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NEW INVESTIGATIONS AT GLINA TELL: 2025 FIELDWORK RESULTS AND PRELIMINARY INSIGHTS INTO MATERIAL AND ENVIRONMENTAL EVIDENCE

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Keywords: Glina, prehistoric tell settlement, Boian culture, Gumelnița culture, Glina culture, multidisciplinary archaeology

Abstract: The prehistoric settlement of Glina Tell (Glina – La Nuci), located on the lower terrace of the Dâmbovița River near Bucharest, represents one of the key reference sites for the prehistoric archaeology of southern Romania, having played a major role in establishing the Boian–Gumelnița stratigraphic sequence and in defining the Glina culture of the Early Bronze Age. Despite its scientific importance, much of the archaeological documentation and material recovered during the twentieth-century excavations remained unpublished or was dispersed across several archives and collections. Systematic archaeological investigations were resumed in 2025 within a broader multidisciplinary research programme focused on the Glina – Bălăceanca archaeological landscape. The present paper constitutes a preliminary report on the first campaign and presents the excavation methodology, stratigraphic observations, and the main categories of archaeological and environmental data recovered during fieldwork. The investigations combined invasive and non-invasive methods, including micro-stratigraphic excavation, single context recording, spatial recording, geophysical surveys, sediment coring, flotation, and interdisciplinary analyses of artifacts and ecofacts. Although preliminary in character, the results demonstrate the exceptional research potential still preserved at Glina Tell and open new perspectives for the future campaigns.

Cuvinte-cheie: Glina, așezare preistorică de tip tell, cultura Boian, cultura Gumelnița, cultura Glina, arheologie multidisciplinară

Rezumat: Așezarea preistorică de tip tell de la Glina (Tell-ul Glina sau Glina – La Nuci), situată pe terasa inferioară a râului Dâmbovița, lângă București, reprezintă unul dintre siturile de referință pentru arheologia preistorică din sudul României, jucând un rol major în stabilirea secvenței stratigrafice Boian–Gumelnița și în definirea culturii Glina din epoca bronzului timpuriu. În ciuda importanței sale științifice, documentația și materialele arheologice recuperate în timpul săpăturilor din secolul al XX-lea au rămas în mare parte nepublicate sau au fost dispersate în mai multe arhive și colecții. Investigațiile arheologice sistematice au fost reluate în 2025, în cadrul unui program de cercetare multidisciplinară mai amplu, axat pe peisajul arheologic Glina – Bălăceanca. Această lucrare constituie un raport preliminar al primei campanii de săpături și prezintă metodologia de cercetare, observațiile stratigrafice și principalele categorii de date arheologice și de mediu recuperate în timpul lucrărilor de teren. Investigațiile au combinat metode invazive și non-invazive, inclusiv săpătura microstratigrafică, înregistrarea contextelor și cea spațială, prospecțiunile geofizice, carotajul sedimentelor, flotația și analizele interdisciplinare ale artefactelor și ecofactelor. Deși au caracter preliminar, rezultatele demonstrează potențialul excepțional de cercetare care încă se păstrează la Tell-ul Glina și deschid perspective pentru campaniile viitoare.

1. INTRODUCTION

The Glina Tell (also known as Glina – *La Nuci*) is located in the Romanian Plain (Fig. 1), on a narrow extension of the high terrace bordering the right bank of the Dâmbovița River floodplain, between the modern settlements of Glina and Bălăceanca. Administratively,

the site falls within the boundaries of the village of Bălăceanca, Cernica commune, Ilfov County. Together with several nearby terrace sites (Fig. 2), the tell forms part of a dense archaeological area referred to hereafter as the Glina – Bălăceanca archaeological landscape, situated at the southeastern outskirts of present-day Bucharest.

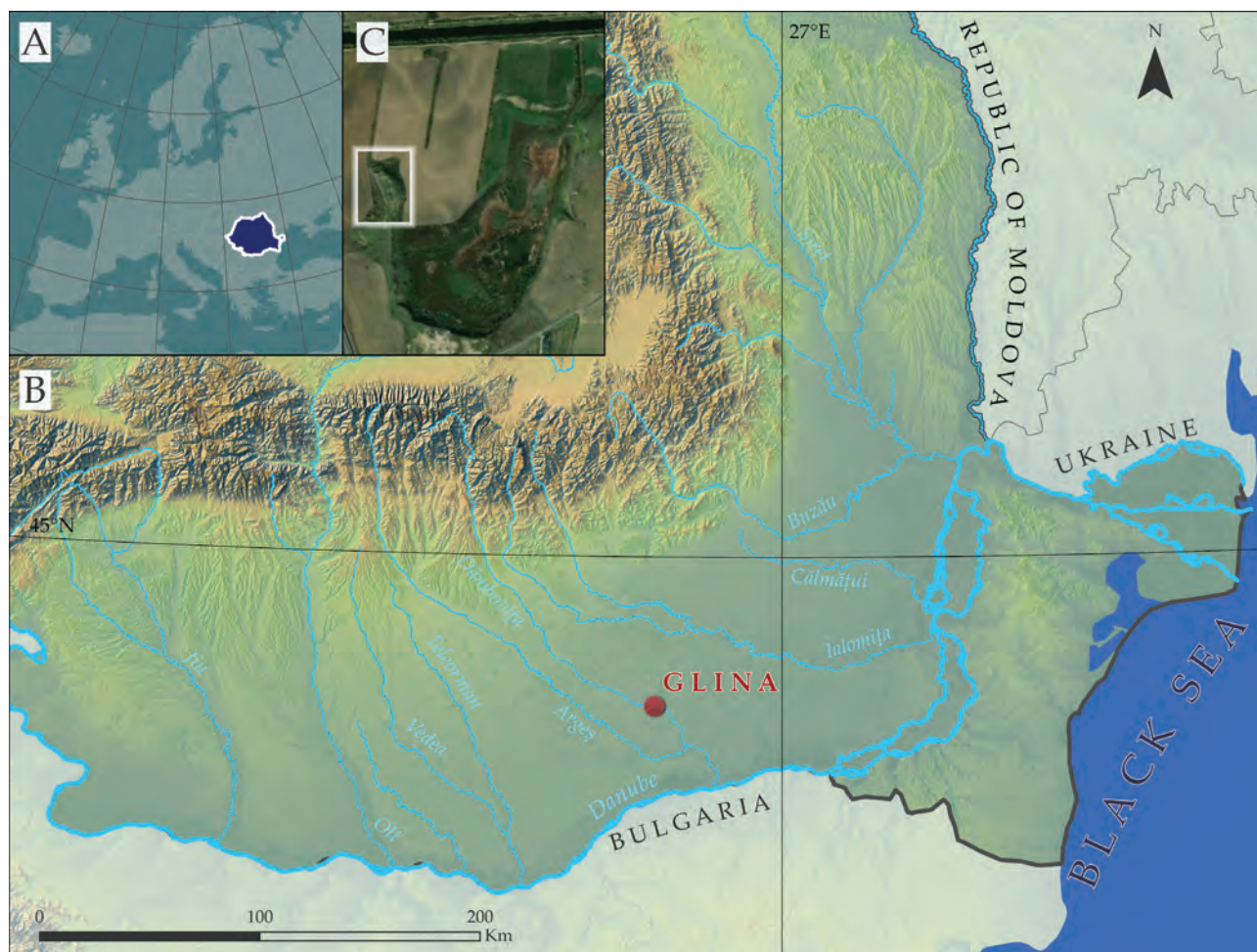


Figure 1. Location of the Glina Tell site.

The multilayered tell site (Bailey 1999) preserves deposits approximately 4 m thick, comprising successive occupation levels attributed to the Boian culture (Vidra phase and sporadically the Spanțov phase), the Gumelnița culture (A1 and A2 phases), and the Glina culture, as well as later materials (Tei culture, Early Iron Age, and Getic periods) in the upper levels (Nestor 1928; 1933; Ștefan 2016, p. 138). Despite its major scientific importance, however, a significant part of the excavation documentation and archaeological materials remained unpublished or only summarily presented, having been dispersed across several archives and museum collections.

The archaeological sequence of the site, its internal organisation, the relationship between the tell and the surrounding terrace occupations, as well as the environmental context of the settlement, remain insufficiently understood. Furthermore, the site's current state of preservation has been significantly affected by earlier excavations, erosion processes, and recent anthropogenic interventions (Moldoveanu, Andreescu 2012, p. 125; Oprîș 2015).

The resumption of systematic archaeological research at Glina Tell in 2025 was initiated as part of the project “Prehistory at the southeastern gates of Bucharest.

Multidisciplinary archaeological research in the prehistoric sites of Glina and Bălăceanca”, implemented by the Bucharest Municipality Museum in partnership with the University of Bucharest, the “Vasile Pârvan” Institute of Archaeology of the Romanian Academy, and the National History Museum of Romania. The project was conceived as a long-term research programme aimed not only at the reinvestigation of the tell itself, but also at the reconstruction of the broader Glina–Bălăceanca archaeological landscape through the integration of archaeological, geophysical, geomorphological, palaeoenvironmental, and spatial data.

The 2025 campaign represents the first stage of this broader research programme and was primarily evaluative and methodological in nature. The main objectives were: (1) to assess the state of preservation and archaeological potential of the site through invasive and non-invasive investigations; (2) to establish a high-resolution stratigraphic and chronological framework for the newly investigated areas; (3) to implement an integrated recording and sampling strategy adapted to the complex depositional sequence of the tell; and (4) to initiate the systematic collection of environmental and archaeological

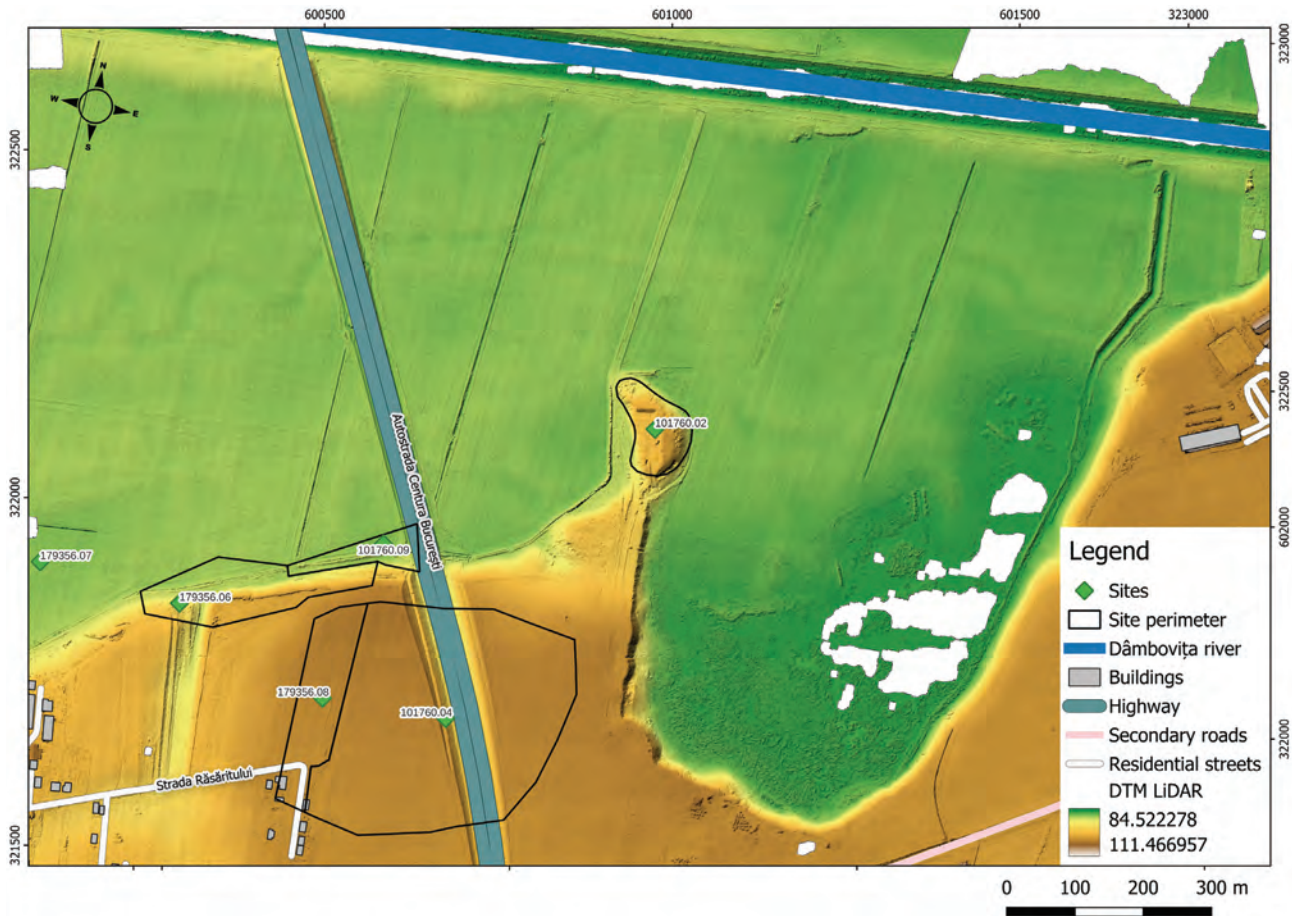


Figure 2. Digital terrain model of the Glina – Bălăceanca area, with Glina Tell in the centre, obtained by LiDAR scanning. Black lines mark the sites as they currently appear in the National Archaeological Repertoire, together with their respective codes.

data necessary for future interdisciplinary analyses and comprehensive studies.

Accordingly, the present contribution is intended as a preliminary fieldwork report. Rather than proposing definitive interpretations regarding the long-term evolution of the settlement or the cultural dynamics of the Boian, Gumelnița, and Glina occupations, the paper focuses on presenting the methodology employed during the 2025 campaign, the principal stratigraphic observations, and the first categories of archaeological and environmental data recovered during the excavations. These preliminary results nevertheless demonstrate the exceptional research potential still preserved at the site and provide the basis for the future development of an integrated, long-term investigation of one of the key prehistoric settlements from the Lower Danube region.

2. BRIEF RESEARCH HISTORY

Discovered by Radu Vulpe and investigated in 1926 and 1927 by Ion Nestor, the site holds major historiographical importance, as it was here that the Boian–Gumelnița

stratigraphic sequence was first established and the Glina III culture was defined (Nestor 1928; 1933). The site thus became the eponymous type-site for this Early Bronze Age culture.

Excavations continued between 1943 and 1948 (Petrescu-Dîmbovița 1944) and again in 1969–1970 (Comșa, Petrescu-Dâmbovița 1996). Although a large portion of the settlement was excavated (Fig. 3), most of the documentation has remained unpublished. The excavation archives and archaeological materials are currently deposited in several institutions, including the “Vasile Pârvan” Institute of Archaeology in Bucharest, the Institute of Archaeology in Iași, the National History Museum of Romania, and the Bucharest Municipality Museum.

Several decades after the latest excavation, studies have begun to recover portions of this legacy data through the reassessment of archival records and old collections. These reassessed finds include an Early Chalcolithic grave containing ornaments (Ștefan 2022a), three dwellings dated to the Middle Chalcolithic period (Ștefan 2015), faunal remains (Haimovici 1997), stone knives (Ștefan 2022b) and ornaments (Ștefan 2016) from the Early Bronze Age, and a collection of flint artifacts (Vornicu, Minea 2025). The latter

study also presents a detailed history of the investigations conducted at the site.

Several sites yielding prehistoric finds are documented on the adjacent terrace (Chirică, Popovici-Baltă 1973). The most recent investigations were carried out during the construction of the A0 Bucharest Motorway, which led to the discovery of features dating to the Late Neolithic (Boian culture–Bolintineanu phase), the Chalcolithic (Gumelnița culture), the Bronze Age (Cernavodă II culture, Tei culture, and the Radovanu aspect), the Early Iron Age (Basarabi culture), Post-Roman period (Chilia–Militari and Ipotești–Cândești cultures), the Early Medieval period (Dridu culture), and the Late Medieval period (17th–18th centuries) (Ștefan 2021; Ștefan *et alii* 2020).

3. TOPOGRAPHIC AND AERIAL DOCUMENTATION

The documentation of the Glina – Bălăceanca archaeological landscape was carried out at two different scales: a macro-scale survey before the excavation, and a micro-scale recording during the fieldwork. In March 2025, an airborne LiDAR survey was undertaken to document the site and its surrounding landscape (Fig. 2). The main objective was to obtain a detailed terrain model suitable for archaeological interpretation and for future monitoring, considering the rapid modern development affecting the area.

The survey was performed using a Quantum Systems Trinity F90+ UAV equipped with a Qube240 LiDAR sensor. The flight was carried out at 120 m AGL and covered 204 ha in approximately 35 minutes. The resulting point cloud was processed using the GNSS trajectory correction (Applanix POSPac), point cloud adjustment and filtering (YellowScan CloudStation), followed by the classification into ground and non-ground points. Based on this dataset, a DEM, DTM, and DSM models were generated (Stal *et alii* 2024).

In addition, the tell was documented using UAV photogrammetry. A DJI Phantom 4 Pro UAV was flown in automatic mode, following a predefined grid to ensure full coverage of the mound. The flight altitude was approximately 60 m AGL, with 80% frontal and lateral overlap. Ground control points measured using RTK GNSS were used to improve positional accuracy. The images were processed in Agisoft Metashape, resulting in a high-resolution orthophoto and DEM of the tell (Fig. 3).

During the excavation, spatial recording was carried out using a Leica total station and UAV photogrammetry. The total station was used to record the absolute coordinates of archaeological features and significant finds in the Stereo 70 coordinate system, ensuring compatibility with the macro-scale dataset. Concurrently, a DJI Mavic 2 UAV was employed to document excavation surfaces and individual features from low altitude. The images were processed in Agisoft Metashape in order to generate orthophotos and detailed surface models. Ground control points measured with the total station ensured accurate georeferencing and consistency with the broader spatial framework.

3.1 RESULTS AND DISCUSSION – MACRO-SCALE SURVEY

Both LiDAR and UAV data provide a detailed representation of the micro-topography of the site and its surroundings, offering a solid basis for analysing both archaeological features and recent landscape modifications.

The tell is located on a terrace promontory, at the boundary between the higher terrace and the lower floodplain of the Dâmbovița River. The northern part of the mound is affected by erosion, while the central-western area shows traces of modern interventions. Nevertheless, the tell still occupies a dominant position in the landscape. This is primarily due to its location on the edge of the terrace, above the flat floodplain area.

North of the mound, the terrain becomes low and flat, typical of a floodplain. This pronounced elevation difference makes the tell easily identifiable in the terrain model. However, the present shape of the valley must be understood in the context of modern river regulation. Over the last two centuries, especially in the Bucharest area, the Dâmbovița River has been heavily modified through channel rectification, embankments, and reservoirs (Stematiu, Teodorescu 2014). As a result of these works, the current floodplain does not fully reflect the original flooding regime and natural river dynamics.

The terrain model also shows significant modern interventions around the site. The Bucharest ring motorway cuts across the terrace west of the tell and represents the most visible landscape change. South and west of the mound, large areas have been levelled for agricultural use. These areas have a regular and flat appearance, distinct from the more natural micro-relief preserved near the terrace edge. New residential areas and secondary roads further fragment the landscape.

In this context, the Glina Tell was originally established within a more dynamic river landscape. The generated models document a terrain that has already been modified by modern engineering works. This must be taken into account when discussing both the choice of location and the preservation of archaeological deposits at the terrace–floodplain boundary.

4. GEOPHYSICAL PROSPECTIONS

4.1. METHODOLOGY

The geophysical prospections were aimed at providing context to the targeted site and the main objectives were to gather information on the presence of archaeological features in the ground and their preservation state, and on the extent of the site where possible, considering the current field conditions.

The first site investigated in this project is Glina, where we targeted the northern and eastern parts of the tell, although a large part of the site was excavated in the

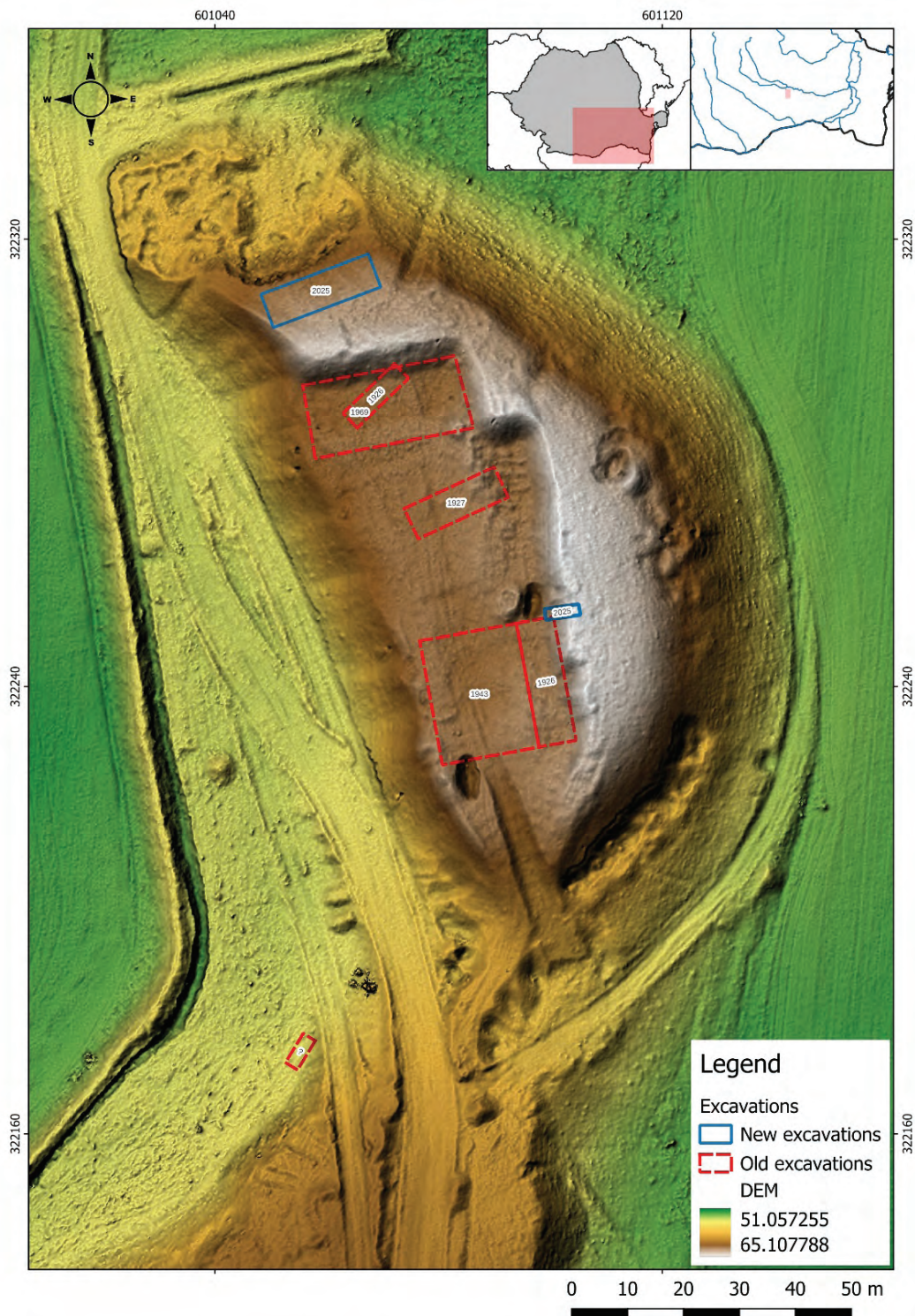


Figure 3. Digital terrain model of the Glina Tell area, obtained by UAV photogrammetry. Red indicates the estimated limits of previous excavations along with their respective years of excavation, while blue marks the areas excavated during the 2025 campaign.

second part of the 20th century. These areas that were less affected by modern interventions were investigated using Electrical Resistivity Tomography (ERT) as a first method of investigation (and the most suited to offer the information required in assessing the presence of archaeological

features and the stratigraphy of the mound), while magnetometry was used to investigate part of the high terrace to the southwest of the tell (Fig. 4). Initially, in the spring of 2025, two relatively perpendicular ERT profiles were measured in the northern part of the site, while a



Figure 4. ERT profiles and magnetometry surveyed area at Glina – Bălăceanca archaeological landscape (Glina Tell and the terrace SE of the tell).

later profile was measured on a south–north direction on the unaffected part of the mound (Fig. 5). An ABEM Mala instrument with 64 electrodes was used. For the first two profiles, the electrode separation was 0.5 m, while for the latter, aimed at giving a broader view of the site and its stratigraphy, the separation was 1.5 m. The data were collected in a Double Dipole configuration.

During the summer of 2025, we also collected around one hectare of magnetic data on the high terrace located to the southwest of the tell. The instrument used was a Bartington Grad601-2 gradiometer and the data was collected in the classical manner of the instrument – 30 m grids with 1×0.25 m resolution (Fig. 6).

4.2. RESULTS AND PRELIMINARY OBSERVATIONS

The ERT profiles from the northern part of the Glina Tell show the stratigraphy and reveal several positive and negative anomalies related to prehistoric archaeological features and possibly later historical periods. Profile 1, oriented east–west, shows a large positive anomaly in the western part and several negative anomalies that could be related to pit- or ditch-type features. Profile 2 has a north–south orientation and reveals a very interesting structure centred around 10.5 to 12 m along the profile: a feature that presents a high resistivity anomaly at the bottom of the anthropic layer with a negative component

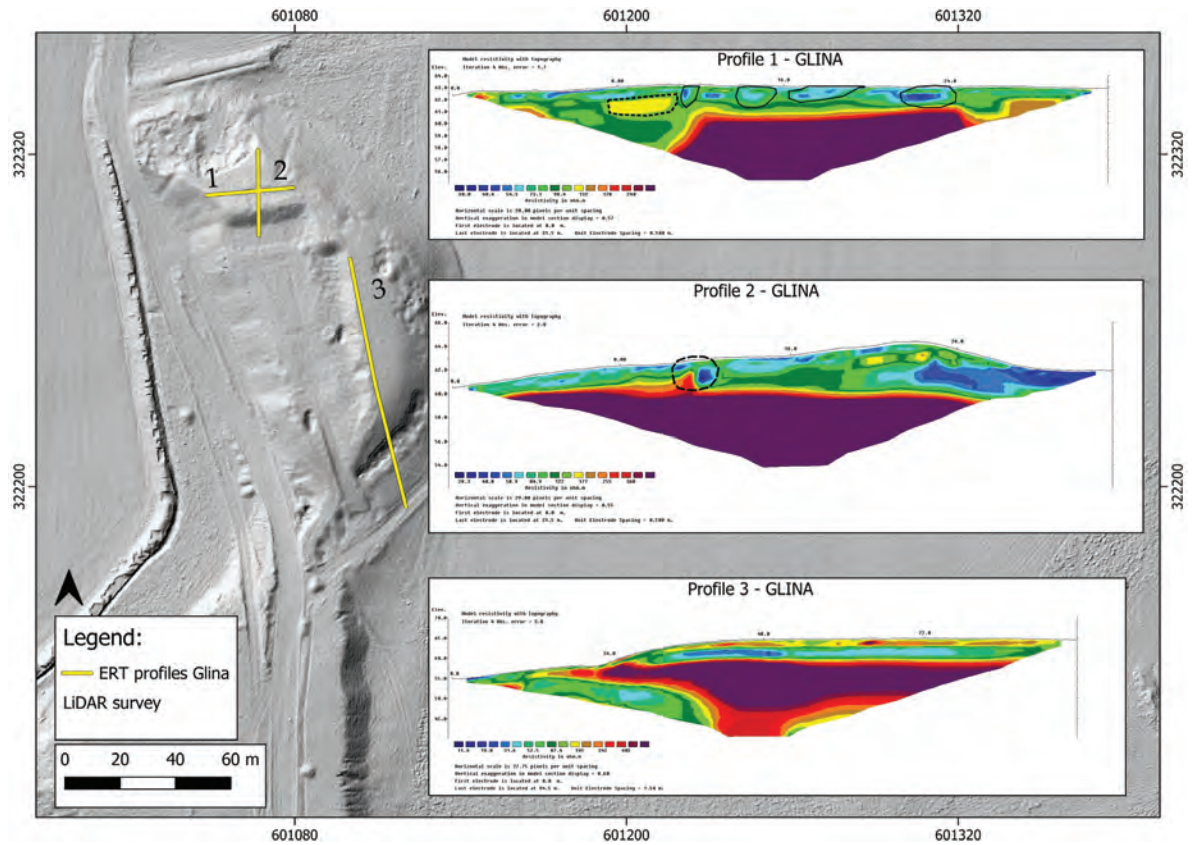


Figure 5. ERT profiles at Glina Tell with identified features.

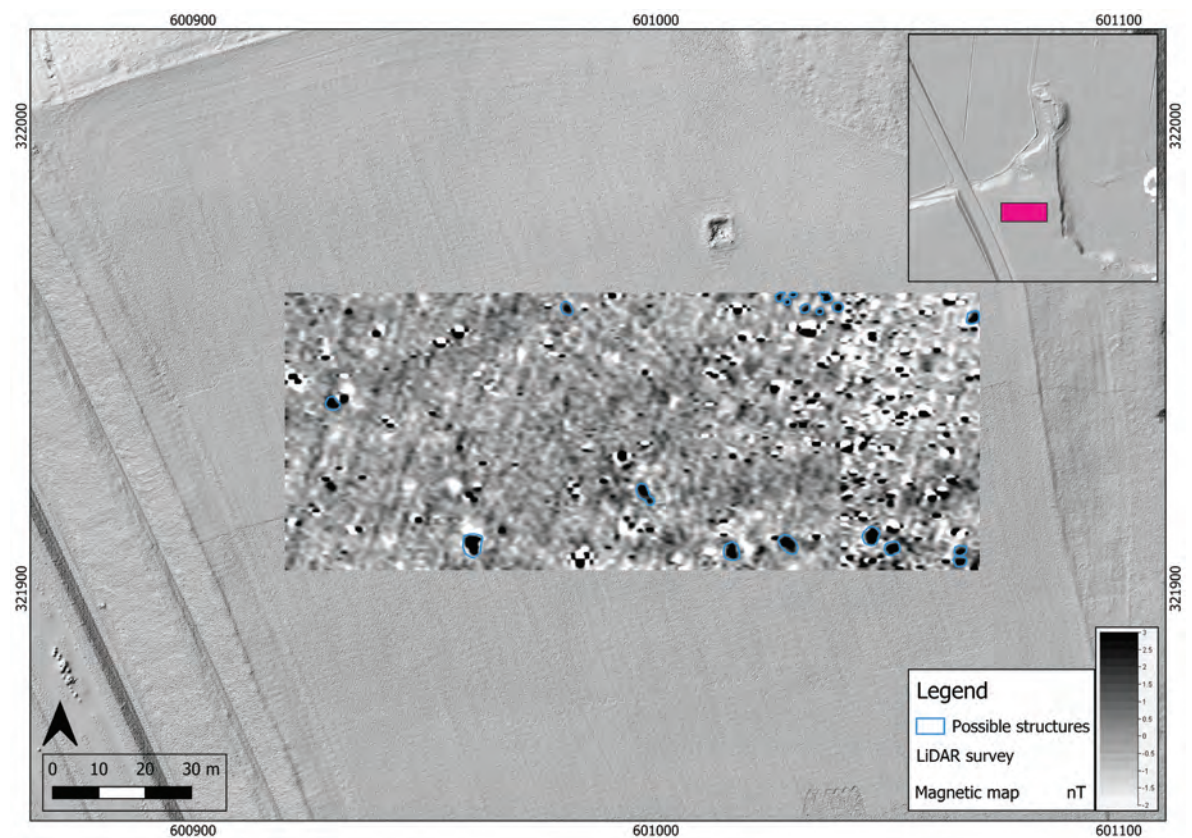


Figure 6. Magnetometry survey on the Terrace area and interpretation of identified features.

to the south. This is indicative of a wall/bank type feature with a possible ditch behind it. The orientation following the edge of the mound gives further motive to formulate this hypothesis. Thus, it might be a feature delimiting the settlement at one point in time. The third profile, oriented north-south, offers information on the structures present on the tell, but also some information related to the southward slope. The stratigraphy observed in this profile shows the highly resistive geology of the mound, as expected. The archaeological layers are c. 2.5 m deep thick and relatively even. Underneath, there is a conductive area of significant thickness. The likelihood that this feature is anthropogenic is low. It is more plausibly a natural layer where water accumulates, situated above a high-resistivity geological unit within the mound. Because this underlying material inhibits infiltration, water is retained in the overlying layer. The magnetic survey conducted on the terrace near the tell is not conclusive regarding possible off-tell activity during the period of interest, but there is a series of positive magnetic anomalies related to pit-type features that can be caused by past human activities. There is no clear pattern and further investigations, especially intrusive, would clarify whether they are prehistoric or more recent.

Overall, the ERT survey enabled us to delineate the anthropogenic layer and gain further insight into the archaeological features preserved within the tell. The potential ditch-and-bank feature provides evidence for the northern boundary of the settlement during a particular phase of its occupation, while the resistivity patterns observed in the pseudosections also allowed us to infer aspects of the underlying structural remains.

5. GEOARCHAEOLOGICAL INVESTIGATIONS

5.1. METHODOLOGY

5.1.1. Sediment Coring and Laboratory Analyses

Two sediment cores (GLB1 and GLB2) were recovered from the Dâmbovița floodplain, within a palaeomeander loop located in the Glina Tell site area, in order to investigate the alluvial stratigraphy and paleoenvironmental evolution of the floodplain–terrace system (Fig. 7). Coring was performed using an Eijkelkamp percussion coring system. Until now, detailed sedimentological and laboratory analyses have been completed only for core GLB2, which also provided the most continuous and informative sedimentary record. The core reached a total depth of 8 m and was analysed using multiple sedimentological and environmental proxies. For grain-size analysis, samples were collected at regular intervals and at each visible change in sediment texture; carbonates were removed using a 30% acetic acid solution, organic matter was oxidized with 10% hydrogen peroxide, and grain-size distribution was measured using a Laser Diffraction Particle Size Analyzer (Analysette 22, from the Fritsch; range: 0.005–3000 μm), with parameters

calculated following Folk and Ward (1957) using GRADISTAT 9.1 (Blott, Pye 2001). Organic matter (OM) and inorganic carbonate (C_{inorg}) contents were determined by Loss on Ignition (LOI) using successive combustion steps at 550°C (6 h) and 950°C (2 h), following Heiri *et alii* (2001) and Wang *et alii* (2011). Additional proxies included magnetic susceptibility measurements and lithological descriptions performed during core opening and subsequently refined through laboratory observations.

Geochemical scanning was performed on the undisturbed half of the core, stored at a constant temperature of 4°C, using a Cox Analytical Systems ITRAX core scanner at 1 mm resolution. A chromium X-ray tube was set at 30 kV and 55 mA with a count time of 10 seconds per step, providing good excitation for a broad range of geochemically relevant elements (Croudace *et alii* 2006). Prior to scanning, cores were covered with a 6 μm Ultralene film to prevent desiccation and avoid contamination of the XRF detector.

5.1.2. Electrical Resistivity Tomography (ERT)

Electrical Resistivity Tomography (ERT) was applied to investigate the subsurface sedimentary architecture of the Dâmbovița floodplain–terrace system in the Glina study area. ERT is a well-established method for imaging subsurface structures, as contrasts in grain size, porosity, water content, and lithology generate distinct resistivity responses (Telford *et alii* 1990; Baines *et alii* 2002; Reynolds 2011). In general, coarse-grained and dry deposits display higher resistivity values, whereas fine-grained and water-saturated sediments are characterised by lower resistivities.

The measurements were carried out using an ABEM Terrameter LS 2 multielectrode system with a Wenner array configuration and 5 m electrode spacing. Two adjacent profiles were acquired and subsequently merged to obtain a continuous section exceeding the cable length limitations, yielding a cumulative profile approximately 385 m long with an investigation depth of ca. 35 m. The profile intersects the floodplain, the terrace front, and the terrace surface of the Dâmbovița valley, with approximately 260 m corresponding to the floodplain area, including the location of core GLB2. Data processing and inversion into a 2D resistivity model were performed using Res2DInv software, including standard error filtering and topographic corrections. The results were further validated through correlation with core stratigraphy, allowing for a refined interpretation of the subsurface sedimentary architecture.

5.2. RESULTS AND DISCUSSION

5.2.1. Floodplain Stratigraphy and Sedimentological Record

GLB2 core description: stratigraphy and sedimentological parameters

The basal part of the GLB2 sequence (800–740 cm) is dominated by relatively coarse deposits, including massive

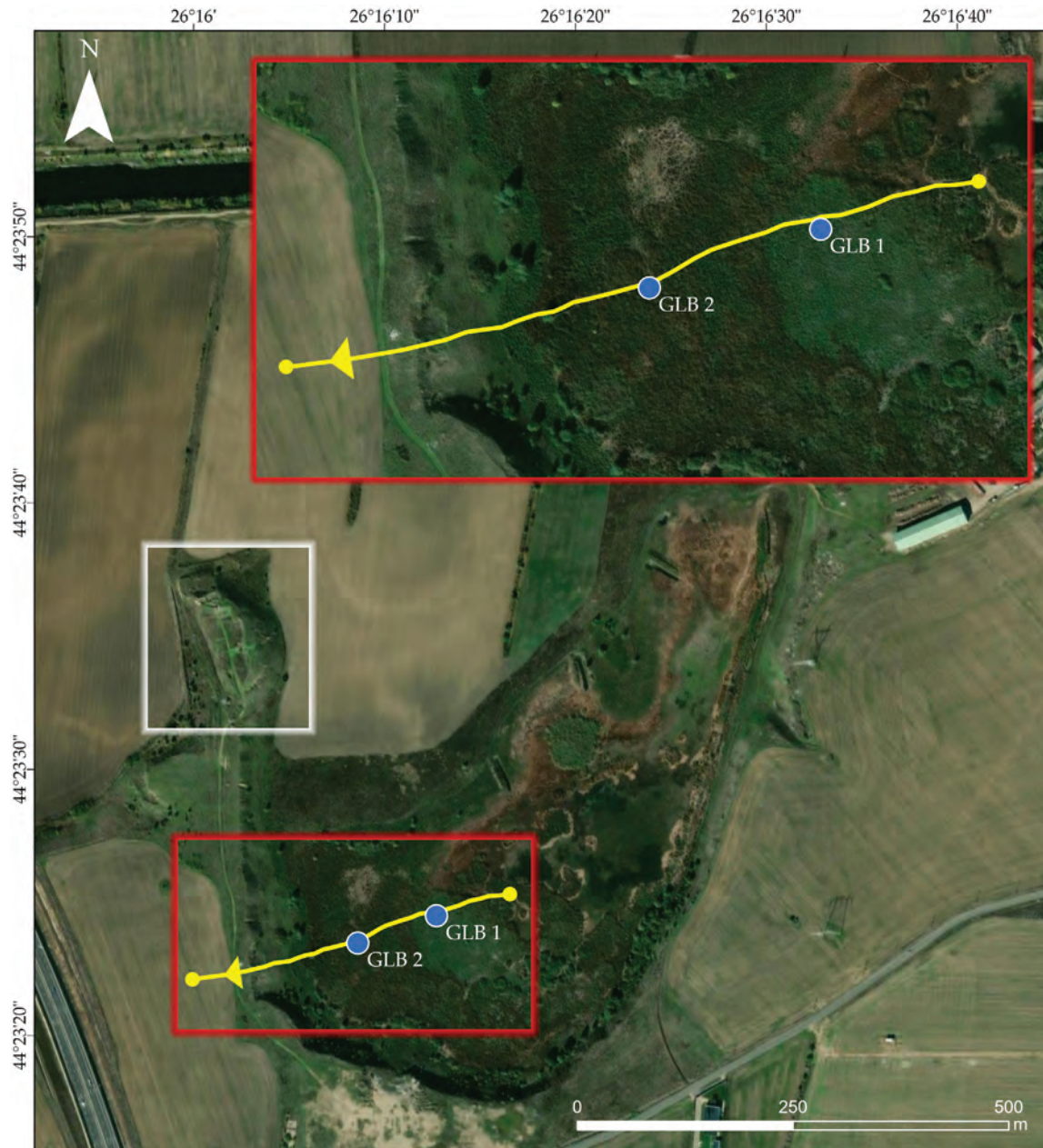


Figure 7. Location of the study area and sampling sites. Satellite image showing the palaeomeander loop within the Dâmbovița floodplain near the Glina archaeological site (tell position is marked in white rectangle), with the positions of sediment cores GLB1 and GLB2 (blue dots) and the ERT profile (yellow).

medium and fine sands with extremely low organic matter ($OM \leq 1\%$) and inorganic carbon (C_{inorg}) contents (Fig. 8). These sediments indicate medium and high-energy fluvial conditions and are interpreted as active channel deposits of the Palaeo-Dâmbovița.

Between approximately 740 and 590 cm in depth, they are overlapped by a gradual fining-upward sequence dominated by sandy and coarse silts (particularly between 740 and 670 cm), suggesting a progressive decoupling of this channel, though not yet complete. The top of this unit (600–590 cm) consists of coarse and medium silts with carbonate precipitates. Notably, this unit is capped by an

8 cm-thick (590–582 cm) well-sorted medium-sand layer comparable in texture to the basal unit (791–776 cm), suggesting a brief hydraulic reconnection with the main channel, most likely during a high-discharge event. A short transition from massive sands to silts occurs at 582–563 cm, above which the interval between 563 and 436 cm is characterised by medium and fine silts with high OM content (8–15%), indicative of lacustrine or semi-lacustrine depositional conditions. Further upward in the core, a gradual and continuous coarsening-upward trend is observed between 436 and 371 cm, corresponding to a transition from fine silts to very fine sands.

