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TARTALOM – INDEX

FROM LOCAL TO MICROREGIONAL AND BEYOND: SPATIAL STRUCTURES IN AND AROUND THE EARLY MEDIEVAL CARPATHIAN BASIN

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CONSIDERATIONS ON THE PRODUCTION AND DISTRIBUTION OF POTTERY IN DOBRUJA AT THE BEGINNING OF THE MIDDLE AGES

Cristina Paraschiv-Talmaţchi[1]

The paper draws attention to data that confirm the establishment of craft areas and commercial activity providing evidence of the production and diffusion of pottery in the territory of Dobruja (southeastern Romania) in the 10–12th century. So far, local pottery production has been proven by four pottery workshops, two tools used to create decorations, fifteen single- or dual-chamber pottery kilns, a few semi-finished vessels, and production waste. Some clues on the distribution area of pottery made in Dobruja were obtained by analysing the decoration and fabric of vessels with potter's marks. The data presented can contribute to the reconstruction of the production and distribution of pottery, the most abundant find type present in the record of dwellings from the beginning of the Middle Ages.

A tanulmányban felvonultatott adatok bizonyítják, hogy a 10–12. századi Dobrudzsa (Délkelet-Románia) területén fazekas zónák jöttek létre és termékeikkel kereskedelemi tevékenység zajott. A helyi fazekasságot eddig négy fazekasműhely, két díszítés készítésére használt mintázófésű, tizenöt egy- vagy kétkamrás fazekas kemence, néhány félkész edény és gyártási hulladék bizonyította. A Dobrudzsában készült kerámia elterjedési területére vonatkozóan a fenékbélyegekkel ellátott edények díszítésének és anyagának elemzésével kaptunk támpontokat. A bemutatott adatok hozzájárulhatnak a korai középkori lakóhelyek leletanyagában leggyakrabban előforduló lelettípus, a kerámia, készítésének és elterjedésének rekonstruálásához.

Keywords: *pottery, workshop, kiln, distribution, Dobruja, Romania*

Kulcsszavak: *kerámia, műhely, fazekaskemence, elosztás, Dobrudzsa, Románia*

In 10–12th-century Dobruja, a territory in the Lower Danube Region bounded in the west and north by the Danube and in the east by the Black Sea, most pottery was produced in local workshops located primarily in the vicinity of fortified settlements but also on smaller ones. Archaeological research has confirmed the presence of production zones and trade-related activity in these settlements and evidence of pottery production and distribution in the study area. These workshops supplied households with the necessary pottery vessels (mainly cookware and tableware and some occasional luxury items) from the beginning of the Middle Ages; the abundance of potsherds in the record of the related sites indicates high demand. This paper aims to draw attention to data that can contribute to reconstructing the production and distribution of pottery, the most abundant find type present in the record of dwellings in the period in focus.

Pottery production

Local pottery production can be assumed when the find material of a site features characteristic elements indicating that (clay composition, certain forms, decorations, etc.) and can be considered proven when the record contains elements connected with that directly: the remains of pottery workshops, specific tools, raw materials, semi-finished products (shaped but not fired), pottery kilns, or ceramic waste. Four

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[1] Museum of National History and Archaeology Constanța; ctalmatchi@gmail.com; ORCID: https://orcid.org/0000-0001-7289-4005

pottery workshops, two tools, fifteen pottery kilns, a few semi-finished vessels, and production waste are known from the beginning of the Middle Ages in Dobruja.

Pottery workshops

Of the four pottery workshops discovered in Tulcea County in northern Dobruja, three were found at Garvăn-Dinogetia (Ştefan et al. 1967, 123–129) and one at Isaccea-Noviodunum (Baumann et al. 1998, 35).

The oldest pottery workshop at Garvăn-Dinogetia (Ştefan et al. 1967, 123) operated in the last decades of the 10th century (*Fig. 1. 1*). The 5.40 × 5.20 m feature (bigger than an average dwelling) was sunken 0.80 m into the one-time surface. Three of its walls in the excavated part were lined with oaken planks, while the fourth was a late Roman stone wall set in mortar. A tray-like, rounded rectangular stone kiln with a 0.12 m high rim, plastered with clay, stood by the western wall, 0.70 m from the

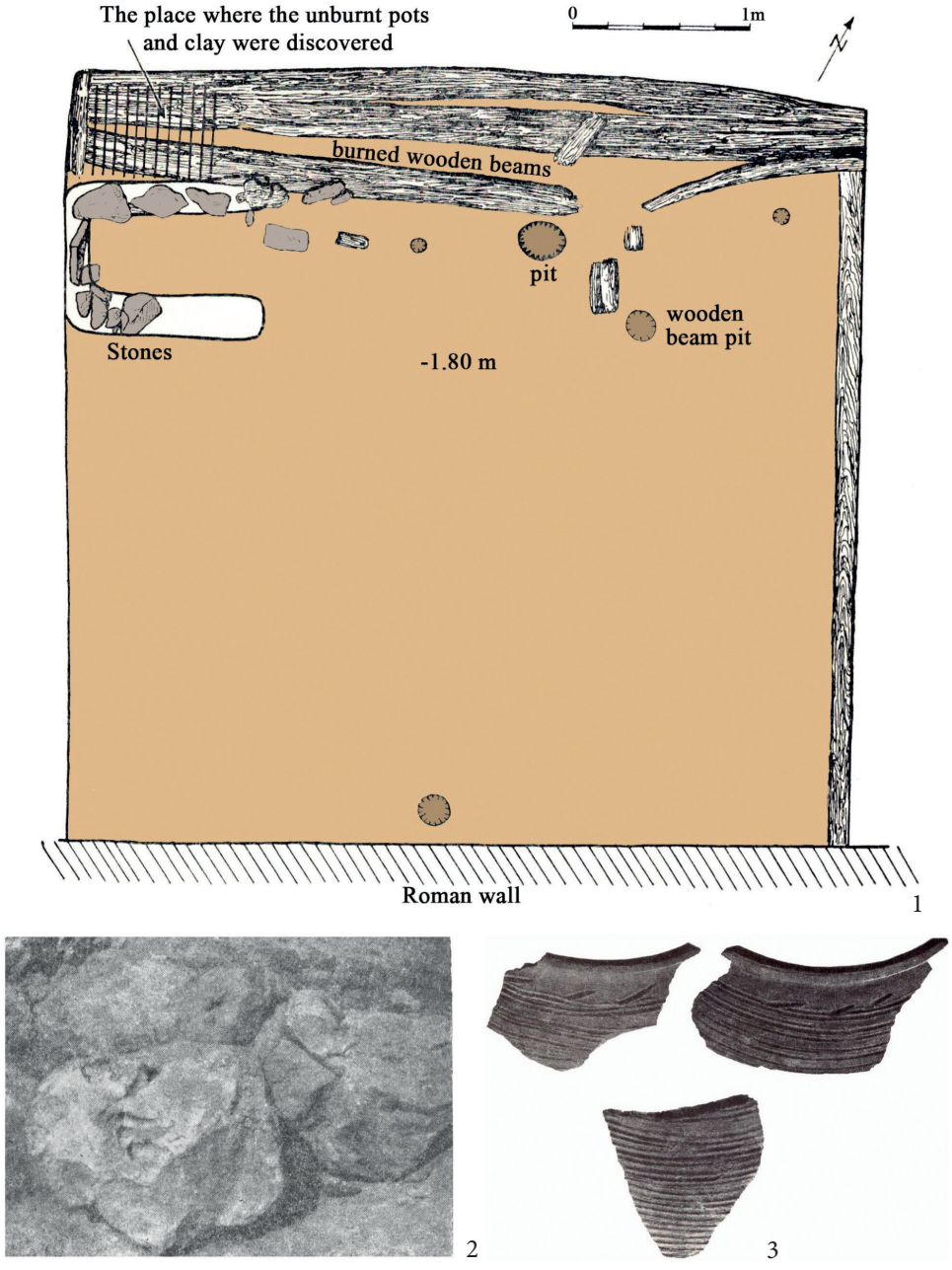


Fig. 1. 1: Survey map of the pottery workshop at Dinogetia (second half of the 10th century); 2: clay lumps (raw material for pottery); 3: dry clay vessel fragments found in the pottery workshop (after Ştefan et al. 1967, 124–126)
1. kép. 1: A dinogetiai kerámiakészítő műhely feltárt területe (10. század második fele); 2: agyagtömbök (kerámia nyersanyag); 3: a fazekasműhelyben talált égetetlen edénytöredékek (Ştefan et al. 1967, 124–126 nyomán)

