

ZIRIDAVA
STUDIA ARCHAEOLOGICA

34

2020

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34
2020

Editura MEGA
Cluj-Napoca
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In Romania, the periodical can be obtained through subscription or exchange, sent as post shipment, from Museum Arad, Arad, Piata G. Enescu 1, 310131, Romania.

Tel. 0040-257-281847.

ZIRIDAVA STUDIA ARCHAEOLOGICA

Any correspondence will be sent to the editor:

Museum Arad

Piata George Enescu 1, 310131 Arad, RO

e-mail: ziridava2012@gmail.com

The content of the papers totally involve the responsibility of the authors.

Layout: Francisc Baja, Florin Mărginean, Victor Sava

ISSN 2392-8786



EDITURA MEGA | www.edituramega.ro

e-mail: mega@edituramega.ro

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Non-invasive archaeological researches performed in the Middle Bronze Age settlement from Alioș-Valea Alioșu (Timiș County, Romania). Structures, chronology, and perspectives*

Andrei Stăvilă, Alexandru Hegyi, Bogdan Alin Craiovan

Abstract: The prehistoric settlement is located north of the municipality of Alioș (Timiș County), on the right slope of Alioș Valley. The site is little known and has been analyzed from the perspective of the structures visible on site and of the materials collected from the surface. Our research is based not only on focused on-site investigations, but also on aerial photography, Structure from Motion, and magnetometric surveys. These sets of methods have led to a more nuanced picture of the inner structure of this settlement and of the natural environment in the proximity of the site. The survey of 4.6 hectares from the area of the plateau has led to the identification of an extended settlement that had developed south of the fortification that dominates Alioș Valley. The second structure identified in the central area of the plateau is published here for the first time. It covers an area of 0.5 hectares and no acceptable analogies have been yet identified. A number of artifacts provide chronological indications: numerous pottery fragments and the Hajdúsámson-type shaft-hole axe, all recovered during field researches. These artifacts date the site to stage MBA II (Reinecke A₂; approximately 1950–after 1700 BC).

Keywords: Middle Bronze Age; tell settlement; Cornești-Crvenka ceramic style; Structure from Motion (Sfm); geophysical prospections.

Introduction

The research of the Middle Bronze Age (2000/1900–1600/1500 BC) in the central and northern areas of Banat during the last decade has had the role of bringing back into discussion older discoveries – that were critically analyzed – or of providing new interdisciplinary data meant to complete the overview of the tell-type habitation phenomenon in this area. The present research can be included in this context, as we aim at discussing certain aspects regarding the morphology, the inner structure, and the relative chronology of the settlement in *Alioș-Valea Alioșu*.

Bódog Milleker has signaled the earliest mentions of discoveries that can be dated to the Bronze Age made in the territory of the municipality of Alioș¹. He mentioned that in November 1903 Uebner János of Hidegkút (Zăbrani) discovered in the territory of the municipality of Alioș four mail chains made of gold that weighed 15.5 g. The items were subsequently included in archaeological repertoires² and dated to the final stage of the Bronze Age³. The loop rings were discussed again in detail⁴ in the published catalogue of the exhibition entitled “Aurul și Argintul României” [The Gold and Silver of Romania] and dated to the Middle Bronze Age⁵. Another Bronze Age settlement was mentioned in the territory of the municipality, but no further details are available⁶.

Researchers became interested in the settlement from Valea Alioșu in 2008 when satellite images became available on various platforms. Leonard Dorogostaiski has presented the first data regarding the morphology and the morphometry of the fortification at the springs of Valea Alioșu⁷. Liviu Măruia

* English translation: Ana M. Gruia.

¹ Milleker, 1906, 7.

² Roska 1942, 281, nr. 29; Luca, 2010, 21, 3.1c.

³ Rusu 1972, 44; Gumă 1993, 244, 247, 283.

⁴ Szentmiklosi 2014, 204–205; Gogăltan, Sava, 2019, 11–12; Fig. 11.

⁵ Țârlea, Popescu, 2013, 49; 56.

⁶ Gudea, Moțiu 1983, 192; Luca, 2010, 21, 3.1b.

⁷ Dorogostaiski 2008–2009.

discussed the structure in the wider context of the archaeological monograph of Lipovei Hills, presenting in detail the materials found during field researches⁸. Some of these materials have also been discussed in a study dealing with the repertory of Bronze Age settlements from West Romania⁹.

The site on the spot called “Valea Alioșu” is located in the north-eastern extremity of Timiș County, part of the geographic unit of the High Vinga Plain (Fig. 1)¹⁰. The prehistoric settlement is located 3.39 km NE of the Roman-Catholic church in Alioș, 1.37 km NE of DJ691 and 0.26 km S of the thalweg of Alioșu Valley (46 03 53 N 21 30 23 E – the center of the fortification). Seen in a wider context, the geography of the place reveals an area of intersection between this typical piedmont plain and two other landscape subunits, Lipovei Hills to the East and the major riverbed of the Mureș to the North.

The site is located on a terrace of fluvatile origin¹¹ included in the interfleuve between the origin of Alioșu Valley and Fânețelor de Sus Valley. The terrace is better individualized on the northern and western sides through the presence of valleys measuring 25–30 m in height and approximately 15 m in relative depth as compared to the area of the plateau. Still, a typical plateau that of the Vinga Plain, develops southwards and eastwards¹². If the Bronze Age settlement covers the plateau area, the fortification is located on its northern end, in a prominent area, bordered to the west and to the east by two large gullies, one of which is still active today. The plateau of the terrace is characterized by flat and quasi-flat surfaces and is bordered by steep slopes, measuring between 15 and 20 degrees in incline, that connect it to the valley areas (Pl. 1).

Methodology and Data Acquisition

The ortophotomosaic and the digital elevation model were obtained throughout photogrammetry and by using the Structure from Motion algorithm. The acquisition of the 281 images with an overlap of approximately 70 % was made by flying a Phantom 4 Pro drone at 50 m over the site. In order to create the digital elevation model we have generated a dense cloud of more than 11 million points. We have thus obtained a digital surface model with a resolution of 11.7 cm/pixel and an ortophotomosaic with the resolution of 1.61 cm/pixel.

As the scientific literature has already demonstrated, magnetic prospection is one of the most developed methods of non-invasive investigation within the archaeological sites by means of geophysics. Therefore, we wanted to rapidly assess the archaeological potential of Alioș site in order to see the distribution of its archaeological features. We have thus designed five grids (100 × 100 m) over the northern and central parts of the site where an impressive number of sherds was found. Using such large grids for our data acquisition represented a compromise in terms of resolution, but nevertheless the results are quite expressive. The magnetometric prospection covered an area of 4.6 ha. The data acquisition was made using two total field magnetometers from Geometrics: G857 as a base station and a G858 dual sensor as a field magnetometer. The dual sensor total field magnetometer was set in horizontal configuration with 1 m sensor separation. The sensors were set to measure 10 points per second. We have also used 5 m marks along each line. As stated above, the G857 magnetometer was used as a base station and was set to measure points each 30 seconds.

Following the field measurements we have taken several pre-processing steps during which we combined the data provided by the two magnetometers. The dataset obtained with the G858 magnetometer was corrected with the data from the base station magnetometer. The variation of the magnetic field during the day of measurements was quite large, exceeding 20 nT in range as seen in Fig. 2. These rapid shifts in magnetic field are known to be mostly related to the activity of the sun. All data were processed with the following softwares: MagMap, MagPick, TerraSurveyor, and Surfer.

⁸ Măruia 2011, 206–209; 400–476.

⁹ Rogozea O.-C., Rogozea P. 2016, 140–141.

¹⁰ In Rogozea O.-C., Rogozea P. 2016, 162, the Stereo 70 coordinates provided for the site in Satchinez-Râtu Mare (Satchinez 13) are erroneous. The correct coordinates for the center of the site are: 190439.179; 497422.05.

¹¹ Posea 1997, 365.

¹² Bizerea 1973.

Results

Aerial photography and Sfm

The satellite photographs taken at various intervals in time have revealed, through the vegetation index, the archaeological features located on the high terrace that dominates Valea Alioșu. All of these images reveal the fortification in the northern area of the plateau (Fig. 3). Two of them also show a second feature, circular in shape, located 90 m SSW of the fortification, as well as the areas with the most intense habitation (Fig. 3/2,4). As for the second feature, the satellite images (Fig. 3/4) reveal that it consists of two anomalies, i.e. two concentric circles of different dimensions. The first anomaly measures 80 m in diameter and between 8 and 10 m in width, while the second measures 40 m in diameter and only 3–4 m in width.

Performed on the basis of the photographs taken by drone, the ortophotoplan and the digital elevation model of the site provide a new perspective exclusively over the fortified area, while other features are not visible (Pl. 1/2–4). The ortophotoplan reveals few chromatic differences that are relevant from an archeological perspective. The uniformity is caused by the fact that the field was plowed when the drone photographs were taken. Still, in the area of the fortification one can identify two ditches based on the differences in soil color. These feature as orange lines placed concentrically and successively, separated by a dark color area (Pl. 1/3). On the digital elevation model (DEM) the elements of the fortification are paler, as they have been gradually levelled through intense agricultural works (Pl. 1/4). Naturally, the ortophotoplan also captures the wider context of the settlement and the DEM is a useful working tool for the extraction of data regarding the morphology and the morphometry of the site (Pl. 1/2).

The magnetometric survey

More than 130 anomalies have been delimited on the magnetogram and they reveal in general lines the structure and planimetric development of the settlement (Pl. 2–3). The fortification and its central mound are described by three anomalies located in the northern end of the plateau. Two of the anomalies are successively concentric, while a third is apse-shaped. The anomalies are positive in the southern half of the fortification (8–12 nT), while in the northern part they are paler. The positive anomalies correspond to the defensive ditches filled in by the ground-level soil that displays high magnetism. One can also note that these positive anomalies that describe defense ditches are doubled to the north (towards the inside) by a series of negative anomalies (–8/–10 nT), thus leading to a series of dipolar magnetic anomalies. These might indicate the presence of brunt palisades, as significant quantities of vitrified clay can be identified at ground surface (Pl. 2/1–3).

In the south-eastern area of the fortification one notes discontinuities on the level of both ditches. These discontinuities measure approximately 6 m in width, followed by a positive anomaly each – their linear distribution most likely marks the access way to the fortification.

At the same time, the magnetogram has also revealed the destruction that the intensive archaeological works in the area have caused to the archaeological site. One can easily observe that the fortification is more poorly preserved towards the NE. This is mainly due to the fact that the successive scarification has deepened the erosion of the terrace towards the valley's thalweg.

The magnetometric survey also confirms the second circular archaeological feature identified on the satellite images. It consists of a dipolar circular anomaly. Thus, the ditch is described by the positive values (approx. 12 nT). Just like the main fortification, this feature was most likely destroyed by fire. Other positive anomalies, smaller in amplitude (4–8 nT), are distributed circularly inside it and measure between 0.5 and 2 m in diameter. At the same time, in the central area of the feature one can note five magnetic imprints of smaller intensity that mark the contour of a possible construction with the sides measuring 20 × 9 m (Pl. 4/5–6). Starting from this structure, in its north-western area, we were able to identify an anomaly of low intensity (2 nT – 6 nT) that might indicate a third enclosed area on the plateau that dominates Valea Alioșu.

