

MUZEUL ȚĂRII CRIȘURILOR

CRISIA

L

O R A D E A • 2 0 2 0

PRELIMINARY REPORT ON THE 2019 EXCAVATION UNDERTAKEN ON THE OUTER SETTLEMENT OF THE TELL FROM TOBOLIU (BIHOR COUNTY)

Alexandra GĂVAN*,
Marian-Adrian LIE*,
Tobias KIENLIN***

ABSTRACT

This paper details the preliminary results of an excavation undertaken in the outer settlement surrounding the tell in Toboliu – *Dâmbu Zănăcanului*. The excavation consisted of a single unit (labelled as Trench 4) measuring 5.80 × 12.30 m and aimed to establish the date, cultural context and construction details of a structure visible in the geomagnetic plan in this part of the site that was interpreted as a possible house (Fig. 1-2). This was the first trench opened on the outer settlement surrounding the tell site from Toboliu and it was located approximately 630 m north and 50 m west of the centre of the settlement mound (Fig. 1). Previous non-invasive investigations at the site consisting primarily of geomagnetic prospections and surface surveys (Lie *et al.* 2019, 356-357, fig. 4-5) indicated that the area under investigation was part of the outer settlement of the tell in Toboliu, with geophysical anomalies corresponding to the surface distribution of Middle Bronze Age (MBA) pottery sherds and burnt daub fragments. This area was chosen for excavation mostly due to accessibility reasons, since it was one of the few surfaces of the outer settlement that was left uncultivated during 2019. Furthermore, a large anomaly was visible in the geomagnetic plan of the outer settlement in this area, which was potentially interpreted to represent the remains of a house (Fig. 2).

Keywords: tell sites, outer settlement, Bronze Age, Eastern Carpathian Basin, excavation

Site description and archaeological background

The Bronze Age site from Toboliu– *Dâmbu Zănăcanului* is a multi-component settlement consisting of a central mound, two enclosing ditches and a vast contemporary outer settlement encompassing ca. 84 ha and extending to the north, east and west of the mound (Lie *et al.* 2019). The complete stratigraphic sequence of the mound has been revealed through excavations conducted between 2014 and 2017. The archaeological deposits in the central part of the tell were 4 m thick and consisted of seven overlapping house phases. The entire evolution of the mound can be approximately placed between the 19th and 16th centuries BC (Lie *et al.* 2019, 363), being thus largely parallel to the evolution of the MBA according to the Hungarian and Transylvanian chronology (Fischl *et al.* 2015; Gogâltan 2015). Besides excavations, non-invasive investigations undertaken here beginning with 2014 (systematic surface survey, geomagnetic surveys, and aerial photography) have revealed the existence of a large outer settlement surrounding the mound. A systematic fieldwalk was conducted in 2015 on a surface of 211.19 ha around the tell in order to establish the boundaries of the outer settlement; pottery sherds that could be securely assigned to the MBA were found on a surface of about 158 ha. However, the highest density of finds with clear

* University of Cologne, Department of Prehistoric Archaeology, e-mail: agavan1@uni-koeln.de

** Romanian Academy – Iași Branch, Institute of Archaeology, e-mail: quirinus_lie@yahoo.com

*** University of Cologne, Department of Prehistoric Archaeology, e-mail: tkienlin@uni-koeln.de

clusters of pottery sherds and frequent fragments of daub with twig impressions, which are giving a more accurate estimation of the actual size of the outer settlement, come from an area of c. 84 ha (Fazecaş, Lie 2018).



Fig. 1. The Bronze Age site from Toboliu – Dâmbu Zănăcanului: geomagnetic plan and location of trench 4

Geomagnetic prospections carried out by the Department of Prehistoric Archaeology, University of Cologne over the course of four campaigns beginning with 2016 and covering a large part of the outer settlement (approximately 75 ha) offered more data on the size, structure and layout of this outer settlement. Moreover, there was a good match between the extension of settlement activity to the north, west and east of the mound as indicated by the surface finds and the results of the magnetometry. Since the systematic fieldwalk on the entire surface of the outer settlement has only revealed MBA material, it can be presumed that the anomalies we can detect in the magnetometer data (consisting of houses and pits) were indeed contemporary with the occupation on the central mound. Our trial excavation from 2019 targeted one of the anomalies located in the northern part of the site that was interpreted as a possible house (Fig. 1-2). The particular objectives of this excavation campaign were to establish the state of preservation of these potential houses ahead of a larger project, determine the depth of cultural deposits in this part of the site, and establish the date of the occupation.

Although open outer settlements surrounding Bronze Age tells are known from a couple of sites such as, for example, Vrábľe - *Fidvár* (Rassmann *et al.* 2018) in Slovakia, the Borsod region (Kienlin *et al.* 2018), Jászdózsa – *Kápolnahalom* (Stanczik, Tárnoki 1992, 120) and Százhalombatta – *Földvár* (Artursson 2010, 107) in Hungary, Moşorin – *Feudvar* (Falkenstein 1998, 266–268) in Serbia, and several tells located in Western Romania (for the most recent overviews, see Kienlin *et al.* 2017; Gogăltan *et al.* 2020), they were mostly documented only through non-invasive investigations such as magnetometric prospections, core drillings, and surface surveys. The lack of excavations or of available radiocarbon dates from these outer settlements means that their chronological relation

with the mound and its enclosure(s), as well as their dynamics relative to each other through time cannot be properly reconstructed. Only in Pecica – *Șanțul Mare* have excavations been undertaken on the outer settlement. These have consisted of four small test units measuring 2×2 m and 2×4 m that have revealed deposits belonging to the MBA, dated to approximately 1770-1720 BC and thus corresponding to phase four identified on the central mound (Nicodemus 2014, 140, fig. 6.6). In this context, it was the aim of our excavation to gather more information on the structure and extent of the occupation on an outer settlement of a Bronze Age tell.



Fig. 2. Toboliu – *Dâmbu Zănăcanului*: detail of the geomagnetic plan and location of trench 4

The 2019 campaign

Our investigation was carried out between 19.08.2019 and 4.09.2019. The excavation unit measured 5.80×12.30 m, and was positioned in order to encompass the entire surface of the anomaly visible in the geomagnetic plan (Fig. 2). The altitude at this point was 102.054 m above the sea level. The trench was aligned along the orientation of the supposed house walls, roughly North-West – South-East. The topsoil (Cx. 001), consisting of light-brown soil with plant and root material heavily disturbed by agricultural works, was removed by spade. The first intact deposits were reached at a depth of approximately 0.30 m below the current ground level (Cx. 002). This cultural layer began immediately below the plough zone, possibly indicating that a substantial part of the cultural layer was ploughed away – a likely scenario considering the intense agricultural activities in the area. The deposit consisted of a dark brown compacted soil with small fragments of daub and occasional flecks of charcoal; in the North-Western corner of the trench, the ploughed soil reached deeper than in the rest of the unit. Within the cultural layer (Cx. 002), several small pottery sherds were found. However, despite repeated cleaning and scraping of the surface, no discrete features or postholes could be identified at this depth (Fig. 3).