northern corner. A 0.12 cm high platform stood between the northern wall and the kiln, with two large clay lumps (processed raw material for making pots) bearing the fingerprints of the potter (*Fig. 1. 2*) and fragments of unfired vessels (*Fig. 1. 3*), which were crushed when the workshop collapsed, likely in a fire. Several postholes of various sizes were observed in the floor about a metre from the northern wall. These are believed to have held the legs of the table where the potter kneaded the clay, prepared clay rolls for shaping vessels, and kept freshly made vessels. One of the postholes, positioned roughly equidistant between the eastern and western walls, is thought to have held the axle of the fixed-axle potter's wheel. A large quantity of small stones, waiting to be crushed and used as tempering material, was found near the kiln, while inside it, several pieces of red ochre were discovered, indicating that ochre was used for changing the colour of kaolin clay (Ștefan et al. 1967, 123).

The other two workshops in the settlement at Garvăn-Dinogetia belong to the occupation level dated to the first half of the 12th century. One operated in a feature that did not differ significantly in terms of construction method and size from the sunken dwellings. Its walls were lined with oak beams, supported at the corners by stakes, and a kiln of stones set in clay had been built inside it. Several unfired vessel fragments were found there, together with a significant quantity of small stones set aside for being crushed and used as tempering material (Ștefan et al. 1967, 129). The existence of the third workshop in this settlement has been presumed based on the discovery of unfired or poorly fired vessels, similar in shape and decoration and bearing no use-related marks, inside a sunken dwelling (Barnea 1955, 108; Ștefan et al. 1967, 129).

An 11th-century pottery kiln with a room-like stoking and working pit was discovered at Isaccea-Noviodunum, in the settlement part delimited in the north by the stone wall of the citadel and in the south by the earthen Rampart I. This complex has been considered a workshop. The fill of a nearby pit abounded with potsherds, with two fragmented wheel-thrown pottery vessels among them (Baumann et al. 1998, 35; Baumann 2010, 20, 47).

The relatively little information at hand makes it difficult to reconstruct an early medieval pottery workshop and formulate hypotheses regarding its capacity. Therefore, incomplete archaeological information was completed with ethnographic data (Paraschiv-Talmațchi 1999, 289–291; Paraschiv-Talmațchi 2011, 314–317) to outline a picture as accurate as possible.

As the presented examples illustrate, the structure, and, partially, furnishing of an average pottery workshop in Dobruja at the beginning of the Middle Ages were similar to that of a dwelling: they had a rammed clay floor and an oven for heating the room; the sunken part of the walls could be covered with planks or stones, while the above-surface part was wattled and plastered with daub; and the roof was timber-framed and thatched with thick layers of reed secured with stones or branches. The workshop from the last decade of the 10th century on the Garvăn-Dinogetia site was bigger than a dwelling, unlike those from the first half of the 12th century or the 11th-century one at Isaccea-Noviodunum, the size of which matched standard residential buildings. Possible special furnishing and equipment included a working table for the potter, traces of the potter's wheel (a posthole for the axle and discs), a separate area for storing clay lumps, and some base materials (tempering materials and ochre).

Ethnographic data suggest that early medieval pottery workshops in northern Dobruja were only slightly different from traditional ones (without electronic potter's wheels and clay mixers) from the past century. Based on their similarity, we can add the following items to the potter's working table: a vessel with water and fine clay dissolved in it, in which they could wet their hands (so their fingers and palms can slide easily on the clay surface) to facilitate the shaping of the vessels and the smoothing of the surface (Mihăescu 2005, 53); a vessel with sand or ashes to be sprinkled on the wheel's rotating table to facilitate, when necessary, the removal of the freshly made vessel (Florescu et al. 1958, 224); a wooden modelling tool for refining shape (its modern version is well-polished, thin, and trapezoidal, with a hole for the potter's thumb at the centre or on a side; its edges are used for refining shapes, while the corners for creating incised patterns, such as straight or wavy lines; see Vlăduțiu 1975, 350, Fig. 92. 4; Iordache 1996, 85–87, Fig. 23. a; Mihăescu 2005, 53); a piece of soaked leather or fabric used for furnishing surfaces and finishing the mouth area (Petrovszky 1975, 144; Iordache 1996, 88); a thread for removing the completed vessels from the wheel (especially from the fast wheel; Iordache 1996, 86, Fig. 23. c); and various tools for decorating the vessels on the wheel (pattern combs, roll stamps, etc.). The rest

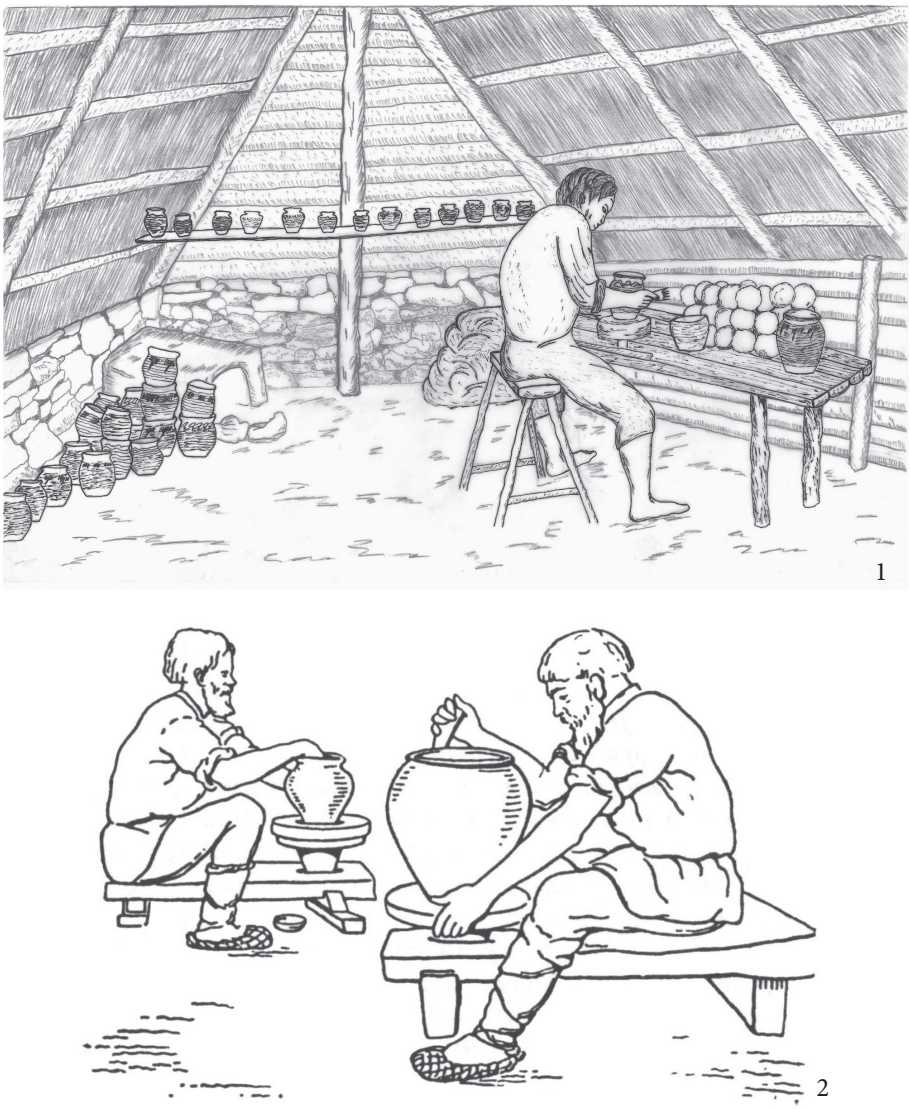
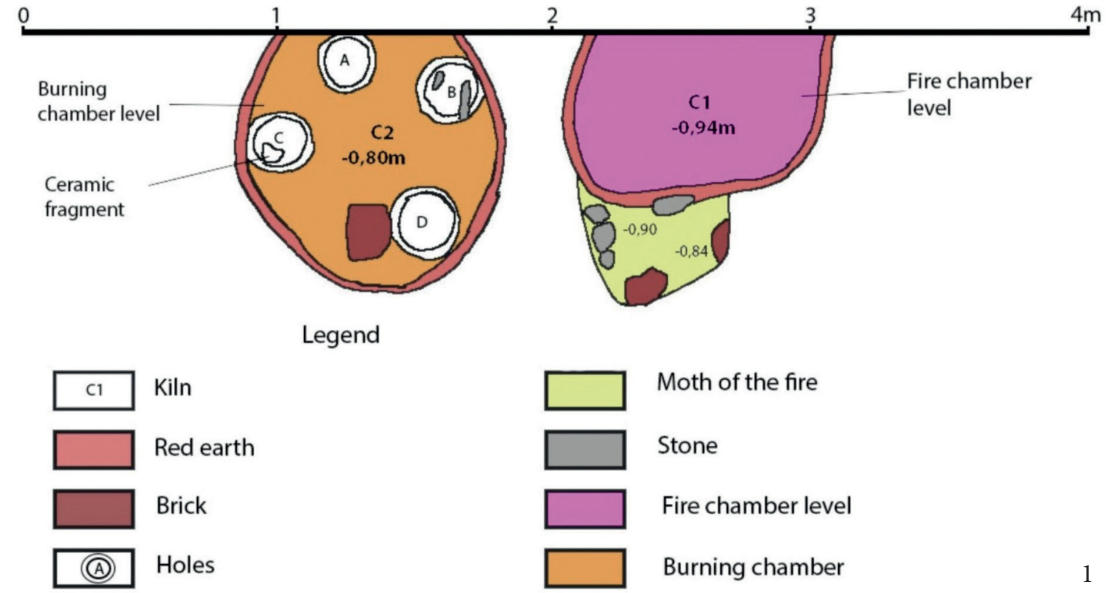


