

## TELL-TALE FRAGMENTS:

## The pottery use of a 6000-year-old community at Bükkábrány

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*A settlement of the Middle Copper Age Hunyadihalom culture (3900–3700 BC) was unearthed in the vicinity of Bükkábrány during excavations led by András Kalli and Eszter K. Tutkovics between 2012 and 2014. The statistical analysis of the pottery material indicates that the community used a diverse set of vessels, with pieces carefully crafted to meet certain requirements connected to their intended functions. The investigation suggests that, although the storage of goods and food preparation likely occurred in smaller quantities, thus involving smaller groups of people, the joint consumption of the prepared meals held a significant role.*

**Keywords:** Hunyadihalom Culture, Copper Age, settlement, pottery use, pottery function

## INTRODUCTION

People lived on the Great Hungarian Plain during the Early and Middle Copper Age (4500–3500 BC) in relatively small communities, relying mainly on animal husbandry and using their settlements for short periods (RACZKY 2016). This also applies to the communities of the Hunyadihalom culture (3900–3700 BC), who occupied mainly the lands along the Tisza River. The culture's distinct pottery was found on settlements with generally scattered inner structures, such as Hajdúböszörmény–Ficsori-tó-dűlő (KOVÁCS *et al.* 2004) and Tiszafüred–Majoros (KALICZ 1980). One of the exceptions is Tiszalúc–Sarkadpuszta, where Pál Patay unearthed, between 1974 and 1990, a complex settlement consisting of 45 timber-framed houses and surrounded by a palisade wall. Another exception is the subject of this paper, the settlement at Bükkábrány–Bánya XI/B: although this site, excavated between 2012 and 2014 by András Kalli and Eszter K. Tutkovics (KALLI & K. TUTKOVICS 2017), does not display a complex inner structure similar to Tiszalúc, it stands out with a high number and density of features. The significant diversity in the structure of the culture's settlements might be attributed to the dissimilarities in the habitation strategies of the related communities or even to differences in the intensity of research in certain areas. A close examination of the remains of everyday life may shed light on this question; accordingly, this paper aims to offer an insight into the pottery use of the Bükkábrány community.

## THE EXCAVATED AREA AND THE HUNYADIHALOM SETTLEMENT

The archaeologists of the Herman Ottó Museum (Miskolc) have been conducting excavations in the territory of the Bükkábrány Lignite Mine since 2007, always adapting their work to the progress of the mining.<sup>4</sup> Between 2012 and 2014, excavations occurred in two separate sub-areas on Site XI on the western bank of the Csincse Stream and its vicinity, subdivided into a southern (XI/A) and a northern area (XI/B). In both areas, the archaeological phenomena appeared with high intensity and covered a broad time span, including several historical periods.

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<sup>4</sup> In 2014, the fieldwork at Site XI, specifically in area XI/B, was preceded by an unfortunate event. During the excavation break at the end of December and the beginning of January, an unexplored part of the site was destroyed by mining in an approximately 150-metre-wide strip at its centre. Fortunately for the research presented in this paper, the destruction did not affect the Copper Age features.