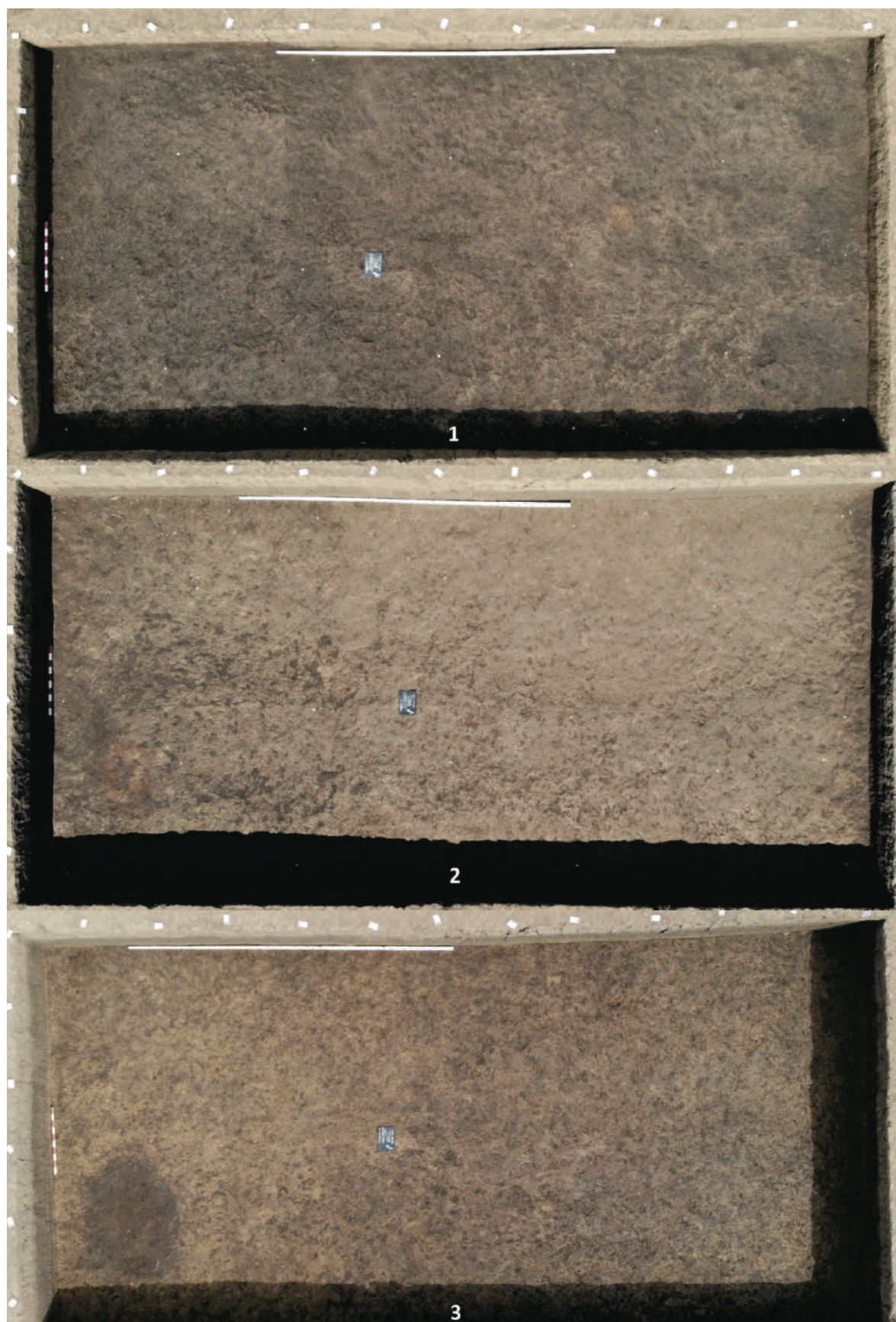


Fig. 3. Trench 4 – first planum.

After documenting the planum at this depth, we then proceeded to excavate further. The soil had the same colour and consistency, with slightly more pottery sherds being identified at this depth. Two samples were taken for radiocarbon dating, one bone sample and one charcoal sample. After reaching a depth of 0.60 m below the current ground level, it was decided to clean and scrape the excavation area in order to detect possible features (Fig. 4, 1). One feature with a round outline having a diameter of 0.35 m (Cx. 003), clearly delineated by its colour and consistency, was interpreted as a possible posthole. However, upon excavation, the feature, whose fill consisted of brown soil mixed with burnt daub fragments, turned up to be only 0.05 m deep. This feature was subsequently interpreted as representing an old fireplace.

Going deeper, it could be observed that the soil did not change its colour or consistency, however fewer sherds were uncovered. Another sample for radiocarbon dating (charcoal) was collected from the northern part of the trench at the depth of 0.80 m below the ground level. Another circular concentration of small burnt daub fragments located 4.7 m south of the northern profile and 2.8 m west of the eastern profile was labelled as Cx. 005. The feature had a diameter of 0.36 m and a depth of 0.07 cm, and was also most probably an old fireplace. A further feature (Cx. 004) could be delineated in the North-Western corner of the trench at the depth of 0.90 m below the current ground level. This feature had an oval shape, measuring 0.78×1.18 m and could be distinguished based on its colour and looser consistency (dark brown soil with many small fragments of burnt daub and flecks of charcoal). Besides this feature, no other remains were distinguishable on the third planum (Fig. 4, 2).

Going deeper, from a depth of about 0.95 m below the current ground level, it could be observed that the number and frequency of pottery sherds and burnt daub fragments continually decreased. Moreover, small spots of yellow soil were observed throughout the excavation unit. At a depth of 1.12 m below the current ground level the yellow virgin soil was reached in all parts of the trench, except for the North-Western corner of the unit, where Cx. 004 penetrated a further 0.37 m into the virgin soil (Fig. 4, 3). The fill of the pit (that at this depth measured 1.73×1.24 m - Fig. 5) contained a few pottery sherds (Pl. 2,2; 5, 3, 7, 12), poorly preserved animal bones, and occasional flecks of charcoal.



