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PRELIMINARY REPORT ON THE 2021 EXCAVATION SEASON AT TOBOLIU

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ABSTRACT

This paper presents the preliminary results of the 2021 excavation campaign carried out in the Bronze Age tell-based settlement complex from Toboliu (Bihor County, Romania). The site consists of a relatively small tell that is surrounded by an extensive horizontal settlement covering an area of about 84 ha. The 2021 excavation season in Toboliu was focused on investigating the outer settlement of this site. An excavation block measuring 5 x 12 m (Trench 5) was opened at about 220 m NNE of the settlement mound. This paper provides an overview of the main archaeological features uncovered in Trench 5, along with the first results of the archaeobotanical, archeozoological and geoarchaeological investigations. The fieldwork and analyses upon which this report is based were conducted within the framework of an interdisciplinary project funded by the German Research Foundation (Deutsche Forschungsgemeinschaft, DFG).

Keywords: Bronze Age, Great Hungarian Plain, tell-based settlement complex, horizontal settlement, excavation, multidisciplinary analyses

Introduction

The Bronze Age tell of Toboliu (Bihor County, Romania) is located at the eastern margin of the Great Hungarian Plain, close to the modern border separating Romania and Hungary, approximately 3.5 km south of the Crișul Repede/Sebes Körös River. Excavations on the settlement mound conducted between 2014 and 2017 exposed its complete stratigraphic sequence, which consisted of seven successive phases of occupation in about 4 m of cultural deposits (Lie *et al.* 2018; 2019). Important new insights into the extent and inner layout of the site were brought by the non-invasive investigations carried out between 2015 and 2019 (systematic fieldwalking, aerial photography and geophysical survey), which have revealed that the tell was only a small component of a significantly larger site. Through these methods, we could establish the existence of an extended horizontal settlement around the mound, covering an area of 84 ha (Fazecaș, Lie 2018; Lie *et al.* 2019). The geomagnetic plan of this outer settlement shows a rather densely

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occupied area with numerous anomalies that can be interpreted as settlement pits and burnt house structures, while the finds from the surface survey indicate that it was at the very least partly contemporary with the occupation on the central mound (Găvan *et al.* 2021).

In 2021 we carried out a coring survey on the outer settlement of the tell from Toboliu targeting several geomagnetic anomalies that were indicative of traces of domestic architecture (Lie *et al.* in prep.). Coring transect 10, located at about 220 m NNE of the central mound, revealed an area of stratigraphic complexity. Therefore, we decided to open a trench in this location (Fig. 1). The main objectives of this excavation were to determine the character, extent, date, and nature of the archaeological remains in this part of the outer settlement. Furthermore, another important aim was to collect material for archaeobotanical, archaeozoological, geoarchaeological and micromorphological analyses. This work was carried out within the framework of an interdisciplinary project funded by the German Research Foundation (Deutsche Forschungsgemeinschaft, DFG,)[1] (see also Găvan *et al.* 2021).

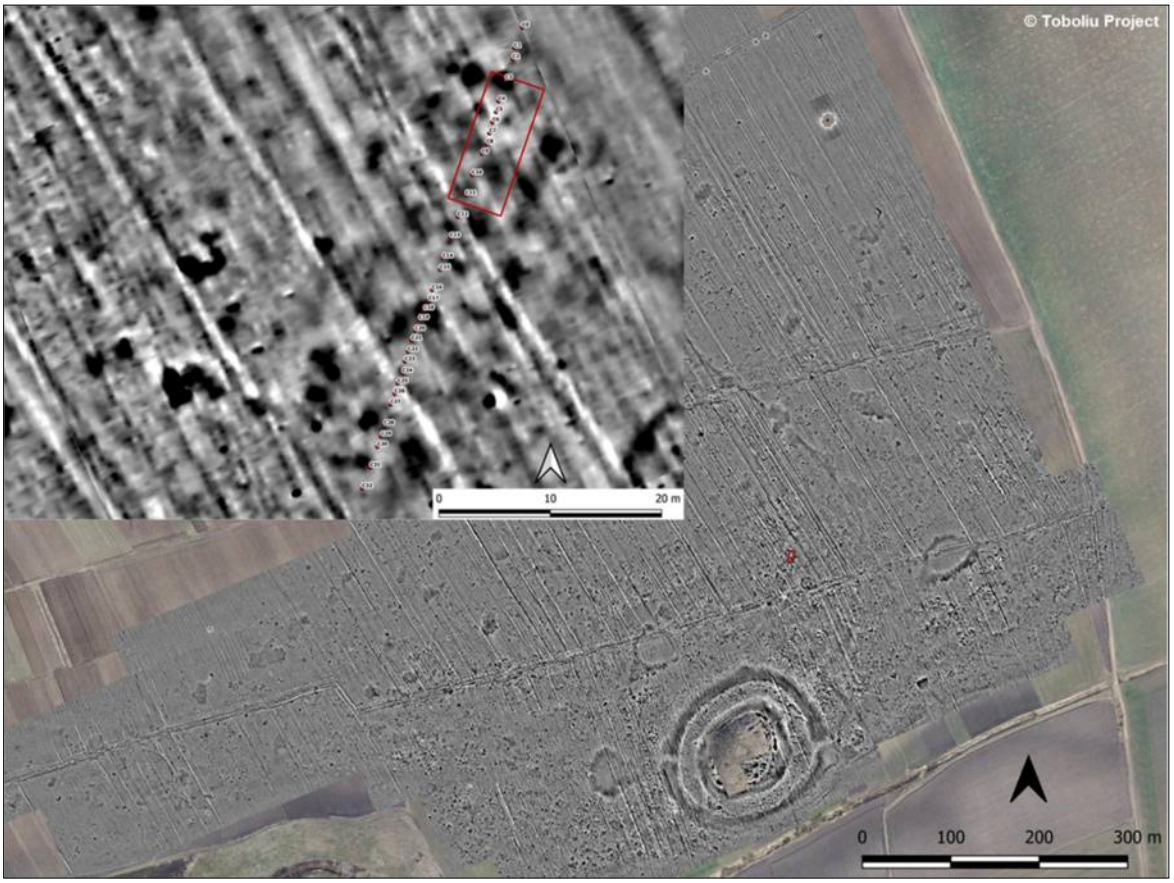

Fig. 1. Toboliu – location of Trench 5 on the geomagnetic site plan.

The 2021 excavation campaign

Excavation and documentation methods

The 2021 excavation season at Toboliu took place between July 27th and August 27th. The excavated block (Trench 5) measured 5 x 12 m and was oriented roughly NE-SW. It was located at about 220 m NNE of the tell (Fig. 1). Regarding the method of excavation, we removed

[1] https://gepris.dfg.de/gepris/projekt/436594565 and https://gepris.dfg.de/gepris/projekt/436834905?language=de.

deposits by natural and cultural strata, following the stratigraphic sequence in order to understand the origin, chronology, and provenience of the archaeological material. All archaeological features were hand excavated. Pit features and hearths were half sectioned in order to document their fill sequence. Samples for flotation and radiocarbon dating were collected from securely sealed features. A system based on the MoLAS system (Museum of London Archaeological Service Site Manual[2]) was used for recording, making use of pro-forma context sheets. Distinct context numbers were given for each context. The stratigraphic relation of every excavated context was recorded on site in order to complete the Harris matrix. In this way the relative stratigraphic sequence in this part of the outer settlement could be reconstructed. (A.G.)

