

Abhandlung

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Multidisciplinary study provides insight into archaeological context and environmental background of short-lived stronghold of Obłeże (Pomerania, Poland)

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Zusammenfassung: Der frühmittelalterliche Siedlungs-komplex in Obłeże, gelegen an der Wieprza, stellt eine einzigartige archäologische Stätte in Mittelpommern dar, die sich durch ihre gut erhaltenen Holzkonstruktionen und die kurze Besiedlungsdauer auszeichnet. Dieser Artikel präsentiert die Ergebnisse der Ausgrabungen von 2021, die durch nicht-invasive geophysikalische Untersuchungen vorbereitet wurden, welche die Schlüsselbereiche der Grabungen präzise identifizierten. Während der Ausgrabungen wurden Überreste eines hölzernen Walls, eines Landungsstegs und eines Straßenabschnitts, der zum Fluss führte, entdeckt. Die dendrochronologische Analyse datiert den Bau der Befestigung auf etwa das Jahr 1110. Die Zerstörung der Siedlung wird mit dem Feldzug Bolesław III. Schiefmunds zur Unterwerfung Pommerns (1116–1122) in Verbindung gebracht. Die Fundstelle lieferte eine außergewöhnlich reiche Sammlung von Artefakten, darunter eine große Sammlung keramischer Funde, Silbermünzen und Schmuckfragmente, was auf den hohen Status der Bewohner und die Rolle der Siedlung als Handelszentrum hinweist. Botanische Überreste und Tier-

knochen gaben Aufschluss über die gemischte Wirtschaftsweise der Gemeinschaft, die Ackerbau, Viehzucht und handwerkliche Produktion (Keramikherstellung, Spinnen, Weben) kombinierte. Hinweise auf Fernhandel belegen eine Einbindung in überregionale Handelsnetzwerke. Die kurze Besiedlungsdauer bietet eine seltene Momentaufnahme des frühmittelalterlichen Lebens.

Schlüsselworte: Pommern, Frühes Mittelalter, Burgwallzentrum, Geophysik, Lidar, Archäobotanik, Dendrochronologie

Abstract: The early medieval settlement complex in Obłeże, situated along the Wieprza River, represents a unique archaeological site in Central Pomerania, distinguished by its well-preserved wooden structures and short period of occupation. This article presents the findings of a 2021 excavation, preceded by non-invasive geophysical surveys that accurately identified key excavation areas. The research uncovered remains of a wooden rampart, a wharf, and a section of road leading to the river, with dendrochronological dating placing the construction of the stronghold around 1110. The settlement's destruction is linked to Bolesław III Wrymooth's campaign to subjugate Pomerania (1116–1122). The site yielded a remarkably rich assemblage of artifacts, including an extensive collection of pottery, silver coins, and jewellery fragments, indicating the high status of the inhabitants and the settlement's role as a trade hub. Botanical remains and animal bones provided insights into the community's mixed economy, which combined agriculture, animal husbandry, and craft production (pottery, spinning, weaving). Evidence of long-distance trade suggests integration into broader commercial networks. The short-lived occupation offers a rare snapshot of early medieval life.

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Keywords: Pomerania, Early Middle Ages, stronghold centre, geophysics, Airborne Laser Scanning, archaeobotany, dendrochronology

Streszczenie: Wczesnośredniowieczny kompleks osadniczy w Obłężu, położony nad rzeką Wieprzą, stanowi unikalne stanowisko archeologiczne na Pomorzu Środkowym, wyróżniające się dobrze zachowanymi drewnianymi konstrukcjami oraz krótkim okresem zasiedlenia. Niniejszy artykuł przedstawia wyniki wykopalisk przeprowadzonych w 2021 roku, poprzedzonych nieinwazyjnymi badaniami geofizycznymi, które dały przesłanki do lokalizacji wykopów archeologicznych. W trakcie badań odkryto drewniane relikty konstrukcji wału grodziska, nabrzeża i fragmentu drogi prowadzącej z grodu do rzeki. Datowanie dendrochronologiczne pozwoliło na określenie czasu wzniesienia grodu na około 1110 rok. Zniszczenie osady można łączyć z wyprawą Bolesława III Krzywoustego w celu podporządkowania Pomorza (1116–1122). Stanowisko dostarczyło niezwykle bogatego zbioru artefaktów, przede wszystkim dużego zespołu ceramiki. Odkryto też srebrne monety i fragmenty biżuterii, co wskazuje na wysoki status mieszkańców oraz rolę osady jako ośrodka handlowego. Szczątki botaniczne i kości zwierzęce dostarczyły informacji o mieszańce gospodarce społeczności, łączącej rolnictwo, hodowlę zwierząt oraz produkcję rzemieślniczą (garncarstwo, przedzalnictwo, tkactwo). Krótki okres zasiedlenia dostarcza rzadkiego wglądu w życie wczesnośredniowieczne.

Słowa kluczowe: Pomorze, wczesne średniowiecze, centrum grodowe, geofizyka, lotniczy skaning laserowy, archeobotanika, dendrochronologia

Introduction

Central Pomerania, stretching between the Parsęta River in the west and the Łeba River in the east, is a land where a political formation with early state characteristics occurred in the 11th century¹. It is a unique and still underestimated area regarding the intensity of archaeological work. The excavations carried out in the 1960s to identify and catalogue the sources for the early medieval strongholds and settlements, conducted by Jerzy Olczak and Kazimierz Siuchniński, should be considered exceptional in this regard². A work of a synthetic nature, dealing with

the period between the 6th and 10th centuries, is Władysław Łosiński's monograph³.

In connection with the necessity for wide-ranging, interdisciplinary archaeological research on early medieval Central and Eastern Pomerania, cooperation was established between the Faculty of Archaeology at the University of Warsaw and the Institute of Archaeology at the Nicolaus Copernicus University in Toruń. A stronghold in Obłęże, Kępice commune, was selected as the first site for research. The site complex is located in the basin of the Wieprza River (Fig. 1). It consists of a ring-shaped, almost completely levelled stronghold and a barrow cemetery, whose chronological and functional relationship with the surveyed settlement has not been confirmed⁴.

The stronghold is located on the east bank, in the meander of the Wieprza River, a few hundred metres from the buildings of Kępice and about 2 km from the buildings of Obłęże village. The site is located in the area of currently unused meadow. To the southeast of the settlement, on a slight terrain uplifted overgrown with forest, there is a set of earthen mounds. Hypothetically, it is possible to see a barrow burial ground in them, although so far, it has not been possible to prove their chronological relationship with the settlement (Fig. 2). The 19th and 20th century local names of the site, Schloss B.(erg) (map of 1837) or Alte Schanze (map of 1909), indicate the existence at the time of mapping of a legible ramparts form that had been degraded by fluvial erosion and intensification of agricultural operations (Fig. 3).

The geomorphological survey revealed that the meander where the stronghold was built was periodically flooded, as indicated by the trough sediments. At the same time, it was proven that the river surrounded the castle on three sides in the early Middle Ages. Its location on a 'peninsula' connected to the rest of the valley by a periodically wet isthmus increased its defensive qualities. The 1909 map additionally suggests that the moat separating the fortification from the rest of the valley was periodically flooded. During such periods, the fortress would have been located on an island. Traces of open settlement have been discovered on the eastern banks of the valley and in the flood zone of the river. A few kilometres north of the fortified settlement, three graves belonging to elite representatives were accidentally discovered in Barwino in 1924 and 1937⁵. The burials should be dated to the second half of the 11th–12th century⁶.

³ Łosiński 1982.

⁴ Wadyl *et al.* 2024.

⁵ Eggers/Giessen 1938, 32–33.

⁶ Biermann 2008, 93.

¹ Rębkowski 2020.

² Lachowicz/Olczak/Siuchniński 1977; Olczak/Siuchniński 1985; 1989.

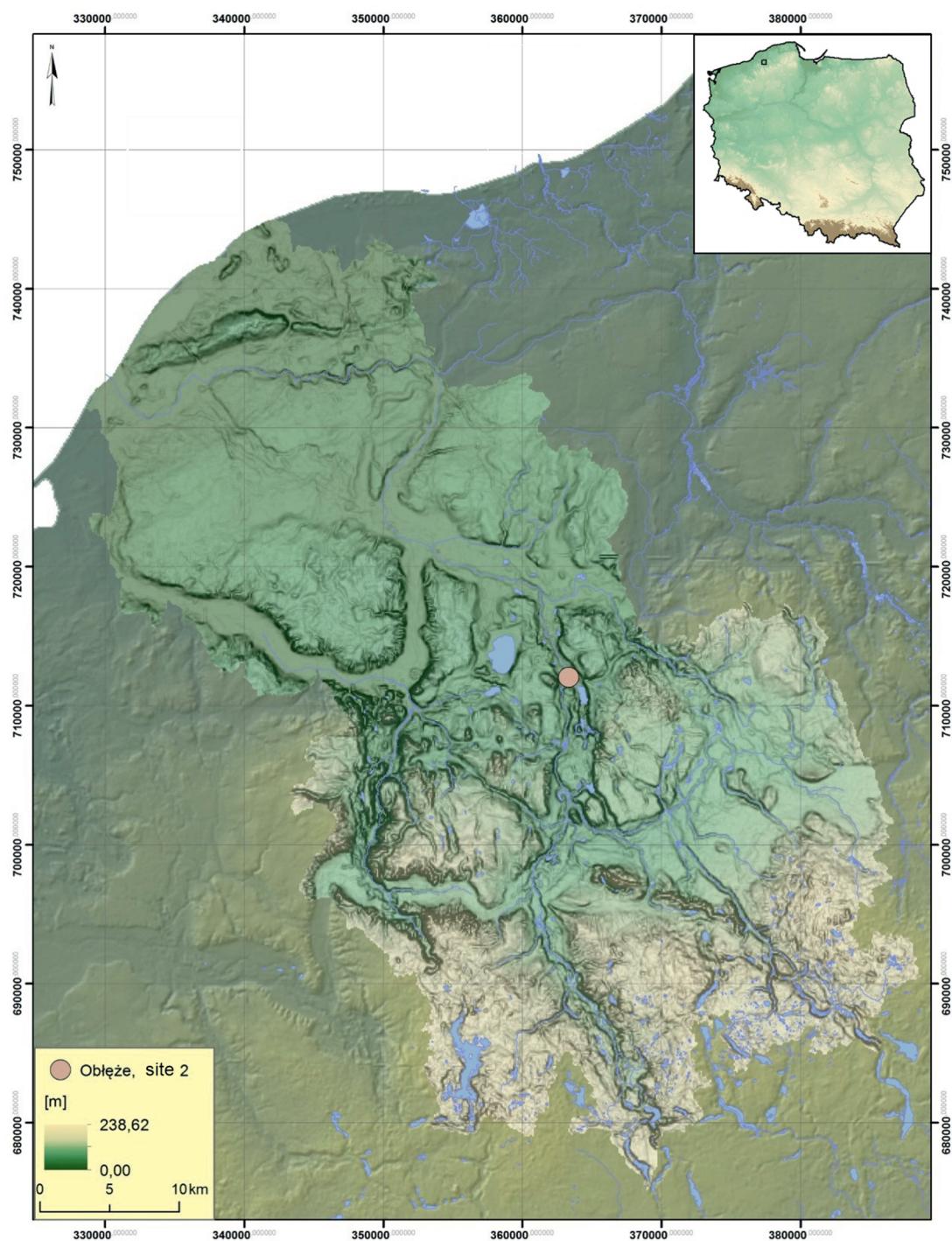


Fig. 1: Location of the study site (graphic by M. Skrzatek).