L • 2020

Fig. 4. Trench 4 – second (1), third (2) and fourth (3) planum

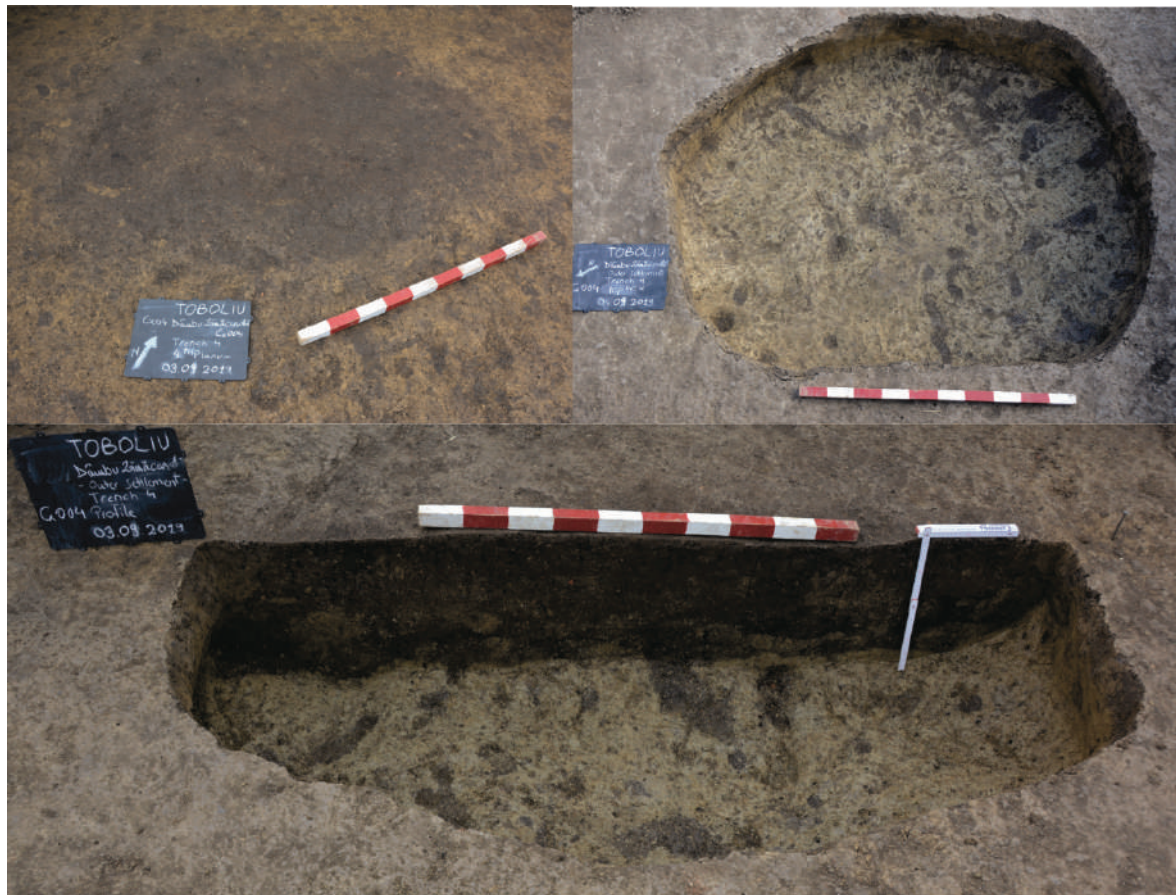


Fig. 5. Cx. 004

Discussion

Although our excavation revealed an occupational build-up approximately 0.80 m thick (Fig. 6) at the northern margin of the outer settlement, no house remains were found within the limits of the trench. While features Cx. 003, Cx. 004 and Cx. 005 had the right shape and size to account for three of the circular anomalies visible in the geomagnetic plan (thus confirming the validity of the geomagnetic prospection), no features that could account for the linear anomalies interpreted as possible house walls were found within the excavation unit. The same situation was also encountered at *Cornești – Iarcuri*, where a trench opened in 2015 inside Ring II in order to excavate a rectangular anomaly interpreted as a house revealed the existence of two cultural layers and several pits in this part of the site, but no house remains (Bălărie *et al.* 2016, 52). This situation was repeated in 2016, when another trench targeted at investigating another rectangular anomaly did not yield any house remains or postholes (Heeb *et al.* 2017, 224). There are several possible explanations for this situation (see, for example, Löcker *et al.* 2015), one of them being that geophysical instrumentation can detect even heavily eroded or weathered house remains, due to the fact that the soil might preserve a “signature” in the shape of a house (Kvamme *et al.* 2006, 249). We do not know if this was also the case at Toboliu. Soil samples for geoarchaeological and micromorphological analyses taken from the unit excavated here will hopefully shed more light on this issue.

As for the assemblage, only extremely fragmented pottery sherds and very few animal bones have been uncovered. To our surprise, all the diagnostic sherds straddle the Middle Bronze Age – Late Bronze Age transition, although our systematic field survey revealed sherds that we assigned to the MBA (see above). Some diagnostic sherds uncovered within the excavated unit can be assigned to the so-called Cehăluț-Hajdúbagos pottery style from the earliest stages of the Late Bronze Age

(LBA I - Gogâltan 2015, 73, fig. 10; see also Némethi 2009) (Pl.1-5). In any case, the Cehăluț-Hajdúbagos assemblages continue MBA pottery traditions, especially those of the Otomani III pottery style (Némethi 2009, 212), which at times makes it hard to differentiate from assemblages dating to end of the MBA and those that already belong to the beginning of the LBA (see also Duffy *et al.* 2019, 74-76). This period corresponds from a relative chronologic point of view to the uppermost occupation layer identified on the central mound, which also yielded ceramic sherds specific to the Cehăluț-Hajdúbagos pottery style (Gogâltan *et al.* 2020, 87). This is an interesting situation and could lead to new perspectives in the interpretation of the site's overall development. Two charcoal samples and one animal bone sample have been collected for radiocarbon dating. We are currently waiting for the results of these dates, hoping that they will shed more light and bring more certainty in the dating of this part of the site. A similar situation can be encountered at Otomani – *Cetatea de pământ/Földvár*, where the upper layer of the site apparently also contained Cehăluț-Hajdúbagos pottery (Némethi 2009, 212); this also seems to have been the case at Pir – *Cetate/Várdomb* and *Curtea Cetății/Várudvar*, where a LBA Cehăluț-Hajdúbagos settlement seems to have covered both MBA find-spots (Kacsó 2013, 19). On the other hand, at Andrid – *Dealul Taurilor*, Cehăluț-Hajdúbagos pottery sherds were only collected from the area outside of the fortified mound (Marta 2014, 28).

