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ABBREVIATIONS

AAC	Acta Archaeologica Carpathica (Kraków)
ActaArchHung	Acta Archaeologica Academiae Scientiarum Hungaricae (Budapest)
ActaMusPapensis	Acta Musei Papensis. A Pápai Múzeum Értesítője (Pápa)
Acta Botanica Hungarica	Acta Botanica Hungarica. A quarterly of the Hungarian Academy of Sciences (Budapest)
Aetas	Aetas. Történettudományi Folyóirat (Szeged)
Agria	Agria. Az Egri Múzeum Évkönyve (Eger)
AgrSz	Agrártörténeti Szemle (Budapest)
AKorr	Archäologisches Korrespondenzblatt (Mainz)
Alba Regia	Alba Regia. Annales Musei Stephani Regis. Az István Király Múzeum Évkönyve (Székesfehérvár)
Antaeus	Antaeus. Communicationes ex Instituto Archaeologico (Budapest)
AÖ	Archäologie Österreichs (Wien)
AR	Archeologické Rozhledy (Praha)
ArchA	Archaeologia Austriaca (Wien)
Archaeometry	Archaeometry (London)
Archeometriai Műhely	Archeometriai Műhely. Elektronikus Folyóirat (Budapest)
ArchÉrt	Archaeologiai Értesítő (Budapest)
ArchHung	Archaeologia Hungarica (Budapest)
Arrabona	Arrabona. A Győri Xantus János Múzeum Évkönyve (Győr)
AV	Arheološki Vestnik (Ljubljana)
BAR-IS	British Archaeological Reports – International Series (Supplementary) (Oxford)
BudRég	Budapest Régiségei (Budapest)
Burgen und Schlösser	Burgen und Schlösser. Zeitschrift für Burgenforschung und Denkmalpflege (Heidelberg)
Cahiers LandArc	Les Cahiers LandArc (Fleurance)
Castrum	Castrum. A Castrum Bene Egyesület Hírlevele (Budapest)
CommArchHung	Communicationes Archaeologicae Hungariae (Budapest)
Cumania	Cumania. Bács-Kiskun Megyei Múzeumok Közleményei. Acta Museorum ex Comitatu Bács-Kiskun (Kecskemét)
Demográfia	Demográfia. Népeségtudományi Folyóirat (Budapest)
DissPann	Dissertationes Pannonicae (Budapest)
DuDolg	Dunántúli Dolgozatok (Pécs)

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Érem	Az Érem (Budapest)
ÉT	Élet és Tudomány (Budapest)
Ethnographia	Ethnographia. A Magyar Néprajzi Társaság Folyóirata (Budapest)
FMTÉ	Fejér Megyei Történeti Évkönyv (Székesfehérvár)
FolArch	Folia Archaeologica (Budapest)
FontArchHung	Fontes Archaeologici Hungariae (Budapest)
FÖ	Fundberichte aus Österreich (Wien)
Föld és Ember	Föld és Ember. Negyedévenként Megjelenő Tudományos Szemle (Budapest)
FrK	Földrajzi Közlemények (Budapest)
Geomorphology	Journal of Geomorphology (New York)
Gesta	Gesta. Historical Review (Miskolc)
Gymnasium	Gymnasium. Zeitschrift für Kultur der Antike und humanistische Bildung (Heidelberg)
GySz	Győri Szemle (Győr)
Határtalan Régészet	Határtalan régészet. Archeológiai Magazin. A Móra Ferenc Múzeum Régészeti Magazinja. Régészeti Ismeretterjesztő Magazin (Szeged)
HungArch	Hungarian Archaeology. E-Journal (Budapest)
Hungarian Studies	Hungarian Studies. A Journal of the International Association for Hungarian Studies and Balassi Institute (Budapest)
Jahrbuch des RGZM	Jahrbuch des Römisch-Germanischen Zentralmuseums Mainz (Mainz)
JAMÉ	A Nyíregyházi Jósza András Múzeum Évkönyve (Nyíregyháza)
JAS	Journal of Archaeological Science (London)
JCAA	The Journal of Computer Applications in Archaeology
KDMK	Kuny Domokos Múzeum Közleményei (Tata)
KMMK	Komárom-Esztergom Megyei Múzeumok Közleményei (Tata)
Korall	Korall. Társadalomtörténeti Folyóirat (Budapest)
KRMK	A Kaposvári Rippl-Rónai Múzeum Közleményei (Kaposvár)
LDMK	A Laczkó Dezső Múzeum Közleményei (Veszprém)
MatArchSlov	Materialia Archaeologica Slovaca (Nitra)
MFME StudArch	A Móra Ferenc Múzeum Évkönyve – Studia Archaeologica (Szeged)
MHKÁS	Magyarország honfoglalás kori és kora Árpád-kori sírleletei (Budapest)
MittArchInst	Mitteilungen des Archäologischen Instituts der Ungarischen Akademie der Wissenschaften (Budapest)
MNy	Magyar Nyelv (Budapest)
Múzeumcafé	Múzeumcafé. A Múzeumok Magazinja (Budapest)

Múzeumi Hírlevél	Múzeumi Hírlevél. A Kalocsai Múzeumbarátok Köre Kiadványa (Kalocsa)
MRT	Magyarország Régészeti Topográfiája (Budapest)
Ókor	Ókor. Folyóirat az Antik Kultúrákról (Budapest)
Ősrégészeti Levelek	Ősrégészeti Levelek. Prehistoric Newsletter (Budapest)
PA	Památky Archeologické (Praha)
PBF	Prähistorische Bronzefunde (München)
PNAS	Proceedings of the National Academy of Sciences (Washington, D. C.)
Quaternary Int	Quaternary International. The Journal of the International Union for Quaternary Research (Oxford – New York)
RégFüz	Régészeti Füzetek (Budapest)
Remote Sens	Remote Sensing (Tulsa)
Savaria	Savaria. A Vas Megyei Múzeumok Értesítője (Szombathely)
SbNM	Sbornik Národního Muzea v Praze Ser. A. (Praha)
SlA	Slovenská Archeológia (Bratislava)
SMK	Somogyi Múzeumok Közleményei (Kaposvár)
SSz	Soproni Szemle (Sopron)
Studia Hercynia	Studia Hercynia. Journal of the Institute of Classical Archaeology (Praha)
ŠtZ	Študijné Zvesti Arheologického Ústavu Slovenskej Akadémie Vied (Nitra)
Századok	Századok. A Magyar Történelmi Társulat Közlönye (Budapest)
Turul	Turul. A Magyar Heraldikai és Genealogiai Társaság Közlönye (Budapest)
UPA	Universitätsforschungen zur prähistorischen Archäologie (Bonn)
VAH	Varia Archaeologica Hungarica (Budapest)
VMMK	A Veszprém Megyei Múzeumok Közleményei (Veszprém)
WMMÉ	A Wosinsky Mór Múzeum Évkönyve (Szekszárd)
ZalaiMúz	Zalai Múzeum (Zalaegerszeg)
ZbSNM	Zborník Slovenského Národného Muzea. Archeológia (Bratislava)
ZfAM	Zeitschrift für Archäologie des Mittelalters (Köln)