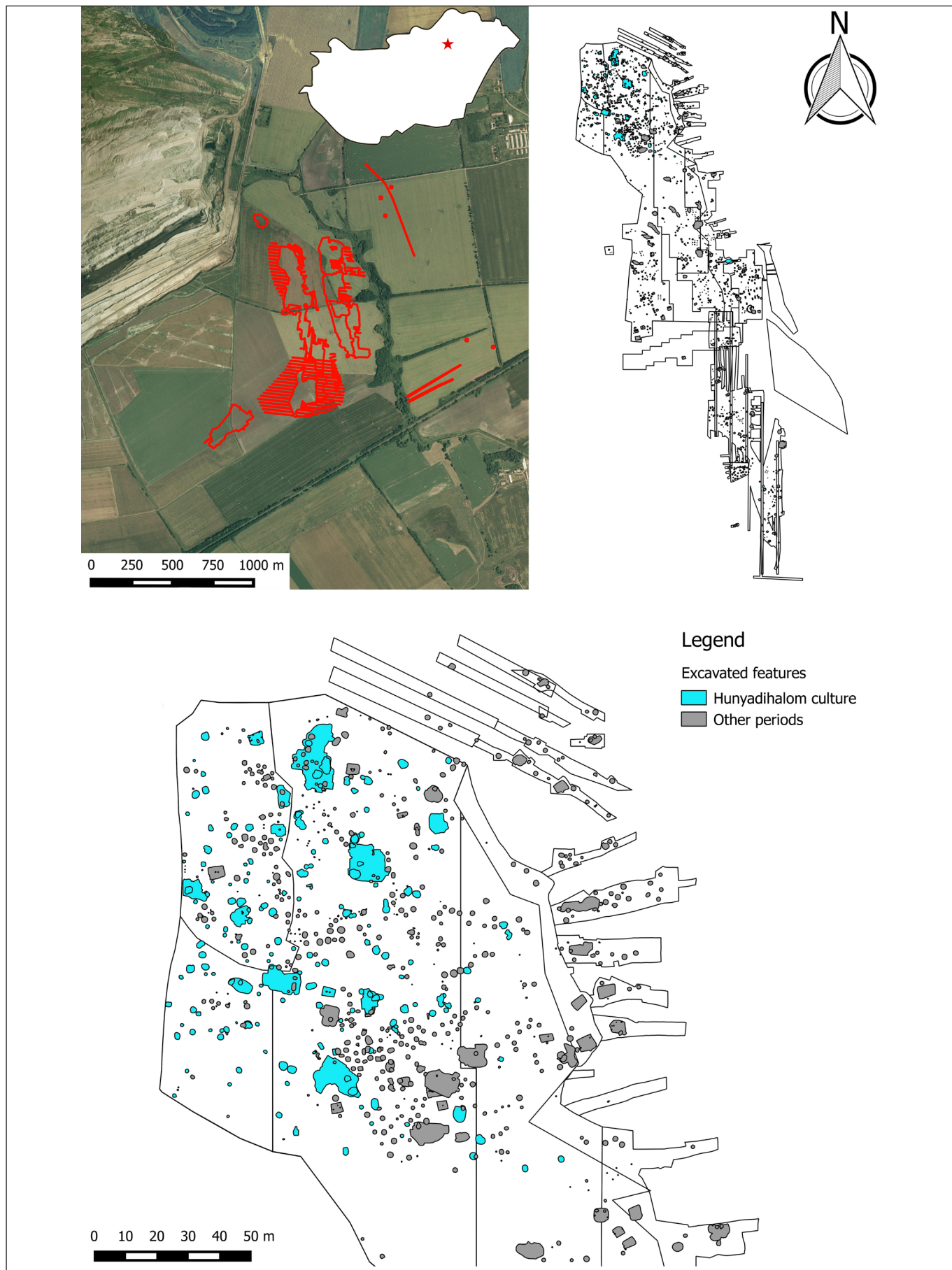


Fig. 1. Bükkábrány-Bánya, Site XI/B

The oldest archaeological remains at Site XI/B were smaller, scattered settlement features of the Middle Neolithic Alföld Linear Pottery culture. On the southern edge of the site, a smaller group of burials assigned to the Early Copper Age Tiszapolgár culture were unearthed, together with a cemetery of 35 graves associated with the Bodrogkeresztúr culture in the western part of the area. The extensive and high-intensity Middle Copper Age Hunyadhalom settlement, consisting of nearly 200 features, was located in the northwestern part, while sporadic features related to it were also found in the southern area. Since these scattered features were not closely linked with the intensive settlement core, they were not included in the evaluation presented here. Besides the extensive clay extraction pit complexes, many round, relatively large pits were unearthed, from which a significant number of pottery sherds, animal bones, bone, and stone tools came to light. The whole northern part of Site XI was covered by the features of a large Celtic settlement, while numerous pits dating to the Roman Imperial and Sarmatian periods were scattered over the entire excavated area. An outer line of the *Csörsz-árok* (Devil's Dyke, a Roman Period defensive ditch system in the Carpathian Basin) also crossed the southern edge of Site XI/B (Fig. 1).