Excavated features

The archaeological remains uncovered in Trench 5 are numerous and can be classified into several feature types, including 12 pits, 8 fire hearths, 4 pottery clusters, and the remains of a burnt wattle and daub structure. In the following paragraphs, a description of these contexts will be presented, starting from the latest and moving down to the earliest. The topsoil (Cx. 001), consisting of greyish-brown soil heavily disturbed by modern ploughing, was up to 40 cm thick. Its upper part (the first 30 cm) was removed by machinery, while the rest was hand excavated. Immediately below this plough horizon, we identified an archaeological layer labelled Cx. 002. This layer was around 20 cm thick and consisted of a dark brown compacted soil with inclusions of small and medium-sized fragments of daub, bone fragments, and large quantities of pottery sherds. Lying within this layer, close to the south-eastern margin of the trench, were two small pottery concentrations (Cx. 004 and Cx. 007), extending over areas of 37 x 33 cm and 36 x 23 cm, respectively.

Going deeper, we uncovered the plastered surfaces of two fire hearths (Fig. 2). The first one (Cx. 003), roughly rectangular in shape with rounded corners, measured 1.06 x 0.7 m and was located approximately in the middle of the trench. Its surface was plastered, and below the plaster was a fire-hardened clay layer approximately 8 cm thick (Cx. 012), which was placed on top of another layer made of pottery sherds (Cx. 014, Fig. 3). Underneath Cx. 014 there was another layer of fire-hardened clay (Cx. 016), which was lying on top of yet another layer of pottery sherds (Cx. 017) that most likely represented the hearth floor preparation. In order to fully understand this sequence, the hearth was half sectioned (Fig. 4). The second hearth (Cx. 005), measuring 0.60 x 0.68 m, was roughly oval-shaped and located approximately 1.1 m west of the first one. Its plastered surface was only partially preserved, and underneath it was a 4 cm thick layer of burnt clay (Cx. 013), which was lying above a layer of pottery sherds (Cx. 015, Fig. 5). Between the two hearths, a concentration of pottery and daub fragments (Cx. 008) could also be identified (Fig. 2).

At the base of both hearths, another layer could be outlined throughout the trench (Cx. 009), which was lighter in colour than Cx. 002. In the south-west corner of the excavation block this 20 cm thick layer was cut by a large pit. The exact shape of the pit could not be detected as it extended under both the southern and western profiles of the trench. The exposed surface of the pit measured 1.46 x 1.98 m, with a maximum depth of 2.20 m. It had a flat base, hourglass-shaped sides, and appeared to have had at least two distinct phases of use. Its first fill also contained the

[2] https://www.colat.org.uk/_assets/doc/mol-site-manual-3rd-edition.pdf.

remains of a dismantled hearth (Cx. 010), which was likely thrown into the pit. Four further fills, which could be distinguished based on their colour and consistency (Cx. 038, Cx. 057, Cx. 061, and Cx. 067), could be identified within this pit. They all contained pottery sherds, daub fragments, and animal bones. Additionally, Cx. 057 and Cx. 061 also contained lots of charcoal, ash, and organic material. Judging by the infill and the nature of the finds, we can tentatively interpret this to be a refuse pit. Other than the two abovementioned fire hearths, no associated traces of domestic architecture were uncovered in layer Cx. 009.

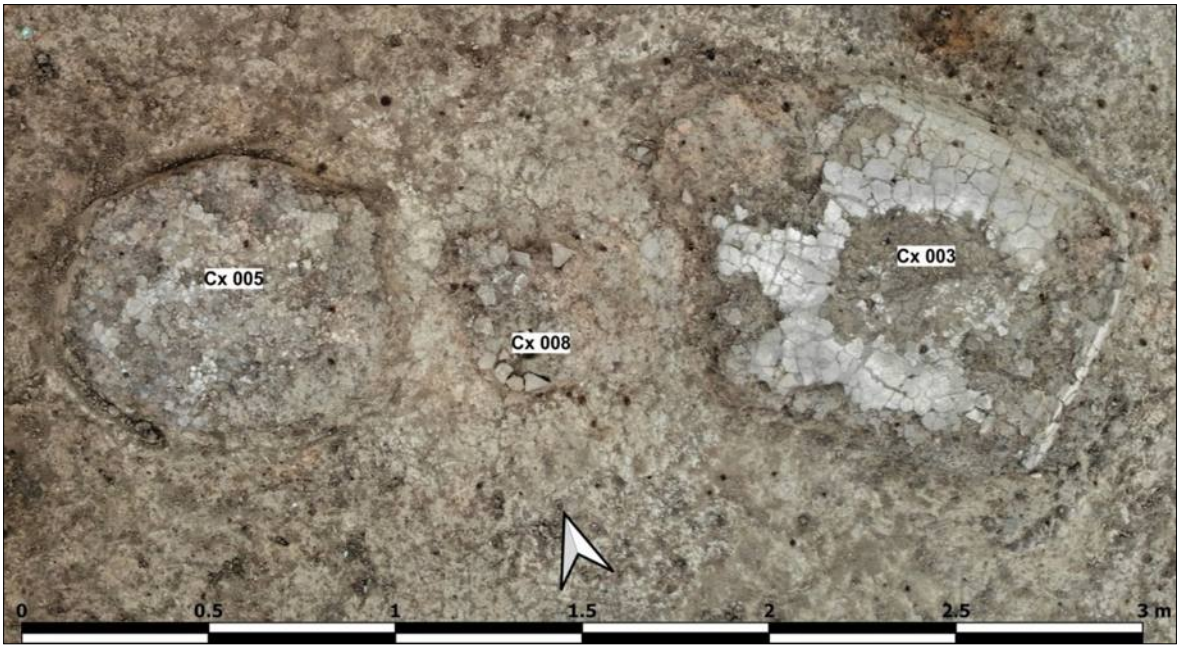

Fig. 2. Detail of the second planum with the two hearths Cx. 003 and Cx. 005 and the pottery concentration Cx. 008.

Fig. 3. Cx. 014.

Fig. 4. Section through fire hearth Cx. 003.

Fig. 5. Cx. 015.