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**LANDSCAPE, SETTLEMENTS, AND ENVIRONMENT
 AROUND TATA CASTLE IN THE MIDDLE AGES**

Zusammenfassung: In unserer Studie untersuchen wir am Beispiel der Umgebung der Burg von Tata, was für Veränderungen der Bau einer Burg hinsichtlich des Umlands mit sich bringt. Tata und die Umgebung der Siedlung erstreckten sich in unmittelbarer Nähe Béla: der Landesmitte (*Medium Regni*), entlang wichtiger Routen, was die Entwicklung der Siedlung ausschlaggebend beeinflusste. Abgesehen von den Dörfern, die uns aus den Quellen bekannt sind, existierten in der Árpádenzeit (11.-13. Jahrhundert) für kürzere und längere Zeiträume auch zahlreiche kleinere Siedlungen im Grenzgebiet. Eine deutliche Entwicklungsdynamik können wir ab dem 14. Jahrhundert feststellen, der teils auch damit zu erklären werden dürfte, dass die Region zu jener Zeit in königliche Obhut genommen wurde. Andererseits spielten sich hier, aufgrund der gesellschaftlichen Veränderungen und der landwirtschaftlichen Neuerungen ähnliche Vorgänge ab, wie in den übrigen Regionen des Landes: die Anzahl der Dörfer schrumpfte und ihre Lagen verfestigten sich. Unter diesen Umständen wurde am Anfang des 15. Jahrhunderts die königliche Burg erbaut, die für das Umland wiederum zahlreiche Veränderungen mit sich brachte, unter anderem die Schaffung des Sees neben der Burg, der bis heute die Umgebung maßgeblich beeinflusst. Unsere Studie untersucht ebendiese Prozesse, ergänzt mit der Analyse des vorliegenden archäologischen und archäobotanischen Fundmaterials.

Keywords: settlement research, historical waterscapes, medieval castle, castle estates, material culture, medieval pottery, metal finds, archaeobotany, Hungary

The town of Tata lies in the valley of the Által-ér (Által Stream), where the Lesser Plain and the Transdanubian Mountains meet in Komárom-Esztergom County, Transdanubia, Hungary (*fig. 1*). As the area is exceptionally rich in springs and lakes, the settlement is also often referred to as ‘The city of waters’.¹ The castle is situated on the shore of Öreg-tó [Lake Öreg] in the heart of the town, on top of a rocky inselberg at 130 m a.B.s.l. In medieval times, the castle was a significant hub because of its vicinity to the *medium regni*, the central part of the Kingdom of Hungary, and the road connecting Buda and Vienna. Moreover, the vast forests abounding with wild game to be hunted made it attractive for kings, too.² The study presents an attempt to outline, based on archaeological, historical, and archaeobotanical results, how the surroundings of Tata looked in the Árpád Age and how it changed later, due partly to the presence of the castle.

¹ Dövényi 2010 330–334.

² Szatmári-Bíró 1977 37.

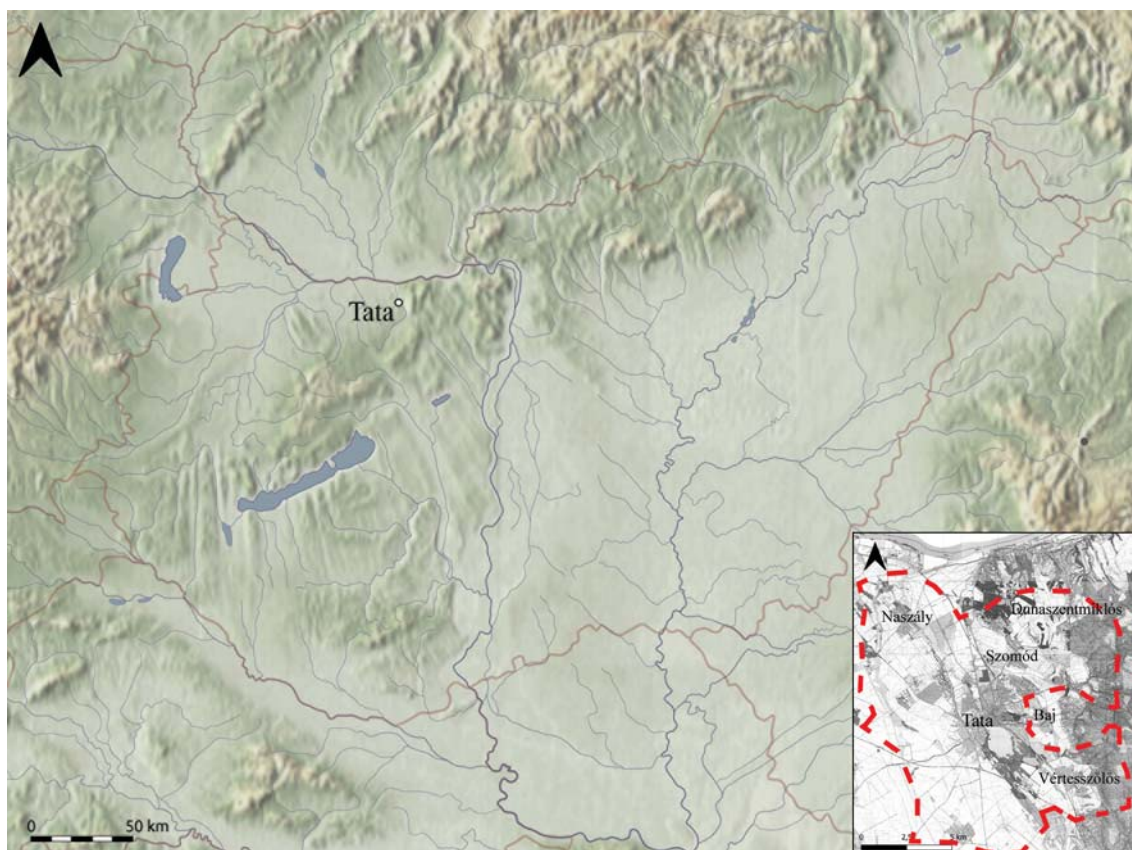


Fig. 1. The position of Tata in relation to the current country border and the study area (©Zsóka Varga, ©Bianka Gina Kovács)

Methods and aspects of research

In late medieval times, the estates of Tata Castle formed a contiguous land in the southern part of the former Komárom County, between today's Tata, Naszály, Szomód, Vértesszőlös, Dunaszentmiklós, the eastern outskirts of Baj, and the northern fringes of Környe (*fig. 1*). This is the focus area of this study, which involves a survey of all historical and archaeological data related to these settlements. Information-wise, the body of archaeological evidence is rather varied: only a few excavations have been conducted in the study area and, therefore, we also had to rely on data gleaned during the archaeological monitoring of public utility development and reconstruction works and surface find collecting surveys. The quality of the latter is also heterogeneous as it incorporates findings from the past more than fifty years; the first surveys were conducted at the end of the 1960s in context with the preparation of the respective volume of the Archaeological Topography of Hungary (which remained unfinished up to this day). There was another upswing in research in the 2000s, an era of extensive industrial development in the region, and the related activity also intensified in the past decade. For clarity, a detailed discussion of the research history is presented in the Data Archive at the end of this paper. Besides, modern sources and maps and an overview of the current terrain were used to reconstruct the landscape. Last but not least, the yet unpublished archaeobotanical results of a recently completed analysis were pivotal in reconstructing the one-time environment; these are also presented in the study.