Fig. 2. 1: Possible reconstruction of an early medieval potter's workshop (drawing by C. Paraschiv-Talmaţchi); 2: the hand-turned wheel (after Rybakov 1948, 167)
2. kép. 1: Egy kora középkori fazekasműhely lehetséges rekonstrukciója (C. Paraschiv-Talmaţchi rajza); 2: a kézzel forgatott fazekaskorong (Rybakov 1948, 167 nyomán)

of the equipment for decorating dry (burnished, painted, or glazed) clay vessels, which were used in a separate phase after modelling and were not needed during shaping, could have been stored on wooden shelves in designated areas (like in the workshop at Garvăn-Dinogetia) or in a corner on the floor. After shaping, the vessels were left to dry on the potter's table (if there was enough space) or perhaps on shelves attached to the walls of the room (*Fig. 2. 1*). The slow wheel was usually built together with a stool (Rybakov 1948, 167, Ris. 31; Bobronskij 1978, 56–57, Ris. 21, 126–127, Ris. 41) (*Fig. 2. 2*), and a stool was also necessary for the potter when working with the fast wheel. The term 'workshop' is more generic when referring to one involving a slow wheel, as the stool with the slow wheel, being mobile, could be moved to wherever the potter wanted to carry out their activity (in a shed, outdoors near the residence, or indoors when the weather was bad). This mobility may be why potter's workshops are quite challenging to identify on archaeological sites of the period in focus; the presence of a pottery kiln is much more reliable evidence. The slow wheel attached to a stool, the main type of potter's wheel used until the end of the 10th century in Dobruja and in some settlements even later, could transform any potter's dwelling into a 'workshop' when needed; also, the space could be easily reverted when the activity stopped for any reason. Therefore, if the one-time owner of a dwelling could have been engaged in making pottery, it can

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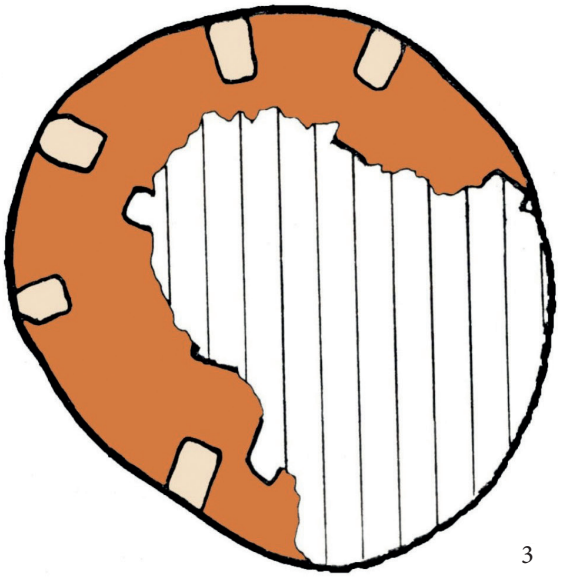
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Fig. 3. 1: Survey map of the kilns discovered in Hârşova (after Şova 2021, 64); 2: kiln 1 in Hârşova at the time of discovery (photo C. Paraschiv-Talmaţchi); 3: survey map of the perforated oven floor of the pottery kiln on Bugeac Hill (after Baraschi, Papasima 1977, 593)

3. kép. 1: A Hârşován felfedezett kemencék felmérési térképe (Şova 2021, 64 nyomán); 2: a Hârşován található 1. kemence a felfedezés idején (C. Paraschiv-Talmaţchi fotója); 3: a Bugeac-hegyi fazekas kemence lyukacsos kemencerostélya a felmérésen (Baraschi, Papasima 1977, 593 nyomán)

only be revealed through fortunate discoveries of pre-processed clay lumps, special tools, etc., instead of the furnishing of the building, the archaeological traces of which might show no difference from that of a 'normal' home.

Could slow wheels be borrowed and used by more than one person? If the possibility of shared or communal use arises in the case of pottery kilns (as illustrated by 20th-century examples of communal pottery firing and shared production; see Dunăre 1967–1968, 40), why not consider a selective lending/borrowing of the slow wheel? Such a practice could account for the differences in the execution of decorative elements (rarer, more hesitant, etc.), the appearing formal variations (innovations, copies), and differences in quality (poorly cleaned clay, over-

all rough appearance, dishes with uneven profiles, etc.). This hypothesis might be challenging to accept but cannot be excluded, as such a practice would seem especially fitting in smaller settlements where the 'potters' were also engaged in other activities and the purchasing power of the residents was limited.

In our opinion, a workshop of a size like the one at Garvăn-Dinogetia could store about forty freshly made medium-sized vessels per square metre and about a hundred dry ones, awaiting firing, stacked (Paraschiv-Talmaţchi 2011, 315). Assuming the potter needed about 10 m² to carry out his activity, 18 m² remained free in an area of about 28 m² for drying clay vessels; this space was enough for storing at least 700 pieces. After turning into pottery during firing, the vessels became even more durable and could be stacked high, their storing thus requiring considerably less space than before. This hypothesis is necessary for formulating an idea about the quantity of goods a potter could sell at a time (the calculation was made for vessels with a 17–18 cm maximum diameter).

Besides, although we do not know of workshops with separate storerooms in this period, such facilities cannot be ruled out entirely.

