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**MODELLI DI INSEDIAMENTO E PAESAGGI ANTROPICI DELLE REGIONI COSTIERE NORD-ADRIATICHE TRA MEDIO E TARDO BRONZO**

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# BRONZE AGE HILLFORTS AROUND ROVINJ ON THE WESTERN COAST OF THE ISTRIAN PENINSULA AND THEIR POTTERY

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Età del Bronzo, siti fortificati, castellieri, gerarchia insediamentale, ceramica

**KEYWORDS**

Bronze Age, hillforts, castellieri, settlement hierarchies, pottery

**RIASSUNTO**

Fin dal XIX secolo l'interesse degli studiosi di antichità si è concentrato sugli insediamenti preistorici dell'Istria, corrispondenti a siti fortificati, denominati anche gradine, castellieri o kastelliere. Nel Carso sono oggi note alcune centinaia di questi insediamenti fortificati, posti sulla sommità delle alture, ma solo alcuni di essi sono stati oggetto di una ricerca archeologica sistematica. Il sito attualmente meglio indagato e scavato con metodi moderni è la Gradina di Monkodonja, datata all'inizio e alla fase avanzata della Media età del Bronzo, posta presso la città portuale di Rovigno sulla costa occidentale dell'Istria. Le recenti ricerche hanno portato a nuovi dati sulla cronologia, sull'organizzazione degli insediamenti e sui contatti a lunga distanza, ma hanno anche sollevato nuove domande. La Gradina di Monkodonja, per le dimensioni, il muro di fortificazione esterno con un perimetro di quasi 1 km e per la sua posizione prominente, è considerata l'insediamento principale al centro di un sistema insediativo con vari abitati satellite più piccoli. Tuttavia, fino ad oggi non si sa molto di questi insediamenti minori, soprattutto per quanto riguarda la loro cronologia. Non è del tutto chiarito se fossero contemporanei all'abitato di Monkodonja e se sia confermato nell'età del Bronzo il sistema gerarchico dei siti fortificati. Una ricerca iniziata nel 2016, finanziata dalla National Research Foundation of Korea, dal Museo Archeologico dell'Istria di Pola e dal Museo di Rovigno, ha come obiettivo l'indagine del sistema di siti fortificati nell'area attorno a Rovigno. Una fase della ricerca ha come oggetto la classificazione cronologica dei siti minori e ha portato significativi risultati dai sondaggi effettuati alla Gradina Monbrodo. In particolare, si affronta in questo articolo la tipologia ceramica, con la presentazione di alcuni reperti ceramici inediti.

**ABSTRACT**

Since the 19th century, the interest of scholars and lovers of antiquity has been focused on the prehistoric hillfort settlements, also known as gradine, castellieri or kastelliere, on the Istrian peninsula. Several hundred of these fortified settlements, located on the tops of the countless hills of the Karst, are registered today. However, only a few of them have been explored through systematic archaeological research. The site that is currently best investigated and excavated with modern methods is the Gradina of Monkodonja near the small port town of Rovinj on the west coast of Istria, which is dated to the developed Early and to the beginning of the Middle Bronze Age. The research has led to numerous new findings, for example regarding chronology, settlement organisation and long-distance contacts. But they have also raised new questions. Given the size of Gradina Monkodonja, with an outer fortification wall almost 1 km long, and its prominent location, it was considered by the excavators to be the centre within a settlement system consisting of a large central settlement and various smaller satellite settlements. However, not much is known about these smaller, presumed satellite settlements to date - especially with regard to their chronology. Therefore, it is

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especially unclear whether they actually lived at the same time as the presumed central settlement of Monkodonja and whether a hierarchical system of hillforts existed in the Bronze Age. New research, funded by the National Research Foundation of Korea and supported by the Archaeological Museum of Istria in Pula and the Rovinj Heritage Museum, has been aiming to explore the system of hillforts around Rovinj since 2016. One step in the investigation is aimed at obtaining new data on the chronological classification of the smaller hillforts. Significant new results come from Gradina Monbrodo, which shed new light on the above-mentioned questions about the settlement system around Rovinj. With a view to the pottery spectrum of Monkodonja, we will discuss some previously unpublished ceramic finds in this paper.

## INTRODUCTION

Gradina Monkodonja occupies a special place among the numerous fortified Bronze Age settlements around Rovinj on the west coast of Istria. It is one of the few settlements that have been intensively researched in recent decades and can be described as the best researched Gradina in Istria to date.[4] Numerous insights have been gained into architecture, social and hierarchical structure, graves in the area of the main gate, subsistence, metallurgy, pottery and contacts with neighbouring and more distant regions. A series of 45 C14 dates based on animal and human bones prove that the foundation of the settlement took place around or before 1800 BC (HÄNSEL *et alii* 2015, pp. 424–452). The first construction activities on the dry stone wall of the main fortification took place in the 19th and early 18th centuries BC. The earlier phase of the main settlement of the hillfort falls in the 18th to 17th centuries BC, the later in the 16th to early 15th centuries BC. According to Reinecke's chronological scheme for Central Europe, this is a period between the end of B A1 and the transition from B B1 to B B2/C1 (HÄNSEL *et alii* 2015, fig. 332). The extensive pottery collection can be considered exemplary for the whole of Istria. Thanks to the detailed analyses and the presentation of the spectrum of vessel forms from Gradina Monkodonja, even highly fragmented pottery from other Istrian hillforts can now be easily classified and dated (HELLMUTH KRAMBERGER 2017). One question that arose in connection with Monkodonja was to what extent the neighbouring hilltop settlements in the vicinity of Rovinj, which are often referred to as "satellites" of Monkodonja, were dependent on the presumed central settlement and whether differences, for example in the ceramic spectrum, can be identified. To this end, excavations were carried out at three coastal sites between 2016 and 2018 as part of a joint Korean-Croatian project. In the following, the ceramic material from one of the three settlements – Monbrodo – is discussed in more detail with an outlook on the findings and finds from Monkodonja, and new, previously unpublished ceramic find material is presented.

## THE POTTERY FROM MONKODONJA

The rich pottery finds from Monkodonja allow an analysis with regard to quite different questions. During the excavations in Monkodonja between the years 1997-2008, more than 350,000 vessel fragments were recovered in about 7,300 find complexes.[5] 7,420 vessels and vessel fragments were analysed in detail and statistically evaluated, i.e. with regard to vessel shape and dimensions, surface treatment, colour, porosity, hardness, tempering and their finding situation (HELLMUTH KRAMBERGER 2017). Of the 7,420 analysed vessels and vessel fragments from Monkodonja, storage vessels, jars and *pithoi* make up the largest proportion (32-35%). Deep and shallow bowls are represented with 10-12 and 5-8% percent respectively, tripods make up 3%. Cups account for 3-4%, other vessel forms such as bottles, jugs or *kantharoi* are not included in the statistics.[6] A total of 160 complete vessel profiles[7] could be reconstructed (for selection see type table Fig. 1). This provides for the first time a clear picture of the richness of vessel types from Monkodonja, which can also be considered representative for all of Istria and the Trieste Karst (Carso). A completely new picture also emerges for numerous characteristic decorative elements, such as the arched plastic ledges, buttons and incised arches: they were namely applied to jars and *pithoi* in a very specific way, in such a way that they show stylised faces in combination with various handles (Fig. 2) (HELLMUTH 2012). The vessels were not only used to store food, but were also carriers of certain religious beliefs. Certain characteristic vessel parts, such as the triangular handle with a rounded end plate or the x-shaped handle, which were previously only known without specific reference to a particular type of vessel (e.g. BURŠIĆ-MATIJAŠIĆ 1997, p. 146 with pl. 12), can now be assigned to specific vessel types. It is also interesting that for the specific type of amphora-shaped jars and *pithoi* (jars and *pithoi* type V) it could be established that both leading handle types occur together (e.g. Fig. 1, No. 67). The amphora-shaped jars and *pithoi* with very well-smoothed surfaces on the inside and outside were very probably used to store liquids.

[4] Among the numerous publications, the following monographs are particularly noteworthy: BURŠIĆ-MATIJAŠIĆ 1998; HÄNSEL *et alii* 2015; HELLMUTH KRAMBERGER 2017; HÄNSEL *et alii* 2020.

[5] The pottery from Monkodonja was recovered during the excavations according to quadrants or special findings/units such as buildings (see HÄNSEL, MIHOVILIĆ, TERŽAN 2015, 69ff, 75ff). All quadrants or units were given with a find-complex number, the numbers of which were sorted according to their discovery.

[6] It should be noted, however, that although the number of clearly identified bottles and jugs is too small to show precipitation in the statistics, they probably had a considerable share in the vessels spectrum. Bottles and jugs, but also cups, all have a very similar rim and base shape, which is why individual fragments cannot be clearly assigned to one or the other.

[7] Thus a continuous profile from the base to the rim.