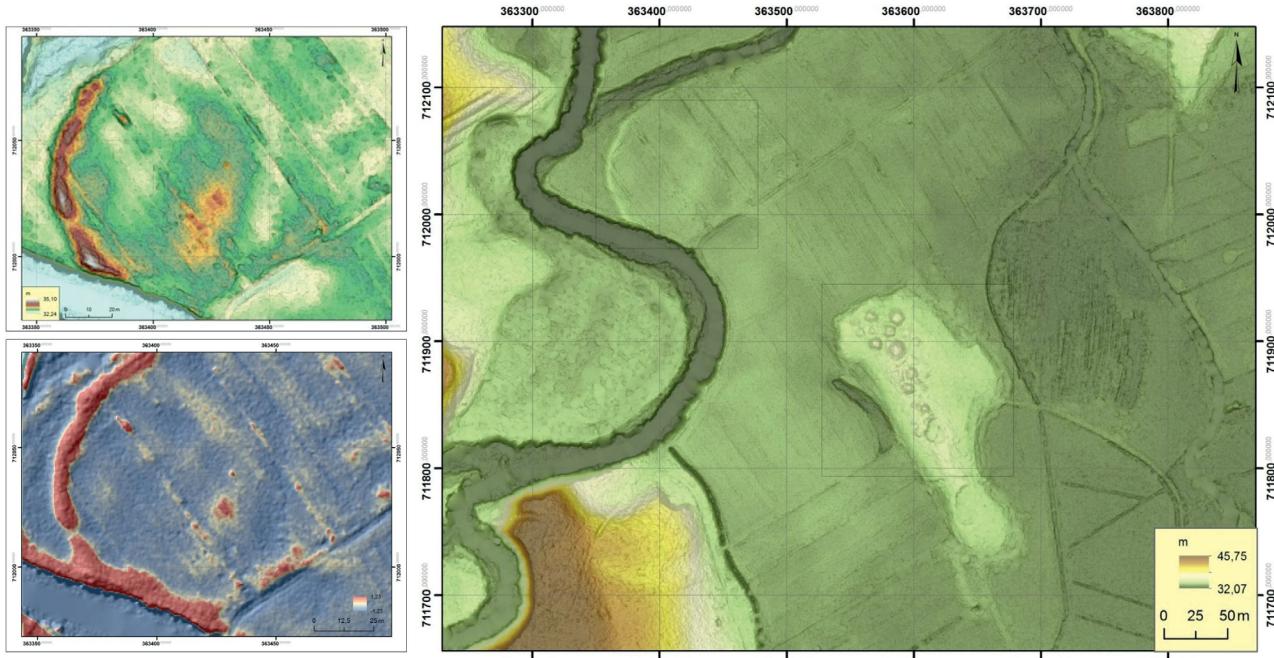


Fig. 2: Hypsometric map of a cluster of sites nestled in a River Wieprza meander (graphic by M. Skrzatek).

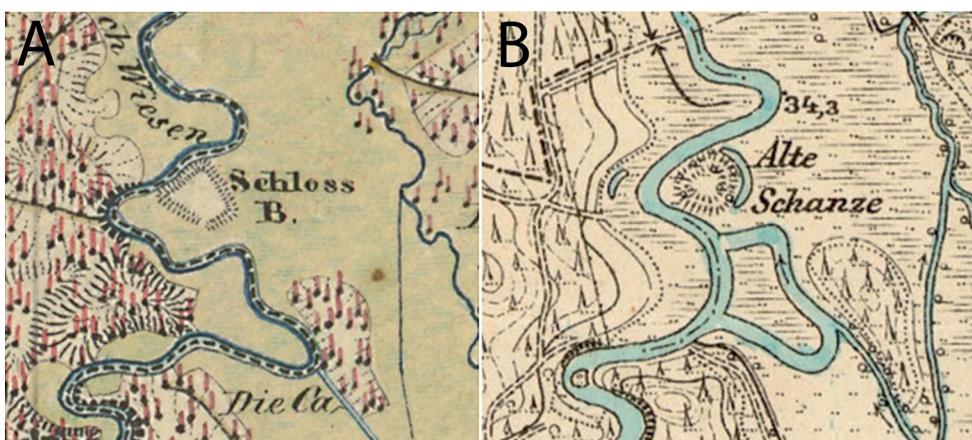


Fig. 3: Archival maps of the site from 1837 (A) and 1909 (B).

Research history and results of non-invasive investigations

The stronghold at Obłęże (germ. Woblanse) is first mentioned in the 1840s⁷. Numerous fragments of early medieval pottery, two stone querns⁸ and an iron Silesian-type bowl were found at that time⁹. The actual surface and sounding

investigations were not carried out until 1964. Three test pits were excavated, and 156 fragments of early medieval potsherds dating from the 2nd half of the 9th to the 11th century were found¹⁰.

The site is currently poorly visible in the field, as the relics of the ramparts and ditches/ moats are almost entirely levelled. However, the site is relatively well visible based on analysis of aerial photographs or derived ALS data. Oval shape stronghold with maximum approximated main axis dimensions: WE 85 × NS 105 m covers area c. 6000 m²

⁷ Giesebricht 1846, 103.

⁸ Olczak/Siuchniński 1989, 86–88.

⁹ Eggers/Giessen 1938, 32.

¹⁰ Olczak/Siuchniński 1989, 89–93.

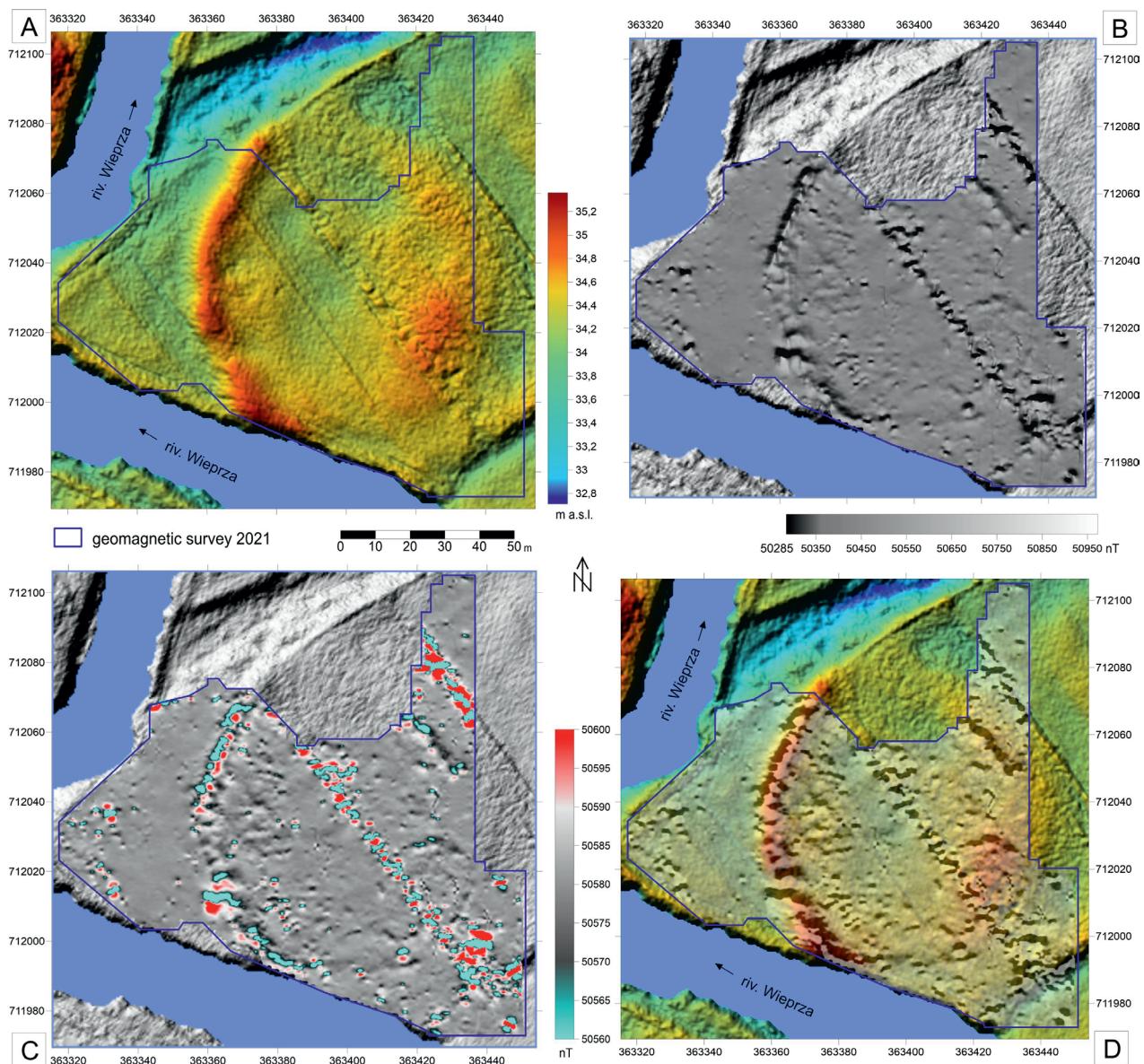


Fig. 4: Visualization of magnetic prospection in ALS LiDAR context: A: magnetic survey area (c. 1 hectare) with *digital terrain model* ALS LiDAR B: magnetic map – greyscale image merged with ALS LiDAR *hillshade* model C: magnetic map – min/max values colour image merged with ALS LiDAR *hillshade* model D: magnetic map (75 % transparency) overlapped *digital terrain model* ALS LiDAR (graphic by W. Małkowski).

(0.6 ha) including the remains of the ramparts which are best preserved in the western part. Survey was carried out unidirectionally with the G-858G Magmappercesium magnetometer synchronously connected to the GNSS RTK location. This solution allowed for measurement and registration of the values of the total magnetic field intensity vector (nT) with resolution: 0.5×0.15 m. Approximately 1 hectare area located in the shape of an irregular terrain polygon were surveyed (Fig. 4). Analysis of the magnetic maps were done using basic filters and algorithms to obtain an optimal contrast between anomalies and their surroundings. Comparing results of magnetic prospection with the results of

excavations which were located in accordance to survey provides information and knowledge on the state of preservation of the stronghold's architecture, which refers to discussion on the methodology of archaeological research consisting in assessing the effectiveness of geophysical measurements in direct relation to the results of old (previously done) and contemporary archaeological excavations carried out on their basis¹¹. Geomagnetic analyses confirm

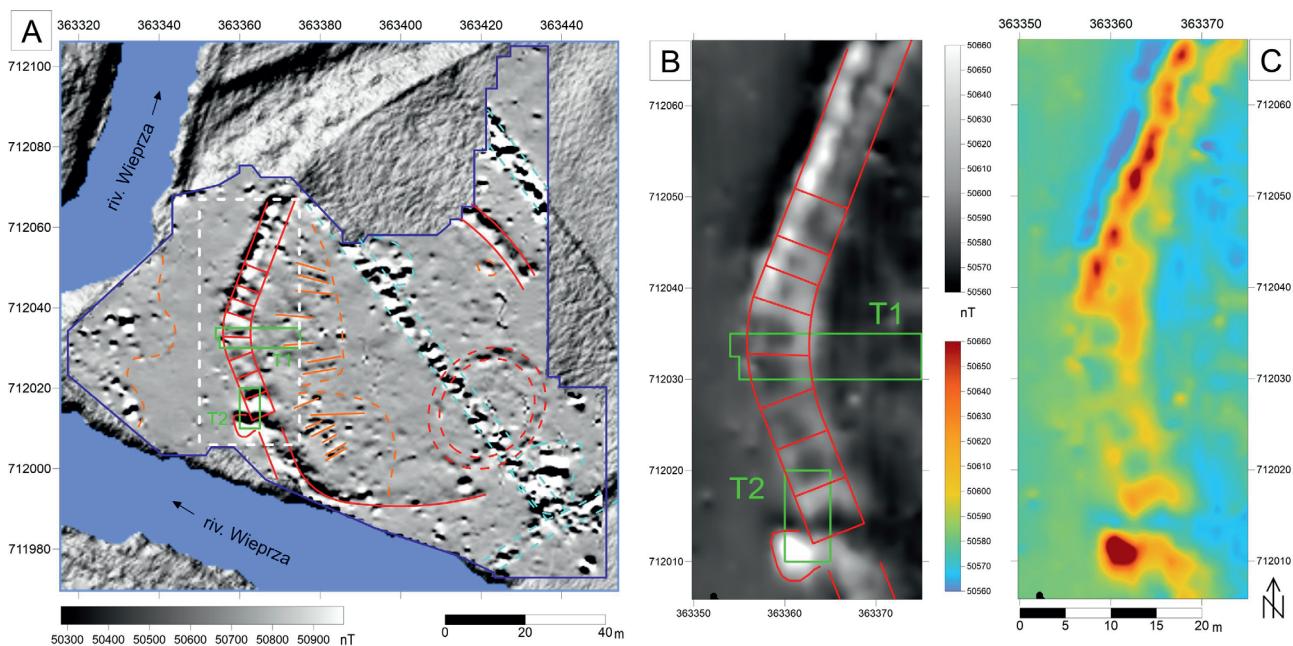


Fig. 5: A: Interpretation of magnetic survey: A – vectorization of magnetic survey map with ALS LiDAR hillshade model; white rectangle of western ramparts area; B: magnetic grayscale map limited to western ramparts area merged with vectorized outline and tranches T1-T2; C: magnetic colorized map – hypsometry schema (graphic by W. Małkowski).

good state of preservation of rampart remains in western part of stronghold.