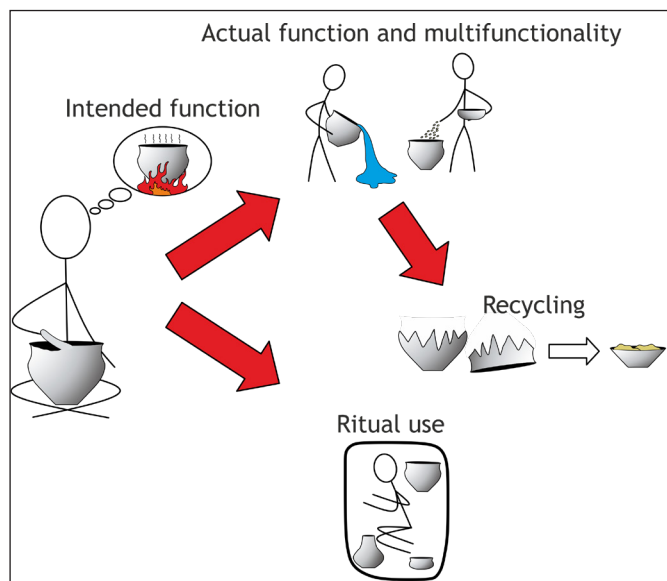
### THE ROLE OF POTTERY IN EVERYDAY LIFE

The pottery used by one-time communities is one of the richest sources of information for archaeologists when it comes to studying everyday life because vessels made of clay and fired into ceramic were used in every activity in households – alongside, of course, objects made from organic materials, which are no longer preserved. The composition of a settlement and, within that, a household's pottery record reveals a great deal of information. It can indicate the intensity and ways of food storage, the food preparation techniques employed, and even the social context of food preparation. Additionally, it can shed light on the nature and extent of communal food consumption, particularly whether those occasions included alcoholic beverage consumption regularly (ATALAY & HASTORF 2006; BUKO 2008; SKIBO 2013; KRAMBERGER 2015; VIEUGUÉ *et al.* 2016; FÜZESI 2022; VUKOVIĆ & BIKIĆ 2022).

Identifying different vessel functions is not a simple task, but one has several applicable methodological approaches to choose from. Examining use-wear traces related to the surface damage occurring during food preparation, storage, or even cleaning allows specific pottery fragments to be linked to certain activities (FORTE *et al.* 2018, 121–122; FORTE 2022). For example, the abrasion of the inner vessel surface caused by fermentation processes can be identified (SKIBO 2013, 115–159; BURKE 2022, 78), as well as soot formation related to cooking (see the paper by Kristóf Fülöp and László Gucsi in this issue). Furthermore, it is also possible to distinguish between cooking with or without liquids (SKIBO 2013, 63–114). The specific use of certain vessels can also be investigated by analysing fatty organic residues, i.e. lipids. These molecules are absorbed into the vessel's material and can be extracted and examined even after thousands of years. The analysis can help determine whether the vessels came into contact with ruminant adipose tissue, milk, or non-ruminant adipose tissue (SALQUE 2012; ROFFET-SALQUE 2017). However, it should be noted in the case of both methods that not all fragments are suitable for these analyses, as not every piece shows signs of use-wear or contained lipid traces.

In general, determining vessel functions begins with studying vessel forms and types; however, challenges already arise there. Firstly, the pottery record of settlements is usually heavily fragmented, making it impossible to reconstruct vessel types in the majority of cases. Secondly, it is crucial to remember that vessels often served multiple functions in prehistory rather than having been used for a single exclusive purpose (FORTE 2022, 31). The use of a vessel could have changed throughout its use-life and was heavily dependent on the context. For example, after a while, a pot used for cooking porridge could have been placed into a burial pit, or if it was damaged, it could have been recycled or repurposed (SKIBO 2013, 2–9). Considering that the complete reconstruction of a vessel's complex use is often unattainable, the goal should be determining a primary, intended function. This allows one to outline the role intended by the potter: in a given context, this is the function that the vessel is the most suitable to fulfil based on its specific characteristics (HALLY 1986, 267–268; SMITH 1988, 912; PHILIPPE 2022, 93) (Fig. 2).





*Fig. 2. The versatility of vessel use. Beyond the intended function, the role of a vessel can vary according to the users' needs and the context. It is important to keep in mind the possibility of the repurposing of damaged pieces, as well as the use of vessels in ritual contexts*

During the making of vessels, potters made a string of conscious decisions related to the intended function, relying on their practical experiences, traditions, and years of experimentation. Several characteristics were adjusted to fit the intended function of the vessels, such as the openness of the mouth, influencing the accessibility of their contents, stability, and capacity. In the case of cooking vessels, it is also important to make the material suitable to withstand thermal shocks. Additionally, some characteristics (such as the vessels' visual and tactile qualities) do not only serve a strictly functional role but also influence the sensory experience of the users. The characteristics with which the potter equips the vessel can be – at least partially – identified through fragments; such are the quality of material, the surface treatment, the wall thickness and, to some extent, the body shape and the decoration. The analysis of these attributes can be the base for reconstructing the intended pottery functions (PORČIĆ 2012, 21; SKIBO 2013, 27–36; PHILIPPE

2022, 88; SKIBO 2022, 352–356; VUKOVIĆ & BIKIĆ 2022, 37–43).