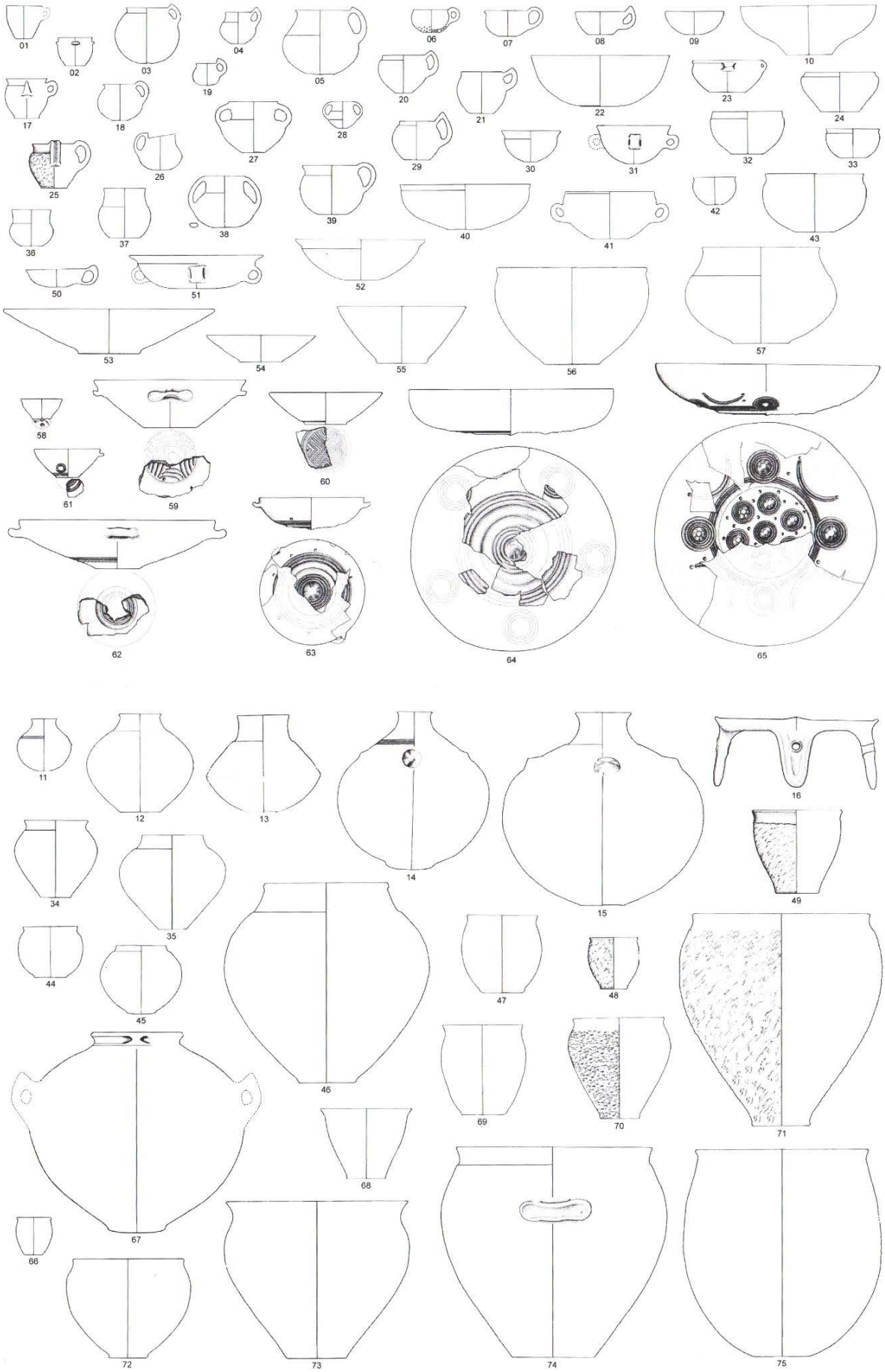


*Fig. 1. Table of types of pottery from Gradina Monkodonja (graphic: A. Hellmuth Kramberger).*
Tavola dei tipi ceramici da Gradina Monkodonja (disegni: A. Hellmuth Kramberger).

It is even possible that they contained table wine, as there is evidence of early wine cultivation in Monkodonja (KROLL 1999; HELLMUTH 2014, pp. 70-71; KROLL 2015, 105ff.). In Monkodonja, the characteristic drinking vessels include, in addition to the spherical bottles already mentioned, various cups (Fig. 1, Nos. 6-8,17,19-21, 29), shallow bowls with handles (Fig. 1, No. 50), beakers (Fig. 1, Nos. 1-2, 36), jugs (Fig. 1, Nos. 4-5, 18, 26) and small *kantharoi* (Fig. 1, No. 28). The surfaces of these vessels are well to very well burnished, often even polished to a metallic sheen and fired under a reducing atmosphere.[8] The characteristic forms also include shallow bowls of various sizes and varieties, which bear decorations on the bottom's underside in the form of concentric circles, protrusions and various incised ornaments (Fig. 1, Nos. 58-65). Especially in the case of the specimens with *tutuli* (bulges) on the bottom underside, it is likely that they served as cover bowls and that the decoration was displayed (Fig. 2). It is even possible that these decorations also had a special meaning connected with astronomical knowledge (HELLMUTH KRAMBERGER 2020).

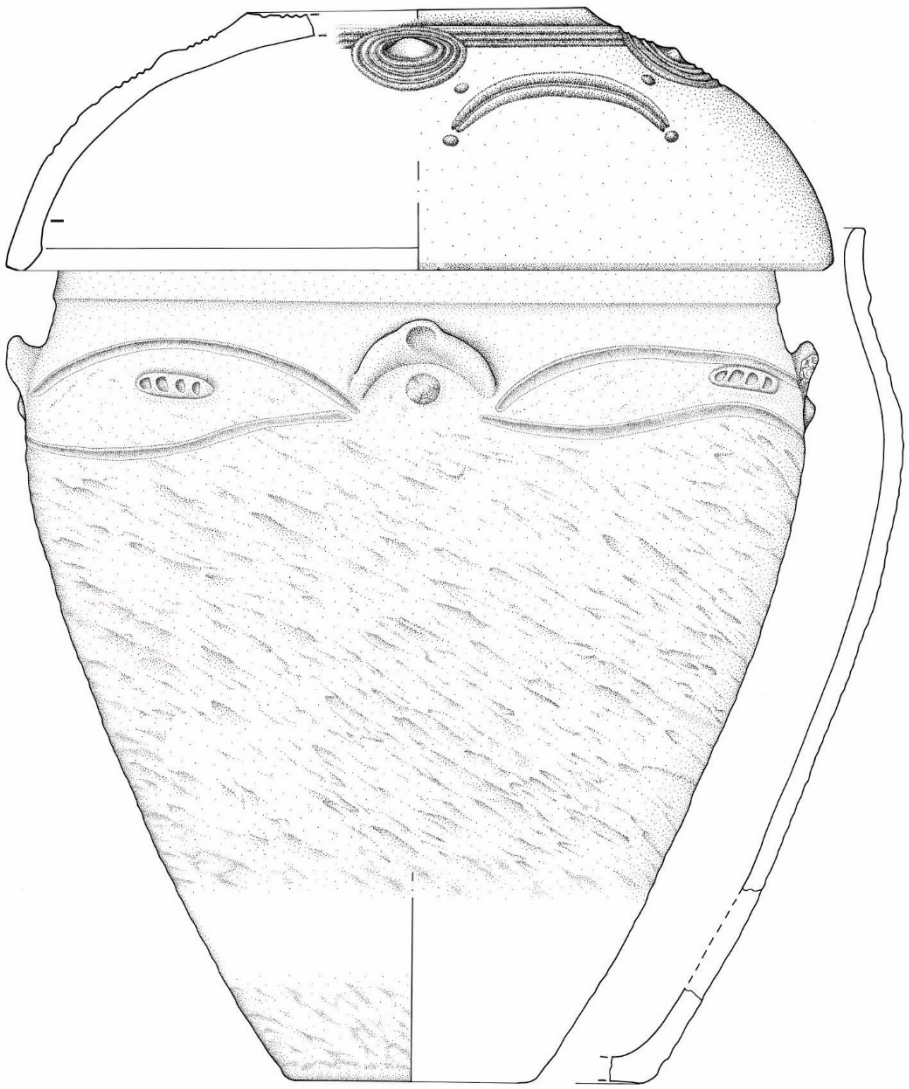


*Fig. 2. A Pithos with anthropomorphic decoration from Gradina Monkodonja (graphic: A. Hellmuth Kramberger).*
Pithos con decorazione antropomorfa da Gradina Monkodonja (disegni: A. Hellmuth Kramberger).