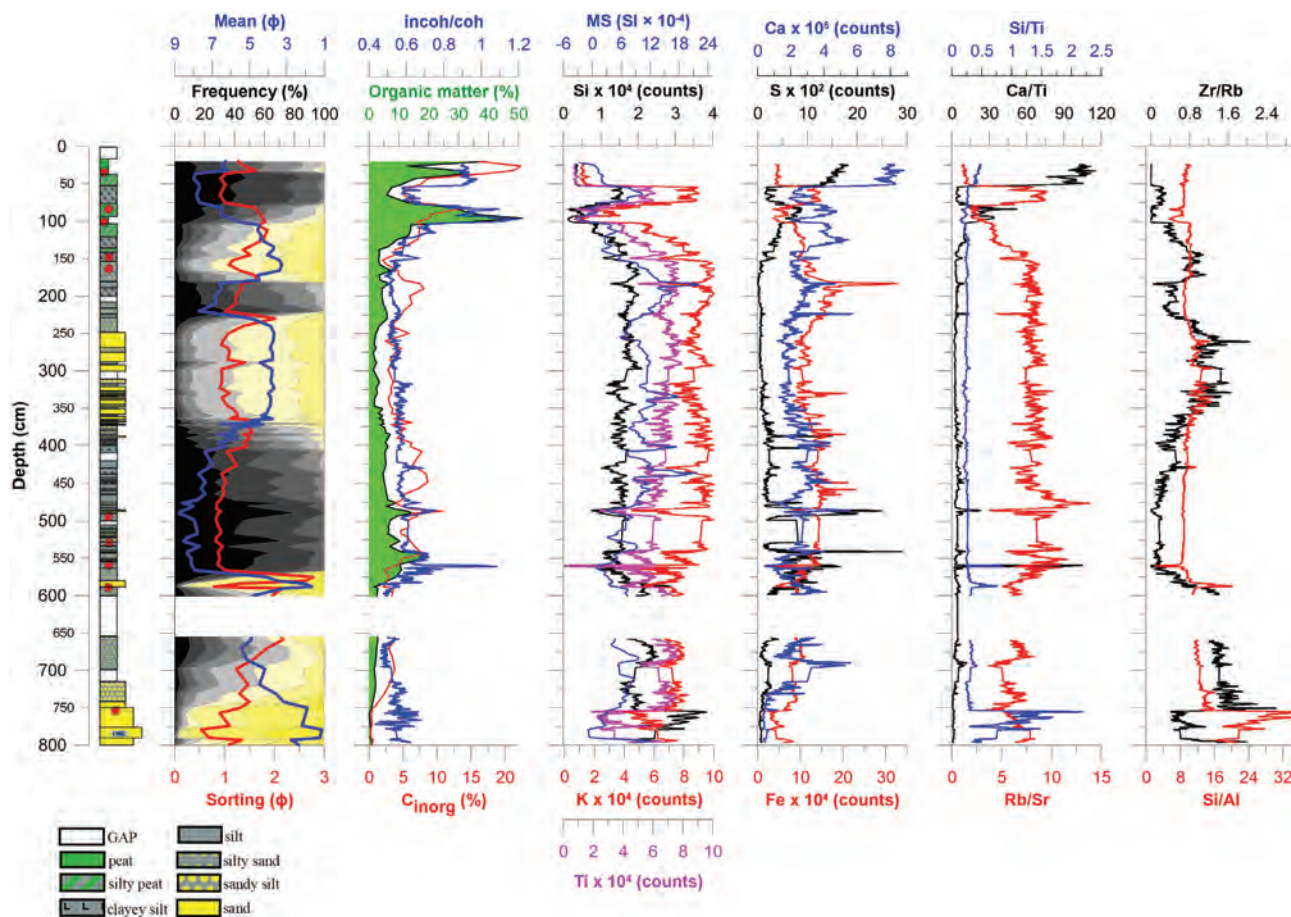


Figure 8. Stratigraphy and multi-proxy sedimentological record of core GLB2. From left to right: lithological log; grain-size frequency distribution with mean grain size (blue line) and sorting (red line); OM (green) and C_{inorg} (blue) contents determined by LOI; magnetic susceptibility (MS); and XRF-derived elemental counts and ratios. The gap between 600 and 640 cm indicates a core recovery hiatus.

From 371 to 248 cm, the sediment consists predominantly of poorly sorted fine and very fine sands intercalated with sandy silts, against a background of relatively low OM (2–3%) and C_{inorg} (3–4%) values. This interval likely indicates a final phase of flow reactivation within this palaeochannel, which probably functioned as a secondary channel receiving water from the main river only during high-discharge events.

Higher up in the sequence, the interval between 248 and 227 cm is characterised by clayey silts with carbonate concretions and oxidation mottles, indicating episodic exposure and pedogenic activity. A distinct chromatic transition from light bluish tones to dark brown-grey is recorded at 169–166 cm depth. A second, weaker coarsening episode is recorded between 176 and 152 cm, characterised by silty fine sands intercalated with clayey silts and moderately elevated C_{inorg} values, suggesting a brief return to higher-energy, minerogenically influenced conditions prior to the onset of peat formation. Above this, peaty silt appears at approximately 135 cm, gradually transitioning into peaty loam and then into classic peat at approximately 100 cm depth, where OM values reach ca.

50%. Between 100 and 50 cm, peat is interbedded with silts, while the uppermost interval (37–15 cm) consists of pure compacted peat. Both upper units indicate the transition toward a *Typha*-dominated wetland facies.

Geochemical proxies

The XRF-derived geochemical record broadly corroborates the sedimentological interpretation and provides additional insight into sediment provenance, redox conditions, and depositional energy changes throughout the GLB2 sequence.

In the basal sandy unit (800–740 cm), elevated Si and Zr counts, together with high Si/Ti and Zr/Rb ratios, reflect the dominance of coarse, poorly weathered, quartz- and zircon-rich sediments transported under high-energy fluvial conditions. Concurrently, low Ca/Ti and Rb/Sr values indicate minimal carbonate content and limited feldspar weathering, consistent with rapid, short-distance transport from upstream sources (Fig. 8).

The fining-upward interval between c. 740 and 590 cm is marked by a progressive decline in Si/Ti and Zr/Rb, accompanied by increasing K and Ti counts, pointing

to a shift toward finer, clay-rich sediments and reduced transport competence as the channel progressively decoupled from this sector.

A thin but geochemically distinctive layer at 590–582 cm warrants separate consideration. Despite its coarse texture and elevated Si and Si/Ti values, which are consistent with a brief fluvial input during a high-discharge event, the simultaneously elevated S and Ca counts suggest this records a sudden flood pulse into a semi-closed oxbow rather than a sustained channel reactivation: the elevated Ca likely reflects carbonate-rich material transported from upstream or precipitated in the disturbed lacustrine water column, while high S values indicate remobilisation of sulphides from the organic-rich lake sediments.

The lacustrine interval (563–436 cm) is characterised by the lowest Si/Ti and Zr/Rb values in the entire core, alongside a marked increase in Fe counts, indicative of reducing conditions in a low-energy, organically enriched depositional environment. Elevated Ca and Ca/Ti values within this unit likely reflect authigenic carbonate precipitation under low-energy, possibly hydrologically semi-closed conditions. The coarsening-upward transition between 436 and 371 cm is reflected geochemically by a gradual increase in Si/Ti and Zr/Rb, marking the progressive shift from lacustrine to fluvially influenced conditions prior to the first reactivation phase.

Two distinct reactivation phases are identified in the upper part of the sequence, each with a different geochemical signature. The first (371–248 cm) shows a clear increase in Si/Ti, Zr/Rb, and Si/Al, consistent with a return to coarser, more minerogenic inputs during secondary channel activity, most likely representing episodic inundation from the main Dâmbovița channel under high-discharge conditions. S counts display notable variability within this interval, possibly linked to fluctuating redox conditions at the sediment–water interface during repeated flood pulses.

The second reactivation phase (176–152 cm) shares some geochemical characteristics with the first — including moderately elevated Si and Si/Ti — but is distinguished by relatively higher Fe, K, and Ca values. This combination suggests a semi-lacustrine, semi-stagnant environment intermittently reconnected to the active Dâmbovița channel, rather than direct secondary channel deposition. The elevated Fe likely reflects reducing conditions in a poorly drained backswamp or floodplain pond, while the higher K and Ca may indicate a mixed input of fluvially transported clays and carbonate material into a persistently low-energy, waterlogged setting.

In the uppermost part of the core (above ca. 200 cm), sharply rising OM values and a concurrent decrease in minerogenic proxies (Si, K, Ti) mark the transition to peat-dominated facies. Elevated Ca counts between 135 and 50 cm may reflect shell fragments or carbonate-rich plant material within the wetland, while the uppermost compacted peat (37–15 cm) displays the lowest minerogenic signal in the entire sequence.

The magnetic susceptibility (MS) profile displays relatively constant moderate values from the base of the core to approximately 600 cm depth, followed by a generally increasing trend toward 340 cm, with notable peaks at approximately 540, 440, 400, 338, and 180 cm. These peaks broadly coincide with the reactivation phases and flood pulse events identified in both the lithological and geochemical records, likely reflecting episodic inputs of magnetically enriched minerogenic material from the Dâmbovița catchment.

5.2.2. Subsurface Architecture from ERT

The ERT section reveals a clear contrast between the floodplain and the terrace deposits. The floodplain is generally characterised by low resistivity values (<50 Ωm), reflecting the predominance of fine- to medium-grained sediments with high moisture content (Fig. 9). In contrast, the terrace sector displays significantly higher resistivity values (200–750 Ωm), mainly due to the presence of unsaturated loess and sandy deposits with low water content. A particularly important feature identified within the floodplain stratigraphy is a laterally extensive horizon with moderately elevated resistivity values (ca. 40–60 Ωm), located at depths of approximately 8–20 m. Toward the terrace front, this unit becomes both thicker (reaching ca. 8–25 m depth) and more resistive (45–80 Ωm). Correlation with the sedimentological information provided by core GLB2, especially the medium- to coarse-grained sandy deposits identified in its lower part, suggests that this horizon corresponds to coarse alluvial sediments, including sands and locally gravels, associated with former active Dâmbovița channel deposits (Fig. 9). These deposits most likely formed during the Early Holocene, although a Late Glacial age (possibly Younger Dryas) cannot be excluded at this stage.

The ERT profile also highlights a high-resistivity body located on the terrace slope. This anomaly is interpreted as a modern anthropogenic deposit composed predominantly of construction and demolition debris. Due to its high porosity and permeability, infiltrated water accumulates beneath this deposit, producing an underlying low-resistivity zone visible in the tomographic section. Overall, the ERT results provide relevant data about the internal structure of the floodplain and the terrace system, but most important is the detection of buried coarse-grained palaeo-channel deposits at 8–20/25 m beneath the present-day floodplain surface.

6. FIELDWORK METHODOLOGY

To prevent the erosion of archaeological deposits in the northern part of the settlement, as well as to verify the stratigraphy in an area unaffected by earlier excavations, three 6 × 6 m areas (A, B, and C) were opened in 2025. They were separated by 1 m baulks and together formed area SI, oriented approximately E–W (Fig. 10).

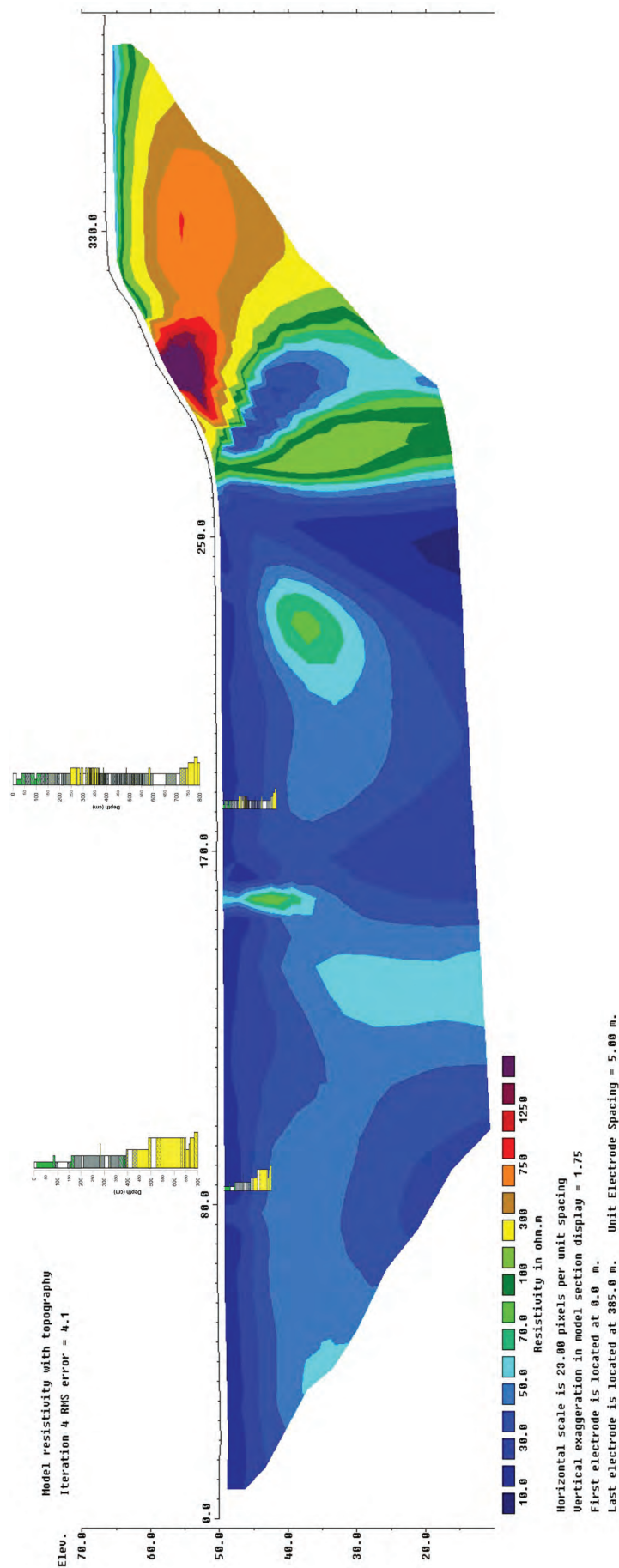


Figure 9. Electrical Resistivity Tomography (ERT) profile across the Dâmbovița floodplain-terrace system at the Glina study site.

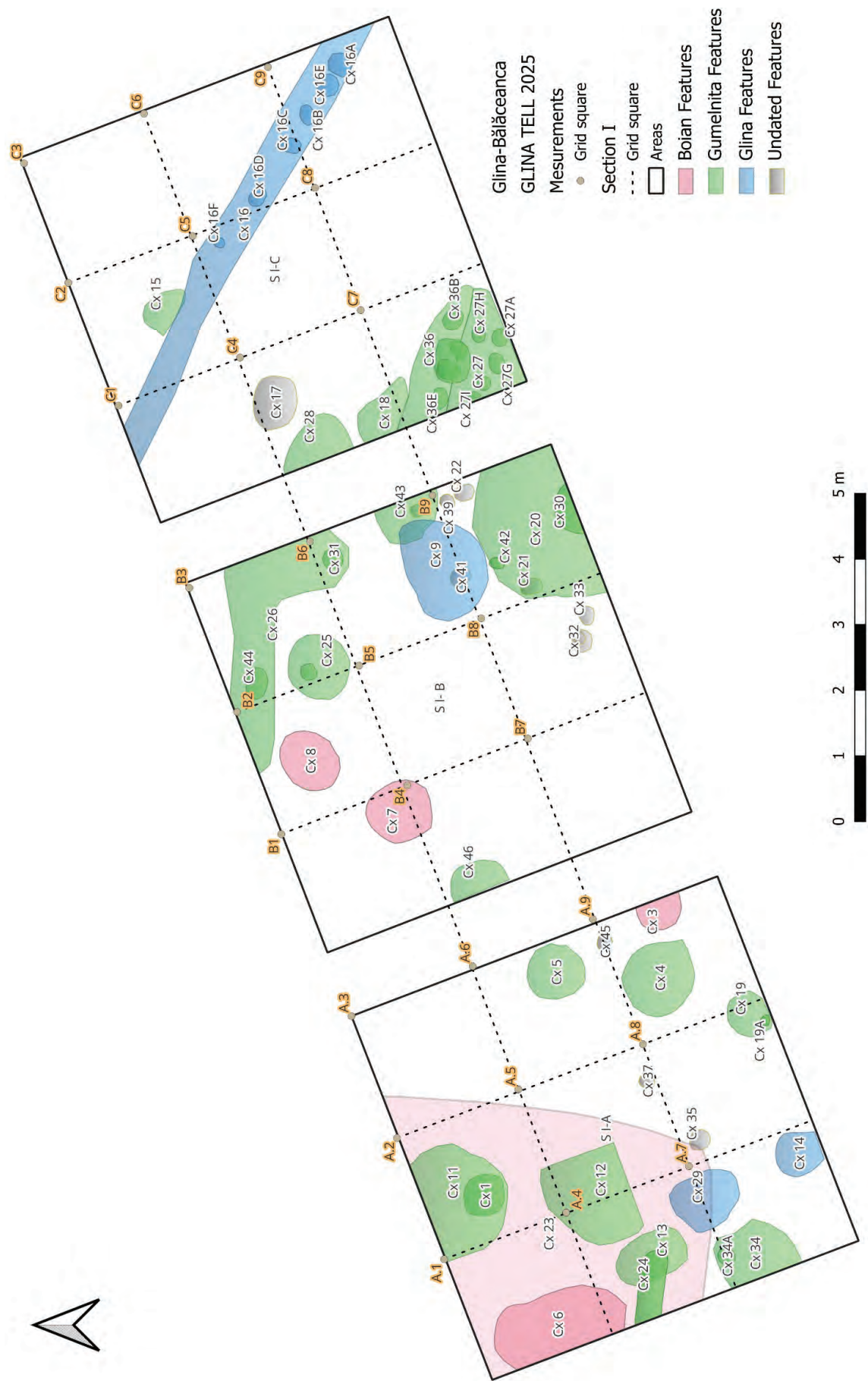


Figure 10. General plan of the excavations in the SI area, with the dating of the archaeological features (SI-A left, SI-B centre and SI-C right).

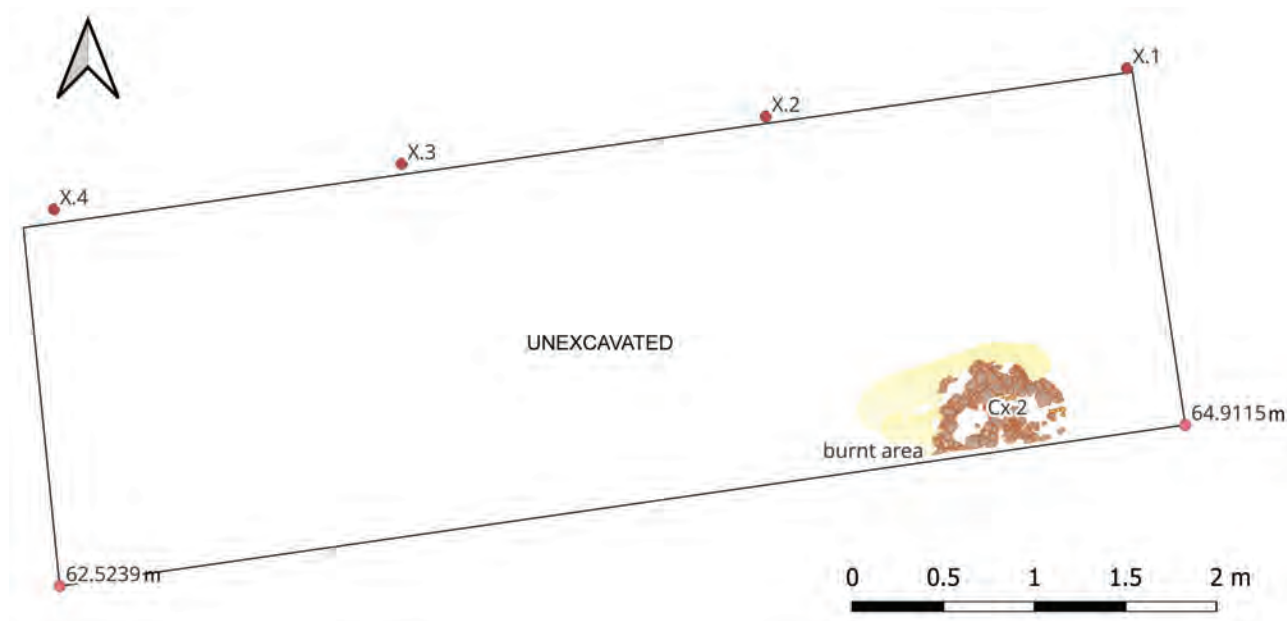


Figure 11. General plan of the excavations in the SII area.

Area SII was opened in the central part of the tell settlement, at the edge of an earlier one and adjacent to a relatively recent unauthorized intervention (Fig. 11), with the aim of verifying the stratigraphy and collecting samples for radiocarbon dating.

The excavation technique applied followed a micro-stratigraphic approach, with stratigraphic recording carried out using the single context system (Stratigraphic Units – SUs), documented on standardized recording sheets and in dedicated registers.

The acquisition of raw geospatial data for planimetric and altimetric recording was carried out using GNSS (Global Navigation Satellite System) receivers, complemented by a Leica TCR 407 Power total station. These data were further supplemented with information obtained from UAV-based surveys (LiDAR and multispectral), as well as through the integration of existing cartographic sources.

Non-intrusive surveys (ERT and magnetometry) were used to delimit the investigated areas according to the nature of the identified archaeological deposits, to define excavation sectors both on the tell and the flat settlement located on the platform south-southwest of the tell, as well as in the Glina–Bălăceanca wetland area, where two sediment cores of 7 m (GLB1) and 8 m (GLB2) in depth, respectively, were extracted.

Sediment samples from the investigated contexts were systematically collected contextually and subsequently sieved, allowing for the recovery of small-sized artifacts and ecofacts such as beads made of various materials, charred seeds, charcoal, and flint chips. Sediment samples were also collected for subsequent wet sieving and/or flotation.

The final stage of the study will consist of sorting and analysing the recovered materials by category.

Twenty-five samples were collected from the investigated features for absolute (radiocarbon, ^{14}C) dating. Of the archaeological samples (animal bones), four were measured at the RoAMS laboratory in Măgurele, Romania (see Section 9.2), while 11 are currently under analysis at the LARA laboratory in Bern, Switzerland. Additional 10 organic samples were collected from sediment core GLB2 and are presently analysed at the RoAMS laboratory in Măgurele, Romania.

7. ARCHAEOLOGICAL EXCAVATIONS

This section outlines the principal archaeological features uncovered during the 2025 fieldwork at the Glina Tell. To document the stratigraphic sequence, all contexts and stratigraphic units are presented for each investigated area (SI-A, SI-B, SI-C, and SII). Each area is characterised individually, with descriptions arranged in chronological and stratigraphic order, from the earliest to the most recent.

Area SI (Fig. 10)

The defining characteristic of area SI (with the A, B, and C sectors) is the absence of consistent multi-layered occupation levels typical of Chalcolithic tell settlements. Most features (pits, ditches, pit-houses) reach the natural soil level (loess – SU2611) (Figs. 15, 16, 20), regardless of their chronology.

To the upper part, these contexts were partially affected by erosion due to the c. 15° south to north slope inclination. The latter triggered the formation of a colluvial layer (SU2501) right below the topsoil (SU2500). It contains mixed, fragmented finds (Pl. V/1–2) originating mostly from the spoil heaps of previous excavations. This layer overlies an earlier colluvial/abandonment level (SU2502), 15–20 cm thick in the southern part of SI, gradually disappearing towards the north due to slope erosion. It contains a lower density of archaeological material compared to SU2501, with areas of higher concentration only in SI-A, squares 8 and 9.

Fifty-six archaeological features were identified in SI, consisting of five ditches, one dwelling, one hearth, 23 pits with varied inventories and functions, and 26 postholes. Eleven pit features and all postholes were fully excavated. The latter were associated with habitation structures (Cx20), ditches (Cx26, Cx36, Cx27, Cx34), and pits (Cx19, Cx25, Cx43), but were also isolated, with no clear association with larger structures. This made their attribution to specific chronological sequences more difficult.

Nineteen other features were only partly investigated and are scheduled for complete excavation in future field campaigns. The following section describes each fully or partially investigated feature with a secure cultural attribution. These are organised according to

the areas where they were identified and presented in chronological order.

7.1. SI-A (Fig. 10, 5.1)

7.1.1. Early Chalcolithic features (Boian culture) in SI-A

Feature Cx3 (Fig. 12) was a circular pit, partly excavated, with the remaining portion overlain by the eastern baulk of SI-A. The walls are straight, and the base is slightly concave. It has a diameter of approximately 0.60 m and a depth of 0.70 m from identification. Two infill layers were recorded (SU2509A and SU2509B). The lower infill, reddish-brown in colour, contained daub and ceramic fragments, spindle-shaped clay beads, faunal remains, and flint flakes, all more abundant towards the base of the pit. The upper infill consisted of compact grey soil containing fragments of burnt daub and very sparse, scattered ceramic sherds. Both ceramic typology and one radiocarbon date assign this feature to the Vidra phase of the Boian culture (see below, Section 9.2).

Feature Cx6 (Fig. 10): a partially excavated pit (eastern side), cut into the fill of Cx23. It is oval in plan, measuring approximately 2 m in length and 0.95 m in maximum observed width. Two fill layers were identified. The lower

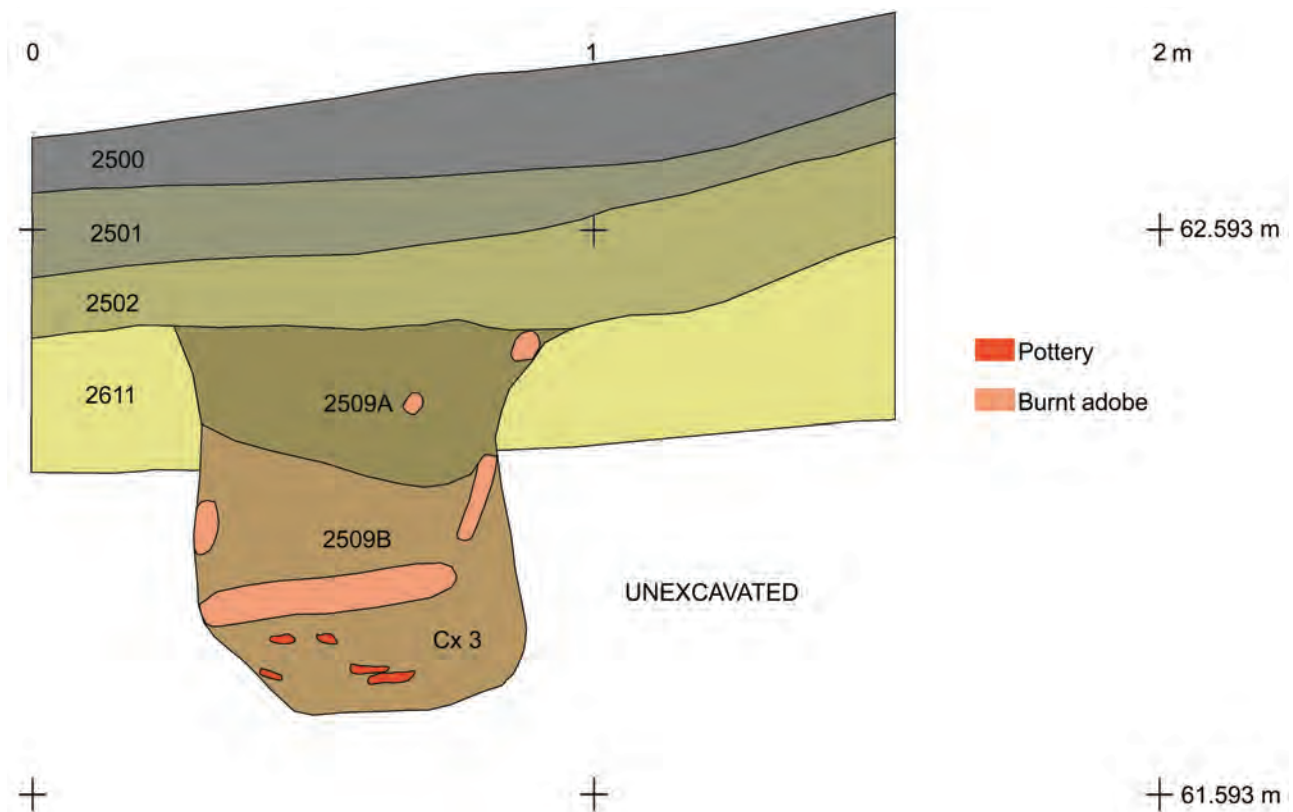


Figure 12. Section I, Area A (SI-A), partial east profile showing feature Cx3.

layer (SU2517) consists of poorly compacted, light grey silty sediment, rich in ash and containing minute charcoal fragments, along with fewer animal bones and pottery fragments than those in the upper layer. The upper layer (SU2515) consists of mixed sediment with variable textures, ranging from compact clay to medium-compact silt. It contains abundant charcoal and, in places, ash, along with animal bones, flint artifacts, and fragmentary pottery of Boian–Vidra tradition.

Feature Cx23 (Figs. 10, 15) was identified as an area of compact brown-grey soil (SU2527), extending over approximately 15 m² in the north-western corner of SI-A. It contained animal bones, charcoal, scattered burnt daub, and fragmented pottery of Boian–Vidra tradition. Only the upper part of this feature has been investigated so far, along with more recent features affecting it, including a series of pits (Cx1, 6, 11, 12, 13, 26), a ditch (Cx24), and an abandonment layer (SU2526). These observations revealed a substantial deposit thickness (over 1.10 m), which has led to a preliminary interpretation of this feature as a delimitation ditch of the Early Chalcolithic settlement. The feature will be further investigated in future excavations, and additional details will be provided accordingly.

7.1.2. Middle Chalcolithic (Gumelnița culture) features in SI-A

Feature Cx1 (Fig. 10, 13): an oval pit, measuring 0.80 × 0.70 m at the mouth and reaching a maximum depth of 1.05 m. It cuts into the abandonment layer SU2526 and overlaps pit Cx11. The fill consists of a weakly compacted, dark (blackish) sediment (SU2507), containing burnt daub inclusions, animal bones, flint artifacts, and fragmented pottery attributed to the A2 phase of the Gumelnița culture.

Feature Cx4 (Fig. 10): a circular pit with a diameter of 1 m and a depth of 0.66 m from the level of identification. It has straight walls and a concave base. Two fill layers were identified. The lower fill (SU2516) consists of weakly compacted brown-grey sediment rich in archaeological material, including circular beads made of burnt bone, bone awls, perforated ceramic discs fashioned from sherds, flint artifacts, carbonised seeds, animal bones, and fragmentary pottery attributed to the A2 phase of the Gumelnița culture. The upper fill (SU2511) is composed of compact yellow clay containing animal bones, fragments of both burnt and unburnt daub, and scattered ceramic sherds.

Feature Cx5 (Fig. 10): a circular pit with a diameter of 0.80 m and a depth of 0.30 m from the level of identification. It has straight walls and an irregular (undulating) base. The fill (SU2513) consists of a grey, weakly compacted sediment containing flint flakes, two bone points, a tubular bead made of burnt bone, fragmented pottery, charcoal, animal bones, and burnt daub. In the central upper part of the feature, a compact mass of unburnt yellow clay was recorded, devoid of archaeological material.

Feature Cx11 (Figs. 10; 13): a pit of indeterminate plan-shape, only partially excavated (southern side), over a length of 1.10 m and a depth of 0.95 m. It is overlain by SU2526 and pit Cx1, and cuts feature Cx23. Three fill layers were identified, all showing a depositional slope from west to east. The lower layer (SU2573) is very compact, yellow-green in colour, with abundant gravel and sand; localized calcium carbonate concretions were observed towards the pit walls. Ceramic fragments were found in clusters, while hearth fragments, animal bones, and charcoal occurred more sporadically. The middle layer (SU2530) contains abundant ash and charcoal, along with hearth fragments, animal bones, and ceramic sherds.

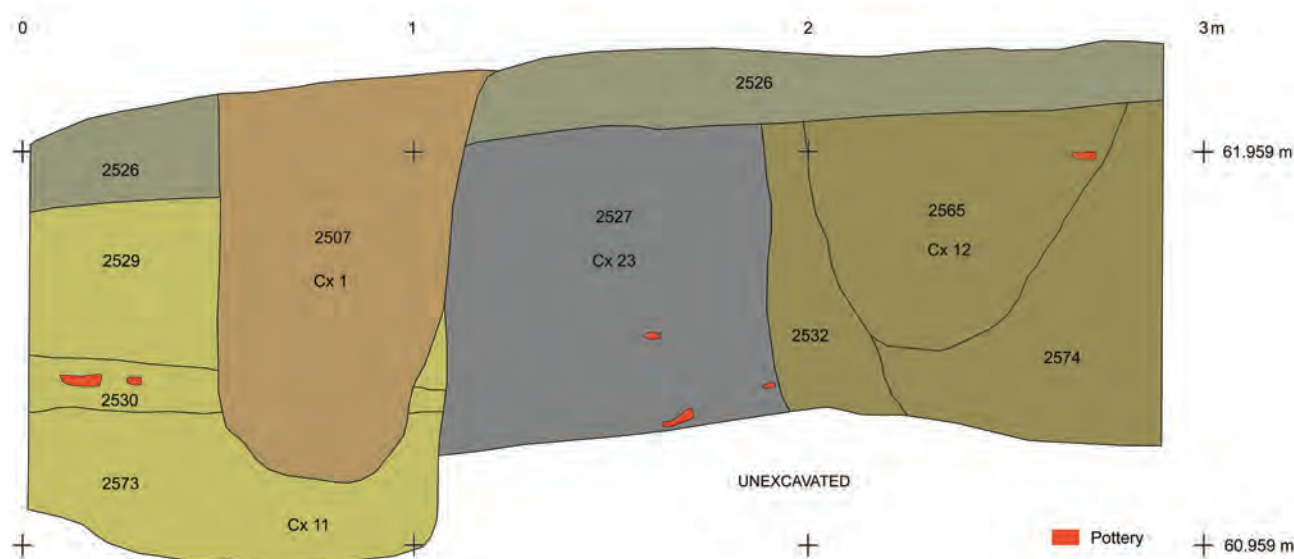


Figure 13. Section I, Area A (SI-A), west profile of a provisory baulk north-south oriented in the middle of the section.

The upper layer (SU2529) is heterogeneous, consisting of weakly compacted yellow-green sediment with layers of burnt adobe and abundant gravel, containing hearth fragments, pottery, animal bones, and flint artifacts.

Feature Cx12 (Figs. 10; 13): a partially excavated pit, documented over a length of 1.05 m and a depth of approximately 0.85 m. It is overlain by SU2526 and cuts feature Cx23. Three fill layers were recorded. The lower lateral deposits (SU2532 and SU2574) contain abundant pottery attributed to the A2 phase of the Gumelnița culture. The upper central fill (SU2565) consists of compact yellowish sandy sediment with only sparse archaeological material.

Feature Cx13 (Fig. 10): an oval pit, measuring 1 m along its north–south axis and 0.55 m along the short axis, with a depth of 0.35 m from the level of identification. It is overlain by the recent colluvium layer (SU2501) and cuts an earlier abandonment level (SU2526) as well as ditch Cx24. The fill (SU2505) consists of loose, brownish-black sediment with traces of burning and charcoal in the upper part, as well as fragmentary pottery and animal bones.

Feature Cx19 (Fig. 10): an oval pit (1.12 × 0.64 m), with a depth of 0.47 m from the level of identification. It contains a homogeneous, medium-compacted brown-grey silty sediment (SU2549), with sparse inclusions of burnt daub, pottery fragments, animal bones, stones, charcoal, and pieces of unburnt yellow clay. At the base of the pit, towards the southern side, a circular depression (c. 0.20 m deeper, with a diameter of approximately 0.40 m) was identified and interpreted as a posthole imprint.

Feature Cx24 (Fig. 10): a partially excavated ditch, oriented NE–SW. It measures 0.40 m in width at the top, 0.25 m at the base, and has a depth of 0.82 m. The walls are sloping, and the base is flat, with no evidence of postholes. The fill (SU2535) consists of loose, dark grey to

black sediment containing charcoal, pottery fragments, and animal bones. It is cut by pit Cx13 and cuts feature Cx23.

Feature Cx34 (Fig. 10): a partially excavated oval pit, measuring 1.20 m in length (oriented SE–NW), 0.80 m in width, and with a maximum depth of 0.63 m. The walls curve towards the base, which is irregular in shape. The fill (SU2582) consists of weakly compacted brown-grey sediment containing burnt daub inclusions, charcoal, pottery fragments, hearth fragments, animal bones, shells, a clay disc, and a bone pendant. It is overlain by the abandonment layer SU2526 and partially cuts feature Cx23 (SU2527). In the north-eastern part, a smaller pit (Cx34A), with a diameter of 0.26 m, was identified. It contained loose fill without archaeological material and was interpreted as a posthole.

7.1.3. Early Bronze Age features (Glina culture) in SI-A

Feature Cx14 (Figs. 10; 15): a partially excavated oval pit/trench (0.75 × 0.60 m), with irregular walls, a flat base, and a depth of 1.17 m. The fill (SU2537) consists of loose, heterogeneous brown-grey silty sediment, with zonally distributed inclusions of burnt daub. It contains scattered charcoal fragments, shells, animal bones, two fragments of bone awls, and fragmentary pottery predominantly of Gumelnița culture tradition, alongside Glina culture material. The feature is overlain by a colluvial layer (SU2501) and cuts an earlier abandonment layer (SU2503).

Feature Cx29 (Fig. 10): an oval pit (1.00 × 0.70 m), with the long axis oriented north–south and a depth of 0.90 m. The fill consists of weakly compacted, brownish-black silty sediment containing animal bones, burnt daub, shells, a prismatic bone figurine, and ceramic fragments predominantly of Gumelnița culture tradition,

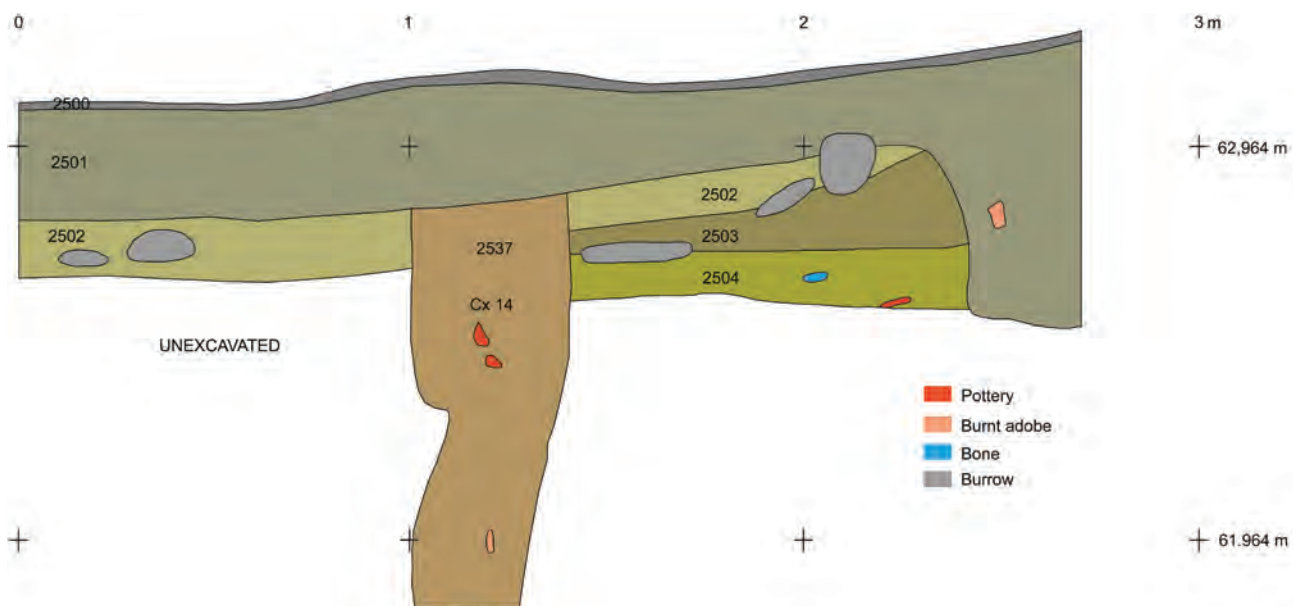


Figure 14. Section I, Area A (SI-A), partial south profile showing feature Cx14.

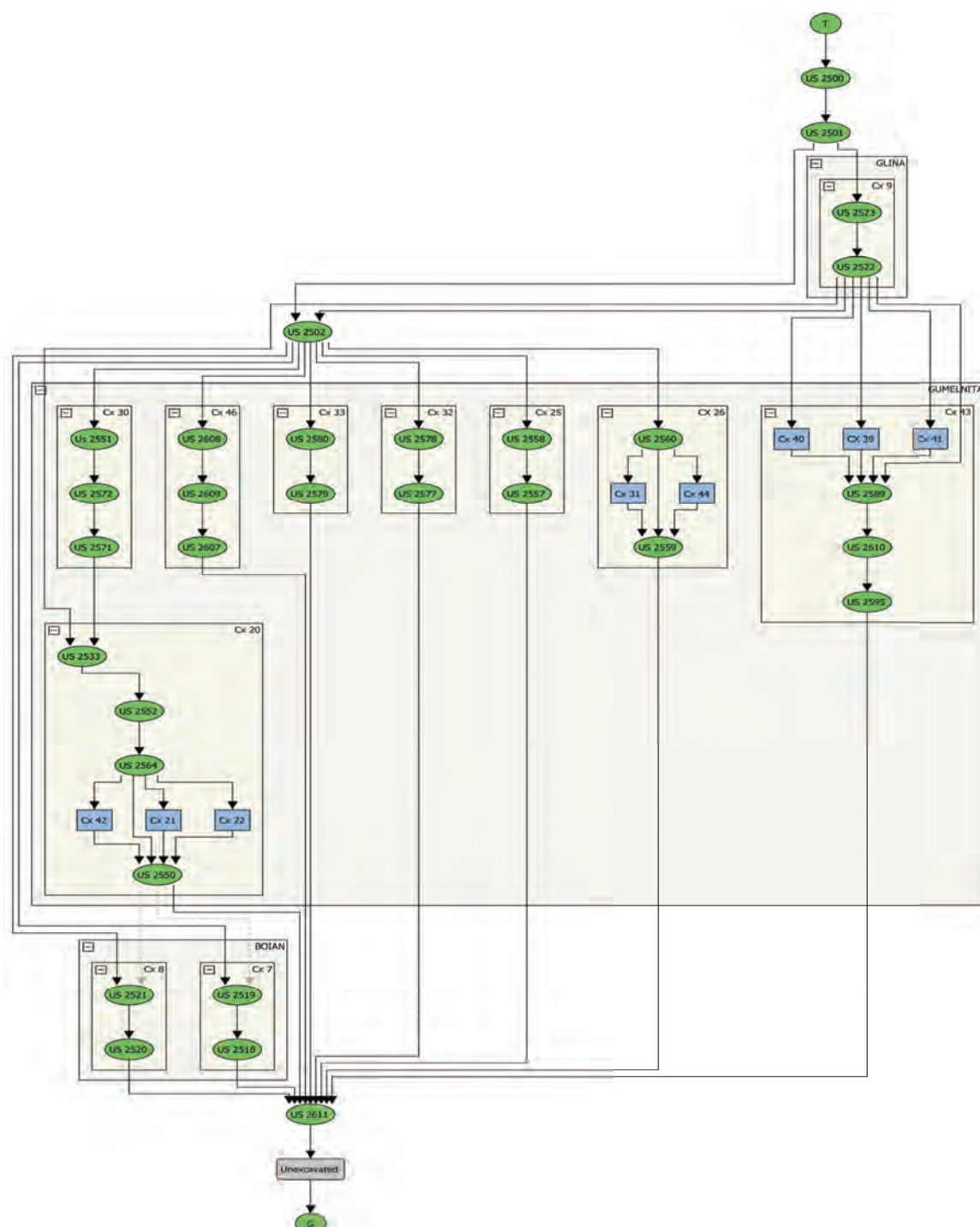


Figure 16. Stratigraphic matrix of the section S I, Area B (SI-B).

brown-grey silty sediment containing charcoal inclusions, very few ceramic fragments of Boian–Vidra tradition, animal bones, and fragments of burnt daub.