Taking all these considerations into account, the presented research consisted of a multi-step statistical analysis involving the largest possible number of vessel fragments and aimed at revealing recurring patterns reflecting the potters' choices in their making. After interpreting these trends, it became possible to establish primary functional categories.

## THE PROCESS OF RECONSTRUCTING POTTERY FUNCTION

As part of the research, an analysis was conducted on 6,527 fragments of 3,782 vessels from randomly selected features. Although the sample set does not encompass the entire Hunyadihalom culture pottery record of the site, it can be considered representative: variance analyses<sup>5</sup> indicated that a random sample of around 750 pieces is already adequate to represent the full diversity of vessel fragments in a record. During the data collection phase, quantitative data (rim diameter, base diameter, wall thickness, rim angle, base angle), qualitative data (rim shape and decoration, base shape, surface treatment and its differences, quality of material, colour), as well as the characteristics indicating the vessels' shape and decoration were recorded. All kinds of fragments (rim, base, and side fragments and complete vessel profiles) were included in the analysis.

The reconstruction of a function from the fragments was carried out by combining various approaches (Fig. 3). Since vessel form is fundamentally related to function (SMITH 1988, 912; KRAMBERGER 2015, 233; BURKE 2022, 74); shape reconstruction was performed whenever it was possible, relying on the typological system developed by Pál PATAY (2005). Additionally, the role of individual characteristics and their relations were explored using multivariate statistical analytical methods (principal component analysis [PCA], multiple correspondence analysis [MCA], and factor analysis of mixed data [FAMD]) (Fig. 4). The aim, in this case, was to identify fragment clusters that are separated by clear differences in vessel shape, size, and qualitative attributes, as fragments of a certain cluster most likely came from vessels crafted following similar principles and fulfilled similar intended functions. Intended vessel functions were reconstructed based on ethnoarchaeological observations (e.g., HENRICKSON & McDONALD 1983; HALLY 1986; SMITH 1988).

<sup>5</sup> The conclusions rely on the degree of variance in the case of quantitative data and on the IQV (index of qualitative variation) values in the case of descriptive (qualitative) data.