Pottery kilns

Pottery kilns with one or two chambers are known from eight settlements: three from Garvăn-Dinogetia (Tulcea County), five from Nufăru (Tulcea County), one from Isaccea-Noviodunum, two from Hârşova (Constanţa County), one from Capidava (Constanţa

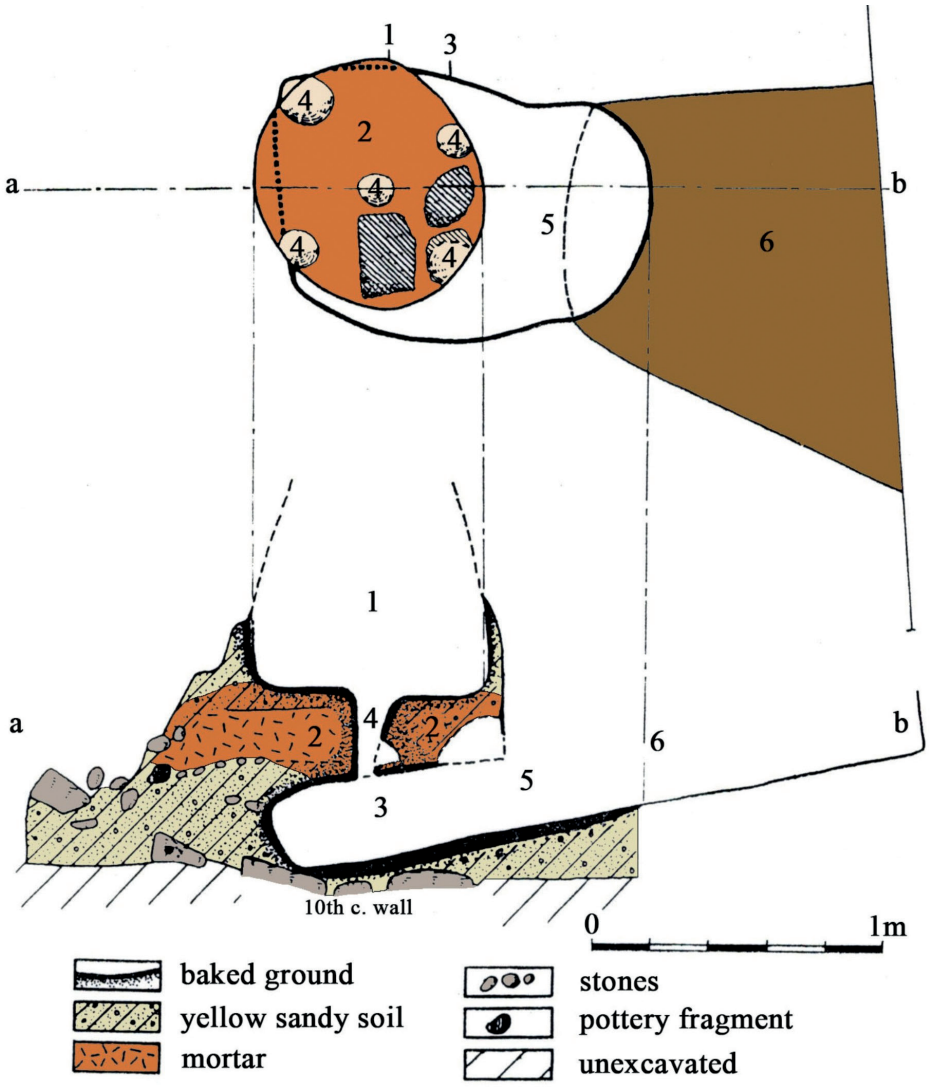

Fig. 4. Plan and cross-section of the pottery kiln at Păcuiul lui Soare. 1: oven chamber; 2: grate; 3: firing chamber; 4: flue holes; 5: mouth of the firing chamber; 6: working pit; a–b axis of the cross-section

4. kép. A Păcuiul lui Soare-i fazekas kemence alaprajza és keresztmetszete. 1: Kemence tűztere; 2: rostély; 3: égetőtér; 4: szelelőnyílások; 5: az égetőtér szája; 6: munkagödör; keresztmetszet a-b tengelyen

County), one from a settlement on Bugeac Hill in Ostrov municipality (Constanța County), one from in the fortress on Păcuiul lui Soare Island (Constanța County), and one from Valu lui Traian (Constanța County).

Simple one-chamber pottery kilns were mentioned only from Garvăn-Dinogetia (Ștefan et al. 1962, 680–684; Ștefan al et al. 1967, 127–129, Fig. 71), where three mid-11th-century conical examples have been discovered outside the fortress.

The slightly domed clay superstructure of the first kiln was preserved up to a height of 0.90 m; it had a vent at 0.50 m. Its walls were 0.25–0.30 m, sometimes 0.40 m thick. Its 2.06 × 1.84 m floor consisted of a 2–3 cm clay layer spread over a layer of small stones and pottery fragments set in clay. The mouth of the kiln had an opening of 0.60 m with the stoking or ash pit in front of it, the floor of which was 0.10 m deeper. The 6 × 4 m pit served three kilns.

A second kiln, preserved to a height of 0.75 m, stood about two metres north of the first. Its slightly domed walls were built of stones and reused Roman bricks set in clay, plastered with a 0.10–0.15 m thick clay layer on both sides. The oven floor, 1.87 m in diameter, was constructed like in the first kiln. Its mouth was 0.48 m wide, lined by a large stone on each side.

A third kiln with walls constructed like the first stood once 2.30 m northwest of the second. Its 2.20 × 1.93 m floor was renewed once; both the original, slightly concave floor and its renewal, of identical thickness, consisted of a bed of stone and potsherds set in clay and covered with a layer of clay mixture.

The five pottery kilns at Nufăru were discovered outside the fortified area. Two unspecified ones west of the enclosure (Mănucu-Adameșteanu 1998, 81) were dated to the 10th–11th centuries; a third one, on the southern fringes of the settlement, had two chambers connected by a grate (it was found at the wall of the excavation trench and could be unearthed only partially in a rescue project; see Mănucu-Adameșteanu 1991, 57–59, Fig. 2; Mănucu-Adameșteanu 1998, 81). The preserved height of the kiln chamber was 0.50 m, while that of the firing chamber below was 0.60 m. This kiln operated in the last decade of the 11th and the beginning of the 12th century.

The last two kilns, dated to the second half of the 10th century, were discovered about 50 m east of the Byzantine fortress in 2022. Both represent the dual-chamber type with a perforated floor (Damian et al. 2023, 602–604).

The 11th-century pottery kiln at Isaccea-Noviodunum was found in the settlement south of the enclosure. It had an approximately round floor and walls made of stones and clay, at least in the preserved part. A central column supported the grate, and the mouth of the oven chamber had a stone threshold; the walls were heavily burnt (Baumann 2010, 20).

The two pottery kilns at Hârșova, dating to the second half of the 11th and the beginning of the 12th centuries, were located in the workshop zone of the settlement, east of the Byzantine enclosure. Both represent the dual-chamber type with a perforated floor (Panait et al. 1995–1996, 130–133, Figs. 5–6; Paraschiv 1996, 163–171; Șova 2021, 63–67, Pl. II).

Only the western part of the oven chamber, a small part of the clay grate, and the fire chamber have remained of the first kiln. The walls of the oven chamber were conical, 0.78 m in diameter at the floor and 0.60 m at the vent hole; they have been preserved up to a height of 0.90 m (*Fig. 3. 1–2*). The bottom of the fire chamber was paved with tiles and brick fragments covered with a layer of yellow clay, extending up its wall, featuring twig, straw, and potsherd imprints and flowing slightly into the single preserved cylindrical flue hole. The walls of the oven chamber were heavily burnt, even vitrified in a 3 cm-thick layer at the feet, in the lower part, and partly, also in the flue hole (Panait et al. 1995–1996, 132; Șova 2021, 65). The grate was 0.37 m thick, and the only preserved flue hole was kept at the 0.25 m height. The mouth of the oven chamber was built of bricks and stones; it was as wide as the base of the short and domed firing chamber (with an extension of 0.38–0.40 m towards the mouth).

The oven chamber of the second kiln, 0.35 m south of the first one (*Fig. 3. 2*), was in poor condition: only the western part of its wall remained up to 0.23 m. The perforated platform separating the two chambers was 0.91–0.95 m in diameter; it had four tubular perforations with heights ranging from 0.23 to 0.52 m (changing with the thickness of the platform). The walls of the holes were fired through but not vitrified, indicating a shorter period of use for the kiln than the first. The slightly arched walls of the oven chamber remained at a height of 0.30 m (Panait et al. 1995–1996, 132; Șova 2021, 65–67).

Remains of a pottery kiln containing early medieval potsherds by the Danube outside the fortification have been reported from Capidava (Florescu et al. 1958, 247; Diaconu 1987, 118). Due to a lack of further data, a typological classification of the feature cannot be attempted.