Tata and its surroundings before the building of the castle

Landscape and settlements from the Árpád Age to the 14th century

The history of Tata goes back to the 11th century. The name appears first in a charter in 1093, which mentions a Benedictine abbey there. The presence of the monastery and the favourable geographic setting likely made the area (which was the estate of the abbey for a long time) a popular target for settling. The number of charters related to the study area increased in the 13th century, providing more data on several settlements there. The Csák kindred occupied the area in the second half of the century. It became royal property again in the 14th century, and the rapid development, a result of which was that Tata was granted market town rights, started then. The Lackfi family became owners of these lands at the end of the century.³

Terrain

The Gerecse Mountains represent the eastern fringes of the study area; the highest peak there is the Öreg-Kovács at 558 m a.B.s.l. The eastern half of the study area is its foothill region with elevations at 150–250 m a.B.s.l. The western half is plainland at 110–150 m a.B.s.l., with only a few lesser elevations like the Látó-hegy [Látó Hill] (183 m) in the northern part of Tata and the Kálvária-domb [Kálvária Hill] (166 m) rising above Öreg-tó in the west.

Hydrographic conditions in the Middle Ages

In the area surrounding Tata, the most important factor determining the position of the settlements was water. The Danube flows north of the study area, the biggest watercourse of which was the Rákos-patak [Rákos Stream] (*lf. Racus*), today Által-ér, which springs from the northern part of the Vértes Mountains and flows towards Tata through Bánhida; as it takes in the water of several hot water springs there, the section under that area was also called Hévíz (*Calida Aqua*) [‘Hot Water’]. The stream discharges into the Danube at Almás (today: Dunaalmás). Military maps proved to be partially useful for the research of the one-time water bodies of the area. Many streams arriving from the Gerecse Mountains in the east join the Által-ér; for example, the confluence of the Árendás-patak [Árendás Stream] is at Szomód. The watercourses in the western part of the area – the Grébicsi-vízfolyás [Grébicsi Stream] and the Fényes-patak [Fényes Stream] (*fl. Homord* in medieval times) – flew into the one-time Füzegy-patak [Füzegy Stream], which joined the Danube at Füzitő (*fig. 2*).⁴

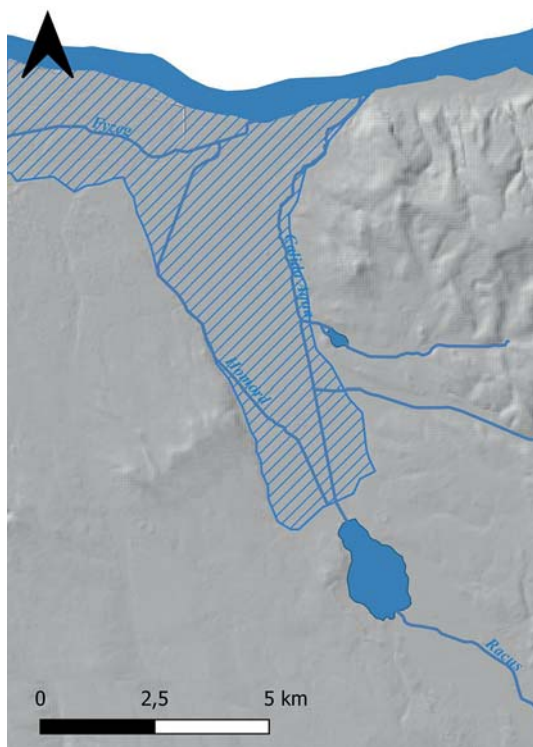


Fig. 2. The terrain of the study area with the one-time watercourses and the estimated extent of the marshland (©Bianka Gina Kovács)

³ See the Data Archive for detailed historical data.

⁴ Györffy 1987 389; Tóth 2013 84.

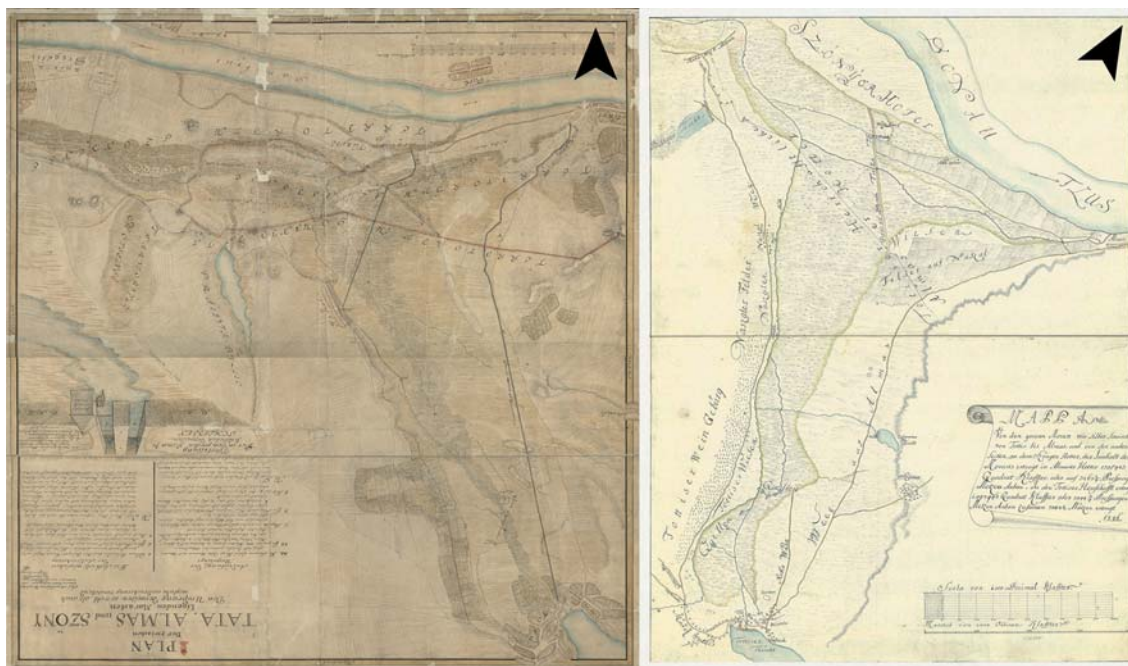


Fig. 3. Surveys made by Sámuel Mikoviny in 1746 of the marshland between Tata, Almás, and Szöny (source: Data Archives of Hungary [MNL] National Data Archive [OL] Data Archive of the princely branch of the Esterházy family, S 11 – No. 290; Institute and Museum of Military History B IX c 715)

The fact that the area between Tata and the Danube was a marshland was another important factor in promoting settling. The swamps were drained only in the 18th century, among the firsts in the country; the works between Tata, Szöny, and Almás, designed by Sámuel Mikoviny, started in 1747. Due to this early date, the marshland did not exist anymore at the time of the First Habsburg Military Survey and, thus, does not appear on the respective maps. However, Mikoviny surveyed the area before the works in 1746 (fig. 3); according to his maps and data, the swamps extended to 3,300,000 *négyszögöl* or 2,750 Hungarian *hold*, i.e., almost 12 km².⁵ The maps and the recent topographic and geomorphological relations help reconstruct where the marshland was once situated (fig. 2).