In the vicinity of the ramparts inside the stronghold area, a number of linear anomalies are visible, perpendicular to the fortifications line, which indicates the presence of the zone of residential architecture adjacent to the ramparts. For the fortified settlement site, where a dataset of total intensity of the magnetic field values in the range 50284–50973 nT was recorded, magnetic maps were presented in different colour conventions and ranges of (nT) values selected to optimise the contrast between the anomalies and their surroundings¹². The results of the survey show clearly defined sets of anomalies related to the architecture of the stronghold – the construction of the ramparts, which were authenticated by highlighting the minimum and maximum values (nT). The linear anomaly recorded inside the fortress is a remnant of the modern subdivision and fencing of the area (marked with light blue colour – fig. 5A). The western part of the stronghold is the best readable on the magnetic map, which is due to the large number of burnt structures below the ground surface, which remnants of building forms may additionally accompany the maypole (visible in the form of anomalies of lower dynamics near the rampart structures – marked with orange colour outline).

The location of an oval (area 450m²), approximately 25 × 29-metre-high anomaly, suggesting the existence of a probable additional representative residence (?) in the southern part of the site (Fig. 5A)¹³.

Clearly visible contrast of the measured physical parameters of the magnetic field values makes possible the analysis of the rampart construction in the western part of the stronghold (Fig. 6). The parametric data indicate an average width of the rampart base of 6.50 m (from 6 m to 6.80 m). The dimensions of the separated boxes are similar to the area of rectangle: 6m × 5m (+/– 20 %). These approximate values are due to the characteristic of the magnetic survey while approaching and moving away from the source of the anomaly which may cause shifts of the location of recorded anomalies in relation to the place of relict presence. It isn't the only one aspect of magnetic map analyses problems but directly related to Oblęże stronghold case study. The excavations significantly improved the location of the sources of magnetic anomalies in relation to discovered remains or rampart. Due to the trenches (T1 and T2) it is possible to calibrate geometric parameters as well as function and the chronology of the archaeological layers units causing changes in the intensity of the natural magnetic field. This process of combining geophysical survey results with in-

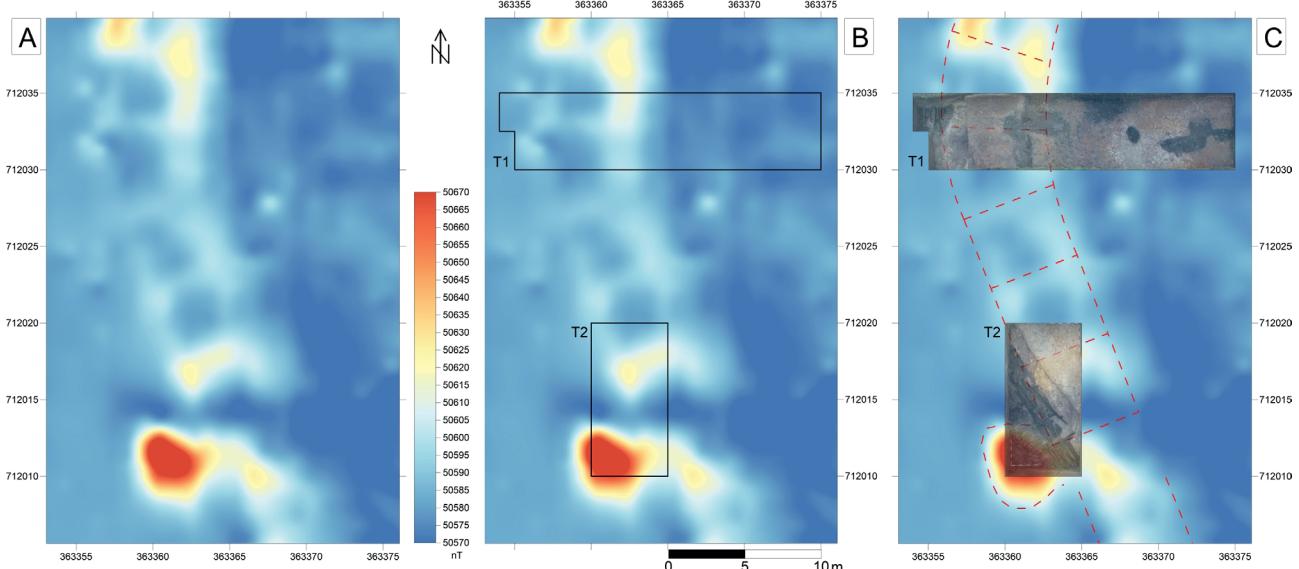


Fig. 6: Analyses of the western rampart area compares magnetic survey with excavation orthoimages. A: magnetic colorized map – hypsometry schema; B: magnetic map with outline of the tranches T1-T2; C: Interpretation – vectorisation of magnetic map with georeferenced orthoimages of excavated buried remains of ramparts T1 – T2 (graphic by W. Małkowski).

formation from excavations enables the acquisition of sufficient knowledge for spatial and cultural analyses of the buried monuments also in aspect of the requirements of conservation protection.

Excavation research and interdisciplinary analysis of its results

The first trench was located where the geophysical survey revealed a transverse anomaly during the rampart – an alleged gate passage. The second trench through the rampart covered a section of the castle's interior buildings (Fig. 7).

In Trench 2, the remains of a burnt rampart structure were discovered at the first levels of exploration. The shape and orientation of the layers corresponded to the image seen in the geophysical analyses (Fig. 8a). Underneath these, the heavily organic fill of the rampart boxes was uncovered. This level was also periodically flooded (Fig. 8b). At the lowest level an excellently preserved foundation in an elaborate oak (*Quercus L.*) timber structure was discovered beneath the burnt parts of the rampart construction erected using the box technique (Fig. 8c). The individual beams had been joined together with mortises, hooks and wedges. Specially prepared yoke beams were also exposed, connecting the entire structure. Directly adjacent to it on the riverside

was a breakwater made of oak beams arranged perpendicular to the line of fortifications. Samples from these structures were subjected to dendrochronological tests. The results show that the timber used to build the rampart was felled in 1110 (Fig. 9).

In Trench 1, in addition to the relics of the rampart (Fig. 6; 10), the remains of a residential building (Fig. 11). Inside the fortress, a rectangular building sunk into the ground, erected in the log technique¹⁴, was uncovered, to which resource and waste pits and stone pavements were associated. Stones were probably also draped over the slopes of the rampart. Burnt remains of the inner edge of the rampart were also discovered in the excavation (Fig. 10). The stratigraphy uncovered in the western part of the trench (Fig. 10D; 11) also shows fluctuating water levels in the river (Fig. 12). In that part of the trench a partially recognised wooden structure – probably a road leading towards the river harbour – was discovered. It was made of untreated beams found directly on waterlogged layers.

¹⁴ Chudziak/Kaźmierczak 2014, 88–90.



Fig. 7: Planigraphy for the rampart structure and features discovered in trenches 1 and 2 (A), and planigraphy for the rampart structure unearthed in trench 2 with location on dendrochronological samples marked (graphic by S. Wadyl).

Analysis of artefacts and ecofacts

Archaeological materials

Numerous artefacts were uncovered in the context of the stratification recorded in both trenches. Particularly noteworthy were two silver coins (an English penny of Cnut [1016–35] of the pointed helmet type, 1024–30 (Fig. 13a); and a Samanid dirham of Ahmad ibn Isma'il, 907–14 (Fig. 13b),

a silver ear ornament, amber beads, spinning equipment in the form of spindle whorls, as well as a quern stone and fragments of a roasting dish used for processing cereals. The fragment of the ear ornament (pol. zausznica) (Fig. 13f) is a bail made of silver wire over which a basket-shaped bead was placed, of which one of the two openwork halves has been preserved¹⁵. The closest analogues have been

¹⁵ Kóčka-Krenz 1993, 64.



Fig. 8: Trench T 2. Three levels of exploration (graphic by S. Wadyl).

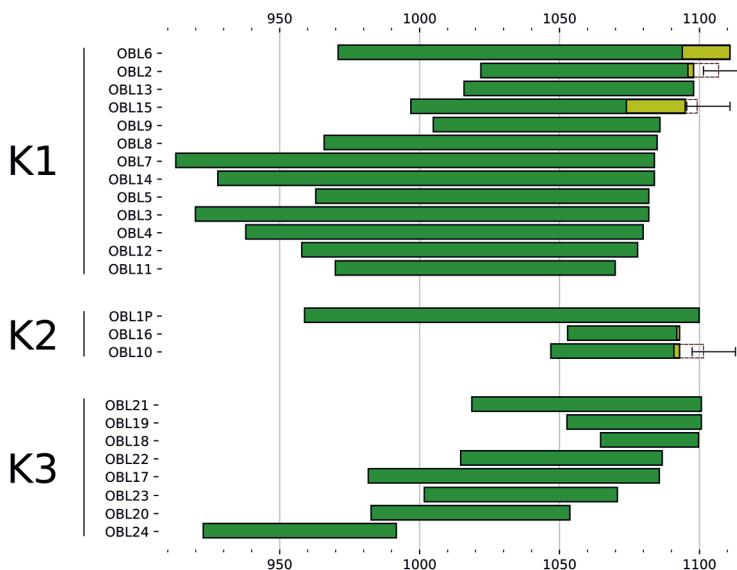


Fig. 9: Diagram showing the span of tree-ring sequence (graphic by M. Krępiec).

discovered in hoards from Strzeczony¹⁶, Kurów¹⁷ and Łupawa¹⁸. The ear ornament of this type has been dated to the 10th–12th century¹⁹. Also included in the ornaments category were two amber, biconical beads, probably made with a lathe. The first is a specimen preserved whole, 1.5cm in diameter (Fig. 13c), with a 0.7cm diameter hole. The second specimen, which is 1.4cm in diameter with a 0.4cm hole, is damaged (Fig. 13d). The holes in both beads were drilled on both sides. The surfaces have not been decorated. The beads resemble spinners by their shape and may have been evidence of the high social position of their owner²⁰. A small rivet made of copper alloy is probably also a remnant of decoration (Fig. 13e). The selected artefact group also includes 11 clay spindle whorls. Four of these have a biconical form (Fig. 13g–j). Three of them have depressed near-hole surfaces (Fig. 13g–i). Three are 3.4cm in diameter (Fig. 13g; i), and the fourth is 3.6cm (Fig. 13:h). Two specimens are undecorated (Fig. 13g–h), and two are decorated with a series of horizontal engraved lines (Fig. 13i–j).