For the majority of the excavation trenches/probes (the probes IX, IV, V, VI, XIV of the main fortification and the probes III, VIII, X of the acropolis), the pottery of the individual find complexes was examined from a functional point of view. This made it possible to characterise the ceramic composition of each find complex, i.e. to determine the proportion of coarse and fine wares, decorated and undecorated vessels, and the dominant vessel forms. An important group are large storage vessels, *pithoi* (Fig. 1, Nos. 46, 71, 73-75; Fig. 3). *Pithoi* were defined as vessels whose height exceeds their width and which have a rim diameter of more than 35 cm. On average, rim diameters of 45 cm were measured. The term "*Pithos*" was used to distinguish between large storage vessels and smaller jars, since the former can be expected to have been used exclusively as storage vessels, while smaller jars could conceivably have been used both

[8] In which resulted black surfaces.

as storage vessels and as cooking vessels.[9] A clear distinction between storage and cooking vessels is not possible without scientific analyses of the vessel surfaces. Specific smouldering or firing marks indicating use as cooking vessels could not be readily detected on the jars from Monkodonja, as much of the pottery shows traces of secondary firing. The latter seems to be partly due to fires that occurred in the course of the destruction of the settlement (HÄNSEL, MIHOVILIĆ, TERŽAN 2015, pp. 452, 506-507). Mostly, the *pithoi* (and also the jars) are vessels that were exposed to a changing atmosphere during the firing process (reducing-oxidising firing).[10] Accordingly, their colouring on the outside changes to various shades of red, brown and orange or, more rarely, beige, while the inside of the vessels is usually black.[11] The outer surfaces of the vessels are often roughly smoothed or, in the majority, covered with barbotine and additionally decorated with sculptural applications and incisions (HELLMUTH 2012, pl. 2,3-6; pl. 3,4-9; HELLMUTH KRAMBERGER 2017, 195ff). The inner surfaces of the vessel are smoothed, sometimes even burnished. In addition to the *pithoi* with barbotine, there is another group of undecorated storage vessels with a well-smoothed surface on the outside and inside of the vessel (Fig. 1, No. 46, 74) as well as the amphora-shaped pithoi with well-smoothed or even polished surfaces (Fig. 1, No. 67).[12] The majority of all *pithoi r*epresent, based on microscopic analysis, a fine-pored pottery with medium or few coarse particles, whereby "fine-pored" here denotes an average pore size of 0.3 mm.

Among the 7,420 vessels and vessel fragments from Monkodonja analysed and statistically recorded, 431 *pithoi* were identified. Exemplary volume calculations were carried out for several vessels from Monkodonja using the cylinder addition method (RICE 1987, p. 222, fig. 7,8; cf. HELLMUTH KRAMBERGER 2021). For several *pithoi*, volumes between 37 and 82 litres were determined. Several times, a capacity in the range of 50 litres was determined. In general, it can be said that most of the vessels belong to the last phase of use of the settlement and date from the time of the destruction of the hillfort. This is also supported by the pottery concentrations, which in their dense location at the site look like relics of the destruction (cf. HÄNSEL, MIHOVILIĆ, TERŽAN 2015, 139ff., p. 141 with fig. 89). The time of the destruction and the abandonment of the settlement can be fixed on the basis of the radiocarbon dating to a time around 1500 BC or shortly thereafter (HÄNSEL, MIHOVILIĆ, TERŽAN 2015, pp. 143-147, 452). A mapping of the *pithoi* shows a clear picture (Fig. 3): there are certain areas where massive concentrations of *pithoi* are recorded (HELLMUTH 2012; HELLMUTH KRAMBERGER 2017, 305ff). First of all, it becomes clear that the concentrations are usually found in areas immediately adjacent to the fortification walls; only on the acropolis are they also found along the wall of a building in the interior. In addition to the latter, four areas can be highlighted where large numbers of *pithoi* are documented. Namely, the area surrounding the corner bastion of the West gate with the stone cist grave B, a section of the casemates on the outer fortification towards the North gate, a zone in the upper town in front of the fortification of the acropolis with a concentration at its northwest corner, and a building attached to the inner side of the fortification wall inside the acropolis. We can probably call these areas storage buildings or magazines. The placement of large quantities of storage containers along the walls in specially designated storage rooms is strikingly reminiscent of contemporary finds from the Mediterranean region[13], as well as from Western Asia[14]. The population of the proto-urban fortified settlement of Monkodonja is estimated by the excavators at about 1,000 people (HÄNSEL *et alii* 2009, p. 153; HÄNSEL, MIHOVILIĆ, TERŽAN 2015, 482ff). The considerable number of large storage vessels from the last settlement phase of Monkodonja and their enormous storage capacity indicate that food was delivered in large quantities to the settlement and stored there centrally, protected by the strong fortification (cf. HELLMUTH KRAMBERGER 2017, 312ff.; HELLMUTH KRAMBERGER 2021). Such extensive storage undoubtedly required administration, and in this context one could also think that the stamped clay tablets, the "bread loaf idols", which were found mainly in the area of the acropolis[15], are related to storage and record keeping. Therefore, it is not surprising that the vast majority of the stamped clay tablets were found in the area of the acropolis - that is, in the same area where particularly many *pithoi* were documented.

[9] For multifunctional use of vessels see HOREJS 2005, 72.

[10] On the technological analyses of the pottery from Monkodonja see: HELLMUTH KRAMBERGER 2017, 39-65.

[11] According to the Munsell Soil Color Charts, the following tones are involved: red tones (7.5R5/8; 7.5R4/6-8; 10R5/8; 10R4/6; 10R4/6); brown tones (5R5/2-4; 5R4/2-4; 5R3/2; 5R2.5/2; 7.5R3/2; 10R3/2; 2.5YR4/4-8; 5YR3/3; 7.5YR3/2); orange tones (2.5YR7/8; 2.5YR6/6-8; 2.5YR5/8; 2.5YR5/6-8; 5YR7/8; 5YR6/8); beige tones (5YR8/2-4; 7.5YR8/2-4).

[12] HELLMUTH KRAMBERGER 2017, 202ff. - The careful surface treatment or compaction of the surfaces may indicate that these vessels served to store liquids (see also below).

[13] For example, in Akrotiri (MARINATOS 1973, picture after WARDLE 1996, 248, bottom) or Knossos (EVANS 1964, VASILAKIS 1999, pp. 137, 216), to name just two prominent examples.

[14] For example in Norşuntepe (z.B. ORTHMANN 1985, 403. Nr. 320a; *Keban 1968-1971*).

[15] TERŽAN, MIHOVILIĆ, HÄNSEL 1998, 182 with fig. 19,1; TERŽAN, MIHOVILIĆ, HÄNSEL 1998, 179, 189 with fig. 32,8; MIHOVILIĆ *et alii* 2001, 52; HÄNSEL, MIHOVILIĆ, TERŽAN 2010, pp. 93, 105 with fig. 17; MIHOVILIĆ, HÄNSEL, TERŽAN 2011, p.132 with fig. 1; HÄNSEL, MIHOVILIĆ, TERŽAN 2015, 488f., fig. 330, 574; MIHOVILIĆ 2021, xx.