The buildings can be identified through two types of anomalies. The first category includes those with irregular contours and variable dimensions that describe agglomerations of strongly magnetized artifacts (more than 10 nT), while the second category groups those that illustrate buildings with rectangular ground plan. We have selected, as examples, four such features from the site (Pl. 4/1–4). The

first magnetic anomaly indicates a complex archaeological structure that seems to have at least two main areas. This could be an important building in the layout of the site. The stronger anomalies seen on the sides could represent pits with structural functions or for debris. The circular anomaly seen in the upper left corner of the building could represent a structure made from diamagnetic materials such as different types of gravel which can be noted over the entire surface of the site (Pl. 4/1). The faint magnetic anomaly identified south of the second ditch of the fortification describes a square-shaped archaeological structure which seems to be compartmented. An interesting anomaly is also visible inside, in the lower part of the building, which can be a part of its internal structure (Pl. 4/2). One of the best-preserved constructions on the site refers to the anomaly identified north of the enclosure in the middle area of the plateau. The anomaly has a rectangular shape and is characterized by an amplitude that covers the range between -1 nT and 8 nT (Pl. 4/3). Another important feature is the negative anomaly which describes an archaeological structure located on the central mound inside the fortifications. The structure of the anomaly indicates that the dwelling is made from non-magnetic materials and remained unburnt (Pl.4/4). Naturally, for the identification of these structures the magnetic measurements should be taken anew at much higher resolution in the area where they are located or even for the entire site and this a goal for our future researches.

Over the entire investigated area one can also identify positive anomalies that measure less than 1.5 – 2 m in diameter and are more likely pits or small agglomerations of archaeological materials. At the same time one can note a negative anomaly (-8 nT) that descends from the north-western corner of the plateau towards the second circular structure. The width of this anomaly varies between 6 m and 14 m and represents a natural compaction, visible at ground level.

Discussions

For a period of ca. 1000 years, starting with the beginning of the Bronze Age, tells were the representative habitat in the entire Carpathian Basin. Several researchers have defined, analyzed, and classified this type of habitation over time, according to various criteria¹³. For the time being, in the absence of invasive archaeological excavations one cannot provide details on the level of anthropic accumulations on the site located at the starting point of Alioşu Valley, and thus none of the classifications suggested in the specialized literature can be employed. Still, analyzing the overall results of the magnetometric survey, one notes that the settlement fits the habitational pattern encountered in the case of most of the sites dated to the Middle Bronze Age¹⁴. The site in Alioş includes an area surrounded by fortification-type structures and a satellite settlement that had developed around it.

The central area of the settlement is a mound that does not surpass the plateau in terms of absolute altitude (155 m). The mound is surrounded by two concentric ditches. The central mound measures 75 m in height and up to 80 m in transversal section. The ditches of the fortification are visible on both datasets provided by the non-invasive researches (Pl. 1- 4). The first anomaly, placed circularly around the central mound, can also be identified in the field, as a depression that is deeper in the southern area. Towards the north it has been leveled by the agricultural works. The route of the second ditch can only be reconstructed based on the non-invasive researches, as it has silted. According to the magnetogram, the first precinct measures 82 m in diameter and encloses an area of 0.51 ha, while the second measures 141 m in diameter and the ditch marks an area of 1.56 ha. Sites such as those in Tiszababolna-Fehérlő tanya, Szakáld-Testhalom or Emőd-Karola szőlők have “central areas” that are similar in size to that of the mound in Alioş¹⁵.

We believe the entrance to the fortification was in the south-eastern area (Pl. 2–3). Ditch discontinuities that mark possible access ways have been documented in Munar-“Wolfsberg”¹⁶, Feudvar¹⁷, and Včelince-Lászlófala¹⁸.

The circular shape of the fortification in Alioş was determined by the geography of the place.

¹³ Gogăltan 2017, 29–30.

¹⁴ Fischl *et al.* 2015, 120, Fig. 1; Kienlin 2018, 27–67.

¹⁵ Kienlin 2018, 55–57, Tab. I–4; Fig. I–35.

¹⁶ Gogăltan 2016, 92.

¹⁷ Falkenstein *et al.* 2014, 118, Abb. 7.

¹⁸ Furmánek, Marková 1992, 295–296.

Though the site is located in a piedmont plain environment with high terraces, the fortification is situated in an accessible area where the slope of the terrace is at an angle measuring between 10 and 15 degrees, unlike the contemporary structures in the Mureș Valley¹⁹ and the Basin of Rivers Criș²⁰ that are semi-circular in shape and speculate the steep slopes of certain terraces.

Inside the fortification, on the central mound, we were able to identify a single structure, rectangular in shape, and on its edge we encountered the apse-shape anomaly. The significant quantity of archaeological material spread at ground level – pottery fragments, daub fragments preserving the wattle structure of the walls, and gallets of different sizes – is clear evidence that the area was inhabited during Prehistory.

The settlement that developed south of the fortification can be reconstructed both on the basis of the sets of satellite images and especially of the results of the magnetometric survey. Based on the differences in color of the vegetation one can identify areas with more intense habitation on the surface of the plateau, confirmed both by the survey and by the presence of archaeological materials at ground level. The survey has envisaged 3.2 ha of the settlement and has led to the identification of a series of anomalies that describe structures varying in shape and dimension. In a significant number of cases, the ground plan of the constructions appears clearly delimited, rectangular in shape, with dimensions varying between 10–12 m in length and 6–8 m in width. These structures are oriented NW-SE or NE-SW, but at the current stage of research one cannot mention if the settlement was structured according to clear patterns or not.

In the Cornești-Crvenka cultural area one can find scattered data on the type of dwellings, the thickness of the anthropic accumulations, and possible inner systematizations of the settlements in the researches of the sites in Cornești, Munar, or Foeni. In Cornești-Cornet specialists have researched both pit-houses and ground dwellings and have also investigated hearths or household annexes²¹. As for the habitat, the research has revealed the fact that the stratigraphic accumulations inside the fortified area are thicker (1.35 m in depth²²) than outside where the stratigraphy is simpler and only consisted of two culture layers²³. In Munar-Wolfsberg, the 2017 archaeological test trench – located approximately 20 m from the central area of the tell – has led to the identification of an area with no habitation structures and with few archaeological materials in the five researched layers, most of them dated to the Middle Bronze Age²⁴. In the same area, magnetometry did not reveal habitation structures inside the fortification, most likely due to agriculture and a constant erosion of the site²⁵. The researches in Foeni-Gomila Lupului I have revealed consistent stratigraphic accumulations measuring up to 1.7 m in thickness and the remains of ground dwellings²⁶.

In the Serbian Banat, the communities that belong to the southern group of the Vatin Culture stand out from the perspective of habitation through significant stratigraphic accumulations, as indicated by the research in Židovar. These studies mention habitation layers measuring between 0.4 and 0.9 m in thickness and inside them archaeologists have identified dwellings with clay floors, post-holes, clay walls supported by beams, or hearths and ovens inside the dwellings²⁷. Few observations regarding the habitation structures in Omoljica-Zlatica and Pančevo-Najeva Ciglana are available. In Omoljica existing publications mention a layer measuring 1 m in thickness, three rectangular ground dwellings, and circular household refuse pits varying in depth between 0.5 and 1.2 m²⁸. On the other hand, the site in Pančevo-Najeva Ciglana has been destroyed during the construction of a brick factory, but three successive Vatin habitation horizons were identified during the researches performed in 2003 and 2004²⁹.

¹⁹ Sava, Gogâltan 2017, 90; Soroceanu, Radu 1975, 36; Luminosu 1972, 28; Gogâltan 2014, 16.

²⁰ Marta 2014, 118, Pl. 1; Ordentlich *et al.* 2014a, 139–140, Pl. I; Ordentlich *et al.* 2014, 207, Pl. I/3; Gogâltan, Fazecaș 2014, 286.

²¹ Radu 1972, 272; Radu 1972a, 35–36; Soroceanu, Radu 1975, 33–34.

²² Radu 1972, 278–279.

²³ Soroceanu, Radu 1975, 36; Gogâltan 2014a, 67–68.

²⁴ Sava, Gogâltan 2017, 93–95.

²⁵ Gogâltan 2016, 92; Sava, Gogâltan 2017, 90–91.

²⁶ Gogâltan 2014b, 99; 105 with the bibliography.

²⁷ Ljuština 2013, 84–88.

²⁸ Ljuština 2015, 60.

²⁹ Ljuština 2015, 64.

The most consistent data were collected from the site in Feudvar-Mošorin. The researches performed in the area of the tell have led to the identification of a structured settlement with dwellings measuring 10–12 m in length and 5.6 m in width, small rectangular squares, and wide alleys³⁰. Approximately 80 dwellings can be reconstructed on the preserved surface of the central mound that is bordered by a ditch with the opening of 30 m and the depth of 5 m. A settlement covering an area of ca. 1 ha has developed around the central mound. It was documented through a culture layer measuring 1 m in thickness³¹.

The interesting feature in Alioș-Valea Alioșu is the second circular structure from the medial area of the plateau (Pl. 4/5–6). We are unaware of similar cases in the Cornești-Crvenka or Vatin cultural environments. One can nevertheless mention the existence of smaller circular structures identified in Cornești-Iarcu and Periam-Movila Șanțului. A circular structure measuring 26 m in diameter was researched through a trial excavation in the south-eastern area of 2nd Enclosure of the Cornești-Iarcu fortification. It consists of a one-meter-deep ditch³². Cornești-Crvenka materials have been recovered from its fill. The role of the feature was connected to the need to protect or enclose animals and it is not the only such structure in the plateau. Two similar constructions have been identified in the same area³³. Structures that are similar to the ones in Cornești-Iarcu have been identified in Periam-Movila Șanțului through magnetometric surveys. The two structures are located south of the tell and measure 10 and 15 m in diameter³⁴.

The field researches performed on the plateau that dominates Alioșu Valley have led to the collection of impressive quantities of archaeological material. The recovered items are highly fragmented, but there are also several pots entirely preserved or which can be reconstructed. Cooking pots are the most numerous among the shapes that can be clearly identified in this pottery lot (Pl. 5; 6/8–9). The cooking pots usually have flared rims and straight walls, and few of them have bulging bellies. The functional and decorative elements of the pots consist of alveoli or notched girdles. One also encounters, albeit more rarely, decoration applied directly to the rim or right under the rim, consisting of short incisions or notches. Such pots have numerous analogies, the closer ones in Cornești-Cornet³⁵ and Iarcu³⁶. One of the fragments recovered from the area of the settlement might belong to a “*pyraunos*”-type pot (Pl. 6/4) with analogies in the southern area of the Vatin Culture³⁷.