The hot springs in Tata have always played an important role in the life of the town. More than ten were known in its territory in the Modern Period, many of which also appear on historical maps.⁶ These did not freeze over even in winter, so it is no wonder that, according to written sources, mills were sited on them as early as the 13th century. A charter from 1237–1240 mentions two mills of the Benedictine Abbey of Pannonhalma, while another from 1268 reports that Maria Laskarina, queen consort of King Béla IV, sold the mill of Komárom Castle to Walter, Master of the Treasury.⁷ In 1331, Tamás Csór, castellan of Csókakő, was granted a mill site. A charter from 1388 describes the positions of the mills of the abbey, which had six of them in Tata at the time. The source also mentions two more mills: one of the nuns of Esztergom Island and one called *Mochochyde*. Only three years later, another document mentions two mills of the Benedictine Abbey of Pannonhalma in the town. In summary, at least ten mills operated within the borders of Tata at the end of the 14th century.⁸ Considering that a single mill could supply even 250 people,

⁵ *Fülöp – Schmidtmayer 2017 41.*

⁶ Map by Sámuel Mikoviny (see fig. 3), First Habsburg Military Survey (1782–1785), Second Habsburg Military Survey (1819–1869). source: maps.arcanum.hu [last accessed on 30.10.2023].

⁷ *Györffy 1987 458–459.*

⁸ *Tóth 2013 86; Dreska 2007 292–293.*

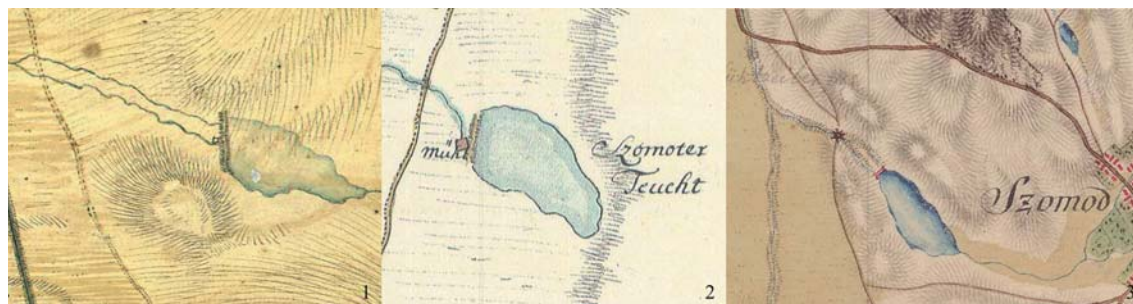


Fig. 4. The mill under the lake at Szomód on the maps of Sámuel Mikoviny (1, 2) and the First Habsburg Military Survey (3)

the milling industry seems to have been important in the economy of the settlement, and renting the mills must have generated substantial profits for the owners.⁹ Naturally, mills were also sited on these watercourses outside the town: a mill and a mill site in Szomód were donated to the Cistercian order of Borsmonostor in 1225. The hypothesis of László Ferenczi¹⁰ that this mill is identical to the one appearing on the maps of the First Habsburg Military Survey and Mikoviny under a fish pond on the western outskirts of Szomód seems likely (*fig. 4*), which also raises the possibility that the pond was created in medieval times. The hot springs within Tata were also utilised in baths; these, however, are only known from Ottoman Period engravings and descriptions.¹¹

It is important to note that no source from that period mentions Öreg-tó, the biggest water body in the area. It does not appear in the 1388 charter describing these lands in detail either, suggesting that the lake did not yet exist.¹²

Forests, vineyards, ploughlands, and pastures

The eastern part of the study area, comprising the slopes of the Gerecse Mountains, was partly covered by forests. A forest is mentioned in the 13th century near Szomód and a copse in the 14th century on the outskirts of Agostyán.¹³ Vineyards are also known from the eastern parts: one is mentioned in the area of Stancs in 1225, and more on the hills next to Újfalu in 1221. This latter settlement was likely a neighbour of Szomód near Tata; it does not appear anymore in later sources.¹⁴ The village of Szőlős [‘Vineyard’] does not appear in documents before the 15th century; the name indicates that the settlement also incorporated vineyards. An orchard is mentioned in Szomód in 1225.¹⁵ Besides, ploughlands, hay meadows, meadows, and pastures were scattered all over the area in focus (e.g., 1367: ploughlands, hay meadows, and pastures in Agostyán, 1388: ploughlands on the outskirts of Alsófalú and Felsőfalú, and more called Szentmiklósfölde and Szentmargitfölde).¹⁶

⁹ Ferenczi 2008 353, 355.

¹⁰ Ferenczi 2010 128, figs. 4–5.

¹¹ Schmidtmayer 2011 211.

¹² Schmidtmayer 2015 246.

¹³ Györffy 1987 456; Tóth 2013 85.

¹⁴ Györffy 1987 405, 462.

¹⁵ Györffy 1987 456.

¹⁶ Tóth 2013. The toponyms Szentmiklósfölde [‘St. Michael’s land’] and Szentmargitfölde [‘St. Margaret’s land’] might refer to one-time churches, perhaps related to the Cistercian and Benedictine *grangias* in Szomód (discussed below).

Roads

The main road connecting Buda and Vienna followed the Danube in the first half of the Árpád Age. After the first Mongol invasion, its path changed on the section between Buda and Győr, and the old road was abandoned for the one passing through Buda, Bánhida, and Győr (also called the ‘Butchers’ Road’). The road leading to Komárom through Tata and passing, according to a 1291 document, the outskirts of Mocsá, branched off this main road towards the north.¹⁷ South of the ‘old’ main road accompanying the Danube, the first crossing through the swampland was at Tata, which also promoted the development of the settlements along it.¹⁸ The importance of this road is highlighted by the fact that a toll was charged for its use at Tata already in the Late Middle Ages, as reported by several documents dated around 1400. The first one is a charter forged around that time, stating that King (Saint) Stephen I donated the toll of the Tata road to Deodatus *comes*, who passed it on to the Benedictine Abbey of Tata. The forged document likely reflects the arrogation of said abbey around 1400.¹⁹ King Sigismund wrote letters to the toll collectors in Tata in 1401 and 1402. Besides, a 1419 document reports that King Louis I (of Hungary) donated half of the toll collected in Tata to the Abbey of Vértesszentkereszt, which might indicate that the toll was already charged back in the 14th century.²⁰