The 9th–10th-century pottery kiln from the settlement on Bugeac Hill in Ostrov municipality represents the dual-chamber type with a perforated platform without central support (Baraschi, Papasima 1977, 591–595, Figs. 1–2). The 10 cm-thick, heavily burnt, and slightly arched walls of the oval oven chamber persisted up to 0.54 m; the mouth of the kiln was 0.50 m wide. The 1.50 m long and 0.21 m grate was oval, featuring five intact and five partial flue holes of the original 12–16 (*Fig. 3. 3*). The dimensions of the intact channels ranged from 0.17 × 0.10 to 0.15 × 0.09 m. No pit connected to the kiln was observed, either because it was destroyed during the terracing work exposing the kiln or because its position on the slope made it unnecessary.

The settlement on Bugeac Hill is 4 km from the fortress on Păcuiul lui Soare Island, in the enclosure of which a mid-11th-century, dual-chamber pottery kiln was discovered approximately 12 m from the northern wall (Baraschi 1974, 461–464, Figs. 1–3) (*Fig. 4*). The conical oven chamber had a round, 0.14 m exhaust vent on the northern side, where the wall was preserved up to a height of 0.45 m. It had an opening of about 0.60–0.70 m on top, through which the vessels were placed into the kiln. The oven floor was oval (0.75 × 0.87 m), with five perforations arranged in a cross, and was not supported by a central pillar. The diameters of the 0.30–0.38 m long intact holes ranged from 0.10–0.14 m. The slightly arched, rounded rectangular firing chamber was 0.28 m high, larger than the oven chamber. The walls of the slightly vaulted, 0.70 m wide and 0.17–0.24 m high stokehole were strongly burnt; the heavily burnt patch extended into the stoking or ash. The working pit was 0.60 m deep and 1.35 m wide; only a 0.80 m long section of it could unearthed (Baraschi 1974, 464; Diaconu 1987, 117).

The last known kiln from the Dobruja region was discovered in the western part of the settlement around the IV Schuchhardt/XXII Tocilescu *castellum*, near the stone wall, not far from the south-southeastern boundary of Valu lui Traian (Paraschiv-Talmaţchi 2022, 350–361). The dual-chamber pottery kiln with a perforated platform without central support, found in the workshop zone, operated in the 11th century (Cliante et al. 2012, 294–295). It was discovered on the western side of a 2.30 × 2.50 m dwelling, with a second, domed one-chamber kiln opening from the opposite eastern wall (*Fig. 5. 1–2*). The oven chamber was still preserved to a height of 0.15–0.17 m. The perforated oven floor,

1

2

Fig. 5. 1: Pottery kiln in Valu lui Traian (11th century); 2: mouth of the firing chamber (photos by C. Paraschiv-Talmaţchi)
5. kép. 1: Fazekaskemence Valu lui Traianban (11. század); 2: az égetőkamra szája (C. Paraschiv-Talmaţchi fotói)

made of clay admixed with some gravel, was almost round (1.05 × 1.09 m) and 0.15 m thick, with five flue holes preserved on the western side (the rest had collapsed). The bottom of the holes, between 4.5 × 5.5 and 6.5 × 7 cm, was wider. The walls of the 1.42 × 2.20 m oven chamber persisted up to 0.63 m. The burnt layer of the bottom extended 0.43 m beyond the firing chamber into the dwelling through a 0.93 m wide and 0.32–0.40 m high stokehole with walls burnt to a depth of 5–7 cm.

Comparing archaeological and ethnographic data, one can say that pottery kilns in Dobruja at the beginning of the Middle Ages were similar in size and smaller than many pottery kilns used today: the floor of the chamber of dual chamber kilns varied between 0.75 × 0.87 m (Păcuiul lui Soare) and 1.05 × 1.09 m (Valu lui Traian), while their length could reach 1.50 m (e.g., the kiln with unknown width on Bugeac Hill). The approximate capacities of these

kilns were calculated from a better-preserved specimen of each type: the one from Hârşova (a 0.78 m round oven floor and walls preserved up to 0.90 m) and the first, one-chamber, kiln from Garvăn-Dinogetia (oven floor 2.06 × 1.84 m, with a 0.50 m wide mouth and walls preserved up to 0.90 m).

As for the set of available ethnographic analogies, a typical pottery kiln in the last century in Marginea (Suceava County) was about 1–1.20 m high, had a round floor of 1.50 m in diameter, and a mouth of about 0.80 m at the top of the superstructure (Florescu 1958, 18–20). It could hold about 140–180 pots at once (depending on vessel size) or around 120 pots if many had handles (including pots with a 6–20 l capacity; see Florescu 1958, 37, 47). The estimated volume of a kiln at Marginea was approximately 1.17 m^3, enough for 180/120 vessels or about 153/102 pots/m^3. The ethnographic analogy was chosen because the calculation was made for pots with or without handles, the most common vessel type in the pottery record of early medieval dwellings in Dobruja.

In comparison, the volume of the kiln in Hârşova was approximately 0.35 m^3 (calculated with a maximum diameter of 0.80 m/upper diameter of 0.60 m/ and height of 0.90 m), which means space for about 35–37 pots based on the model presented above, while the kiln at Garvăn-Dinogetia (with a maximum diameter of 2 m/upper diameter of 0.50 m/ and height of 0.90 m) had a ca. 1.25 m^3 volume or 127–130 pot capacity.

A previous analysis concluded that, on average, medieval craftspeople could construct a pottery kiln – including all necessary operations from excavating clay to cooling down the kiln and obtaining wood for fuel, but not counting delay due to bad weather and resting days – in about a month and a half. Considering that most potters worked seasonally, during the winter, 4–5 firings on average could be completed in a year (Paraschiv-Talmaţchi 2011, 321). Accordingly, at Hârşova, where 35–37 vessels could be fired at once, about 185 pieces could be produced in a year, in contrast to the 650 in the same period made with the big, 127–130-vessel-capacity kiln in Garvăn-Dinogetia. Returning to the time needed for making the seven hundred vessels that could be stored at once in a workshop of size like the one in Garvăn-Dinogetia, and supposing the average five firings a year, the potter in Hârşova needed nearly four years (about 19 firings) to complete the batch, while the one in Garvăn-Dinogetia only one (about 5 firings). Conclusively, a potter with a kiln the size of the one in Hârşova likely did not make and store seven hundred vessels, which could only be completed over several years anyway. Only a workshop at Garvăn-Dinogetia, with a kiln with a capacity of the 11th-century one, could make so many vessels within a reasonable time. This suggests that potters in Hârşova did not need a workshop the size of the one in Garvăn-Dinogetia, but only a smaller one, somewhat similar to a dwelling, and therefore not distinguishable by its surface area. These are purely hypothetical and indicative data.

Vessel types, fabric, and tools

Some information on the pottery produced and raw materials discovered in the early medieval workshops and kilns has already been mentioned. Based on the potsherds found there (from vessels with no handles, a narrow base, a carinated shoulder, a short neck, and a flared lip), the workshop at Garvăn-Dinogetia, relying on a hand-turned wheel with a fixed axle, operated in the last decades of the 10th century. The vessels were coiled first of common yellowish clay tempered with a significant amount of sand (Ştefan et al. 1967, 123) and decorated with incised patterns consisting of horizontal lines above which, below the neck, short oblique lines were drawn arranged at a distance. The presence of pieces of ochre in the kiln indicated that the potter also worked with kaolin clay that, mixed with ochre, gained a light or darker pinkish colour after firing (depending on the amount of ochre added). The heap of gravel found next to the kiln indicates that the potter used this material as a tempering agent after crushing it (Ştefan et al. 1967, 123, 126, Fig. 70). We do not exclude the possibility that after being crushed and ground, it may have been used for substances to decorate the vessels (such as paint or glaze).

Pots with no handles and a small amphora-shaped jug, either unburnt or poorly fired, were found in the workshops from the first half of the 12th century. All had been slow-wheeled with a potter's wheel with a mobile axis, resulting in irregular profiles from clay heavily tempered with sand, which gave them an overall rough appearance (Ştefan et al. 1967, 129, 132, Fig. 74).