Underneath layer Cx. 009, in the southern and central part of the excavation block, a deposit with ash, daub and burnt material could be outlined (Fig. 6). While cleaning this deposit, burnt daub fragments from a house structure were found. Among these were numerous pottery fragments, animal bones, and ash. The architectural remains (Cx. 026) covered a surface of about 6.60 x 3.30 m. The exact measurements of the house cannot be reconstructed as its southern and western parts were cut by two pits that were dug some time later, while its eastern edge, also sectioned by another pit, extended further into the eastern profile of the trench. Based on the preserved section, the structure was oriented roughly north-south. Since the remains of the house were heavily truncated by later pits, it is difficult to reconstruct its original shape. Moreover, since the amount of uncovered architectural debris is rather small, it is possible that it was already cleared out in the past. No foundation or post holes could be detected. Several clusters of complete and fragmentary pottery sherds were found on top and within the debris (Fig. 7). A badly preserved hearth (Cx. 029) could also be identified close to the eastern edge of the structure. No sherd preparation could be detected under its plastered surface. Towards the northern part of the trench, the house debris was much thinner, with only sporadic fragments of burnt daub identified. Very few pottery sherds were uncovered in this area. In the eastern part of the excavation block, the structure was truncated by a shallow pit (Cx. 043) about 38 cm deep that extended under the eastern profile, while in the western part it was cut by an 80 cm deep pit with two fills (Cx. 040 and Cx. 060) that continued underneath the western profile. Overlaying the first fill of this pit (Cx. 040) was another hearth with plastered surface (Cx. 027) and no prepared floor of pottery sherds. This feature also extended under the western profile, so only a part of it could be exposed within the surface of the trench.

Fig. 6. Cx. 026 – first outline.

To the east and west of the domestic architectural remains, two hearths with plastered surfaces and incised decoration were uncovered. The first of these was only partially preserved and had an irregular, approximately oval shape. It was located at about 60 cm from the eastern profile and measured 0.87 x 0.76 cm. The plastered surface (Cx. 021) was decorated on the edges with incised triangular motifs (Fig. 8). Underneath, there was a layer of hard-burned clay (Cx. 062), which was placed on top of a layer of pottery sherds (Cx. 063) that rested on another layer of burned clay (Cx. 064). The second hearth (Cx. 022), roughly rectangular in shape with slightly rounded corners, was only partially excavated, as it extended under the western profile of the excavation block. It had a rim and a decoration consisting of incised lines at its margins (Fig. 9). This hearth showed a phase of rebuilding. Underneath a layer of hard-burned clay with pottery sherds (Cx. 047) lying directly under the first plastered surface Cx. 022, a second plastered surface (Cx. 050) could be detected. This surface was applied to a layer made of pottery sherds (Cx. 056). It cannot be demonstrated conclusively that the two afore mentioned hearths were associated with the house structure presented above (Cx. 026), but it seems likely, given their proximity. Another badly preserved hearth (Cx. 023) with plastered surface was also found to the south of Cx. 021, overlaying Cx. 026 at its eastern margin. Underneath the plaster there was only a layer of fire-hardened clay without a substructure.

Fig. 7. Pottery and daub clusters in Cx. 026.

Fig. 8. Hearth with decorated plaster surface (Cx. 021).

Fig. 9. Hearth with decorated plaster surface (Cx. 022).

Fig. 10. Fill sequence of pit 1.

Fig. 12. Detail of Cx. 030.

Fig. 11. Cx. 037 with the remains of a cattle skull.

In the northern quarter of the excavation block, where no architectural debris was found, the ancient surface level was reached at the depth of around 74 cm below ground level. Within this layer the outlines of several pit structures of different sizes and depths were clearly visible. The largest of these was a 1.50 m deep pit with a circular shape, a diameter of about 1.50 m, and a complex infill sequence comprising five separate layers that could be exposed by sectioning the pit (Fig. 10). One of its fills (Cx. 035), which was 1.05 m thick, consisted of a brown soil mixed with substantial amounts of burnt daub fragments, most of them with smooth outer surfaces and imprints. These fragments most likely originate from the wall of a structure. A decorated clay wheel was also found within this fill. Underneath Cx. 035, there was another fill (Cx. 037), which contained the remains of a cattle skull (Fig. 11) and an almost complete skeleton of a neonate pup (see the archaeozoological analyses section below). Interestingly, this pit was cut by another narrow pit approximately 60 cm deep (Cx. 078), whose fill also contained large daub fragments (though in a lesser proportion). 1.4 m east of the large pit we found a smaller one with an oval shape, measuring 68 x 56 cm. It had only one fill approximately 15 cm thick (Cx. 031) and contained very few finds (mostly fragments of daub). More artefacts were uncovered in a pit located in the north-eastern corner of the trench (Cx. 030, Fig. 12), which extended under both the eastern and northern profiles of the excavation block. Among these finds was a miniature cup. At the bottom of this 2.10 m deep pit a restorable vessel was also found. A further pit could be identified 2.40 m west of Cx. 030. Labelled Cx. 069, this was a shallow pit (50 cm deep) with few finds (mostly pottery sherds) that extended beyond the excavated part towards the north. Approximately 2 m south of the large pit structure mentioned above we detected another oval pit that contained an impressive amount of pottery and large daub fragments (Cx. 079). The pit dimensions were 72 x 54 cm with a maximum depth of about 40 cm. All these pit structures were dug into what is likely the ancient (Bronze Age) surface level. The discovery of burnt daub with wattle impressions in the infill of these pits might imply that other domestic structures also existed in this location, as it seems unlikely that large quantities of daub would have been transported over larger distances in order to be discarded in these pits.

In the central part of the trench, after the complete removal of the remains of the burnt structure, the ancient surface level was reached at about 80 cm below the modern surface. Three more pits could be clearly outlined at this level. Cx. 041 was a 50 cm deep oval-shaped pit measuring 92 x 85 cm that contained a very high number of daub fragments, animal bones and charcoal, alongside occasional pottery sherds. It truncated an earlier pit (Cx. 042) with an irregular outline and a depth of 20 cm. To the south of this feature, at about 1.4 m, another large oval-shaped pit could be identified. The feature measured 1.60 x 1.52 m and was 1.31 m deep. It had a complex fill sequence consisting of five different layers, one of which (Cx. 054) also contained a fragment of a human viscerocranium[3]. Other finds from the infill of the pit consisted of pottery sherds, daub fragments, and animal bones, alongside organic material, indicating that it was most likely used as a refuse pit.

(A.G.)

[3] We are grateful to Angela Simalcsik ("Olga Necrasov" Center of Anthropological Research, Romanian Academy – Iași Branch) for the anthropological determination.