There are also numerous tronconic narrow-mouth bowls with flared rim, mostly carinated from below the rim and more rarely items with small lobes³⁸ (Pl. 5). The decoration of such narrow-mouth bowls is often rich and incised, consisting of triangles with inner hachures, stripes made of obliquely placed incisions, simple arches or arches with hachures on the outside, rows of dots, or zigzag lines. Deeper bowls are similar in shape and follow the decorative patterns specific to the category of pots described above (Pl. 6). Such items have analogies in Peciu Nou-Stietzel³⁹, Satu Mare-Weingarten⁴⁰, Foeni-Gomila Lupului I⁴¹, and Gornea-Păzăriște⁴².

The repertory of shapes is completed by cups decorated with incised stripes, zigzag lines, fine grooves placed on or below the rim⁴³, and combinations of circular or triangular motifs (Pl. 6/3). In the category of drinking vessels one can also include a cup with flared rim, a short cylindrical neck, globular body, and ring-shaped base. The pot was carelessly made, with oxidation firing. The cup is decorated with incised stripes that consist of one, two, or three lines and with garlands on the maximum

³⁰ Falkenstein *et al.* 2016, 14.

³¹ Falkenstein *et al.* 2016, 19; Fig. 12.

³² Bălărie, Szentmiklosi 2016, 258–259.

³³ Bălărie, Szentmiklosi 2016, 261, Pl. III/2.

³⁴ Becker 2012.

³⁵ Radu 1972, Fig. 9/1, 3–10.

³⁶ Bălărie, Szentmiklosi 2016, Pl. VI/10; Pl. VII/2–8, 10–11.

³⁷ Fischl *et al.* 2001, 178–179.

³⁸ Rogozea O-C., Rogozea P. 2016, 183, Pl. V/1.

³⁹ Martiș 2008, Pl. III/1–2.

⁴⁰ Gogâltan 2014c, 199, Pl. I/3.

⁴¹ Gogâltan 2004, Pl. VII/2–3; Pl. VIII/3.

⁴² Lazarovici, Săcărin 1979, Fig. 8; Fig. 10/1–2; Fig. 12/1, 3–5.

⁴³ Rogozea O-C., Rogozea P. 2016, 140, Pl. IV/7–9, 12.

diameter; $\varnothing_{\text{mouth}} = 6.5$ cm; $\varnothing_{\text{max}} = 5$ cm; $\varnothing_{\text{base}} = 3.5$ cm, $H = 8$ cm; (Pl. 6/7). The cup fragment discovered in Cornești-Iarcuiri is very similar in shape⁴⁴.

Several fragments attest the use of breeze-keepers⁴⁵ (Pl. 6/1,6), while ellipsoidal pots and “fish trays”⁴⁶ are only represented by a single item each (Pl. 5). The breeze-keepers have good analogies in Feudvar⁴⁷ and Židovar⁴⁸, while the ellipsoidal pot has fine parallels among the discoveries from Omoljica-Zlatica⁴⁹ and Pančevo-Najeva Ciglana⁵⁰.

In the category of miniature pots one can include two tronconic items with rounded lip and straight walls that descend obliquely towards the base that is flat⁵¹ or slightly profiled⁵². One of these pots displays an incised decoration consisting of simple stripes or stripes filled with obliquely placed incisions (Pl. 5). The item has analogies in layers IIIb and IV in Feudvar⁵³. The same pottery category includes a cup with bitronconic body and strongly profiled base. It is made of fine fabric with mixed firing. The surface features shades of brown and black. The area of maximum diameter is decorated with a succession of five lines placed horizontally and the upper half of the cup is decorated with arches; $\varnothing_{\text{max}} = 5.5$ cm; $\varnothing_{\text{base}} = 2$ cm; $H_{\text{preserved}} = 4$ cm (Pl.6/2). To the same category one can also include a fragment from a cup with globular body⁵⁴. It was made of fine fabric with reduction firing and has black walls. Its area of maximum diameter is decorated with arches. The two types of cups also feature among the discoveries made in Cornești-Cornet⁵⁵, Peciu Nou-Stietzel⁵⁶, and Băile Herculane-Peștera Oilor⁵⁷.

A “lamp-type” pot was also preserved, though fragmentarily⁵⁸. Its lower part is tronconic and the upper part is semi-spherical. The item has a flat base. The two parts of the pot meet in the area of maximum diameter that is marked by an edge measuring 0.7 cm in width. Pairs of vertical perforations have been placed along this edge at equal distances, allowing for the pot to be hanged. The item was made of fine fabric, with oxidation firing. The walls are brick-red in color, but the area of the base is black both inside and out. The incised decoration is only placed in the upper part and is structured in rows. The first row contains arches, the second, placed right above the area of maximum diameter, consists of a zigzag line, while the third decorates the visible parts of the edge with double arches and short vertical lines; $\varnothing_{\text{max}} = 18$ cm; $\varnothing_{\text{base}} = 8$ cm; $H_{\text{preserved}} = 9$ cm (Pl. 6/10). Similar pots have been identified in Cornești-Cornet⁵⁹ and Foeni-Gomila Lupului I⁶⁰.

A bitronconic whorl and a small cart wheel were also made of clay⁶¹ and such items were also found in the Vatin layer in Vinča⁶². To the pottery one can add the artifacts made of stone⁶³, some of which are small (Fig. 6/5) and might have been used for finishing possible bronze items.

A shaft-hole axe rescued from the central area of the plateau during field researches performed in 2014 has remained unpublished. It displays a cutting edge, a trapezoidal body, and a straight blade. The head is hexagonal in section (Pl. 7/1–2). The item is in a good state of preservation, but the patina is poorly preserved, light green in color, only covering small areas of the surface (Pl. 7/3–8); $L = 7.8$ cm; $L_{\text{bit}} = 2.5$ cm $\varnothing_{\text{eye}} = 1.1$ cm. The axe is of the Hajdúsámson type, the plain variant (type

⁴⁴ Bălărie, Szentmiklosi 2016, Pl. V/1.

⁴⁵ Măruia 2011, 145, 249; Rogozea O-C., Rogozea P. 2016, Pl. IV/2 (we believe that based on the morphology of the presented fragment it can be included in the category of food smokers; for strainers see Radu 1972, 276–277, Fig. 7/2a-b).

⁴⁶ Măruia 2011, 441; Rogozea O-C., Rogozea P. 2016, Pl. V/10.

⁴⁷ Ihde 2001; Falkenstein *et al.* 2016, 15, Fig. 9.

⁴⁸ Ljuština 2011, 105, Fig. 1/3.

⁴⁹ Ljuština 2015, Fig. 5/10, 12–16, 18.

⁵⁰ Ljuština 2015, Fig. 9/9.

⁵¹ Măruia 2011, 423.

⁵² Măruia 2011, 458.

⁵³ Ihde 2001, 136, Abb. 1; Falkenstein *et al.* 2016, Fig. 9.

⁵⁴ Rogozea O-C., Rogozea P. 2016, Pl. IV/4.

⁵⁵ Radu 1972, Fig. 8/5–7, 9, 11.

⁵⁶ Marțiș 2008, Pl. IV/2.

⁵⁷ Gumă 1997, Pl. XLI/3.

⁵⁸ Radu 1972a, 36; Gumă 1997, 43.

⁵⁹ Radu 1972, 277, Fig. 7/3.

⁶⁰ Gogâltan 2004, 145, Pl. IX/1; Gogâltan 2014, 109, Pl. III/4.

⁶¹ Rogozea O-C., Rogozea P., 2016, Pl. V/12–13.

⁶² Ljuština 2010, Fig. 4/1; 6/2.

⁶³ Rogozea O-C., Rogozea P. 2016, 141, Pl. VI/1–4.

Cb in Amália Mozsolics's typology⁶⁴). The distribution of such axes is restricted to certain areas of Banat, Transylvania, and North-East Hungary and few completed items have been identified⁶⁵. More numerous are the casting moulds which were discovered (11) 40 km downstream from Alioșu Valley, in the tell from Pecica-Șanțul Mare⁶⁶. To the casting moulds from Pecica one can add those found in Pir-Cetate, Berea, Cehăluț, Cetea, Rusu de Jos, and Vatin in Serbia⁶⁷. As for the dating of the shaft-hole axe of the Hajdúsámson type, they have been included in stage MBA II⁶⁸ though according to a more recent opinion the Apa-Hajdúsámson horizon should be dated to stage MBA III (ca. 1700 BC–1600/1500 BC)⁶⁹.

Conclusions

The present paper stresses the characteristics of the landscape and the inner structure of an almost unknown site that we believe to be very important for the research of the Middle Bronze Age in the eastern part of the Carpathian Basin. By corroborating classical archaeological topography with aerial photographs we were able to identify the contours of the main characteristics that describe the site's natural environment, but also its elements of fortification. Conventional satellite images only reveal one of the ditches of the fortification, but the ortophotoplan has proven to be a useful tool in detecting a second ditch.

The magnetometric survey has confirmed the existence of the two structures of fortification and has provided new data regarding the central mound, the settlement, and the spatial distribution of the dwellings. A novel structure consists of a circular feature identified in the central area of the plateau. We were unable to find acceptable analogies for it on already researched sites. Though no data are available for the vertical stratigraphy of the site, the overall picture provided by the non-invasive research reveals the fact that the site in "Valea Alioșu" has the characteristics of a tell or a tell-type settlement characteristic to that period.

The archaeological items collected through focused field researches are significant for the chronological and cultural identification of the site. The pot shapes, the ornaments, and the axe with transversal socket date the settlement to stage MBA II (Reinecke A₂; approximately 1950–after 1700 BC). From a habitational perspective, the fourth horizon of the tell-type settlements developed during this chronological interval⁷⁰, while from a cultural perspective the Cornești-Crvenka II ceramic style can be encountered in Central-North Banat.

The results are also important from the perspective of cultural management and extra measures should be taken for the preservation of the site. The deep agricultural works damage the site every year, bringing up to the surface pottery fragments, sometimes entire pots such as those presented here, and fragments from the walls of dwellings.

For us the results equally represent the beginning of wider researches that envisage the extension of the magnetometric survey, the use of other survey methods – ERT or GPR –, as well as trial excavations inside the settlement in order to establish its vertical stratigraphy and to obtain sample for absolute dates.

Acknowledgements

The publication of the current paper was financed through *Entrepreneurial Education and Professional Counseling for Social and Human Sciences PhD and Postdoctoral Researchers to Ensure Knowledge Transfer Project*, financed through Human Capital Programme (ATRiUM, POCU380/6/13/123343); Also, this work was supported by hardware resources through the Big Data Science grant PN-III-P1-PFE-28 and by a grant of Ministry of Research and Innovation, CNCS – UEFISCDI, project number PN-III-P1-1.1-PD-2019-0939, within PNCDI III.

⁶⁴ Mozsolics 1967, 18; Abb.1.

⁶⁵ Găvan 2015, 92.

⁶⁶ Găvan 2013, 144; Gogăltan, Găvan 2014, 15–16; Găvan, Gogăltan 2014, 110; Gogăltan, Găvan 2014a, 31–32, Abb. 4.

⁶⁷ Găvan 2015, 92, Fig. 37, with the bibliography.

⁶⁸ Gogăltan 1999, 145; Găvan 2013, 144; Găvan 2015, 92, Pl. 86.

⁶⁹ Gogăltan 2015, 78.

⁷⁰ Gogăltan 2017, 34, 55.