The cultural sequences excavated at Obłęże yielded a total of 8231 vessel sherds, discovered in context related to the building. The analysed collection of ceramics was divided into five ceramic assemblages, corresponding to the contexts in which they were found. Only one assemblage

originated from the topsoil layers (humus), limiting its research value. The remaining ceramic assemblages were found in a residential building or within layers associated with the collapse of a rampart, giving them greater significance for study. The most valuable assemblages, linked to the dwelling and associated structures, included a total of 8062 vessel sherds. Due to its homogeneity and the short, defined time period in which it was created, the entire pottery collection holds substantial research value.

Fragments of the most distinctive part, namely the rims, accounted for 12 % (1014 fragments). Less numerous were the fragments of vessel bases (380), making up 5 %. The largest group consisted of body fragments (6776), which represented 82 % of the total. Sixty-one fragments (just under 1 %) came from lids. The analysed material was relatively well-preserved, with a moderate level of fragmentation; however, the relatively strong surface erosion on the vessels was notable.

The analysed collection contained only fragments of vessels that were entirely wheel-finished. Their frequency was 100 %. Nearly all vessels were made using a single clay mixture recipe, which was characterized by relatively good distribution of components and included both fine- and medium-grained sand, as well as sharp-edged crushed temper. Potter's marks were noted on eight bases. These included simple cross symbols as well as more complex shapes, such as star designs or symbols resembling a schematic human figure (Fig. 14g–i; 15i). An important part of the analysis involved estimating the number of vessels in the collection. The maximum estimated number of specimens is 433, while the minimum number of vessels, based on preserved rim-to-body sections, is 362. A total of 347 vessels were intact from the rim edge to the widest part of the body, which

¹⁶ Łęga 1930, 154; Kiersnowscy 1959, 99–100; Bogucki/Illisch/Suchodolski 2016, 507–510.

¹⁷ Łęga 1930, 154; Kiersnowscy 1959, 60–61; Bogucki/Illisch/Suchodolski 2016, 299–301.

¹⁸ Łęga 1930, 463; Kiersnowscy 1959, 60–61; Bogucki/Illisch/Suchodolski 2016, 319–346.

¹⁹ Kóćka-Krenz 1993, 65.

²⁰ Drozd-Wadyl 2024, 438.



Fig. 10: Trench T 1. Four levels of exploration (graphic by S. Wadyl).



Fig. 11: Plan view of structures unearthed in Trench 1, with rampart and house features indicated (photo by S. Wadyl).



Fig. 12: Cross-section view of the rampart uncovered in trench 1 (photo by S. Wadyl).

allowed for typological classification. These vessels were represented by form groups G/Vipperow, J/Teterow, K, L/Kowall, M/Bobzin, and H/Weisdin.

The most common vessels were those corresponding to type G/Vipperow, comprising 44 % of the collection (154 specimens). Type K vessels were also well-represented, comprising 26 % (90 specimens), along with those similar to type J/Teterow at 23 % (79 specimens). Vessels of type L/Kowall were less frequent (4 % – 14 specimens), followed by type M/Bobzin (2 % – 6 specimens), and type H/Weisdin with only 1 % (3 specimens) (Fig. 17).

The presence of decorations was noted on all vessels except those preserved only in the basal portions. During the analysis phase, all decorative motifs were recorded. Subsequently, ornamental systems preserved on whole or largely intact vessels were identified. The vast majority of vessels featured more or less complex ornamental arrangements. A relatively small variation in decorative motifs and ornamental systems was observed. The most common were motifs in the form of encircling lines arranged horizontally, created with a stylus (62 %). The second most frequent

group consisted of short oblique stylus impressions (19 %). Less commonly recorded were ornaments in the form of comb impressions and multi-toothed stamp impressions (7 % each) and wavy lines made with a comb (4 %).

In the analysed collection, 286 vessels were preserved to a degree that allowed for the identification of their complete decorative systems. Half of the vessels featured a single-motif design, consisting exclusively of encircling grooves (Fig. 14b, d, e; 15a, c, f; 16b, d). Forty-seven percent of the vessels had a two-motif arrangement, the most common being vessels with a primary motif of encircling grooves and a secondary, crowning motif of oblique cuts made with a stylus (Fig. 14a, c; 15b) or comb impressions (Fig. 14:e).

The ceramic assemblage from Oblęże is highly homogeneous, consisting exclusively of fully wheel-thrown pottery. No ceramic materials associated with older traditions of early medieval pottery were identified. Vessels of this type represent the latest technical and stylistic trend in early medieval pottery. The analysed collection consisted of a slightly varied assortment of forms, characterized by some diversity in decoration and micromorphology. The

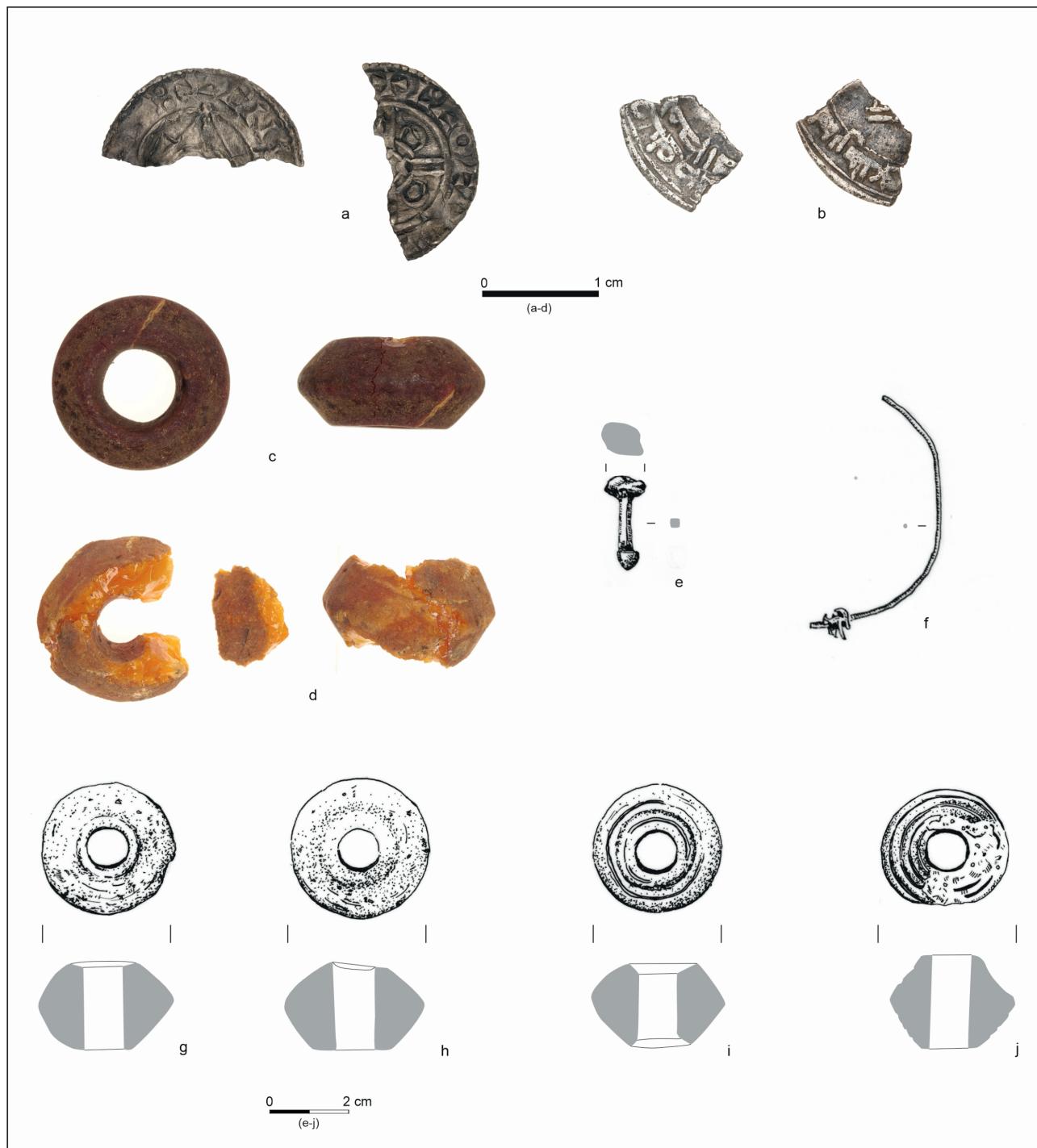


Fig. 13: a, b – silver coins, c, d – amber beads, e – copper alloy rivet, f – silver ornament. A, b – trench 1, layer1, f – trench 1, layer 7, c–e – trench 1, layer 5, j – trench 1, layer 29. (Drawing by D. Żak-Boryszko, photo by J. Szmith).

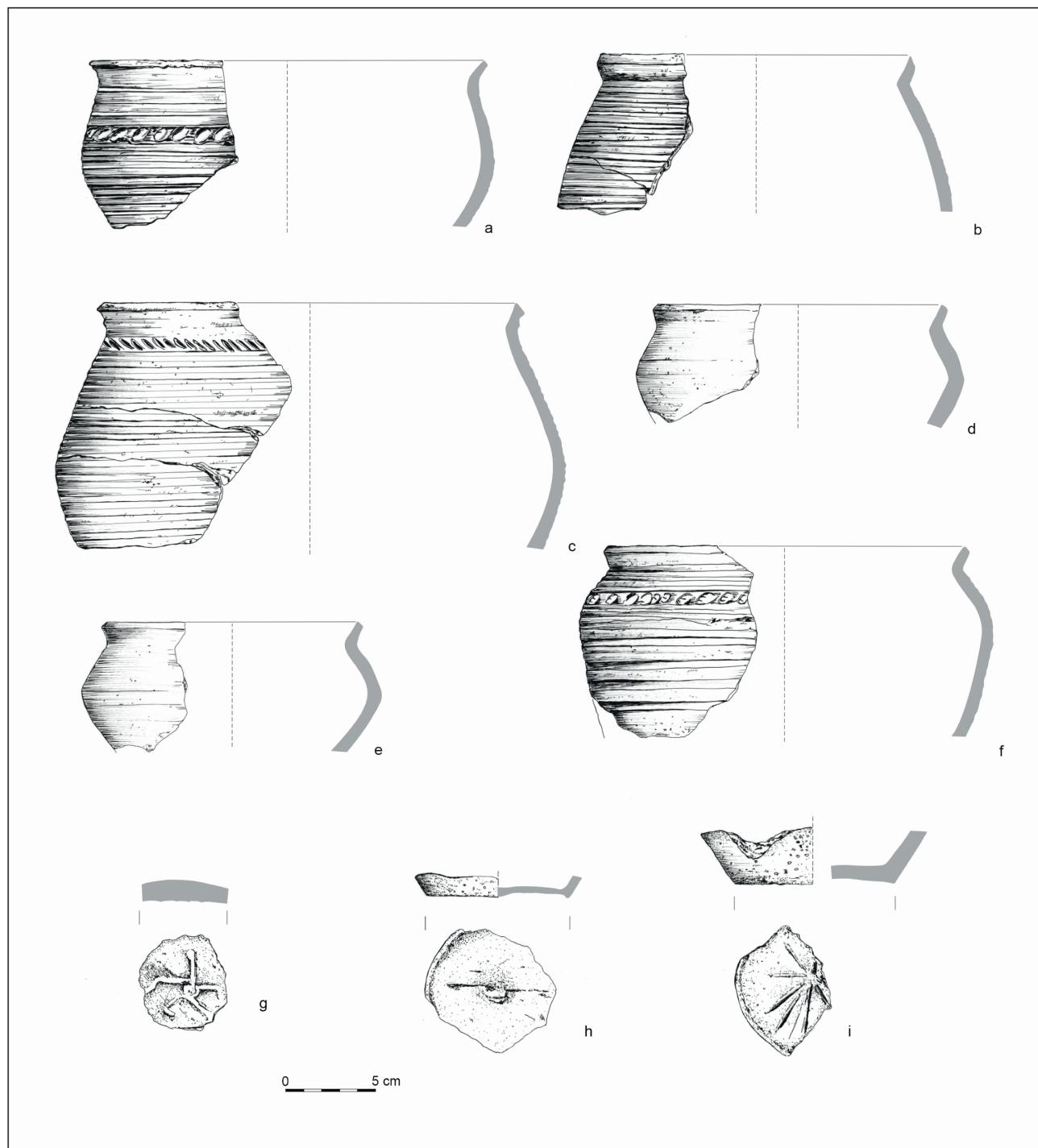


Fig. 14: Clay vessels. a – trench 1, layer 5/7, b, c – trench 1, layer 6/7, d – trench 1, layer 5, e – trench 1, layer 29, f-i – trench 1, layer 7 (drawing by D. Żak-Boryszko).