To demonstrate the technological level achieved by the potters at Garvăn-Dinogetia, it is worth mentioning that there are signs of them having produced pottery with olive-green glaze: sherds of common

11th-century vessels with glaze spots, unglazed fragments with applied decoration (stripes, relief buttons, arches, etc.) similar to 11th–12th-century glazed jugs, and a kaolin pot decorated with incised motifs and glazed (Ştefan et al. 1967, 133, Fig. 75. 238).

One of the kilns found west of the enclosure at Nufăru in northern Dobruja contained, at the time of discovery, a load consisting of fifteen fine, yellowish clay jugs in different sizes, with one or two handles and round or trilobate mouths (*Fig. 6. 1*); besides, numerous potsherds were found in the ash pit of the other kiln there (Mănucu-Adameşteanu 1998, 81). Some handle-less pot, bowl, and cauldron fragments from the kiln and its ash pit on the southern fringes of the settlement were subjected to neutron activation analysis revealing that they were made from clay extracted from the same deposit. The clay of a jar and a jug with similar but not identical values was likely also obtained from a local but different deposit. In contrast, all five fragments of vessels made from kaolinite clay (three of them glazed) yielded different results, indicating that they were not produced locally but in other workshops or workshop centres (Mănucu-Adameşteanu 1991, 67–73).

Several potsherds have been recovered from the oven chamber of the first kiln in Hârşova. Some were fired multiple times, which caused them to change colour and become thinner and deformed (Şova 2021, 65–66, Pl. III). These scraps were probably used to separate vessels during firing or were part of the plug closing the top of the kiln during firing. The fragments were made from common and kaolin clay on a slow or a fast wheel, fired in an oxidation environment, and decorated with incised motifs. They came from vessels with no handle, a slightly profiled shoulder, a short neck, and a slightly flared or everted rim. The base of some bears a stamped potter's mark (Paraschiv-Talmaţchi 2009, 429–431).

Based on the fragments found on the perforated oven floor, in the clogged or collapsed flue holes, and in the oven chamber, pots with no handles and cauldrons were fired in the kiln at Păcuiul lui Soare. The pots were formed on a hand-turned wheel from clay, tempered with coarse sand, and fired in an oxidation environment, but not at too high temperatures as they have a grey core. The cauldrons were made from clay tempered with micaceous sand and crushed limestone (Diaconu 1987, 118) and fired like pots. Both types were decorated with incised motifs. Two fragments of a cauldron and a pot show signs of secondary firing; these are rejects reused later for spacing the dishes or covering the mouth

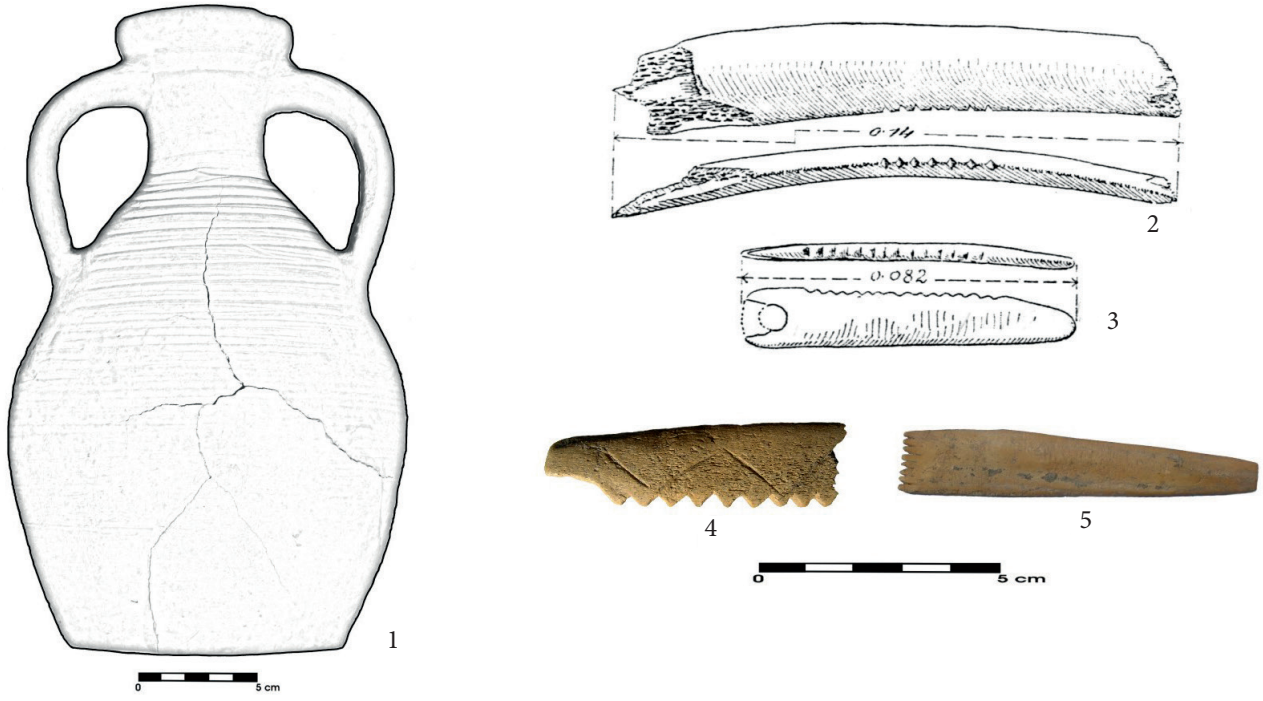

Fig. 6. 1: Jug found in the pottery kiln at Nufăru (drawing by C. Paraschiv-Talmaţchi); 2–5: pattern combs for decorating pottery (2–3: Garvăn-Dinogetia; 4: Oltina; 5: Capidava)
6. kép. 1: A nufărui fazekas kemencében talált korsó (C. Paraschiv-Talmaţchi rajza); 2–5: mintázófésűk a kerámia díszítésére (2–3: Garvăn-Dinogetia; 4: Oltina; 5: Capidava)

of the upper chamber during firing (Baraschi 1974, 466–467, 471).

Several bone artefacts identified as pattern combs for decorating pottery have also been recovered from the sites discussed. Three were found in the settlement at Garvăn-Dinogetia; one is a simple tool, a piece of animal rib with several teeth carved into its side (*Fig. 6. 2–3*). The slightly curved shape of the rib made it suitable for decorating pottery (Barnea 1955, 105, Fig. 5. 1–2). Another pattern comb comes from a debris patch on the settlement of Capidava. This well-polished, elongated trapezoidal tool was made of a sheep rib (*Fig. 6. 5*). Its narrow end is straight, while the wide one has eight teeth; it could be used to create incised patterns in the soft clay (Covacef 1980, 256, Pl. II. 1). The straight end could also be used for creating grooves, channels, or other decorative elements. The fragment of a similar bone tool with seven preserved teeth and a tanged end for easier handling comes from the habitation layer on Oltina-"Capul Dealului" (*Fig. 6. 4*).

Distribution of pottery

The products of a workshop were sold at diverse distances; how far they got was determined by their quality, which depended on the technical and aesthetic levels achieved by the craftspeople in the workshop. These were often influenced by the state of development of society and the community in which the workshop operated, as well as by local and regional competition. The pottery record of the 10th–12th-century Lower Danube Region suggests that a significant part of the vessels were produced locally (Bugoi et al. 2015, 296–301; Bugoi et al. 2018, 110–114; Bugoi et al. 2019, 1–16; Bugoi et al. 2020, 80–86). The assortment of local workshops included household vessels and some luxury items, such as olive-coloured glazed vessels with incised or applied decoration. Some products were likely traded to nearby settlements within the region and areas north of the Danube River (*Fig. 7*).

One can gain some insight into the distribution area of pottery made in Dobruja by examining the decoration and clay substance used for some particular vessels with potter's marks (see Paraschiv-Talmațchi 2006 for a detailed discussion).