We are grateful to Dr. Habil. Florin Gogâltan (The Institute of Archaeology and Art History in Cluj-Napoca/The West University of Timișoara) who had the patience to read the present study and guide us throughout the research. The microscopic images of the surface of the axe, presented in the article, have been taken by Prof. Univ. Dr. Marin Cârciumaru (The Museum of Paleolithic Technology and Human Evolution in Târgoviște), and we hereby express our gratitude for it. At the same time, the illustration of the archaeological material would have been poorer without Alina Gheorghe's involvement and we thank her.

Andrei Stăvilă

West University of Timișoara
Timișoara, ROU
andrei.stavila@e-uvt.ro

Bogdan Alin Craiovan

West University of Timișoara
Timișoara, ROU
bogdan.craiovan@yahoo.com

Alexandru Hegyi

University of Cyprus, Department of History and Archaeology,
Archaeological Research Unit, Chair "Sylvia Ioannou"
for Digital Humanities; West University of Timișoara
Timișoara, ROU
alexandruhegyi@gmail.com;

BIBLIOGRAPHY

- Bălărie, Szentmiklosi 2016 A. Bălărie, Al. Szentmiklosi, *Descoperirile arheologice de tip Vatina din Incinta II de la Cornești-Iarcuri (jud. Timiș)*. Raport preliminar. Banatica 26, 2016, 257–271.
- Becker 2012 <http://becker-prospection.blogspot.com/2012/09/periam-rumanien.html> (H. Becker, *Periam, Rumänien*, accessed 05.01.2020)
- Bizerea 1973 M. Bizerea, *Câmpia Vinga. Studiu morfo-tectonic*. SGB 3, 1973, 20–47.
- Dorogostaiski, 2008–2009 L. Dorogostaiski, *Utilizarea imaginilor satelitare, ortofotogramelor, hărților topografice, GPS-ului și fotografiilor digitale la realizarea perieghezelor. Studiu de caz: descoperirea fortificație preistorice de la „Valea Alioșu”, Alioș (comuna Mașloc, județul Timiș)*. SIB 2008–2009, 256–274.
- Falkenstein *et al.* 2014 F. Falkenstein, B. Hänsel, P. Medović, *Feudvar bei Mošorin (Serbien). Ausgrabungen und Forschungen in einer Mikroregion am Zusammenfluss von Donau und Theiß – eine Bilanz*. In: W. Schier, M. Meyer (Hrsg.), *Vom Nil bis an die Elbe. Forschungen aus fünf Jahrzehnten am Institut für prähistorische Archäologie der Freien Universität Berlin*. Rahden/Westf. 2014, 111–132.
- Falkenstein *et al.* 2016 F. Falkenstein, B. Hänsel, P. Medović, *Feudvar near Mošorin (Serbia) – Excavations and Research in a Micro-region at the Confluence of the Danube and Tisza: a recapitulation after thirty years*. In: H. Kroll, K. Reed, *Die Archäobotanik. Feudvar III. Würzburger Studien zur Vor- und Frühgeschichtlichen Archäologie 1*. Würzburg 2016, 5–35.
- Fischl *et al.* 2001 K. P. Fischl, V. Kiss, G. Kulcsár, *A hordozható tűzhelyek használatát a kárpát-medencében I. Középső bronzkor*. In: J. Dani, Z. Hajdú, G.E. Nagy, L. Selmecezi, ΜΩΜΟΣ I. „Fiatal Őskoros Kutatók” I. Összejövetelének konferenciakötete, 10–13 november 1997. Debrecen 2001, 163–193.
- Fischl, Kienlin 2013 K. P. Fischl, L. T. Kienlin, *Results of a Systematic Survey Programme on the Hatvan Sites of Emőd-Nagyhalom and Tard-Tatárdomb in Northern Hungary*. ActaArchHung 64, 2013, 5–32.
- Fischl *et al.* 2015 K. P. Fischl, T. L. Kienlin, B. Tugya, *Bronze Age settlement research in North-Eastern Hungary. Bronzkori Településkutatások Északkelet-Magyarországon*. Archeometriai Műhely XII, 2, 2015, 117–134.

- Furmánek, Marková 1992 V. Furmánek, K. Marková, *Siedlung des Tell-Typs in Včelince*. In: J. Herrmann (Hrsg.), Heinrich Schliemann. Grundlage und Ergebnisse moderner Archäologie 100 Jahre nach Schliemanns Tod. Berlin, 1992, 293–303.
- Găvan, 2013 Al. Găvan, *Metalurgia tell-urilor epocii bronzului din vestul României (II)*. Terra Sebus 5, 2013, p. 141–192.
- Găvan 2015 Al. Găvan, *Metal and metalworking in the Bronze Age tell settlements from the Carpathian Basin*. Cluj-Napoca 2015.
- Găvan, Gogâltan 2014 Al. Găvan, Fl. Gogâltan, *Modelul „Centru-Periferie” în arheologie. Studiu de caz: tell-ul epocii bronzului de la Pecica-Șanțul Mare*. Terra Sebus 6, 2014, 101–126.
- Gogâltan 1999 Fl. Gogâltan, *Bronzul Timpuriu și Mijlociu în Banatul Românesc și pe Cursul Inferior al Mureșului*. Timișoara 1999.
- Gogâltan 2004 Fl. Gogâltan, *Bronzul Mijlociu în Banat. Opiniile privind grupul Cornești-Crvenka*. In: P. Rogozea, V. Cedică (hrsg.), *Festschrift für Florin Mededeț zum 60 Geburtstag*. Timișoara 2004, 79–153.
- Gogâltan 2014 Fl. Gogâltan, *Bronze Age tell, tell-like and mound-like settlements on the eastern frontier of the Carpathian Basin. History of research*. In: Fl. Gogâltan, C. Cordoș, A. Ignat (eds.), *Bronze Age Tell, Tell-Like and Mound-Like Settlements on the Eastern Frontier of the Carpathian Basin. History of Research*. Cluj-Napoca 2014, 13–24.
- Gogâltan 2014a Fl. Gogâltan, *Cornești “Dealul Cornet = Cornet”, Timiș County*. In: Fl. Gogâltan, C. Cordoș, A. Ignat (eds.), *Bronze Age Tell, Tell-Like and Mound-Like Settlements on The Eastern Frontier of The Carpathian Basin. History of Research*. Cluj-Napoca 2014, 67–76.
- Gogâltan 2014b Fl. Gogâltan, *Foeni “Gomila Lupului I”, Timiș County*. In: Fl. Gogâltan, C. Cordoș, A. Ignat (eds.), *Bronze Age Tell, Tell-Like and Mound-Like Settlements on The Eastern Frontier of The Carpathian Basin. History of Research*. Cluj-Napoca, 2014, 104–110.
- Gogâltan 2014c Fl. Gogâltan, *Satu Mare “Weingarten”, Timiș County*. In: Fl. Gogâltan, C. Cordoș, A. Ignat (eds.), *Bronze Age Tell, Tell-Like and Mound-Like Settlements on The Eastern Frontier of The Carpathian Basin. History of Research*. Cluj-Napoca 2014, 196–199.
- Gogâltan 2015 Fl. Gogâltan, *The Early and Middle Bronze Age Chronology on the Eastern Frontier of the Carpathian Basin. Revisited after 15 Years*. In: R. Németh, B. Rezi (eds.), *Bronze Age Chronology in the Carpathian Basin. Proceedings of the International Colloquium from Târgu Mureș 2–4 October 2014*. Târgu Mureș 2015, 53–96.
- Gogâltan 2017 Fl. Gogâltan, *The Bronze Age Multilayered Settlements in the Carpathian Basin (ca. 2500–1600/1500 BC). An old catalogue and some chronological problems*. JAHA 4, 3, 2017, 28–55.
- Gogâltan, Fazecaș 2014 Fl. Gogâltan, G. Fazecaș, *Vășad “Cartierul țiganilor = Cigány tanya = Cigánynegyed = Groapa cu lut = La nord de sat”, Bihor County*. In: Fl. Gogâltan, C. Cordoș, A. Ignat, *Bronze Age Tell, Tell-Like and Mound-Like Settlements on The Eastern Frontier of The Carpathian Basin. History of Research*. Cluj-Napoca, 2014, 286–288.
- Gogâltan, Găvan 2014 Fl. Gogâltan, Al. Găvan, *Der Bronzezeitliche Tell von Pecica „Șanțul Mare”. Ein Metallurgisches Zentrum des Karpatenbeckens (I)*. EphNap XXIV, 2014, 7–38.
- Gogâltan, Sava 2019 Fl. Gogâltan, V. Sava, *Înainte de apariția mega-forturilor bronzului târziu de la Mureșul de Jos (2000/1900–1600/1500 BC)*. Crisia XLIX, 2019, 65–94.
- Gudea, Moțiu 1983 N. Gudea, I. Moțiu, *Observații în legătură cu istoria Banatului în epoca romană*. Banatica 7, 1983, 151–202.
- Gumă 1993 M. Gumă, *Civilizația primei epoci a fierului în sud-vestul României*. București 1993.
- Gumă 1997 M. Gumă, *Epoca bronzului în Banat. Orizonturi cronologice și manifestări culturale*. Timișoara 1997.
- Ihde 2001 Ch. Ihde, *Die früh- und mittelbronzezeitliche Keramik von Feudvar, Gem. Mošorin, Vojvodina (Serbia)*. Arch.Inf. 24/1, 2001, 135–139.
- Kienlin 2018 T. L. Kienlin, *Borsod Region Bronze Age Settlement: ‘Diversity in Uniformity’*. In: T.L. Kienlin, K.P. Fischl, T. Pusztai (eds.), *Borsod Region Bronze Age Settlement. Catalogue of the Early to Middle Bronze Age Tell Sites Covered by Magnetometry and Surface Survey*. Universitätsforschungen zur Prähistorischen Archäologie Band 317. Bonn, 2018.