7.2.2. Middle Chalcolithic features in SI-B

Feature Cx20 (Figs. 10, 17, 18): a large pit, partially uncovered and excavated over an area of approximately

3 m², in the SE corner of SI-B. The upper part consisted of a loose greyish fill (SU2533), containing abundant fragmented materials (animal bones, ceramics of the Gumelnița culture tradition, lithics), ranging in thickness from 0.45 m in the central area to 0.05 m towards the west. Towards the base, two additional fill layers (SU2552 and SU2564), 0.10–0.20 m thick, were identified; these were compact and contained less archaeological material. In the upper

The upper layer consists of homogeneous loose brown-grey sediment, with rare ceramic fragments, animal bones, and flint flakes. The lower fill is composed of multiple lenses of yellow clay, sand, and sediment rich in ash towards the base. Within this layer, abundant ceramic fragments (Gumelnița culture), two copper fragments, complete bone tools, and bone beads were discovered.

7.2.3. Early Bronze Age features in SI-B

Feature Cx9 (Fig. 10): a circular pit with curved walls and a convex base, measuring 1.20 m in diameter at the mouth and having a maximum depth of 0.26 m. The fill (SU2523) consists of silty brown-grey sediment with abundant ash in the upper part, containing animal bones, charcoal inclusions, and scattered ceramic fragments of Glina culture tradition.

7.3. SI-C (Fig. 10, 5.3)

7.3.1. Middle Chalcolithic features in SI-C

Feature Cx15 (Fig. 10): a partially excavated hearth, with a single plaster layer (SU2539), yielding ceramics of Gumelnița culture tradition on its surface and in the surrounding area (SU2538). It was cut during the Early Bronze Age by trench Cx16 (SU2540). The preserved dimensions are 0.80 × 0.55 m, and the shape is irregular.

Feature Cx18 (Figs. 10, 19, 20): a partially excavated feature, possibly a trench, approximately 0.50 m wide. It is cut to the south by Cx36 (trench) and cuts Cx28 (pit) to the north. It contains two fill layers: the lower (SU2612), a loose grey sediment with fragmentary Gumelnița culture ceramics, lithics, and faunal remains; the upper (SU2547), a medium-compact brown-grey sediment containing lenses of unburnt clay, fragmentary Gumelnița culture ceramics, a stone grinder, and burnt daub inclusions in the upper part.

Feature Cx27 (Figs. 10, 19, 20): a partially excavated sunken feature, possibly a trench for post-setting. In the northern area, it is overlain by Cx36 and Cx38. Within

the investigated area, five postholes (Cx27A, 27F, 27G, 27H, and 27I) were identified, four of which are aligned along a NW–SE axis. The feature has two fill layers. The postholes became visible after removal of the upper fill (SU2563), consisting of brown-grey sediment with more abundant archaeological material towards the lower part. The lower fill (SU2566) is a more compact brown sediment with less archaeological materials and was only partially excavated.

Feature Cx28 (Figs. 10, 19, 20): is a pit identified in the western profile of SI-C and partially excavated. It is cut by Cx18 and has a semi-circular shape. The fill (SU2568) consists of loose grey sediment with rare inclusions of burnt clay, charcoal, and carbonate concretions. It contains Gumelnița culture ceramics, lithics, and faunal remains.

Feature Cx36 (Figs. 10, 19, 20): is a partially excavated sunken feature, possibly a trench used for post support. It overlies Cx18 to the north and Cx27 to the south. The fill (SU2588) is granular, brown-grey with grey-white areas, containing burnt clay inclusions, charcoal, and calcium carbonate. It contains fragmentary Gumelnița ceramics, lithics, and faunal remains. Within its perimeter, four postholes (Cx36B, 36C, 36D and 36E) were identified and excavated. Postholes Cx36C and Cx36D cut a rectangular pit (Cx38) in the southern half of Cx36.

7.3.2. Early Bronze Age features in SI-C

Feature Cx16 (Fig. 10): is a trench interpreted as part of a fence or defensive structure, running obliquely across SI-C along a SE–NW direction, following the north-eastern edge of the tell terrace. It was partially excavated. The upper part is affected by slope erosion, resulting in a maximum depth of 1.20 m in the southern area and only 0.40 m in the northern area. The cross-section is ogival in shape, with widths at the mouth (identification level) ranging from 0.80 m (south) to 0.40 m (north). The fill (SU2541) consists of loose black-grey silty sediment with abundant fragmented materials, including ceramics of Glina culture tradition (as well as Gumelnița culture ceramics), animal bones, hearth

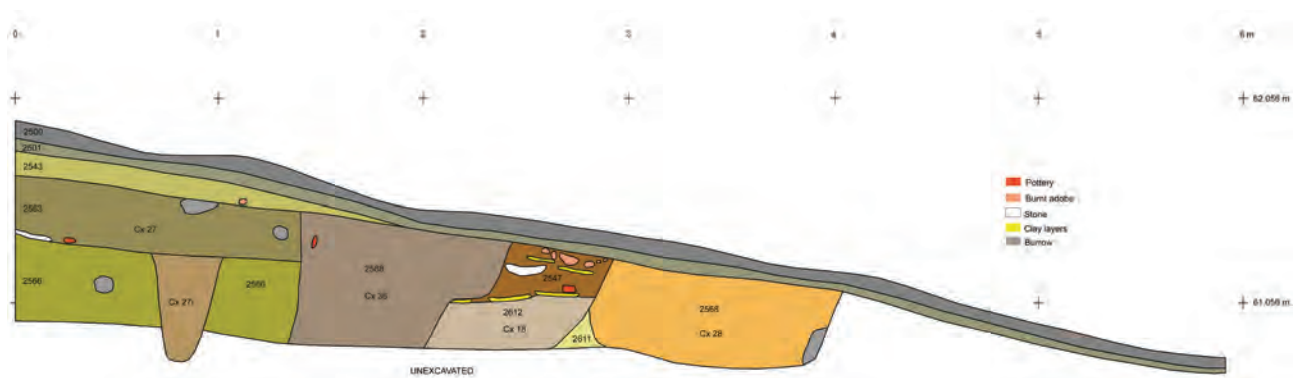


Figure 19. Section I, Area C (SI-C), west profile.

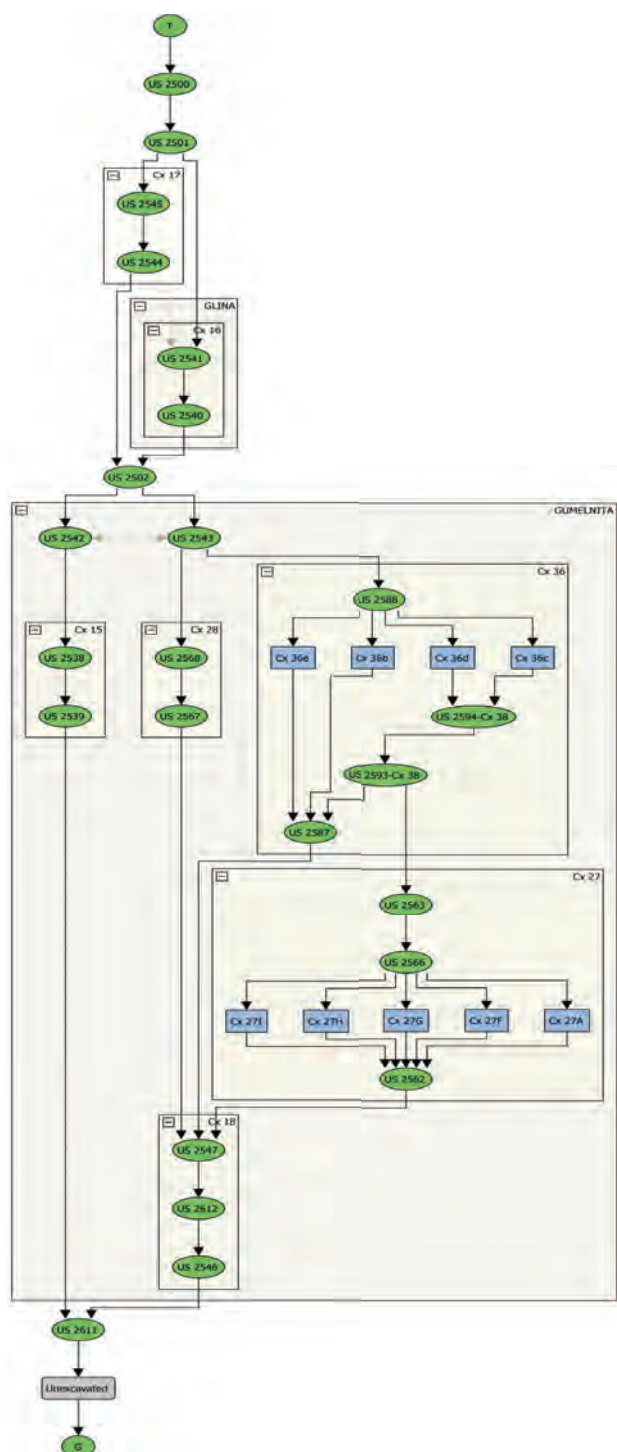


Figure 20. Stratigraphic matrix of the section S I, Area C.

fragments, charcoal, and burnt daub inclusions. At the base of Cx16, particularly in the southern sector, several postholes were identified, with diameters ranging from 0.30 to 0.50 m and depths between 0.70 and 1.20 m from the identification level of Cx16. Between these postholes, charred wooden beams were discovered along the base of the trench, arranged longitudinally in the eastern part. The trench cuts through a Chalcolithic hearth (Cx15) and extends into the eastern and northern profiles of SI-C.

7.4. Area SII (Fig. 11)

7.4.1. Middle Chalcolithic features in SII

The positioning of Section II in the central area of the tell, perpendicular to the profile of a previous archaeological trench, allowed for several preliminary stratigraphic observations, although only the upper levels, the topsoil (SU5000) and colluvial layer (SU5001) (Pl. V/3), were cleaned. The base of the anthropogenic deposits consisted of a loess layer, in which an initial human intervention was identified in the form of a sunken feature, whose fill (SU5007) contained ceramic material of Gumelnița culture tradition (see Section 9.2 for radiocarbon date). Above this feature, clay plaster layers belonging to the floors of an unburnt dwelling (SU5006) were identified, which also yielded Gumelnița culture ceramic material. At present, there is no stratigraphic evidence indicating the presence of earlier (Early Chalcolithic) occupation levels in this area. The Middle Chalcolithic anthropogenic deposits reach a thickness of approximately 2.9 m, with the most recent level (SU5005) (see Section 9.2 for radiocarbon date) being directly overlain by the first layer (SU5004) attributed to the Early Bronze Age. This stratigraphic relationship is likely due to the fact that the context that contained the Gлина culture hearth (Cx2, see below) and the layer surrounding it (SU5004) appeared to be a sunken feature, most probably a pit-house. However, this hypothesis must be verified during future fieldwork.

7.4.2. Early Bronze Age features in SII

Feature Cx2 (Fig. 11): is a hearth constructed from clay plaster (SU5003), associated with materials of the Early Bronze Age (the Gлина culture tradition). It was identified beneath a substantial layer of sediment containing abundant materials from the same period (SU5002). The feature was partially identified and excavated, displaying a semi-circular shape within SII, with a diameter of 0.85 m. The surrounding layer (SU5004), which contained fragmentary ceramics, animal bones, and lithics, was also partially investigated.

8. THE ANALYSIS OF THE ARCHAEOLOGICAL ARTIFACTS AND BIOLOGICAL REMAINS

8.1. POTTERY

Pottery analysis was conducted following the protocol outlined in Lazăr *et alii* (2017), based on a sherd-by-sherd approach and the systematic quantification of technological, typological, and functional attributes within a computerized database. Given the time-intensive nature of this methodology, the present study adopts a selective strategy. Complete assemblages of fragmentary pottery were analysed from two Boian-Vidra pits (Cx3 and Cx7) and two Gumelnița culture features (Cx4 and Cx5). For other

contexts, one attributed to the Gumelnița culture (Cx20) and four assigned to the Glina culture, only selected elements (rim sherds, bases, and representative fragments such as handles and decorated pieces) were examined. This approach was intended to identify general trends and diagnostic characteristics across the different occupational phases documented in this sector of the Glina Tell. A comprehensive analysis of the entire ceramic assemblage will be presented in a future dedicated study.

8.1.1. Early Chalcolithic pottery – Boian culture

Pottery in archaeological contexts

Two assemblages of fragmentary pottery were analysed, originating from pits Cx3 and Cx7, both attributed, on typological and decorative grounds, to the Vidra phase of the Boian culture (Pl. I). Pit Cx3 was only partially excavated, whereas Cx7 was fully investigated. The assemblages comprise 201 sherds which, following primary restoration, correspond to 131 items. The total weight is 2112 g, and the dimensional distribution of the fragments is presented in Table 1. Both assemblages are quantitatively limited and highly fragmented, consisting predominantly of body sherds smaller than 5 cm. Most fragments exhibit features such as small size, low individual weight, eroded edges, and a low refitting rate. These characteristics indicate repeated depositional processes prior to their incorporation into the analysed contexts and are consistent with secondary (domestic) refuse. Nevertheless, differences in depositional

patterning can be observed. In Cx7, the assemblage is dispersed within a homogeneous fill, whereas in Cx3, the material is concentrated in the lower part of the first fill layer and associated with a significant quantity of clay and stone beads (see Section 6.3).

Paste analysis

The paste composition of the two assemblages is broadly comparable, with differences primarily reflected in the relative proportions of ware categories, notably a higher frequency of fine ware in pit Cx7. Fine pottery accounts for 28% in Cx3 and 50% in Cx7. Semi-fine ware is predominant in Cx3 (55%) and less represented in Cx7 (33%), while coarse ware occurs in identical proportions (17%) in both assemblages. Grog constitutes the principal tempering agent in both features. Chaff-tempered sherds are rare, whereas fine wares without added temper occur more frequently (Fig. 21). Among natural inclusions, sand is most common, while pebbles occur less frequently, both often associated with dispersed vegetal matter. Carbonate inclusions are comparatively rare.

Forming techniques and constructed shapes

Where primary forming traces could be identified, the predominant technique is the use of horizontally arranged coils. Rare instances of combined techniques, such as coiling in association with superimposed slabs, were observed exclusively in pit Cx3. The distribution of

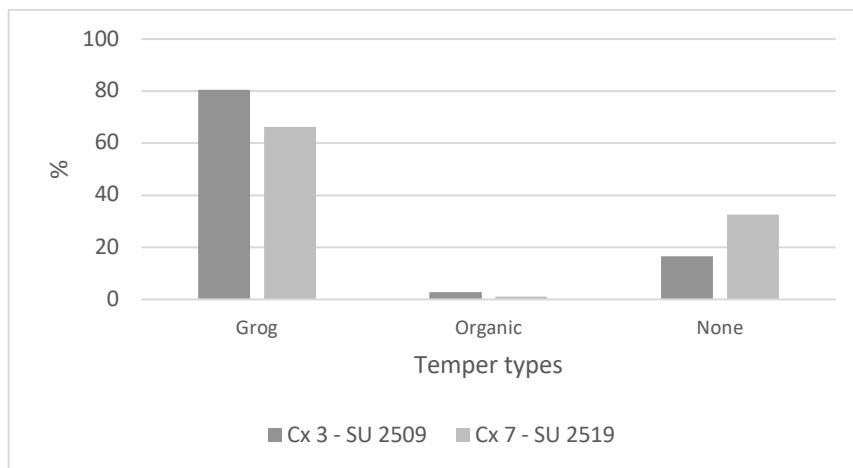


Figure 21. Percentage distribution of the temper types in the Early Chalcolithic pottery assemblages (n=201).

Surface	Feature	Stratigraphic unit	<2.5 cm	<5 cm	<7.5 cm	<10 cm	>10 cm	Total items	Total sherds	Weight (g)
SI – 2025	Cx3	2509	13	14	4	1	4	36	85	1107
	Cx7	2519	49	35	6	4	1	95	116	1005
	Total		62	49	10	5	5	131	201	2112

Table 1. Contextual distribution of the Early Chalcolithic pottery by sherd size and weight.

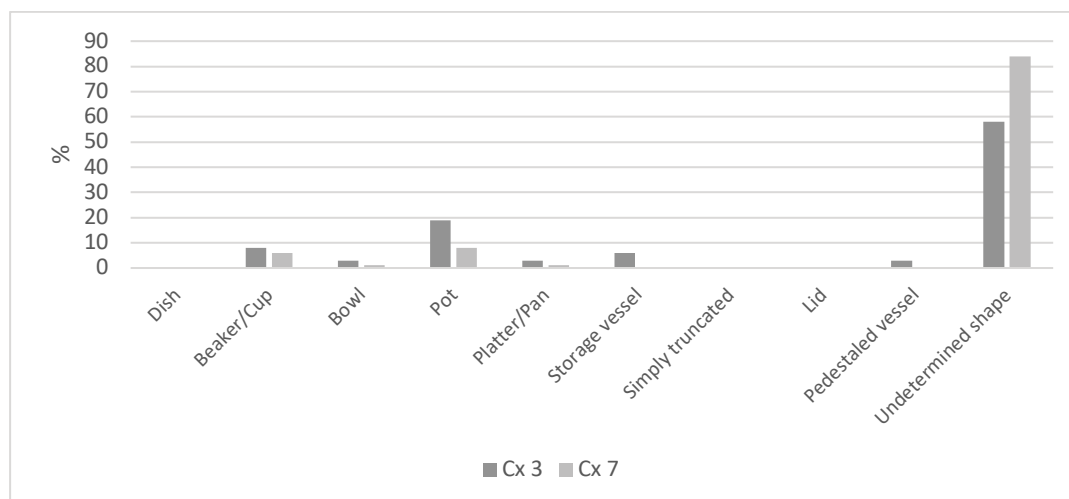


Figure 22. Relative distribution of the undetermined and identifiable Early Chalcolithic pottery shapes (n=201).

vessel shape categories is heavily conditioned by the high proportion of undetermined fragments, yet still allows for the identification of several meaningful tendencies.

Both assemblages are structurally similar in being overwhelmingly composed of undetermined fragments (Fig. 22), which limits morphological resolution. However, they differ in the degree of identifiable variability. Cx3 preserves a broader spectrum of vessel types and a clearer predominance of pots, suggesting a more representative cross-section of functional categories. Fragments attributable to storage vessels and footed vessels (Pl. I/2) were recorded only in pit Cx3. In contrast, Cx7 is more heavily skewed toward indeterminate material and displays a narrower range of identifiable forms, which may reflect differences in preservation, recovery, or depositional context rather than strictly cultural choices.

Surface treatments and decoration methods

The analysis of surface treatments highlights coherent but distinct technological profiles when external and internal finishes are considered together. Cx3 is characterised by a relatively balanced distribution of surface treatments. Externally, vessels are predominantly smoothed (c. 38%) and burnished (c. 36%), with a notable presence of irregular barbotine (c. 16%) and only marginal polishing. Internally, the assemblage shows a similar heterogeneity, with smoothing (c. 36%) remaining significant alongside polishing (c. 33%) and burnishing (c. 25%). This pattern suggests a flexible technological approach, combining medium- and high-intensity treatments, with less emphasis on achieving highly standardized or highly lustrous surfaces. Cx7, by contrast, displays a more consistent and intensive finishing strategy. Externally, burnishing is clearly dominant (c. 58%), followed by smoothing (c. 27%), while other treatments are marginal. Internally, this preference for advanced finishing is even more pronounced, with polishing (c. 46%)

and burnishing (c. 44%) overwhelmingly prevailing and smoothing reduced to a minor role. The assemblage thus reflects a systematic investment in producing well-finished, carefully treated surfaces, both inside and outside, associated with fine ware.

The distribution of decorative types (Fig. 23) indicates a shared ornamental repertoire, structured around a high proportion of undecorated vessels, but with meaningful differences in the selection and frequency of specific decorative methods. Cx3 presents a relatively diversified decorative profile. While undecorated surfaces dominate (c. 53%), a significant proportion of vessels display decoration. The most common techniques include patterned barbotine (c. 14%), impressed decoration (c. 8%) (Pl. I/6), and the combination of “*plissé* and impressed” (c. 8%) (Pl. I/4), alongside excision (c. 5%). *Plissé* (i.e. channelled) decoration alone is less frequent (c. 5%), excised motifs have similar values (c. 6%) (Pl. I/2), and incised or combined incised and painted motifs occur only sporadically (around 2–3%). Cx7, although similar in the overall dominance of undecorated surfaces (c. 52%), shows a more uneven distribution of decorative methods. *Plissé* decoration is markedly more prominent (c. 20%) (Pl. I/1), representing the principal decorative technique in this assemblage. Organized barbotine is also well represented (c. 15%), while other methods, such as impressed (c. 3%) (Pl. I/7–8), excised (c. 4%) (Pl. I/3), and incised (c. 3%) (Pl. I/5) decoration, occur at lower frequencies. The combination of *plissé* and impressed motifs, as well as incised and painted decoration, is rare or nearly absent.

Firing observations

The firing characteristics reveal both shared technological practices and significant differences in firing control and atmosphere (Fig. 24). Cx3 is dominated by incompletely oxidised fabrics (c. 44%), followed by a substantial proportion

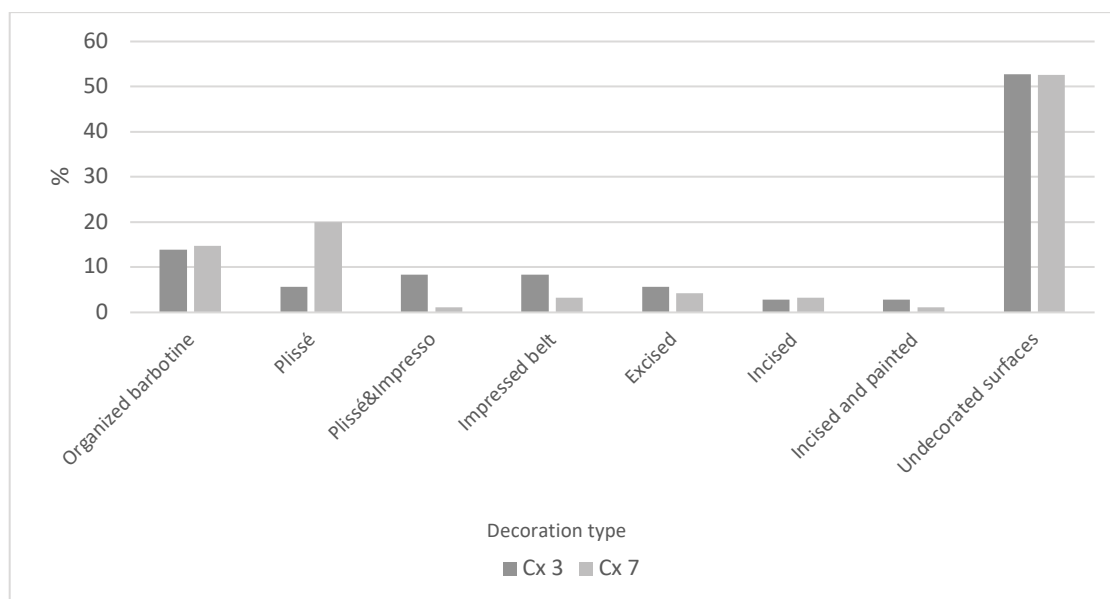


Figure 23. Distribution of decorative types in the Early Chalcolithic pottery assemblages (n=201).

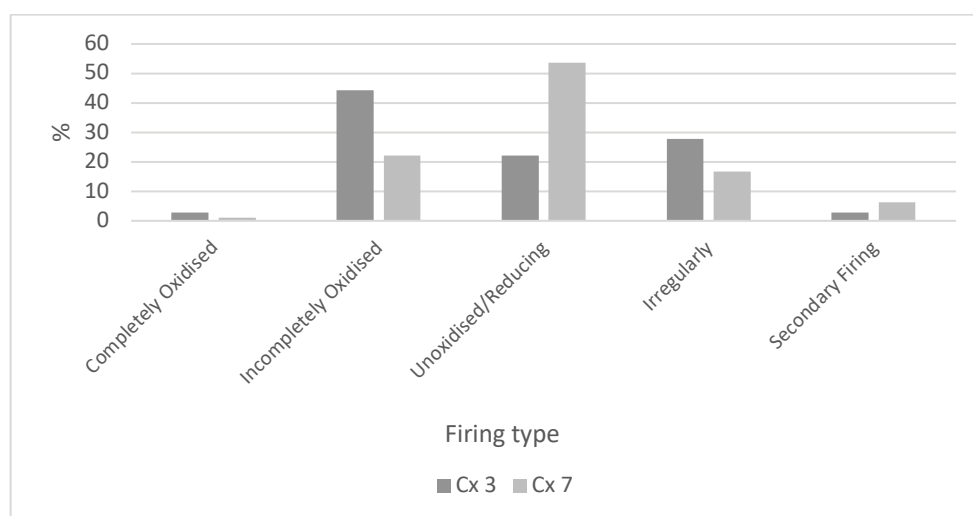


Figure 24. Comparison of firing types in the Early Chalcolithic pottery assemblages (n=201).

of irregular firings (c. 27%) and a notable presence of unoxidised/reducing conditions (c. 22%). Completely oxidised sherds are rare (c. 3%), as are cases of secondary burning (c. 3%). This distribution indicates a relatively heterogeneous firing regime, with limited control over atmosphere and temperature, resulting in variable outcomes. Cx7, in contrast, is characterised by a clear predominance of unoxidised/reducing firings (c. 54%), accompanied by lower but still significant proportions of incompletely oxidised (c. 22%) and irregular firings (c. 17%). Secondary burning is slightly more frequent (c. 6%), while completely oxidised

examples remain minimal (c. 1%). This pattern suggests a more consistent preference for reducing conditions, implying a greater degree of control or intentionality in achieving darker, reduced fabrics.

8.1.2. Middle Chalcolithic pottery – Gumelnița culture

Pottery in archaeological contexts

The analysed Middle Chalcolithic pottery assemblage from Glina Tell derives from features Cx4, Cx5, and Cx20 (Pl. II–IV), belonging to several stratigraphic units within the

Surface	Feature	Stratigraphic unit	<2.5 cm	<5 cm	<7.5 cm	<10 cm	>10 cm	Total items	Total sherds	Weight (g)
SI – 2025	Cx4	2516	59	42	15	9	7	132	210	3008
		2516 & 2511	0	0	0	2	3	5	56	696
		2511	82	65	14	7	3	172	189	2110
	Cx5	2513	69	30	17	4	3	123	139	1359
	Cx20	2533	19	112	44	15	4	194	207	6709

Table 2. Contextual distribution of the Middle Chalcolithic pottery by sherd size and weight.

2025 excavation area S I. The material comprises 801 sherds (626 items), with a total weight of 13,878 g (Tab. 2). It should be noted that the material from Cx20 was selectively analysed, with priority given to diagnostic elements, particularly rim sherds, while the remaining assemblage is still under study and will be published separately. This introduces a degree of bias in the quantitative and morphological representation of this context.

From a dimensional perspective, the assemblage is dominated by small- and medium-sized fragments, especially in the <2.5 cm and <5 cm categories, indicating a high degree of fragmentation. Larger fragments are less frequent but better represented in Cx20, likely reflecting both preservation conditions and the selective recovery of diagnostic pieces. The average weight per sherd varies between contexts, further reflecting differences in preservation and sampling strategy. Eroded margins and carbonate deposits are common across all contexts, particularly in Cx4 and Cx20, indicating prolonged exposure to post-depositional processes. The distribution of vessel parts confirms the impact of these factors. While body sherds dominate in Cx4 and Cx5, Cx20 shows a markedly higher proportion of rim fragments, reflecting the selective analytical strategy rather than the original composition of the assemblage.

Overall, the Middle Chalcolithic pottery is highly fragmented and affected by secondary depositional processes, most likely related to domestic refuse. At the same time, the selective nature of the analysed material from Cx20 must be taken into account in any comparative or quantitative interpretation, pending the full publication of the assemblage.

Paste analysis

The paste composition is broadly homogeneous across the analysed contexts (Cx4, Cx5, and Cx20), with only moderate variations in the relative proportions of fabric categories. In all three contexts, fine and semi-fine wares dominate the assemblage, each representing roughly comparable proportions (generally between c. 40–55%). Semi-fine fabrics are slightly more prevalent in Cx4, while Cx5 and Cx20 show a more balanced distribution between fine and semi-fine categories. Coarse wares are consistently

rare, accounting for less than 10% in all contexts, indicating a clear preference for better-prepared pastes.

From the perspective of tempering practices, grog is overwhelmingly dominant (Fig. 25), reaching particularly high values in Cx20, while remaining very frequent in Cx4 and Cx5 (c. 75–80%). Sherds without added temper are present in all contexts but in significantly lower proportions (c. 5–20%), while organic temper is extremely rare. This pattern points to a strong technological standardization in paste preparation, with grog representing the principal tempering agent.

The analysis of natural or accidental inclusions reveals a more diversified picture. Fine sand is consistently well represented across all contexts (c. 20%), often associated with organic debris or limestone fragments. Organic inclusions display notable variability, being particularly frequent in Cx5 and Cx20, while less represented in Cx4. Limestone and mixed inclusions (*e.g.*, sand and limestone, limestone with organic matter) occur regularly but in moderate proportions, suggesting the use of clay sources with heterogeneous mineral content. Coarser components such as rare pebbles are present but remain marginal.

The paste composition indicates a relatively standardized technological framework, characterised by the systematic use of grog temper and a preference for fine and semi-fine fabrics. At the same time, the variability observed in natural inclusions reflects differences in raw material procurement and clay preparation, likely conditioned by local resource availability rather than strict technological choices.

Forming techniques and constructed shapes

The analysis of primary forming techniques is significantly constrained by the high proportion of undiagnostic fragments. Consequently, the category of indeterminate forming techniques dominates across all contexts, particularly in Cx5 and Cx20 (reaching c. 80–85%), and remains substantial even in Cx4 (c. 75%). Where diagnostic traces are present, coiling appears as the principal forming method, accounting for c. 10–25% of the assemblage depending on context, with slightly higher values in Cx20. Other techniques, such as coiling combined with slabbing, hand modelling, or moulding, are only sporadically attested. This pattern suggests that coiling was the

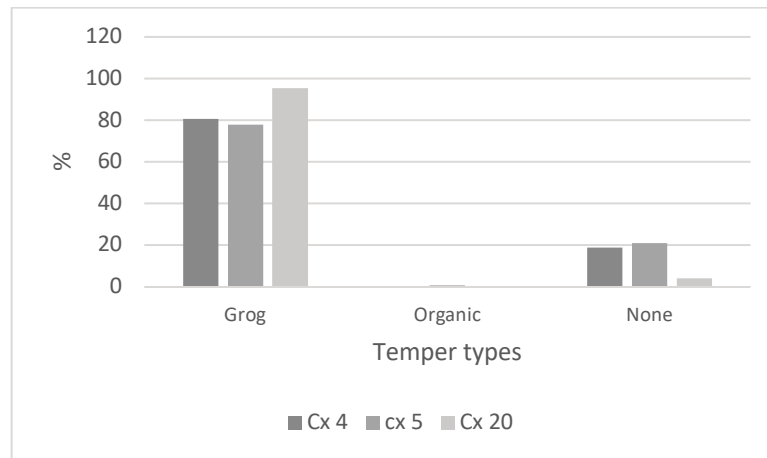


Figure 25. Percentage distribution of temper types in the Middle Chalcolithic pottery assemblages (n=626).

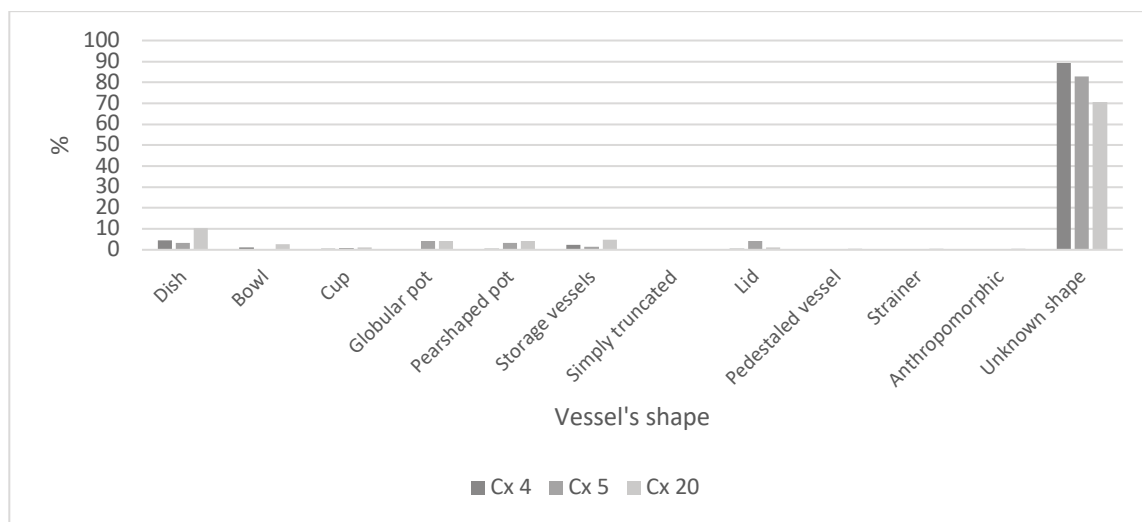


Figure 26. Relative distribution of indeterminate and identifiable Middle Chalcolithic pottery shapes (n=626).

dominant forming technique, although its visibility is limited by fragmentation and preservation conditions.

The distribution of general vessel shapes is likewise heavily affected by the high proportion of undetermined fragments, which represent between c. 60% (Cx20) and nearly 90% (Cx4). Among the identifiable forms, open and closed shapes are relatively balanced, with a slight predominance of open forms in Cx20 and a more even distribution in Cx4 and Cx5.

A more detailed typological breakdown confirms this pattern (Fig. 26). Undetermined shapes overwhelmingly dominate in all contexts (c. 70–90%), limiting morphological resolution. Among identifiable vessel types, dishes (Pl. II/1–4; Pl. IV/1–2, 10–12) and globular (Pl. III/3; Pl. IV/9, 17) or pear-shaped (Pl. III/5; Pl. IV/5–8, 13–14, 16) pots are the most consistently represented categories, followed

by bitruncated storage vessels (Pl. III/1, 4, 6, 8; Pl. IV/4, 15) in moderate proportions, particularly in Cx20. Bowls (Pl. II/5; III/2), cups (Pl. III/11), and lids (Pl. IV/3) occur sporadically, while specialized forms such as pedestaled vessels, strainers, or anthropomorphic pieces are rare or isolated occurrences.

Surface treatments and decoration methods

The analysis of surface treatments in the Middle Chalcolithic assemblage reveals both shared technological patterns and notable differences between contexts. Externally, finishing techniques vary considerably. In Cx4, burnishing (c. 34%) and polishing (c. 29%) are well represented alongside smoothing (c. 27%), indicating a relatively balanced distribution of medium- and high-intensity treatments. In Cx5, smoothing becomes

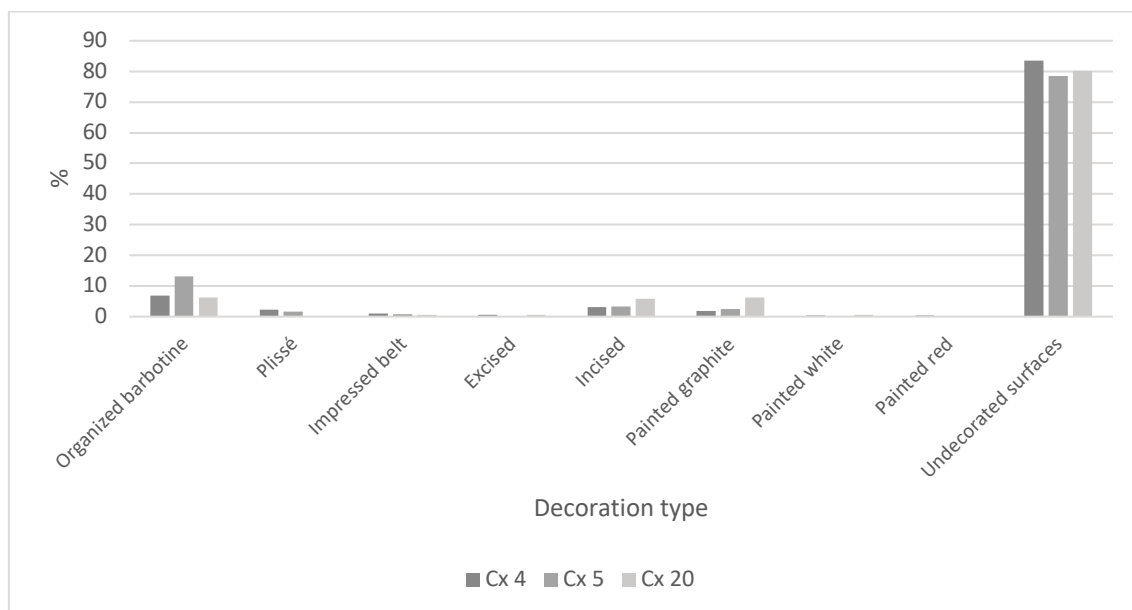


Figure 27. Distribution of decorative types and undecorated sherds from Middle Chalcolithic pottery assemblage (n=626).

the dominant technique (c. 36%), followed by burnishing (c. 28%) and polishing (c. 18%), suggesting a preference for more moderate surface preparation. By contrast, Cx20 is strongly dominated by burnishing (c. 58%), with significantly lower frequencies of smoothing and polishing, reflecting a more standardized and intensive finishing strategy. Other treatments, such as scraping and unorganized barbotine, occur only sporadically across all contexts.

Internally, the assemblage shows a more coherent pattern. Polishing and burnishing dominate in all contexts, with polishing particularly prominent in Cx4 and Cx5 (c. 40–45%), while burnishing reaches its highest values in Cx20 (c. 50%). Smoothing is less frequent internally, especially in Cx4, and scraping is negligible. This distribution suggests a general emphasis on well-finished interior surfaces, likely related to vessel functionality.

The correspondence between external and internal treatments varies by context. Cx20 displays a consistent preference for burnished surfaces both externally and internally, indicating a more standardized technological approach. In contrast, Cx4 and Cx5 exhibit greater variability, combining multiple finishing techniques within the same assemblage.

The distribution of decorative types (Fig. 27) is dominated by undecorated surfaces, which account for c. 80–82% of the combined assemblage. Among the decorated material, organized barbotine represents the most frequent technique (c. 6–13%, depending on context) (Pl. IV/8–9, 13–14, 16), followed by incised decoration (generally c. 3–6%) and painted graphite motifs (c. 2–6%). Other techniques, such as *plissé*, impressed bands, excision, and painted decoration in white or red, occur only sporadically and remain quantitatively insignificant.

At the contextual level, Cx4 and Cx5 display similar technological and decorative profiles, with a balanced use of surface treatments and a shared repertoire that includes organized barbotine, incised motifs, and the presence of *plissé* decoration. Cx20, by contrast, is characterised by a more standardized finishing strategy, dominated by burnishing, and by a different decorative profile. The absence of *plissé* and the higher frequency of graphite-painted motifs distinguish this assemblage from the others. These differences may have chronological significance, suggesting that Cx20 belongs to a later stage within phase A2 of the Gumelnița culture, while Cx4 and Cx5 reflect an earlier horizon within the Middle Chalcolithic occupation.

Firing characteristics

In all three features, incompletely oxidised and unoxidised/reducing fabrics dominate (Fig. 28), indicating a general reliance on low- to moderately controlled firing conditions. In Cx4, incompletely oxidised (c. 35%) and reducing fabrics (c. 40%) are relatively balanced, suggesting variable firing atmospheres. Cx5 shows a similar structure, although with a slightly higher proportion of irregular firings (c. 19%), pointing to less stable firing conditions. Cx20, by contrast, is strongly dominated by reducing conditions (over 50%), accompanied by a lower proportion of incompletely oxidised fabrics (c. 24%). This pattern indicates a more consistent preference for reducing atmospheres and, implicitly, a greater degree of control over the firing process. Completely oxidised ceramics are rare in all contexts (generally below 10%), while secondary burning is present in moderate proportions, particularly in Cx4.

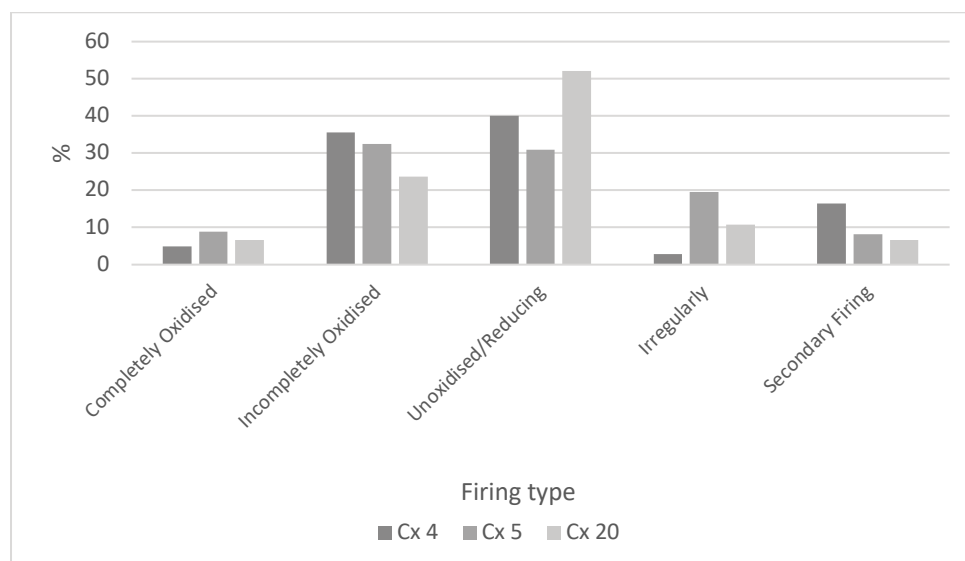


Figure 28. Comparison of firing types in the Middle Chalcolithic pottery assemblage (n=626).

