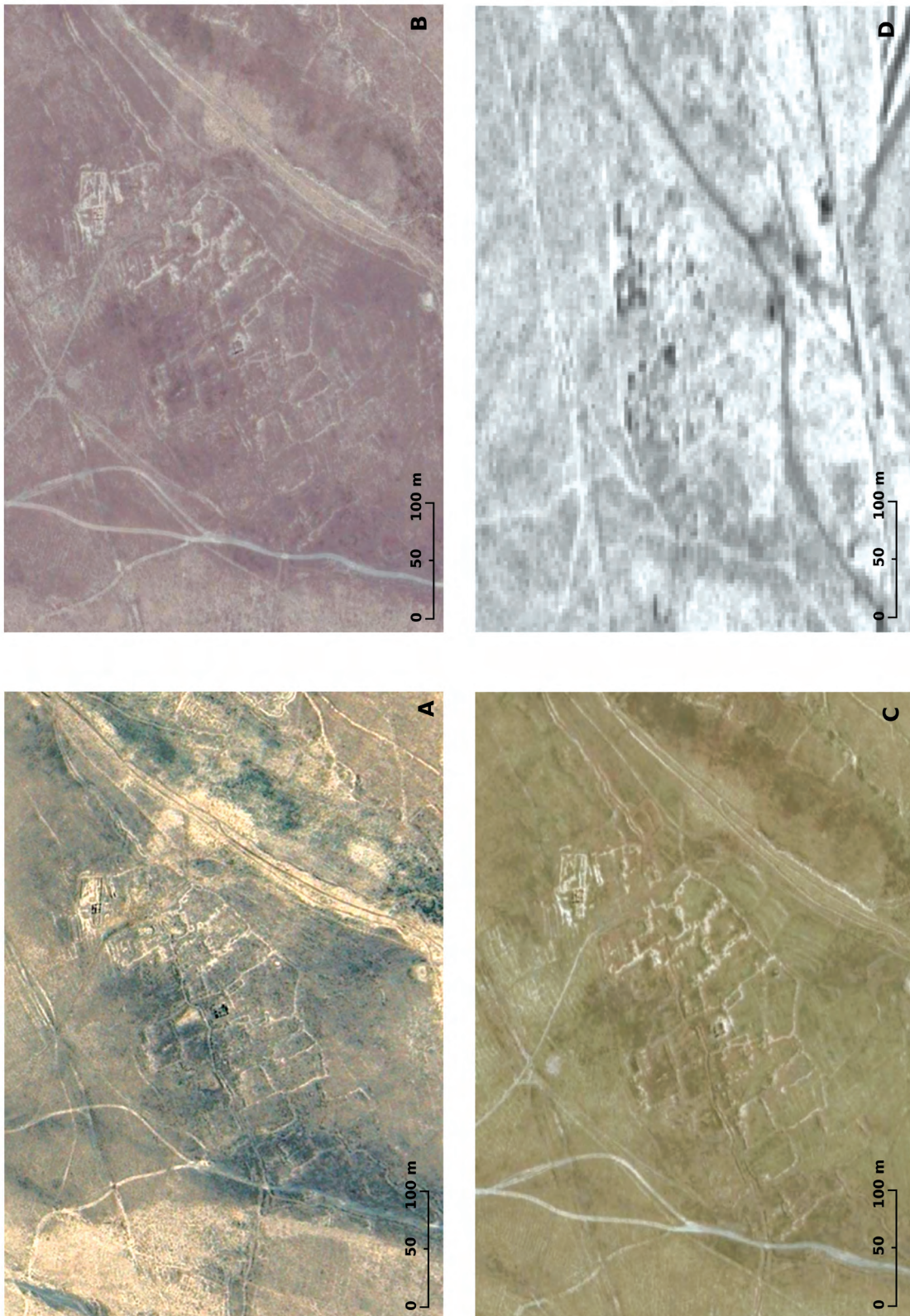
Institute of Classical Archaeology
Faculty of Arts, Charles University in Prague
Celetná 20, CZ-110 00, Prague 1
anaugust23@gmail.com
petra.cejnarova@gmail.com