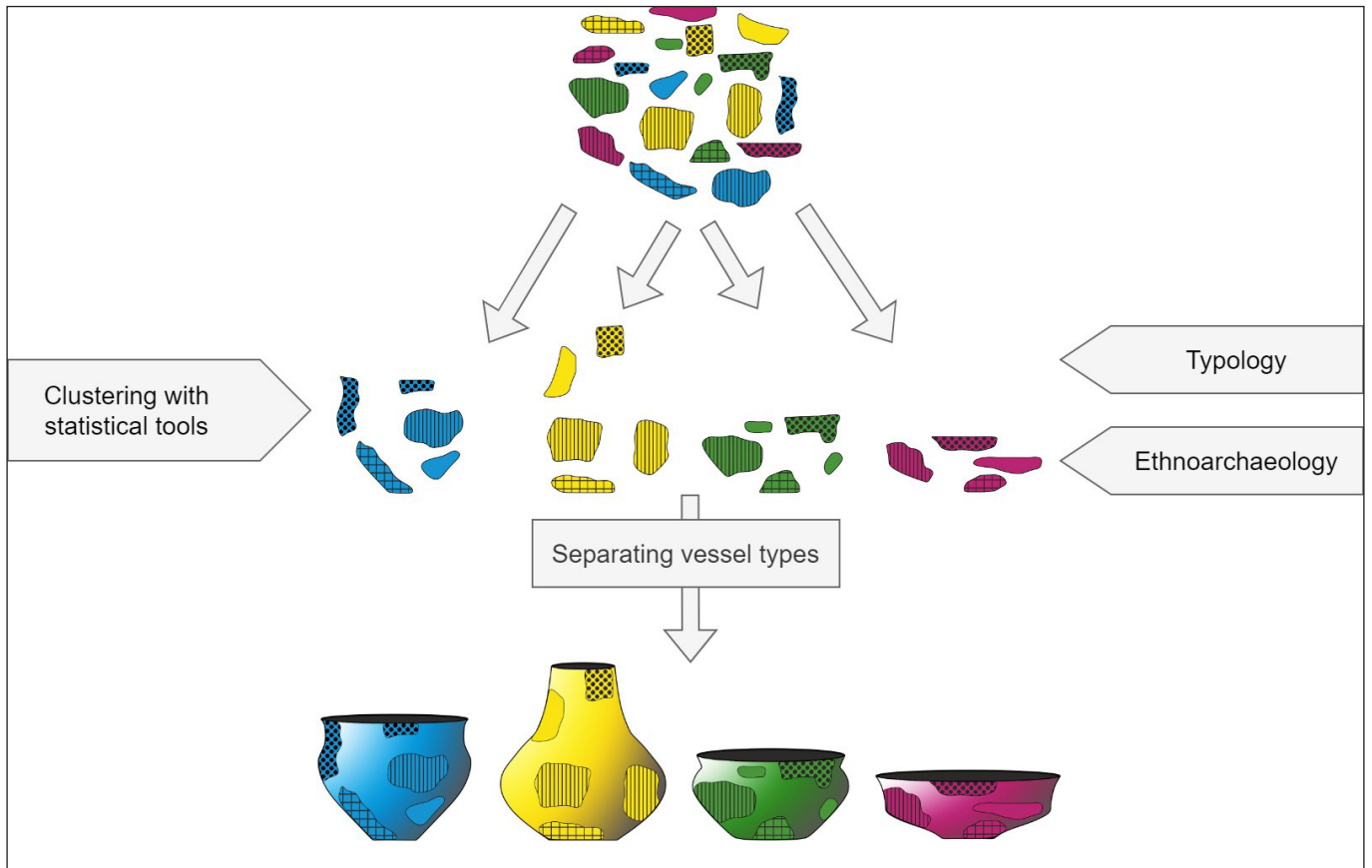


Fig. 3. Based on typological and ethnoarchaeological observations and statistical examinations, it was possible to outline fragment clusters and vessel types and link them to specific functions