8.1.3. Early Bronze Age pottery – Glina culture

Pottery in archaeological contexts

From the Early Bronze Age pottery assemblages (Pl. V–VIII), a total of 128 sherds (126 items) were selected for analysis in this study, with a cumulative weight of 5635 g (Tab. 3). The assemblage consists predominantly of rim sherds (c. 58%), followed by body sherds (c. 36%), while bases and handles are less frequent (c. 16% each). The assemblage is heavily dominated by material from feature Cx16, which alone accounts for 107 sherds (over 83% of the total) and 5001 g (c. 89% of the total weight), indicating a highly uneven contextual distribution.

In terms of dimensional classes, the assemblage is primarily composed of medium-sized fragments, with the <5 cm (n=57) and <7.5 cm (n=40) categories being the most frequent. Larger fragments are also relatively well represented, particularly in Cx16, where sherds exceeding 7.5 cm (n=26, combining the <10 cm and >10 cm categories) suggest better preservation conditions or reduced post-depositional fragmentation compared to other contexts.

Overall, the dataset points to a strongly skewed distribution pattern, with Cx16 representing the principal depositional context for Early Bronze Age pottery within the investigated area, while the other features provide only supplementary and highly fragmented material. Given this distribution, the following *chaîne opératoire* approach considers the Early Bronze Age pottery assemblage as a single analytical unit.

Paste analysis

The paste composition of the Early Bronze Age pottery assemblage is characterised by a clear predominance of grog-tempered fabrics (Fig. 29), which account for approximately 53% of the analysed sherds. A substantial proportion of vessels (c. 41%) lack intentionally added temper, suggesting either the use of naturally suitable clays or a deliberate technological choice favouring untempered fine pastes. Minor categories include mixed temper recipes, such as grog combined with shell (c. 4%), and the sporadic use of mineral inclusions such as sand or small pebbles (c. 2%). Organic temper is virtually absent.

Surface	Feature	Stratigraphic unit	<2.5 cm	<5 cm	<7.5 cm	<10 cm	>10 cm	Total items	Total sherds	Weight (g)
SI – 2025	Cx9	2523	0	6	2	1	0	9	10	270
	Cx14	2537	0	3	3	0	0	6	6	96
	Cx16	2541	1	45	34	16	10	106	107	5001
	Cx29	2570	0	3	1	1	0	5	5	268
	Total		1	57	40	18	10	126	128	5635

Table 3. Contextual distribution of the Early Bronze Age pottery by sherd size and weight.

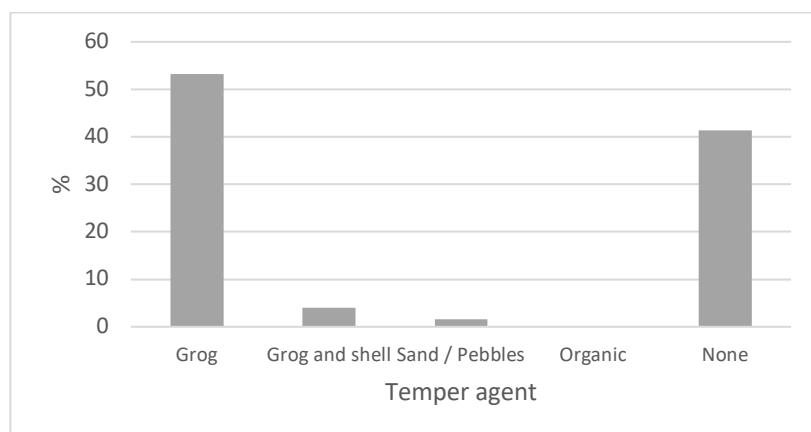


Figure 29. Percentage distribution of temper types in the Early Bronze Age pottery assemblage (n=126).

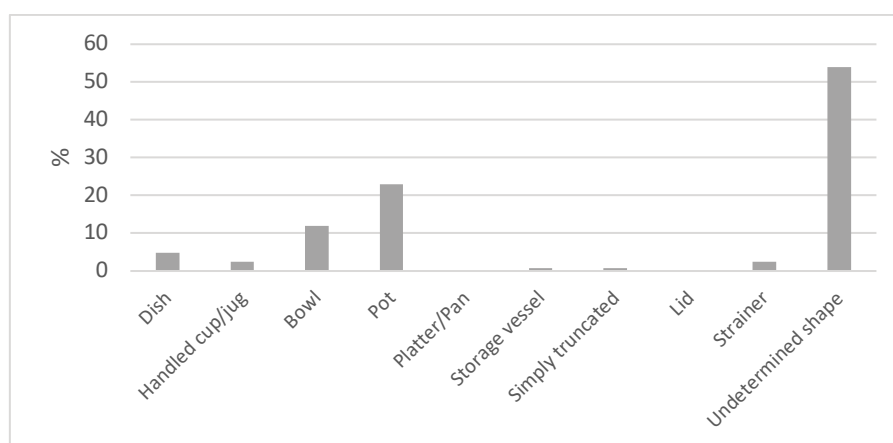


Figure 30. Relative distribution of undetermined and identifiable Early Bronze Age pottery shapes (n=126).

The analysis of natural or accidental inclusions reveals a strong dominance of coarse mineral components, particularly pebbles and sand, which together account for approximately 60% of the observed inclusions. Fine sand is also well represented (c. 31%), while combinations involving organic matter or limestone occur only sporadically (generally below 5%). The near absence of purely organic inclusions further reinforces the mineral character of the raw materials employed.

Forming techniques and constructed shapes

The analysis of primary forming techniques indicates an overwhelming dominance of coiling, which accounts for approximately 85% of the assemblage. This confirms the central role of coiling as the principal forming method in the Early Bronze Age pottery. A smaller proportion of fragments (c. 15%) could not be assigned to a specific forming technique due to the absence of diagnostic traces. Other manufacturing techniques, such as slabbing, hand modelling, or moulding, are absent or not securely attested in the analysed material.

The distribution of general vessel shapes is strongly affected by the high proportion of undetermined fragments, which represent nearly half of the assemblage (c. 47%). Among the identifiable forms, closed shapes (c. 23%) slightly outnumber open forms (c. 25%). This pattern suggests a slight predominance of restricted vessels, although the high degree of fragmentation limits detailed functional interpretation.

A more detailed typological breakdown further illustrates the structural composition of the assemblage (Fig. 30). Indetermined shapes constitute the largest category (c. 54%), followed by hole-mouth or necked pots (c. 23%) (Pl. V/1–3, 5, 7, 9–11; Pl. VI/2–9, 14–17; Pl. VII/1–5, 7–9; Pl. VIII/14–15, 17–20, 26–30) and bowls (c. 12%) (Pl. V/4, 12–13; Pl. VI/13; Pl. VII/6, 12). Other vessel types, including dishes (c. 5%) (Pl. VII/11, 14–15), handled cups/jugs (c. 2%) (Pl. V/14; VII/12, 16; Pl. VIII/1–11, 13), strainers (c. 2%) (Pl. VIII/12), and storage vessels (Pl. VI/1, 10–11) or simply truncated forms (Pl. VIII/21, 24) (each below 1–2%), are only marginally represented. Platters/pans and lids are absent.

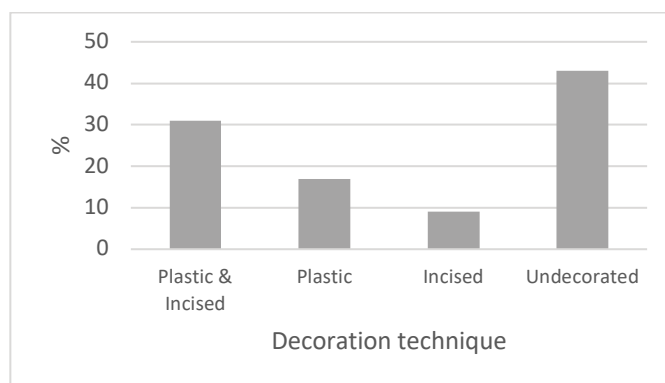


Figure 31. Distribution of decorative elements and undecorated sherds from Early Bronze Age pottery assemblages (n=126).

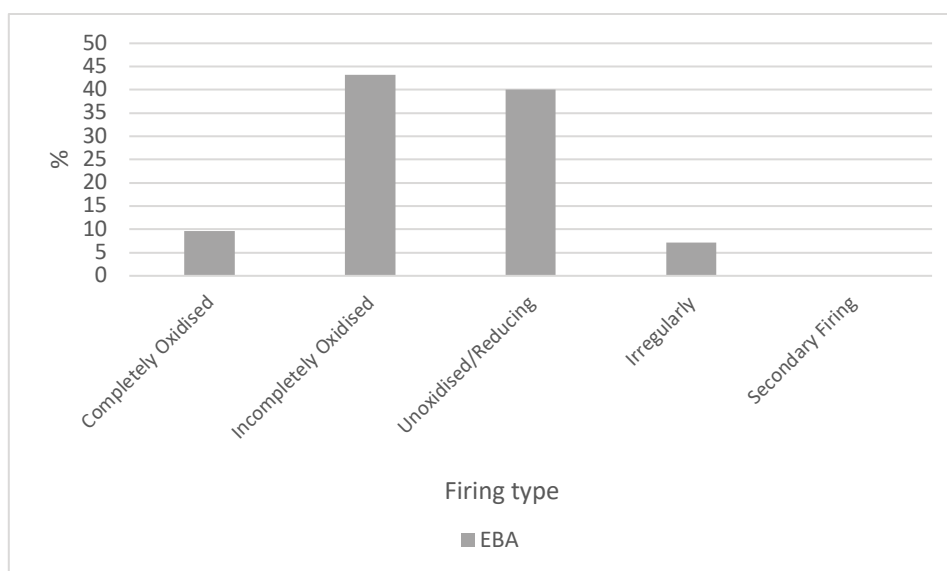


Figure 32. Comparison of firing types in the Early Bronze Age pottery assemblage (n=126).

Surface treatments and decoration methods

The analysis of surface treatments indicates a clear predominance of smoothing as the principal finishing technique, both externally (c. 68%) and internally (c. 69%). This suggests a consistent preference for medium-intensity surface preparation, resulting in relatively uniform vessel surfaces. Polishing (c. 14–15%) and burnishing (c. 10–12%) are also well represented, indicating a secondary level of investment in achieving more compact and lustrous finishes. Other treatments, such as scraping (c. 2–4%) and irregular barbotine (c. 2%), occur only sporadically, while untreated or indeterminate surfaces are negligible.

The distribution of decorative techniques (Fig. 31) reveals a predominance of undecorated vessels, which account for approximately 43% of the assemblage. Among the decorated material, plastic and combined plastic-incised ornamentation are most common (Pl. V–VIII).

Vessels featuring both plastic and incised elements represent c. 31%, while exclusively plastic decoration accounts for c. 17%, and purely incised motifs are comparatively rare (c. 9%).

A more detailed analysis of decorative elements shows that impressed buttons (c. 21%) and handles or knobs (c. 17%) are the most frequent features, followed by impressed geometrical patterns (c. 14%) and impressed belts (c. 8%). More complex combinations, such as impressed bands associated with incisions, are uncommon (c. 3%). The assemblage is characterised by a relatively restrained decorative system, dominated by undecorated surfaces and supplemented by a limited range of plastic and impressed techniques. This pattern suggests a functional orientation of the pottery, with decoration playing a secondary and selectively applied role within the broader technological framework.

Firing characteristics

The firing regime of the Early Bronze Age pottery assemblage is dominated by incompletely oxidised (c. 43%) and unoxidised/reducing fabrics (c. 40%), which together account for the vast majority of the material (Fig. 32). Completely oxidised sherds are relatively limited (c. 10%), suggesting that fully oxidising atmospheres were only occasionally attained. Irregular firings account for a smaller proportion of the assemblage (c. 7%), reflecting fluctuations in firing conditions, such as uneven temperature or oxygen supply during the firing process. No clear evidence of secondary burning has been identified.

8.1.4. Discussion on prehistoric pottery from Glina Tell

The Early Chalcolithic pottery from Glina Tell represents the first documented occurrence of this assemblage type in the Bucharest area (Nestor 1928) and can be attributed to the Vidra phase of the Boian culture. Earlier studies (Nestor 1928; 1933; Petrescu-Dîmbovița 1944) provided only general qualitative observations, based on material lacking secure archaeological contexts and without quantitative evaluation. The newly analysed assemblages derive from two small pits. Their dimensional indices, high degree of fragmentation, and erosion patterns indicate multiple depositional episodes prior to their incorporation into the recorded contexts, suggesting a secondary domestic refuse. At a regional scale, the assemblages can be assigned to a late phase of the Vidra phase, the only technological feature with potential chronological relevance being the low proportion of vegetal temper. Comparative analysis with Boian–Vidra assemblages from Berceni – *Sit 12*, Gumelnița Terrace, and Sultana (Opriș *et alii* 2017; 2023; Lazăr *et alii* 2020) indicates a broadly conservative pattern of production at the regional level, reflected in vessel forms, decorative practices, and technological choices within the *chaîne opératoire*.

The analysed Middle Chalcolithic pottery comes from features Cx4, Cx5, and Cx20 and can be attributed to the Gumelnița culture. The assemblages are characterised by a high degree of fragmentation, frequent eroded edges, and carbonate deposits, indicating secondary deposition processes, probably related to domestic refuse. Cx4 and Cx5 display similar technological and decorative profiles, while Cx20 differs both in its quantitative dominance and its selective composition, which affects its representativeness. Paste preparation is relatively standardized, with a clear predominance of grog temper and fine to semi-fine fabrics. Forming techniques are dominated by coiling, and the assemblage is largely composed of utilitarian forms, although morphological resolution is limited by fragmentation. Surface treatments combine smoothing, polishing, and burnishing, with a stronger emphasis on burnishing in Cx20. Decorative practices are generally restrained, with undecorated vessels prevailing and decoration mainly consisting of barbotine, incised motifs, and occasional graphite painting. The presence of *plissé*

in Cx4 and Cx5, its absence in Cx20, and the higher frequency of graphite painting in this latter context suggest a chronological distinction, with Cx20 belonging to a later stage within phase A2 (Voinea 2005), or even the early stage of phase B1 (Ignat 2018). Firing regimes are dominated by incompletely oxidised and reducing conditions, indicating moderate control over firing processes. Generally, the assemblage reflects a coherent technological tradition with limited variability.

The Early Bronze Age pottery derives from several features (Cx9, Cx14, Cx16, and Cx29), forming an assemblage strongly dominated by material from Cx16. As in the earlier assemblages, fragmentation patterns indicate secondary deposition, most likely of domestic origin. Technologically, the assemblage is characterised by a predominance of grog-tempered fabrics alongside a significant proportion of untempered wares, pointing to a flexible approach to paste preparation and the use of locally sandy clay resources. Forming techniques are overwhelmingly dominated by coiling. Morphologically, the assemblage is dominated by utilitarian forms, particularly pots and bowls, with a slight prevalence of closed shapes. Surface treatment is relatively standardized, with smoothing as the dominant technique on both vessel surfaces, complemented by limited polishing and burnishing. Decorative practices are restrained, with undecorated vessels prevailing and decoration mainly consisting of plastic and impressed/incised elements, a common feature of the Glina culture pottery (Băjenaru 2014, p. 177). The firing regime is dominated by incompletely oxidised and reducing conditions, suggesting moderate control over firing processes. Overall, the Early Bronze Age pottery reflects a coherent and functionally oriented technological tradition, consistent with domestic production within a stable *chaîne opératoire*.

8.2. OSSEOUS INDUSTRY

The analysed archaeological assemblage comprises 67 pieces processed from bone (n=45), antler (n=2), bivalve shell (n=14), and tortoise carapace (n=4) (Tab. 4, 5). Five pieces originate from contexts attributed to the Boian culture, 48 pieces from Gumelnița contexts, six pieces from Glina contexts, and eight pieces from mixed levels.

8.2.1. Early Chalcolithic – Boian Culture

Bone. Two pointed tools, a small bevelled tool, and an artifact of undetermined function were created from bone. Different transformation schemes were applied to both pointed tools. In the case of the first specimen, although it is a mesial fragment (Fig. 33/a), it can be stated that a flat blank, obtained through quadripartition, was used. The longitudinal debitage procedures involved grooving, identifiable by several specific striations present on the inferior side. The entire surface was rigorously shaped by abrasion. The second pointed tool (Fig. 33/b) was processed from a fibula, preserving the anatomical

Raw material		Bone							Antler	
Processing stage		Finished Piece			Preform			Finished Piece		
Typological category		Pointed tool	Bevelled tool	Spatula	Abraded astragalus	Figurine	Undetermined	Perforated plate	Figurine	Undetermined
S1A	-	SU2500	1							
	-	SU2501	1							1
	Cx3	SU2509	1							1
	Cx4	SU2516	1							
	Cx5	SU2513	2				1			
	Cx6	SU2515	1				1	1		
	-	SU2526								
		SU2532	1							
	Cx12	SU2565		2			1			
		SU2574								
S1B	Cx14	SU2537	2							
	Cx23	SU2527	1							
	Cx24	SU2535		1						
	Cx29	SU2570					1			
	-	SU2500		1						
	Cx9	SU2523	1			1				
		SU2533	1	1	2			1		
	Cx20	SU2552	1	1						
		SU2564	1	1						
	Cx26	SU2560	1							
S1C	Cx46	SU2609	2	1						
	-	SU2500				1				
	-	SU2501							1	
	Cx16	SU2541	3	1						
	Cx27	SU2566		1					1	
				3						
	Mixed	-		17	3	2	1	4	1	2
TOTAL										

Table 4. Artifacts made of bone and antler, distributed according to archaeological contexts (Cx3, Cx6, Cx23 – Boian culture; Cx4, Cx5, Cx12, Cx20, Cx24, Cx26, Cx27, Cx46 – Gumelnița culture; Cx9, Cx14, Cx16, Cx29 – Glina culture). Bone artefacts from features Cx14 and Cx29 were manufactured according to Gumelnița technological traditions but were recovered as residual material in pits dated to the Glina culture period.

Raw material	Processing stage	Typological category	SIA			SIB		SIC					TOTAL
			Cx12	Cx19	-	Cx20		Cx18		Cx27	Cx28	-	
			SU2574	SU2549	SU2526	SU 2533	SU2564	SU2546	SU2547	SU2566	SU2568	SU2543	
Shell	Finished piece	Scraper	2	1	1	3	1	1	1	2	1	1	14
Tortoise shell	Finished piece	Container	2		1		1						4

Table 5. Tools made from bivalve shells and tortoise carapace, distributed according to archaeological contexts (all contexts belong to the Gumelnița culture).

volume of the bone. Technologically, interventions occurred only at the distal level, where scraping was applied around the circumference (Fig. 33/c) to prepare a sharp active end. This exhibits specific use-wear marks, consisting of a modification of the initial morphology from a pointed to a rounded shape, macroscopic polish, and fine transverse striations (Fig. 33/d). It has a length of 51 mm, a width of 16 mm, and a thickness of 8 mm.

The small bevelled tool (Fig. 33/e) preserves the anatomical volume of the bone. At the proximal level, the segmentation of the epiphysis occurred through percussion. The debitage edge was not shaped. The active end was also prepared by percussion (Fig. 33/g). A part of the percussion edge was prepared by abrasion (Fig. 33/f), which extends onto the superior side. The active end is affected by use-wear, characterised by a significant loss of material (Fig. 33/h), which created a denticulated morphology. At this level, the abrasion marks were eliminated, and the surface acquired macroscopic polish and functional longitudinal striations (Fig. 33/i). The length of the artifact is 90 mm, the maximum width is 18.4 mm, and the maximum thickness is 12 mm.

Two rib fragments (Fig. 33/j) most likely originate from a single artifact. The fragments preserve technological marks useful for reconstructing the employed procedures. A flat blank was used, obtained through a longitudinal bipartition procedure involving grooving, the marks of which are visible on both the mesial fragment (Fig. 33/k) and one of the edges of the proximal fragment (Fig. 33/l). Other technological marks appear on this latter fragment: the superior side was regularized by longitudinal scraping, which is covered by abrasion at the proximal end (Fig. 33/m).

Antler. A proximal fragment, strongly affected by taphonomic processes, originates from a red deer antler beam (Fig. 33/n). We cannot reconstruct the morphology of the artifact and, implicitly, we do not know to which typological category it belonged. The blank is in volume, the beam having been segmented by percussion applied around the entire circumference. The artifact is functionally broken at the level of a biconical perforation, obtained through bifacially applied rotation.

8.2.2. Middle Chalcolithic – Gumelnița culture

Bone. The category of pointed tools is represented by ten specimens that underwent varied processing schemes. In the case of blanks preserving the anatomical volume, the active end was created through a percussion blow. On one specimen (Fig. 34/a), the debitage edges remained largely in a raw state. Only at the distal level was abrasion applied around the circumference to form the pointed end. This is heavily rounded (Fig. 34/b), with flattened areas and longitudinal functional striations (Fig. 34/c). The artifact has a length of 77 mm, a width of 20 mm, and a thickness of 21 mm. Conversely, at another artifact (Fig. 34/d), a large part of the debitage edge was shaped through abrasion. Abrasion (Fig. 34/f) was also applied at the distal level around the entire circumference. The tip is blunted, exhibiting a modification of the initial volume and the disappearance of technological traces (Fig. 34/e). Its length is 80.4 mm, width 39.4 mm, and thickness 22 mm.

To obtain flat blanks (Fig. 34/g), a longitudinal bipartition procedure utilizing double grooving was applied (Fig. 34/h). The debitage edges were not entirely shaped. Only at the distal level was abrasion applied on the edges and on both sides (Fig. 34/i) to form the sharp active end. The tip exhibits heavy use-wear, being rounded, with polish and longitudinal striations (Fig. 34/j–k). The morphometric data are as follows: length – 82 mm, width – 15 mm, thickness – 11.2 mm. Division by percussion was applied to another specimen (Fig. 34/l). A portion of the surface of the debitage edges was regularized through diffuse percussion (Fig. 34/m). Only at the distal level is abrasion present around the entire circumference. The end shows a radical modification of the initial volume, being blunted, with the development of macroscopic polish (Fig. 34/n). The piece measures 73 mm in length, 14 mm in width, and 11 mm in thickness.

Another longitudinal debitage variant consisted of fracturing the bone by percussion (Fig. 35/c) into multiple splinters. One such splinter (Fig. 35/a) from the diaphyseal wall was used to make a pointed tool, currently fractured proximally. A large part of the debitage edges surface remained unshaped. Abrasion was applied to the edges (Fig. 35/b), as well as to both sides, only at the distal level. The

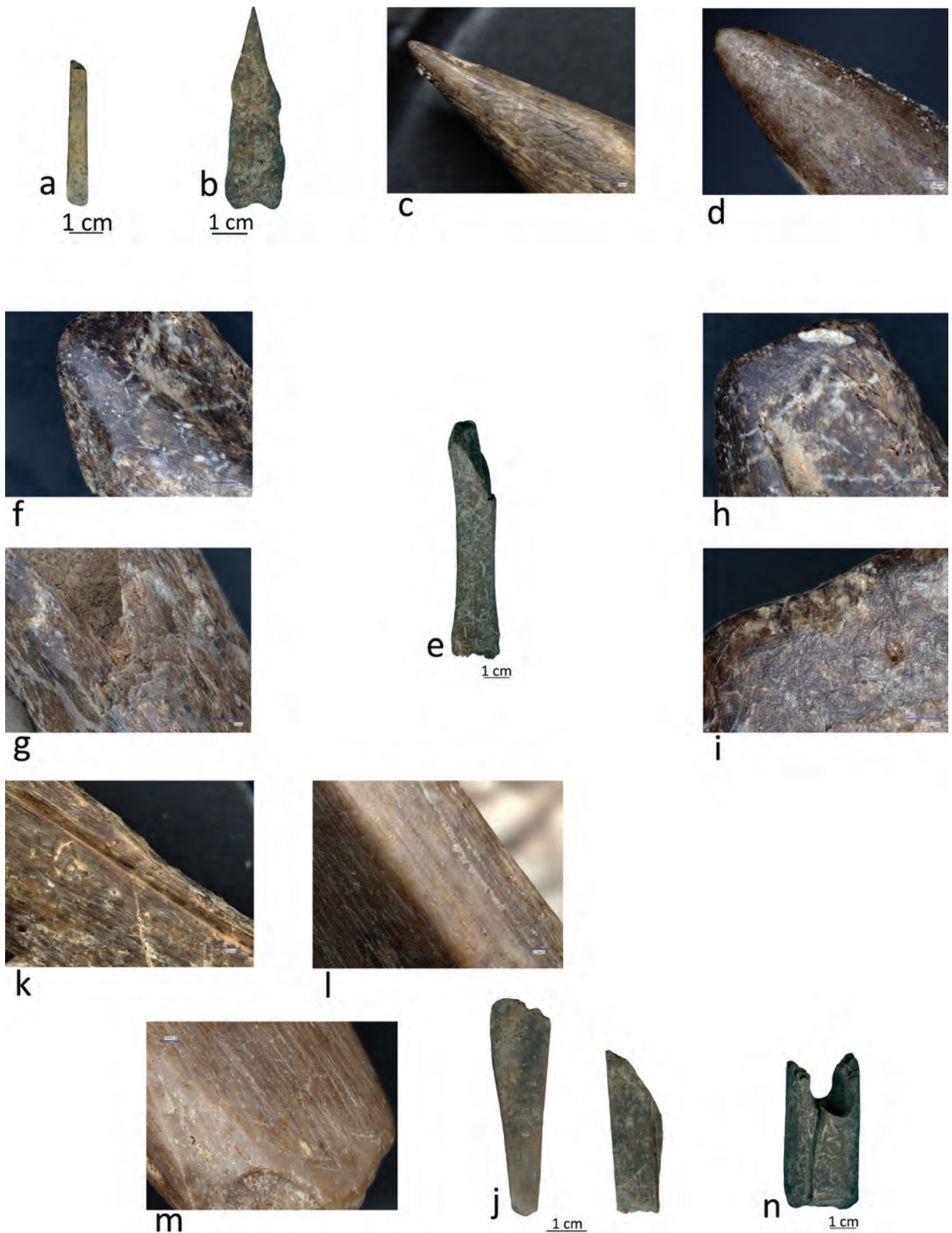


Figure 33. a, b. Pointed tools made of bone (Boian culture); c. Scraping marks; d, h–i. Active end details; e. Bevelled tool made of bone (Boian culture); f. Abrasion marks; g. Percussion marks; j. Undetermined bone fragments (Boian culture); k–l. Grooving marks; m. Scraping marks superimposed by abrasion; n. Fractured tool made of antler (Boian culture).

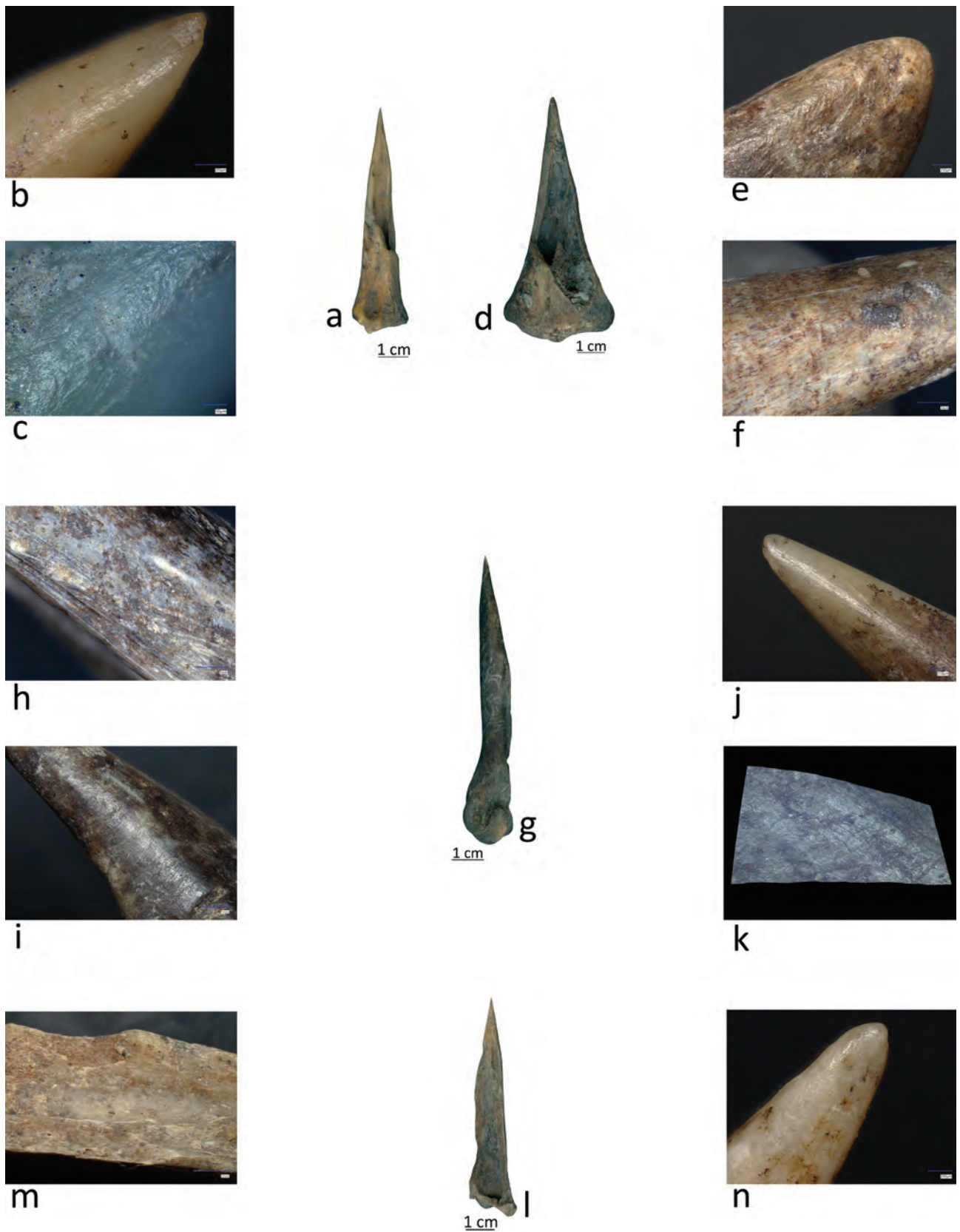


Figure 34. a, d, g, l. Pointed tools made of bone (Gumelnița culture); b, e, j, n. Active end details; c, k. Use-wear area; f, i. Abrasion marks; h. Grooving marks; m. Percussion marks.

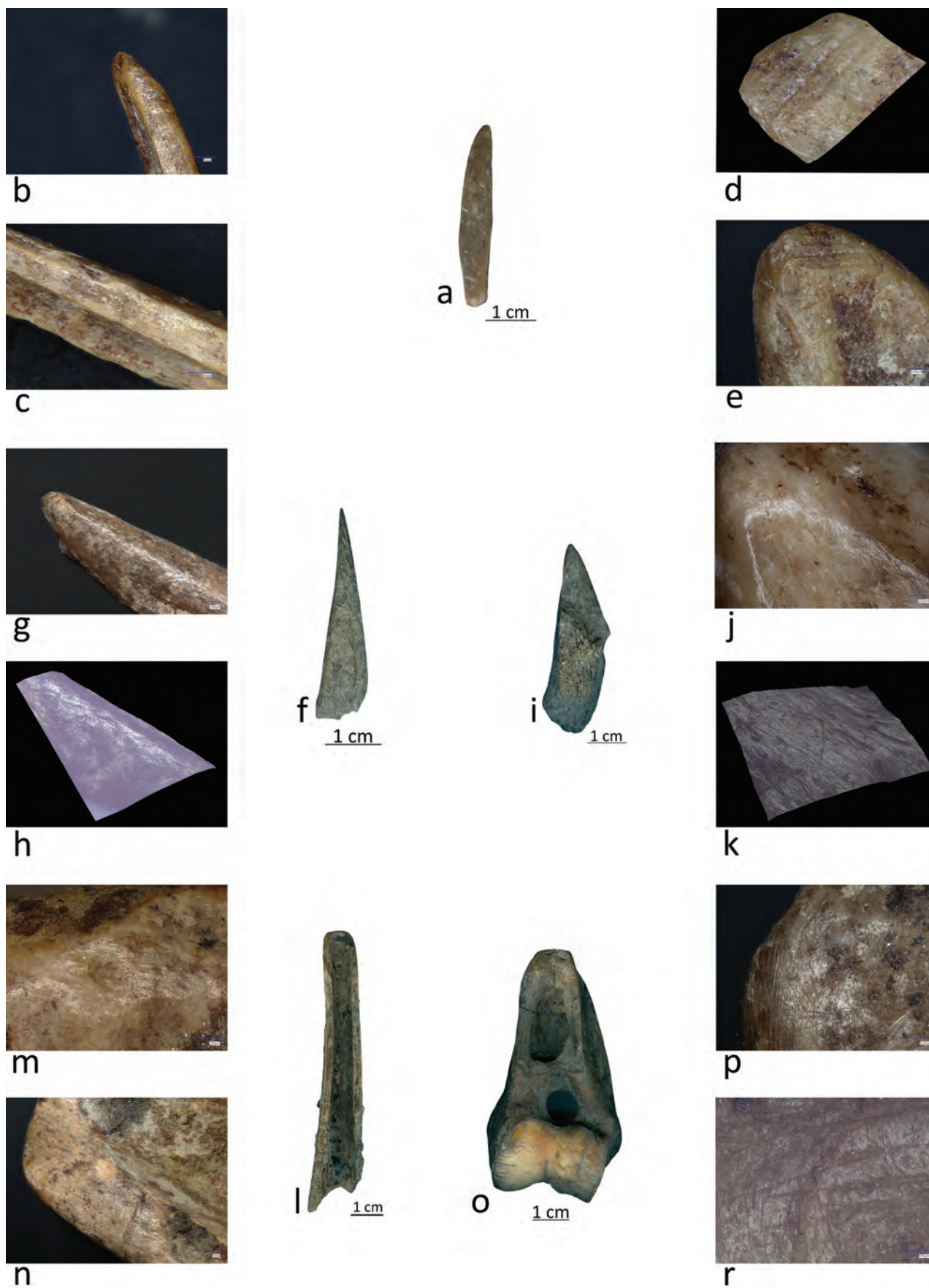


Figure 35. a, f, i. Pointed tools made of bone (Gumelnița culture); b, n. Abrasion marks; c. Percussion marks; d, h, j–k, m, r. Use-wear area; e, g, p. Active end details; l, o. Bevelled tools made of bone (Gumelnița culture).

active end is heavily affected by use. We observe that the abrasion marks are very evident and superimpose areas of polish with longitudinal functional striations (Fig. 35/d–e). It is not excluded that the artifact was resharpened when it became blunted.

A mesial fragment of a pointed tool was crafted from a splinter originating from the diaphyseal wall of a long bone, obtained through successive percussion blows. The debitage edges were not regularized. Only at the distal level was bilateral scraping applied to create the convergence of the edges and a sharp active end. Through the same procedure of successive partitioning, the blank for another point – currently only a distal fragment (Fig. 35/f) – was obtained. In this case as well, the debitage edges were not shaped. Only at the level of the distal portion was abrasion applied around the entire circumference. The tip is rounded, affected by use-wear represented by polish and longitudinal striations (Fig. 35/g–h). A third fragment preserves only the proximo-mesial area. The blank is flat, being a splinter from the diaphyseal wall. We cannot determine the debitage procedures because the entire preserved surface has been shaped.

A small distal fragment was made from a diaphysis transformed into a flat blank. However, we cannot reconstruct the longitudinal debitage procedures. Longitudinal scraping was applied to the edges. The active end is slightly fractured, but we were able to microscopically capture use-wear marks in the form of polish and longitudinal functional striations. Another specimen (Fig. 35/i) also exhibits multiple fractures, such that we cannot reconstruct the debitage procedures. Only at the level of the active end were we able to identify the application of abrasion. In contrast, elements related to the use-wear of the artifact are visible, consisting of macroscopic polish and the development of deep, rather sparse striations, arranged longitudinally in relation to the axis of the artifact (Fig. 35/j–k).

The bevelled tools are represented by ten specimens made on both in-volume and flat blanks. The first category includes a bevelled tool (Fig. 35/l), currently longitudinally fractured. The epiphysis was removed by percussion, without shaping the debitage edge. At the distal level, a percussion was applied after which the debitage edge was shaped by abrasion (Fig. 35/n). The use-wear of the end is evident, exhibiting polish and dense, rather deep longitudinal striations (Fig. 35/m). Another specimen (Fig. 35/o), made from a *Sus* sp. humerus, has a preserved epiphysis. To prepare the active end, percussion was applied obliquely on the segmentation plane. Abrasion is present only at the distal level, on the inferior side. The active end is heavily blunted, with loss of raw material (Fig. 35/p), polish, and long, irregularly arranged striations (Fig. 35/r). It has a length of 73.5 mm, a width of 41 mm, and a thickness of 40.2 mm. In the case of an ulna (Fig. 36/a), the epiphysis was removed by percussion, without shaping the debitage edge. Interventions occurred at the distal level, with bifacial transverse abrasion (Fig. 36/c). Use-wear striations are present, but they are sparse, long, and slightly oblique

to the end (Fig. 36/b). The morphometric data are as follows: length – 91 mm, width – 36.4 mm, thickness – 17.2 mm. A second specimen made from an ulna is heavily fractured, with only a distal fragment preserved. The same technological procedures were employed.

One caprine radius (Fig. 36/d) has its epiphysis removed by percussion. At the distal level, an oblique percussion blow was applied, accompanied by the abrasion of the debitage edge. Use-wear is pronounced, with a significant loss of raw material at the median level, creating a concavity covered by polish (Fig. 36/f). The use-wear also consists of rather irregular, deep striations developed on both sides of the end (Fig. 36/e). We can assume that a hard material was processed. The length of the bevelled tool is 68.2 mm, the width is 12.5 mm, and the thickness is 6.4 mm.

Splinters from the diaphyseal wall were also utilized, obtained through successive partitions by percussion, with the edges left in a raw state. In the case of the first specimen (Fig. 36/g), abrasion was applied to the debitage edges and end, at the proximal level. At the distal level, the active end is shaped by bifacial transverse abrasion (Fig. 36/i). The abrasion striations are visible and superimpose a use-wear area with polish and dense, fine longitudinal striations (Fig. 36/h). Evidently, periodic resharpening of the artifact took place. The length of the tool is 56 mm, the width is 25 mm, and the thickness is 7 mm.

A second specimen (Fig. 36/j), fractured proximally, has its debitage edges regularized by abrasion. On the superior side, along a median longitudinal area, abrasion was applied to flatten the convexity of the bone. At the level of the active end, a bifacial transverse groove is evident, suggesting that transverse segmentation was achieved through sawing (Fig. 36/l). The use-wear consists of macroscopic polish and dense longitudinal striations covering the abrasion (Fig. 36/k).

On another specimen (Fig. 36/m), which is multiply fractured, the abrasion applied only at the level of the active end on the inferior side is difficult to distinguish (Fig. 36/o). The active end is heavily affected, with significant losses of raw material that created a concavity at the median level. The surface was covered by use-wear consisting of long, fine striations arranged perpendicularly to the end (Fig. 36/n).

At two other specimens (Fig. 36/p), fractured at the proximal level, shaping by abrasion was applied bifacially only at the level of the active end (Fig. 36/s). The use-wear is pronounced, developing flattened areas with macroscopic polish, alongside dense, fine striations oblique to the end (Fig. 36/r).

Three pieces belong to the category of figurines. The only specimen (Fig. 37/a) that reached the final stage of processing is a prismatic figurine from a *Sus* sp. metapodial. Although characteristic of the Gumelnița culture tradition, it was recovered from an Early Bronze Age pit (Cx29) attributed to the Glina culture, where it most likely represents residual material. Technological interventions

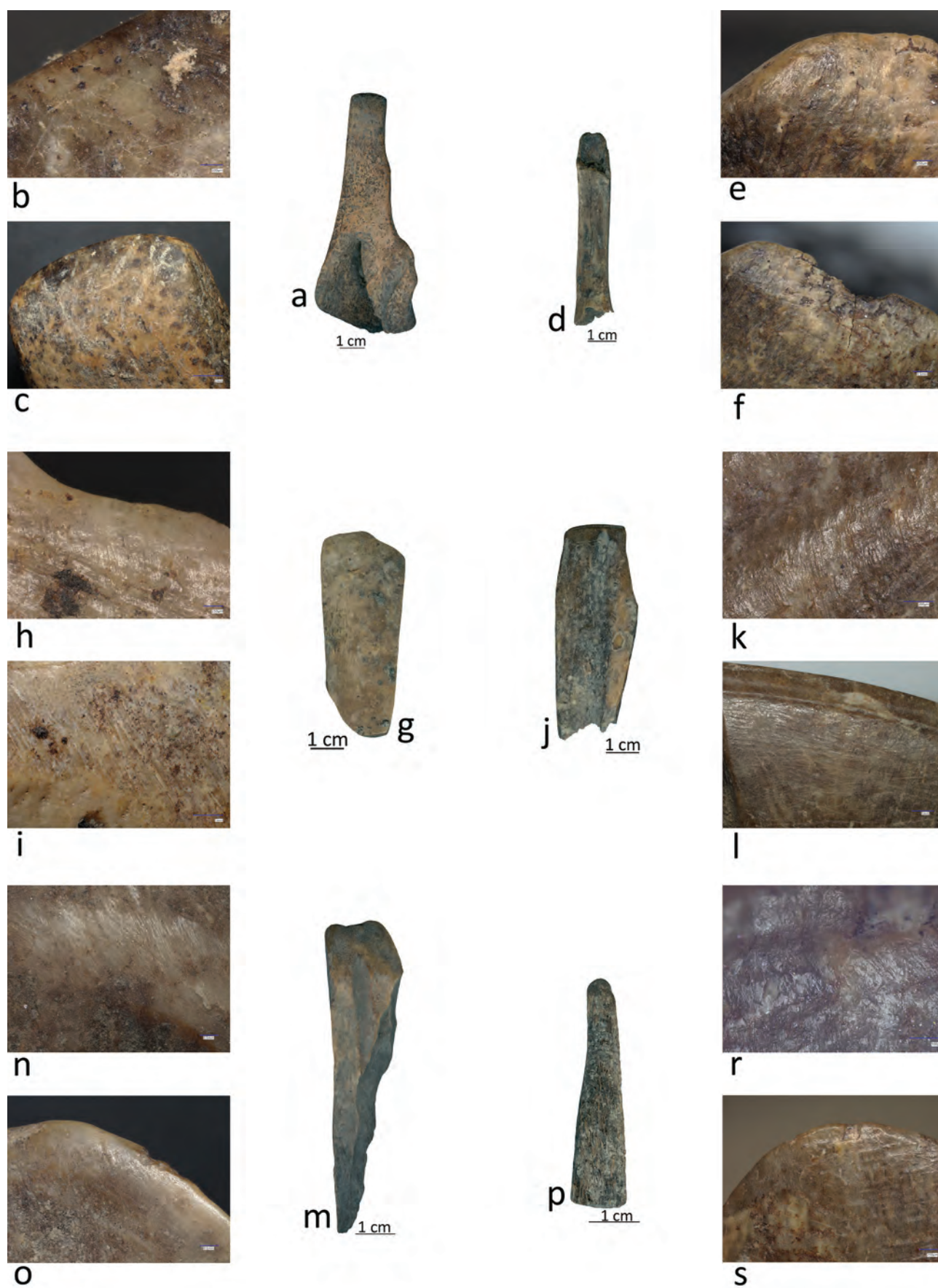


Figure 36. a, d, g, j, m, p. Bevelled tools made of bone (Gumelnița culture); b, e, h, k, n, r. Use-wear area; c, f, l, o, s. Active end details; i. Abrasion marks.