The pottery assemblage

The large pottery assemblage recovered from Trench 5 indicates an intensive habitation of this area in the outer settlement of the tell from Toboliu. Due to time constraints, only a few typical ceramic fragments will be discussed in this report. Regarding pottery shapes, although several restorable vessels were retrieved, they are still being processed. Therefore, the main focus of this section will be on the decoration techniques and style of selected pottery sherds. Five main techniques of decoration could be identified within the assemblage: incisions (A), impressions (B), stitches (C), grooves (D), and embossed decoration (E). Incised decoration is mostly represented by lines running parallel with the rim of the pots or depicting arcades and spiral motifs (Fig. 13/1, 3, 5, 8; Fig. 14/1). Incisions with notched aspect are found as continuous bands on rims (Fig. 13/1, 5, 10; Fig. 14/1), infill of arcades (Fig. 13/1), and bands delimited by incised lines or in combination with raised bands. Only in a few cases could incisions obtained by the *comb stroke* technique be identified as in Fig. 14/2. Impressed decorations can be classified into different categories: larger oval ones that are usually achieved by pressing the finger into the wet clay and are commonly found on or beneath the rims (Fig. 14/3) and/or on raised bands that are usually associated with coarse ceramics. Smaller impressed decorations were obtained with the help of a blunt tool that had either a circular (Fig. 13/5; 14/5), a triangular (Fig. 13/3, 6, 7, 14; Fig. 14/4) or a quadrilateral (Fig. 13/13; 14/4) shaped point. In some cases, it can be observed that a small round raised knob is present inside this type of impressions, which could be the result of a tool that has an empty duct, such as a thin hollow bone. The third category of decoration techniques is represented by the so-called stitches, which were obtained with the help of a pointed tool and appear in several varieties. Wide successive stiches (Fig. 13/8; Fig. 14/6) were created within an incised line. Thin simultaneous stiches were likely made by using a tool with multiple points and are usually found as bands marking rims (Fig. 13/7; Fig. 14/5) or incised delimited bands that represent geometric patterns (Fig. 14/5). Yet another type of stitch-like decoration is found on certain vessels where the ends of incised lines are marked by a deep singular stitch (Fig. 13/4; Fig. 14/8). Channelled decoration is also well represented among the ceramic assemblage from Trench 5 as either thin grooves (Fig. 13/9; Fig. 14/7) or wide ones (Fig. 13/10), and is sometimes associated on the same vessels with incised lines, notches or knobs. Embossed decoration is represented by rim lobes (Fig. 13/5), conical and oval-shaped knobs (Fig. 13/11, 12), zig-zag patterns (Fig. 13/14) and raised bands.

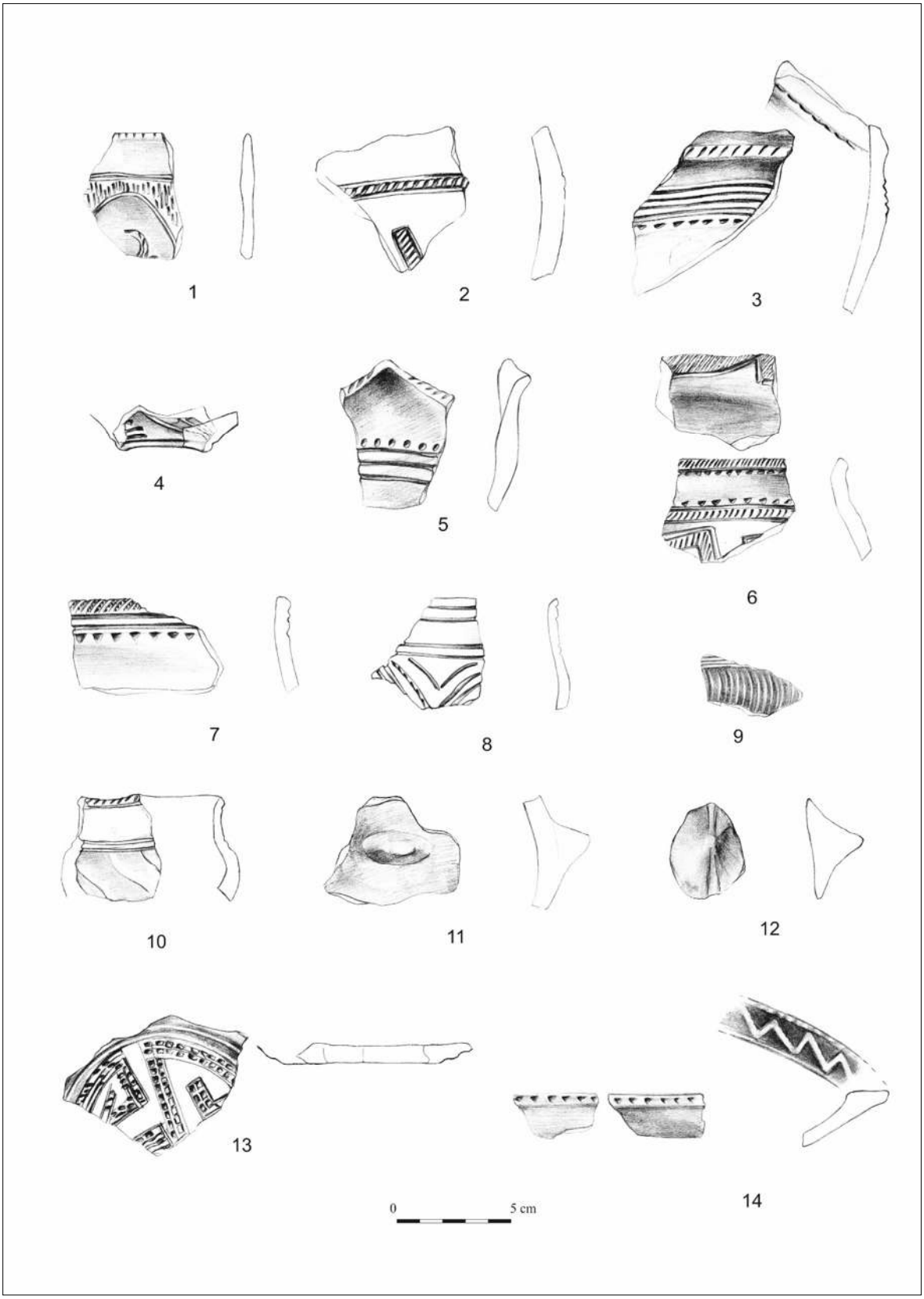

Fig. 13. Decorated pottery sherds from Trench 5 in Toboliu, Phase 1. 1-13: Cx. 002; 14: Cx. 038.