Vessels decorated with a roulette pattern wheel appeared in Dobruja in the second half of the 10th century; the type became widespread in the first half of the following century in settlements in northern Dobruja (Barnea, Ștefănescu 1971, 252). Such vessels make up about 70% of all pottery vessels on the settlement at Ostrov-Beroe (Stănică 2015, 223) and a significant part of the pottery record of Garvăn-Dinogetia, a settlement inhabited in the third quarter of the 11th century (Ștefan et al. 1967, 202). So far, the southernmost settlement with rouletted vessels in significant proportions is Hârșova, while the few such fragments in southern Dobruja (at Oltina, Păcuiul lui Soare, and Adamclisi, for example) suggest trade (Diaconu, Vîlceanu 1972, 82) from workshop centres like Garvăn-Dinogetia or Hârșova.

Some potters are known to have marked some of the vessels they produced. A few years ago, 1,718 vessels with potter's marks were catalogued from the territory of Romania, of which 1,069 originate from Dobruja (Paraschiv-Talmațchi 2006, 91–192). Analyses have revealed that the clay of these vessels is generally similar to that of the usual pottery inventory and the composition of the clay deposits (Bugoi et al. 2015; Bugoi et al. 2018; Bugoi et al. 2019; Bugoi et al. 2020). Most were made in local workshops and sold in nearby territories and beyond.

In Dobruja, Garvăn-Dinogetia and Capidava are two settlements where vessels with potter's marks were made, as evidenced irrefutably by the large number of specimens and the workshops and kilns discovered there. These two settlements have been dated by coins (Ștefan et al. 1967, 29) to the 10th–12th centuries, specifically the second half of the 10th and the first part of the following century (Florescu et al. 1958, 238). The late pottery style, as well as the presence of a Byzantine bronze coin in the layers of the feature, have dated the pottery kilns at Hârșova to the second half of the 11th and the beginning of the following century (Panait et al. 1995–1996, 133). Nufăru, Isaccea, and Păcuiul lui Soare are three more sites where potters operated for sure: five pottery kilns operating from the 10th until the beginning of the 12th century were discovered at Nufăru, vessels with potter's marks have been recovered from archaeological contexts contemporaneous with the kiln and the pottery workshop in Isaccea, and 10th–11th-century vessels with potter's marks and a kiln that operated until the mid-11th century have been unearthed at Păcuiul lui Soare. In this case, it is possible that the early vessels from the fortified settlement on the island were made in the pottery kiln on the Bugeac Hill, active in the 9th–10th centuries.

Most sites with vessels with potter's marks in Dobruja were by or near the commercial routes of the

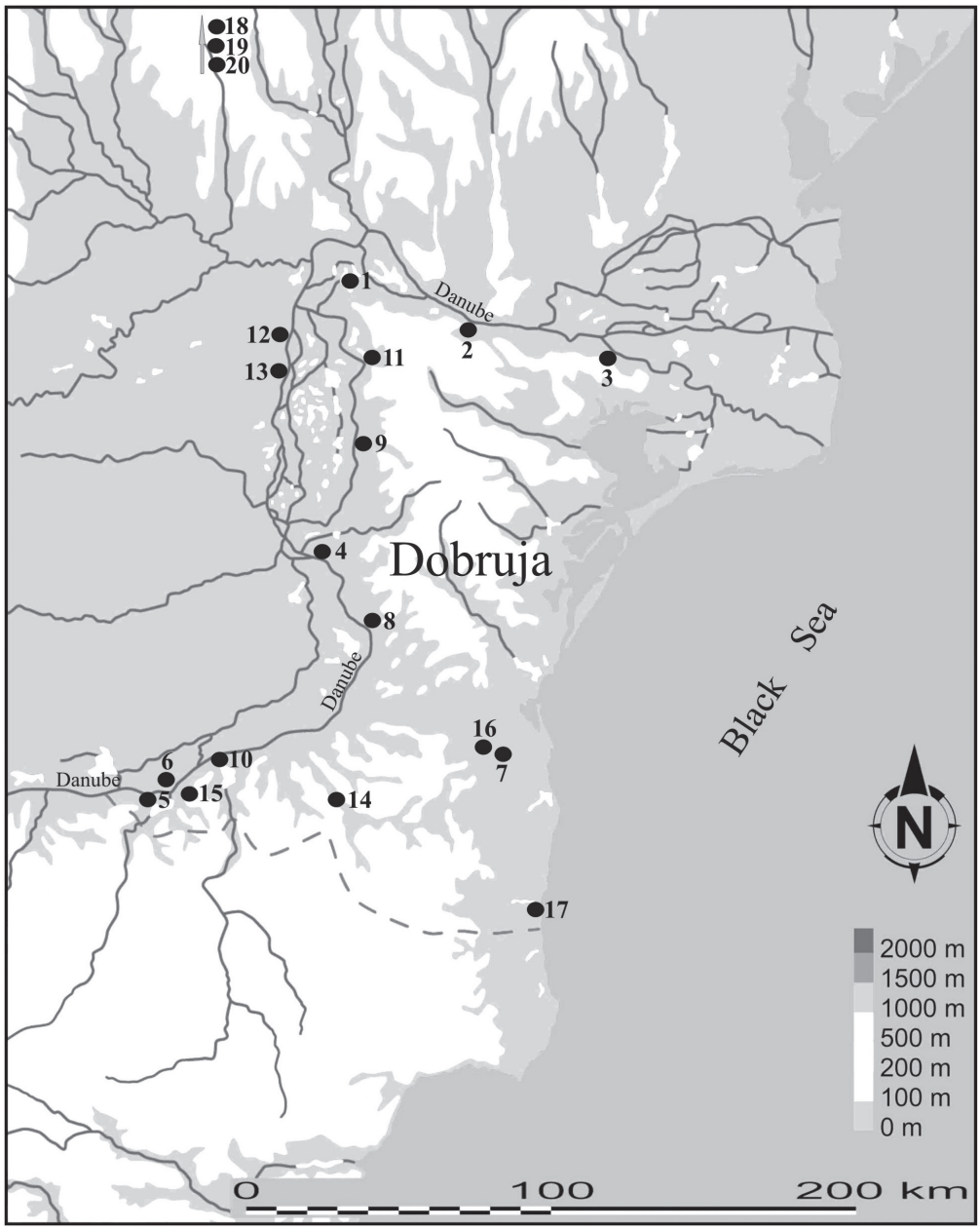

Fig. 7. Geographic position of the sites mentioned in the article
7. kép. A tanulmányban említett lelőhelyek földrajzi helyzete
1: Dinogetia-Garvăn; 2: Noviodunum-Isaccea; 3: Nufăru; 4: Hârşova; 5: Bugeac Hill; 6: Păcuiul lui Soare; 7: Valu lui Traian; 8: Capidava; 9: Ostrov-Beroe; 10: Oltina; 11: Igliţa; 12: Chişcani; 13: Tighileşti; 14: Adamclisi; 15: Canlia; 16: Murfatlar-Basarabi; 17: Mangalia; 18: Hlincea-Iaşi; 19: Iaşi; 20: Gara Banca

time. Following the road network (which had changed little since the Roman Period), the sites are situated along or near the roads. Products, ideas, and know-how have spread through these roads for a long.

The distribution areas of two of the identified centres could be outlined. It's worth noting that many vessels produced in Garvăn-Dinogetia were made of clay tempered with crushed limestone (Ştefan et al. 1967, 134, 174), a rock specific to this area. Vessels with potter's marks, made of such substance, have been found in features coeval with the estimated time in operation of this pottery centre in the Istro-Pontic territory in Isaccea (Paraschiv-Talmaţchi, Stănică 2005–2006, 287), Igliţa (Tulcea County) (Mănucu-Adameşteanu 1980, 233), Ostrov (Paraschiv-Talmaţchi 2006, 179–183), Murfatlar-Basarabi (Constanţa County) (Barnea 1962, 355–356), Mangalia (Constanţa County) (Barnea 1959, 905), and Păcuiul lui Soare (Constanţa County) (Diaconu, Vîlceanu 1972, 71). Such vessels north of the Danube