L • 2020



Fig. 6. Trench 4 – Northern Profile

The overall state of preservation of the ceramic assemblage uncovered in Trench 4 of the outer settlement from Toboliu is very fragmentary and degraded. In many cases it could be observed that the outer surface of the sherds was worn out, thus the impossibility of recognizing any decoration or other typical features on them. However in several cases some shape and plastic designs could be observed.

From the partially preserved profiles of some ceramic vessels the following shapes could be identified:

1. Urns/Pots (Pl. 2/3; Pl. 4/5): the preserved fragments represent the rim and neck of the pots. Both of them have an everted rim. The lack of decoration and the small representation of the vessel make it difficult to make more comparisons with other similar shaped pots from the Cehăluț-Hajdúbagos repertoire.
2. Barrel shaped vessels (Pl. 2/4; 3/5): The first specimen (Pl. 2/4) displays a raised band decorated with round digital marks. Similar imprints are present on the straight rim of the vessel. The second fragment (Pl. 3/5) displays a large oval-shaped knob. (Némethi 2009, Pl. I/1-4 flower-pot shaped and barrel-shaped vessels; Chidioșan, Emödi 1982, Fig. 4/7; Chidioșan, Emödi 1983, Fig. 7/3-6; Ignat 1984, Pl. II/2,3; Bulzan *et al.* 2000, Pl. IV/6; Pl. V/2,4; Kacsó 1997, Pl. I/2; Pl. V/5)
3. Jug? (Pl. 2/2): The rim is decorated with a knob.
4. Bowls (Pl. 3/4, Pl. 4/2-4): The first bowl (Pl. 3/4) has a knob pulled from the rim. Pl.2/3 has the outer surface completely exfoliated, so no further interpretations can be made

regarding its decorative style. Pl. 4/4 has a small lobe rising from the rim surrounded by semicircular thin grooves. (Nemeti 2009, Pl. I/ bowls 3, Pl. II/ Palm bowl 2; Chidioşan, Emödi 1982, Fig. 4/3; Chidioşan, Emödi 1983, Fig. 5/6; Kacsó 1997, Pl. 2/1-3).

5. Cups (Pl. 2/1; 3/2, 3): The specimens from Pl. 2/1 and Pl. 3/3 have knobs on the maximum diameter of their bodies. Pl. 2/1 is also decorated on the same part of the cup with vertical thin grooves. A thin rim which probably presents a broken small lobe (Pl. 2/2) could also be tentatively assigned to this group. (only for shape Nemeti 2009, Pl. II/ cups 2,4) (Ignat 1984, Pl. III/1, Kacsó 1997, Pl. VIII/2)
6. Pyraunos (Pl. 1/6): A small fragment belonging to a portable heart. It presents a broken circular aperture.

Plastic decorative techniques are represented by the following:

1. Incisions (Pl. 1/2,3,5; Pl. 5/2,4,8-10,12): Fragments that present a typical disposition are the following: Pl. 1/3 with three vertical parallel incisions that start at the limit between the neck and body of the vessel. Pl.1/5 displays a triangle-like motif on the upper part of the vessels body that probably continues symmetrically on a horizontal band. Pl.5/2 presents two horizontal incisions under which an oblique band of parallel incisions fill the visible upper part of the body. It is uncertain whether they form a continuous band of oblique parallel incisions or if they fill in a triangle-shaped band.
2. Thin grooves (Pl. 1/4; Pl. 2/1; Pl. 4/4; 5/3,7,11): Unlike the grooves that are made by digital imprints, thin grooves are probably obtained with the help of a blunt/rounded pointed tool. The examples from Pl.1/4 and Pl.5/7 both represent the decorated bottom of the vessel. However Pl. 5/7 has a more complete representation where the grooves are represented by four arches bent inwards facing a circular impression made by the same tool. The rest of the thin grooved examples are discussed within the next paragraph of combinations of decorative techniques.
3. Grooves (Pl. 5/1,5): Pl. 5/1 horizontal parallel grooves disposed on the neck of the pot. Here a raised band can also be observed, which is triangular in section. Pl. 5/5 displays parallel grooves disposed in a bent/semi-circular pattern.
4. Large circular impression (Pl. 1/2): Only a small part of it is preserved. Usually it has a small knob within its centre.
5. Circular impression (Pl. 3/1): usually displayed in a continuous horizontal line at the limit between the body and the bottom of what appears to be a small cup.
6. Oval shaped impressions (Pl. 5/10): At the lower part of the incision a slightly more sunken part can be observed.
7. Knobs: Regarding the position they occupy within the overall part of the pot two categories can be differentiated: a). Knobs displayed on the body of the pot (Pl. 1/7,8; Pl. 2/1; Pl. 3/1,5; Pl. 5/3,11) and b). Buttons placed on the rim (Pl. 2/2; Pl. 3/4).
8. Lobes (Pl. 3/2; Pl. 4/4; Pl. 5/6): Unlike the other two examples the lobe from Pl. 5/6 is of a larger size. The main difference between lobes and knobs found on the rim is the fact that the knob is placed and the lobe is pinched directly from the fabric of the vessel.
9. Raised band (Pl. 2/4): It is decorated with circular digital impressions, which match the same shape and size of the ones placed on the top part of the rim.

Combinations of decorative motifs:

1. Large circular impression combined with parallel incisions (Pl. 1/2). Due to the small size of the preserved sherd no further interpretations can be made regarding its decorative style.
2. Thin grooves and knobs placed on the maximum diameter of the vessel's body (Pl. 2/1; Pl. 5/3, 11). All of the aforementioned examples seem to represent fragments of cups. On Pl. 2/1 and Pl. 5/3 the knobs are placed on the maximum diameter (middle of the

body) and the thin grooves are vertical and form a band continuing on the rest of the middle of the pot. Example Pl. 5/11 displays a knob pushed from the inner part of the fabric and the parallel thin grooves surround it in a semi-circular manner (it is uncertain in this case whether they cover the upper or the lower part of the body).

3. Lobe raised from the rim and parallel semicircular grooves surrounding the lower part (Pl. 4/4): This example is represented by a partially preserved bowl.
4. Two parallel horizontal incisions combined with oval shaped impressions (Pl. 5/10).