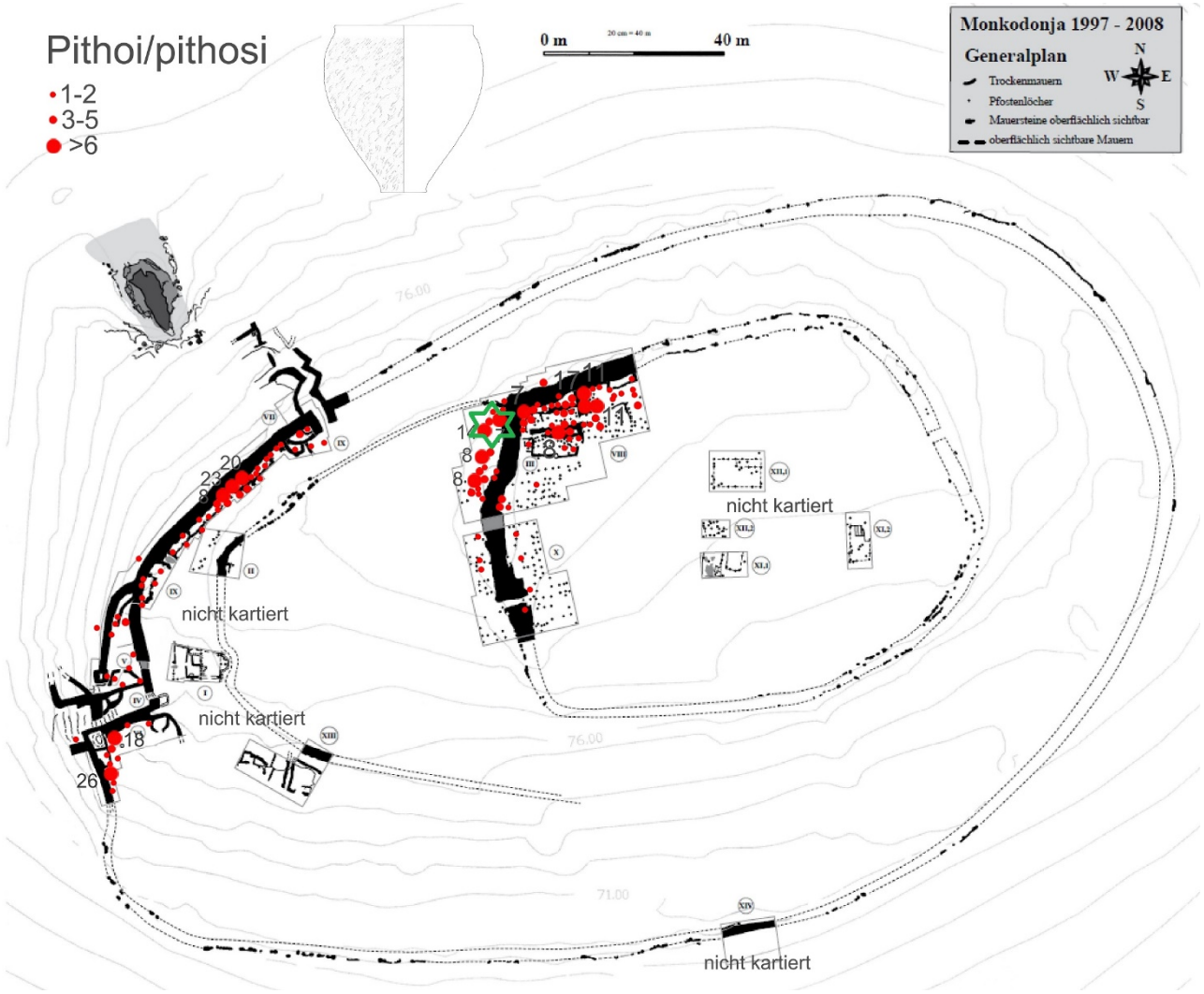



*Fig. 3. The distribution of pithoi in Gradina Monkodonja (graphic: A. Hellmuth Kramberger).*
Distribuzione dei pithoi a Gradina Monkodonja (disegni: A. Hellmuth Kramberger).

The special role of the acropolis, apart from its dominance as a storage, is made clear above all by the occurrence of fine pottery. The situation is obvious with regard to the distribution of a special group of fine pottery, namely the small *kantharoi*. These particularly small-sized, thin-walled drinking vessels have a cylindrical neck and a more or less pronounced biconical body and usually two opposing vertical handles (Fig. 1, No. 28)[16]. An exemplary calculation of the vessel volume resulted in a capacity of 54 cl (cf. HELLMUTH KRAMBERGER 2021). The majority of the small *kantharoi* were made in a reducing firing atmosphere and are therefore black or black-brown in colour, while the few examples made in an oxidising firing atmosphere appear in various tones of orange and beige[17]. The surfaces on the outside are very well burnished, sometimes polished. On the insides, there was usually rather a rough treatment of the surface, which, however, may explain the small size of the vessels - careful treatment was simply not possible here. This is a fine-pored pottery, whose pore size is clearly below the average value of 0.3 mm for Monkodonja, the temper shows only very fine particles. Small *kantharoi* make up only a very small proportion of the typologically determinable pottery fragments from Monkodonja, namely less than 1% (n = 7,420). The low proportion could be due to the high susceptibility of these fragile, small vessels to decay. The mapping of the small *kantharoi* in the settlement shows a clear concentration of finds on the acropolis, with only three pieces coming from the area of the outer fortification[18] or from one of the houses on the slope in the lower town. While fine drinking vessels in the acropolis were sometimes stored in the same storerooms as the *pithoi*, this does not seem to apply to the storerooms of the casemates on the

[16] HELLMUTH KRAMBERGER 2017, 96ff; cf. also: *Monkodonja i Mušego 2009/2011*, 39 first row second vessel from the right; BURŠIĆ-MATIJAŠIĆ 1998, pl. 37,530-531.
[17] According to the Munsell Soil Color Charts, the following tones are involved: black (5R2.5/1; 7.5R3/1; 7.5R2.5/1; 10R3/1; 10R2.5/1; 2.5YR3/1; 2.5YR2.5/1; 5YR2.5/1; 7.5YR3/1; 7.5YR2.5/1; 10YR2/1; 2.5Y3/1; 2.5Y2.5/1; GLEY1 2.5/N), brown tones (5R5/2-4; 5R4/2-4; 5R3/2; 5R2.5/2; 7.5R3/2; 10R3/2; 2.5YR4/4-8; 5YR3/3; 7.5YR3/2), beige tones (5YR8/2-4; 7.5YR8/2-4) and orange tones (2.5YR7/8; 2.5YR6/6-8; 2.5YR5/8; 2.5YR5/6-8; 5YR7/8; 5YR6/8).
[18] Again at the corner bastion of the West gate with the stone-cist grave B.

outer fortifications. An obvious reason for this would be that fine tableware was not needed or used here, which underlines the prominent position of the acropolis.

The pottery from Monkodonja also reflects the position of Istria as an important contact zone between the Adriatic cultural region and the Danube-Carpathian region and Central Europe. On the one hand, this involved contacts in the directly bordering areas and, on the other, communication over distances of several hundred kilometres. Since these contacts have already been discussed in detail elsewhere (HELLMUTH KRAMBERGER 2017, pp. 337-391; HELLMUTH KRAMBERGER 2020; HELLMUTH KRAMBERGER 2021), only a few will be pointed out here. In general, they may have led to the exchange of finished products and the exchange of ideas and techniques. We can recognize similarities in design, but also the existence of a common pool of knowledge regarding manufacturing technologies and the use of certain vessels. The latter is particularly obvious in the case of the tripods, because not only is it a form of the Eastern Mediterranean, but it was also associated with a very particular way of preparing food (HÄNSEL, MIHOVILIĆ, TERŽAN 2015, p. 503; HELLMUTH KRAMBERGER 2022). Interestingly, some pottery finds from Monkodonja attest to contacts with northern Italy and the western Adriatic coast, more precisely with Puglia (cfr. HELLMUTH KRAMBERGER 2021). In contrast to the tripods, which on the one hand go back to Mediterranean raw models and on the other hand represent a leading type of Bronze Age Istria and the Trieste Karst, these individual finds appear completely atypical in the local ceramic spectrum of Monkodonja or in Istria in general. Especially in the case of the pieces that find their comparisons in Puglia, e.g. bowls with concave, irregular everted rim (HELLMUTH KRAMBERGER 2021, fig. 2,i-j ), one could be right in assuming that the trade route led across the sea. In this context, we can recall the large flow vortex that bridges the western and eastern Adriatic coasts and forms a link between the Dalmatian islands of Split and the Gargano of Puglia (HÄNSEL, MIHOVILIĆ, TERŽAN 2015, p. 50, fig. 14). It is therefore no coincidence that, for example, similar bottles with small *tutuli* (bulges) on the shoulder have been found in Monkodonja[19], on the island of Vis[20] and in the settlement of Coppa Nevigata[21] on the coast of Puglia.
Another important contact zone is the Danube-Carpathian region. Not only individual pieces can be compared with finds from the Early to Middle Bronze Age cultures of the Western Danube-Carpathian region, in particular the Aunjetitz culture in Lower Austria with the Unterwölbing Group and the Böheimkirchner group of the Věteřov culture or the Hungarian Füzesabony Culture, but above all we can recognise common features (HELLMUTH KRAMBERGER 2017, figg. 273,a.c.e; 274,a.c.e.g; 275,a; HELLMUTH KRAMBERGER 2020). In particular, these are the occurrence of dark, polished fine ceramics with spherical body and elongated neck, bell-shaped barbotine jars and *pithoi* among the storage vessels, bowls with decorated bottom-underside or small pitchers (or in Monkodonja also small *kantharoi*) as special drinking vessels. Here too, we are not only dealing with purely formal similarities, but it can be assumed that they were used in a similar way. Especially with the fine ceramics with the regularly occurring small drinking vessels, we can think of similar drinking habits.

## POTTERY FROM MONBRODO

The hillfort of Monbrodo, with its superficially visible but heavily forested, encircling ramparts is situated near the sea on a 30 m high hill near the bay of Cisterna, about 7 km south of the city of Rovinj.[22] It is a little more than 3 km south of Monkodonja. While Monkodonja was inhabited exclusively in the developed Early and Middle Bronze Ages until the middle of the 2nd millennium BC, Monbrodo most likely shows occupation during various Bronze and Iron Age periods. Three trenches were excavated on the western flank of the hill, one on the central plateau, "the acropolis" (Sonda 1), one on the second terrace (Sonda 3) and one on the third terrace (Sonda 2) (Fig. 4). No prehistoric traces of use could be identified on the third settlement terrace (MÜLLER, ČUKA, HELLMUTH KRAMBERGER 2016, p. 41), but extensive traces of use from different periods were found on the central plateau and on the second settlement terrace (Figs. 5-6). An initial analysis of the pottery finds revealed that both the acropolis and the second settlement terrace must have been inhabited at the same time when the settlement on Monkodonja existed (MÜLLER, ČUKA, HELLMUTH KRAMBERGER 2016; HELLMUTH KRAMBERGER, MÜLLER, ČUKA 2018).

[19] HELLMUTH KRAMBERGER 2017, pl. 69.5. Fragments of bottles decorated with tutuli (bulges) were also discovered during recent excavations on the contemporary Gradina Monbrodo near Monkodonja (previously unpublished material). This coastal settlement is believed to have played an important role in maritime trade during the developed Early and Middle Bronze Age (cf. MÜLLER, ČUKA, HELLMUTH KRAMBERGER 2016).