- Lazarovici, Săcărin 1979 Gh. Lazarovici, C. Săcărin, *Epoca bronzului în „Clisura Dunării”*. Banatica 5, 1979, 71–106.
- Ljuština 2010 M. Ljuština, *Clay objects from the Vatin Culture settlement at Vinča, North Serbia*. In: H. Pop, I. Bejinariu, S. Băcuet-Crișan, D. Băcuet-Crișan (eds.), *Identități culturale, locale și regionale în context european Cluj-Napoca 2010*, 101–109.
- Ljuština 2011 M. Ljuština, *Well defined or taken for granted – the Bronze Age Vatin Culture a century after*. In: D. Măgureanu, D. Măndescu, S. Matei (eds.), *Archaeology: making of and practice. Studies in honor of Mircea Babeș at his 70th anniversary*. Pitești 2011, 103–113.
- Ljuština 2013 M. Ljuština, *Sudul Câmpiei Panonice în prima jumătate a Mileniului II î.Hr. Studiu de caz: Židovar, Banatul de Sud, Serbia*. Istros XIX, 2013, 79–117.
- Ljuština 2015 M. Ljuština, *The Danube connects: Middle Bronze Age settlements at Omoljica-Zlatica and Pančevo-Najeva Ciglana vs. Their neighbours from Vinča-Belo Brdo, North Serbia*. Istros XXI, 2015, 57–106.
- Luca 2010 S. A. Luca, *Descoperiri arheologice din Banatul romanesc. Repertoriu*. Sibiu 2010.
- Luminosu 1972 D. S. Luminosu, *Contribuție la cunoașterea istoricului cercetărilor privind cultura Periam-Pecica de pe teritoriul R.S România*. Tibiscus 1972, 27–34.
- Marta 2014 L. Marta, *Medieșu Aurit “Ciuncaș”, Satu Mare County*. In: Fl. Gogâltan, C. Cordoș, A. Ignat (eds.), *Bronze Age Tell, Tell-Like and Mound-Like Settlements on The Eastern Frontier of The Carpathian Basin. History of Research*. Cluj-Napoca 2014, 118–122.
- Martăș 2008 Fl. Martăș, *Locuirea de epoca bronzului de la Peciu Nou*. Banatica 18, 2008, 37–46.
- Măruia 2011 L. Măruia, *Cercetări interdisciplinare vizând reconstituirea geografiei istorice a Dealurilor Lipovei*. Timișoara 2011.
- Milleker 1906 B. Milleker, *Délmagyarország régiségleletei honfoglalás előtti időkből*. III Rész. Timișoara 1906.
- Mozsolics 1967 A. Mozsolics, *Bronzefunde des Karpatenbeckens: Depotfundhorizonte von Hajdúsámson und Kosziderpadlás*. Budapesta 1967.
- Ordentlich et al. 2014 I. Ordentlich, Al. Găvan, C. Ghemiș, *Sălcea “Dealul Vida = Vida hegy”, Bihor County*. In: Fl. Gogâltan, C. Cordoș, A. Ignat (eds.), *Bronze Age Tell, Tell-Like and Mound-Like Settlements on The Eastern Frontier of The Carpathian Basin. History of Research*. Cluj-Napoca 2014, 207–230.
- Ordentlich et al. 2014a I. Ordentlich, M. Lie, C. Ghemiș, *Otomanii “Cetățuie = Vârhegy”, Bihor County*. In: Fl. Gogâltan, C. Cordoș, A. Ignat (eds.), *Bronze Age Tell, Tell-Like and Mound-Like Settlements on The Eastern Frontier of The Carpathian Basin. History of Research*. Cluj-Napoca 2014, 139–147.
- Posea 1997 G. Posea, *Câmpia de Vest a României. Câmpia Banato-Crișană*. București 1997.
- Radu 1972 O. Radu, *Contribuții la cunoașterea culturii Vatină. Săpăturile de la Cornești, jud. Timiș*. SCIV, 23, 2, 1972, 271–283.
- Radu 1972a O. Radu, *Cultura Vatină în așezarea de epoca bronzului de la Cornești, județul Timiș*. Tibiscus II, 1972, 35–38.
- Rogozea O-C., Rogozea P. 2016 O-C. Rogozea, P. Rogozea, *Contribuții la repertoriul așezărilor atribuite epocii bronzului din vestul României (I)*. Sargeția VII, 2016, 139–200.
- Roska 1942 M. Roska, *Erdély régészeti repertórium, I: Óskor*. Kolozsvár 1942.
- Rusu 1972 M. Rusu, *Considerații asupra metalurgiei aurului din Transilvania în Bronz D și Hallstatt A*. ActaMN IX, 1972, 29–63.
- Sava, Gogâltan 2017 V. Sava, Fl. Gogâltan, *The Bronze Age Fortifications in Munar “Wolfsberg”, Arad County. The 2014 and 2017 Archaeological Researches*. AnArchRessoviensia 12, 2017, 75–100.
- Soroceanu, Radu 1975 T. Soroceanu, O. Radu, *Șantierul arheologic Cornești (jud. Timiș). Săpăturile din 1973 și 1974*. Tibiscus IV, 1975, 33–39.
- Szentmiklosi 2014 Al. Szentmiklosi, *Inele de buclă, Alioș, com. Mașloc, jud. Timiș*. In: R. Oanță-Marghitu (ed.), *Aurul și Argintul Antic al României. Catalog de expoziție*. Conphys, Râmnicu Vâlcea 2014, 204–205.
- Țârlea, Popescu 2013 Al. Țârlea, A-D. Popescu, *Aurul și argintul în epoca bronzului și prima epocă a fierului*. R. Oanță-Marghitu (ed.), *Aurul și Argintul Antic al României. Catalog de expoziție*. Conphys, Râmnicu Vâlcea 2014, 48–63.

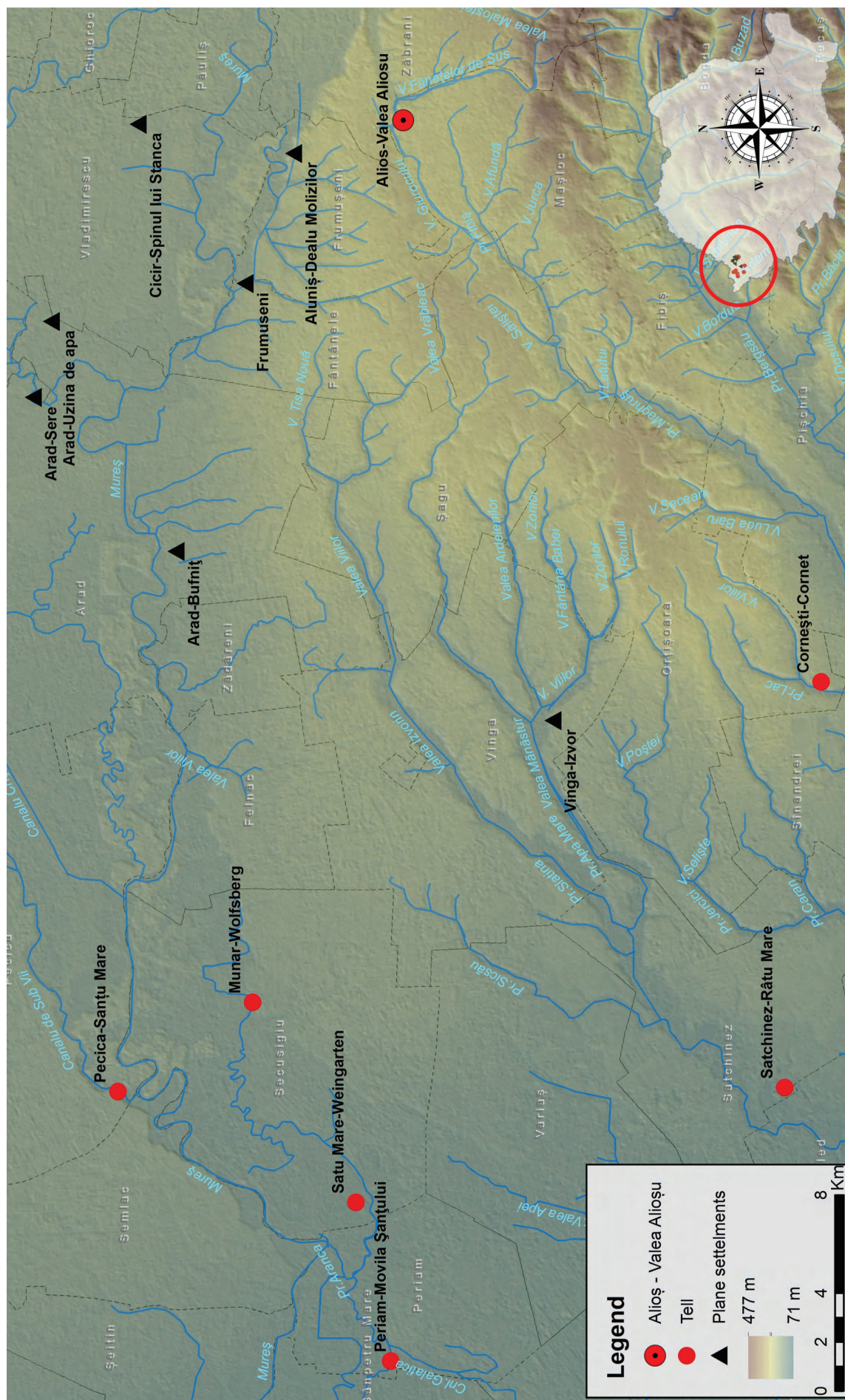


Fig. 1. Location of the site in Alioș-Valea Alioșu as compared to the multistrata and flat settlements of the Middle Bronze Age in the Vinga Plain and the major riverbed of the Mureș.

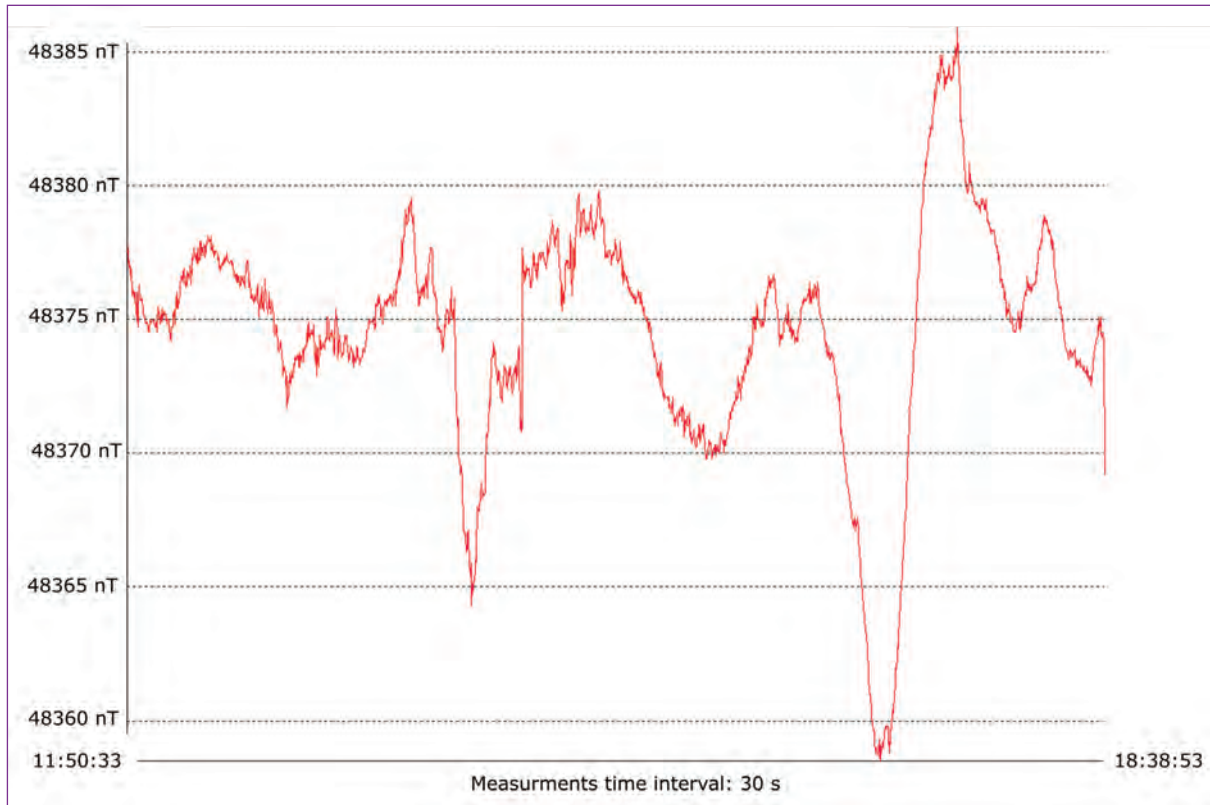


Fig. 2. Magnetic field variation during the day when we have collected the magnetic data. The plot was made from the base station magnetometer which was set to record points each 30 seconds.