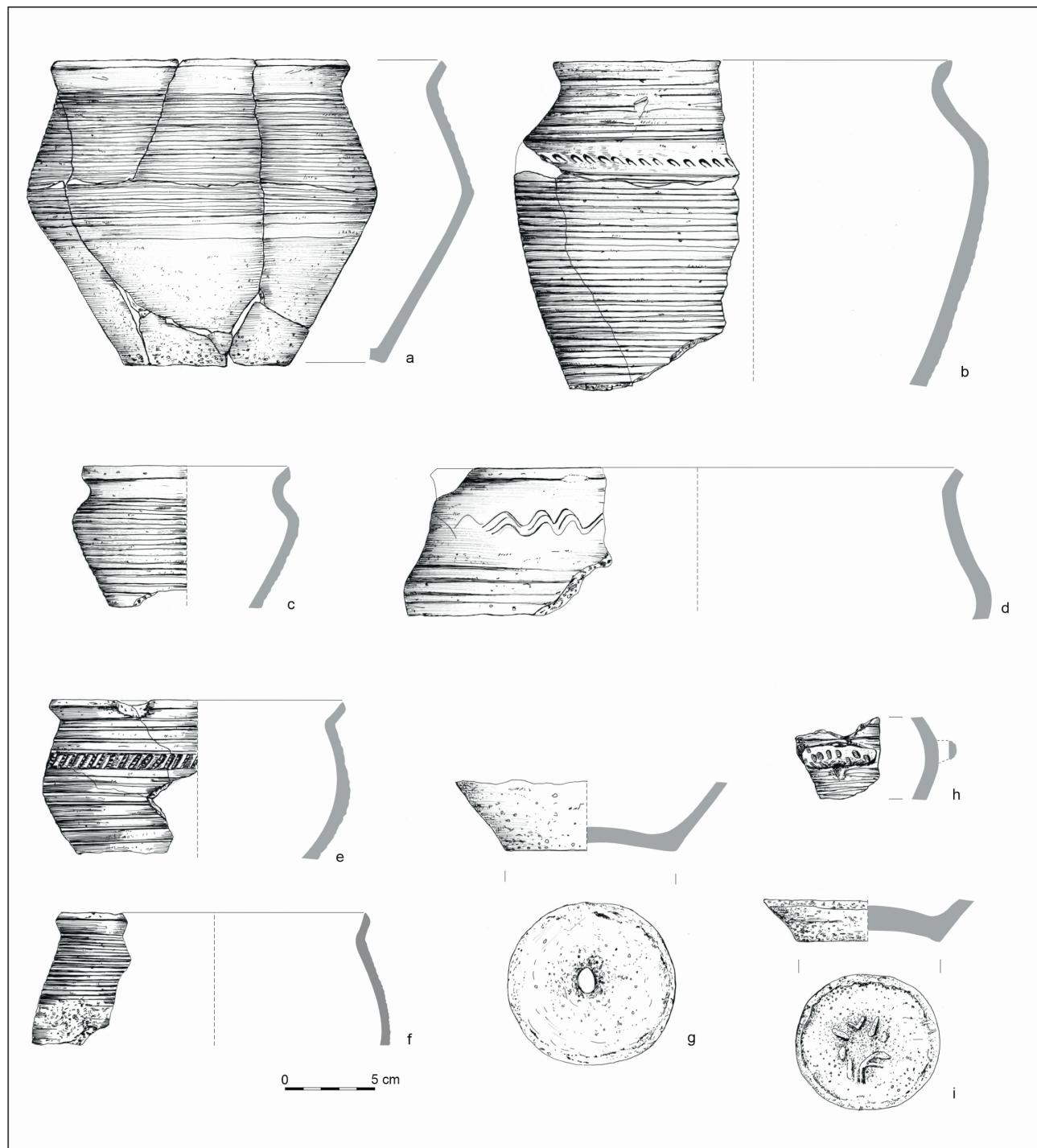


Fig. 15: Clay vessels. a, d – trench 1, layer 5, b – trench 2, layer 3, c–e, i – trench 1, layer 8, g – trench 1, layer 29, h – trench 1, layer 28 (drawing by D. Żak-Boryszko).

Tab. 1: List of identified features from the site of Obłęże studied archaeobotanically.

Trench	Feature Number	Feature type	Description in graphs	Number of samples	SedimentVol (l)	Type of sediment
1	5	rampart, destruction layer	Feat5_RampDestr	3	15	dry
1	6	pit house, deposit	Feat6_Pit House	1	5	dry
1	7	pit house, deposit	Feat7_Pit House	7	44	dry
1	15	rampart, alluvium layer	Feat15_RampAlluv	1	0,5	wet
1	21	cultural layer	Feat21_Cult layer	1	8	dry
1	29	pit house, deposit	Feat29_Pit House	1	6	dry
1	30	pit house, deposit	Feat30_Pit House	1	3	dry
1	33/33a	pit, deposit	Feat33/33a_Pit	1	6	dry
1	33/33c	pit, deposit	Feat33/33c_Pit	1	5	dry
2	26	rampart, alluvium layer	Feat26_RampAlluv	2	1	wet
2	27	rampart, alluvium layer	Feat27_RampAlluv	1	3	wet

most characteristic feature of local pottery was vessels resembling the G/Vipperow type (Fig. 14a, c, f; 15e, f; 16b, c, e) according to the classification of ceramics from Western Pomerania/Mecklenburg²¹. These vessels are abundant among Gdańsk ceramics²² and do not differ from vessels widely distributed across the Polish Lowlands²³. Pots of this type rank among the most common morphological types across the entire north western Slavic region. They are characterized by a high level of technological advancement and a rather limited variety of decorative motifs. The second most frequent category consisted of vessels with a bulbous belly and a cylindrical neck (Fig. 16a, f, i). These vessels have counterparts in the K-type vessels identified for Western Pomerania (types I and II of Szczecin ceramics)²⁴. An important component of the analysed assemblage was vessels classified in the Western Pomerania-Mecklenburg typology as J/Teterow²⁵ (Fig. 15c; 16e, g). Vessels of this group are among the most distinctive forms of fully wheel-thrown pottery from the later phases of the early Middle Ages at Pomeranian sites and are commonly found throughout the entire northwestern Slavic region. Other vessel types (H/Weisdein, L/Kowall, M/Bobzin) played only a minor role in local pottery production.

The structure of the analysed assemblage (Fig. 17), dominated by vessels of the G/Vipperow type, with a smaller

proportion of vessels of the K type and J/Teterow type, and a marginal presence of other types, indicates a late 11th to early 12th-century dating of the assemblage.

Archaeozoological analysis

A small series of animal bones were also discovered (Fig. 18). Pig bones predominated, followed by cattle and sheep/goat bones, with a few other species represented by single specimens. This distribution, with the highest percentage of pig remains, is very well known for early medieval strongholds and settlements in Greater Poland, Pomerania and Lower Silesia, elaborated on the base of numerous specimens²⁶. The presence of domestic chicken is also a common feature of the collections from the mentioned regions. It was the most commonly consumed domestic bird. The hare and roe deer presence are treated as indicators of deforestation and agricultural landscape²⁷.

Archaeobotanical analysis

The archaeobotanical analysis focused on carpological remains, mainly seeds and fruits. In total, 20 samples from 11 features were processed, representing 96.5 litres of sediment: 92 litres from well-drained contexts (8 features) and 4.5 litres from waterlogged, alluvial sediments (3 features) (Table 1). Dry-context samples were water-floated on-site

²¹ Schuldt 1956, 44–49; Łosiński/Rogosz 1983, 213–214; Błędowski/Chudziak 2014.

²² Lepówna 1968, fig. 31,e,h; 35,a–b,l; 36,i; 38,b; 41,k–l.

²³ Chudziak 1991, 85–86.

²⁴ Łosiński/Rogosz 1983, 217–218 fig. 192; see also Stanisławski 2012, 67; 228–229, fig. 74–75; Lepówna 1968, 33–34 fig. 31,b,g,j; 35,a; 36,i; 38,b.

²⁵ Schuldt 1956; Łosiński/Rogosz 1983, 215–216 fig. 189.

²⁶ Makowiecki 2018.

²⁷ Makowiecki 2006.

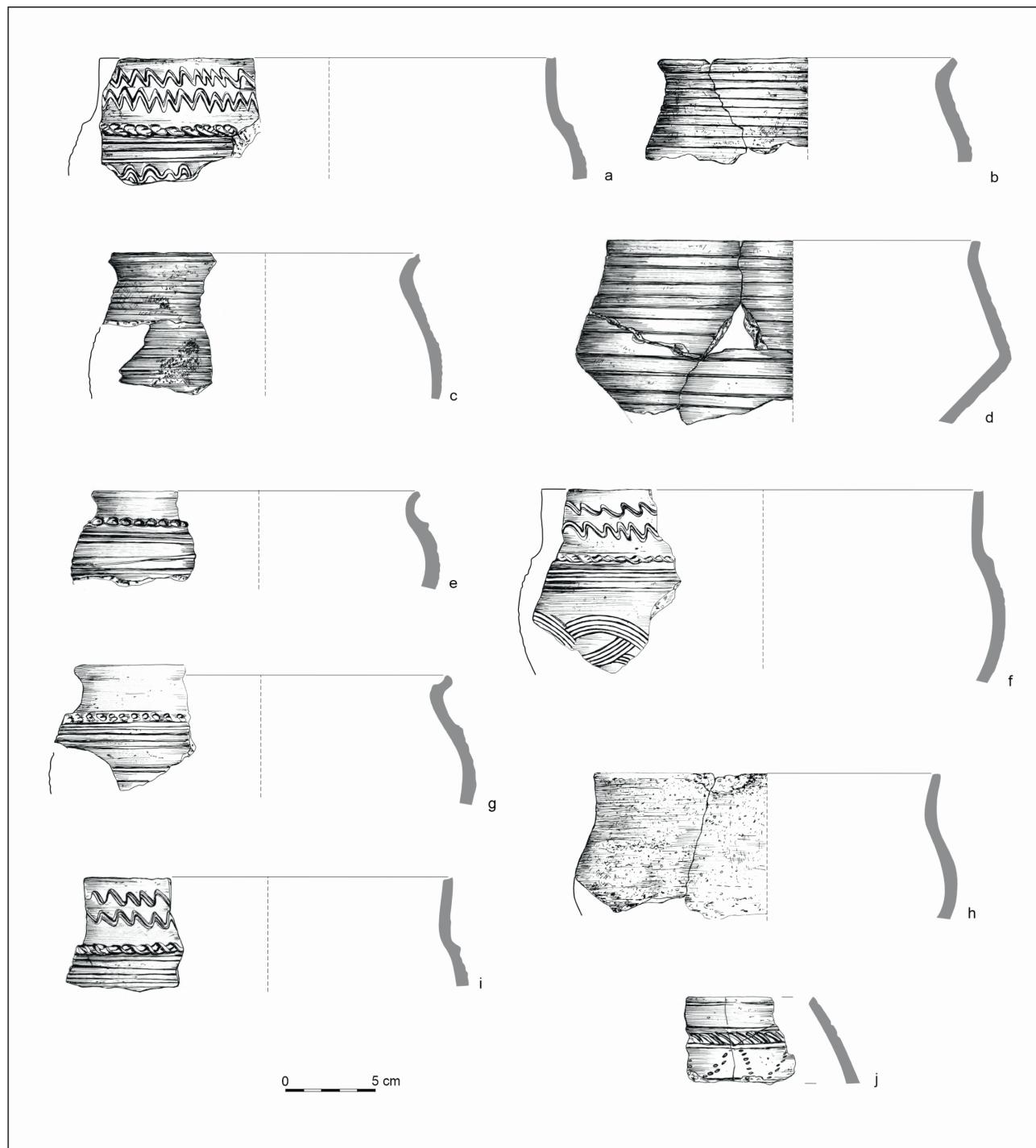


Fig. 16: Clay vessels. a, d, i – trench 1, layer 8, b, c, e, g, j – trench 1, layer 5, f – trench 1, layer 29, h – trench 1, layer 9 (drawing by D. Żak-Boryszko).