have been found in Tichileşti (Brăila County) in Muntenia (Sîrbu 1979, 35; Harţuche 1980, 335) and Hlincea (Iaşi County) (Petrescu-Dîmboviţa et al. 1953, 317–318) and Iaşi (Chirică, Tanasachi 1984, 196) in Moldavia. Clay in Isaccea-Noviodunum was tempered with crushed limestone and snail shells; such a vessel was found in Igliţa but not in Garvăn-Dinogetia where, albeit diverse tempering materials (limestone, crushed shells, schist, broken shards) appear in the pottery record, crushed snail shells are not present. That and the three vessels with potter's marks, made of snail shell-tempered clay, at Igliţa indicate trade between this settlement and the pottery centre at Isaccea-Noviodunum. It cannot be excluded that two vessels made of limestone-and-snail shell-tempered clay found in Hlincea and Iaşi in Moldavia also came from Isaccea-Noviodunum. Some vessels found in Ostrov, Mangalia, and Chiscani (Brăila County) can be attributed to the potters of Garvăn-Dinogetia (Harţuche et al. 1967, 140, 148). Pottery with true grog temper was mainly found in Canlia in southern Dobruja (Constanţa County), save for a single piece from north of the Danube, the material of which, containing quartz or quartz and limestone, is similar to that of the vessels produced in the Dobrujan citadel (Irimia 1981, 118), Chiscani in Muntenia (Harţuche et al. 1967, 150), Gara Banca in Moldavia (Vaslui County) (Maxim-Alaiba 1988, 254), as well as a vessel with crushed shell temper from Iaşi (Andronic et al. 1967, 194) and six more with crushed limestone and shell temper from Hlincea.

Recent research results outline the distribution area of the vessels with potter's mark made by the Garvăn-Dinogetia pottery centre. This area corresponds to the Dobruja region (especially along the Danube and towards the Black Sea) and the central, southern, and eastern parts of the South Carpathian region, connected, through the Prahova Valley, with communities in southeast Transylvania. Vessels of this centre seem to have spread in Moldavia as far as the settlements along the Bahlui Valley. Vessels with potter's marks made in Isaccea-Noviodunum, a pottery centre with a smaller distribution area in Dobruja than Garvăn-Dinogetia, have also reached this area.

Conclusions

With the exception of the kiln in Valu lui Traian about 11 km west of the Black Sea coast near Constanţa, all other reliable evidence of local pottery production centres was found in settlements on the right bank of the Danube, between southwestern Dobruja (Bugeac, Păcuiul lui Soare) and the estuary (Nufăru). This image reflects, without a doubt, a research bias, as the fortified settlements along the Danube have received more attention since the middle of the last century.

The pottery kilns discovered so far in the Istru-Pontic region have one or two chambers. One-chamber kilns are only known from Garvăn-Dinogetia. The dual-chamber type has several variants: the most common one comes with a perforated oven floor or grate (Nufăru, Hârşova, Păcuiul lui Soare, and the settlements on the Bugeac Hill and at Valu lui Traian), there is one with a platform with lateral consoles resting on a central pillar (Isaccea-Noviodunum), and another unique specimen with two chambers that only partially overlap, are connected by a channel, and presumed to have a perforated platform (but no direct evidence thereof; Nufăru). The kilns and the related workshops could be dated to the 10th–12th centuries and indicate uninterrupted pottery production, with a focus on meeting local demand, during this period.

These discoveries have revealed that local pottery primarily included kitchenware (pots with no handles and cauldrons) and tableware (bowls and pitchers) made from common clay and kaolin; also, the pottery type distribution suggests that these types were in the highest demand. Interdisciplinary analyses could confirm and expand the range of pottery types produced in Dobruja and identify higher-quality vessels, such as those with green-olive glaze or globular amphorae (Bugoi 2015, 296–301; Stănică 2015, 227; Bugoi et al. 2019, 1–16; Bugoi et al. 2020, 80–86; the presence of amphorae is suggested by some stamps found at Isaccea-Noviodunum and Păcuiul lui Soare). For nearly a century, starting with the return of Byzantine administration to Dobruja (after 971), both slow wheels (especially for household items and in less developed settlements) and fast wheels were used for making pottery in the region.

The workshops and pottery kilns give a pottery production centre character to some early medieval settlements in Dobruja. The analysis of the vessels with potter's marks, the features related to pottery making, and the clay substances and ceramics have revealed that most pottery was produced locally and that pottery centres traded their products. The distribution area of the two identified pottery centres

mainly corresponds to the Dobruja region (especially along the Danube and towards the Black Sea), but some vessels reached the central, southern, and eastern parts of the south Carpathian region and, through the Prahova Valley, southeastern Transylvania and settlements along the Bahlui Valley in the east Carpathian region.

Although relatively few, the four potter's workshops and fifteen pottery kilns are undeniable evidence of local pottery production in Dobruja at the beginning of the Middle Ages. These data contribute to the reconstruction of craft activity in the period in the Istro-Pontic region and may suggest similarities in other areas.

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GONDOLATOK A DOBRUDZSAI KERÁMIAELŐÁLLÍTÁSRÓL ÉS -TERJESZTÉSRŐL A KÖZÉPKOR ELEJÉN

Összefoglalás

A Duna-Pontusi régióban eddig feltárt fazekas kemencék egy vagy két tűztérrel rendelkeznek. Egyterű kemencék csak Garvăn-Dinogetiából ismertek. A kétkamrás típusnak több változata van: A leggyakoribb az átlyuggatott kemencepadlóval vagy ráccsal jellemzett típus (Nufăru, Hârşova, Păcuiul lui Soare, valamint a Bugeac-hegy és Valu lui Traian település), amelynek két változtat van, az egyikrostélya oldalkonzolos és egy központi oszlopon nyugszik (Isaccea-Noviodunum), a másik egyedi példány, amelynek két kamrája csak részben fedi egymást, csatornával vannak összekötve és feltételezhetően átlyuggatott rostéllyal rendelkezik (bár erre nincs közvetlen bizonyíték, ld. Nufăru). A kemencék és a kapcsolódó műhelyek a 10–12. századra datálhatók és arra utalnak, hogy ebben az időszakban megszakítás nélkül folyt a helyi keresletet kielégítő kerámiagyártás.

E kutatások fényében a helyi kerámiaspektrum elsősorban konyhai edényeket (nyél nélküli edények és üstök) és asztali edényeket (tálak és kancsók) tartalmazott, amelyeket közönséges agyagból és kaolinból készítettek; a kerámiatípusok eloszlása is arra utal, hogy ezekre a típusokra volt a legnagyobb kereslet. Az interdiszciplináris elemzések megerősíthetik és kibővíthetik a Dobrudzsában gyártott kerámiatípusok körét, és azonosíthatják a jobb minőségű edényeket, például a zöld oliva színű mázas vagy gömb alakú amforákat (Bugoi 2015, 296–301; Stănică 2015, 227; Bugoi et al. 2019, 1–16; Bugoi et al. 2020, 80–86; az amforák jelenlétére utal néhány Isaccea-Noviodunumban és Păcuiul lui Soare-ban talált pecsét). A bizánci közigazgatás Dobrudzsába való visszatérésétől kezdve (971 után) közel egy évszázadon keresztül a térségben mind a lassúkorongot (különösen a háztartási kerámiához és a kevésbé fejlett településeken), mind a gyors fazekaskorongot használták a kerámiakészítésre.

A műhelyek és fazekaskemencék fazekasközpont jelleget kölcsönöznek egyes kora középkori településeknek Dobrudzsában. A fenékbélyegekkel ellátott edények, a fazekassággal kapcsolatos jelenségek, valamint az agyag alapanyagok és kerámiák elemzése azt mutatta, hogy a legtöbb edényt helyben állították elő, és a fazekasközpontok kereskedtek termékeikkel. A két azonosított fazekasközpont terjesztési területe elsősorban a Dobrudzsa régiónak felel meg (különösen a Duna mentén és a Fekete-tenger felé), de néhány edény eljutott a Déli-Kárpátok középső, déli és keleti régióiba

is, valamint a Prahova-völgyön keresztül Délkelet-Erdélybe és a Keleti-Kárpátok régiójában a Bahlui-völgy mentén fekvő településekre.

Bár viszonylag kevés, a négy fazekasműhely és tizenöt fazekaskemence tagadhatatlan bizonyítéka a helyi fazekasságnak Dobrudzsában a középkor elején. Ezek az adatok hozzájárulnak a korabeli kézművestevékenység rekonstrukciójához a Duna-Pontuszi térségben.