Fig. 3. The fortification in Alioş-Valea Alioşu documented by satellite images (©Google Earth): 1. Image dated 04.03.2012; 2. Image dated 16.06.2016; 3. Image dated 01.03.2014; 4. Image dated 24.07.2019.

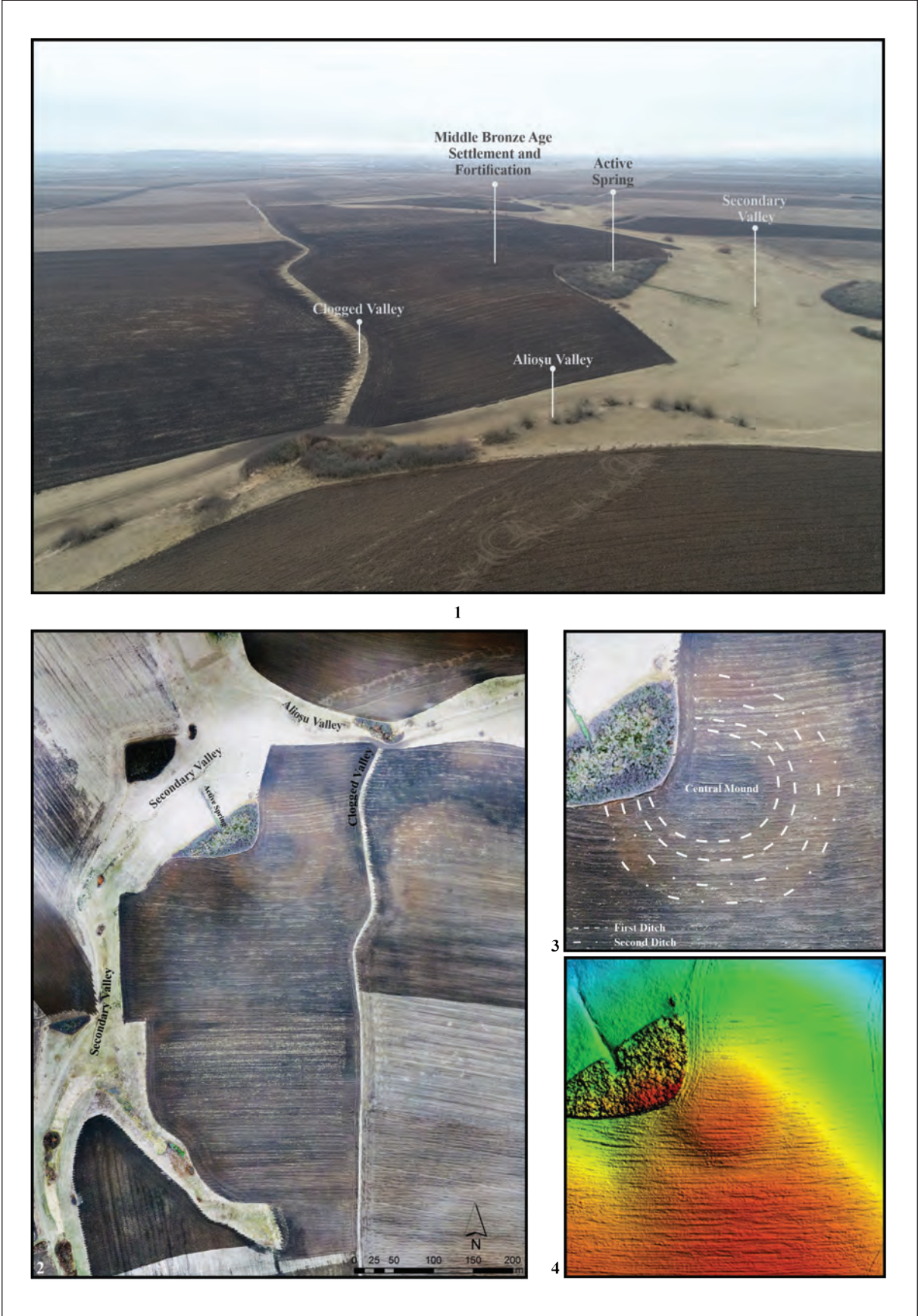


Plate 1. Geographic context of the Valea Alioșu micro-region (1-2); ortophotoplan (3) and digital elevation model (DEM) in the area of the fortification (4).

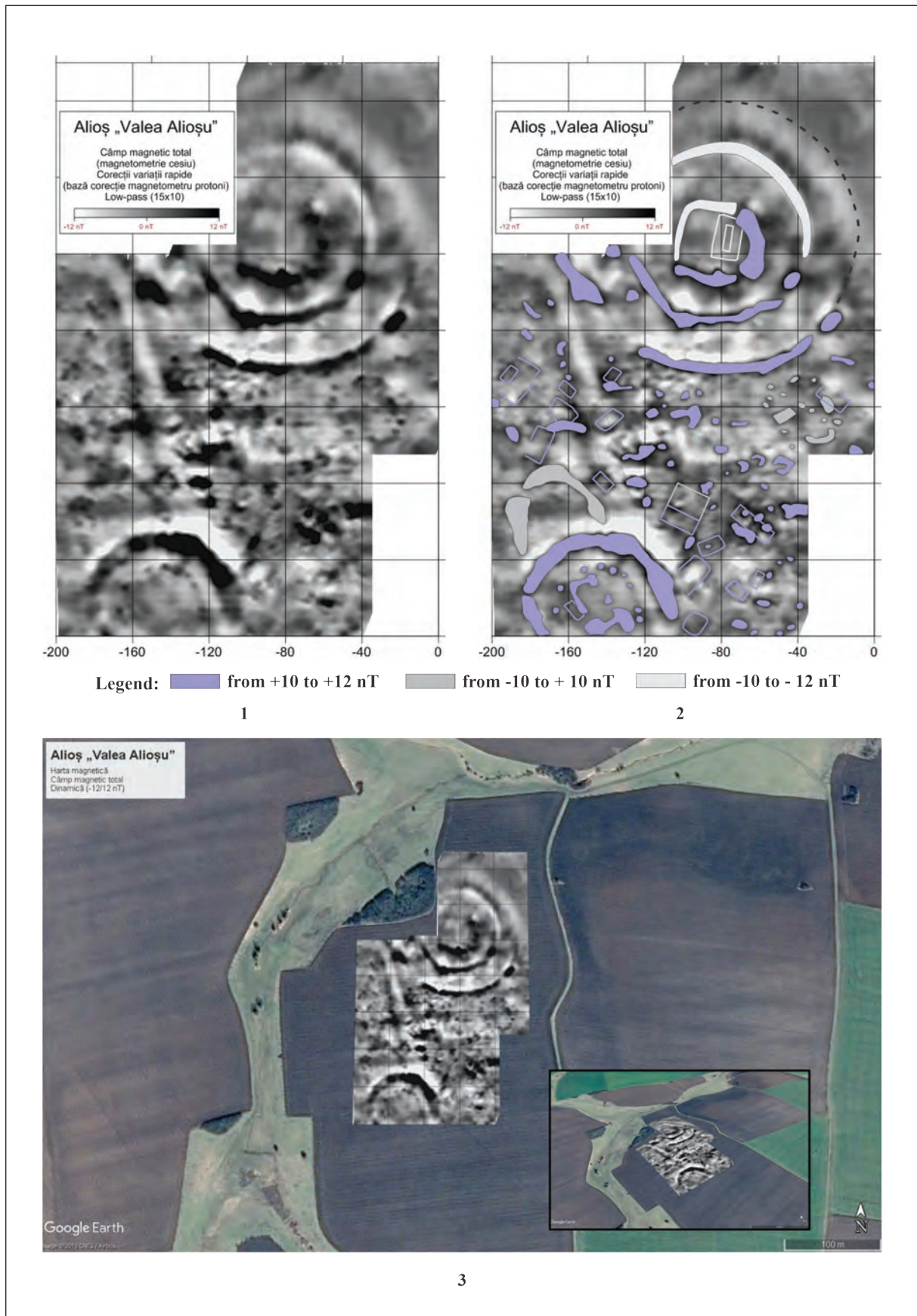


Plate 2. The magnetometric ground plan of the surveyed area (1) and its interpretation (2); The magnetometric plan overlapped to the satellite image (3).