Petr Mach

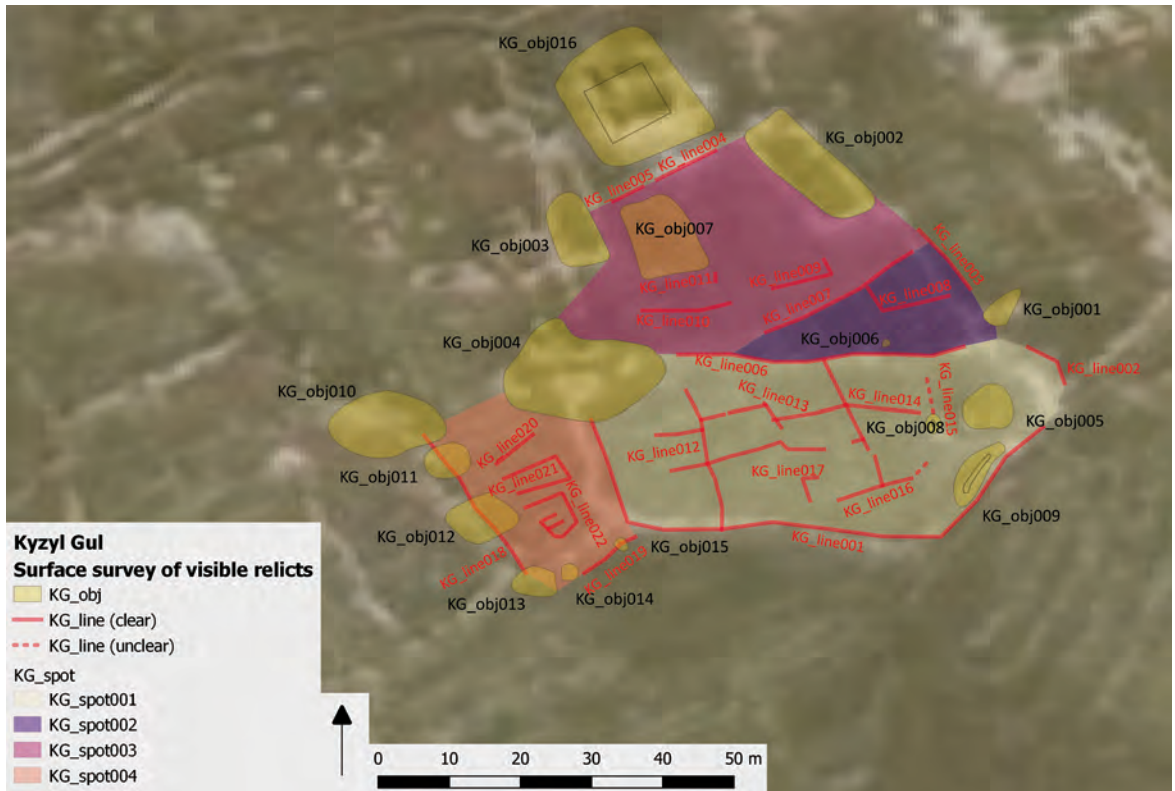
Institute of Archaeology
Faculty of Arts, Charles University
Celetná 20, CZ-11000, Prague 1
pmach3@seznam.cz



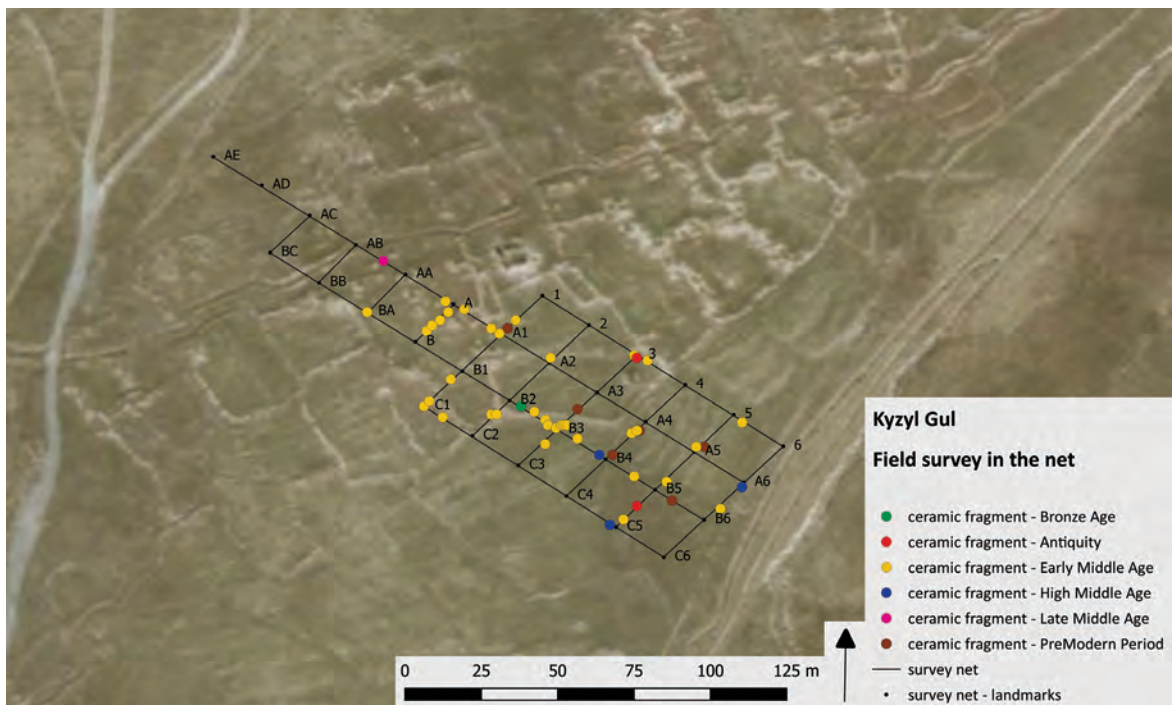
Pl. 1/1: The recognized features on the satellite imagery in Kyzyl Gul (map by A. Augustinová).



Pl. 1/2: Kyzyl Gul on satellite imagery. A: Google Maps 2005 (10th July 2005), B: Google Maps 2013 (21st May 2013), C: World Imagery (ESRI), D: CORONA.



Pl. 1/3: The results of the surface survey in Kyzyl Gul - the measured visible relicts (map by A. Augustinová).



Pl. 1/4: The results of the surface survey in the net with the colour differentiated dating of the finds (map by A. Augustinová).