[20] KAISER, FORENBAHER 2002, 106 with fig. 9,1; HELLMUTH 2012, 42 with fig. 6,8, 43 with fig. 7,2.

[21] CASSANO *et alii* 1987, 150 with fig. 73,13, 157 with fig. 76,2; cf. HELLMUTH KRAMBERGER 2017, fig. 98,b.

[22] MÜLLER, ČUKA, HELLMUTH KRAMBERGER 2016; HELLMUTH KRAMBERGER, MÜLLER, ČUKA 2018. The excavations at Gradina Monbrodo between 2016 and 2018 were made possible by a Korean-Croatian cooperation. On the Korean side, the project was led by Dr. S. Müller from the Institute for Mediterranean Studies (IMS) in Busan and supported by a grant from the National Research Foundation of Korea funded by the Korean government (NRF-2016S1A5A8018505). On the Croatian side, the project was supported by the director D. Komšo and M. Čuka from the Archaeological Museum of Istria in Pula, and by D. Matošević from the Rovinj Heritage Museum.


Fig. 4. *Location of the excavation trenches 2016-2018 on Gradina Monbrodo (GPS-mapping by A. Hellmuth Kramberger in a satellite image on Google Maps).*
Localizzazione delle trincee 2016-2018 a Gradina Monbrodo (elaborazioni di A. Hellmuth Kramberger su base satellitare Google Maps).


*Fig. 5. View of* Trench *1 of Monbrodo with visible acropolis wall from the the Middle Bronze Age (drone photo by AMI-Pula).*
Vista del sondaggio1 a Monbrodo in cui è visibile il muro dell'acropoli della Media età del Bronzo (foto da drone di AMI-Pula).

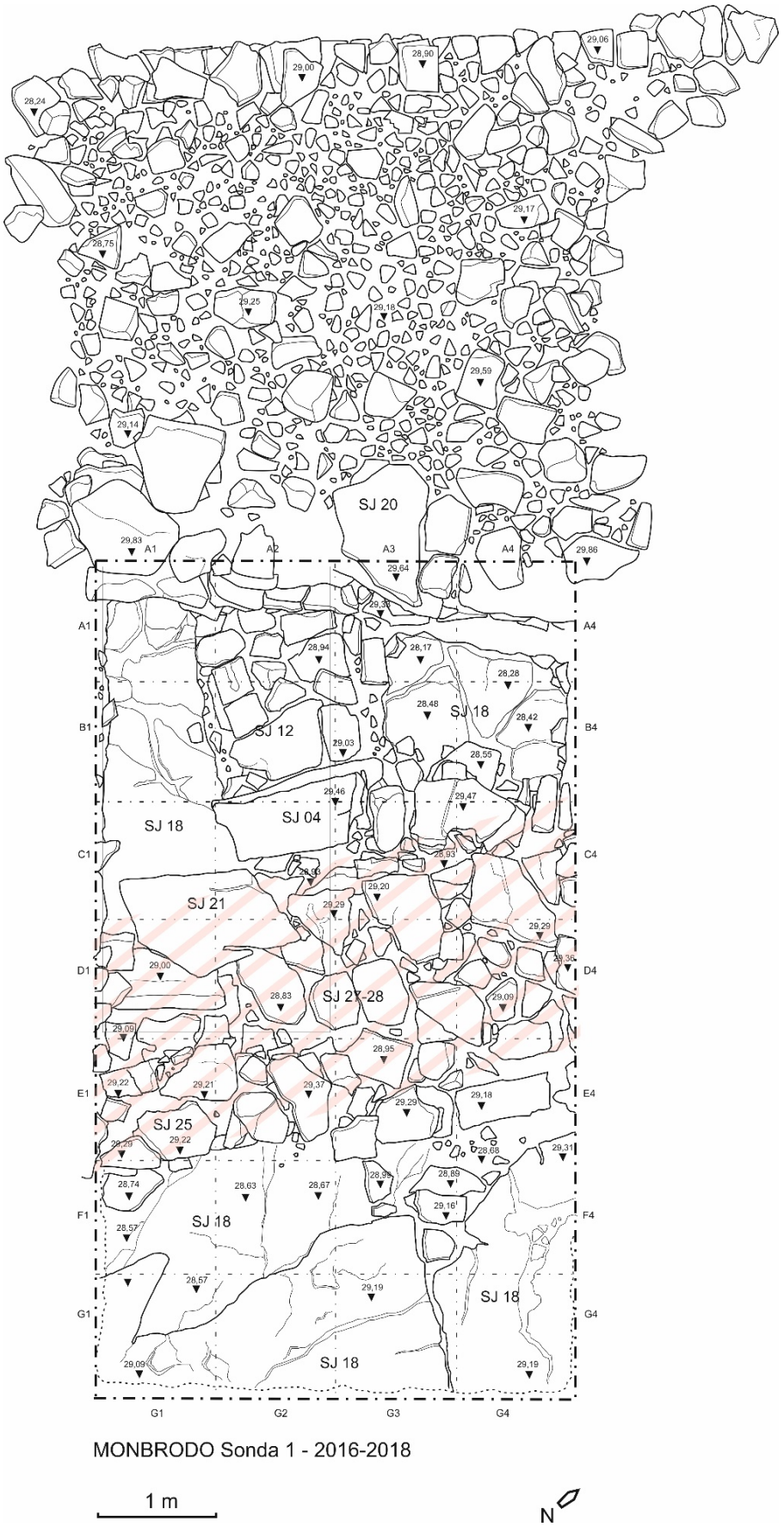



*Fig. 6.* Trench *1 of Monbrodo with signed acropolis wall dating to the Middle Bronze Age (hatched area) (graphic by A. Hellmuth Kramberger).* Planimetria del sondaggio1 a Monbrodo con evidenziato il muro dell'acropoli della Media età del Bronzo (disegno di A. Hellmuth Kramberger).

It should be emphasised that such an extensive stratigraphy of almost 2 m as was discovered in Trench 1 on Monbrodo (Fig. 7) has rarely been preserved on other hill settlements in the karst (Carso) due to erosion processes. The large quantities of handmade pottery from the lowest stratigraphic units immediately above the bedrock are comparable to the pottery assemblage from Monkodonja (MÜLLER, ČUKA, HELLMUTH KRAMBERGER 2016, pp. 32–35; HELLMUTH KRAMBERGER, MÜLLER, ČUKA 2018, pp. 34–35, Pl. 2–3), so that the evidence currently available suggests that the construction of a first fortification on the acropolis dates to the developed Early or Middle Bronze Age, even though not all the material has been published yet.

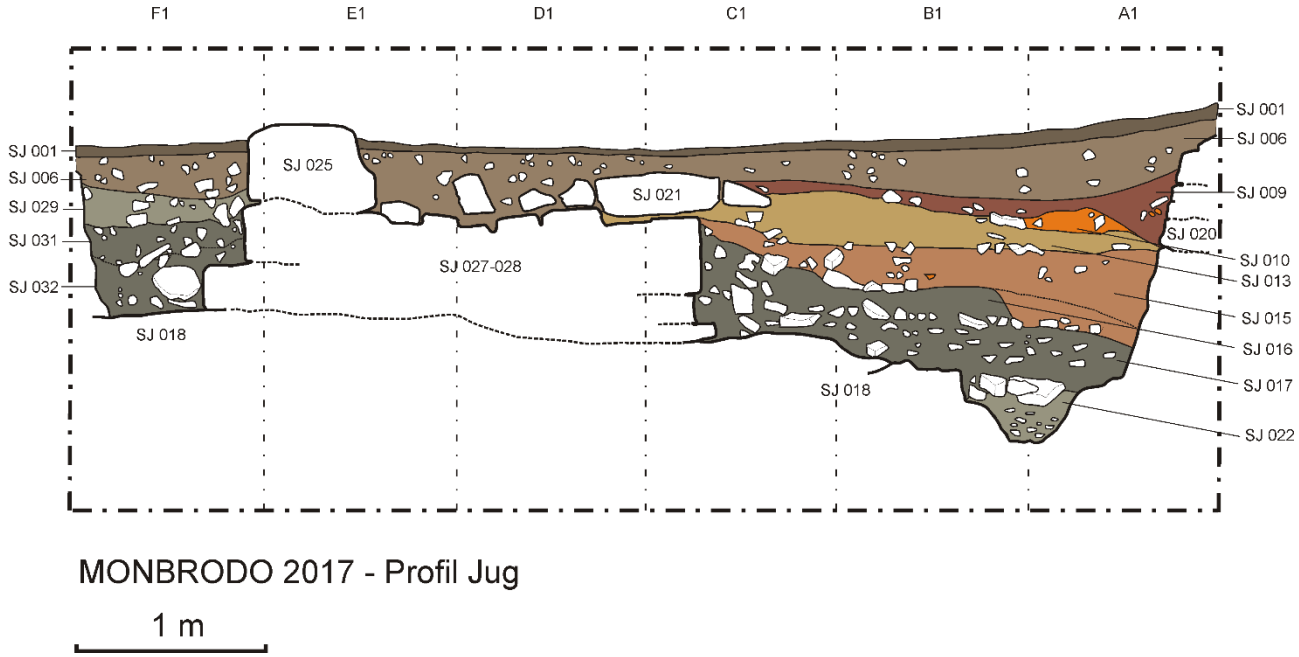



*Fig. 7. Southern profile of Trench 1 (acropolis) on Monbrodo (graphic by A. Hellmuth Kramberger).*
Sezione stratigrafica sud del sondaggio 1 a Monbrodo (disegno di A. Hellmuth Kramberger).