The closest parallels for this ceramic assemblage can be found in the recently discovered site from Toboliu *Râțul Alceului* (Lie 2019, 29-48), which is located at a distance of about 1.7 km South-West from the present investigated area and 1.5 km South-West from the settlement mound. Since the site was only investigated through field surveys, the collected assemblage is scarce and fragmentary. However, some common elements can be seen, as is the case of the vessels decorated on the bottom with grooves presented at Pl. 1/4 and Pl. 5/7 (see Lie 2019, Pl. 7/15), and those with lobes raised from the vessel's rim Pl. 3/2; Pl. 4/4; Pl. 5/6 (see Lie 2019, Pl. 7/2-4).

Conclusions

Summing up, while no house remains were uncovered, our excavation proved that even at a distance of about 630 m north of the tell there were fairly thick Bronze Age deposits (of about 0.80 m) pointing towards an intense settlement activity. The stratigraphy at this part of the site basically consisted of one cultural layer. It is really interesting that all uncovered pottery can be assigned to the very beginning of the LBA in the region and thus corresponds to the uppermost layer identified on the tell. While the fragmentary state of the pottery sherds uncovered do not allow for a more precise chronological assignment, we hope that the radiocarbon samples that are currently being processed will offer a more secure basis for dating the settlement activity in this part of the site.

Acknowledgements

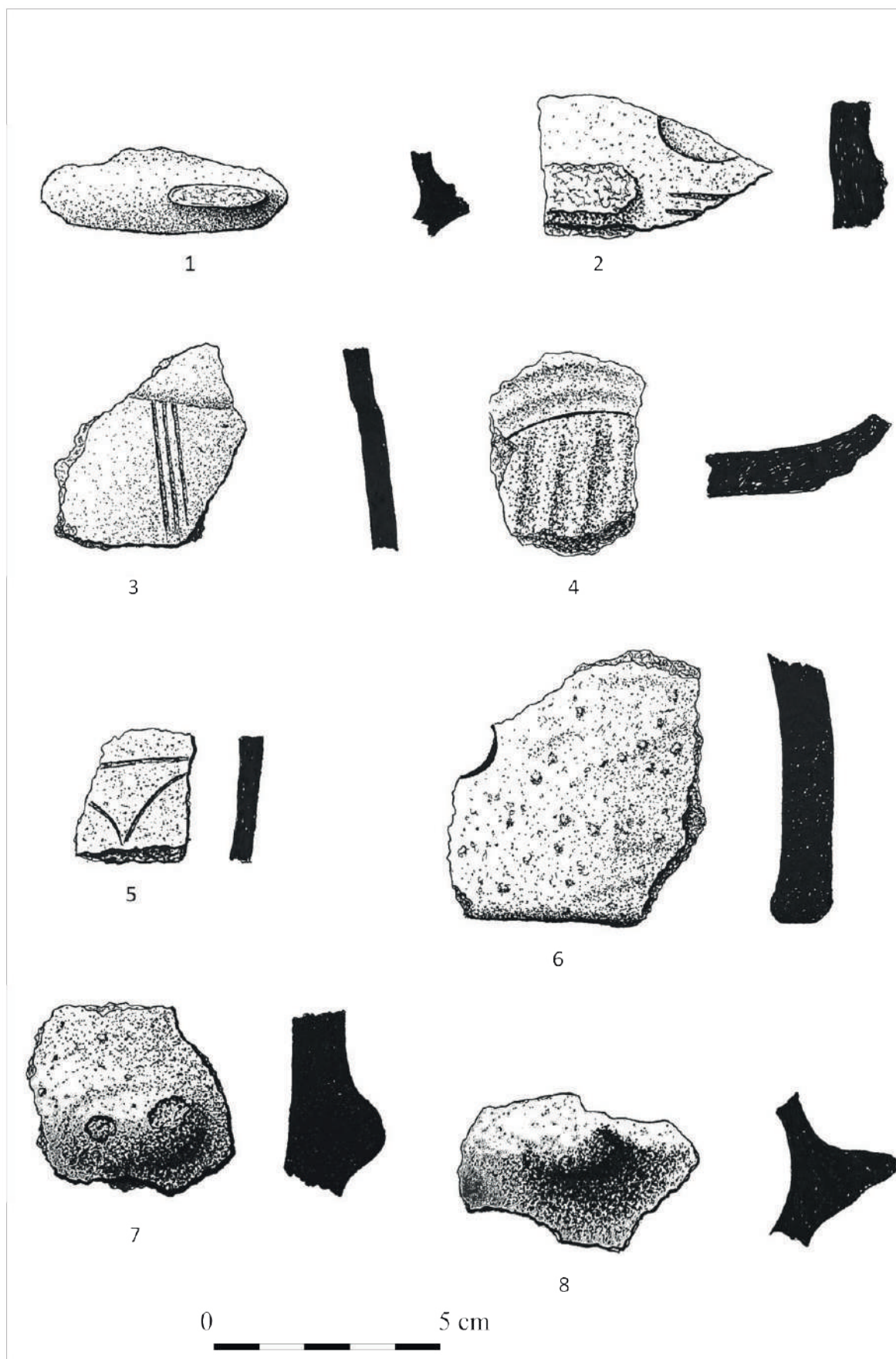
This excavation was funded by the Chair for the Archaeology of the Metal Ages, Department of Prehistoric Archaeology at the University of Cologne (Prof. Dr. Tobias Kienlin). We are deeply grateful to Gruia Fazecaș, M.A. for his help and assistance in conducting the fieldwork. We also want to extend our gratitude to Viktoria Fries, Laura Gross, Nadine Quentin, and Thomas Sickel, who participated in the fieldwork.