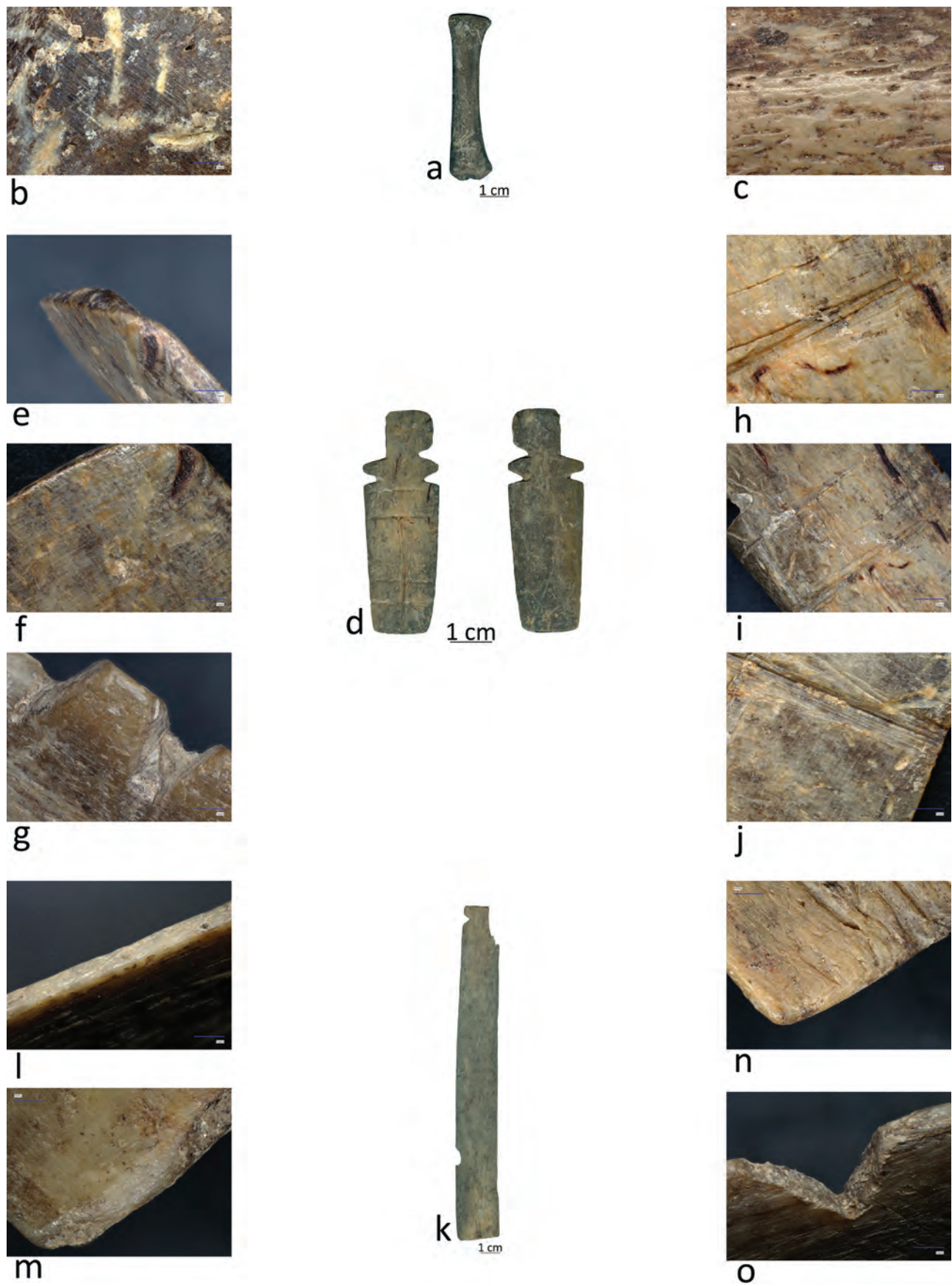


Figure 37. a. Prismatic bone figurine (Gumelnița culture); b, e–f, n. Abrasion marks; c. Use-wear area; d, k. Flattened bone figurines under processing (Gumelnița culture); g, h–i, o. Sawing marks; j. Grooving marks; l. Scraping marks; m. Sawing marks superimposed by abrasion.

occurred only at the distal level. The bone was shaped by abrasion (Fig. 37/b), forming three flattened facets that suggest an anthropomorphic head. The distal end was also shaped until it became rectilinear. At the mesial level, the artifact exhibits use-wear characterised by the flattening of the surface and macroscopic polish, resulting from handling (Fig. 37/c). The length of the piece is 58.5 mm, the maximum width is 15 mm, and the maximum thickness is 15.8 mm. The other two pieces are in various stages of processing and were intended to be transformed into flat figurines. For the first specimen (Fig. 37/d), the longitudinal debitage procedures are unknown because the entire contour was shaped by abrasion (Fig. 37/e). The detachment of the head and arms was achieved through alternate bifacial sawing (Fig. 37/g), with visible cutting marks. The entire surface of the artifact, on both sides, was regularized by abrasion (Fig. 37/f). On the superior side, at the level of the pelvis, the creation of specific anatomical elements was initiated, without the process being finalized. In the area of the pubic triangle, two transverse grooves appear (Fig. 37/h). Starting from these, a central longitudinal incision was traced through grooving (Fig. 37/j) to mark the separation of the legs. Lower down, towards the feet, another two transverse grooves are present (Fig. 37/i). The morphometric data are as follows: length – 51 mm, maximum width – 17 mm, maximum thickness – 2 mm. For the second specimen (Fig. 37/k), a large mammal rib was used. The rib was longitudinally bipartitioned most likely by scraping (Fig. 37/l), as the traces of this procedure appear on the debitage edges. Transversally, at both ends, segmentation by sawing was used, superimposed by the abrasion of the debitage edge (Fig. 37/m). The inferior side was rigorously shaped (Fig. 37/n) to eliminate the spongy tissue. The piece is fractured at one end, but it is visible that the procedure for detaching the head had been initiated through alternate cutting by sawing (Fig. 37/o). Its length is 158 mm, maximum width 18 mm, and maximum thickness 1.8 mm.

Three rib fragments were transformed into spatulas. The first two specimens are fractured at the proximal level. For the first spatula (Fig. 38/a), the rib was longitudinally bipartitioned by percussion, without shaping the debitage edges. Only at the level of the active end was a bifacial transverse abrasion applied (Fig. 38/c). This is largely eliminated by the use-wear of the front, which is heavily blunted, exhibiting macroscopic polish and dense, deep longitudinal striations (Fig. 38/b). At the second specimen (Fig. 38/d), the anatomical volume was preserved. To prepare the active end, a percussion blow was applied. The regularization of the debitage edge was carried out only at the level of the active end (Fig. 38/f). The use-wear is localized at the level of the front (Fig. 38/e), demonstrating that the artifact was not used for a long time. The last spatula (Fig. 38/g) preserves a large part of the rib in its anatomical shape, with technical interventions localized at the distal level. At one end, abrasion was applied (Fig. 38/h) to confer a convex morphology. The use-wear is in this

case as well localized at the level of the front, consisting of macroscopic polish and the appearance of short, dense striations (Fig. 38/i). The spatula has a length of 154 mm, an average width of 14 mm, and an average thickness of 7.2 mm.

A rib fragment from a large mammal (Fig. 38/j) was processed to be transformed into a perforated plate, though the procedure was not finalized. The rib was longitudinally divided by percussion. One of the debitage edges was not modified, while the other was shaped by abrasion (Fig. 38/k). Transversally, segmentation was applied through sawing with evident technological marks. Centrally, a perforation was created by bifacial rotation (Fig. 38/l). The morphometric data are as follows: length – 26.5 mm, width – 16.5 mm, thickness – 4 mm, perforation diameter – 6 mm.

Three pieces are heavily fractured; thus, we do not know to which typological category they belonged. For the first specimen (Fig. 38/m), a rib originating from a medium-sized mammal was used. The blank is flat, obtained through bipartition in percussion, with unshaped debitage edges. A perforation by bifacial rotation is present (Fig. 38/n). Another rib fragment preserving the anatomical volume has one of the edges abraded until reaching the spongy tissue. For the third fragment (Fig. 38/o), the diaphysis of a long bone was used, longitudinally debited through a quadripartition procedure involving grooving (Fig. 38/p) and percussion. At the distal level, abrasion was applied (Fig. 38/r) around the circumference.

Shell. 11 shell fragments of *Unio* sp. (Fig. 39/a) and three of *Anodonta* sp. (Fig. 39/f) were utilized as scrapers in cleaning activities. In no instance was there any technological intervention; the shell was used in its natural shape. The morphology of the shell allows it to be easily held in the hand. Three use-wear areas, with variable amplitudes and combinations, are visible on these artifacts. The first develops at the ventral end, towards the internal side. The natural ventral edge has a convex and sharp morphology. In contrast, on the archaeological specimens, the contour is linear, with a rounded morphology of the wall and a smooth texture. Under the microscope, the lamellar structure specific to the shell is no longer visible; the end is now wider, exhibiting short, dense striations arranged perpendicularly to the edge (Fig. 39/b–c, g). These marks demonstrate that the ventral end functioned as the active front and was used in a bidirectional rubbing action, which determined the development of functional marks perpendicular to the axis of the artifact. The second use-wear area develops on the internal side. This presents an alternation of nacreous areas and opaque areas (Fig. 39/d, h). We considered this to be the result of a hand-friction process that exfoliated the nacre layer. The third use-wear area is visible on the external side, at the median level. It appears as a flattened surface that led to the alteration of the natural structure of the shell, sometimes with the appearance of small areas with polish (Fig. 39/e).

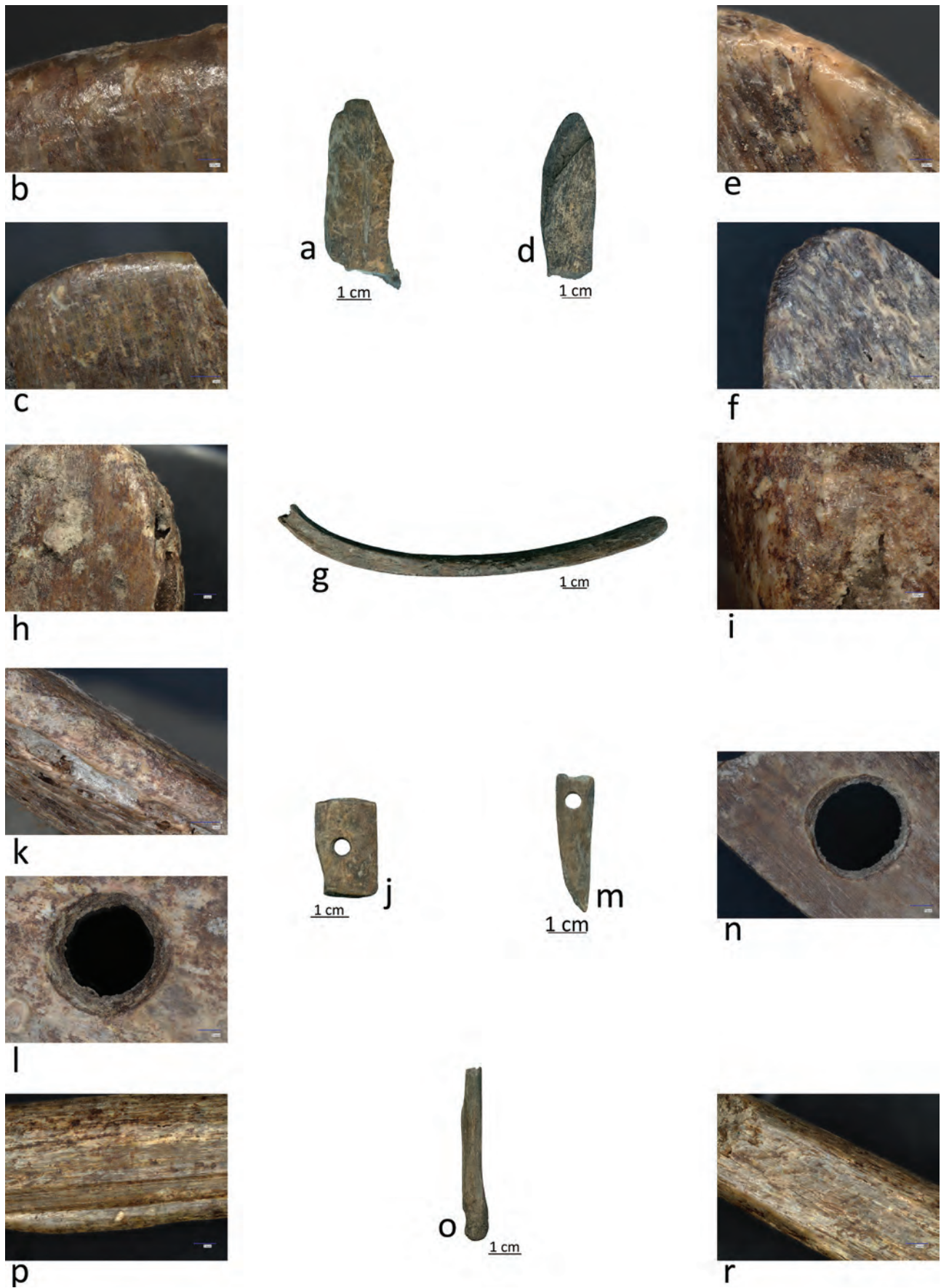


Figure 38. a, d, g. Spatulas made of bone (Gumelnița culture); b, e, i. Use-wear area; c. Active end detail; f, h, k, r. Abrasion marks; j. Bone plate under processing (Gumelnița culture); l, n. Perforation details; m, o. Undetermined pieces made of bone (Gumelnița culture); p. Grooving marks.

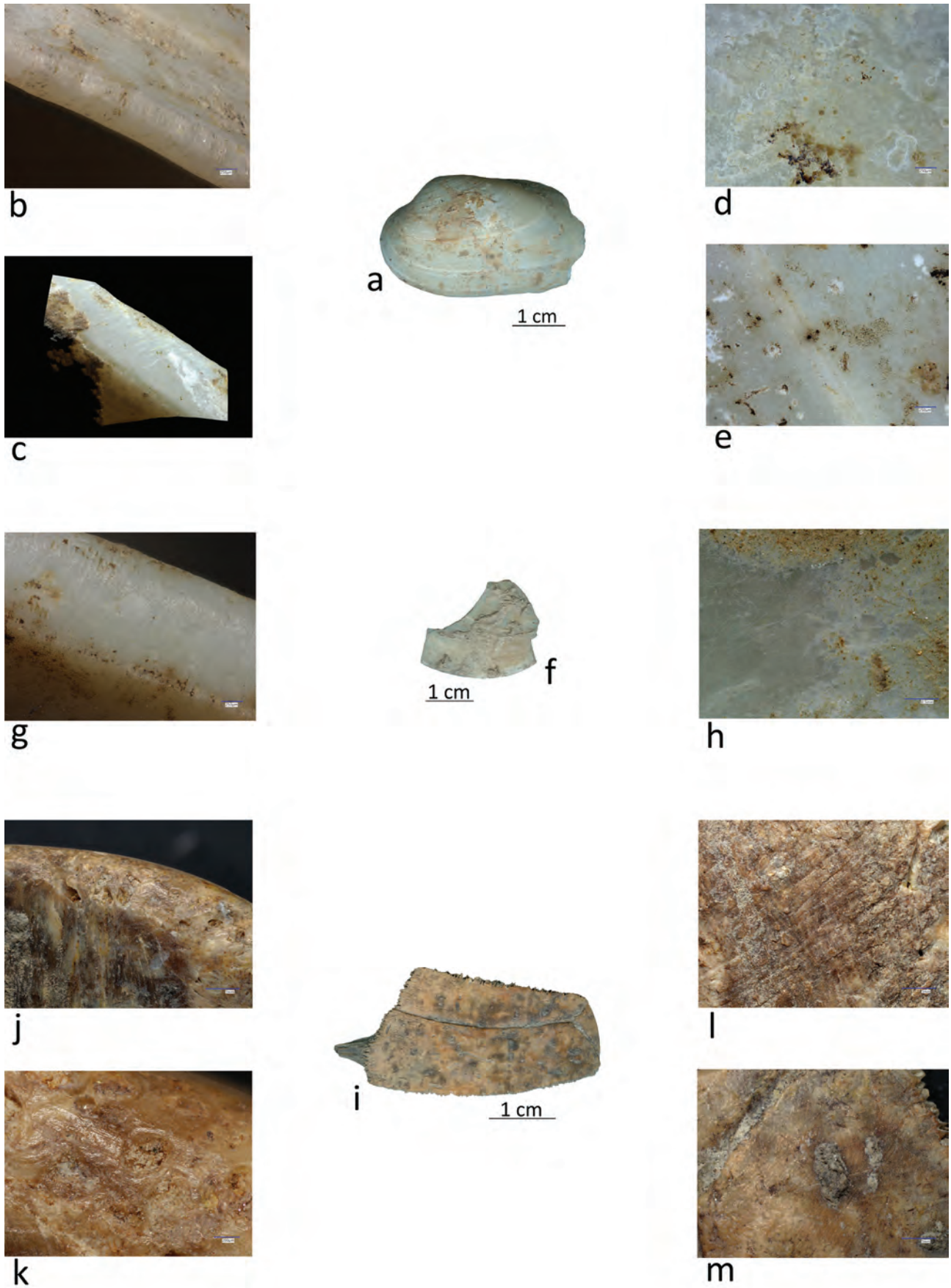


Figure 39. a, f. Scrapers made of shells (Gumelnița culture), b–c, g. Functional marks at the ventral end; d, h, l. Use-wear at the internal side; e, m. Use-wear at the external side; i. Container made of carapace (Gumelnița culture); j. Abrasion marks; k. Use-wear area.

Carapace. Four carapace fragments, belonging to *Emys* sp., bear on their surface traces compatible with their use in anthropogenic activities. On one specimen (Fig. 39/i), on the single preserved external edge, the contour was abraded (Fig. 39/j). The specific elements of all these fragments consist of varied traces that support the hypothesis of their use as containers. On the inferior side, at the periphery of the contour, a use-wear area formed, characterised by the rounding of the wall and macroscopic polish (Fig. 39/k), while deep incisions, rather irregular in their arrangement, are present in the interior (Fig. 39/l). On the superior side, the use-wear marks consist of flattened areas with macroscopic polish and irregular *striae* (Fig. 39/m).

8.2.3. Early Bronze Age – Glina culture

Bone. The category of pointed tools is represented by four specimens. One specimen, fractured at the distal level (Fig. 40/a), originates from the diaphysis of a long bone. The blank is flat, obtained through quadripartition by percussion. A large part of the debitage edges remained unshaped. Abrasion (Fig. 40/b) was applied at the level of the distal end and at the meso-distal level, around the entire circumference, to prepare the front. Another pointed tool (Fig. 40/c), a meso-distal fragment, was also obtained through a bone quadripartition procedure, only this time by double grooving (Fig. 40/e). The shaping procedure was applied at the distal level, around the entire circumference. The active end is heavily blunted, acquiring a concave morphology and macroscopic polish (Fig. 40/d).

A splinter (Fig. 40/f) from the diaphyseal wall, obtained through fracturing, was transformed into a pointed tool. The artifact is a meso-distal fragment. Only distally was a bilateral abrasion applied (Fig. 40/h) on the debitage edges and around the circumference, towards the tip. This is heavily rounded, exhibiting a radical modification of the volume, polish, and fine striations (Fig. 40/g). A fragment (Fig. 40/i) from a flat bone, obtained through fracturing by percussion, was prepared only at the distal level through a combination of scraping (Fig. 40/k) and abrasion. The active end is rounded, with functional striations developed longitudinally (Fig. 40/j). It has a length of 72.5 mm, a width of 13 mm, and a thickness of 2.4 mm.

A caprine astragalus (Fig. 40/l) was utilized for a short period of time. On the dorsal side, small flattened areas are present (Fig. 40/m), especially at the level of the protuberances, with specific abrasion striations (Fig. 40/n). The astragalus measures 32 mm in length, 19.2 mm in width, and 19 mm in thickness.

A small bevelled tool (Fig. 40/o) was processed from a diaphysis fragment of a long bone belonging to a large mammal. It is only a fragment of a multiply fractured artifact. The flat blank was obtained through successive partitions, although the specific procedures cannot be identified. On the preserved fragment, both sides were regularized by abrasion (Fig. 40/r). The use-wear is not

advanced; however, small areas of polish and flattening had begun to form (Fig. 40/p).

8.2.4. Undetermined contexts

Bone. Five bevelled tools originate from such contexts. For an artifact preserving the anatomical volume (Fig. 41/a), a caprine ulna was used. The epiphysis was removed by percussion, without the regularization of the debitage edge. Only at the distal level was abrasion applied on both sides to create a bevelled-type active end (Fig. 41/c). The front displays evident use-wear, with dense, parallel, and rather deep longitudinal striations (Fig. 41/b). It measures 60 mm in length, 22 mm in width, and 8 mm in thickness.

A caprine tibia (Fig. 41/d) was longitudinally bipartitioned by percussion. The artifact is fractured proximally. The debitage edges were prepared by diffuse percussion, with visible marks (Fig. 41/f). The active end was shaped by bifacial abrasion applied only at the distal level. The abrasion marks are covered by strong polish, with fine and dense longitudinal striations (Fig. 41/e). Evidently, a resharpening process of the active end did not take place, as we observed at other artifacts.

A splinter (Fig. 41/g) was obtained by percussion from a mandible, resulting in a flat blank. The debitage edge was not shaped; only at the end, on both sides, was a transverse abrasion applied (Fig. 41/i) to create a specific active front for a bevelled tool. This end has a denticulated appearance, but with areas of rounding, polish, and fine longitudinal striations (Fig. 41/h). At the median level, on the superior side, the artifact exhibits small areas of polish, flattening, and chaotically arranged fine striations. It measures 63 mm in length, 32 mm in width, and 14 mm in thickness.

The fourth bevelled tool is heavily affected by post-depositional processes. A splinter from the diaphyseal wall was obtained by percussion, with its edges left largely unshaped. At the proximal level, longitudinal scraping was applied to one of the edges to form a sharp proximal end. At the level of the active front, a transverse abrasion was applied bifacially. The end has significant material loss, over which use-wear appears to superimpose. The length of the bevelled tool is 74 mm, the width is 26 mm, and the thickness is 7.5 mm. A fragment (Fig. 41/j) from the diaphysis of a long bone belonging to a large mammal is heavily burnt, with surface deposits that have covered some of the technological marks. The blank is flat, obtained from the diaphyseal wall through successive percussions. Abrasion was applied bifacially (Fig. 41/l) at the distal level and appears to superimpose use-wear areas with evident longitudinal striations (Fig. 41/k). It is clear that the end was reshaped when it became blunted. The morphometric data are as follows: length – 83 mm, width – 22.5 mm, thickness – 11.2 mm.

A caprine astragalus (Fig. 41/m) was intensely utilized. The lateral sides were intensely abraded until the surfaces became perfectly flat (Fig. 41/o). From the dorsal and plantar sides, a perforation was performed by bifacial rotation. The artifact was suspended on a thread,

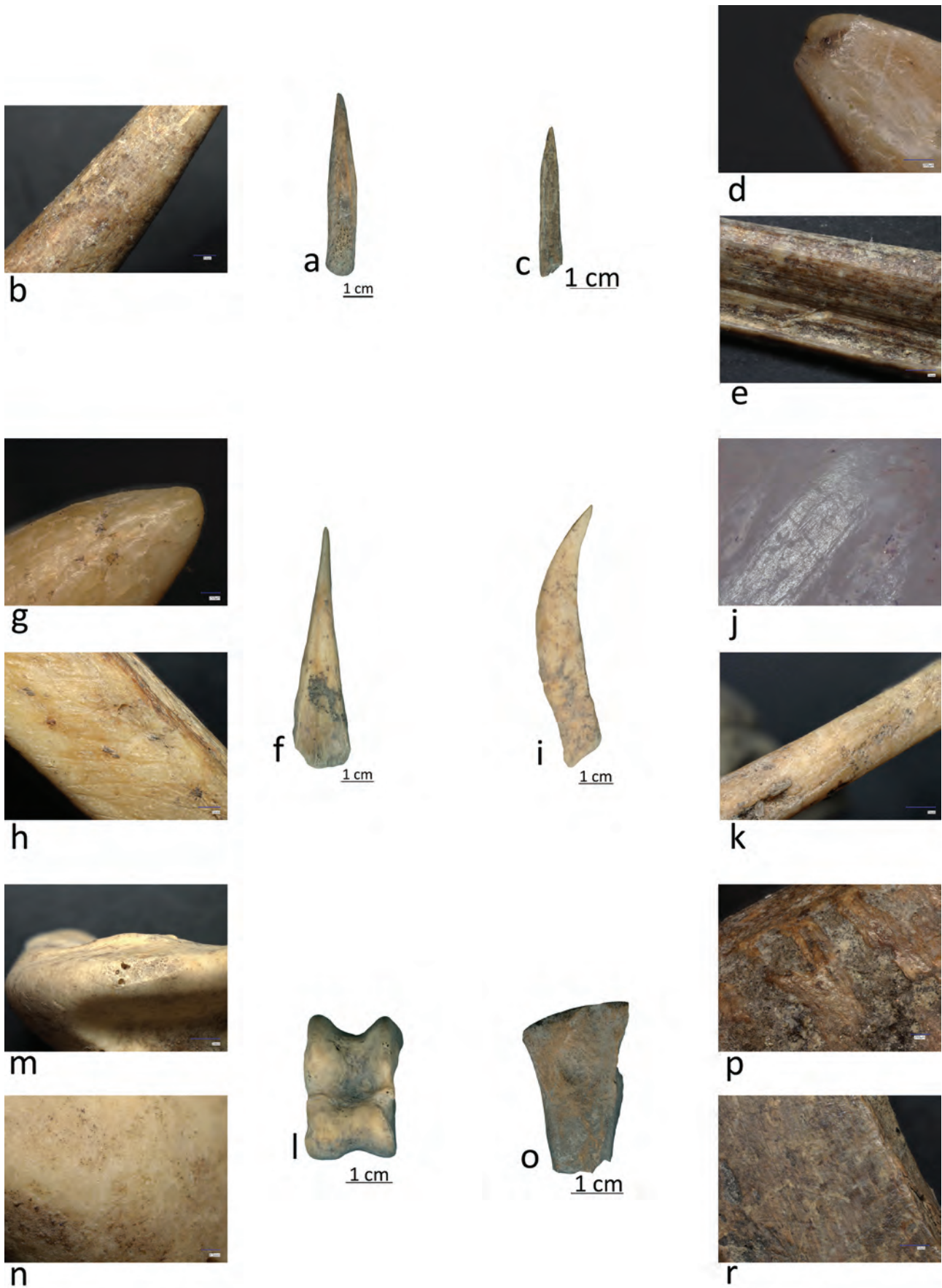


Figure 40. a, c, f, i. Pointed tools made of bone (Glina culture); b, h, m-n, r. Abrasion marks; d, g, p. Active end details; e. Grooving marks; j. Use-wear area; k. Scraping marks; l. Abraded astragalus (Glina culture); o. Bevelled tool made of bone (Glina culture).

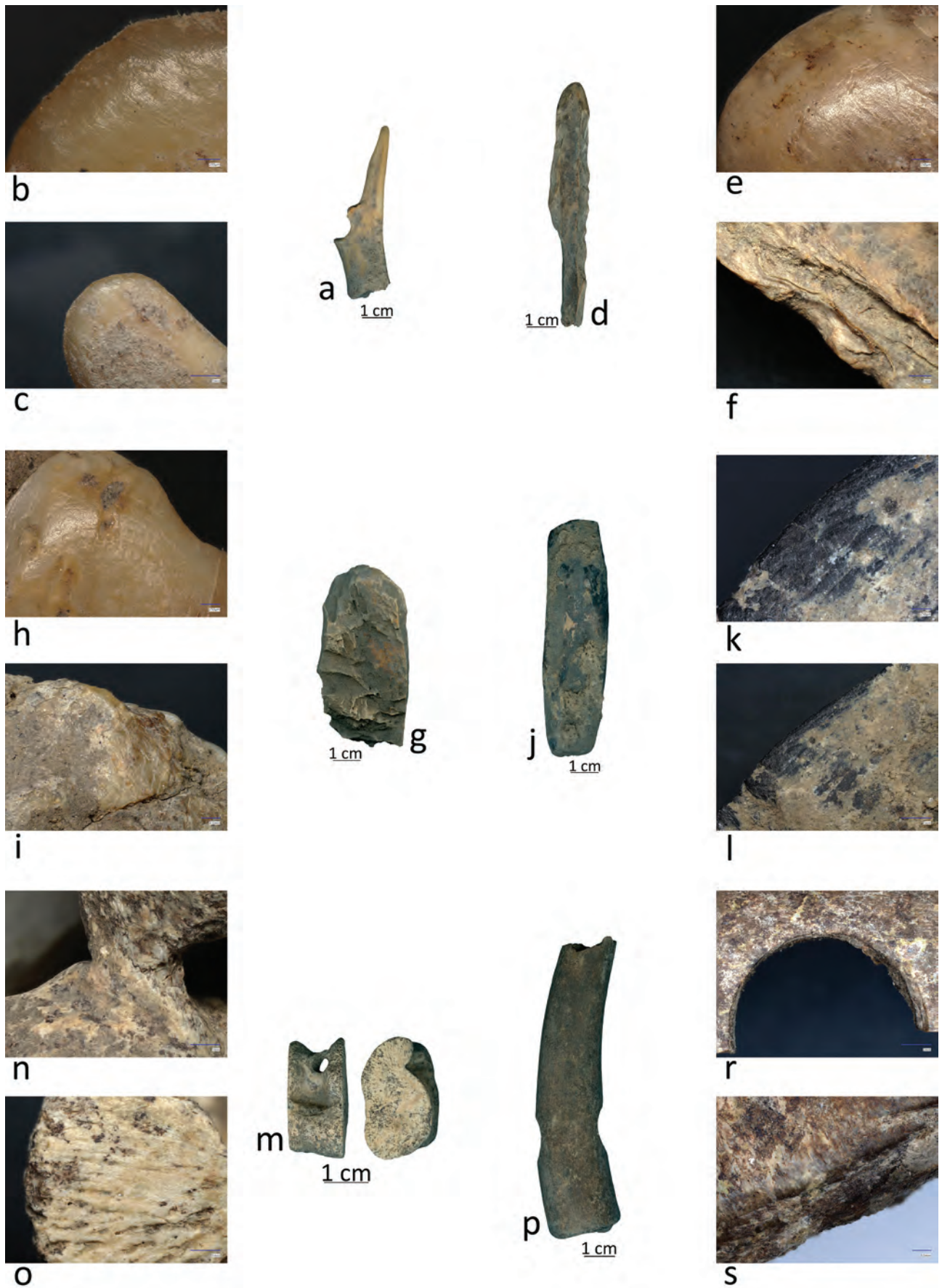


Figure 41. a, d, g, j. Bevelled tools made of bone (undetermined context); b, e, h, k. Use-wear area; b, c. Active end detail; f, s. Percussion marks; i, l, o. Abrasion marks; m. Abraded astragalus (undetermined context); n, r. Perforation details; p. Tool made of antler (undetermined context).

as the wall towards the extremity is cracked (Fig. 41/n) as a result of pressure. The length of the astragalus is 28 mm, the width is 13 mm, the thickness is 15 mm, and the perforation diameter is 4 mm.

A pointed tool, currently fractured at the distal level, was made from the diaphyseal wall of a long bone, debited through successive percussion blows. The debitage edges, as well as the proximal end, were shaped by abrasion.

Antler. A red deer antler tine (Fig. 41/p), preserving the anatomical blank, was segmented from the branch by percussion (Fig. 41/s). The artifact is fractured both transversally, at the level of the active end, and longitudinally. At the proximal level, the artifact was provided with a perforation performed by bifacial rotation (Fig. 41/r), which ensured a transverse hafting.

8.2.5. Discussion on osseous industry

Raw materials. Bone represents the dominant raw material in all three analysed cultures, being systematically exploited by utilizing the diaphyses of long bones, as well as flat bones and specific skeletal elements. The Boian culture differs in this respect through the more frequent use of red deer antler, which occurs only occasionally in the analysed assemblages attributed to the other two cultural groups. The Glina culture additionally resorts to the caprine astragalus, utilized without technical modifications, reflecting an opportunistic exploitation of the bone's natural morphology. The Gumelnița culture is distinguished by the broadest spectrum of raw materials, including, besides bone, bivalve shell (*Unio* sp. and *Anodonta* sp.) and tortoise carapace (*Emys* sp.), exploited with a minimum level of technological intervention.

Typological categories. Pointed tools and bevelled tools constitute the typological categories common to all three cultures, representing the functional core of the hard animal material industry and responding to diverse needs for processing raw materials. The Boian culture presents the most restricted typological repertoire, limited to these two categories and a few artifacts of indeterminate function, while the Glina culture adds the use of the astragalus. The Gumelnița culture stands out, once again, through a considerably more diversified typological repertoire that exceeds the strictly utilitarian sphere, including spatulas, perforated plate, shell scrapers, carapace containers, and anthropomorphic figurines. The presence of the latter, in various stages of processing, demonstrates that the bone industry in the Gumelnița culture was not limited to the production of tools but extended into the domain of symbolic expression.

Technology. The comparative analysis of the technical production schemes reveals a technological background common to all three cultures, materialized in the use of the same fundamental longitudinal debitage procedures (percussion and grooving) and the same shaping techniques, namely abrasion and scraping, applied predominantly at the distal level for the preparation of the active end. Differences reside mostly in the level of elaboration of the

finished artifacts: the Gumelnița culture tends towards a more systematic regularization of the surfaces, including through the abrasion of the debitage edges and the sides of the artifacts, while in the Boian and Glina cultures, the edges are more frequently kept in a raw state. Sawing represents a technique attested exclusively in the Gumelnița culture, utilized in the processing of figurines and perforated plate, indicating a higher level of technical specialization associated with the production of objects with complex morphology. Additionally, the practice of reshaping worn artifacts, documented for pointed tools and bevelled tools in the Gumelnița culture, demonstrates a more careful management of the toolkit.

Functionality. The use-wear marks identified on the pointed tools from all three cultures (rounding of the active end, macroscopic polish, and longitudinal functional striations) are compatible with their use in processing materials of low/medium hardness, such as hide or vegetal fibres, indicating a common functionality regardless of the culture. The bevelled tools also present a homogeneous use-wear pattern across the three cultures, characterised by significant losses of raw material, a denticulated or concave morphology of the end, and deep striations, suggesting the processing of hard materials, possibly wood or bone. The Gumelnița culture, however, expands the functional spectrum: spatulas and shell scrapers are associated with modelling or smoothing clay-like materials, while carapace containers indicate use in storage or preparation activities. Figurines enter the sphere of symbolic and ritual functionality, a dimension absent in the analysed assemblages for the Boian and Glina cultures. The available data do not, however, allow definitive conclusions regarding the overall picture of these industries due to the small size of the samples, especially concerning the Boian and Glina cultures.

8.3. PERSONAL ADORNMENTS

8.3.1 Early Chalcolithic – Boian culture

In Cx3, attributed to the Boian culture, 79 clay beads exhibiting a biconvex morphology were identified (Fig. 42/a). The lateral edges are convex and convergent, whereas the ends are rectilinear. A central perforation with a cylindrical morphology was created (Fig. 42/b–d). The ends display small concavities with rounded walls (Fig. 42/e–f), resulting from friction against the suspension thread. The morphometric data are included in the Table 6.

Additionally, three cylindrical beads made from *Spondylus* shell are included (Tab. 8; Fig. 42/g, j). They exhibit a circular morphology, a rectangular cross-section, and a central perforation performed by bifacial rotation. The surface of the artifacts has been rigorously abraded (Fig. 42/h, k–l). The perforation displays a slight deformation, characterised by the flattening of the wall, the obliteration of rotation marks, macroscopic polish, and fine striations

No.	Length	Maximum diameter	Perforation diameter
1.	6	4	1.8
2.	6.4	3	1.2
3.	6	3.2	1.8
4.	6.5	3.4	1.3
5.	7.1	3.5	1.4
6.	5	3.5	1.4
7.	5	3.4	1.2
8.	6.2	3.5	1.1
9.	6	3.2	1.1
10.	7	3	1.2
11.	6.5	3	1.1
12.	7	3	1.3
13.	7.2	3.2	1.4
14.	6.8	3.5	1.2
15.	7.4	3.5	1.4
16.	7.4	3	0.8
17.	6	3.2	1.4
18.	8	3.2	1.4
19.	6.5	3.2	1.4
20.	6	3.4	1.4
21.	7	3.5	1.2
22.	6	3.5	1.1
23.	6.5	3.5	1.2
24.	6	3.5	1.1
25.	6	3.6	1.8
26.	5.2	4	1.1
27.	5.2	3	1.1
28.	6	3.2	1.4
29.	6	3.2	1.4
30.	6	3.5	1.6
31.	5.2	3.8	1
32.	6.2	3.2	1
33.	6	3.8	1.5
34.	6	3.5	1.1
35.	7	3.2	1
36.	5.1	4	2
37.	6.2	3.8	1
38.	6.2	3.5	1
39.	6	3.2	1.1
40.	6.5	4	1.1

No.	Length	Maximum diameter	Perforation diameter
41.	5.5	3.2	0.9
42.	4.8	3.2	1.6
43.	6.3	3.8	1.1
44.	6	3.5	1.6
45.	6.2	3.8	1.1
46.	5.2	3.5	1.3
47.	5	3.2	0.8
48.	6	3.5	1.2
49.	4.8	3.2	1.1
50.	4.9	3	0.9
51.	4.8	3.1	1.4
52.	4.9	3.4	1.5
53.	5.4	3.2	1.8
54.	4.7	3	1.4
55.	6.2	-	-
56.	7.5	3.1	0.9
57.	6	3.5	1.3
58.	7	3.6	1
59.	6.5	3.2	1.1
60.	6.8	3.2	1.2
61.	6	3.2	1.2
62.	7	3.5	1.4
63.	6	3	1.2
64.	6.2	3.2	1.2
65.	5.2	3.2	1.2
66.	6	3.1	1.2
67.	6	3.5	1.2
68.	5.2	3.2	1
69.	5.5	3.2	1.2
70.	5	3.2	1
71.	5	3	1
72.	5.5	3.2	1.2
73.	6	3.5	1.8
74.	6	3	1.2
75.	6	3	1.4
76.	6	3	1.4
77.	6	3.5	2
78.	5.3	3.2	1.4
79.	4.6	3.2	1.8

Table 6. Dimensions (in mm) of biconvex beads made of clay.

Raw material	Processing stage	Typological category	S1A						S1B			TOTAL
			Cx3	Cx4	Cx5	Cx6	Cx12		Cx7	Cx21	Cx46	
			SU2509	SU2516	SU2513	SU2517	SU2565	SU2574	SU2519	SU2554	SU2609	
Clay	Finished piece	Biconvex bead	79									79
Stone	Finished piece	Cylindrical bead		9			2	2		1	3	17
Shell	Finished piece	Cylindrical bead	1			1			1			3
		Pendant				1						1
Bone	Finished piece	Tubular bead	1		1							2
	Preform	Tubular bead		1								1

Table 7. Stratigraphic distribution of personal adornments at the Glina Tell, depending on the raw materials and typological category (Cx3, Cx6, Cx7 – Boian culture; Cx4, Cx5, Cx12, Cx21, Cx46 – Gumelnița culture).

oriented perpendicularly to the opening (Fig. 42/i, m). The artifacts present the following dimensions:

No.	Diameter	Thickness	Perforation diameter
1.	4	2	1.2
2.	4	1.2	1.8
3.	4.8	1.4	1.4

Table 8. Dimensions (in mm) of cylindrical beads made from *Spondylus* shell.

A pendant imitating a deer canine was processed from the same type of shell (Fig. 43/a). The debitage procedures used to obtain the blank remain unknown due to interventions during the next stage. The specific shape was created through abrasion (Fig. 43/b). Towards the distal end, a perforation was created by bifacial rotation (Fig. 43/d). The perforation exhibits a small use-wear area towards the distal side which corresponds to a minor fracture at the end (Fig. 43/c). It is highly probable that this represents the pressure area of the suspension thread. One of the sides is intensely flattened and displays macroscopic polish (Fig. 43/e), functioning as the friction surface against the skin or clothing. The morphometric data are as follows: length – 16.5 mm, maximum width – 5.8 mm, maximum thickness – 3 mm, perforation diameter – 2.1 mm.

A tubular bead made from the bone diaphysis of a small-sized mammal, was also recovered. It presents multiple surface deposits; thus, specific technological traces cannot be identified. However, it can be stated that the artifact was obtained by preserving the anatomical volume of the bone through the segmentation of the diaphyseal wall. The medullary canal was utilized, rendering a perforation stage unnecessary.

8.3.2. Middle Chalcolithic – Gumelnița culture

In Gumelnița contexts, 16 cylindrical black stone beads are present (Tab. 9; Fig. 43/f), featuring a rectangular cross-section and parallel rectilinear edges. Centrally, a perforation was performed by bifacial rotation. The surface

of the artifacts was rigorously abraded (Fig. 43/g–i) to achieve the desired shape and dimensions. At the level of the perforations, small deformation areas are evident, characterised by the obliteration of rotation marks and the flattening of the wall (Fig. 43/j–k), alongside fine, dense striations arranged obliquely to the opening (Fig. 43/l). The morphometric data are presented in Table 9.

No.	Diameter	Thickness	Perforation diameter
1.	3.5	1.2	1.3
2.	3.6	1.2	1.6
3.	3.8	1.2	1.2
4.	3.8	2	1.8
5.	4	1.2	1.8
6.	4	2	2.6
7.	4.2	1.1	1.4
8.	4.5	2	2
9.	5	1.4	2
10.	5	1.6	2.2
11.	5	1.6	2.8
12.	5	2	1.8
13.	5	2	1.8
14.	5	2.2	1.4
15.	5	2.2	2.8
16.	5.2	1.8	2.2

Table 9. Dimensions (in mm) of cylindrical beads made of stone.