To date, only a few vessels and vessel fragments from the excavations at Gradina Monbrodo have been published (MÜLLER, ČUKA, HELLMUTH KRAMBERGER 2016, Pl. 1-5; HELLMUTH KRAMBERGER, MÜLLER, ČUKA 2018, Pl. 2-3; HELLMUTH KRAMBERGER in *print*, Pl. 1-3); further material was examined and drawn in a processing campaign in 2019 and has not yet been published. Some previously published and until now unpublished finds from the Middle Bronze Age strata are discussed below.

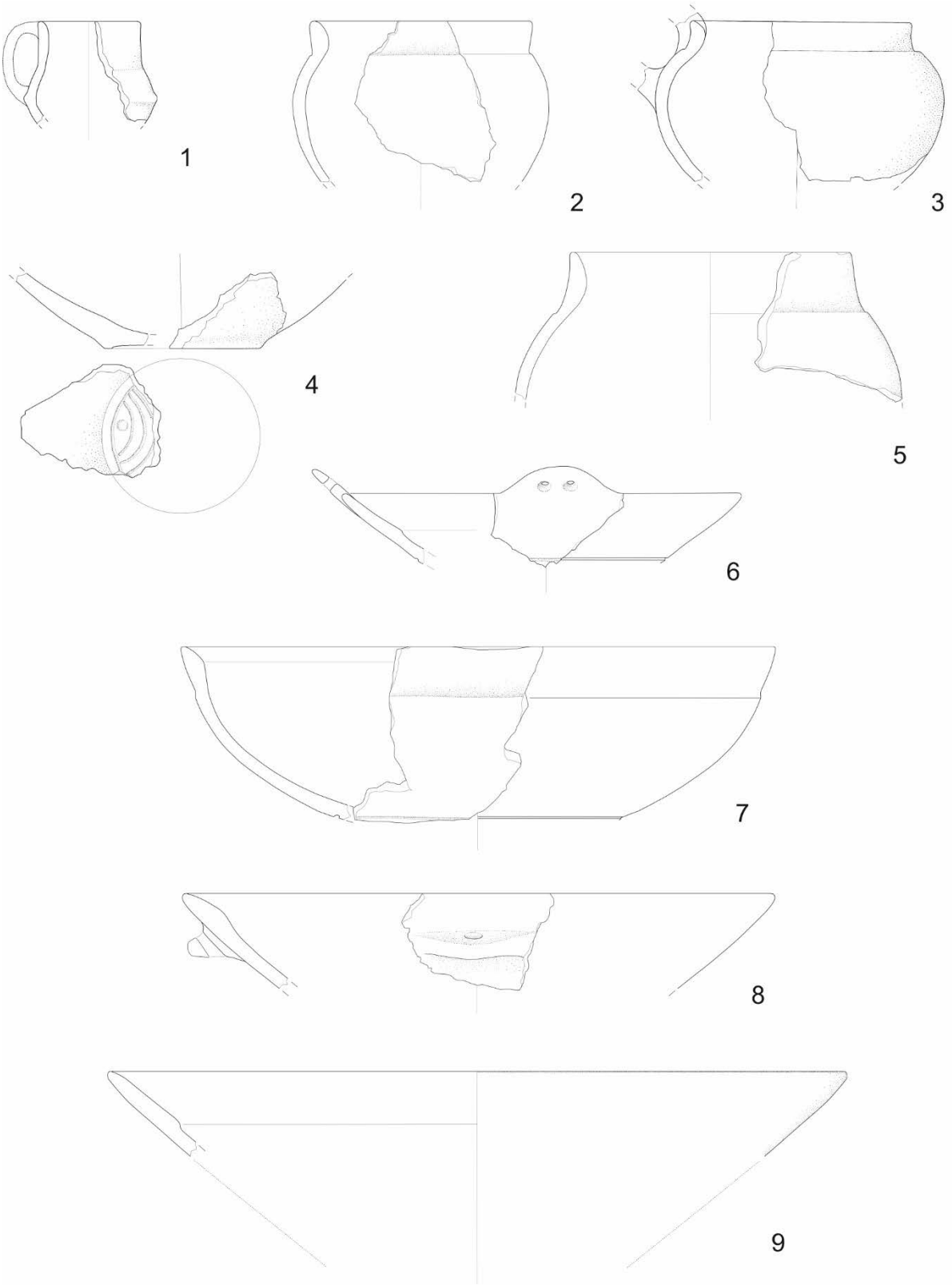
Particularly rich pottery finds were discovered on the acropolis in Trench 1 on the inner side of the Bronze Age wall (cf. Figs. 5-6) in the lowest layers directly above the bedrock. The pottery showed a good state of preservation of the surfaces and it was possible to connect fragments belonging to one and the same vessel. The very characteristic pottery finds that could be identified include amphora-shaped jars and *pithoi* with x-shaped handles below the rim and large triangular handles with a rounded end plate at the widest part of the body (Pl. 3,2-4) (MÜLLER *et alii* 2016, p. 32, Pl. 3,7; HELLMUTH KRAMBERGER, MÜLLER, ČUKA 2018, Pl. 2.5; 3.3). On the second settlement terrace in Trench 3, several shoulder fragments of a large amphora-shaped vessel with a distinctive decoration consisting of a horizontal plastic rib and a grooved wavy line ornament with recessed dots above the rib were discovered (Pl. 3,2). An exact equivalent of this ornament has not yet been found in Istria, but it is vaguely reminiscent of an ornament on a large amphora-shaped vessel from the Grotta dei Ciclami/Orehova Pejca in the karst area of Trieste (LEGNANI, STRADA 1963; HELLMUTH KRAMBERGER 2017, p. 208, fig. 175). In general, this is a vessel type, probably for liquids, which can be described as an important "leading type" of the Early and Middle Bronze Age hillforts in Istria and in the Trieste Karst (Carso)[23]. Another characteristic vessel type of the Istrian hillforts, which was maybe used for storing liquids[24], are spherical bottles with a bulge (*tutulus*) decoration on the shoulder (HELLMUTH 2012; HELLMUTH KRAMBERGER 2017, 116ff., 117ff fig. 86). Fragments of such bottles were also found on the acropolis of Monbrodo (Pl. 3,1). The fine wares also include fragments of bowls with decorated bottom-underside (Pl. 1,4) (HELLMUTH KRAMBERGER 2017, 163ff., 162ff fig. 133, 164ff fig. 134). Since the ornaments are on the underside, we can assume that these bowls were mainly used as lids (cf. Fig.

[23] HELLMUTH 2014; HELLMUTH KRAMBERGER 2017, 203ff., 205 Fig. 170. As already mentioned, in view of the fact that grape seeds were discovered in Monkodonja (KROLL 2015, p. 105 et seq.), it has been argued that these vessels were used to store wine.
[24] The surfaces on the outside and inside of the vessels were very well compacted, burnished and often polished, meaning they were very good for holding liquids.