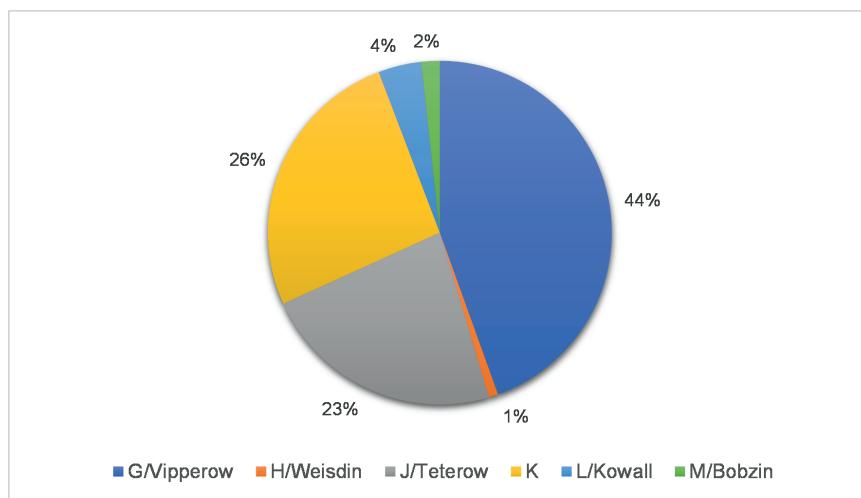


Fig. 17: Percentage of individual vessel types (graphic by S. Wadyl).

using a sieve column (mesh sizes: 0.2–1 mm), dried, and then analysed. Waterlogged samples were water-sieved in the lab using the same set of sieves but analysed without drying. Plant material was analysed under a binocular microscope (6×–40× magnification).

Carpological densities varied (Fig. 19): dry samples generally had low seed counts, except in pit house – feature 7 (14 items/litre). Waterlogged samples from the alluvial rampart layer were rich in plant remains, with up to 476 items/litre (feature 15). Charred remains appeared in both contexts, with densities of 122 items/litre (feature 26), 40 items/litre (feature 15), and 3 items/litre (feature 27).

Plant identification was conducted at the University of Warsaw, using reference collection and literature²⁸. Plant nomenclature follows Flowering Plants and Pteridophytes of Poland: A Checklist²⁹. The identified plants are listed alphabetically according to their broad ecological groups (Table 2), following ArboDatMulti database conventions³⁰.

Among the charred remains, fat-hen (*Chenopodium cf. album*) was the most abundant (Fig. 21c), appearing in six features and particularly numerous in pit house (feature 7), where 260 seeds were recovered. *Polygonum lapathifolium/persicaria* and *Ranunculus* sp. were also well represented (Fig. 21b). Grains of rye (*Secale cereale* and cf. *S. cereale*) (Fig. 21a) were less frequent, with a total of 67 found in three features, primarily in feature 7. Other cultivated plants, including hulled barley (*Hordeum vulgare*), oats (*Avena sativa* and *A. sp.*), flax (cf. *Linum usitatissimum*), proso millet (*Panicum miliaceum*), and bread wheat (*Triticum aestivum*),

were identified exclusively in feature 7, but in very small quantities. These cultivated plants were accompanied by two seeds of corncockle (*Agrostemma githago*), a typical field crop weed (Table 2).

Waterlogged remains were found in only three features associated with the rampart and alluvial sediments. These remains represent 52 plant taxa, with the majority (37 taxa) occurring in very low quantities, not exceeding 10 items in total. The most abundant waterlogged remains belong to *Ranunculus* sp., primarily found in feature 27. Interestingly, while charred remains of this genus were also identified in three features, they were least numerous in feature 27. The second most abundant taxon among the waterlogged remains is nettle (*Urtica dioica*), present in features 15 and 27. Other well-represented taxa (Fig. 23) include *Juncus* sp., *Carex* sp., *Poaceae indet.* (small-grained), and *Cuscuta* sp.. Fat-hen (*Chenopodium cf. album*) was found in only one feature, with a total of 15 specimens, making it less abundant than St. John's wort (*Hypericum perforatum* and *Hypericum* sp.), which was represented by 20 items across three features (Table 2).

Taking into account the division of plants based on their ecological properties, proportions were calculated for four features (features 7, 15, 26, and 27), including both charred and waterlogged remains (Fig. 20). However, the type of fossilization significantly influences the composition of the archaeobotanical assemblages (Fig. 22). The charred assemblage identified in pit house (feature 7) is dominated by weeds and ruderals, with fat-hen (*Chenopodium album*) being the most abundant species. Other common taxa include *Polygonum lapathifolium*, *Spergula arvensis*, *Fallopia convolvulus*, *Agrostemma githago*, and *Echinochloa crus-galli*. In this feature, cultivated plants make up less than 20 % of the assemblage, while grassland species account for less than 10 %. Forest plants are rare,

²⁸ Katz/Katz/Kipiani 1965; Kulpa 1974; Latalowa 1999; Cappers/Bekker/Jans 2006; Bojnansky/Fargašová 2007.

²⁹ Mirek *et al.* 2002.

³⁰ Ellenberg *et al.* 1991; Kreuz/Schäfer 2002; Mueller-Bieniek/Woch 2012.

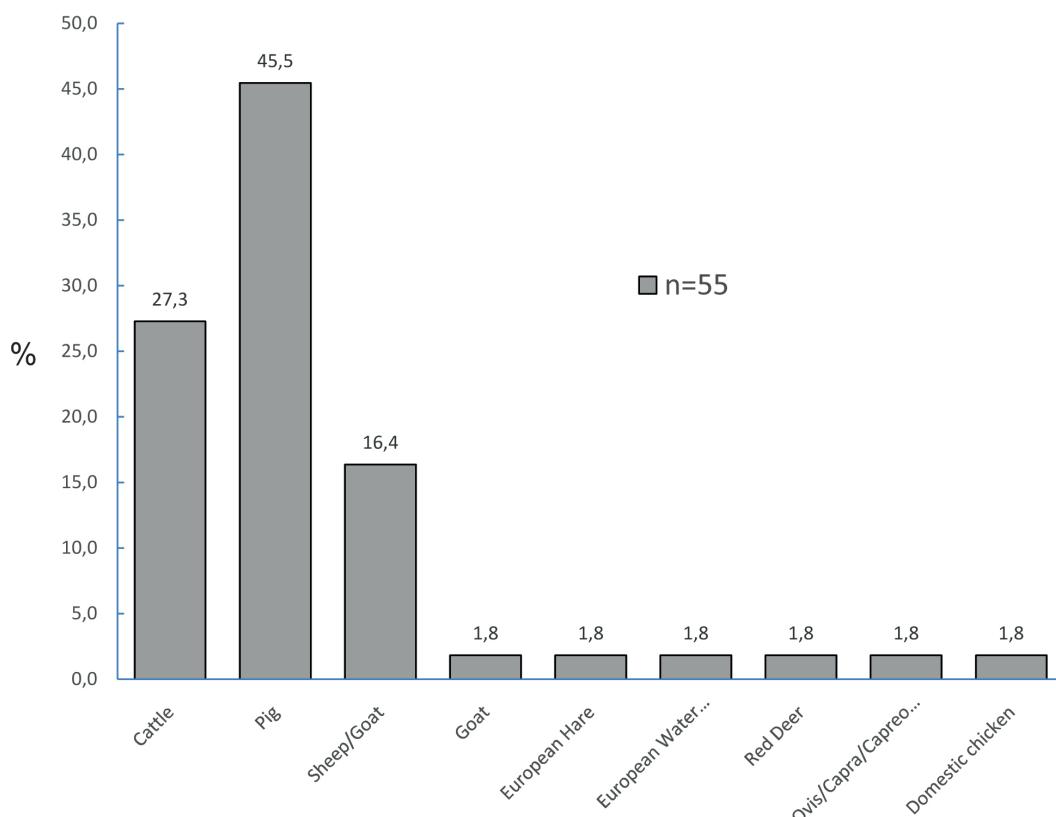


Fig. 18: Species differentiation of discovered animal bones (graphic by D. Makowiecki).

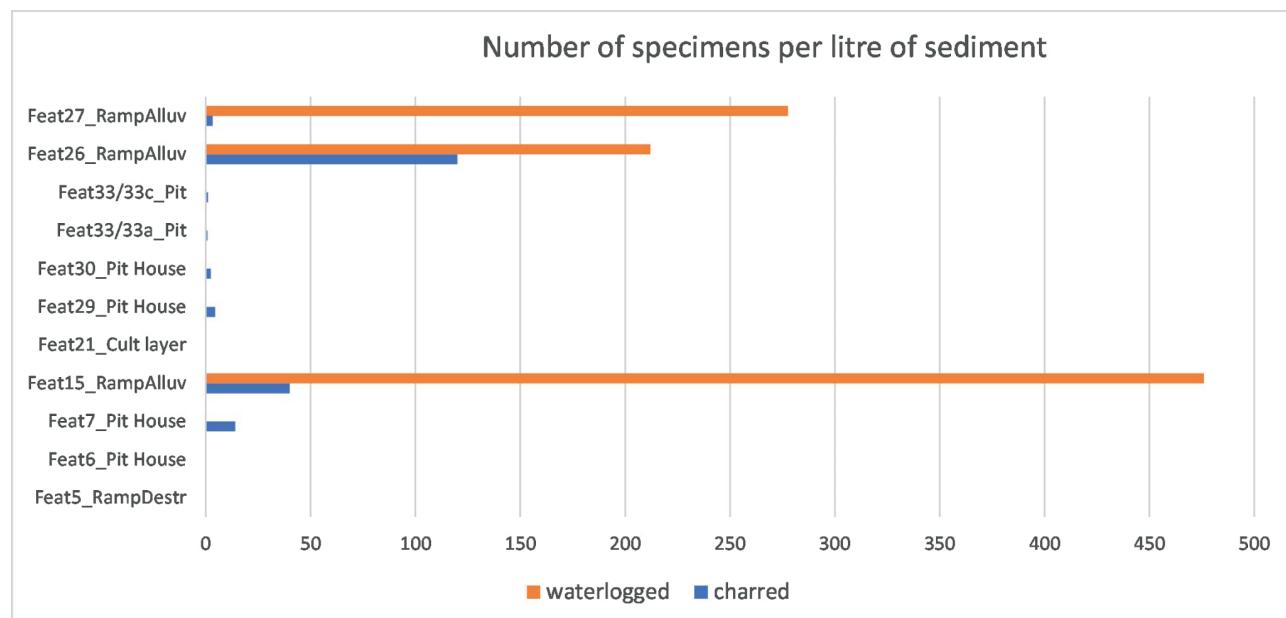


Fig. 19: Density of plant macroremains preserved by charring and waterlogging in the studied material (graphic by A. Mueller-Bieniek).