Archaeological data

Except for the built-up part of Tata, archaeological data on the Árpád Age settlement network in the study area were gleaned in surface find collecting surveys and site inspections. More than fifty 11th–14th-century settlements could be identified this way, most of which were not inhabited in the whole period in focus (*fig. 5*). This tendency matches the one observed in other regions in the country: as a result of the widespread practising of alternate fallowing and relatively high mobility at the time, the inhabited part was barely permanent but moved within the perimeters of the settlement when the cultivated strips of land next to them wore out; moreover, besides villages, the area was also spotted with low-intensity farmstead-like settlements.²¹ Written sources from this period also mention more such settlements than 15th-century ones. Such villages, abandoned after the 13th–14th centuries, were Bánkülése, Bodolófölde, Sár, Újfalú, Alsófalú, and Felsőfalú. The last three were likely situated in the territory of today’s Tata, albeit Újfalú could also be on the northern outskirts of Szomód.²² Historical research has generally accepted that Felsőfalú is identical to the later Szentiván, albeit no written source provides evidence on that.²³ Bánkülése and Bodolófölde only appear in 14th-century sources; historical research accepts the hypothesis that both were near Agostyán, on the southern and western outskirts of the village, respectively. However, even if the reasons are different, identifying these settlements with archaeological sites is challenging in all cases: too many suitable sites are known from the territory of Tata, and none from Agostyán. The history of Sár is also interesting: it is mentioned in 1237–1240 as a village, and it even had a perambulation in 1269, only to disappear from all sources after that. Based on the perambulation, the settlement was situated somewhere between Naszály and Almás, and the text mentions the Által-ér (*Calida Aqua*) and the Fényes-forrás (*Homord*), and two toponyms,

¹⁷ *Glaser 1929* 152. A charter by Béla IV on Tömörd mentions the road connecting Tata to the Bánhida–Győr road, joining it at Igmánd.

¹⁸ *Schmidt Mayer 2011* 196–197.

¹⁹ *Weisz 2013* 397.

²⁰ *Schmidt Mayer 2011* 197.

²¹ *Rác 2019* 157–158.

²² *Tóth 2013*; *Györffy 1987* 462.

²³ *Schmidt Mayer 2011* 193.

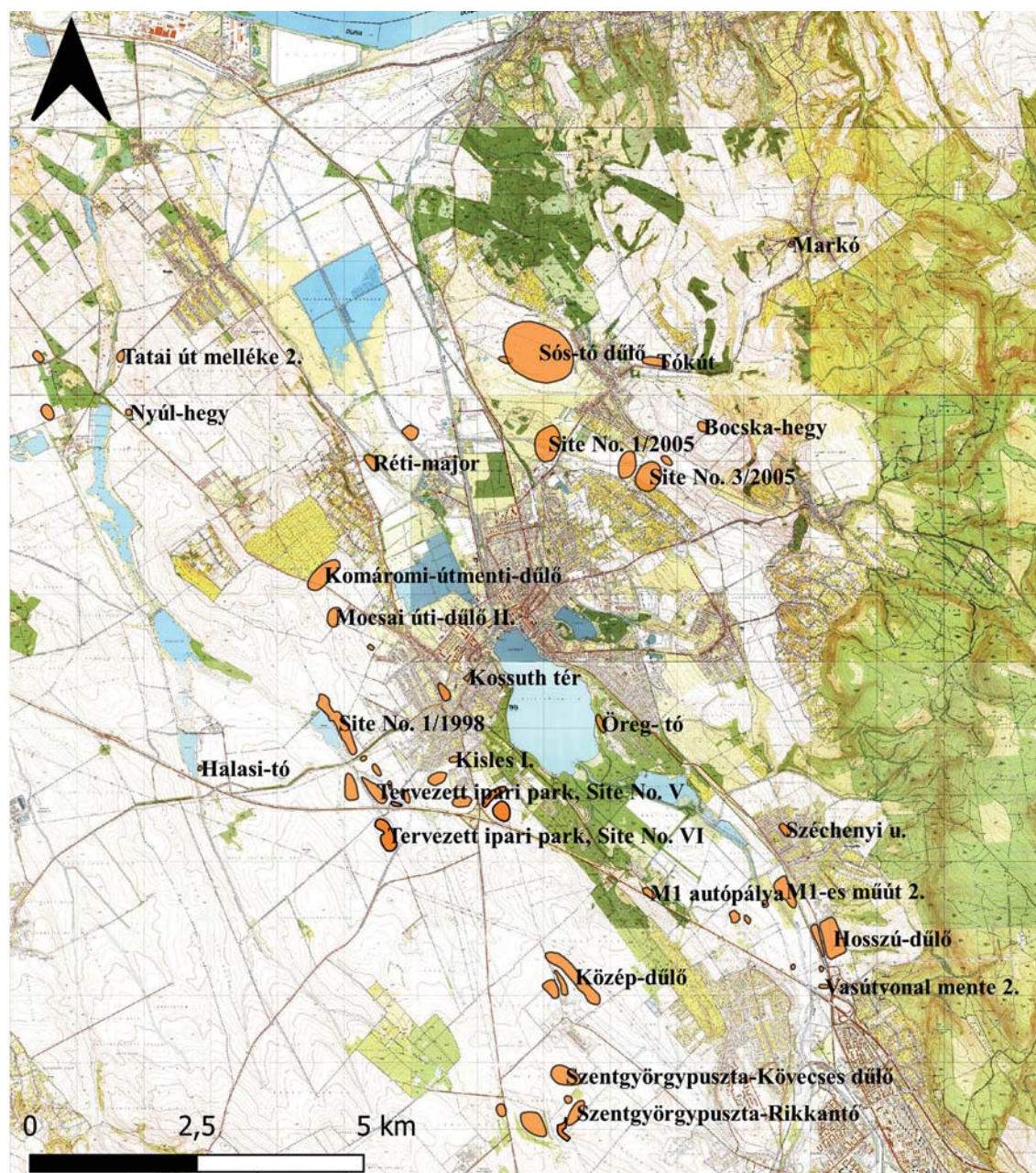


Fig. 5. 11th–14th-century settlement traces in the study area (©Bianka Gina Kovács)

Zaarhonk and *Keurus*, which Györffy believes to have lived on in the Homoki and Kőrösi malom placenames in later cadastral maps. Its name (Sár means ‘mud’) and approximate location connect the one-time settlement with the marshland. It appears in the 1269 perambulation already as ‘*terra Saar*’, described as being a part of the neighbouring Füzitő,²⁴ and it is not mentioned in 14th-century sources anymore. The village likely became depopulated, perhaps due to changes in the extent of the marshland.

²⁴ Györffy 1987:450. Cadastral maps (19th century). Source: maps.arcanum.hu, last accessed on 31.10.2023. The site could likely be identified as one of the medieval sites registered on the western outskirts of Dunaalmás (site IDs in the Central Register of Archaeological Sites (IVO) in Hungary: 45283, 45284, 45285, 45289; source: IVO database at www.oeny.hu) or the densely covered 11th–14th-century site, Naszály-Négyes, identified during the 1968 surface find collecting survey (see the Data Archive at the end of this study).