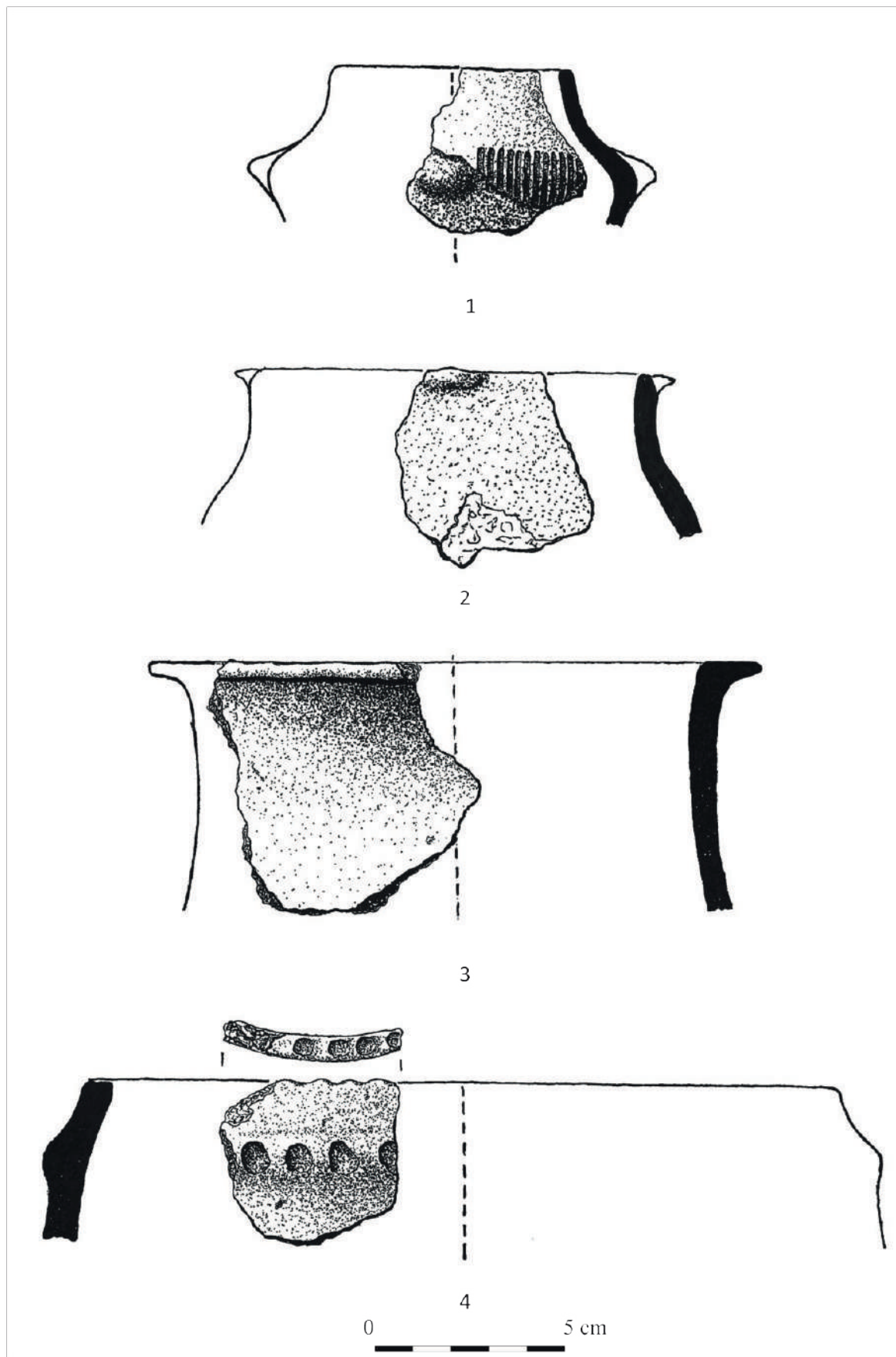
References

- Artursson 2010 A. Artursson, Settlement structure and organisation. In: T. Earle, K. Kristiansen (eds), *Organizing Bronze Age Societies. The Mediterranean, Central Europe and Scandinavia Compared*. Cambridge: Cambridge University Press 2010, 87–121.
- Bălărie *et al.* 2016 A. Bălărie, B. S. Heeb, A. Szentmiklosi, K. Teinz, R. Krause, M. Wemhoff, A. Harding, Erste Ergebnisse der Feldforschung an der spätbronzezeitlichen befestigten Siedlung Cornești-Iarcuri im Sommer 2015. *Acta Praehistorica et Archaeologica* 48, 2016, 51 – 54.
- Bulzan *et al.* 2000 Săpăturile de salvare de la Oradea – Salca Pepinieră, *Crisia XXX*, 2000, 81-140).
- Chidioșan, Emödi 1982 N. Chidioșan, I.Emödi, Grupul Cultural Igrîța de la sfârșitul Epocii Bronzului, *Crisia XII*, 1982, 61-86.
- Chidioșan, Emödi 1982 N. Chidioșan, I.Emödi, Descoperirile arheologice din Peștera Izbândiș (Comuna Șuncuiuș) aparținând Grupului Cultural Igrîța, *Crisia XIII*, 1983, 17-32.