Tab. 2: List of identified taxa categorized by ecological groups. Abbreviations: Pres – type of preservation; ch – charred; wa – waterlogged.

Tab. 2 (continued)

Tab. 2 (continued)

Tab. 2 (continued)

Tab. 2 (continued)

Trench	1	1	1	1	1	1	1	1	1	2	2
Number of samples	3	1	7	1	1	1	1	1	1	2	1
SampleVol (l)	15	5	44	0,5	8	6	3	6	5	1	3
Feature Number	5	6	7	15	21	29	30	33/33a	33/33c	26	27
Botanical name	Pres										
Carex spec. bicarpellat				1							
Caryophyllaceae				4			1				
Polygonum spec.				2							
Viola spec.				1							
Galeopsis cf. speciosa				1							
Indeterminata				3							
Cenococcum geophilum		30			50					110	10

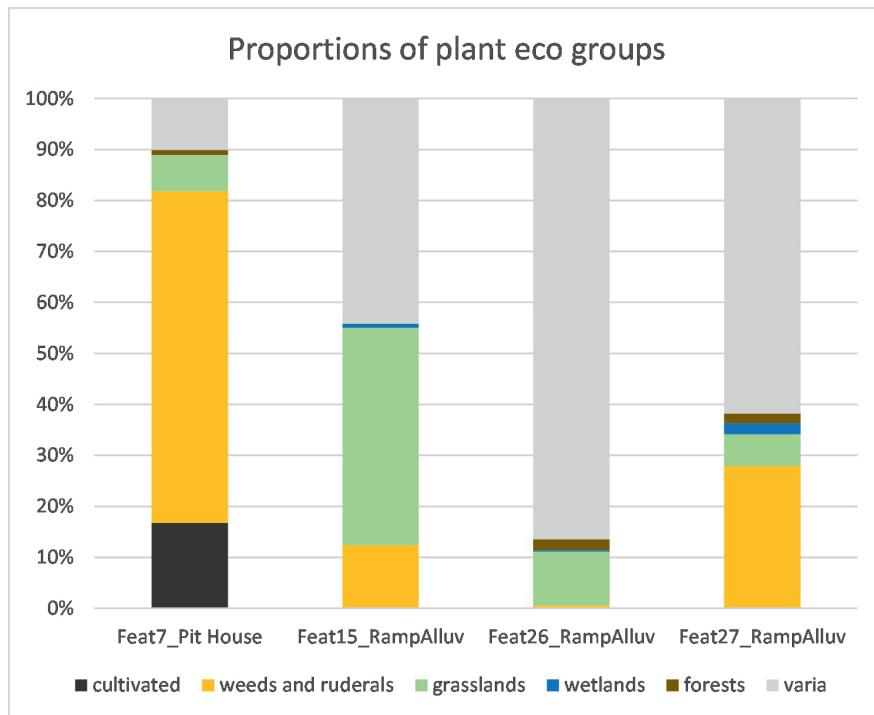


Fig. 20: The proportions of seeds divided into broad ecological groups (Table 2). The group 'varia' includes several taxa that were not precisely identified but predominantly belong to genera or families characteristic of grassland plants growing in diverse habitats, including very humid environments (*Ranunculus* sp., *Poaceae*, *Juncus* sp., *Plantago major*, *Polygonum* sp., *Rumex* sp., *Hypericum* sp.). Sum of remains – feat 7: N=615, feat 15: N=258, feat 26: N=332, feat 27: N=843 (graphic by A. Mueller-Bieniek).

represented by seeds of hornbeam (*Carpinus betulus*), hazel (*Corylus avellana*), and wild strawberry (*Fragaria* sp.). The 'varia' group is not significant in the charred assemblage from feature 7.

Compared to the three waterlogged assemblages, the dominance of plants associated with human activity is particularly evident in the charred assemblage from house pit 7. However, it is important to note that other domestic pits are not directly comparable to feature 7. In pit houses 29 and 30, only a few plant remains were recovered, with

single grains of rye being the only identified cultivated species.

In the waterlogged assemblages, the proportion of the varia group is significant. When varia group is excluded, features 15 and 26 are dominated by grassland plants, whereas feature 27 is characterized by weeds and ruderal species (Fig. 20). Despite the richness of these assemblages, no remains of cultivated plants were directly identified, and typical weeds were very scarce (with only a single specimen of *Scleranthus annuus* recorded in feature 27). However, the



Fig. 21: Charred remains from pit house (feature 7).
 A – rye (*Secale cereale*), b – *Polygonum lapathifolium/persicaria*, c – fat-hen (*Chenopodium album* type)
 (graphic by M. Bogacki).

presence of *Spergula arvensis* and *Cuscuta* sp., though not identified to the species level, is noteworthy (see Tab. 2). Furthermore, representatives of wetland vegetation are preserved in all three waterlogged assemblages, while forest plants are recorded in features 26 and 27.

The archaeobotanical analysis of sediment samples from Oblęże suggests that field crop cultivation and processing were not particularly significant at the site. The charred plant assemblages are dominated by seeds of fat-hen (*Chenopodium album*), a plant now commonly regarded as a noxious weed in gardens and root crop fields,

as well as a fast-growing ruderal species. Fat-hen seeds have been recorded in archaeobotanical assemblages since the beginning of the Neolithic, particularly in the early phases of settlement³¹. All parts of fat-hen are edible, and its seeds can be stored³².

Cultivated plants are relatively scarce, though the presence of all major crops is confirmed, including rye, hulled

³¹ Lityńska-Zajęc 2005; Mueller-Bieniek *et al.* 2019.

³² Łuczaj/Szymański 2007.

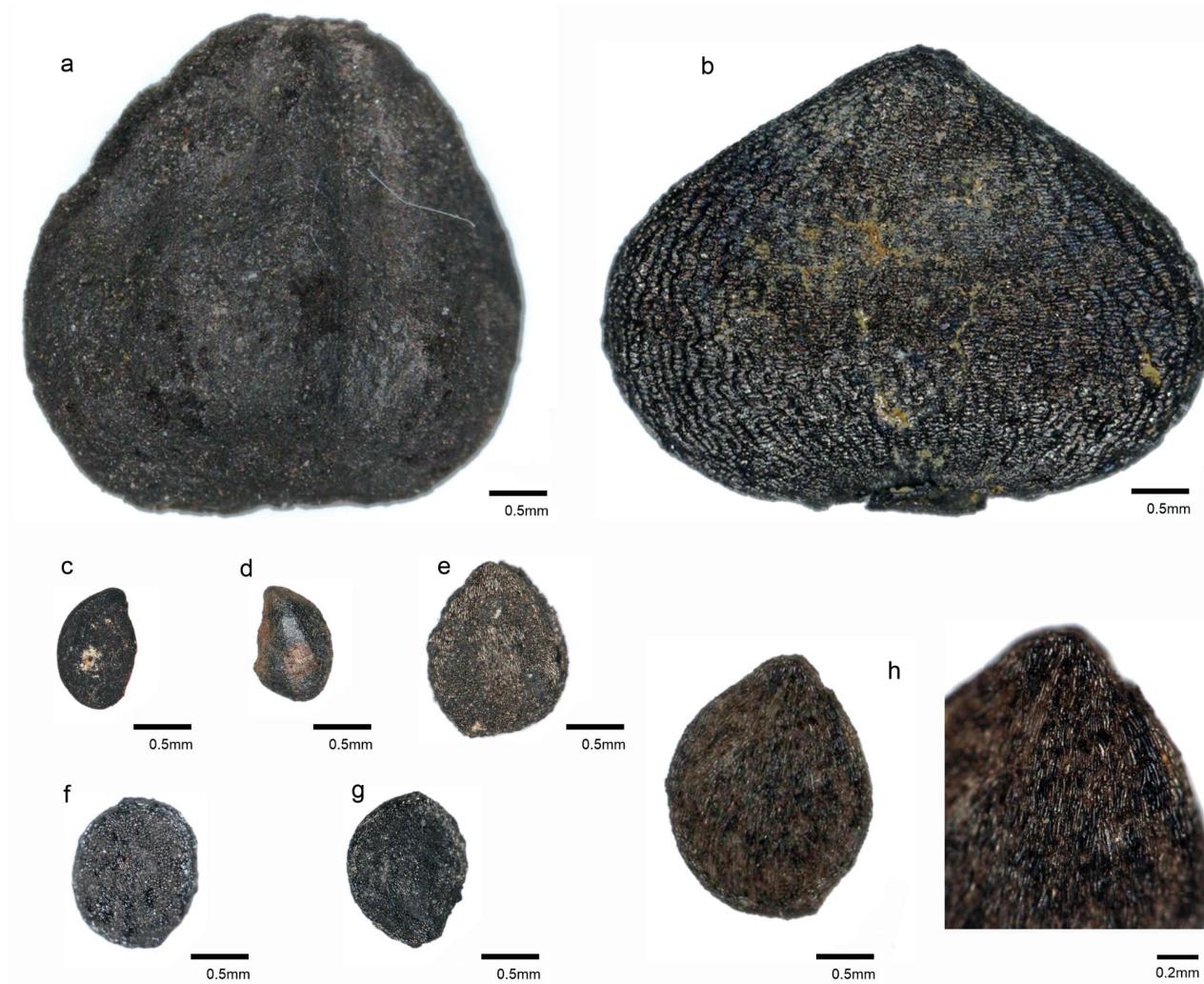


Fig. 22: Charred remains from feature 26 (rampart, alluvial layer). A – *Carpinus betulus*, b – cf. *Iris pseudacorus*, c – *Linum catharticum*, d – *Potentilla* sp., e–h – *Ranunculus* sp. (graphic by A. Mueller-Bieniek).

barley, bread wheat, oats, and proso millet. Additionally, two heavily degraded flax seeds were identified. The cultivation and processing of flax may be indirectly suggested by the presence of specialized flax weeds. A bundle of flax, radiocarbon dated to the 9th–10th century AD (1210 ± 70 uncal B.P., 830 ± 90 cal A.D.), was discovered at the nearby site of Wrześniica, where its archaeobotanical context was thoroughly analyzed³³. Several weeds recorded at Wrześniica also appear in the assemblages from Obłęże. However, no specialized flax weeds were identified. Notably, *Cuscuta* seeds, though not identified to species level, were found in relatively large quantities among waterlogged remains from Feature 15, as well as in single charred remains from features 15 and 26.

Charred archaeobotanical assemblages from settlements are typically dominated by cultivated plants, weeds, and ruderal species³⁴. However, at Obłęże, grassland vegetation – including meadow and pasture species – plays a significant role in both the charred and waterlogged assemblages. This may suggest the use of hay as fodder or insulation. Based on the available data, it is not possible to determine the extent of local plant food production. However, the relatively low number of cultivated plant remains and the limited presence of weed flora suggest that local crop agriculture may not have been a significant aspect of life during the stronghold's occupation.