Of the settlements described as the property of Tata in 15th-century sources (see the Data Archive at the end of this study for details), Ótata could be located the most precisely: it could be identified with features unearthed in the area of the main square of today's Tata. Besides, a site with late medieval pottery but no Árpád Age find material is known from the area of Grébics village; thus, the oldest settlement, mentioned first by 13th-century sources, was not there but can be identified with one of the Árpád Age sites on the outskirts of the recent village instead. As only a single medieval site is known from the area of Dunaszentmiklós, its predecessor, the village appearing under the name of *Stancs* in 13th-century sources, was likely in the area where the built-up part of the settlement is today. In contrast, many registered Árpád Age sites are known from the lands belonging to Szomód; this abundance is due to the 'wandering' of the settlements mentioned above and that, according to written sources, a *grangia* (grange) of the Cistercian order and a manor of the Benedictine Abbey of Tata were also located there. Of all these, the identification of the Cistercian grange is the most certain today. Many Árpád Age settlements are known from the administrative areas of Naszály and Szentgyörgy, too; part of these might likely be identified with settlements mentioned in coeval sources. Only the medieval church of Kovácsi was excavated, but the Árpád Age settlement is yet to be located in the currently forested area. And last, as it was mentioned, no Árpád Age settlement is known from the territory of Agostyán.

Identifying the mills mentioned in the sources is also problematic. Archaeological research was conducted on the sites of two current mills (Wagner- and Jenő-malom) in Tata, but neither brought to light evidence of their medieval origin.²⁵ Ethnographic research has identified some mills mentioned in a 1388 charter with still standing ones built in the 18th century but without any explanation or supporting evidence.²⁶ Considering the extent of the water regulation works in the territory of the town in the 18th century, such an identification cannot be accepted without archaeological evidence.

General characteristics of the find material

The find material available from most sites comes exclusively from surface collecting surveys and is accordingly scarce. The pottery finds could be classified based on colour, material, and shape, which often also refer to their provenance.²⁷ The most common vessel type is the pot (*fig. 6. 2–3, 5–14, 16–18*), with specimens made from clay tempered with pebbles or coarse sand and fired to red, pink, yellow, or off-white, usually with dark grey spots outside. They had simple rims with vertical, band-like lips or more complex ones with carinated lips, profiled outside; the first variants with lid grooves appeared in the late Árpád Age. Early variants were decorated with a couple of incised wavy line bundles, while younger ones feature mostly incised straight line bundles or a spiral around their body. Excavated find materials often include pottery with a combination of these patterns, as well as nail imprints and wavy lines. Vessels with a potter's mark on the base are also known exclusively from excavated materials, and their proportion in the pottery records of the respective sites is always rather low. Only two early graphitic vessel fragments have been found; however, grey ware (dark grey vessels and lids fired in a reduction environment but containing no graphite) appears from as early as 13th–14th-century contexts in the excavated find material. The proportion of 'classic' white ware is also insignificant: the surface find assemblages only include a few side fragments of some spiral-decorated or ribbed pots (*fig. 6. 2*), completed by a couple of cup fragments in excavated materials. Fragments of red bottles with roll-stamped patterns are

²⁵ *Kisné Cseh – Petényi 2004* 18; on S. Petényi's excavation at Jenő-malom [Jenő Mill], see IVO ID No. 63800, Angolpark (source: IVO database, <https://www.oeny.hu/oeny/ivo/lelohely?azon=63800>).

²⁶ *Körmendi 1968* 406–407.

²⁷ *Holl 1963* 336.

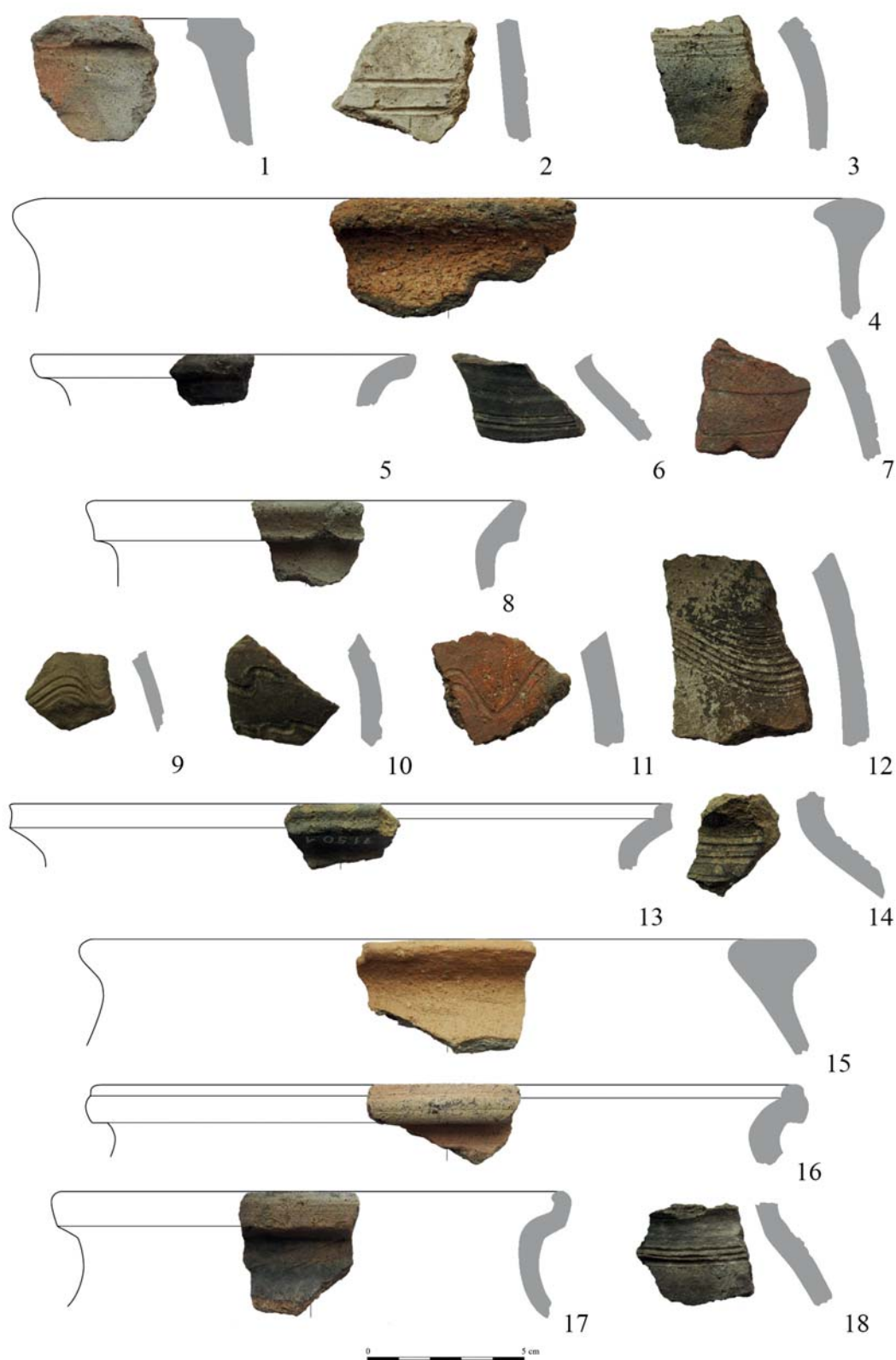


Fig. 6. Selection of 11th–14th-century finds from the study area. 1–3. Naszály-Felső-Grébicpuszta: Inv. No. KDM 71.20.1, 3, 5; 4. Naszály: Inv. No. KDM 71.42.23; 5–7. Naszály-Fényes-part: Inv. No. KDM 71.44.1, 3–4; 8. Szomód-Sóstó: Inv. No. KDM 70.9.23; 9. Szomód-Bocskahaegy: Inv. No. KDM 71.48.5; 10. Szomód: Inv. No. KDM 71.63.9; 11–12. Szomód: Inv. No. KDM 71.49.3, 2; 13–14. Szomód: Inv. No. KDM 71.50.1–2; 15–18. Tata-Réti malom: Inv. No. KDM 71.40.1–3, 10 (©Zsóka Varga, ©Bianka Gina Kovács)