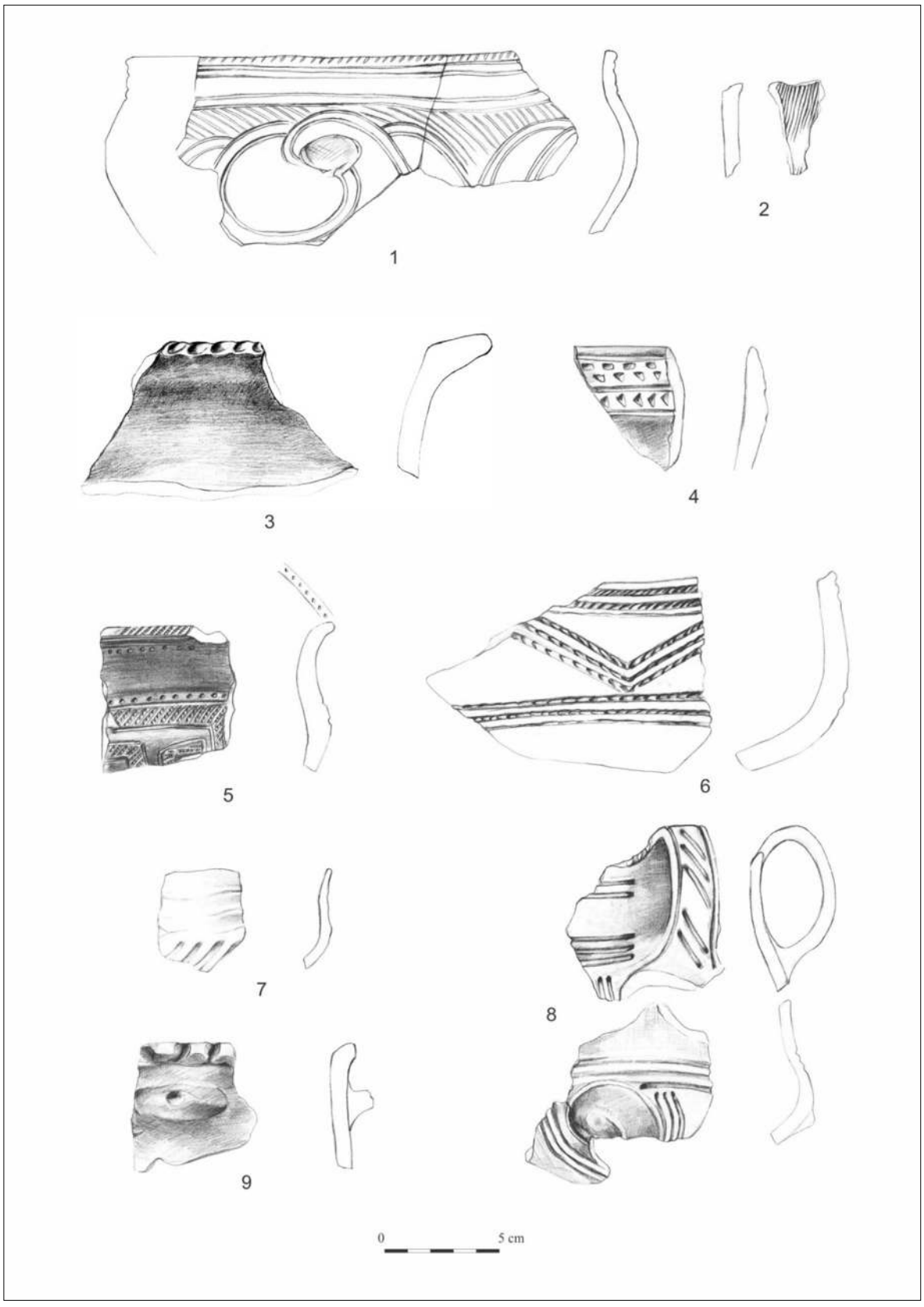

Fig. 14. Decorated pottery from Trench 5 in Toboliu, Phase 2. 1, 3, 5: Cx. 054; 2: Cx. 042; 4: Cx. 035; 6, 8: Cx. 040; 7, 9: Cx. 009.

Certain decoration techniques can be ascribed to particular pottery styles, as for example the simultaneous stitches and impressed triangles, which are commonly associated with the Classic Wietenberg phase according to Bălan et al. (Bălan *et al*. 2016a, 80; see also Boroffka's Wietenberg B-C phase: Boroffka 1994, 250; Chidioșan's Wietenberg III B-C: Chidioșan 1980, 77-81). The successive wide stitches are usually ascribed to the Late Wietenberg phase according to Bălan et al. (Bălan *et al*. 2016a, 86; see also Chidioșan's Wietenberg IV B-C: Chidioșan 1980, 81-84; Boroffka's Wietenberg D phase: Boroffka 1994, 251). Among the pottery assemblage uncovered in Trench 5 are also specimens typical for the Otomani III pottery style (Fig. 13/1; 14/1). Some decoration techniques, such as the deep stitches marking the end of incised lines, likely represent a late Otomani III style as seen at Vărșand *Movila dintre vii*, where they are found in association with channelled material (Găvan 2014, pl. II-V). Similar finds were also recovered within the upper two phases of the tell from Toboliu. Other decoration techniques (such as lobed rims, knobs and grooves) are often seen as elements of the Cehăluț-Hajdúbagos pottery style (Găvan *et al*. 2020, 64-66). A good parallel is offered by the assemblage unearthed at the settlement from Palota Veche (located close to the Bronze Age tell-site from Sântion), where Otomani III/Cehăluț and Wietenberg III-IV elements are encountered together (Emődi 2002, 5-35). Although the Cehăluț-Hajdúbagos group seems to be more associated with the first phase of the Late Bronze Age, we tend to ascribe the ceramic assemblage from Trench 5 to the Middle Bronze Age III phase (MBA III) rather than to the early Late Bronze Age (LBA I). This is based on correlations with the ceramic assemblage found in the upper two phases at the tell in Toboliu (that have a well-established absolute chronology: Lie *et al*. 2019), as well as with other pottery assemblages, such as the one from Otomani *Cetatea de pământ/Földvár* (Németi 2009, 212).

(M.A.L.)

Archaeobotanical Analyses

During the excavation, 42 samples with a total volume of 372 liters of sediment were collected for archaeobotanical analysis. The processing of these samples included bucked flotation on site using a 0.315 mm sieve. The charred plant material separated this way was dried afterwards. Back in the Archaeobotanical Laboratory of the University of Cologne, the plant remains were sorted and identified using a binocular at 6.3 to 40 x magnification. For archiving the data, all determinations were entered into the archaeobotanical database ArboDat 2015 (Kreuz, Schäfer 2012; 2015).

A total of 527 charred remains from 43 taxa were found. The concentration – i.e., remains per liter of sediment examined (n/l) – of the samples varied from 0.1 to 20.6 n/l. These low values suggest that the plant remains were randomly deposited in the backfill of the features and should be considered as 'settlement noise' (see Bakels 1991). In addition, the plant material was poorly preserved, which explains the rather high proportion of about 10% of indeterminable remains (Indeterminata). Because of the small dataset, a phase-related evaluation of the archaeobotanical material is not possible, and only an overview can be given.

The percentages of all recorded ecogroups are plotted in Fig. 15. At around 60%, cereal residues have the highest share of the total spectrum: emmer, barley, millet, einkorn and probably rye are documented. Legumes (1.1%) consisting of lentil and pea, as well as oilseeds (5.4%) consisting of gold of pleasure and flax, were also present. The high proportion of gathered fruit and nuts is remarkable, making up more than 7% of the total spectrum (= ecogroup deciduous forest/bushes). Besides hazelnut, wild apple, raspberry and elderberry, stone seeds of

cornelian cherry are particularly numerous with 16 records. The rest of the spectrum consists of weeds (e.g. Black Bindweed, False Cleavers), segetal and/or ruderal taxa (e.g. Fat-Hen, Black Nightshade, Danewort), and grassland taxa (e.g. Clover), as well as taxa of the riparian and floodplain vegetation (e.g. Marsh Stitchwort).