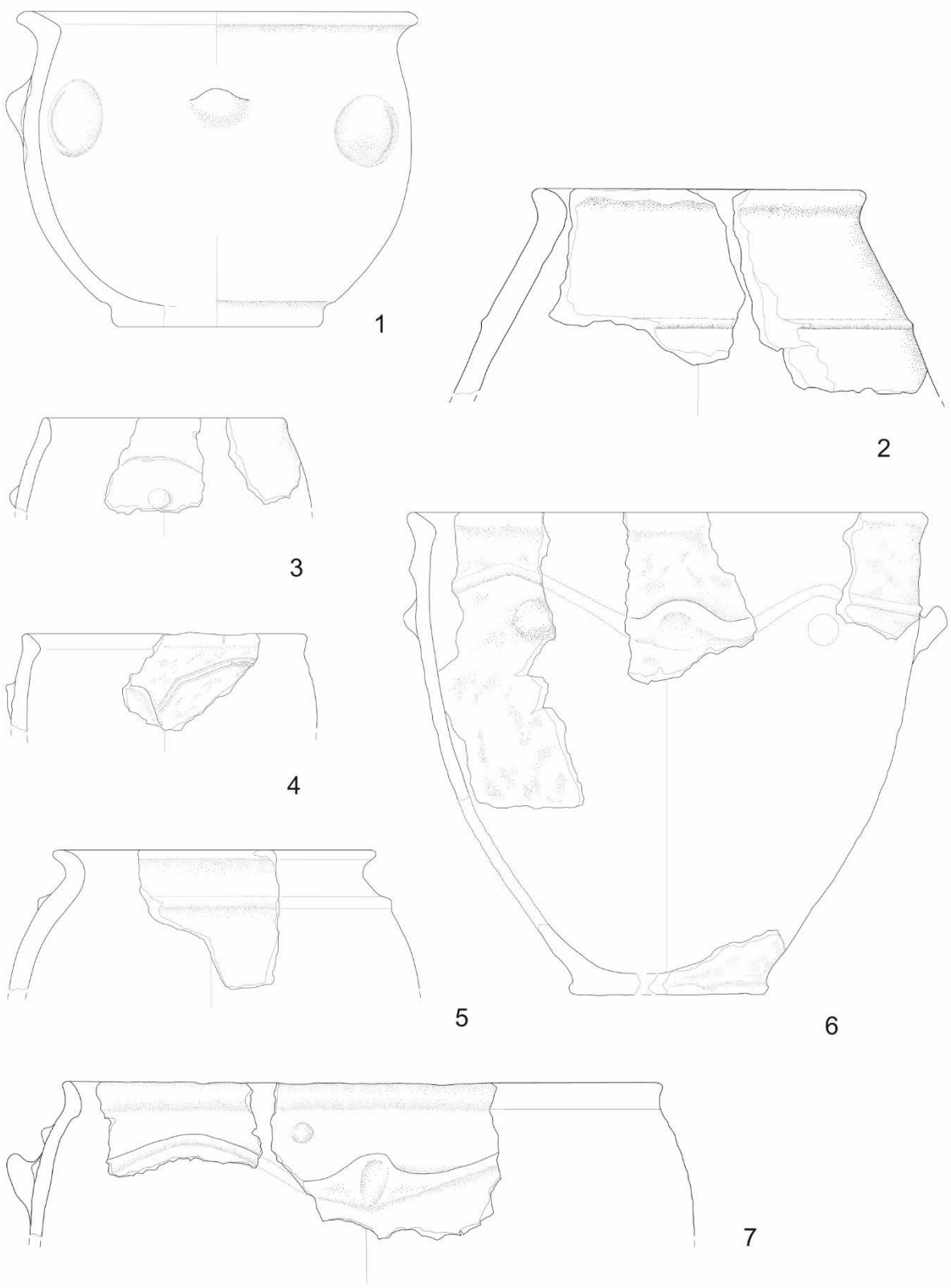
2). Other characteristic bowl types described in Monkodonja are also attested in Monbrodo, such as conical bowls[25] (Pl. 1,8-9) or calotte-shaped bowls[26] (Pl. 1,7), all from the black fine pottery group. Interesting is a rim fragment of a conical bowl with a double perforated handle protruding over the rim (Pl. 1,6). The fine drinking vessels include large cups with rounded bellies and bordered rims (Pl. 1,2-3) and a small jug or *kantharos* with a cylindrical neck (Pl. 1,1) (HELLMUTH KRAMBERGER, MÜLLER, ČUKA 2018, Pl. 2,1). The type of small jug or *kantharos* can also be assigned to the vessel type that represents an important leading type of the Early and Middle Bronze Ages in Istria (HELLMUTH KRAMBERGER 2017, 99ff). Possibly, as mentioned above, they give an indication of certain drinking habits and even served as a social indicator, as they were found almost exclusively on the acropolis in the nearby Gradina of Monkodonja (HELLMUTH KRAMBERGER 2017, pp. 310-311, fig. 248). Jars and *pithoi* with anthropomorphic decoration are also very characteristic (Pl. 2,3-4.6-7) (cf. HELLMUTH 2012; HELLMUTH KRAMBERGER 2017, pp. 214-215, 214, fig. 182). Several fragments of a larger barbotine-jar with anthropomorphic decoration were discovered on the inner side of the Middle Bronze Age acropolis wall in the layer above the bedrock (Pl. 2,6). It can be assumed that this ornament was not only decorative but also had a spiritual, possibly apotropaic meaning (HELLMUTH 2012). A well-preserved (reconstructed) spherical jar from Trench 1 on Monbrodo, decorated with small tongue shaped handles and large bulges (*tutuli*) (Pl. 2,1), has no direct comparison in Monkodonja. However, the shape of the spherical jars themselves is attested in Monkodonja, but without decoration[27]. A spherical jar with thin walls and a decoration with bulges as well as an arch-shaped plastic rib is also documented among the ceramic material from B. Baćić's excavations at Monkodonja (BURŠIĆ-MATJAŠIĆ 1998, Pl. 32,492).

As we have already indicated (HELLMUTH KRAMBERGER, MÜLLER, ČUKA 2018, p. 29), and what becomes even clearer now that a larger amount of ceramic material has been processed, it can be stated that the spectrum of the pottery from Monbrodo does not show any significant differences compared to the pottery from Monkodonja. On the contrary, the ceramics appear identical in terms of their shape spectrum and technology, and macroscopically no qualitative differences can be detected. On the acropolis of Monbrodo and also on the second settlement terrace, the same high-quality pottery was found as in Monkodonja. All the characteristic forms of fine and coarse pottery are represented, such as amphora-shaped jars and *pithoi* with very good burnished or even polished surfaces, barbotine jars with anthropomorphic decorations, small *kantharoi* from the group of fine polished wares, jugs, bottles with bulge decoration (*tutuli*), bowls with decorated bottom undersides, etc. The nature of the relationship between these two sites, at least partially occupied at the same time, remains unclear at the moment, even if Monbrodo was somewhat smaller than Monkodonja during the Middle Bronze Age, the range of pottery finds shows no differences so far.[28]

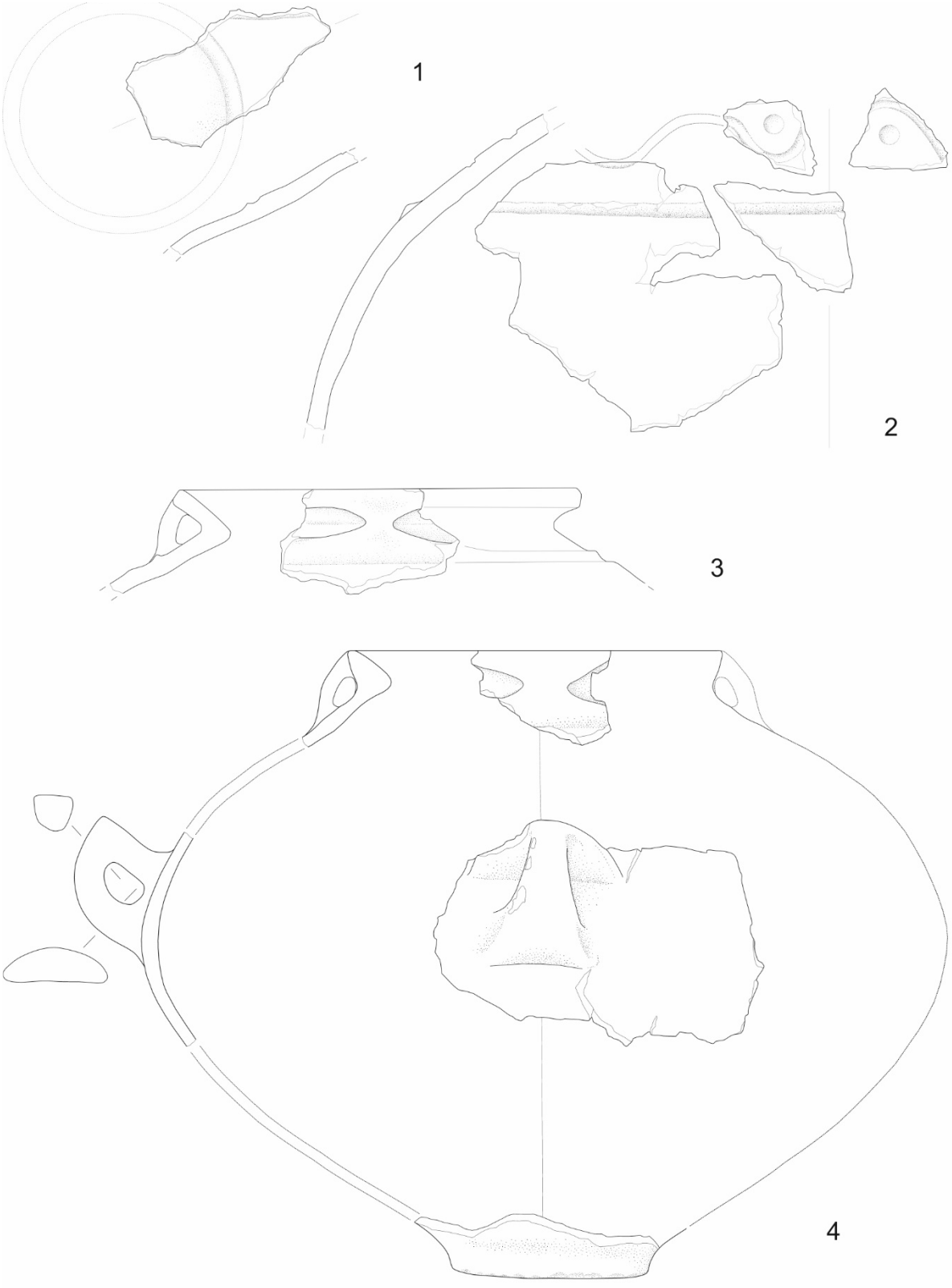
[25] ibid., 137, 138 Fig. 109.
[26] ibid., 146ff., 138 Fig. 109.
[27] Jar type VII (HELLMUTH KRAMBERGER 2017, 169 Fig. 139, 184ff.).
[28] This paper was supported by the Slovenian Research Agency (ARRS) as part of the research group "Raziskave kulturnih formacij / Research of Cultural Formations (P6-0278 (A), 2019-2024)" at the Alma Mater Europaea - Institutum Studiorum Humanitatis, Fakulteta za podiplomski humanistični študij Ljubljana.