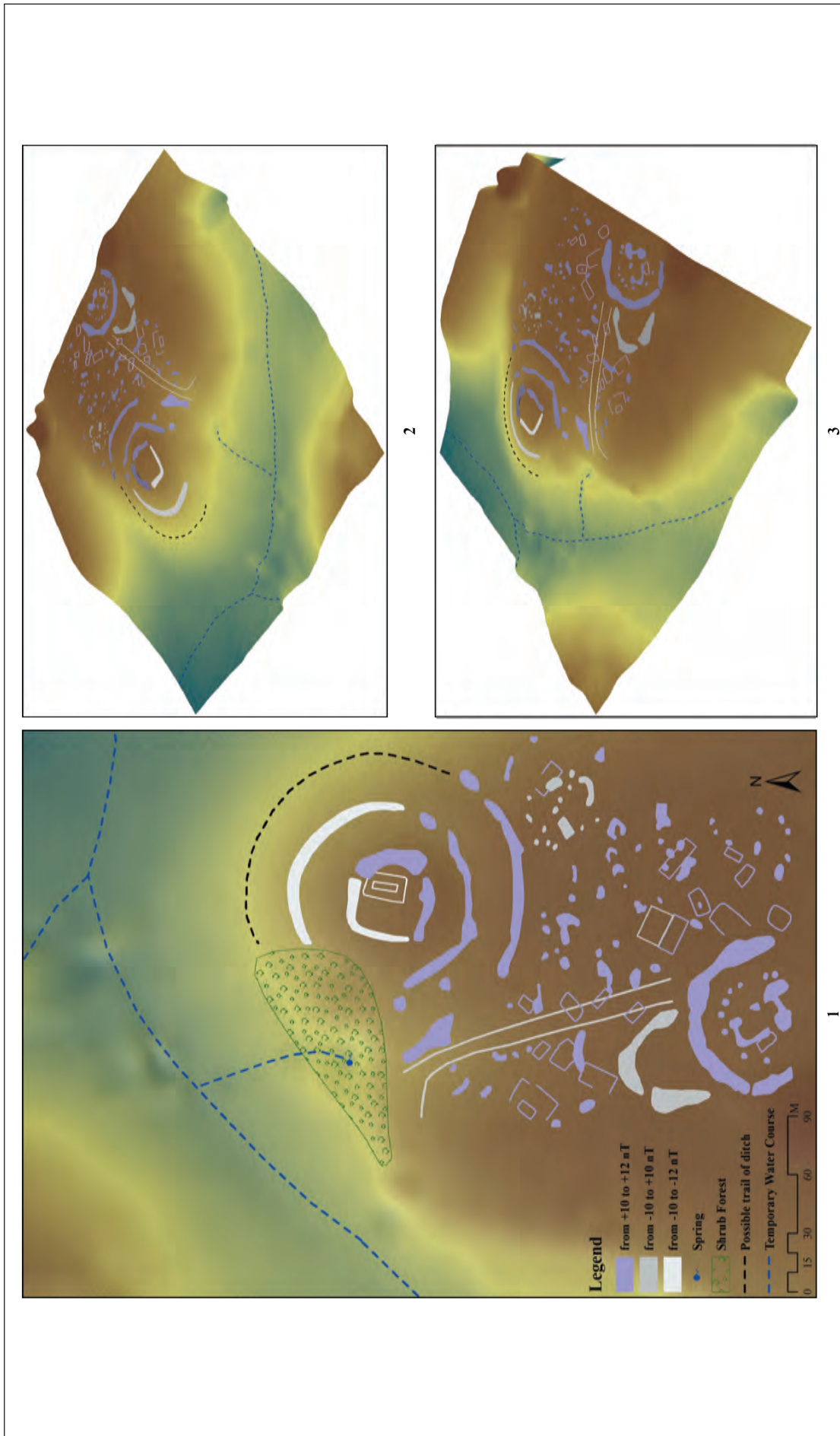


Plate 3. Contextualization of the results of the magnetometric survey – the anomalies overlapped to the digital elevation model (DEM).

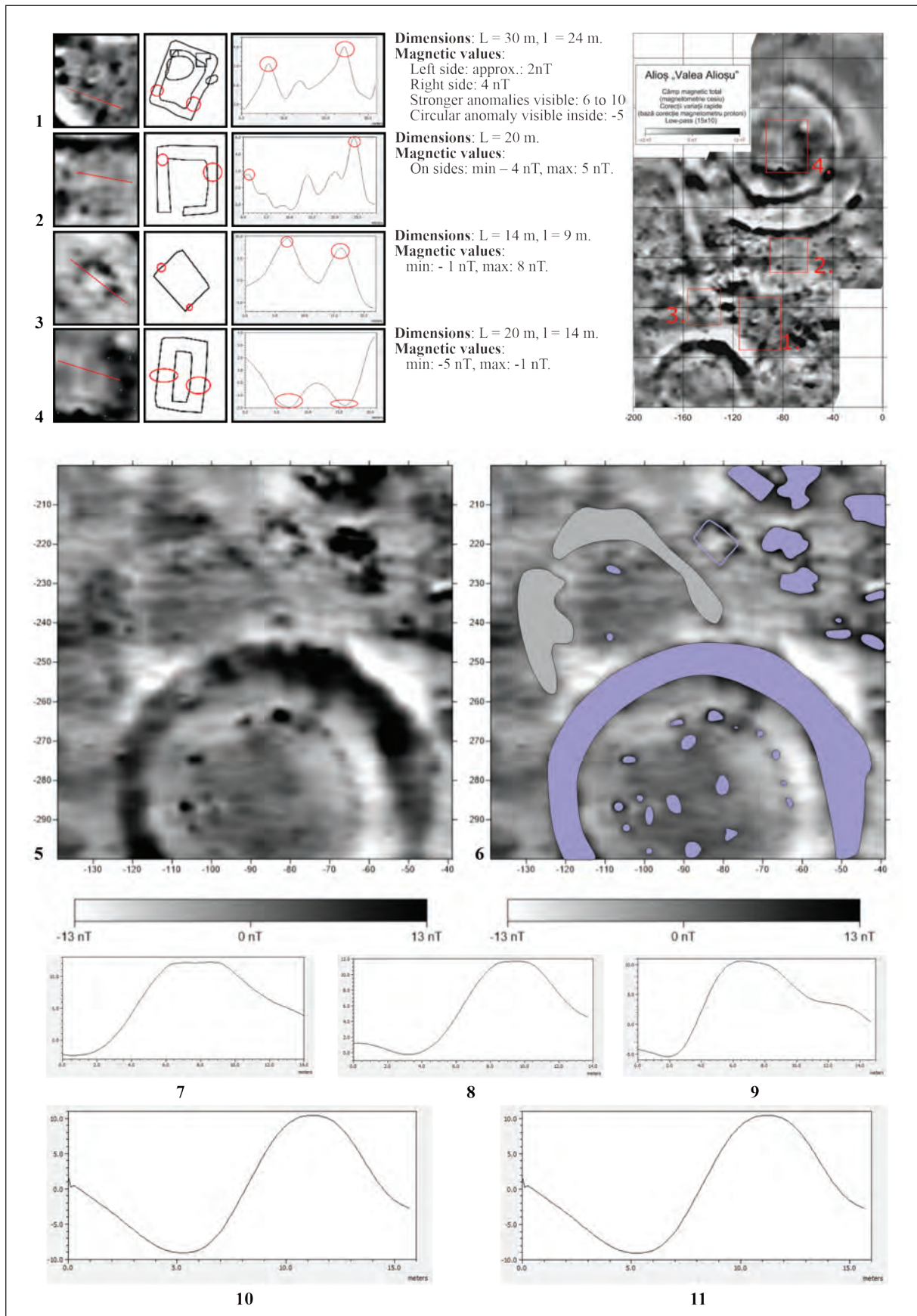


Plate 4. Examples of habitation structures identified through the survey (1-4); magnetometric ground plan of the second circular structure and its interpretation (5-6); magnetometric profiles from the apse-shaped anomaly (1), the first (8-10) and the second ditch of the fortification (11).

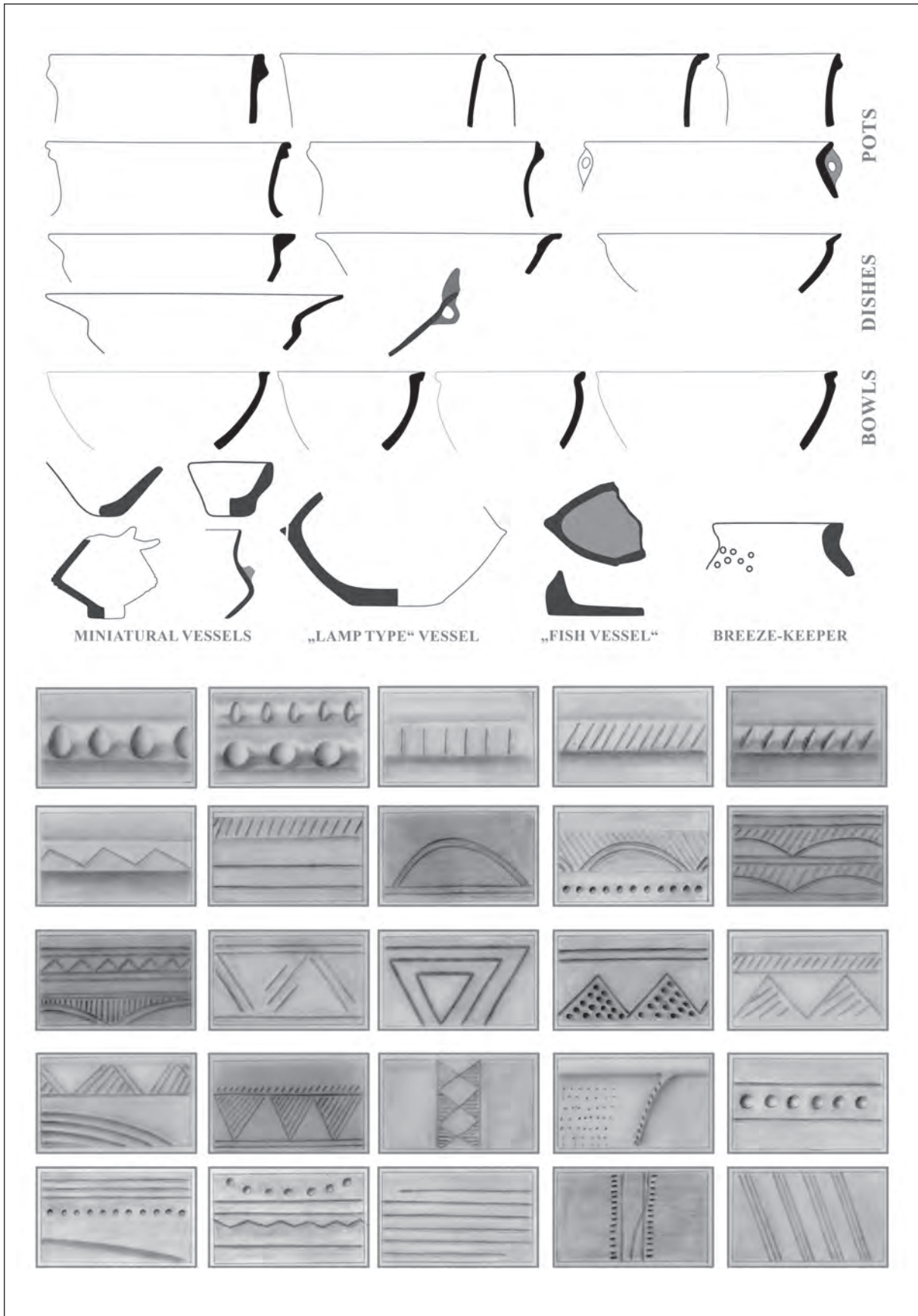


Plate 5. Types of pots and decorations identified among the pottery material collected during field researches.