also known only from excavations. The oldest pitchers also appear in 13th–14th-century features. These variants are yellow, with a design of some imitating the white ware of Buda,²⁸ while others resemble grey pottery forms (e.g., with handles decorated with oblique incisions). The proportion of pottery cauldrons (*fig. 6. 1, 4, 15*) in all find assemblages is relatively low. Cauldrons were made from clay tempered with gravel or micaceous clay; their rims have a T-profile, with rounded inner and angular or rounded outer edges (Types B and D in Miklós Takács's classification).²⁹ The pieces the form of which could be reconstructed could all be assigned to Takács's Type IID2b (medium-deep cauldrons imitating ones made in metal).³⁰ The few fragments of cauldrons with inverted L-profile rims and nail impressions likely represent an early variant.³¹ Another minor group within the pottery record is white cauldron fragments with a rim with an angular profile and rough surface³² resembling the bottom of the vessels of 13th–14th-century white Buda ware;³³ these probably represent the youngest cauldron variant.

No metal finds have been recovered during the surface collecting trips. Excavated materials include agricultural iron tools (e.g., sickles and a ploughshare), as well as grave finds from the excavated cemeteries, mostly clothing accessories and gold, silver, and bronze jewellery.³⁴ A few modest clothing accessories (e.g., strap fastener and spur) have also been unearthed in the settlements.³⁵

Archaeobotanical data from the period under study

Thus far, archaeobotanical evidence has only been obtained by a single excavation in the study area: samples were taken from 12th–14th-century contexts in Tata-Kossuth tér 16. (16 Kossuth Square). The aim of the archaeobotanical and historical ecological evaluation of the seed and fruit finds was to reconstruct the flora diversity of the period in order to learn about the life of the residents and the agricultural practices they followed. The samples taken during the excavation contained charred remains. No coeval samples are known from the area and wider surroundings of the settlement.³⁶

Methods

In 2016, the samples were transported to the Department of Nature Conservation and Landscape Ecology of the Department of Environmental Sciences of the Szent István University³⁷ for further processing. After providing them with an ID for the processing, each sample was weighed and wet cleaned using a series of 0.5 mm, 1.0 mm, 2.0 mm, and 4.0 mm sieves.

After drying them gently, the seeds were separated from the other organic and inorganic remains using a ZEISS Discovery V8 stereo binocular microscope. Besides plant remains, the

²⁸ Kovács 2018 5, figs. 9–11, 36.

²⁹ Takács 1996 168–169.

³⁰ Takács 2010 139–144.

³¹ Takács 1996 169, Abb. 16.

³² Kovács 2018 fig. 8.

³³ Holl 1956 180.

³⁴ See in detail in Kovács – Libor 2023.

³⁵ Kovács 2018 figs. 10–11.

³⁶ A small medieval archaeobotanical find assemblage comprising only a few seeds (including elder, jimson weed, and *Euphorbiaceae* [spurge] seeds) was also recovered during the 1972 rescue excavation led by Sarolta Szatmári at Tata-Fürdő Street. Máté Merkl has identified the species and concluded that their composition reflects anthropogenic influence in the area of the site; however, the sample was too small to draw further conclusions.

³⁷ Today Hungarian University of Agriculture and Life Sciences.

samples included inorganic (pottery, daub) and organic fragments (bone, snail shell, relatively many insect remains and cocoons; see *Table 1*). The selected seeds and produce were identified using seed identification handbooks and archaeobotanical studies³⁸ and checked against reference collections of recent seeds. Diaspora fragments were identified in general on species or subspecies level, depending on their condition; in some cases, only the *genus* could be determined, and some samples were too fragmented to be identified at all (these appear in the datasheet of botanical remains as ‘indet.[ermined]’).³⁹

The quantitative assessment of the botanical macroremains started with introducing their basic data in an Excel sheet (*Table 2*).⁴⁰ Next, we counted the number of species and seeds per sample and calculated the concentration indices in every sample, i.e., the ratio of plant remains (seeds and other macrobotanical materials) relative to the original weight of the sample, to make their species and seed contents comparable.

The identified plant species were classified as cultivated plants, weeds, and species of the natural environment; the following evaluation was made in accordance with the anthropogenic species division by Vera Árendás.⁴¹

In light of the species identified in the sample set, the assessment focused on the following categories:

- Crops: the species included in this category were cultivated, used as cereals, substitutes thereof, or garden vegetables; their grains and seeds were consumed;
- Weeds: according to our current knowledge, the species included here are typical of ploughlands, fallows, gardens, and trodden land (ruderal species);
- Spontaneous plants: charred diaspora remains of plant species from the one-time natural environment of the settlement; they only occur by chance, and there is no other explanation for their presence. These macroremains usually appear amongst or near cereal remain concentrations. Besides occasional occurrences, the evaluation considers their potential uses (e.g., wild fruits, medicinal plants, spices, etc.). Spontaneous plants represent important information on the one-time natural environment and climate.

The ecological division of weeds is the following:

- *Secalietea* = class of winter cereal weeds,
- *Chenopodietea* = class of segetal and ruderal weeds,
- *Polygono-Chenopietalia* = class of spring cereal weeds.⁴²

The cereal composition analysis can provide valuable information on the quality of cultivation and the lifestyle of the residents; however, weeds are just as important because their presence and quantity hints at the skills and knowledge of the one-time farmers and helps clarify whether the cultivated species were winter or spring crops, and maybe even that how they were reaped.

³⁸ Based on Schermann 1966; Soó – Kárpáti 1968; Cappers – Bekker – Jans 2006.

³⁹ We could not take photos of the identified seeds because of the defect of the microscope camera available at the department.

⁴⁰ The sheet enlists the Latin and English names of the identified species, the type and condition of the botanical remains, the ecogroup of their habitats, their family, biogeographical statuses, flora classifications, as well as data on their heights, life forms, possible drug effects, and counts per sample.

⁴¹ Árendás 1982 6–7. The gist of the method developed based on Árendás’ is to classify the plant finds into artificial categories of origin, where a plant may appear in multiple categories. These artificial categories describe the relationship between humans and the flora around them: cereals, fruits, grapes, fibre plants, oil plants, vegetables, medicinal herbs, dye plants, and decorative plants. When completed with data on relative frequency per specimen and species, this classification provides a reliable image of the agricultural practice and knowledge of the flora of the one-time archaeological culture, as well as the flora diversity in the period in focus.