Even if the number of plants remains in the analyzed samples from Trench 5 is not very high, the recorded taxa nevertheless represent the immediate surroundings of the settlement during its occupation fairly well: in addition to arable land with various cultivated plants and weeds, there must also have been numerous stands of wild fruit and nut trees/shrubs such as forest edges or loose patches of shrubbery. In addition, anthropogenically disturbed areas with ruderal vegetation, grassland and, to a certain extent, the wet lowland south of the tell are also documented.

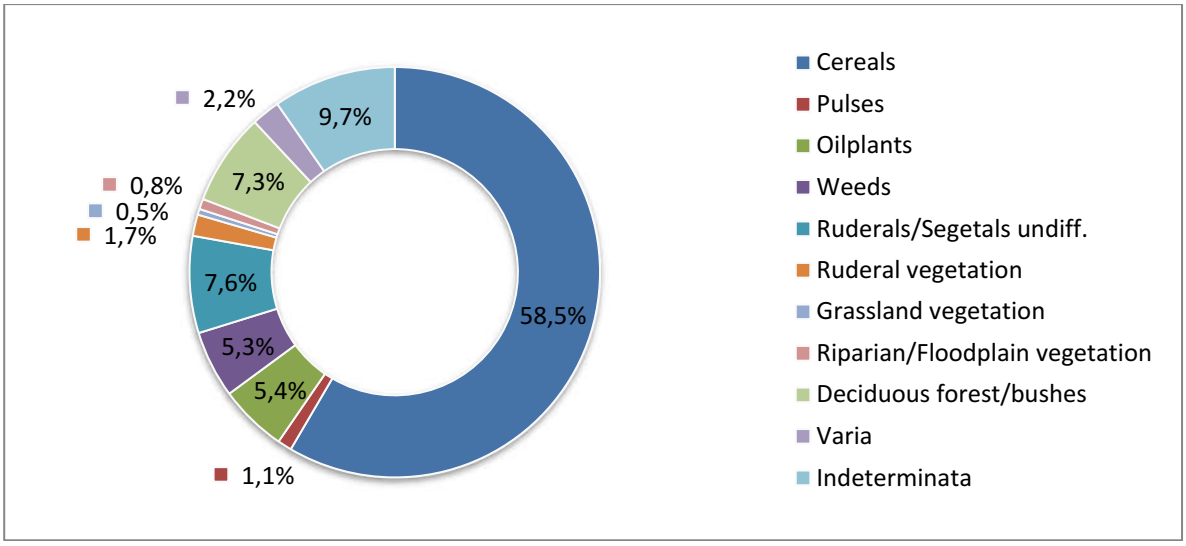

Fig. 15. Percentages of ecological groups in the samples from Trench 5 (basis of calculation = concentration n/l). (T.Z.)

Archaeozoological Analyses

Excavations in Trench 5 have also yielded a large quantity of animal bones, which were analysed archaeozoological. A total of 2,090 faunal remains with a total weight of about 16 kg were recovered. The material is well preserved, but mostly heavily fragmented. Therefore, only about 40% of the material (n= 850) could be taxonomically determined, while 1,240 remains were unidentified – i.e., only a family classification or size category could be given (Fig. 16).

Among the determinable remains, domestic animals predominate, with cattle and pigs being the most numerous, followed by sheep and goats. Horses had almost no significance for human nutrition; this is shown by their low proportion among the bone remains as well as the lack of butchery marks. Cut marks could be found only on one metatarsal, which, however, might have also originated from the removal of the skin. Dogs are comparatively numerous with 54 bone remains, but this can be explained by the recovery of an almost complete skeleton of a neonate pup, as well as a partial skeleton of another neonate pup (Ind. Cf1 and Ind. Cf2), which were found together with the above-mentioned cattle skull in the fill of a large pit (Cx. 037) (Fig. 10, 17). The two puppies can be easily distinguished from each other due to their different bone sizes. It remains speculative whether the animals come from one litter and were disposed of together or at different times and placed in the fill. Traces that would have indicated the cause of death were not found. The incompleteness of the skeletons can be explained, at least in part, by

the very fragile, almost paper-thin structure of the bones, so that the fragile outer extremities of the hand and foot bones have very little chance of preservation. However, even a secondary insertion of a decaying body cannot be ruled out in the case of the second, more incomplete individual (Ind. Cf 2).

Domestic mammals		**N**	**Weight (grams)**
Horse	*Equus caballus*	11	413.3
Cattle	*Bos taurus*	198	7,614.8
Sheep	*Ovis aries*	4	15.6
Goat	*Capra hircus*	3	42.9
Sheep/Goat	*Ovis / Capra*	105	575.1
Pig	*Sus domesticus*	174	1,946.9
Dog	*Canis familiaris*	54	321.1
Total domestic mammals		**549**	**10,929.6**
Wild mammals			
Red deer	*Cervus elaphus*	50	953.8
Roe deer	*Capreolus capreolus*	5	16.0
Deer	*Cervidae*	7	48.4
Wild boar	*Sus scrofa*	17	510.7
Hare	*Lepus europaeus*	19	15.0
Beaver	*Castor fiber*	2	12.9
Common hamsetr	*Cricetus cricetus*	7	2.8
Hamster	*Cricetus* spec.	10	1.0
Marten	*Martes* spec.	1	0.8
Total wild mammals		**118**	**1,561.4**
Wild or domestic mammals			
Pig/Wild boar	*Sus* spec.	7	52.9
Dog/Wolf	Canid, large	5	33.1
Wild/domestic cattle	Bovidae, large	1	6.0
Total wild or domestic mammals		**13**	**92.0**
Human			
Human	*Homo sapiens*	1	6.0
Total human		**1**	**6.0**
Fish			
Roach	*Rutilus* spec.	2	0.3
Cyprinids	Cyprinidae	8	0.1
Total fish		**10**	**0.4**
Bivalves			
Common river mussel	*Unio crassus*	1	17.4
Painter's mussel	*Unio pictorum*	2	14.9
River mussel	*Unio* spec.	28	49.5
River mussels	Unionidae	125	28.6
Total bivalves		**156**	**110.4**
Gastropods			
	Cepaea spec.	1	0.5
	Monacha spec.	2	0.8
Total gastropods		**3**	**1.3**
Unidentified			
Rodents	Rodentia	5	< 0,1
Large ruminants	Ruminantia, large	4	16.6
Medium sized ruminants	Ruminantia, medium	2	4.3
Large Mammals	Mammalia, large	481	2,403.2
Medium sized mammals	Mammalia, medium	619	1,051.2
Small mammals	Mammalia, small	19	6.0
Micromammals	Mammalia, micro	2	0.2
Mammals	Mammalia	99	68.8
Birds	Aves	1	4.0
Fish	Pisces	6	0.6
unidentified	indet.	2	1.1
Total unidentified		**1,240**	**3,556.0**
Total		**2,090**	**16,257.1**

Fig. 16. Number and weight of animal bone finds from Trench 5.