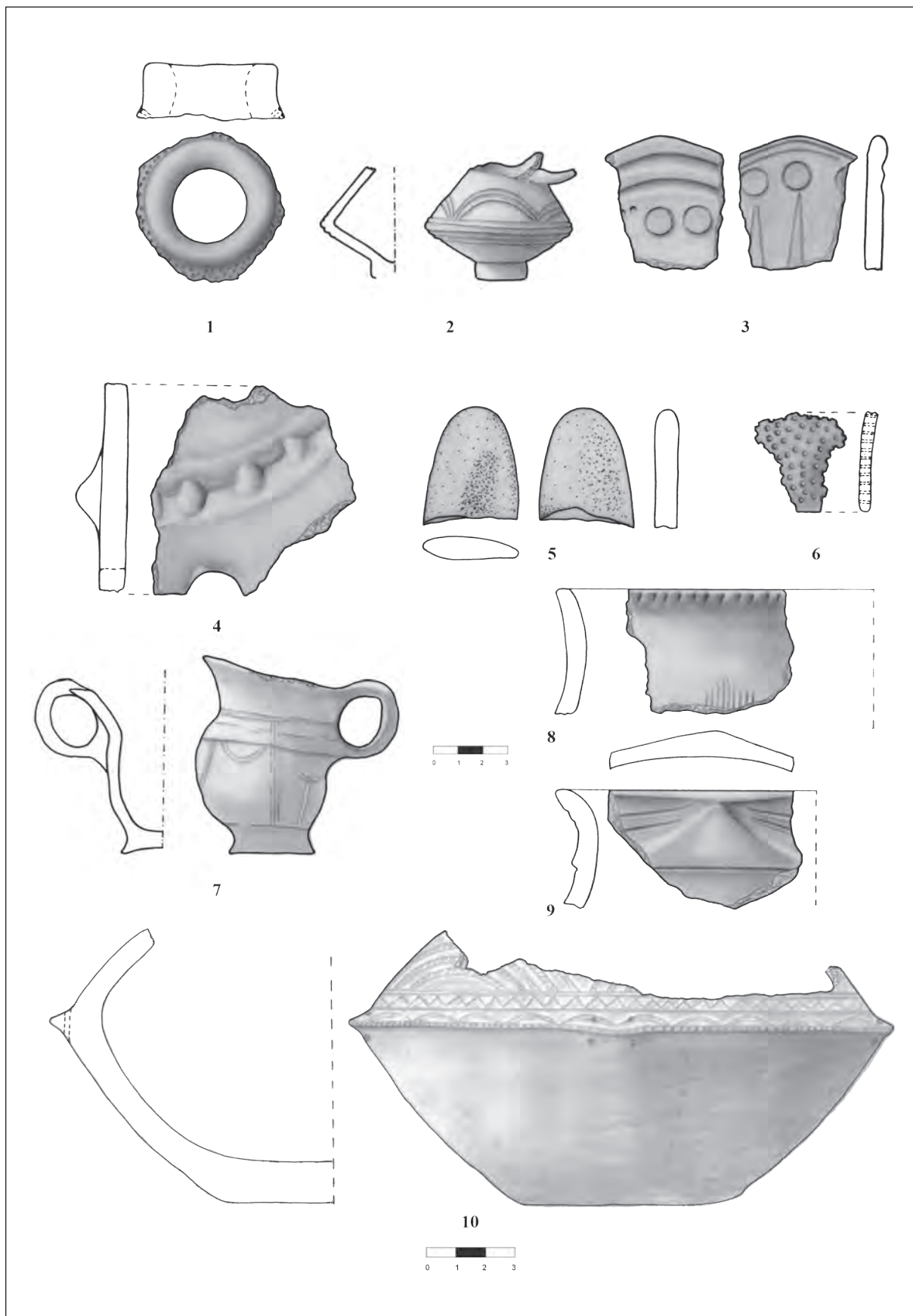


Plate 6. The archaeological materials found during field researches.

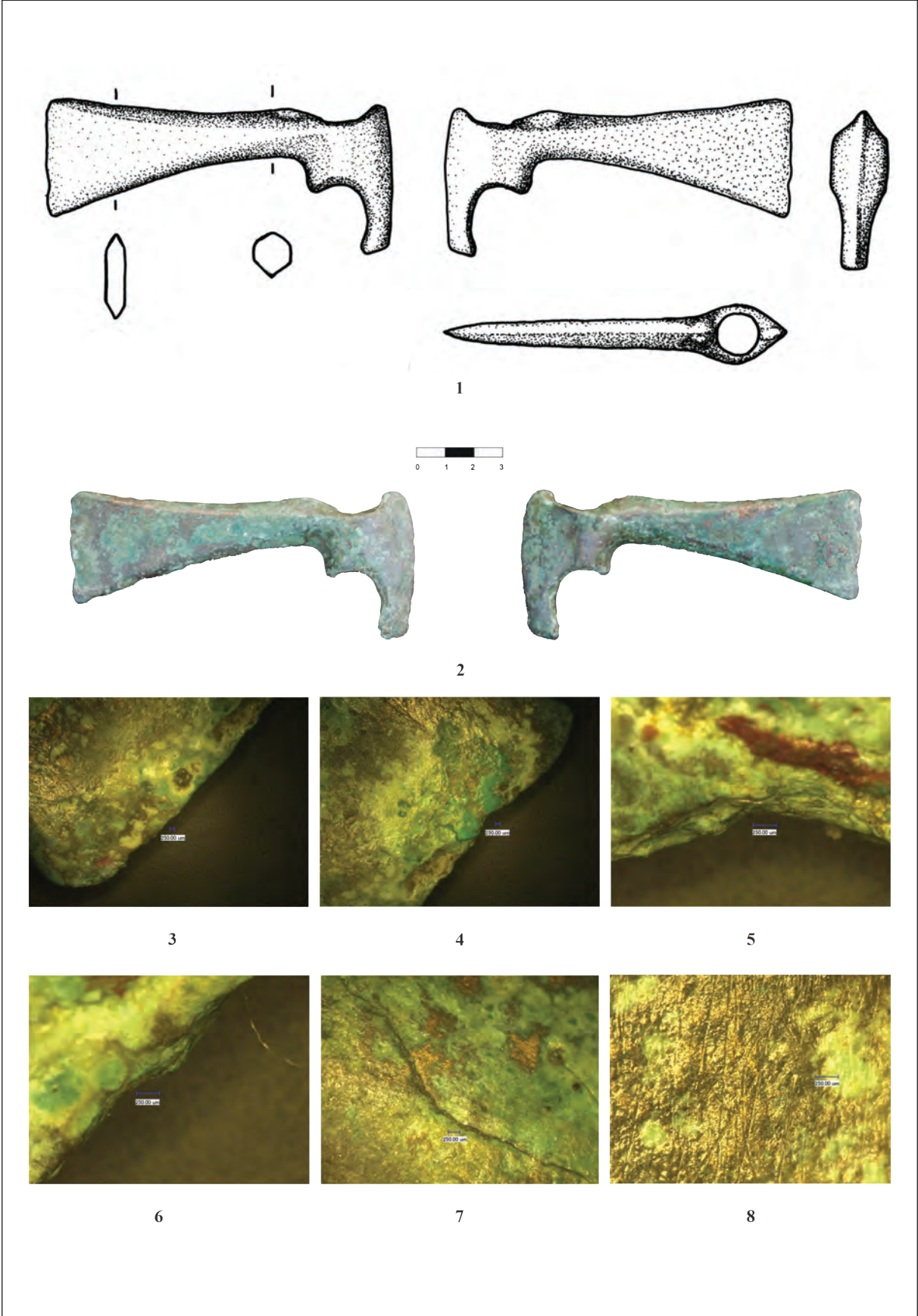


Plate 7. Hajdúsámson-type axe with transversal socket: drawing and photograph (1–2); microscopic details from the surface of the axe (3–8).

Abbreviations

ActaArchHung	Acta Archaeologica Academiae Scientiarum Hungaricae.
AAC	Acta Archaeologica Carpathica, Cracow.
ActaMN	Acta Musei Napocensis, Cluj-Napoca.
ActaMP	Acta Musei Porolissensis, Zalău
AnArchRessoviensia	Analecta Archaeologica Ressoviensia, Rzeszów.
AAS at CEU	Annual of Medieval Studies at CEU, Budapest.
Apulum	Acta Musei Apulensis – Apulum, Alba-Iulia.
Alba Regia	Alba Regia, Székesfehérvár.
Antaeus	Antaeus, Budapest.
Arrabona	Arrabona, Győr.
ArhMed	Arheologia Medievală, Cluj-Napoca, Brăila, Reșița.
ArchBaltica	Archaeologia Baltica, Vilnius.
Arch.Inf	Archäologische Informationen.
ATS	Acta Terrae Septemcastrensis, Sibiu.
ArchÉrt	Archaeologiai Értesítő, Budapest.
Banatica	Banatica, Reșița.
BBMÉ	A Béni Balogh Ádám Múzeum Évkönyve, Szekszárd.
BUFM	Beiträge zur Ur- und Frühgeschichte Mitteleuropas.
BCMI	Buletinul Comisiei Naționale a Monumentelor, ansambluri situri istorice. București.
CommArchHung	Communicationes Archaeologicae Hungaricae, Budapest.
CCA	Cronica Cercetărilor Arheologice, Comisia Națională de Arheologie, București.
CIL	Corpus Inscriptionum Latinarum, Berlin.
CMA	Complexul Muzeal Arad.
Dolgozatok	Dolgozatok az Erdélyi Múzeum érem- és régiségtárából, Cluj.
Dolg.	Dolgozatok a Magyar Királyi Ferencz József Tudományegyetem Archaeologiai Intézetéből, Szeged.
Dolg. ÚS	Dolgozatok az Erdélyi Múzeum Érem- és Régiségtárából, Új Sorozat. Cluj-Napoca / Kolozsvár.
EphNap	Ephemeris Napocensis, Cluj-Napoca.
HOMÉ	A Hermann Ottó Múzeum Évkönyve. Miskolc.
JAHA	Journal of Ancient History and Archaeology, Cluj-Napoca.
JAM	Jósa András Museum, Nyíregyháza.
JPMÉ	Janus Pannonius Múzeum Évkönyve.
JRGZM	Jahrbuch des Romisch-Germanischen Zentralmuseums, Mainz.
KRRMK	Kaposvári Rippl Rónai Múzeum Közleményei, Kaposvár.
LMI	Lista monumentelor istorice, updated in 2015.
MittArchInst	Mitteilungen des Archäologischen Instituts der Ungarischen Akademie der Wissenschaften.
MOL	Magyar Olaj- és Gázipari Részvénytársaság / Hungarian Oil and Gas Public Limited Company
Marisia	Marisia, Târgu Mureș.
NyJAMÉ	A nyíregyházi Jósa András Múzeum Évkönyve, Nyíregyháza.
PBF	Praehistorische Bronzefunde. Berlin.
Przegląd Archeologiczny	Przegląd Archeologiczny, Wrocław.
Rad	Jósa András Museum, Archaeological Archive
RégFüz	Régészeti Füzetek, Budapest.

RKM	Régészeti Kutatások Magyarországon/Archaeological Investigations in Hungary, Budapest.
RAJ Arad	Repertoriul Arheologic al Mureşului Inferior. Judeţul Arad. Timişoara 1999.
RAN	Repertoriul Arheologic Naţional.
Sargetia	Sargetia. Acta Musei Devensis, Deva.
SCIV(A)	Studii şi Cercetări de Istorie Veche şi Arheologie, Bucureşti.
SGB	Studii de Geografie a Banatului, Timişoara.
SIB	Studii de Istorie a Banatului, Timişoara.
Slavia Antiqua	Slavia Antiqua, Poznań.
SlovArch	Slovenská Archeológia, Nitra.
SMK	Somogyi Múzeumok Közleményei, Kaposvár.
SovArh	Sovetskaja Arheologija, Moskva.
SRTM	Shuttle Radar Topography Mission.
StudiaUBB Historia	Studia UBB Historia, Cluj-Napoca.
SzKMÉ	A Szántó Kovács Múzeum Évkönyve, Pécs.
Századok	Századok, Budapest.
Terra Sebus	Terra Sebus. Acta Musei Sabesiensis, Sebeş.
Tibiscum S. N.	Tibiscum S. N., Caransebeş.
TransRev	Transylvanian Review, Cluj-Napoca.
ZalaiMúz	Zalai Múzeum, Zalaegerszeg.
ZSA	Ziridava. Studia Archaeologica. Arad.
Živa Antika	Živa Antika, Skopje.