A bead with circular morphology was most likely made of clay (Fig. 44/a). It has one flattened side, and the other has converging convex edges (Fig. 44/b). A cylindrical perforation was made in the center (Fig. 44/c). Its diameter is 6.5 mm, its thickness is 2.6 mm, and the diameter of the perforation is 1.3 mm.

The tubular beads were obtained from the diaphyses of long bones (Fig. 44/d) from small mammals. The finished

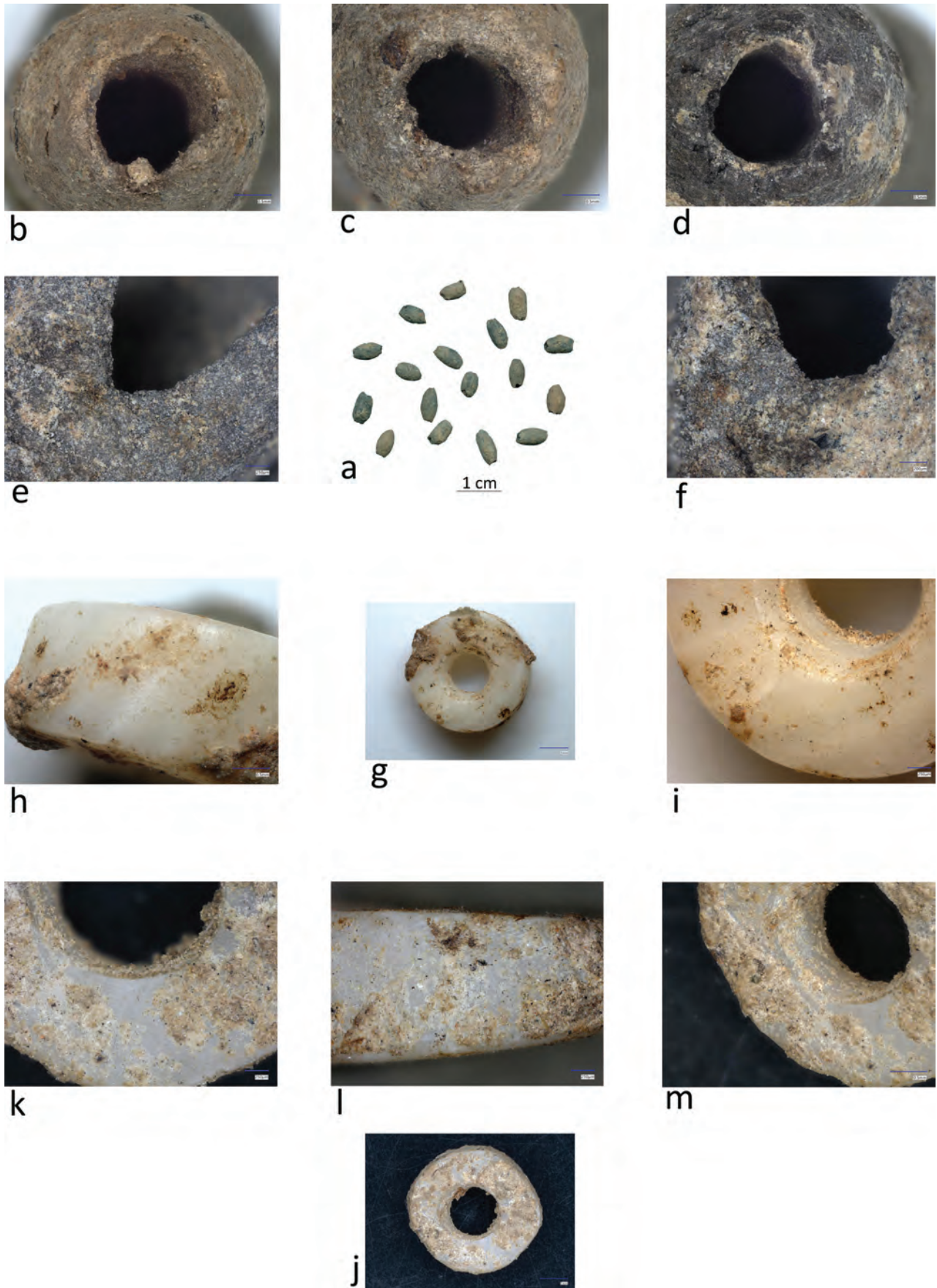


Figure 42. a. Beads made of clay (Boian culture); b–d. Perforation details; e–f. Perforation deformation; g, j. Beads made of *Spondylus* shell (Boian culture); h, k–l. Surface details; i, m. Use-wear at the perforation level.

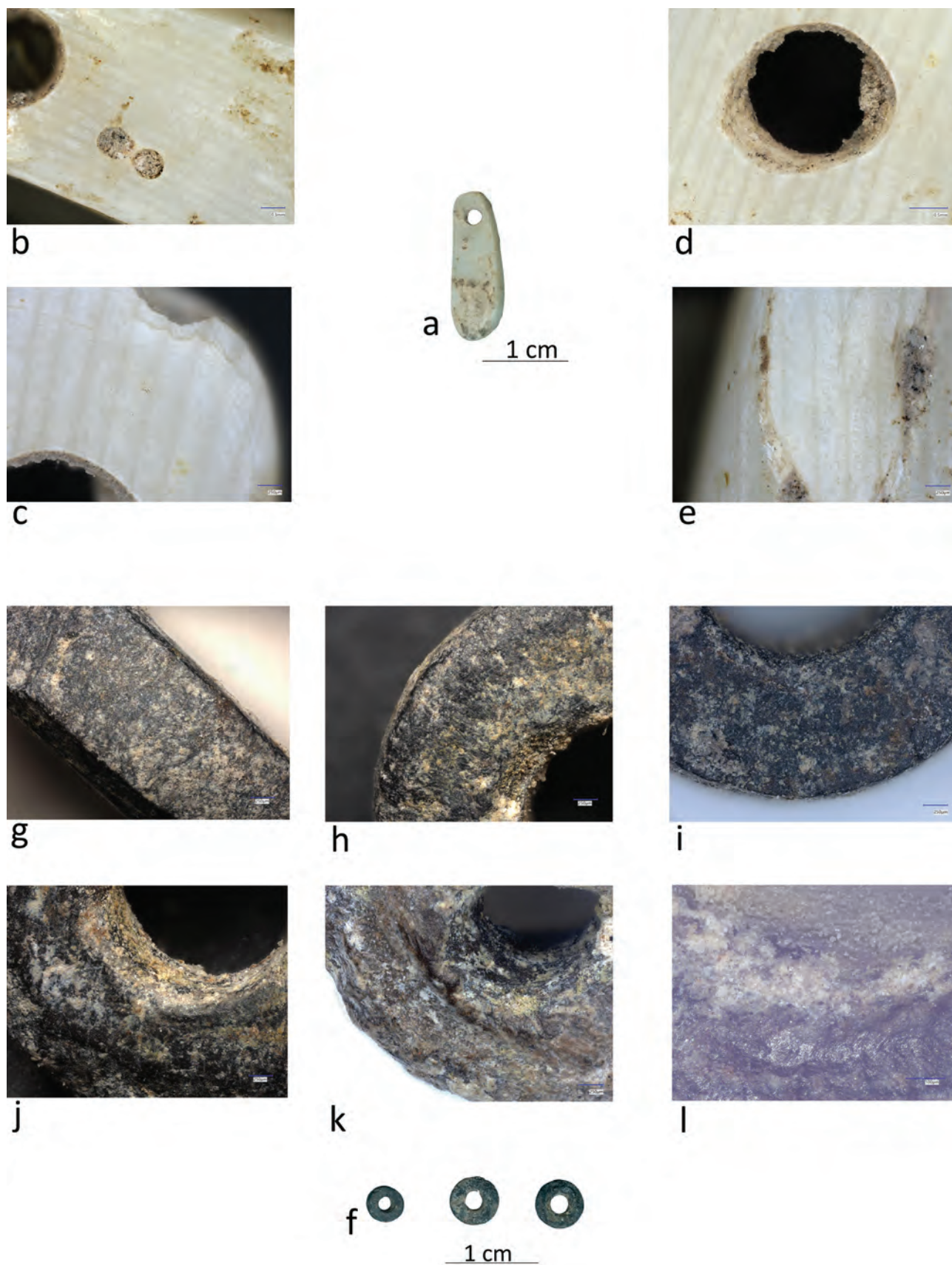


Figure 43. a. Pendant made of *Spondylus* shell (Boian culture); b, g–i. Surface details; c, e. Use-wear area; d. Perforation detail; f. Beads made of stone (Gumelnița culture); j–l. Use-wear at the perforation level.

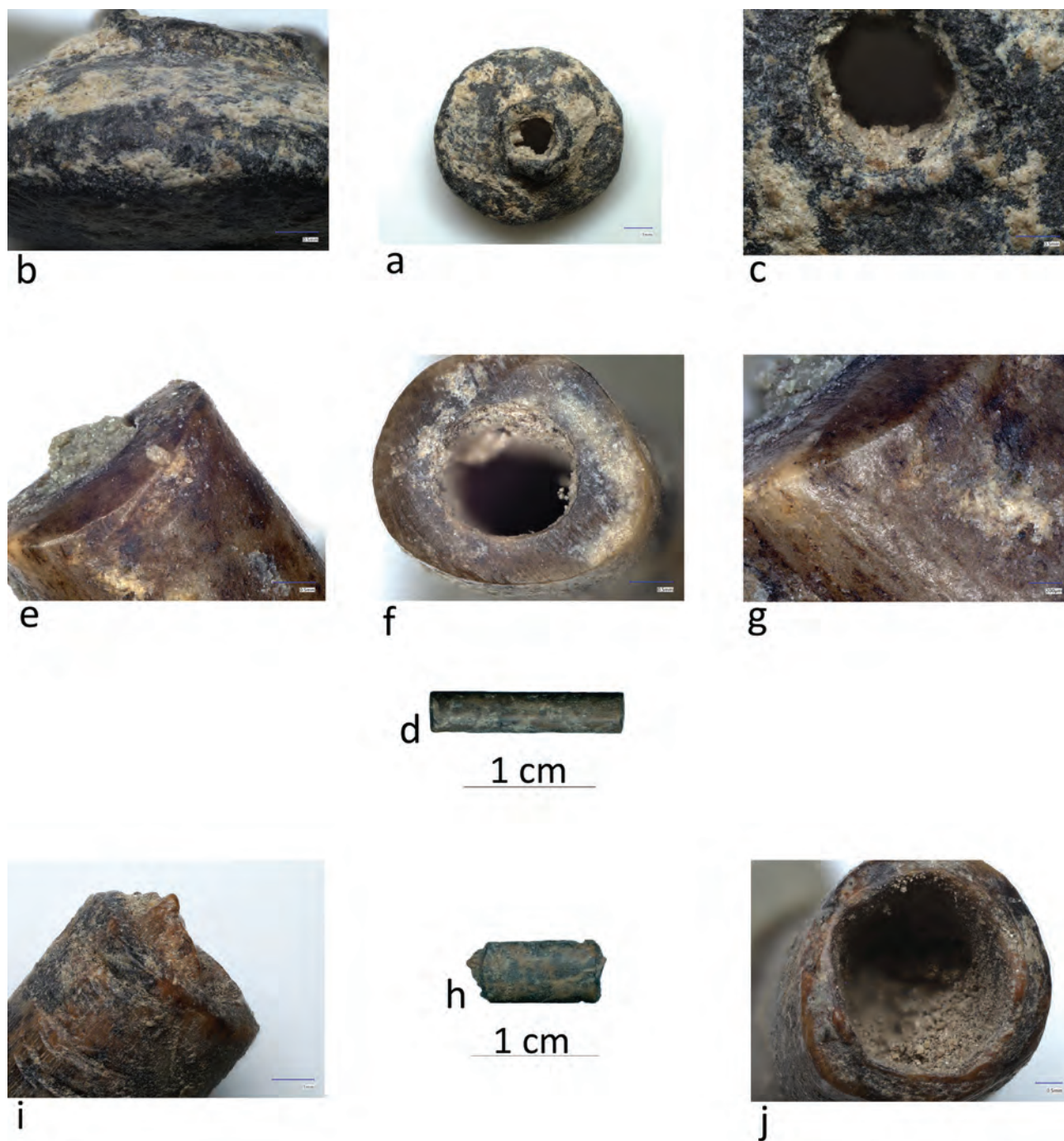


Figure 44. a. Bead made of clay (Gumelnița culture); b. Surface detail; c. Perforation detail; d. Bead made of bone (Gumelnița culture); e, i–j. Sawing marks; f. Abrasion marks; g. Use-wear at the end; h. Bone preform (Gumelnița culture).

piece was made by segmenting the diaphyses at both ends by sawing (Fig. 44/e), followed by the rigorous shaping of the segmentation edge (Fig. 44/f). There was no need for a perforation process, as the medullary canal of the bone was utilised. The piece shows use-wear at the periphery of the end, consisting of rounding of the wall, macroscopic lustre and fine striations arranged perpendicularly to the end (Fig. 44/g). An additional specimen (Fig. 44/h) appears to still be under processing. The marks of the sawing used in

the debitage operation are very clearly visible (Fig. 44/i–j). However, the segmentation edge was not shaped. The dimensions of these pieces are provided in Table 10.

No.	Length	Diameter	Perforation diameter
1.	14.5	2.8	1.3
2.	10.2	3.2	1.8

Table 10. Dimensions (in mm) of tubular beads made of bone.

8.3.3. Discussion on personal adornments

The comparative analysis of the personal adornments from the Boian and Gumelnița cultures reveals both similarities and differences that reflect distinct techno-cultural traditions. Typologically, both cultures utilized tubular bone beads and clay beads, demonstrating the continuity of shared traditions. However, differences reside in the variety of shapes and raw materials: the Boian culture is distinguished by a more pronounced typological diversity, including the cylindrical *Spondylus* beads and the pendant imitating a deer canine, artifacts with an evident prestige value that indicate the existence of exchange networks. Conversely, the Gumelnița culture introduces cylindrical stone beads as a distinctive element, reflecting local adaptations in the procurement of raw materials. Technologically, both cultures employed similar techniques: bone segmentation by sawing, rigorous surface abrasion, and bifacial perforation. From a functional perspective, the use-wear traces identified on the artifacts of both cultures (flattening of the perforation walls, macroscopic polish, and fine striations) confirm that all analysed categories were utilized as personal adornments, worn as pendants or necklaces.

8.4. CLAY REPRESENTATIONS

During the 2025 excavations at the Glina Tell settlement, five clay representations were identified in SI (Tab. 11; Fig. 45). The artifacts were subjected to macroscopic examination, in order to determine their morphological and technological characteristics.

Two zoomorphic figurines (Fig. 45/1–2) were identified in contexts dated to Gumelnița period (features Cx18 and 20). The first figurine was made of semi-fine clay paste, with grog added as temper, while the other was made of fine clay paste, without added temper. The surface treatment was done by smoothing. Regarding the firing technique, the zoomorphic figurines were burnt in an oxidising atmosphere. The anatomical features are schematically represented, through a perforation which described the

nose of one of the figurines (2). The other artefact (1) is perforated obliquely in opposite directions, from head to bottom. Additionally, use-wear traces were observed on the feet of the first figurine (1), while the second (2) has the legs fractured in antiquity and only one preserved horn.

In feature Cx4 (dated to Gumelnița period) and Cx6 (dated to the Boian period) two miniature leg fragments were discovered (4, 3), made of semi-fine clay paste, without added temper (Fig. 45/3–4). The surface treatment was done by smoothing. Regarding the firing technique, the artifacts were made in an incompletely oxidising atmosphere. Feature Cx4 yielded a fragmented miniature chair (5), made of fine clay paste, without added temper (Fig. 45/5). The surfaces were smoothed. Firing was conducted under reducing conditions. After macroscopic examination, the exterior edges of the clay object are eroded, due to secondary deposition. It can be observed that the clay representation has a perforation in the middle of the area where the leg should be.

The zoomorphic figurines represent quadrupeds specific to the Gumelnița culture, with little emphasis on anatomical details. The first one, schematically modelled with two perforations, resembles those identified in other Gumelnița archaeological contexts (Sultana – *Malu Roșu*, Gumelnița, Căscioarele, Geangoiești, Vidra) (Marinescu-Bîlcu, Ionescu 1967, p. 37, Pl. XII; Ilie, Dumitru 2014, Pl. III/3; Andreescu, Vintilă 2017, p. 120, Pl. IV). The second specimen has a long body, with the legs anciently fractured and a single preserved horn. The miniature chair resembles those identified in other tell settlements such as Sultana – *Malu Roșu*, Gumelnița, Vidra, Căscioarele, Cunești (Andrieșescu 1924; Comșa 1980; Dumitrescu 1925; Rosetti 1938; Ștefan 1925; Ștefan 2011).

8.5. METAL ITEMS

Metal artifacts were identified in areas SI-A and SI-B. A particularly significant artifact, consisting of a double-spiral (double volute) pin, was identified in feature Cx20, interpreted as a dwelling dated to the Gumelnița

No.	Type	Context	Measurements	in text
1	Zoomorphic figurine	SI-C, □ C7, SU 2543, 62381, ID 17, reg. no. 31.	L=5,7 cm/D=1,7 cm	1
2	Zoomorphic figurine	SI-B, B9, Feature Cx20, SU 2552, 61991, reg. no. 36	L=6,2 cm; l=2,5 cm	2
3	Miniature leg fragment	SI-A, □ A1, Feature Cx6, SU 2515, reg. no. 32	L=3 cm/H=2,5 cm; T=1,4 cm	3
4	Miniature leg fragment	SI-A, Feature Cx4, SU 2516	L=1,9 cm; T=1,4 cm	4
5	Miniature chair fragment	SI-A, Feature Cx4, SU 2516	L=3,4 cm; l=3,1 cm	5

Table 11. The list of clay representations found at Glina Tell in 2025.



Figure 45. Clay representations found at Glina Tell, 2025 campaign: zoomorphic figurines (1–2); miniature leg fragments (3–4); miniature chair fragment (5).

period, located in the south-eastern part of trench SI-B. This feature also yielded numerous ceramic fragments, animal bones, hearth fragments and charcoal (see above).

As part of a common ornament category specific to Kodžadermen–Gumelnița–Karanovo VI cultural complex,

the artifact is characterised by two volute spirals and a circular cross-section at the distal end, which tapers to a pointed tip. The object is completely preserved (Fig. 46/1). Such artifacts are found predominantly in settlements, as isolated finds, or as part of deposits (*e.g.*



Figure 46. Metal items found at Glina Tell during the 2025 fieldworks: double volute pin (1); awl fragment (2); fragments (3–4).

No.	Type	Site	Year	Context	Measurements	in text	Results of XRF analyses (%)				
							Cu	Sn	Ni	Fe	Pb
1	Double volute pin	Glina	2025	SI-B, □ B9, Feature Cx20, SU2552, 62091, ID 19, reg. no. 34.	L = 9,6 cm	1	93.98	n.d.	0.85	4.54	n.d.
2	Awl fragment	Glina	2025	SI-A, □ A7, SU2526, 62171, ID 23, reg. no. 39	L = 2,9 cm	2	88.49	n.d.	0.65	10.34	n.d.
3	Fragment	Glina	2025	SI-B, □ B4, Feature Cx46, SU2609, reg. no. 63.		3	81.65	n.d.	0.57	17.67	n.d.
4	Fragment	Glina	2025	SI-B, □ B4, Feature Cx46, SU2609, reg. no. 65.		4	91.01	4.26	1.81	1.47	0.59

Table 12. The list of metal objects found at Glina Tell in 2025, their archaeological contexts, measurements and chemical composition by XRF (nd = not detected).

Căscioarele – Ostrovel, Gărăgău, Geangoiești, Gumelnița, Jilava, Morteni, Pietrele, Sărulești, Teiu, Vărăști settlement, Vidra, Ruse, Găbarevo, Karanovo, Popovo, Dolen Čiflik, Čatalka, Teliš, Zavet, Goljamo Delčevo, and Varna necropolises) (Bem 2000, p. 155–179; Ilie, Neaga 2010,

p. 79–97; Comșa 1965; 1978, p. 113, fig. 4 (12); Darie, Georgescu 2017, p. 56–77; Todorova, Vajsov 2001).

Another awl fragment (2) was found in SU2526; this represents a common morphological category found within KGK VI area (Fig. 46/2). Two fragmented objects (3, 4) were

found in feature Cx46, alongside animal bones, adobe fragments, flint, shells, snail and bone tools (Fig. 46/3–4).

The metal objects are currently undergoing restoration at the National History Museum of Romania. Before the restoration process, the items were analysed using XRF method by Dragoș-Alexandru Mirea at the Bucharest Municipality Museum Laboratory with a handheld Skyray Instruments Genius spectrometer. The results indicate copper as the main constituent element, with values between 81–93% and high values of iron, which may indicate the composition of the artifacts' exterior surface due to soil deposition (Tab. 12).

To conclude, it should be noted that the objects found during the 1926–1927 and 1943 excavations at Glina (*e.g.* flat axe, awls, rings, pins, flat bone figurine with copper ornaments) were published in the archaeological reports and studies (Nestor 1928, p. 123–124, 129; Petrescu-Dîmbovița 1944, p. 69; Mareș 2002) and a series of them were subjected to the chemical analyses performed by S. Junghans, E. Sangmeister, and M. Schröder in the 1960s (Junghans *et alii* 1968, p. 238–239). The spectral analyses demonstrated the presence of native copper with minor elements such as silver, nickel, iron, and lead (Mareș 2002, p. 80). Recent studies adopt a techno-morphological approach, corroborated by XRF analysis, as presented by C.E. Ștefan (2016, p. 233–239; 2022a, p. 23–37) in relation to finds from National Museum of Antiquities. Among these is the assemblage of ornaments from Grave no. 6 at Glina, comprising 158 items (23 cylindrical copper beads and 135 pieces made of *Spondylus*, *Dentalium*, limonite, marlstone, and limestone) (Ștefan 2022a, p. 30).

8.6. ARCHAEOZOOLOGY

The studied faunal assemblage comprises 2,201 remains originating from various types of archaeological features (pits, foundation trenches, and dwellings), as well as from cultural layers associated with the Boian culture (Vidra phase), the Gumelnița culture (A2 phase), and the Glina culture. An archaeozoological study of the fauna from the Glina level (approximately 1,500 remains) was carried out nearly 30 years ago (Haimovici 1997); however, given the preliminary nature of that analysis, we did not consider it appropriate to make comparisons with it. Faunal remains from various classes of animals have been identified, including molluscs, fish, reptiles, birds and mammals (Fig. 51), the latter representing the most numerous category.

The taxonomic identification of the faunal remains, especially the mammal bones, was carried out using the reference collection (comparative anatomy) of the Archaeozoology Laboratory of the “Vasile Pârvan” Institute of Archaeology of the Romanian Academy. Additionally, methodological works by Silver (1969), Schmid (1972) and Barone (1986) were consulted. The distinction between sheep and goat was made based on the postcranial skeleton following the criteria of Boessneck (1969) and Zeder and Lapham

(2010). For age-at-death estimations, several works were used: Schmid (1972) for dental eruption; Ducos (1968) and Grant (1982) for cattle dental wear; Horard-Herbin (1997) for pigs and Payne (1973), Zeder and Pilaar (2010) for caprines. For correlating dental/skeletal ages with biological ages, the work of Udrescu *et alii* (1999) was used. Measurements of faunal remains were taken using callipers with a precision of 0.1 mm, following the recommendations of von den Driesch (1976). Withers height for sheep and pigs was calculated using Teichert's (Udrescu *et alii* 1999, p. 89, 97) indices. In the following sections, the faunal material will be presented according to their successive cultural levels, from the earliest (Boian culture) to the most recent (Glina culture).

8.6.1. Early Chalcolithic – Boian culture

The Boian culture is poorly represented in the faunal assemblage, with only 294 remains recovered (Tab. 13). The fauna originates exclusively from archaeological features (Cx) such as pits (Cx3, 6, 7, 8) and trenches (Cx23). The richest feature is Cx6, from which 159 remains were recovered (54.1% of the total). Mammal remains predominate (92.9%), followed by birds (1.4%), molluscs (3.7%), fish (1%), and reptiles (1%).

Mollusca. The remains of gastropods and bivalves are relatively few ($n=19$). The terrestrial snail *Helix* sp. and the aquatic snail *Viviparus* sp. were identified. Among bivalves, fragments of valves belonging to the river mussel *Unio* sp. and the lake mussel *Anodonta* sp. predominate.

Pisces. Only three remains were identified, two of which belong to a single pike individual (*Esox lucius*), with an estimated total length of 0.49 m and a weight of 0.8 kg.

Reptilia. Three fragments of carapace belong to the aquatic turtle *Emys orbicularis*. One of these shows a polished distal edge, probably resulting from processing the carapace for use as a container.

Aves. Only four diaphysis fragments were identified, belonging to small-sized birds, whose species could not be established.

Mammalia. Within the mammal assemblage, only 119 remains (43.6%) were taxonomically identified, weighing 1,239 g (75.3%). The list of identified species is relatively short, including both domestic species (cattle, sheep, goat, dog) and wild species (red deer, roe deer, wildcat, and hare) (Tab. 13). A number of suid remains could not be precisely identified and are therefore included under *Sus domesticus*/*Sus scrofa* (*Sus* sp.). Despite the small faunal sample, a brief characterisation of the animal economy can be made. Domestic animals dominate in terms of number of remains (79.8%). Among these, cattle (35.3%) slightly exceed caprines (34.5%), followed by pigs (7.6%) and dogs (2.5%). Game represents 16.8%, more than half of which is hare (10.9%), followed by cervids (2.5% each). By weight, large species dominate: cattle (61.3%), followed by caprines (11.2%), pigs (5.2%), and dogs (1.3%). Among wild species (16.2%),

Section	SI-A	SI-A	SI-A	SI-B	SI-B	SI-A	SI-A	TOTAL N	%	TOTAL W	%	TOTAL MNI	%
Feature	Cx3	Cx6	Cx6	Cx7	Cx8	Cx23	Cx23						
Species/SU	2509	2515	2517	2519	2521	2527	2534						
<i>Anodonta</i> sp.	1	1						2		0.8			
<i>Unio tumidus</i>								0		0			
<i>Unio</i> sp.	2	2	2					6		4.8			
<i>Helix</i> sp.		1						1		1			
<i>Viviparus</i> sp.		2						2		0.9			
Total Mollusca	3	6	2					11		7.5			
<i>Esox lucius</i>				2				2		0.7			
Pisces undetermined				1				1		0.3			
Total Pisces				3				3		1			
Reptilia (<i>Emys orbicularis</i>)	1	1		1				3		2.7			
Aves		2	2					4		1.6			
<i>Bos taurus</i>	7	26	3	2		1	3	42	35.3	760	61.3	2	12.5
<i>Ovis/Capra</i>	1	9	3	13	1	9	3	39	32.8	106	8.6	1	6.3
<i>Ovis aries</i>				1				1	0.8	20	1.6	1	6.3
<i>Capra hircus</i>		1						1	0.8	13	1.0	1	6.3
<i>Sus domesticus</i>	2	3		3	1			9	7.6	64	5.2	2	12.5
<i>Canis familiaris</i>		1		1			1	3	2.5	16	1.3	1	6.3
<i>Cervus elaphus</i>	1	1					1	3	2.5	54	4.4	1	6.3
<i>Capreolus capreolus</i>	3							3	2.5	98	7.9	2	12.5
<i>Felis sylvestris</i>		1						1	0.8	2	0.2	1	6.3
<i>Lepus europaeus</i>	4	6		2			1	13	10.9	47	3.8	3	18.8
<i>Sus domesticus/ Sus scrofa</i>		4						4	3.4	59	4.8	1	6.3
Total identified	18	52	6	22	2	10	9	119	100	1239	100	16	100
undetermined large-sized	3	32	5	4		4	5	53		273			
undetermined medium-sized	7	46	5	23	4	9	7	101		134			
Total mammals	28	130	16	49	6	23	21	273		1646			
Total fauna	32	139	20	53	6	23	21	294		1658.8			

Table 13. The numerical and percentage distribution of the number of remains (N), weight (W), and minimum number of individuals (MNI) of the fauna identified in the features of the Boian culture.

roe deer dominate (7.9%), followed by red deer (4.4%) and hare (3.8%) (Fig. 47; Tab. 13).

The estimation of the minimum number of individuals (MNI) was carried out despite the small size of the faunal sample (Fig. 47; Tab. 13). Thus, cattle are represented by one juvenile (6–18 months) and one adult (4–9 years), both identified based on dentition; sheep and goat are each represented by one subadult/adult individual (distally fused metapodials), to which is added one juvenile caprine of

indeterminate species (unfused scapula); pigs are attested by one individual aged 10–12 months and one male aged 12–18 months (identified based on dentition); the dog is represented by one subadult/adult individual.

Wild taxa exhibit a relatively high proportion based on MNI (43.5%), likely due to the small sample size, which tends to overestimate poorly represented species. Thus, the hare is the most numerous species, with three individuals (one juvenile – proximal unfused radius and two

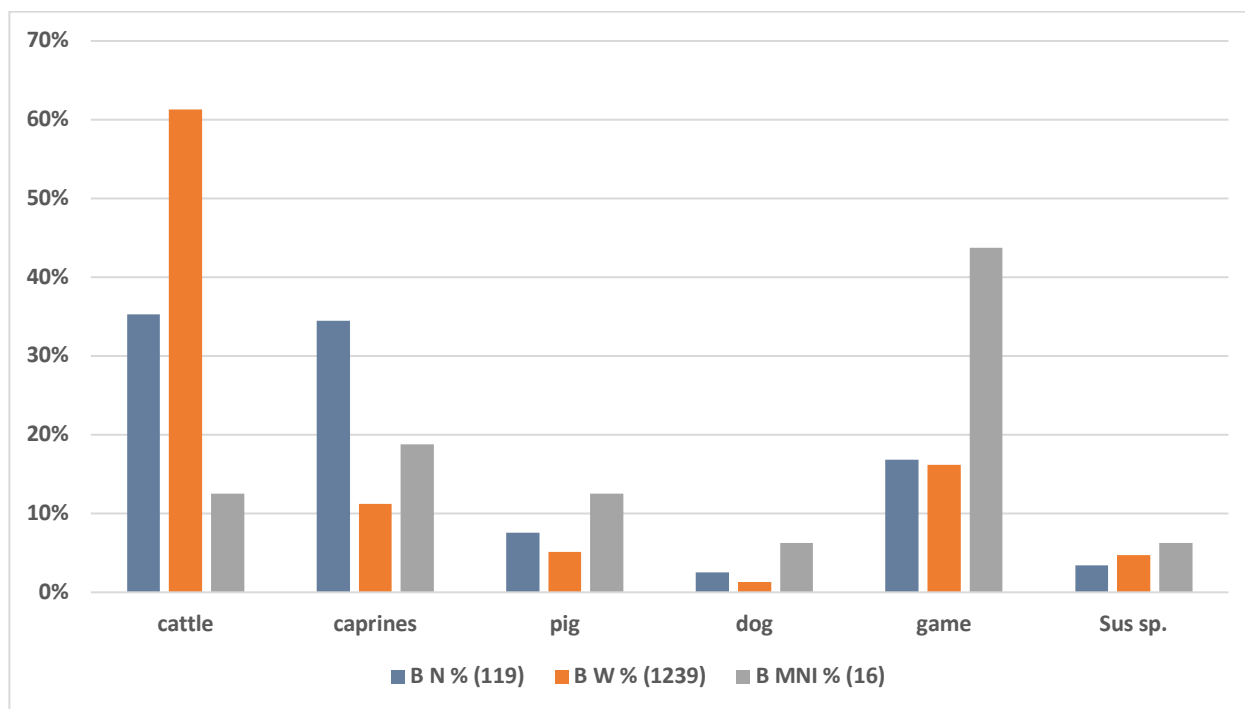


Figure 47. Percentage distribution of the number of remains (N), weight (W), and minimum number of individuals (MNI) of the fauna from the Boian culture discovered at the Glina Tell. Legend: B – Boian culture; game – red deer, roe deer, wildcat, and hare.

adults – distally fused femora), followed by roe deer with two subadult/adult individuals (distally fused metatarsals), one adult red deer (distally fused femur), and one subadult/adult wildcat (distally fused humerus). One newborn/fetus individual of *Sus* sp. was identified based on a scapula.

Within the faunal assemblage, a sheep metatarsal was identified, based on which a withers height of 54.9 cm was calculated using Teichert's index (Udrescu *et alii* 1999, p. 97).

8.6.2. Middle Chalcolithic – Gumelnița culture

Compared to the Boian and Glina cultural levels included in this study, the Gumelnița assemblage is relatively rich in osteological remains, with a total of 1,399 remains recovered. The faunal material originates from several archaeological features (Cx1, 4, 5, 11, 12, 13, 18, 19, 20, 21, 22, 24, 26, 27, 28, 30, 34, 43, 46) as well as from the cultural layer (CL). The number of remains per feature varies considerably, the smallest assemblage (Cx1) being represented by a single remain (0.07%), while the richest (Cx20) yielded 428 remains (30.6%) out of a total of 1,399 remains (Tab. 14).

Mollusca. A total of 55 bivalve shell fragments were recorded. These belong to species of the genus *Unio* (*Unio tumidus* and *Unio crassus*) and the genus *Anodonta*. Only a few could be measured: *U. tumidus* with a valve height of 24 mm and two *U. crassus* specimens with values of 19.2 and 21.5 mm. These measurements represent small to medium values, characteristic of a river with features similar

to those near the settlement. The relatively high proportion of *Anodonta* sp. (lake mussels) (32%) is noteworthy, which are characteristic of areas with ponds or lakes permanently supplied by a river. It is likely that, during the Eneolithic period, the area surrounding the settlement included a wetland environment with ponds and lakes that were periodically flooded during higher water levels. Several fragments of *Anodonta* sp. and *Unio* sp. fragments (approximately 21% of the identified valves) display ventral edge wear caused by abrasion, likely resulting from their use as tools.

Pisces. Only a single caudal vertebra was identified, belonging to a carp (*Cyprinus carpio*) individual with an estimated total length of approximately 0.65 m and a weight of 4.5 kg.

Reptilia. Only seven remains from the carapace of the European pond turtle (*Emys orbicularis*) were identified, in just three of the investigated units (Tab. 14). In the case of the carapace, some fragments with internal traces (scratches) were identified in US 2532 (Cx12), and in US 2564 (Cx20), the latter also showing worn edges. Most likely, the carapace was processed for use as a container.

Aves. Only a single diaphysis fragment from a long bone belonging to a small-sized bird was identified.

Mammalia. Mammal remains predominate (1,335 remains, representing 95.4% of the total analysed assemblage). From a taxonomic point of view, only 428 remains (32.05%) were identified to species level; however, these account for 6,935 g (83.9%) of the total weight (Tab. 14).

Table 14. Numerical and percentage distribution of the number of remains (N), weight (W), and minimum number of individuals (MNI) of the fauna from the Gumelnița culture at the Glină Tell.

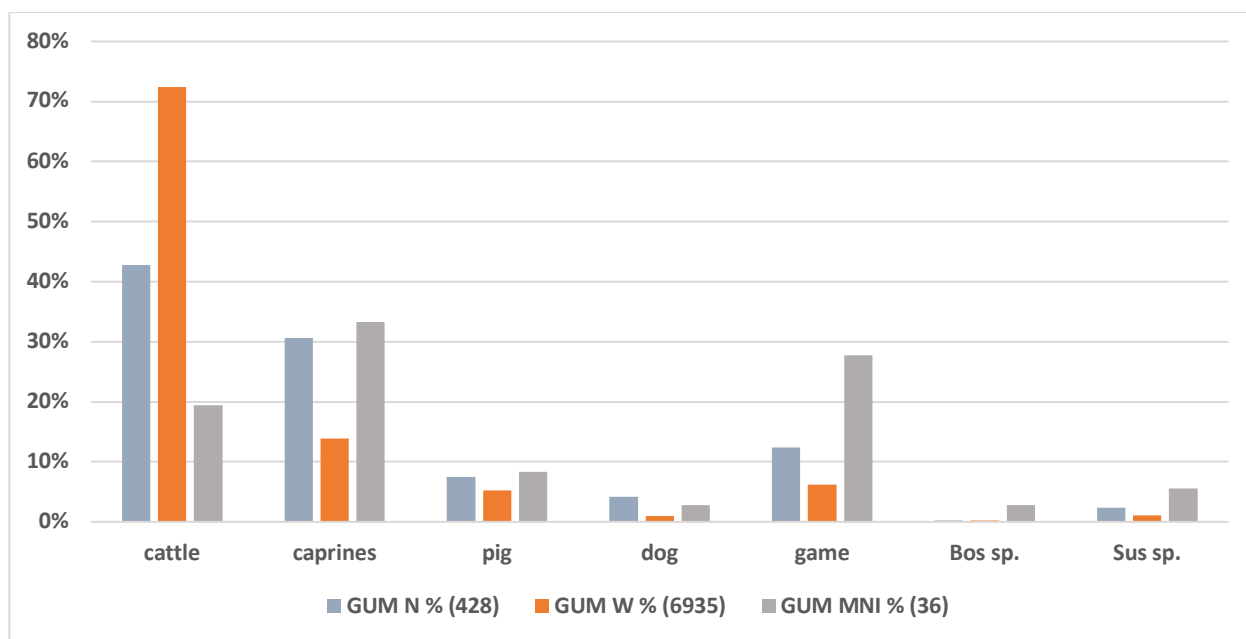


Figure 48. Percentage distribution of the number of remains (N), weight (W), and minimum number of individuals (MNI) of the fauna from the Gumelnița culture discovered at the Glina Tell. Legend: GUM – Gumelnița culture; game – aurochs, red deer, roe deer, wild boar, marten, badger, fox, and hare.

The identified taxonomic spectrum is relatively rich and includes both domestic species (cattle, sheep, goat, pig, and dog) and wild species (aurochs, red deer, roe deer, wild boar, badger, marten, fox, and hare).

Considering the frequency of the number of remains, domesticates clearly dominate the faunal assemblage, with 364 remains (85%). Cattle rank first, with 183 osteological remains (42.8%), followed by caprines with 131 remains (30.6%), pigs with 32 remains (7.5%), and finally dogs with 18 remains (4.2%). It is worth noting that on the mandible of a juvenile/subadult dog, a disarticulation mark was observed on the external surface, which may indicate its slaughter for consumption.

Wild species are represented by 53 remains (12.3%), most of which are attributed to hare, with 18 remains (4.2%), followed by fox with 16 remains (3.7%) and red deer with 10 remains (2.3%), while the other species are poorly represented (under 1%) (Fig. 48).

A similar pattern can be observed in terms of the weight of bone remains. Cattle clearly dominate with 72.4%, followed by caprines with 13.9%. At a considerable distance are pig (5.2%) and dog (1%). Among wild species, red deer (2.4%) and wild boar (1.4%) are the most significant, while the remaining species have a negligible proportion (below 1%) (Fig. 48).

Based on the faunal assemblage, an estimation of the minimum number of individuals (MNI) was also carried out (Tab. 14 and Fig. 48). Thus, cattle are represented by seven individuals (19.4%), identified exclusively on the basis of dentition (one aged 6–12 months, two aged 1–1.5 years, one aged 2–4 years, one aged 4–6.5 years, one aged 6.5–9 years, and one old adult over 11 years).

Caprines have the highest proportion in terms of MNI (33.3%). Sheep are represented by four individuals (one individual under 3 months based on a proximally unfused first phalanx and three subadult/adult individuals based on left astragali), while goat is attested by five individuals identified on the basis of dentition (one aged 6–12 months, two aged 1–1.5 years, one aged 3–4 years, and one aged 4–6 years). Caprines that could not be identified to species level are represented by three individuals (one foetus/newborn individual based on a left unfused scapula and two individuals aged 9–12 months based on dentition).

Pig, represented by three individuals (8.3%), was identified exclusively on the basis of dentition (one aged 8–10 months, one aged 12–14 months, and one aged 24–30 months), while dog (2.8%) is attested by a single adult individual.

Large- and medium-sized game (aurochs, red deer, roe deer, and wild boar) are each represented in this assemblage by one subadult/adult individual. Carnivores are represented by three species only: badger and marten, each represented by one adult individual (identified based on cranial fragments), while fox is represented by two individuals (one infant/juvenile identified on the basis of a proximally unfused tibia and one subadult/adult based on a distally fused radius).

Hare is represented by two individuals identified on the basis of two right calcanei. *Bos sp.* is represented by one foetus/newborn individual, while *Sus sp.* is represented by one foetus/newborn individual based on a right femur and one individual aged 2–4 months based on dentition.

At sheep, four withers heights were estimated, all calculated using Teichert's (Udrescu *et alii* 1999, p. 97)

index. Two values were obtained based on astragali (60.3 and 59.3 cm) and two based on calcanei (60.7 and 58.3 cm), resulting in an average of 59.65 cm.

At pig, two withers heights were identified: one based on an astragalus (72.7 cm) and one based on a metacarpal IV (79.4 cm), both calculated using Teichert's (Udrescu *et alii* 1999, p. 86) index.

8.6.3. Early Bronze Age – Glina culture

It is represented by 508 faunal remains recovered from a series of archaeological features, including pits (Cx9, 14, 29) and ditches (Cx16), as well as from the cultural layer (CL). The majority of the bones were recovered from features (97.2%), the richest being the Cx16 (66.9%) (Tab. 15; Fig. 49). Within this feature, two remains belonging to the carapace and plastron of a European pond turtle (*Emys orbicularis*) and one axonost from a fish assigned to the cyprinid group were also identified. Given the scarcity of faunal material belonging to other animal classes, the following section will focus exclusively on mammals.

Mammalia. Out of the total mammal assemblage, 209 fragments (41.5%) were taxonomically identified,

representing a total weight of 2,063 g (76.9%). As in the case of the Boian culture, the list of identified species is relatively limited, including the typical domesticates (cattle, sheep, goat, pig, and dog). At this stage of research, the absence of the domestic horse is noteworthy.

Wild fauna is represented by only five species: red deer, roe deer, wild boar, fox, and hare (Tab. 15).

Animal husbandry is well illustrated by the quantity of bones belonging to domestic mammals. Thus, caprines dominate with 45.5%, followed by cattle (34.9%), pig (9.6%), and dog (4.8%). Wild fauna is very poorly represented in terms of the number of remains (only eight), among which hare (1.4%) and wild boar (1%) have the highest proportions (Tab. 15).

In terms of weight, cattle predominate with 67.3%, followed at a considerable distance by caprines (18.8%), pigs (9.8%), and dogs (2%). The proportion of wild fauna also remains low (1.6%), within which wild boar is relatively well represented (0.8%).