Pl. 1. *Monbrodo, Trench 1. 1,4:, SJ/SU 32; 2: SJ/SU 35; 3: SJ/SU 25; 5: SJ/SU 35; 6,8: SJ/SU 29; 7: SJ/SU 32; 9: SJ/SU 06. Scale 1:3.*
Monbrodo, Trincea 1. 1,4:, US 32; 2: SJ/SU 35; 3: US 25; 5: US 35; 6,8: US 29; 7: US 32; 9: US 06. Scala 1:3.




*Pl. 2. Monbrodo, Trench 1. 1: SJ/SU 32; 2: SJ/SU 26/30; 3: SJ/SU 29; 4: SJ/SU 32; 5: SJ/SU 26; 6,7: SJ/SU 32. Scale 1:3.*
Monbrodo, Trincea 1. 1: US 32; 2: US 26/30; 3: US 29; 4: US 32; 5: US 26; 6,7: US 32. Scala 1:3.




*Pl. 3. Monbrodo, Trench 1. 1:,SJ/SU 35; 2: SJ/SU 08/20; 3: SJ/SU 06; 4: SJ/SU 32. Scale 1:3.*
Monbrodo, Trincea 1. 1:,US 35; 2: US 08/20; 3: US 06; 4: US 32. Scala 1:3.

## CATALOGUE [29]

**Plate 1, 1:** Trench 1, Quadrant F2, SU 32; Partially preserved small jug or *kantharos*. Publication: HELLMUTH KRAMBERGER, MÜLLER, ČUKA 2018, 30, Table 2,1.

**Plate 1, 2:** Trench 1, Quadrant G2, SU 35; Partly preserved large cup without handle. Surface on the external side polished, on the internal side fired, colour on the internal and external surface black, colour in the cross-section black. Porosity is fine, the pottery is hard. Clay fabric FA (HELLMUTH KRAMBERGER 2017, fig. 23, 31).

**Plate 1,3:** Trench 1, Quadrant E2, SU 25; Partly preserved large cup with fragmented handle. Publication: HELLMUTH KRAMBERGER, MÜLLER, ČUKA 2018, 30, Table 2,2.

**Plate 1,4:** Trench 1, Quadrant F1, SU 32; Bottom-fragment of a bowl, ornamented with incised bows and imprinted dots. Publication: HELLMUTH KRAMBERGER, MÜLLER, ČUKA 2018, 30, Table 2,4.

**Plate 1,5:** Trench 1, Quadrant G1, SU 35; Rim-fragment of a jar. Surface on the internal and external side not preserved due to secondary burning, colour on the internal and external surface grey, colour in the cross-section dark grey. Porosity is fine, the pottery is hard. Clay fabric FA (HELLMUTH KRAMBERGER 2017, fig. 23, 31).

**Plate 1,6:** Trench 1, Quadrant F3, SU 36; Rim-fragment of a conical bowl with a double perforated extension (grip). Surface on the external and internal side polished, colour on the internal and external surface black, colour in the cross-section black. Porosity is fine, the pottery is very hard. Clay fabric FA (HELLMUTH KRAMBERGER 2017, fig. 23, 31).

**Plate 1,7:** Trench 1, Quadrant G2, SU 32; Fragments of a large bowl with rounded profile and groove-decoration above the bottom. Surface on the external side polished, burnished on the internal side, colour on the internal and external surface black, colour in the cross-section black. Porosity is fine, the pottery is very hard. Clay fabric MA a (HELLMUTH KRAMBERGER 2017, fig. 24, 31)

**Plate 1,8:** Trench 1, Quadrant F4, SU 29; Rim-fragment of a conical bowl with a horizontal perforated grip. Surface on the external and internal side burnished, colour on the internal and external surface black, colour in the cross-section black. Porosity is fine, the pottery is hard. Clay fabric MA a (HELLMUTH KRAMBERGER 2017, fig. 24, 31).

**Plate 1,9:** Trench 1, Quadrant G4, SU 06; Rim-fragment of a large conical bowl. Surface on the external and internal side burnished, colour on the internal and external surface black, colour in the cross-section black. Porosity is fine, the pottery is hard. Clay fabric GA a (HELLMUTH KRAMBERGER 2017, fig. 24, 31).

**Plate 2,1:** Trench 1, Quadrant G1, SU 32; Globular jar with tongue-shaped grip and plastic applications, bulges (*tutuli*). Surface on the external and internal side polished, colour on the internal and external surface black, colour in the cross-section black. Porosity is very fine, the pottery is very hard. Clay fabric MA a (HELLMUTH KRAMBERGER 2017, fig. 24, 31).

**Plate 2,2:** Trench 1, Quadrants B3/B4, SU 26/SU 30; Rim-fragments of a jar with conical neck and horizontal plastic ledge. Publication: HELLMUTH KRAMBERGER, MÜLLER, ČUKA 2018, 30, Table 3,1.

**Plate 2,3:** Trench 1, Quadrant E3, SU 29; Rim-fragment of a jar with incised ornament and knot. Surface on the external and internal side well burnished, colour on the internal and external surface black, colour in the cross-section black. Porosity is very fine, the pottery is very hard. Clay fabric MA a (HELLMUTH KRAMBERGER 2017, fig. 24, 31).

**Plate 2,4:** Trench 1, Quadrants G1/G2, SU 32; Rim-fragment of a jar with incised ornament and tongue-shaped grip. Surface on the external side Barbotine, burnished on the internal side, colour on the internal and external surface blackish brown, colour in the cross-section black. Porosity is fine, the pottery is very hard. Clay fabric MA a (HELLMUTH KRAMBERGER 2017, fig. 24, 31).

**Plate 2,5:** Trench 1, Quadrants B4, SU 26 30; Rim-fragment of a globular jar with horizontal plastic ledge. Surface on the external side burnished, smoothed on the internal side, colour on the internal and external surface brown, colour in the cross-section black. Porosity is fine, the pottery is very hard. Clay fabric MC b (HELLMUTH KRAMBERGER 2017, fig. 24, 31).

**Plate 2,6:** Trench 1, Quadrant G1, SU 32; Rim- and bottom-fragments of a jar with plastic decoration and grips. Surface on the external side Barbotine, smoothed on the internal side, colour on the external surface brown, black on the inside, colour in the cross-section black. Porosity is fine, the pottery is very hard. Clay fabric MA a (HELLMUTH KRAMBERGER 2017, fig. 24, 31).

[29] All macroscopic analyses and drawings were performed by A. Hellmuth Kramberger.

**Plate 2,7:** Trench 1, Quadrant F1, SU 32; Rim-fragments of a jar with arched plastic ledges, knots and grips with finger-imprint. Publication: HELLMUTH KRAMBERGER, MÜLLER, ČUKA 2018, 30, Table 3,2.

**Plate 3,1:** Trench 1, Quadrant G1, SU 35; Plastic application, bulge (*tutulus*), probably part of a bottlelike vessel. Surface on the external side burnished and on the internal side smoothed, colour on the external surface black with brown and orange spotting, on the internal side black, colour in the cross-section black. Porosity is fine, the pottery is very hard. Clay fabric MA a (HELLMUTH KRAMBERGER 2017, fig. 24, 31).

**Plate 3,2:** Trench 3, Quadrant D2, E2, SU 08, 20; Shoulder fragments of a large jar (perhaps amphora-shaped) with plastic and grooved ornament. Surface on the external and internal side burnished, colour on the internal and external surface black, colour in the cross-section black. Porosity is fine, the pottery is hard. Clay fabric MA a (HELLMUTH KRAMBERGER 2017, fig. 24, 31).

**Plate 3,3:** Trench 1, Quadrant G2, SU 06; Rim-fragment of an amphora-shaped jar with x-shaped handle. Surface on the external and internal side burnished, colour on the external surface orange and on the internal surface black, colour in the cross-section black. Porosity is fine, the pottery is hard. Clay fabric MA a (HELLMUTH KRAMBERGER 2017, fig. 24, 31).

**Plate 3,4:** Trench 1, Quadrant F1, SU 32; Rim-fragment, completely preserved bottom and wall-shards with triangular handle of an amphora-shaped jar with x-shaped handle. Publication: HELLMUTH KRAMBERGER, MÜLLER, ČUKA 2018, 30, Table 3,3.

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