33 Latałowa 1998; Latałowa/Rączkowski 1999.

34 Wasylkowa *et al.* 2002; Mueller-Bieniek 2011.

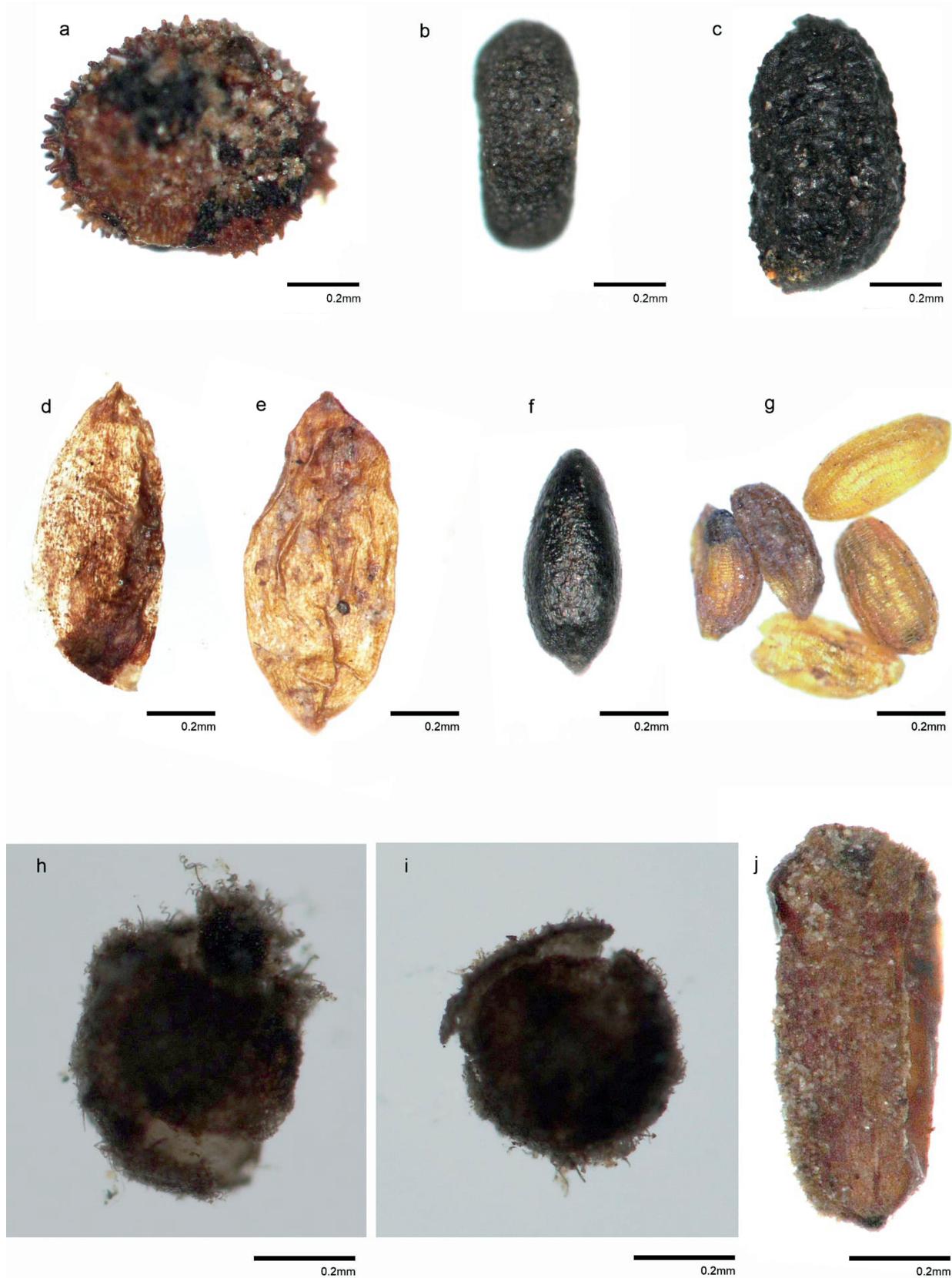


Fig. 23: Plant remains from feature 15 (rampart, alluvial layer): A – *Lychnis flos-cuculi*, b – *Hypericum* sp., c – *Scrophulariaceae* cf. *Verbascum*, d–f – Poaceae small grained, g – *Juncus* sp., h–I – *Cuscuta* sp., j – *Epilobium* cf. *hirsutum*. All remains waterlogged with exception of f (graphic by A. Mueller-Bieniek).

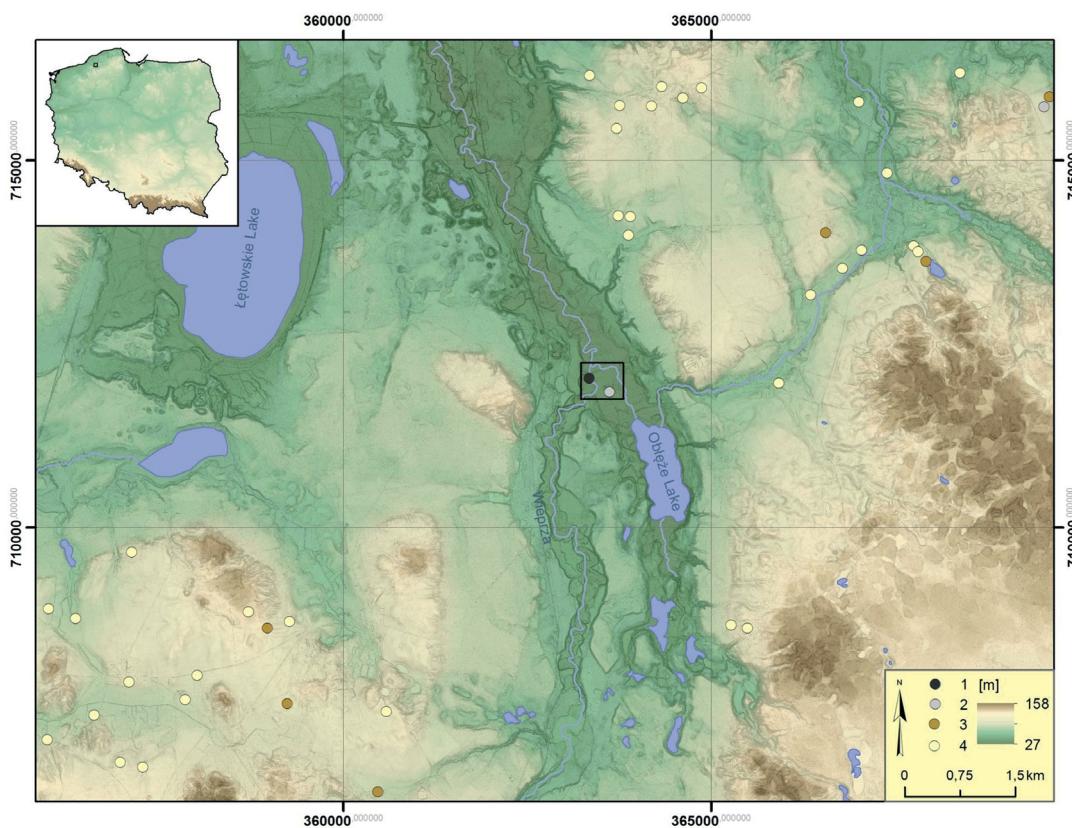


Fig. 24: Location of the study site against the distribution of early medieval sites in the area. 1 – stronghold, 2 – cemetery, 3 – settlement, 4 – settlement trace (graphic by M. Skrzatek).

Settlement context

The stronghold is located in a river valley and has a poorly recognised settlement background (Fig. 24). These settlement structures have only been recognised on field surfaces by discovering a small number of pottery shards as part of the AZP (The Polish Archaeological Record) surface survey. One of the reasons for this is the degree of forest cover in the neighbouring areas. Traces of distributed settlement have been registered primarily between the riverbed of the Wieprza River and the Bystrzenica River, which is its right tributary. Between the two riverbeds are remnants of settlements on sandy, deforested land. The largest are Barcino to the east, Warcino to the west and Barwino to the north. The location of the stronghold in the centre of a micro-region with a diameter of about 10 km suggests its central role at the local level. The location of the stronghold directly on the river, on the other hand, had to do with supra-local trade and the communicative role of the Wieprza River. Obleże is the southernmost stronghold associated with this river, which provided control over the entire route in the early 12th century and played an extremely important, even short-lived, role in the stronghold network of Central Pomerania.

Summary

The results of the research carried out in 2021 at the stronghold in Obleże, Kępice commune, should be regarded as exceptional. This is primarily due to the unprecedented state of preservation of wooden structures in Central Pomerania. The discoveries made it possible to take a series of samples for dendrochronological dating and establish that the castle was built in 1110. No data can conclusively point to an earlier chronology proposed in the older literature on the subject. Its foundation should be linked to the Pomeranian centre of power and an attempt to resist attacks from the south – Piast's State. In addition, it was probably essential to maintain control over the Wieprza River, which provided communication with the Baltic Sea. The end of the stronghold came soon afterwards and was directly related to the military actions of Bolesław III Wrymouth, who captured Pomerania between 1116 and 1122³⁵. The archaeological discoveries attest that we are dealing with an essential point on the map of early medieval Pomerania, located on an

35 Rosik 2013, 155–191; Wybranowski 2017, 88–92.

important trade route. Unfortunately, none of the sources mentions the Obłęże stronghold or settlement complex. Still, its importance is evidenced by the need to destroy it by the army of the Wrymouth to annex this part of Pomerania to the Kingdom of Poland.

The archaeological research conducted in Obłęże has provided a range of evidence for extensive economic activity in the early Middle Ages. This included animal husbandry, agriculture, craft production (pottery, spinning, weaving), and trade. The diversity of these activities suggests a well-organized community with a complex economic structure capable of sustaining both the local population and facilitating regional exchanges.

What is particularly valuable in the case of the studied site is its short period of settlement. This temporal limitation allows researchers to capture a detailed snapshot of life around the year 1100, offering insights into daily routines, social organization, and economic practices without the complications introduced by long-term, multi-period occupations. The well-preserved archaeological layers provide clear stratigraphic contexts, which are crucial for accurate interpretations of material culture and settlement patterns.

Evidence from animal bones, plant remains, and tools indicates that the inhabitants practiced mixed farming, combining crop cultivation with livestock breeding. Archaeobotanical analyses reveal the cultivation of cereals such as rye, common wheat, barley, and oat alongside pulses and other food plants. This suggests a diversified agricultural strategy aimed at ensuring food security. Animal husbandry focused on pigs, cattle and sheep/goat, with indications of secondary products like milk and wool being utilized.

Craft production played a significant role in the settlement's economy. Pottery fragments show a variety of forms and decorative styles, reflecting both local traditions and some external influences. Spinning and weaving tools, such as spindle whorls and loom weights, point to domestic textile production, likely supplemented by specialized artisans.

Trade connections are evidenced by the presence of non-local materials and artifacts, indicating exchange networks that extended beyond the immediate region. This includes items such as metal goods, amber beads suggesting active participation in broader commercial routes.

However, several questions remain unanswered at this stage. One of the most intriguing issues concerns the political affiliation of the settlement. It is unclear whether Obłęże functioned as an independent centre, was part of a larger political entity, or operated under the influence of a regional power. The settlement's strategic location might have played a role in its political and economic significance, potentially serving as a node in administrative or military networks.

Moreover, the settlement background is not fully identified. It is challenging to determine the nature and extent of its connections with nearby villages and strongholds. Further research, including extensive field surveys and geophysical studies, is needed to map the surrounding settlement landscape and understand the economic and social networks that linked Obłęże to the broader region.

Future investigations combining archaeological data with environmental analyses, and advanced dating techniques will be essential to address these questions. Such multidisciplinary approaches will help reconstruct the settlement's role within the early medieval socio-political and economic landscape, providing a more comprehensive picture of life in central Pomerania during the 11th–12th century. The research shows the enormous scientific potential of early medieval sites from Middle Pomerania. The investigated fortress is in an exceptional position not only because of the state of preservation of the relics but also because it functioned for a very short time, and its life was directly connected with the development of the Polish state and the conquest of Pomerania.

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