The estimated minimum number of individuals (MNI) indicates that caprines have the highest representation, with six individuals (30%). Of these, two are sheep (one

Section	SI-B	SI-A	SI-C	SI-A	SII	TOTAL N	%	TOTAL W	%	TOTAL MNI	%
Feature	Cx9	Cx14	Cx16	Cx29							
Species / SU	SU2523	SU2537	SU2541	SU2570	SU5002						
Pisces			1			1		0.5			
Reptilia (<i>Emys orbicularis</i>)			3			3		2.6			
Mammals											
<i>Bos taurus</i>	4	8	49	8	4	73	34.9	1389	67.3	4	20.0
<i>Ovis/Capra</i>	15	6	50	9	6	86	41.1	322	15.6	2	10.0
<i>Ovis aries</i>			6			6	2.9	41	2.0	2	10.0
<i>Capra hircus</i>		2	1			3	1.4	25	1.2	2	10.0
<i>Sus domesticus</i>	6	2	11	1		20	9.6	203	9.8	3	15.0
<i>Canis familiaris</i>	4		5	1		10	4.8	41	2.0	1	5.0
<i>Cervus elaphus</i>		1				1	0.5	7	0.3	1	5.0
<i>Capreolus capreolus</i>			1			1	0.5	3	0.1	1	5.0
<i>Sus scrofa</i>			2			2	1.0	16	0.8	1	5.0
<i>Vulpes vulpes</i>			1			1	0.5	2	0.1	1	5.0
<i>Lepus europaeus</i>		1	2			3	1.4	6	0.3	1	5.0
<i>Sus domesticus/Sus scrofa</i>	1		2			3	1.4	8	0.4	1	5.0
Total identifiable	30	20	130	19	10	209	100.0	2063	100.0	20	100.0
undet. large-sized	20		75	4	4	103		408			
undet. medium-sized	49		131	11		191		209			
Total mammals	99	20	336	34	14	503		2680			
deer antler	1					1		140			
Total fauna	100	20	340	34	14	508	0	2823.1			

Table 15. Numerical and percentage distribution of the number of remains (N), weight (W), and minimum number of individuals (MNI) of the fauna from the features and cultural layer (CL) of the Glina culture at the Glina Tell. Legend: G – Glina culture; game – red deer, roe deer, wild boar, fox, and hare.

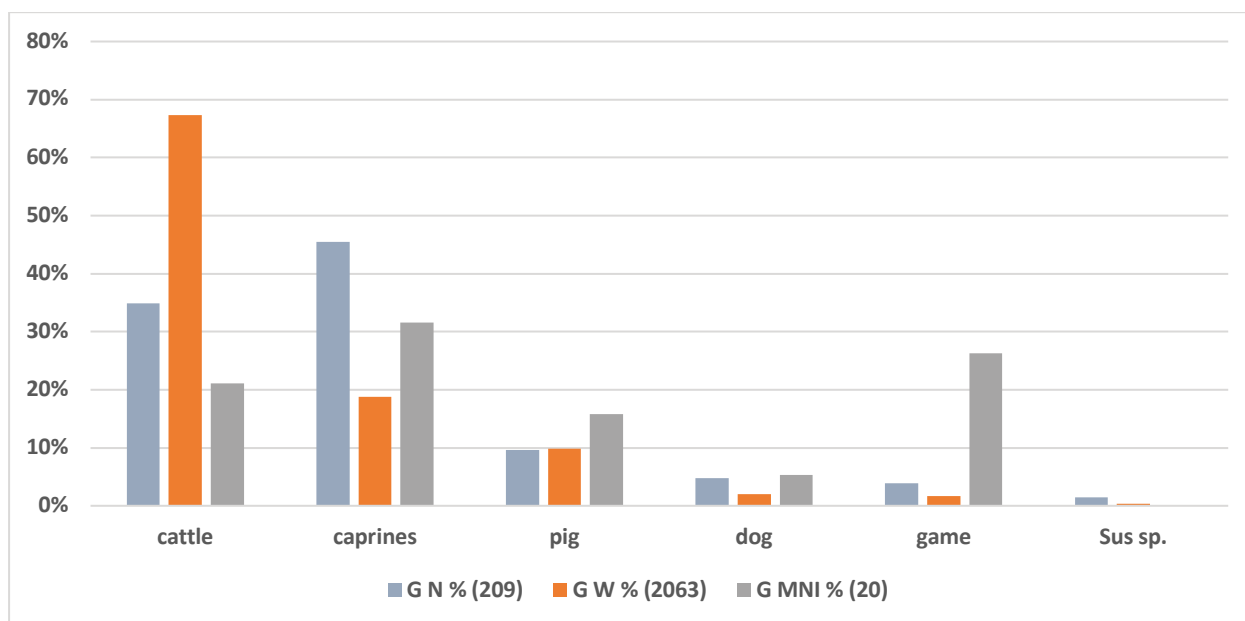


Figure 49. Percentage distribution of the number of remains (N), weight (W), and minimum number of individuals (MNI) of the fauna from the Glina culture discovered at the Glina Tell. Legend: G – Glina culture; game – red deer, roe deer, wild boar, fox, and hare.

aged 6–12 months and one aged 12–24 months, identified based on dentition), two are goats (one approximately 4 months old – distal humerus in the process of epiphyseal fusion – and one aged 18–24 months, based on dentition), and two are caprines not identified to species level (one newborn and one individual aged 2–4 years, both identified based on dentition).

Cattle are represented by four individuals (20%), all identified based on dental eruption and wear (one aged 6–12 months, one aged 1.5–2 years, one aged 3–4 years, and one aged 6.5–9 years). Pig, represented by three presumed individuals (one aged 6–10 months, one female aged 12–16 months, and one aged 18–20 months, identified based on dentition), account for 15%. Dog is attested by a single adult individual.

Wild fauna, in terms of MNI, appears excessive (25%) in this relatively small sample, each species being represented by a single subadult/adult individual, except for wild boar (one subadult aged 18–20 months), for which a more precise age estimation was possible based on dentition (Tab. 15). One infant individual of *Sus* sp. was identified based on an extremely porous and unfused ulna.

A sheep metacarpal recovered from the faunal assemblage allowed the estimation of a withers height of 55.7 cm, calculated using Teichert's (Udrescu *et alii* 1999, p. 97) index.

8.6.4. Archaeozoology – intra-site comparisons

In terms of the number of remains, cattle and caprines clearly dominate the faunal spectrum in each cultural assemblage, competing for primacy. Thus, in the

Boian culture sample, they are almost equal (35% cattle and 33.3% caprines); in the Gumelnița culture assemblage, cattle (42.8%) exceed caprines (30.6%), while in the Glina culture assemblage the ratio is reversed (caprines account for 45.5% and cattle for 34.9%). Based on the current data, it can be observed that pigs and dogs do not play a significant role in the economy of these communities (below 10%). As for wild fauna, it can be observed that its importance decreases from the Boian culture (16.8%) to the Glina culture (3.8%) (Fig. 50).

In terms of weight, cattle clearly dominate, ranging from 61.3% (Boian assemblage) to 72.4% (Gumelnița assemblage) (Fig. 50), while caprines show a gradual increase from the Boian assemblage (11.2%) to the Glina culture (18.8%). A similar trend is observed in pigs, whose proportion increases from 5.2% in the Boian assemblage to 9.8% in the Glina assemblage. Dogs again have an almost negligible contribution to the palaeoeconomy of these cultures (below 2%). A relevant aspect is represented by wild fauna, which maintains its importance in the Boian assemblage (16.2%), but decreases progressively in the Gumelnița (6.2%) and Glina assemblages (below 2%).

From the perspective of MNI, caprines dominate and increase significantly from 18.8% (Boian assemblage) to over 30% in both the Gumelnița (33.3%) and Glina (30%) assemblages. Cattle follow a similar trend, increasing from 12.5% (Boian assemblage) to 19.4% (Gumelnița assemblage) and exceeding 20% in the Glina culture. Pigs show variations between 8.3% (Gumelnița assemblage) and 15% (Glina assemblage), while dogs range between 2.8% (Gumelnița assemblage) and 6.3% (Boian assemblage). Although the MNI of cattle is lower than that of caprines,

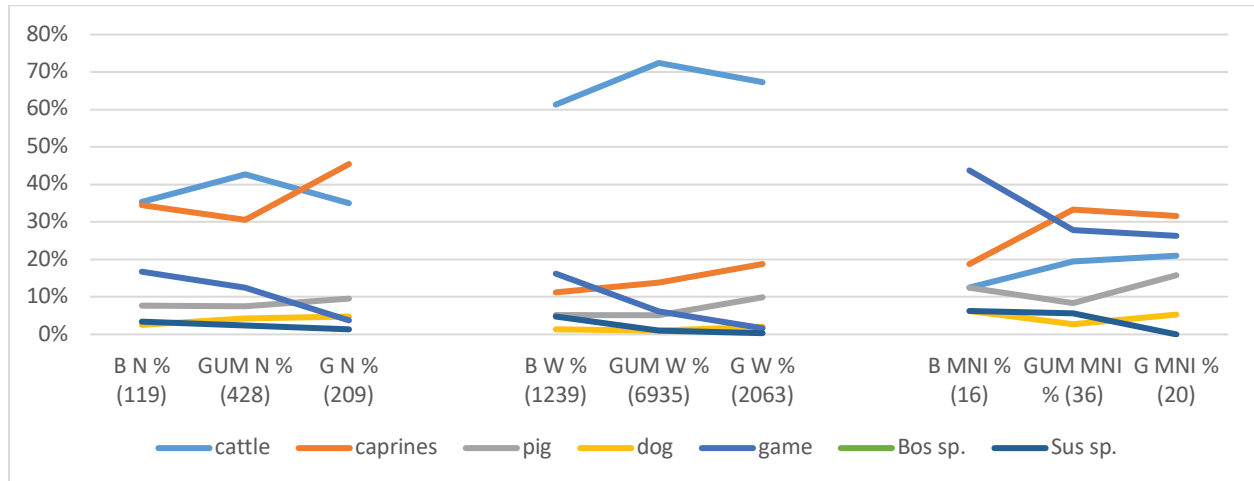


Figure 50. Percentage distribution of the number of remains (N), weight (W), and minimum number of individuals (MNI) of the fauna from the Boian, Gumelnița, and Glina cultures discovered at the Glina Tell. Legend: B – Boian culture; GUM – Gumelnița culture; G – Glina culture; game – red deer, roe deer, wild boar, marten.



Figure 51. Examples of faunal remains with specific traits from all cultural levels (scale in centimetres). 1. Cattle (Bos taurus), atlas with multiple defleshing marks (Cx27); 2. Sheep (Ovis aries), fused right metacarpal (Cx16); 3. Pig (Sus domesticus), unfused right ulna (CL); 4. Roe deer (Capreolus capreolus), fused right metatarsal (Cx12); 5. Marten (Martes sp.), skull (Cx20); 6. Hare (Lepus europaeus), right mandible (Cx20); 7. Fox (Vulpes vulpes), left mandible (Cx24).

cattle remain the most exploited species in terms of meat production, as in archaeozoology one head of cattle is considered equivalent to six caprines or three pigs.

With regard to wild fauna, the situation is particularly interesting. In the Boian assemblage, the proportion of domestic species (50%) is almost equal to that of hunted species (43.8%); however, it should be noted that the Boian sample is numerically very small. The proportion of wild fauna decreases in the Gumelnița (27.8%) and Glina (25%) assemblages (Fig. 50).

8.6.5. Preliminary archaeozoological conclusions

Our archaeozoological study highlights, despite the relatively small sample sizes, the evolution of animal-based palaeoeconomy across the three cultural phases (Boian, Vidra phase; Gumelnița, A2 phase; Glina). Animal husbandry plays an important role in the life of these communities, particularly cattle and caprines, which compete for primacy, followed by pigs, whose proportion increases throughout the cultural sequence.

Wild fauna has a relatively higher proportion in the Boian culture and a reduced presence in the Gumelnița and Glina cultures. The apparent overrepresentation of wild species may also be due to the small sample sizes, an aspect that should be carefully monitored in future research.

From the perspective of the exploitation of environmental animal resources, the data provided by this study offer limited information. The aquatic environment supplied a certain amount of food through shellfish gathering and fishing, especially during the summer period, particularly for Chalcolithic communities. The turtle *Emys orbicularis* also appears to have been consumed, although to a lesser extent. However, it can be observed that both shells and turtle carapaces were used as tools or containers in daily activities. After use, they were discarded, representing a type of expedient tool made from easily accessible food waste available during certain periods of the year.

8.7. ARCHAEOBOTANICAL DATA

From the 2025 archaeological campaign, 17 soil samples were collected with a total volume of 111.5 litres. All of them were processed by flotation at the „Vasile Pârvan” Archaeological Institute of the Romanian Academy, resulting 32 subsamples of 2 mm and 0.3 mm, respectively. The sorted material produced a mixed archaeobotanical assemblage comprising charred, dry/mineralized and modern plant remains, including cereals, pulses, fruits, weed seeds and indeterminate charred fragments. Detailed information regarding sample distribution, sediment volume, plant concentration and taxonomic composition is provided in Table 16. Since only two samples have so far been completely analysed, the results remain preliminary and should be interpreted with caution.

Together with the samples above, 39 charcoal and seeds samples were collected by hand *in situ* and through dry sieving. These samples were collected from SI. Only 13

samples contained a total of 35 macrobotanical remains (from features Cx3, Cx4, Cx6, Cx7, Cx16, Cx46 and other stratigraphical units). The taxonomical analysis was carried out with the Bresser Advance ICD microscope and different botanical atlases (Cappers, Bekker 2013; Sârbu *et alii* 2013; Bojňanský, Fargšová, 2007; Jacomet 2006). All in all, 10 samples from Early Chalcolithic features were analysed taxonomically (Cx3, Cx6, Cx7, Cx8), 7 samples from Middle Chalcolithic features (Cx 4, Cx5, Cx13, Cx31 and Cx46), 4 samples from Early Bronze Age features (Cx9 and Cx16) and other three samples from undated features (Cx21, Cx22 and one from SII, square X1) were also analysed. The taxonomical identifications are shown in Table 16.

Most of the macrobotanical remains are dry and modern (84%) and the rest of them are charred. This difference is a result of the agglomeration of corn gromwell (*Lithospermum arvensis*) nutlets found in Cx9 (=3192) and more of them spread in other archaeological features (Fig. 52). This agglomeration can be interpreted as animal activity. The richest features are Cx6 and Cx16, a fact triggered by the larger number of samples collected and processed. In general, most of the charred remains belongs to the cereal group (55%), followed by the unidentified group (34%). The unidentified group is represented here by the amorphous remains, found in features Cx5 and Cx2. The weed group is represented by 7% of charred macrobotanical remains; the gathered fruits (2%), pulses (1%) and oily group (1%) have a low distribution (Fig. 53). From now on, we will only discuss the charred macrobotanical remains.

The domesticated cereals group is mostly represented by *Cerealia*. These fragmented remains were found primarily in waste areas. Moreover, the majority of the *Cerealia* fragments come from the Early Bronze Age features. The next species is barley (*Hordeum vulgare* – with a total of 20 caryopses) (Fig. 55/a, b) followed by emmer (*Triticum dicoccum*) and wheat (*Triticum* sp.). Other species documented are einkorn (*Triticum monococcum*) (Fig. 55/c, d) represented in all chronological periods, naked and hulled barley, found only in Early Bronze Age contexts. Finally, millet (*Panicum milliaceum*) (Fig. 55/g) was found in small quantities in Cx6 and Cx16, respectively. This finding can be explained by taphonomic intrusion. The pulses category has a low distribution and representation. Peas (*Pisum sativum*) is found in the Late Eneolithic period (Cx46), but with one 2 seed cotyledons, and one whole seed from feature Cx2. Bitter vetch (*Vicia ervilia*) was identified only at Early Eneolithic level (Cx6). The other taxonomic determinations were collected from the Late Eneolithic (Cx4) and Early Bronze Age features (Cx16).

The flax seeds (*Linum usitatissimum*) (Fig. 55/e) were found in a Late Eneolithic feature with 3 seeds and one seed was found in the Early Bronze Age waste area (Cx16). The gathered plant group is represented here by plum family (*Prunus* sp.), with stone fragments found in Early and Late Eneolithic features (Cx6 and Cx5, respectively) (Fig. 55/f). Cornelian cherry stones (*Cornus* sp.) were found

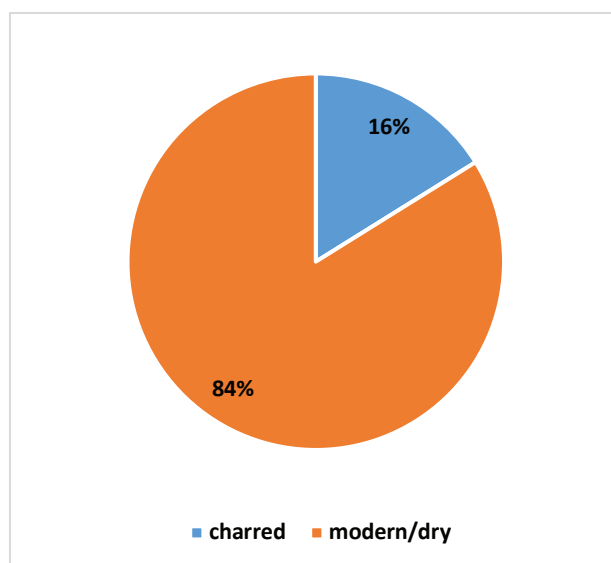


Figure 52. The distribution of charred and modern/dry macrobotanical remains in the identified samples (n= 4190).

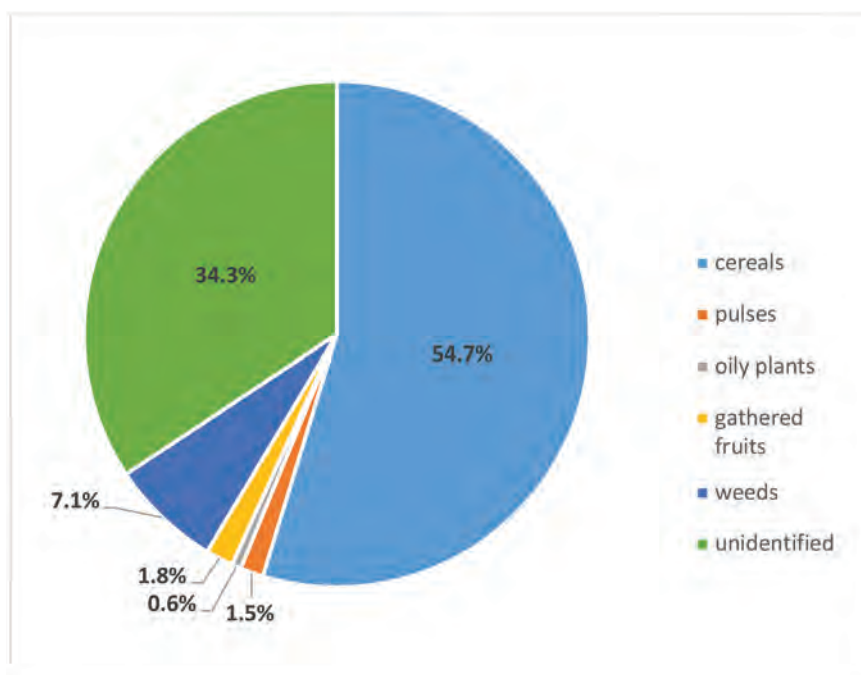


Figure 53. The distribution of charred plant remains (n= 676).

in the Early Bronze Age feature (Cx16). Finally, blackthorn (*Prunus spinosa*) was identified in the Early Eneolithic feature (Cx6) (Fig. 54).

The weeds category is the most diverse but occurs in small quantities. For the Early Eneolithic the species identified are black mustard (cf. *Brassica nigra*), fat hen (*Chenopodium album*), needle grass (*Stipa* sp.) and

sedges (*Carex* sp.). For Late Eneolithic, savory (*Lamiaceae* cf. *Satureja*), fat hen (*Chenopodium album*), danewort (*Sambucus ebulus*) were identified. The Early Bronze Age is represented by wild cereals (brome – *Bromus* sp.), cleavers (*Galium* sp.), and fat hen (*Chenopodium album*). The unidentified group has a large representation, with a peak in the Early Bronze Age. This could be explained

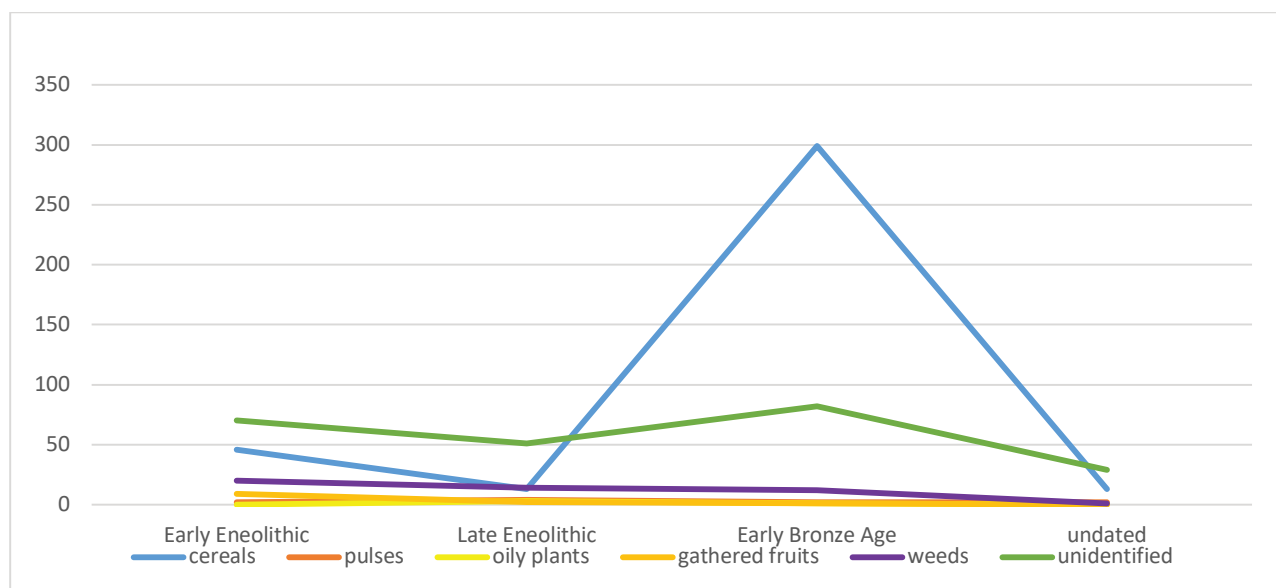


Figure 54. Plant group distribution based on the chronological periods of archaeological features (n=676).

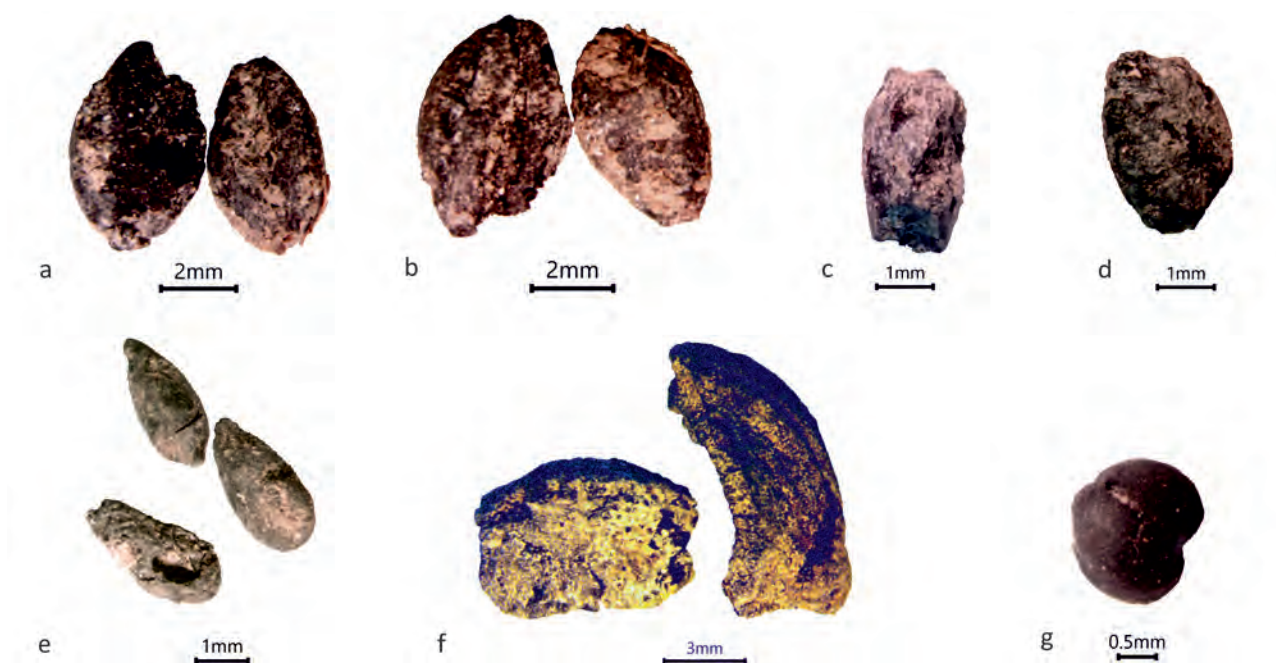


Figure 55. Examples of charred macrobotanical remains: a. barley caryopses (*Hordeum vulgare*), ventral side, Cx31; b. barley caryopses (*Hordeum vulgare*), dorsal side, Cx31; c. einkorn caryopses (*Triticum monococcum*) dorsal side, Cx2; d. einkorn caryopses (*Triticum monococcum*), ventral side, Cx2; e. flax seeds (*Linum usitatissimum*), Cx13; f. prune family stone fragments (*Prunus* sp.), Cx6; g. millet grain (*Panicum miliaceum*), Cx6.

by the number of samples processed and identified but also by the type of features from which the samples were collected. As such, most of these fragments are a result of waste managements.

Ecologically, the species from the gathered plant group (cornelian cherry, plum species and blackthorn) develop in forest-steppe environments, either as

ecotones between forests and open spaces, or they can grow near human settlements (ruderal species). They can form an ecological association with different species of cleavers, or plants from the mint family (*Lamiaceae*). Black mustard is also a ruderal plant species and can grow in plant associations with chenopod species (Sârbu *et alii* 2013).

If we take into account the modern and dry plant species found, we see that most of them develop in a dry and hot environment, typical to a steppic area. These are saltbush (*Atriplex* cf. *patuta*), fat hen (*Chenopodium album*), field needleleaf (*Polycnemum arvense*), bindweed (*Convolvulus* sp.) and milkvetch (*Astragalus* sp.). The saltbush species, chenopods species, common purslane (*Portulaca oleracea*), bindweeds, milkvetch, corn gromwell (*Lithospermum arvensis*), common gromwell (*Buglossoides officinale*) and common vetch (*Vicia sativa*) are also included in the segetal and ruderal groups (Sârbu *et alii* 2013; Săvulescu 1953; 1960). Large-leaved Lime (*Tilia platyphyllos*) and elderberry (*Sambucus nigra*) are trees and shrubs that grow in the forest-steppe environment, elderberry as an ecotone between both forests and open areas, and ruderal species. Danewort (*Sambucus ebulus*) grows as a ruderal species, and it develops ecological associations with chenopods (Sârbu *et alii* 2013). The wild cereals (*Stipa* sp., *Bromus* sp.) are species typical for steppe environments (Sârbu *et alii* 2013).

Archaeologically, most of the identified domestic plant species are reported at other Early and Middle Chalcolithic sites in Romania (specifically, during the Boian and Gumelnița cultures). For example, einkorn, emmer and barley were found extensively at Gumelnița tell, Călărași County; Hârșova tell, Constanța County; Bordușani – Popină, Ialomița County; Vlădiceasca, Radovanu, Sultana – Malu Roșu, Călărași County; Pietrele, Giurgiu County; Teiu, Argeș County; Geangoești, Dâmbovița County etc. (Lazăr *et alii* 2017; 2020; Golea *et alii* 2014; Bogaard 2001; Toderăș *et alii* 2009; Monah 1999; Cârciumar 1996). Until now, no archaeobotanical material was analysed from Glina culture (Early Bronze Age). Millet (*Panicum milliaceum*) was found at different archaeological sites from this period, but they were later radiocarbon dated to the Late Bronze Age (Golea *et alii* 2023). Flax seeds are rarely found, until now, only at Bordușani – Popină, Ialomița County and at the Gumelnița Tell settlement, Călărași County were identified but in small quantities (Golea 2025). Peas and bitter vetch are commonly found in the Boian and Gumelnița cultures. The gathered plant species are also commonly found at Chalcolithic sites in the southern part of present-day Romania, for example all three species (plum family, cornelian cherries and blackthorn) were documented at Pietrele, Giurgiu County; Gumelnița tell, Sultana – Malu Roșu, Călărași County and so on (Müller *et alii* 2025; Lazăr *et alii* 2020, 2017; Toderăș *et alii* 2009).

In conclusion, the identification of a diverse list of species of both domesticated and wild plants at Glina Tell provides a first baseline for discussing plant remains at the site. At the same time, the plant determinations for Glina culture (Early Bronze Age) are a novelty, as does the plant list for this site. Hopefully, future excavations will bring forth more information regarding the type of agriculture, land management and food preferences.

9. RELATIVE AND ABSOLUTE CHRONOLOGY

9.1. Relative chronology

Given the limited extent of the 2025 excavation, much of which focused on an area affected by erosion and lacking a consistent archaeological stratigraphy (SI), the contribution of the present investigations to the relative chronology of the site remains modest in comparison with previous research (Nestor 1928; 1933; Petrescu-Dîmbovița 1944; Ștefan 2016). Nevertheless, the known succession of the Early Chalcolithic (Late Boian culture), Middle Chalcolithic (Gumelnița culture), and Early Bronze Age (Glina culture) occupations was once again confirmed.

At the same time, the current investigations represent the first attempt to systematically integrate stratigraphic and contextual observations with the analysis of archaeological artifacts and ecofacts recovered from controlled excavations. Based on pottery typology, particularly vessel shapes and decorative patterns, the Late Boian contexts identified in area SI can be assigned to the Vidra phase of the culture (Comșa 1974). The Middle Chalcolithic assemblages display certain internal differences: most of the investigated contexts correspond to a typical Gumelnița A2 horizon (Voinea 2005), while feature Cx20 may indicate a later A2 stage and possibly an early B1 horizon. The Early Bronze Age ceramic assemblage displays the characteristic traits generally associated with the Glina culture (Băjenaru 2014), unsurprisingly given that this cultural group was originally defined on the basis of materials discovered at the site of Glina – La Nuci itself.

9.2. Absolute chronology

Four AMS radiocarbon determinations were obtained on faunal remains recovered from secure archaeological contexts, while an additional earlier date from a human bone discovered in the previous excavations was integrated into the present analysis. The available dataset therefore comprises five radiocarbon determinations corresponding to the Boian–Vidra and Gumelnița A2 cultural horizons documented at the site (Table 17; Fig. 56).

The earliest determination, Poz-52571 (5890 ± 40 BP), published previously by Lazăr *et alii* (2013), derives from a human bone recovered from a funerary context tentatively attributed to the Boian culture–Vidra phase. Although the precise archaeological context is insufficiently documented due to the circumstances of the old excavations, the calibrated interval (4850–4680 cal BC) fits well within the expected chronology of the late Boian horizon in southern Romania (Lazăr *et alii* 2020; Opreș 2025; Opreș *et alii* 2017; 2022). The new date obtained during the 2025 fieldwork from pit Cx3 in SI-A (RoAMS-3928.4: 5876 ± 39 BP) provides an important confirmation of this attribution. Recovered from a secure archaeological context associated with Boian–Vidra pottery, this determination calibrates between 4843 and 4616 cal BC and is statistically consistent with

Lab. Code	Archaeological context	Culture-Phase	14C Age BP	$\pm 1 \sigma$	Start	End	Sample type	Species	References
Poz-52571	grave (?)	Boian-Vidra	5890	40	4850	4680	bone	<i>Homo sapiens</i>	Lazăr <i>et alii</i> 2013
RoAMS-3928.4	SI-A, Cx3, SU2509	Boian-Vidra	5876	39	4843	4616	bone	<i>Ovi-caprine</i>	This study
RoAMS-3929.4	SII, SU5007, 61.457 m	Gumelnița-A2	5609	34	4532	4355	bone	Herbivore	This study
RoAMS-3931.4	SII, SU5005, 64.377 m	Gumelnița-A2	5640	27	4541	4368	bone	Herbivore	This study
RoAMS-3930.4	SI-C, Cx16, SU2541, 61.444 m	Glina	5506	36	4446	4263	bone	Herbivore	This study

Table 17. Characteristics of samples selected for radiocarbon dating and the results of the radiocarbon dating (calibrated intervals at 95.4%).

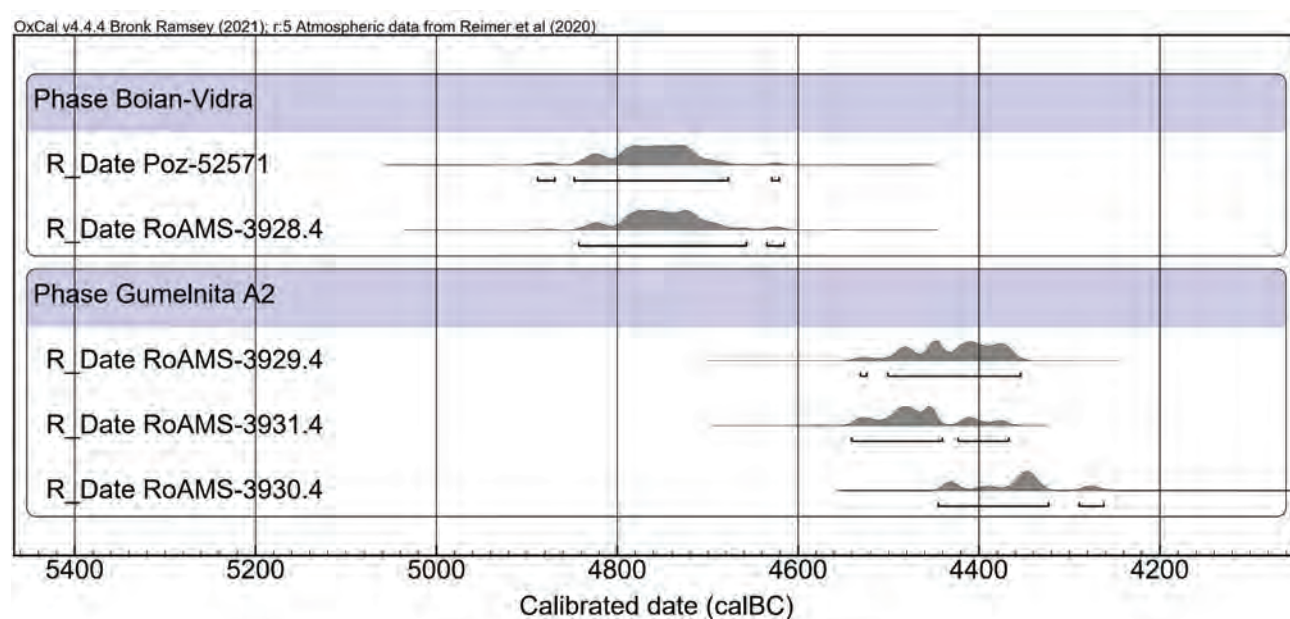


Figure 56. Plot of the calibrated radiocarbon dates for the Boian–Vidra and Gumelnița A2 occupations from Glina Tell, generated in OxCal v4.4.4 using the IntCal20 atmospheric calibration curve (Reimer *et alii* 2020).

the previously published determination. Together, the two dates indicate an Early Chalcolithic occupation of the tell during the later stages of the Vidra phase.

Two additional radiocarbon determinations derive from Middle Chalcolithic contexts investigated in Section II. Sample RoAMS-3931.4 (5640 ± 27 BP), recovered from SU5005 at an elevation of 64.377 m, calibrates between 4541 and 4368 cal BC, while sample RoAMS-3929.4 (5609 ± 34 BP), originating from SU5007 at 61.457 m, calibrates between 4532 and 4355 cal BC. Both samples are associated stratigraphically and typologically with the Gumelnița A2 occupation identified in SII. Although the stratigraphic relationship suggests that SU5007 predates SU5005, the two radiocarbon determinations are statistically very close, and Bayesian modelling produced acceptable but relatively low agreement indices ($A_{\text{model}} = 62.3$;

$A_{\text{overall}} = 67.5$). This indicates slight tension between the measured radiocarbon ages and the observed stratigraphic sequence, although not sufficient to invalidate the model. Overall, the dates place the investigated Gumelnița occupation within the first part of the second half of the 5th millennium cal BC, corresponding well with the generally accepted chronology of Gumelnița A2 communities in the Lower Danube region (Popescu *et alii* 2023).

The final determination, RoAMS-3930.4 (5506 ± 36 BP), derives from the fill of Early Bronze Age trench Cx16 (SU2541) in SI-C, a feature attributed archaeologically to the Glina culture. However, the calibrated interval (4446–4263 cal BC) clearly places the dated sample within the Middle Chalcolithic and overlaps entirely with the Gumelnița A2 horizon rather than the Early Bronze Age occupation. This discrepancy is best explained by the residual character of

the dated faunal remain. The interpretation is strongly supported by the archaeological composition of the feature fill itself, which contained a substantial quantity of Gumelnița A2 pottery alongside ceramics characteristic of the Glina culture. The radiocarbon determination should therefore not be regarded as dating the construction or use of trench Cx16, but rather as evidence for the redeposition of earlier Chalcolithic material into an Early Bronze Age feature. This situation highlights the complex depositional processes affecting the upper levels of the tell and demonstrates the importance of correlating radiocarbon results with stratigraphic observations and associated artifact assemblages.

10. CONCLUSION

The 2025 investigations at Glina Tell represent the first stage of a broader multidisciplinary research programme aimed at reassessing one of the key prehistoric settlements of the Lower Danube region. Despite the extensive disturbances caused by earlier excavations, erosion, and recent anthropogenic interventions, substantial archaeological deposits and coherent stratigraphic sequences remain preserved across several areas of the settlement.

The application of micro-stratigraphic excavation methods, single-context recording, high-resolution spatial documentation, geophysical prospection, geomorphological investigations, and systematic environmental sampling has provided the first coherent dataset capable of integrating archaeological, spatial, and palaeoenvironmental evidence within a unified interpretative framework. Even at this preliminary stage, the results contribute significantly to a better understanding of the internal organisation of the tell, depositional and post-depositional processes, and the long-term dynamics of habitation within the broader Glina–Bălăceanca archaeological landscape.

The archaeological assemblages recovered during the campaign confirm the complex multi-period occupation of the site, spanning the Early Chalcolithic, Middle Chalcolithic, and Early Bronze Age. At the same time, the newly documented contexts provide, for the first time, securely recorded stratigraphic and contextual data suitable for future chronological, technological, and palaeo-environmental analyses. The integration of artefactual, archaeozoological, archaeobotanical, sedimentological, and radiocarbon data has the potential to substantially refine current understandings of cultural developments and settlement dynamics in the Bucharest area and, more broadly, in the Lower Danube region.

Although the present contribution is limited to a preliminary presentation of the first campaign results, the investigations carried out in 2025 establish the methodological and analytical foundations for a long-term research programme. Future excavation campaigns and laboratory analyses will allow the refinement of the chronological framework, the reconstruction of habitation

sequences and environmental changes, and a more detailed evaluation of the role played by Glina Tell within the prehistoric networks of southern Romania.

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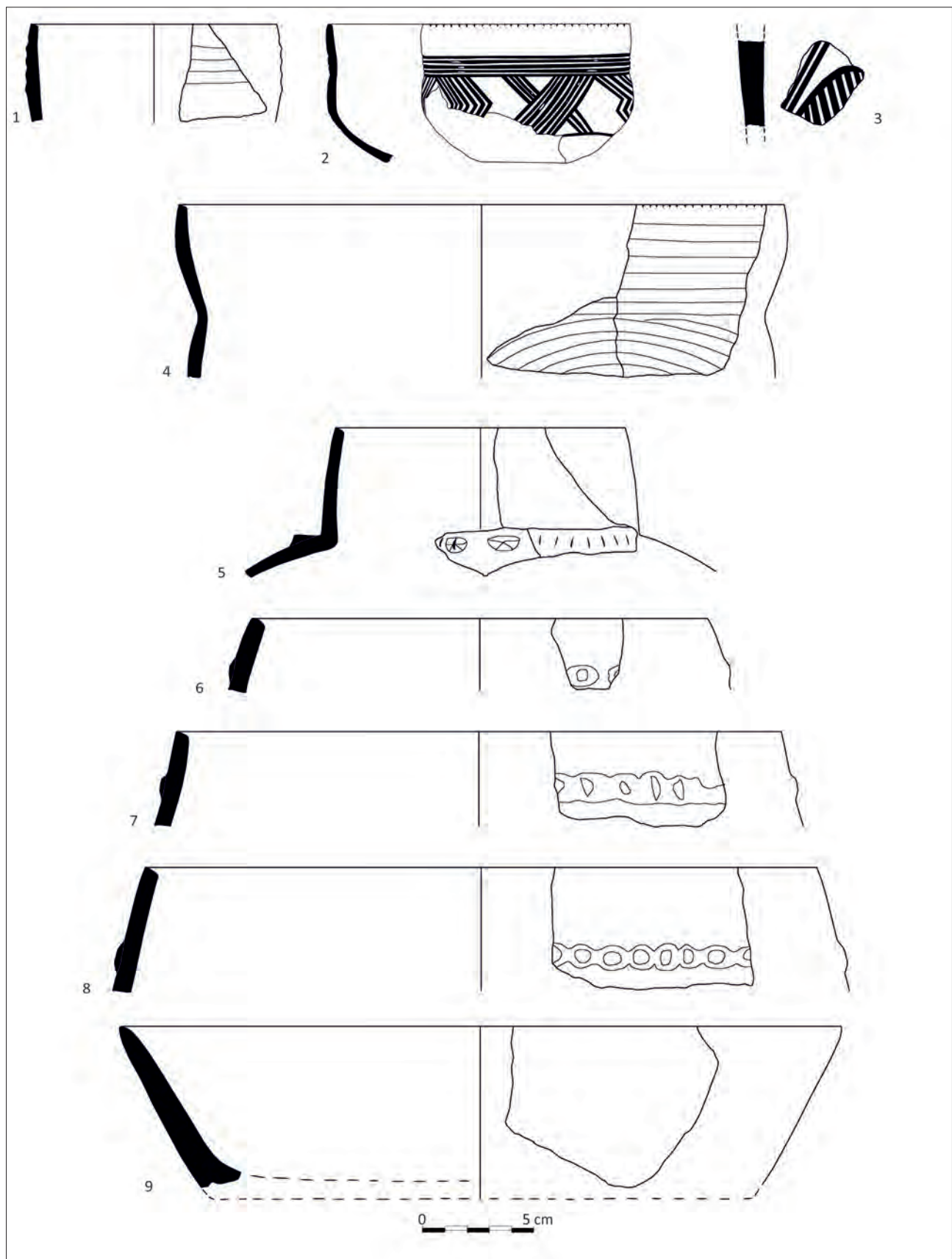


Plate I. Early Chalcolithic pottery (Boian culture). 1, 3, 5, 7–8. SI-A, Cx7; 2, 4, 6, 9. SI-A, Cx3.