Meat of wild animals was also consumed. Red deer and wild boar dominate, but roe deer, hare and beaver were also hunted. Burrowing animals such as hamsters may have entered the cultural layers after the abandonment of the site, and may date from more recent periods. Until

the 20th century, their population was favoured by the intensive agriculture of the open cultivated landscape of western Romania, which is why they were long considered pests and were killed *en masse* (Hegyeli et al. 2015). In addition to beaver finds, numerous fragments of river mussels suggest the use of aquatic resources for human nutrition, which could be ensured by the nearby seasonal stream located immediately south of the tell, and/or from the Crișul Repede River, which is located approximately 3.5 km north of the site. In addition, further indications of the use of aquatic resources are extremely scarce, as shown by the low proportion of fish. Due to time constraints, it was not possible to carry out a systematic flotation or sieving of all the excavated soil during the 2021 excavation campaign. However, even the features selected and water-sieved for archaeobotanical studies show only a few remains of fish, mostly scales, which could only be identified no further than the family level of Cyprinidae (carplike fish). In addition, two finds of roach (*Rutilus rutilus*) could be determined, both of which were slightly smaller compared to a 29 cm long individual (Ind. Nr. Rr 1) from the reference collection at the Institute for Prehistory of the University of Cologne.

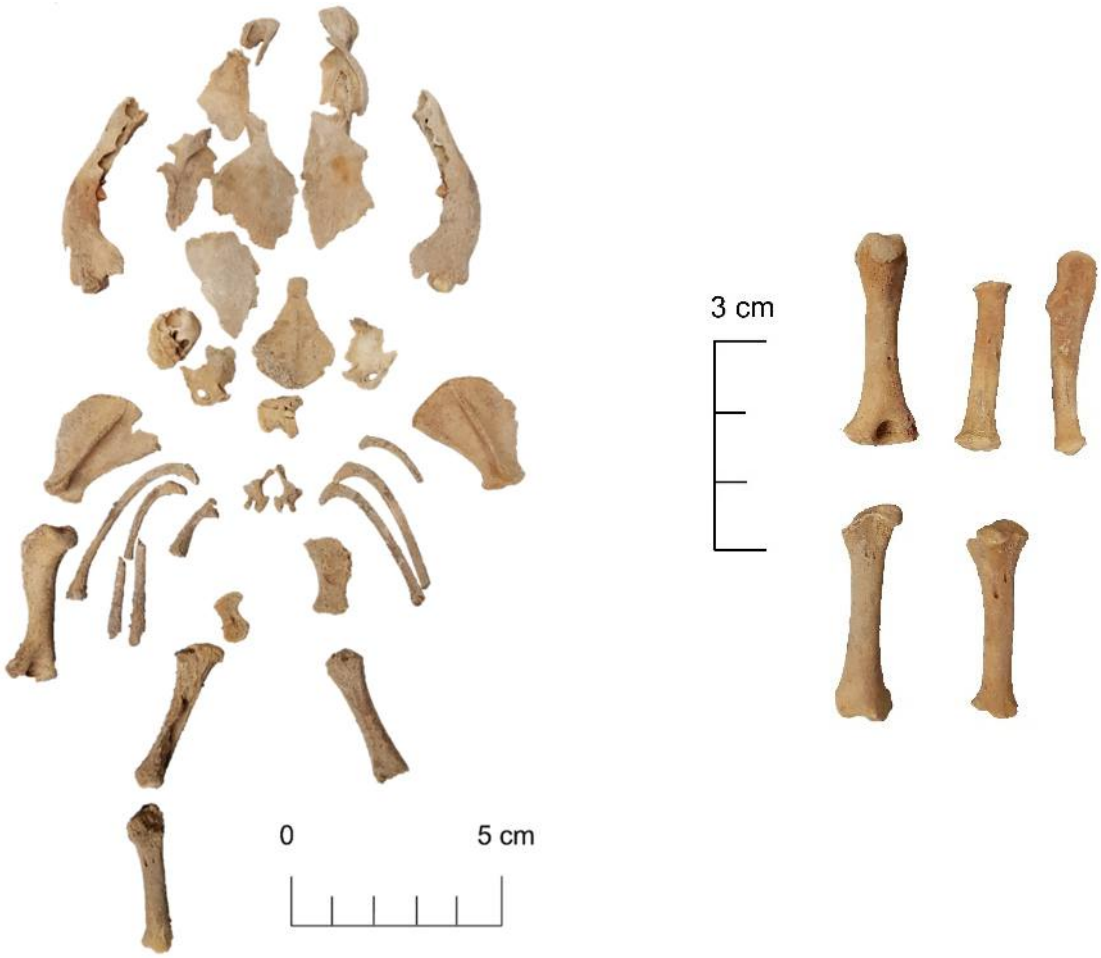

Fig. 17. Bones of the two pups from Cx. 037. Left: Ind. Cf1 with skull, mandible (right and left), scapulae (right and left), one cervical vertebra, ribs, left humerus, pelvic fragments (right and left), femur (right and left) and tibia (left). Right: Ind. Cf2, (from left to right) top: Humerus (left), radius and ulna (right); bottom: Femur (right), Tibia (left).

In addition to the afore mentioned human skeletal fragment uncovered in a secondary context within Cx. 054 (left upper jaw, still attached to the left zygomatic bone), a fragment of a calcined human radius was discovered among the animal bones in another fill of a pit (Cx. 057).

It is possible that this was also a secondary inclusion, most likely coming from an earlier cremation burial.

(N.N.)

Fig. 18. Sampling for micromorphological analyses (Trench 5, Eastern profile).

Geoarchaeological Investigations

During the archaeological excavation 13 soil samples for micromorphological and geoarchaeological investigations (including grain size distribution, XRF – X-ray fluorescence spectroscopy – and Corg. – Total organic carbon – values) were taken. The goal was to obtain deeper insights into the site stratigraphy, as well as into settlement features such as floors, waste deposits and pit infills. From the eastern profile four overlapping samples were taken from contexts Cx. 002, Cx. 009, Cx. 024 and Cx. 026 (Fig. 18). In order to reconstruct the different infills from two of the large pits described in detail above, five micromorphological samples were taken from contexts belonging to pit 1 (Cx. 028, Cx. 034, Cx. 035, Cx. 037 and Cx. 045) and two from pit 4 (Cx. 057 and Cx. 067). Additionally, 14 more soils samples were collected from several other contexts in Trench 5 in order to better characterize their composition.

(A.R./M.Z.)