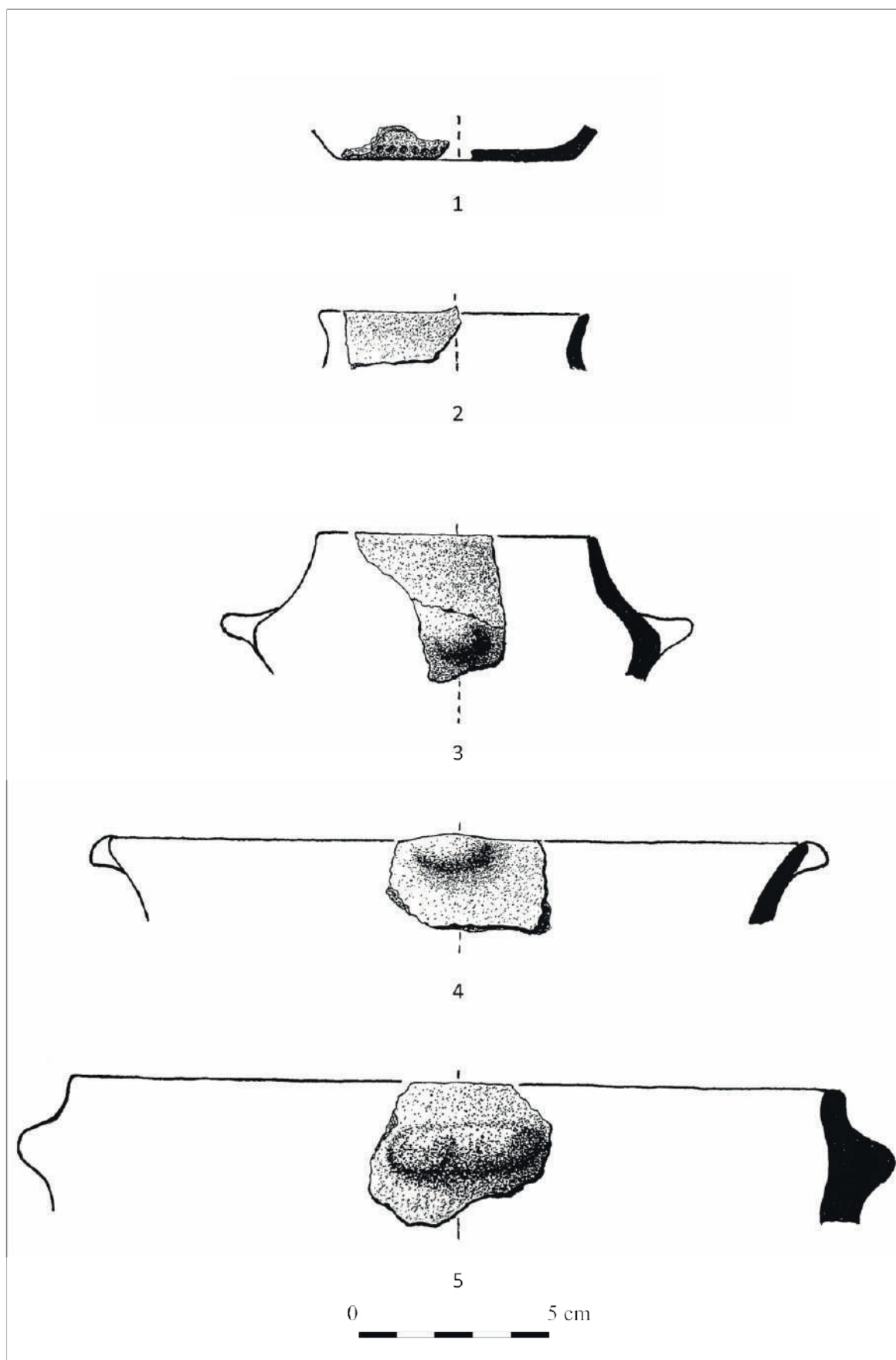
- Duffy *et al.* 2019 P. Duffy, G. Parditka, J. Giblin, L. Paja, The problem with tells: Lessons learned from absolute dating of Bronze Age mortuary ceramics in Hungary. *Antiquity* 367, 63–79.
- Falkenstein 1998 F. Falkenstein, Feudvar II. Die Siedlungsgeschichte des Titeler Plateaus. *Prähistorische Archäologie in Südosteuropa* 14. Kiel: Oetker/Voges 1998.
- Fazecaș, Lie 2018 G. Fazecaș, M. A. Lie, Determinarea suprafeței sitului arheologic de epoca bronzului de la Toboliu *Dâmbu Zănăcanului*. *Crisia* 47, 2018, 29–38.
- Fischl *et al.* 2015 K. Fischl, V. Kiss, G. Kulcsár, V. Szeverényi, Old and new narratives for Hungary around 2200 BC. In: H. Meller, H. W. Arz, R. Jung, R. Risch (Hrsg.), 2200 BC - Ein Klimasturz als Ursache für den Zerfall der alten Welt? 2200 BC - A climatic breakdown as a cause for the collapse of the old world? 7. Mitteldeutscher Archäologentag vom 23. bis 26. Oktober 2014 in Halle (Saale). 7th Archaeological Conference of Central Germany October 23-26, 2014 in Halle (Saale). Halle (Saale): Landesamt für Denkmalpflege und Archäologie Sachsen-Anhalt 2015, 503–523.
- Gogâltan 2015 F. Gogâltan, The Early and Middle Bronze Age chronology on the eastern frontier of the Carpathian Basin. Revisited after 15 years. In: R.E. Németh, B. Rezi (eds), *Bronze Age Chronology in the Carpathian Basin. Proceedings of the International Colloquium from Targu Mureș 2–4 October 2014*. Târgu Mureș: Mega Publishing House 2015, 53–95.
- Gogâltan *et al.* 2020 F. Gogâltan, A. Găvan, M. A. Lie, G. Fazecaș, C. Cordoș, T. L. Kienlin, Exploring the Bronze Age Tells and Tell-like Settlements from the Eastern Carpathian Basin. Results of a Research Project. In: A. Blanco-González, T. L. Kienlin (eds.), *Current Approaches to Tells in the Prehistoric Old World*. Oxford: Oxbow 2020, 73–95.
- Heeb *et al.* 2017 B. S. Heeb, A. Szentmiklosi, A. Bălărie, R. Lehmpuhl, R. Krause, Cornești-Iarcuri – 10 years of research (2007–2016). Some important preliminary results. In: B. S. Heeb, A. Szentmiklosi, R. Krause, M. Wemhoff, *Fortifications: the rise and fall of defended sites in Late Bronze and Early Iron Age of South-East Europe. International Conference in Timișoara, Romania from November 11th to 13th, 2015*. Berlin: Staatliche Museen zu Berlin - Preußischer Kulturbesitz 2017, 217–227.
- Ignat 1984 D. Ignat, Așezarea de la sfârșitul epocii bronzului de la Suplacu de Barcău (jud. Bihor), *Crisia* XIV, 1984, 9-26.
- Kacsó 1997 C. Kacsó, Faza finală a culturii Otomani și evoluția culturală ulterioară acesteia în nord-vestul României, *Studii și comunicări* XIV, 1997, 85-110.
- Kacsó 2013 C. Kacsó, Pumnalul de bronz de la Pir. *Revista Bistriței* XXVII, 2013, 14 – 30.
- Kienlin *et al.* 2017 T. L. Kienlin, K. P. Fischl, L. Marta, Exploring divergent trajectories in Bronze Age landscapes: Tell settlement in the Hungarian Borsod Plain and the Romanian Ier Valley. *Ziridava. Studia Archaeologica* 31, 2017, 93–128.
- Kienlin *et al.* 2018 T. L. Kienlin, K. P. Fischl, T. Pusztai, Borsod Region Bronze Age Settlement (BORBAS). *Catalogue of the Early to Middle Bronze Age Tell Sites Covered by Magnetometry and Surface Survey*. Bonn: Habelt 2018.
- Kvamme *et al.* 2006 K. Kvamme, E. Ernenwein, M. Hargrave, T. Sever, D. Harmon, F. Limp, B. Howell, M. Koons, J. Tullis, *New Approaches to the Use and Integration of Multi-Sensor Remote Sensing for Historic Resource Identification and Evaluation*. SERDP Project SI-1263. Electronic document, <http://www.serdp.org/Research/upload/SI-1263-FR.pdf/>. Accessed August 12, 2020.
- Lie 2019 M. Lie, A New Archaeological Site Found at Toboliu „Râtu’ Alceului” (Bihor County). *Crisia* XLIX, 2019, 29-48.