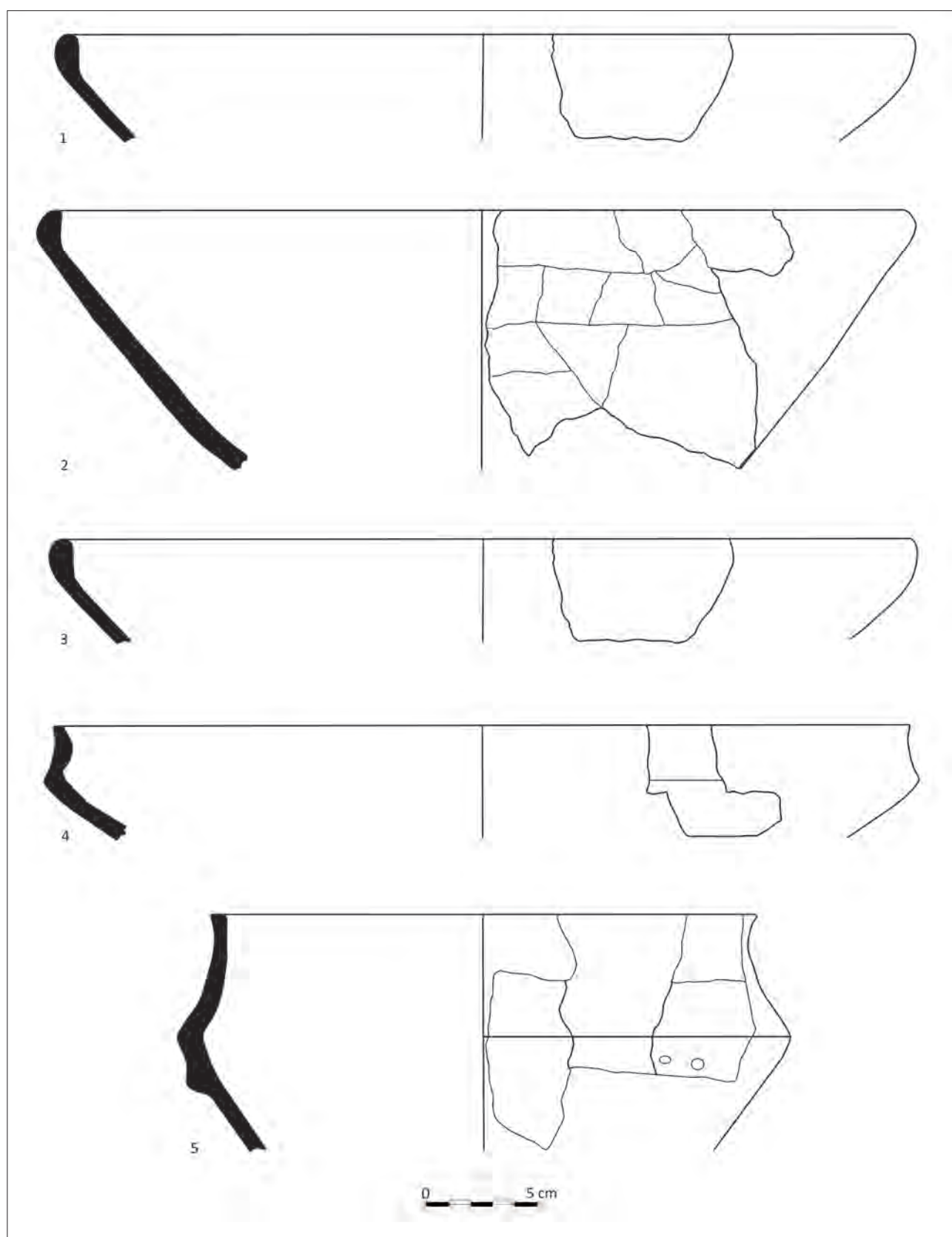


Plate II. Middle Chalcolithic pottery (Gumelnița culture). 1–5 SI-A, Cx4.

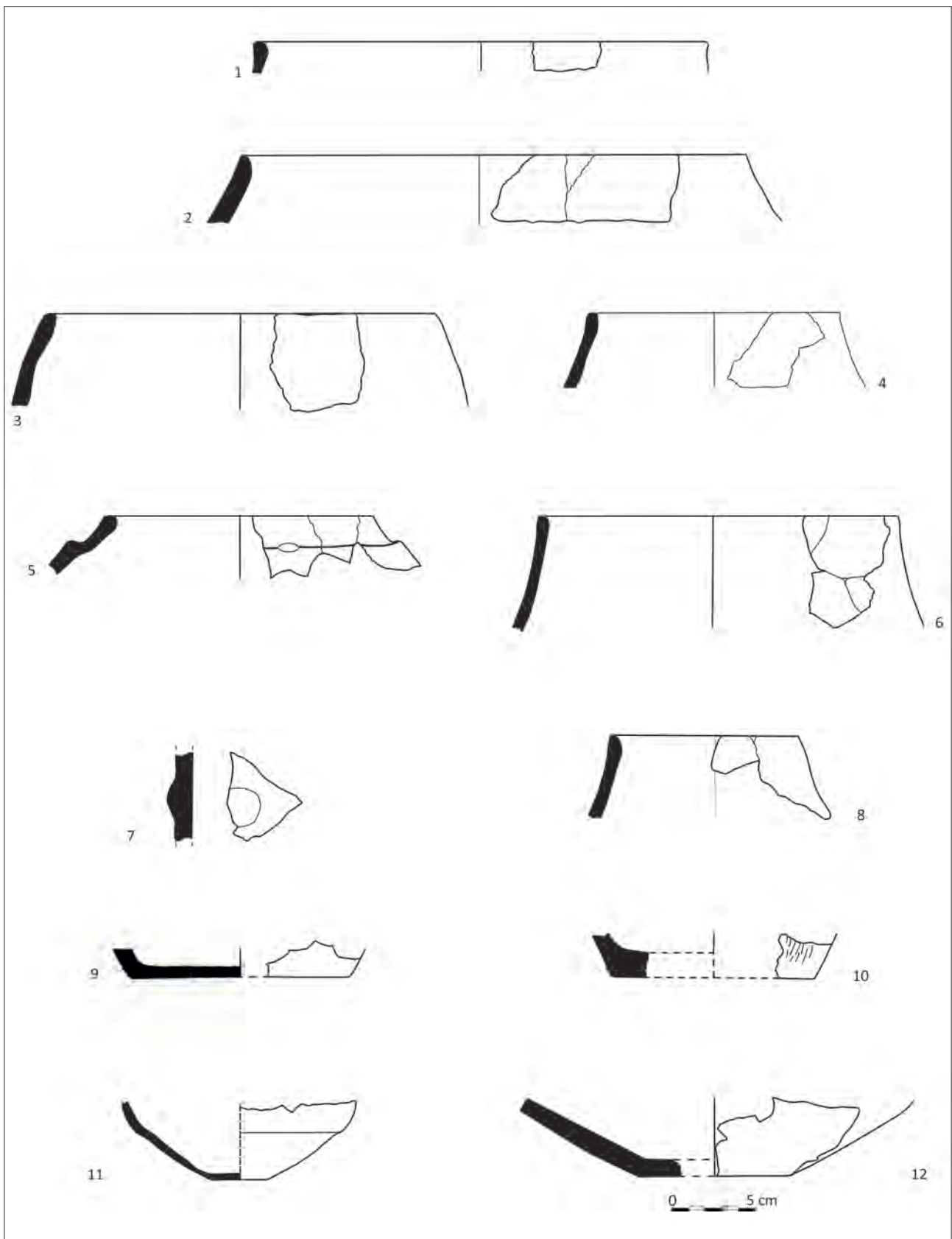


Plate III. Middle Chalcolithic pottery (Gumelnița culture). 1–12. Sl-A, Cx4.

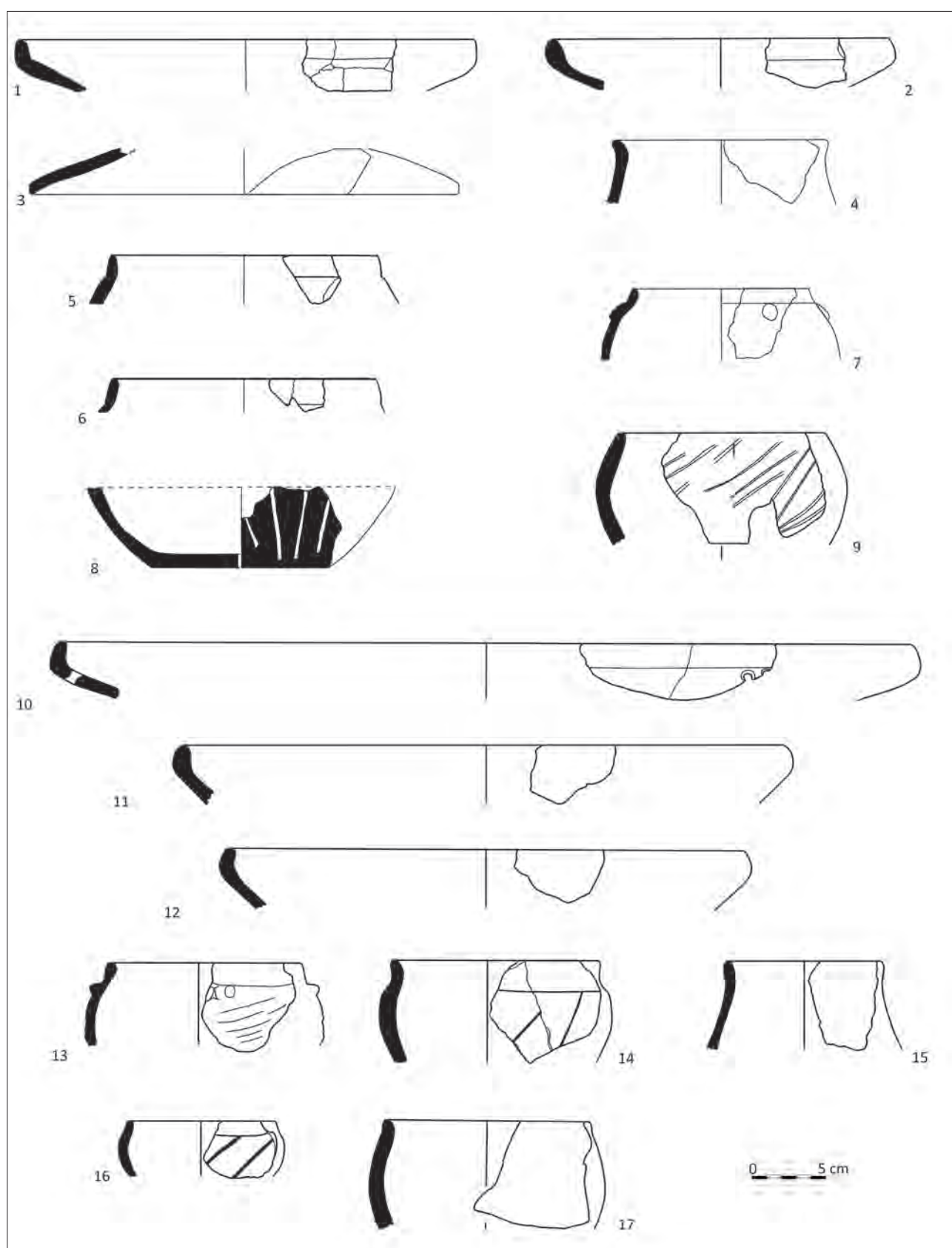


Plate IV. Middle Chalcolithic pottery (Gumelnița culture). 1–9. SI-A, Cx5; 10–17. SI-B, Cx20.

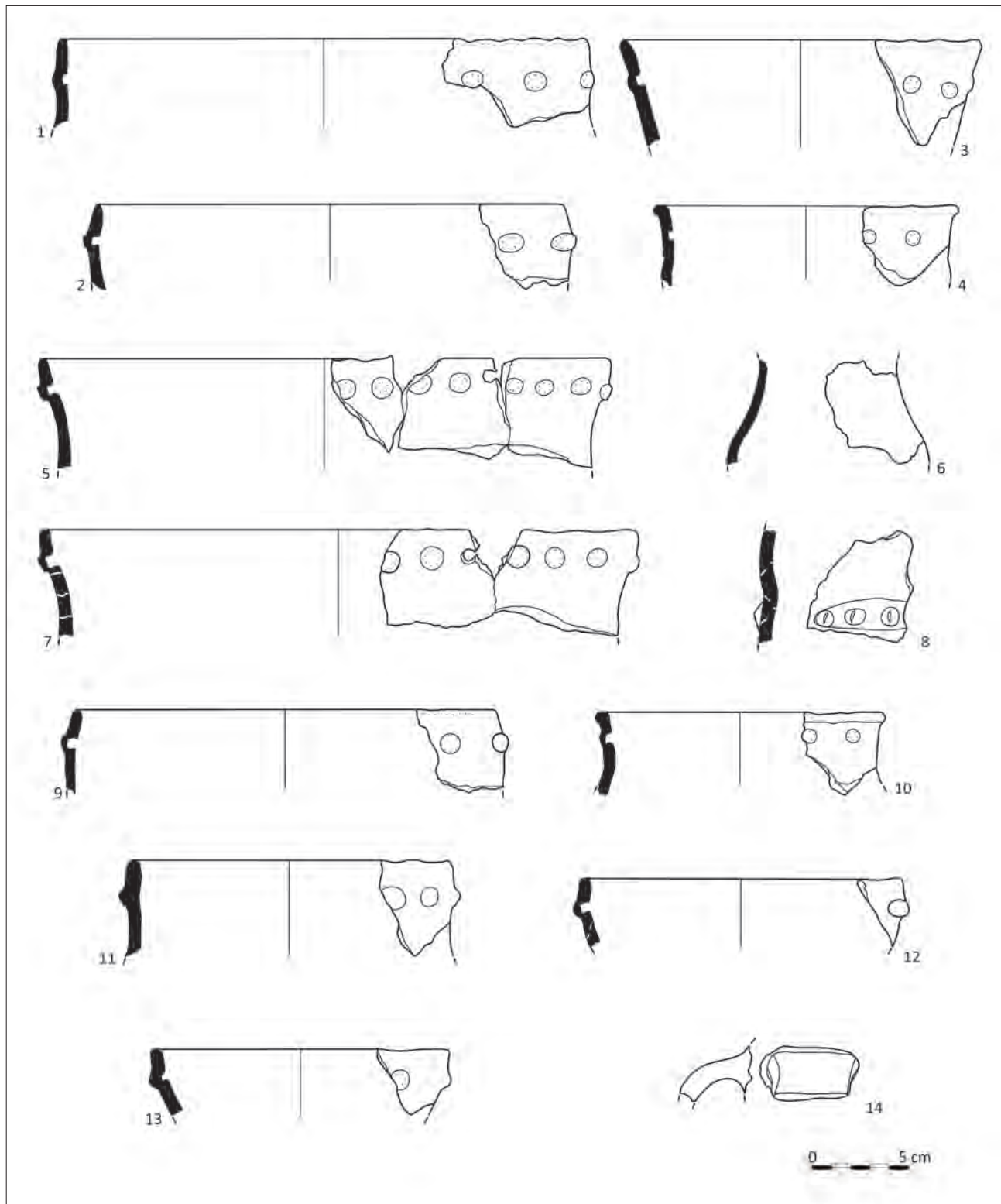


Plate V. Early Bronze Age pottery (Glina culture). 1–2. SI-A, SU2501; 3. SII, SU5001; 4–14. SI-B, Cx9.

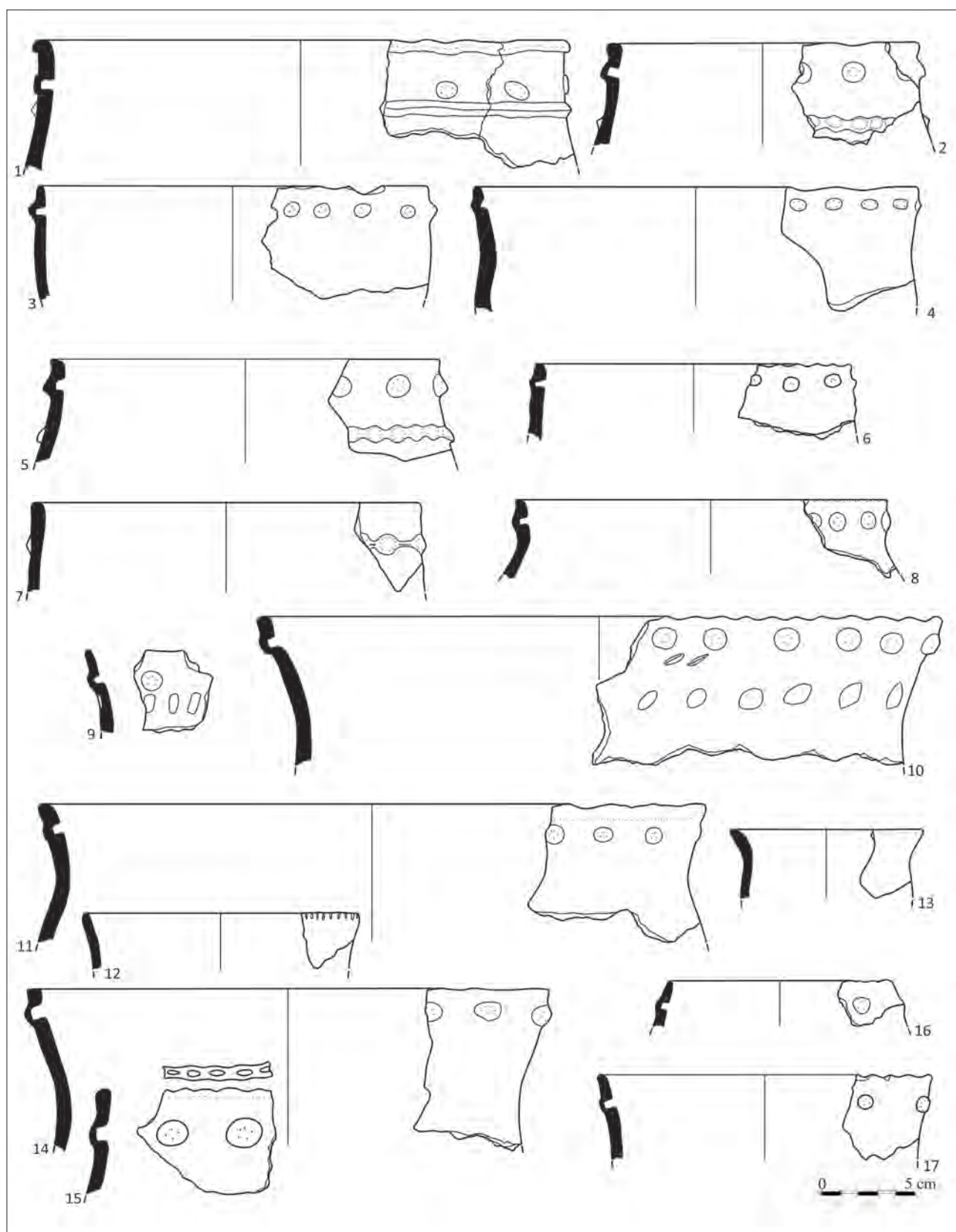


Plate VI. Early Bronze Age pottery (Glina culture). 1–17. SI-C, Cx16.

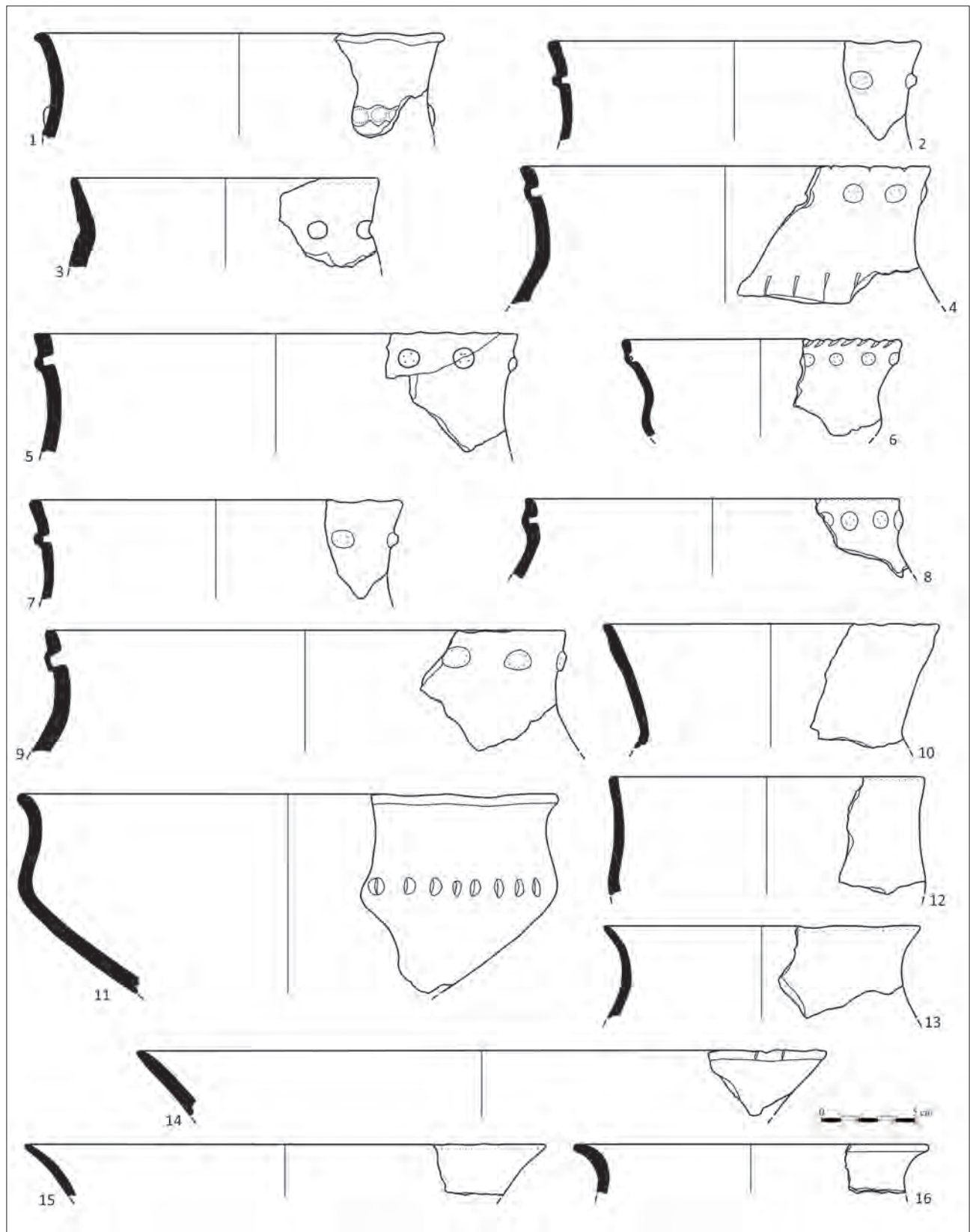


Plate VII. Early Bronze Age pottery (Glina culture). 1–16. SI-C, Cx16.

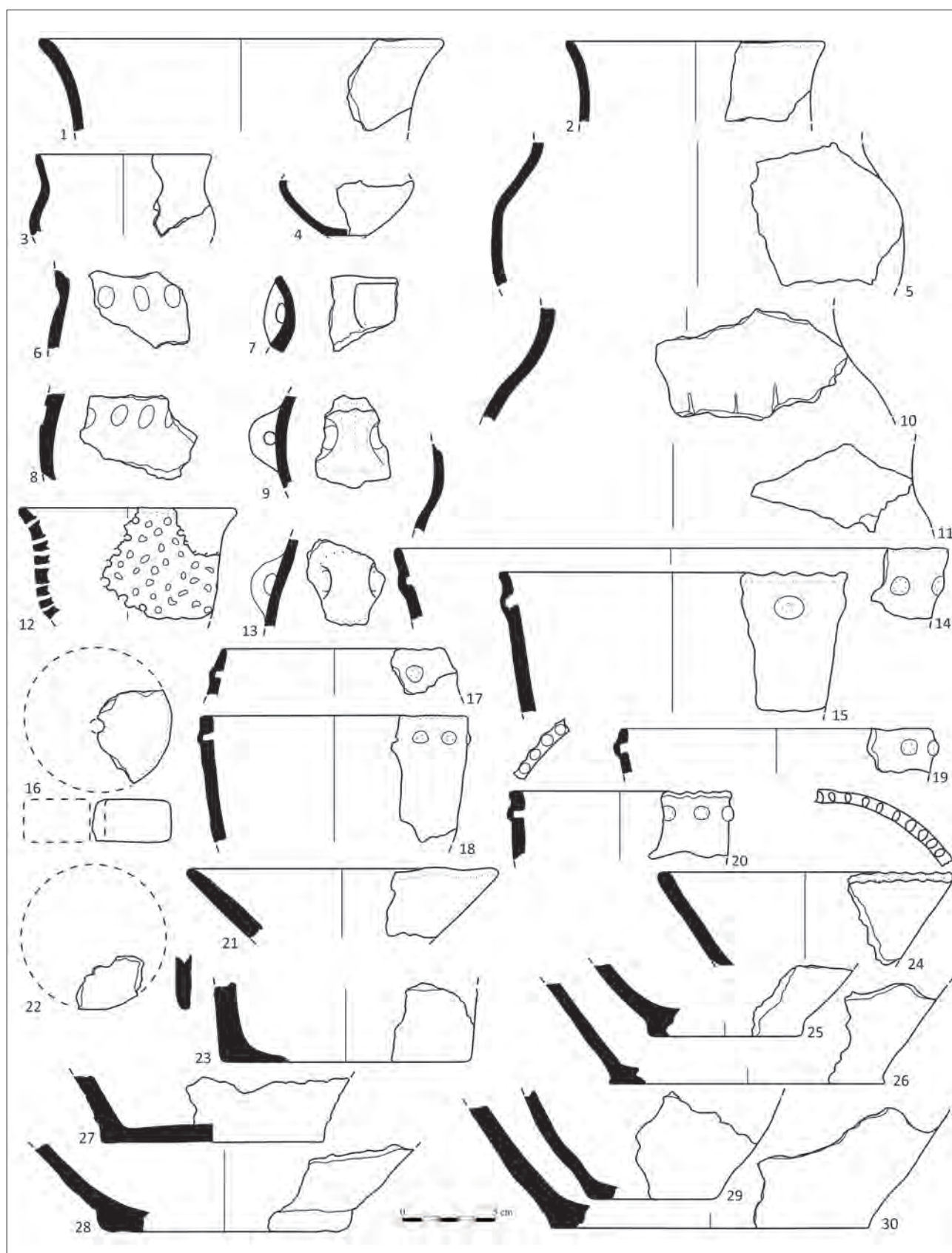


Plate VIII. Early Bronze Age pottery and clay wheel fragments (Glina culture). 1–30. SI-C, Cx16.

ABREVIERI / ABRÉVIATIONS / ABBREVIATIONS

- AAC – Acta Archaeologica Carpatica, Kraków
ACMI – Anuarul Comisiunii Monumentelor Istorice, București
ActaArchHung – Acta Archaeologica Academiae Scientiarum Hungaricae, Budapest
Acta Classica Univ. Scient. Debrecen – Acta Classica Universitatis Scientiarum Debreceniensis, Debrecen, Ungaria
ActaMN – Acta Musei Napocensis, Cluj
ActaMP – Acta Musei Porolissensis, Zalău
ActaPraehistA – Acta praehistorica et archaeologica
AIGR – Anuarul Institutului Geologic al României, București
AIIAC – Anuarul Institutului de Istorie „George Barițiu”, Cluj
AJA – American Journal of Archaeology, Boston
AJPA – American Journal of Physical Anthropology
Alba Regia – Alba Regia. Annales Musei Stephani regis, Székesfehérvár
Anatolia Antiqua – Anatolia Antiqua. Revue internationale d'archéologie anatolienne. Institut Français d'Etudes anatoliennes d'Istanbul
Anatolica – Anatolica. The Netherlands Institute for the Near East in Leiden
AnB – Analele Banatului, Muzeul Banatului, Timișoara
AncNearEastSt – Ancient Near Eastern Studies, Leuven, Belgia
Angustia – Angustia. Arheologie, Etnografie, Sfântu Gheorghe
Anmed – Anmed. Anadolu Akdenizi Arkeoloji Haberleri, Antalya, Turcia
AnSt – Anatolian Studies. British Institute of Ankara
AnUCraiova – Analele Universității din Craiova, Craiova (seria Istorie)
AnUVT – Annales d'Université “Valahia” Târgoviște, Section d'Archéologie et d'Histoire
Apulum – Acta Musei Apulensis. Muzeul Național al Unirii, Alba Iulia
ArchBulg – Archaeologia Bulgarica, Sofia
ArchÉrt – Archaeológiai Értesítő, Budapest
ArchHung – Archaeologia Hungarica, Acta Archaeologica Musei Nationalis Hungarici, Budapest
ArchKorr – Archäologisches Korrespondenzblatt, Mainz
ArchMűh – Archeometriai Műhely
ArchRozhledy – Archeologické Rozhledy, Praha
Argesis – Argesis. Muzeul Județean Argeș. Pitești
Arheologia Medievală. Complexul Muzeal Bistrița-Năsăud, Bistrița
ArheologijaSSSR – Arheologija SSSR. Svod Archeologičeskikh Istočnikov, Moscova
Arheološki vestnik – The Research Center of the Slovenian Academy of Sciences and Arts
ArhMold – Arheologia Moldovei, Iași
AS – Archeologica Slovaca, Bratislava
AST – Eski Eserler ve Müzeler Genel Müdürlüğü, I. Araştırma Sonuçları Toplantısı, Istanbul / General Directorate of Ancient Monuments and Museums
AȘUI – Analele științifice ale Universității Alexandru Ioan Cuza, Iași
BA – Biblioteca de Arheologie, București
BaBesch – Bulletin antieke beschaving. Annual Papers on Classical Archaeology
BAI – Bibliotheca Archaeologica lassiensis, Iași
Baltic-Pontic Studies – Adam Mickiewicz University, Poznań, Institute of Archaeology, Institute of Eastern Studies, Poland
Banatica – Banatica. Muzeul Banatului Montan, Reșița
BarBrSer – British Archaeological Reports. British Series, Oxford
BARIntSer – British Archaeological Reports. International Series, Oxford
BCMI – Buletinul Comisiunii Monumentelor Istorice
Be-Ja – Bulgarian e-Journal of Archaeology
BerRGK – Bericht der Römisch-Germanischen Kommission des Deutschen Archäologischen Instituts, Frankfurt am Main
BIAA Monograph – British Institute of Archaeology at Ankara
BiblEphemNap – Bibliotheca Ephemeris Napocensis, Cluj-Napoca
BiblMemAnt – Bibliotheca Memoriae Antiquitatis, Piatra-Neamț
BiblThrac – Bibliotheca Thracologica, București

- BMC – *Coins of the Roman Empire in the British Museum*, Londra; II, *Vespasian to Domitian*, 1930; IV, *Antoninus Pius to Commodus*, 1968; V, *Pertinax to Elagabalus*, 1950 (H. Mattingly)
- BMI – Buletinul Monumentelor Istorice, București
- BMJT – Buletinul Muzeului Județean Teleorman, Alexandria
- BMTAG – Buletinul Muzeului Județean „Teohari Antonescu”, Giurgiu
- BSA – British School at Athens, Athens
- BSNR – Buletinul Societății Numismatice Române, București
- BSPF – Bulletin de la Société Préhistorique Française, Paris
- BSSC – Buletinul Societății de Științe din Cluj
- București-MIM – București. Materiale de Istorie și Muzeografie. Muzeul Municipiului București
- BYZAS – German Archaeological Institute of Istanbul
- CA – Cercetări Arheologice. Muzeul Național de Istorie a României, București
- CAB – Cercetări arheologice în București. Muzeul Municipiului București
- Caiete ARA – Caietele ARA, Revistă de Arhitectură. Restaurare și Arheologie, Asociația ARA, București
- Carpica – Carpica. Complexul Muzeal „Iulian Antonescu” Bacău, Bacău
- CCA – Cronica Cercetărilor Arheologice din România, București
- CCDJ – Cultură și Civilizație la Dunărea de Jos, Călărași
- Cerclst – Cercetări Istorice, Muzeul de Istorie a Moldovei, Iași
- CN – Cercetări numismatice, București
- CollAn – Colloquium Anatolicum. Anadolu Sohbetleri, Institutum Turcicum Scientiae Antiquitatis, Istanbul
- Crisia – Crisia. Muzeul Țării Crișurilor, Oradea
- Cuadernos del Museo Geominero – Museo Geominero, Instituto Geológico y Minero de España, Madrid
- Current Anthropology – Current Anthropology. University of California, Merced
- Dacia – Dacia (Nouvelle Série). Revue d'archéologie et d'histoire ancienne. Académie Roumaine. Institut d'archéologie « V. Pârvan », Bucarest
- Danubius – Danubius, Revista Muzeului de Istorie Galați
- Documenta Praehistorica – Documenta Praehistorica, University of Ljubljana, Faculty of Arts, Department of Archaeology, Ljubljana
- DolgCluj – Dolgozatok az Erdélyi Nemzeti Múzeum Érem- és Régiséggyűjtéséről, Kolozsvár
- DTKFD – Ankara Üniversitesi Dil ve Tarih-Coğrafya Fakültesi Dergisi
- EJA – European Journal of Archaeology
- ERAUL – Études et Recherches archéologiques de l'Université de Liège
- ÉtAlex – Études Alexandrines, Centre d'Études Alexandrines
- ÉtTrav – Etudes et travaux. Studia i prace. Travaux du Centre d'archéologie méditerranéenne de l'Académie Polonaise des Sciences
- EurAnt – Eurasia Antiqua. Deutsche Archäologisches Institut, Berlin
- FrC – Fragmenta Comica
- FolArch – Folia Archaeologica. A Magyar Nemzeti Múzeum Évkönyve. Annales Musei Nationalis Hungarici, Budapest
- FSI – Forensic Science International
- Germania – Germania. Anzeiger der Römisch-Germanischen Kommission des Deutschen Archäologischen Instituts, Frankfurt
- Geoarchaeology – Geoarchaeology. An International Journal
- Hesperia – Hesperia. Journal of the American School of Classical Studies at Athens, Cambridge
- HOMO – HOMO. Journal of Comparative Human Biology, Stuttgart
- Human Evolution – Human Evolution, International Institute for Humankind Studies and University of Florence
- Ialomița – Ialomița. Studii de cercetări de arheologie, istorie, etnografie și muzeologie, Slobozia
- IJO – International Journal of Osteoarchaeology
- Iran – Iran. Journal of the British Institute of Persian Studies
- IstMitt – Istanbul Mitteilungen, Istanbul
- Istros – Istros, Muzeul Brăilei, Brăila
- IzvestijaVarna – Izvestija na Archeologiceskii Institut, Sofia
- JAHA – Journal of Ancient History and Archaeology, Cluj-Napoca
- JAnat – Journal of Anatomy
- JAS – Journal of Archaeological Science
- JAS: Reports - Journal of Archaeological Sciences: Reports
- JDAI.AA – Jahrbuch des Deutschen Archäologischen Instituts, Archäologischer Anzeiger, Berlin
- JFS – Journal of Forensic Sciences

- JHE – Journal of Human Evolution
 JRA – Journal of Roman Archaeology
 JRGZM – Jahrbuch des Römisch-Germanischen Zentralmuseums Mainz, Mainz
 JRS – The Journal of Roman Studies
 KST – T. C. Kültür Bakanlığı, Eski Eserler ve Müzeler Genel Müdürlüğü, I. Kazı Sonuçları Toplantısı, Ankara / Republic of Turkey, General Directorate of Ancient Monuments and Museums, Ankara, Turkey
 LIMC – Lexicon Iconographicum Mythologiae Classicae, Zürich, München, Düsseldorf
 Litua – Litua, Studii și cercetări, Târgu-Jiu
 LRBC – *Late Roman Bronze Coinage A.D. 394-498*, Londra, 1965: I, *The Bronze Coinage of the House of Constantine A.D. 324-346* (P. V. Hill, J. P. C. Kent); II, *Bronze Roman Imperial Coinage of the Later Empire A.D. 346-498* (R. A. G. Carson, J. P. C. Kent).
 Macedoniae Acta Archaeologica – Macedonian Archaeological Society, Skopje, Republic of Macedonia
 MAMA – Monumenta Asiae Minoris antiqua. Publications of the American Society for Archaeological Research in Asia Minor
 Marisia – Marisia. Studii și materiale. Arheologie – Istorie – Etnografie, Târgu Mureș
 Marmatia – Muzeul Județean de Istorie și Arheologie Maramureș, Baia Mare
 MarNero – Il Mar Nero. Annali di archeologia e storia
 MCA – Materiale și Cercetări Arheologice, București
 MDOG – Mitteilungen der Deutschen Orient Gesellschaft
 MemAnt – Memoria Antiquitatis, Piatra Neamț
 MFMÉ – A Móra Ferenc Múzeum Évkönyve, Szeged
 Mousaios – Mousaios. Buletinul Științific al Muzeului Județean Buzău
 MuzNaț – Muzeul Național, București
 NAC – Numismatica e Antichità Classiche, Lugano-Pregassona
 OIP – Oriental Institute Publications, University of Chicago
 OJA – Oxford Journal of Archaeology, Oxford
 Olba – Mersin University Publications of the Research Center of Cilician Archaeology, Mersin, Turkey
 PALMA – Papers on Archaeology of the Leiden Museum of Antiquities, Leiden, Olanda
 PAS – Prähistorische Archäologie in Südosteuropa, München-Berlin
 PBF – Prähistorische Bronzefunde, Münster
 Peuce – Peuce. Studii și cercetări de istorie și arheologie, Institutul de Cercetări Eco-Muzeale, Tulcea
 Phoenix – Phoenix. The Journal of the Classical Association of Canada
 Plural – Journal of the History and Geography Department „Ion Creangă” Pedagogical State University, History, Culture. Society. Seria Archaeologica II, Chișinău
 PMMB – Publicațiile Muzeului Municipiului București
 Pontica – Pontica. Studii și materiale de istorie, arheologie și muzeografie, Muzeul de Istorie Națională și Arheologie Constanța
 PZ – Prähistorische Zeitschrift, Berlin-Mainz
 Quaternary International – Quaternary International. The Journal of the International Union for Quaternary Research
 Quaternary Science Reviews – Quaternary Science Reviews. The International Multidisciplinary Research and Review Journal
 RA – Revue Archéologique, Paris
 RAASI – Revista de Arheologie, Antropologie și Studii Interdisciplinare, Institutul de Cercetări Bioarheologice și Etnoculturale, Republica Moldova
 Radiocarbon – An International Journal of Cosmogenic Isotope Research, Cambridge
 RCAN – Revista de Cercetări Arheologice și Numismatice, Muzeul Municipiului București
 RevBistr – Revista Bistriței. Complexul Muzeal Bistrița-Năsăud, Bistrița
 RevMuz – Revista Muzeelor, București
 RGZM – Römisch-Germanisches Zentralmuseums Mainz, Mainz
 RIC – *The Roman Imperial Coinage*, Londra: I², *From 31 BC to AD 69*, 1984 (C. H. V. Sutherland); II, *Vespasian to Hadrian*, 1926 (H. Mattingly, E. A. Sydenham); II.1, *From AD 69-96. Vespasian to Domitian*, 2007 (I. A. Carradice, T.V. Buttrey); II.3, *From AD 117-138. Hadrian*, 2019 (R. A. Abdy, P. F. Mittag); III, *Antoninus Pius to Commodus*, 1930; IV.1, *Pertinax to Geta*, 1968 (H. Mattingly, E. A. Sydenham); IV.2, *Macrinus to Papien*, 1938; IV.3, *Gordian III – Uranian Antoninus*, 1949 (H. Mattingly, E. A. Sydenham, C. H. V. Sutherland); V.1, 1927 (reimprimat 1968; P. H. Webb); VII, *Constantine and Licinius A.D. 313-337*, 1966 (P. M. Bruun); VIII, *The Family of Constantine I A.D. 337-364*, 1981; X, *The Divided Empire and the Fall of the Western Parts A.D. 395-491*, 1994 (J. P. C. Kent)
 SAA – Studia Antiqua et Archaeologica, Iași
 Sargetia – Sargetia. Acta Musei Devensis. Buletinul Muzeului județean Hunedoara, Deva

SAV – Študijné zvesti Archeologicky ústav SAV, Nitra
Sci Rep – Scientific Reports
SCIV(A) – Studii și Cercetări de Istorie Veche (și Arheologie), București
SCN – Studii și Cercetări de Numismatică, București
Seleucia – Seleucia. Olban Excavations Series
SP – Studii de Preistorie, București
SprawArch – Sprawozdania Archeologiczne, Warsaw
SRMKA – Seramik Araştırmaları Dergisi, The Journal of Ceramic Research
StArchBrno – Studia Archaeologica Brunensia, Masaryk University, Brno
Starinar – Starinar. Arheološki institut Beograd
StComPitești – Studii și Comunicări, Seria Istorie, Muzeul Județean Argeș, Pitești
StudCom Satu Mare – Studii și comunicări Satu Mare
Studia Praehistorica – National Archaeological Institute with Museum of the Bulgarian Academy of Sciences
Syria – Syria. Archéologie, art et histoire. Institut Français du Proche-Orient
Terra Sebus – Terra Sebus. Acta Musei Sabesiensis, Anuarul Muzeului Municipal „Ioan Raica”, Sebeș
Th-D – Thraco-Dacica, București
Thracia – Thracia, Sofia
TIB – *Tabula Imperii Byzantini*, Wien
Transylvanian Review – Transylvanian Review. Centrul de Studii Transilvane, Cluj-Napoca
TÜBA-AR – TÜBA-AR Türkiye Bilimler Akademisi arkeoloji dergisi (TÜBA-AR Turkish Academy of Sciences Journal of Archeology)
UPA – Universitätsforschungen zur Prähistorischen Archäologie, Bonn
VAH – *Varia Archaeologica Hungarica* V. Redigit Csanád Bálint. Publicationes Instituti Archaeologici Academiae Scientiarum Hungaricae, Budapest
Varia Anatolica – *Varia Anatolica*. L'Institut Français d'Études Anatoliennes, Istanbul
Ziridava – Ziridava. Studia Archaeologica, Arad