Concluding remarks

To summarize, excavations in Trench 5 revealed a complex sequence of cultural deposits (Fig. 19) in the outer settlement of the tell from Toboliu and indicated the intensive habitation of the site for a longer period of time. Although only one strongly eroded wattle and daub structure could be identified within the excavated area, the discovery of burnt daub fragments belonging to the structural remains of a building or buildings in most of the pits uncovered in this trench indicates that there were probably other structures around this location. It is likely that some of the pits uncovered in Trench 5 were initially dug with different purposes in mind (such as clay extraction or storage); however, most of them ended up being used as refuse pits. Furthermore, the mix of animal bones, pottery sherds, ground stone tools, and organic macro remains uncovered within these pits are a strong indicator that domestic activities were carried out in this part of the outer settlement. This is further reinforced by the discovery of several hearths in the trench, all of which had plastered surfaces. In the case of the four better-preserved hearths with plaster linings (Cx. 003, Cx. 005, Cx. 021, and Cx. 022), pottery sherds were used to form the base. The reason behind this is that sherds accumulate and store heat (Balossi Restelli 2015, 136). Hearths with a substructure made of pottery sherds were also found on the tell itself (Lie 2021, 258-260). In contrast to the hearths unearthed within the outer settlement, most of the hearths on the tell tended to have a circular or oval shape.

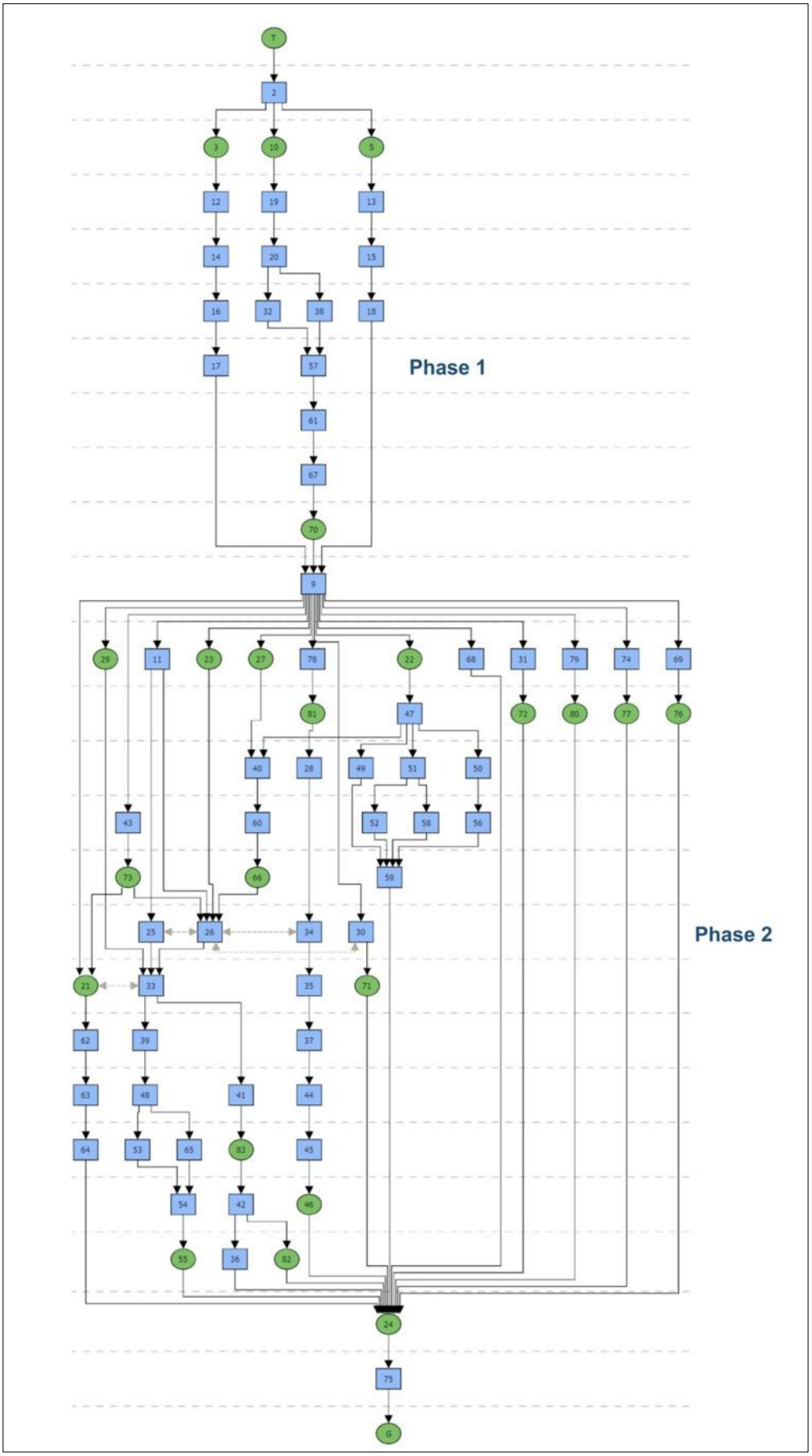

Fig. 19. Harris Matrix of the excavated contexts in Trench 5 from Toboliu.

Hearths with incised decoration are known from several Bronze Age settlements further east in the Wietenberg milieu such as Albești *Bază* (Baltag, Boroffka 1996, 390, fig. 10/2), Aiud *Groapa de Gunoi* (Bălan et al. 2016b, 47, pl. 13/1), Rotbav *La Pârâuț* (Dietrich 2014, 175–176, fig. 7/11), and Sighișoara *Wietenberg* (Horedt, Seraphin 1971, 69–71, 74–76, fig. 55/9–19, 59, 60). Other Bronze Age settlements have yielded fragments of hearths decorated through channelling: Geogiu de Sus (Ciugudean 1997, 73, fig. 10), Giurtelecu Șimleului *Coasta lui Damian* (Bejinariu 2005, 367, pl. 12/1), and Șoimuș *Teleghi* (Rișcuța, Marc 2015). Fragments from a decorated hearth were also found within a pit in the Cehăluț-Hajdúbagos settlement dating from the beginning of the LBA from Zăuan *Dâlma Cimitirului* (Bejinariu 2001, 160–161, pl. 3/1–2).

Based on the vertical stratigraphy and the superposition of the excavated contexts, two settlement phases could be identified within Trench 5 (Fig. 19). The uppermost (and chronologically the latest) is defined by two hearth features (Cx. 003 and Cx. 005) and the large pit identified in the south-western corner of the trench that extended under both the southern and western profiles. Layer 9 separated this phase from the second one. To this second, earlier horizon we can ascribe the wattle and daub structure Cx. 026 and its associated contexts. The fact that large amounts of wall debris from this structure were missing indicates that parts of it were carefully cleared out after its destruction. This phase is also represented by the three pits (Cx. 039, Cx. 041 and Cx. 042) uncovered underneath the remains of the burnt structure, as well as the six pit structures located in the northern quarter of the trench. The same holds true for the two decorated hearths Cx. 021 and Cx. 022. From a typo-chronological perspective, the pottery assemblage uncovered in Trench 5 can be dated between the MBA III and the LBA I phase. The 12 samples collected for AMS radiocarbon dating from Trench 5, which are currently being processed, will hopefully help in building a more precise chronology of the occupation sequence in this part of the outer settlement from Toboliu.

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