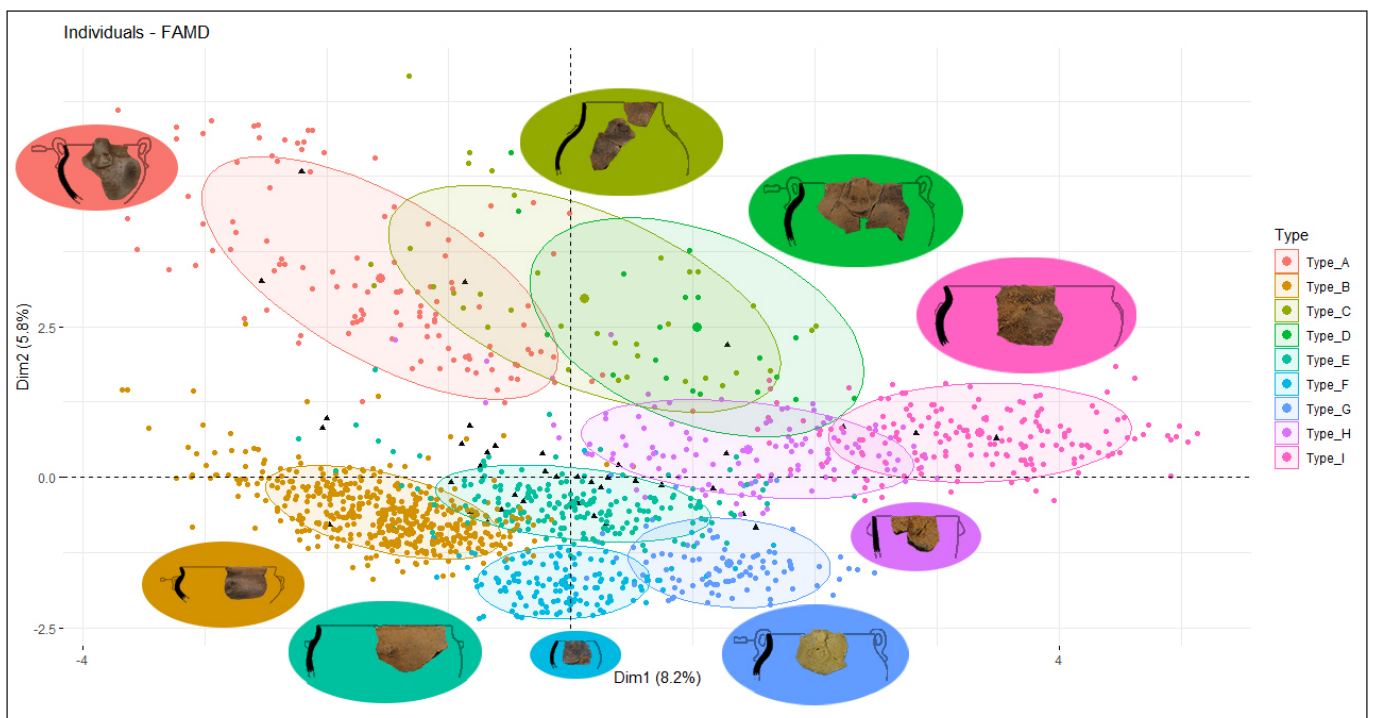


Fig. 4. FAMD (factor analysis of mixed data) plot of the different clusters distinguished based on measurements and attributes of rim fragments and representing vessel types in the pottery record of the Bükkábrány settlement. Type A: vessels of individual liquid consumption, Type B: vessels of individual consumption, Type C: liquid storage vessels, Type D: vessels of communal consumption, Type E: large multifunctional household pottery, Type F: small storage vessels, Type G: cooking vessels, Type H: small multifunctional household pottery, Type I: large storage vessels

Scholarly literature tends to categorise pottery into three main functional groups: storage, cooking and serving vessels (HALLY 1986, 285–290; SMITH 1988, 913–914; PORČIĆ 2012, 24; KRAMBERGER 2015, 241–244; ROUX 2019, 233). Therefore, the goal was to identify these main functional groups and the vessels associated with them in the Bükkábrány record.

### WHAT CAN ONE LEARN ABOUT THE POTTERY USE OF THE MIDDLE COPPER AGE COMMUNITY AT BÜKKÁBRÁNY?

As a result of the multi-step analysis, a complex picture emerged of the pottery usage of the Hunyadihalom community living in Bükkábrány (Fig. 5).

First, they had suitable vessels for communal and individual food serving and consumption. These pieces were generally carefully crafted, burnished, made of fine clay, and often fired to a dark colour in a reductive environment. While no vessel shape could clearly be associated with individual liquid consumption, smaller, globular vessels or conical cups with a capacity<sup>6</sup> under 1 litre may be interpreted as such. The vessels of communal food consumption were larger and deeper, usually with an open mouth providing easy access to their contents. The so-called *situla*-shaped vessel, often decorated with a *Scheibenhenkel* (disc handle), is a frequent type (PATAY 2005, 76–77). Vessels of communal consumption had a capacity of around 5–6 litres, while the ones serving individuals were smaller and had a rather open shape. This group includes short-necked oblate spherical vessels, one of the most distinctive types of the Hunyadihalom culture (PATAY 2005, 79). Vessels of this type were often decorated with grooves under the neck and sometimes with channelling on the belly or a *Scheibenhenkel*. Their capacity varies between 1 and 1.5 litres. Compared to other pottery types, these two – the *situla*-shaped and the short-necked oblate spherical vessels – appear very consistently in the context of consumption, presumably because there were important traditions and strict social constraints associated with their use during communal meals.

Food was cooked in pots of various sizes, with a capacity of 3 to 6 litres. Some fragments were sooty, which facilitated their identification. These pots were most often sturdy, with an ovoid body and rough finish, which played a role in ensuring their durability when exposed to the intense mechanical and thermal stress of cooking (HENRICKSON & McDONALD 1983, 631; RICE 1987, 237–238; VIEUGUÉ *et al.* 2016, 105–108). In some cases, the cooking pots' form resembled *situla*-shaped vessels (used for communal consumption), but the thicker wall, the coarser material, and the rougher design clearly set them apart from the pieces serving a function more closely related to representation. The rims of cooking pots were often decorated with impressions.