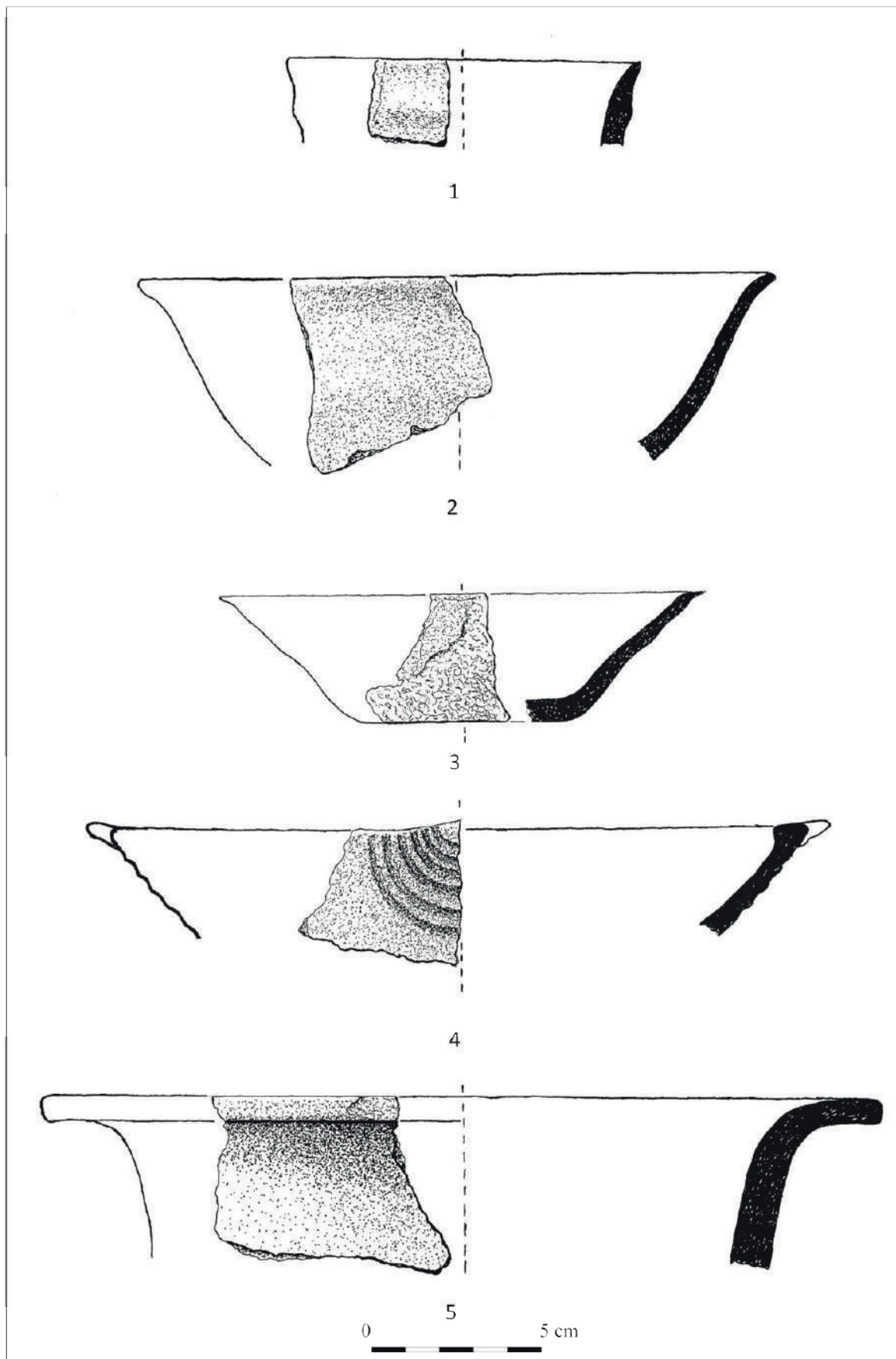
- Lie *et al.* 2019 M. Lie, A. Găvan, C. Cordoș, T. L. Kienlin, G. Fazecaș, F. Gogâltan, The Bronze Age tell settlement at Toboliu (Bihor County, Romania). A brief outline of recent investigations. In: K.P. Fischl, T.L. Kienlin (eds), *Beyond Divides – The Otomani-Füzesabony Phenomenon. Current Approaches to Settlement and Burial in the North-Eastern Carpathian Basin and Adjacent Areas*. Bonn: Habelt 2019, 351–368.
- Löcker *et al.* 2015 K. Löcker, M. Kucera, I. Trinksa, W. Neubauer, Successfully falsified ... On epistemological problems of archaeological excavations and geophysical surveys. *Archaeologia Polona* 53, 2015, 222-224.
- Marta 2014 L. Marta, Andrid “Dealul Taurilor = Bikadomb”, Satu Mare County. In: F. 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: Mega Publishing House 2014, 27–30.
- Németi 2009 J. Németi, The Hajdubagos/Pișcolt-Cehăluț group. In: S. Berecki, R. Németh, B. Rezi (eds), *Bronze Age Communities in Carpathian Basin: Proceedings of the International Colloquium from Târgu Mureș, 24–26 October 2008*. Cluj-Napoca: Mega Publishing House 2009, 203–221.
- Nicodemus 2014 A. Nicodemus, *Bronze Age Economies of the Carpathian Basin: Trade, Craft Production, and Agro-Pastoral Intensification* (Unpublished Ph.D. thesis). Ann Arbor: University of Michigan 2014.
- Rassmann *et al.* 2018 K. Rassmann, J. Bátor, N. Müller-Scheeßel, S. Reiter, M. Ivanova, A. Behrens, K. Radloff, M. Bača, Tracing taphonomic processes. Multiple layer analysis of ceramic distribution from surface collection and excavation at the Early Bronze Age settlement of Vráble-Fidvár. *Slovenská Archeológia* 66(2), 2018, 219–234.
- Stanczik, Tárnoki 1992 I. Stanczik, J. Tárnoki, Jászdózsa-Kápolnahalom. In: W. Meier-Arendt (ed.), *Bronzezeit in Ungarn. Forschungen in Tell-Siedlungen an Donau und Theiss*. Frankfurt: Museum für Vor- und Frühgeschichte, 120–127.





Pl. 2. Toboliu – Trench 4, Cx. 002: 1, 3-4; Cx. 004: 2.





Pl. 4. Toboliu – Trench 4, Cx. 002.