Large storage containers were robust, taller, and with thick walls, suitable for preserving produce for long periods. They often had a clay slip coating and applied impressed rib decoration. Their capacity varied but was generally around 15 to 20 litres, although the largest vessels found at Bükkábrány could have held up to 40 litres. Besides large storage vessels, this category included smaller but still robust and coarse

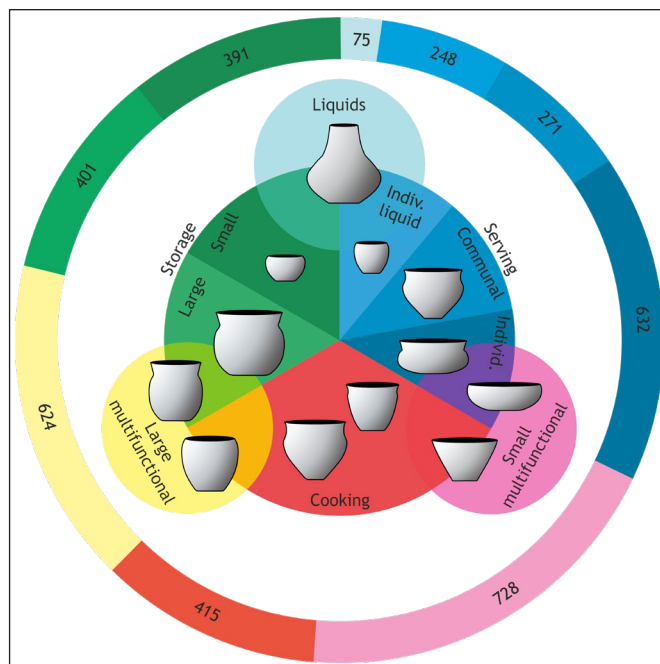


Fig. 5. Functional categories, the vessel shapes associated with them, and the number of vessels in each category

<sup>6</sup> The calculation of the vessel types' capacity was based on the reconstructed shapes, with the use of the method described by ENGELS *et al.* (2009), available online at <https://capacity.ulb.be/> (last accessed: 2023.07.26.).

pieces. These small storage vessels, with a capacity of around 0.5 to 3 litres, typically had a spherical shape and were most likely used to contain food and materials in smaller quantities, such as herbs and spices. Another group of storage vessels had a specific design, making them suitable for storing, possibly transporting, and serving liquids. To hold liquids properly, the pores of the material were closed off, most often by burnishing (VUKOVIĆ 2010, 11). The neck of such containers was often narrow and funnel-shaped, and they had a capacity of around 4–5 litres.

In addition to the vessel types mentioned above, the record of the site contained various pieces of household pottery whose function cannot be determined clearly – not only because many fragments were not diagnostic but also because potters created on intent vessels that could serve multiple purposes (SKIBO & SCHIFFER 2008, 10). Among these multifunctional vessels, the smaller pieces often had an open form; they could have been used for individual consumption, storage of small amounts of materials, and food processing without heating. Larger, more closed and taller multifunctional pots were perhaps used for cooking or storage. The capacity of small multifunctional vessels ranged from 1 to 2 litres, while larger ones ranged from 5 to 9 litres.

### SUMMARY

The analysis of the pottery record of the Bükkábrány site shows that the community had complex production and usage traditions. The vessel forms of the site are similar to that of other sites of the culture; however, in the lack of a detailed functional analysis of the material of those, one cannot determine whether there were any local tendencies in the pottery use of the community in focus. Nevertheless, it is evident that functionality was an important consideration of the Bükkábrány community when designing the vessels: they aimed to equip the individual pieces with properties that would make them as suitable to fulfil their desired function as possible. One cannot see clear-cut distinctions in vessel shape, as various shapes within a given quality and size range could be classified into the same functional category. Vessels linked with individual and communal consumption are exceptions: these types show strong standardisation, indicating that joint meals might have had a particularly important social role (HASTORF 2017, 2–3). Cooking and storage vessels are predominantly small, with only a few exceptions, perhaps because food preparation and storage were carried out in smaller quantities and on a household level. However, it is essential to note that not only pottery vessels but also containers made of organic materials, such as wood and wicker, could have been used for storage. The following categories are the best-represented in the analysed record: vessels of individual consumption (16%), various multi-purpose household pottery types (35%) (particularly the smaller ones (19%)), and cooking pots (11%), largely because these vessel types were intensively and extensively used in everyday life, and as a result, their lifespan may have been relatively short (VIEUGUÉ *et al.* 2016, 105).

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