⁴² Ellenberg 1974.

A quantitative assessment was followed by a qualitative (ecosociological)⁴³ one based on the plant sociological and plant ecological system developed with consideration to the habitat requirements of plants. This system was developed by Stephanie Jacomet, Christoph Brombacher and Martin Dick (1989),⁴⁴ adapted to archaeobotanical finds by Friedrich Ehrendorfer (1973)⁴⁵ and Heinz Ellenberg (1974)⁴⁶ and, based on their works, to the flora of the Carpathian Basin by Attila Borhidi (1995). This analysis takes into account that the composition of plant communities might change with time.⁴⁷

Charred wood remains, like the carpological material, were isolated from the samples by wet sieving; in the following phase, the fragments were dried at room temperature and assorted using a stereo microscope. Each find was given a separate identifier within the sample ID No. (*Table 3*). The isolated anthracological samples were identified using a MicroQ-W(widefield) PRO camera with a measurement overlay software mounted on a Nikon Eclipse LV100 POL polarised light binocular microscope, based on the guide written by Károly Babos for conservators, a study by Pál Greguss on the anatomy of wood, *Dendrology* by László Gencsi and Rudolf Vancsura, and an identification webpage on the Internet.⁴⁸

Sampling

Two charred grain concentrations (Features 12 and 18) and ash layers (in and around Feature 1) were observed and sampled during the excavation.⁴⁹

Feature 1 was an external oven from the Late Árpád Age. Its floor was renewed two times. Sample 6 was taken from the ash layer (SE 30) above the central floor layer (or first renewal, SE 02; see *fig. 7. 1*), which, for some reason, had not been cleaned before the third floor (or second renewal, SE 03) was plastered onto it. The central oven floor layer included fragments of a large pot, while the upper one had some shards of a pottery cauldron, a large and two smaller pots, and a liquid container, perhaps a pitcher. All vessels could be dated to the Late Árpád Age (12th–13th century).⁵⁰

An independent red clay or daub layer (SE 04) was found above Feature 1; it contained three bottom fragments of a pot (*fig. 7. 2*), each with a ca. 3 cm thick ashy layer inside. The samples taken from the three fragments were given separate IDs (Samples 3–5). Based on the pottery finds recovered from it, the red clay/daub layer could be dated to the 14th century.⁵¹

Besides the ovens, two round shallow depressions filled with grey and black ash (probably open fireplaces) were observed in the excavation (*fig. 7. 3*). We sampled the ashy fill of one (Feature 12), which contained plenty of charred grains of corn (Sample 1). It did not contain any find of chronological value but was likely created in the Late Árpád Age (13th–14th centuries)

⁴³ Willerding 1983. Thanatocoenology is the study of the ecological relations of excavated archaeobotanical finds to reconstruct the one-time botanical conditions in the site, including the habitats it consisted of, the related flora, and plant communities. The recovered botanical record is referred to as *thanatocoenosis* after Willerding's work.

⁴⁴ Jacomet – Brombacher – Dick 1989.

⁴⁵ Ehrendorfer 1973.

⁴⁶ Ellenberg 1974.

⁴⁷ Borhidi 1995.

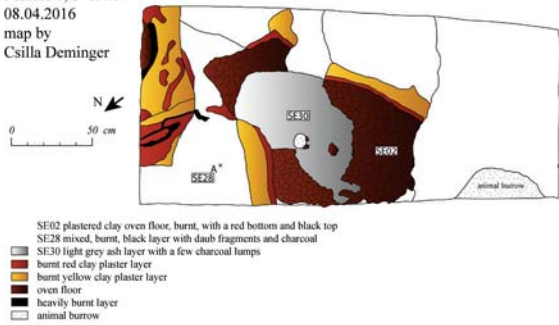
⁴⁸ Babos 1994; Greguss 1959; Gencsi – Vancsura 1992; Schoch et al. 2004.

⁴⁹ Kovács 2018 32–34, *fig. 2*.

⁵⁰ Kovács 2018 32. The finds from the first renewal (central layer) of the oven's floor (SE 02) were inventoried under Inv. No. KDM 2016.13.1.5–8 (Kuny Domokos Museum, Archaeological Collection, Tata), and those from the second renewal (upper oven floor layer, SE 03) under Inv. No. KDM 2016.13.1.9–21.

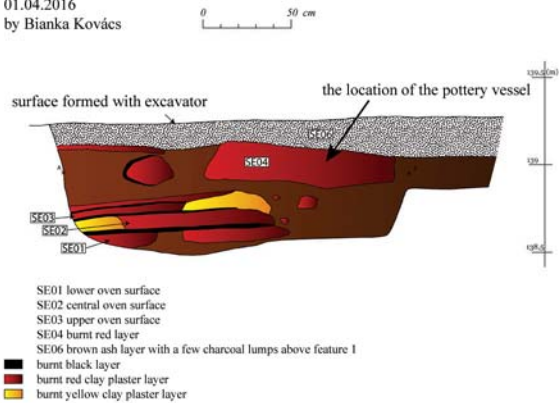
⁵¹ Kovács 2018 33–34. The finds recovered from the clay or daub layer (SE 04) were inventoried under Inv. No. KDM 2016.13.4.1–154, 299–300; the Inv. No. of the pot's bottom fragment with the ashy fill is Inv. No. KDM 2016.13.4.152.

Tata - Kossuth tér 16.
 Feature 1, overview
 08.04.2016
 map by
 Csilla Deminger



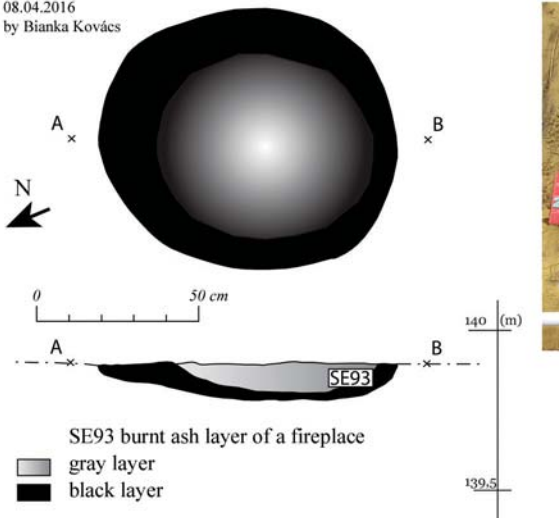
1

Tata - Kossuth tér 16.
 Feature 1, profile
 01.04.2016
 by Bianka Kovács



2

Tata - Kossuth tér 16.
 Feature 12, overview and profile
 08.04.2016
 by Bianka Kovács



3

Fig. 7. Position of the findspots of archaeobotanical samples No. 1 and 3–6 (©Bianka Gina Kovács, ©Csilla Deminger)

Tata - Kossuth tér 16.

Feature 18, overview and profile

12.04.2016

by Csilla Deminger

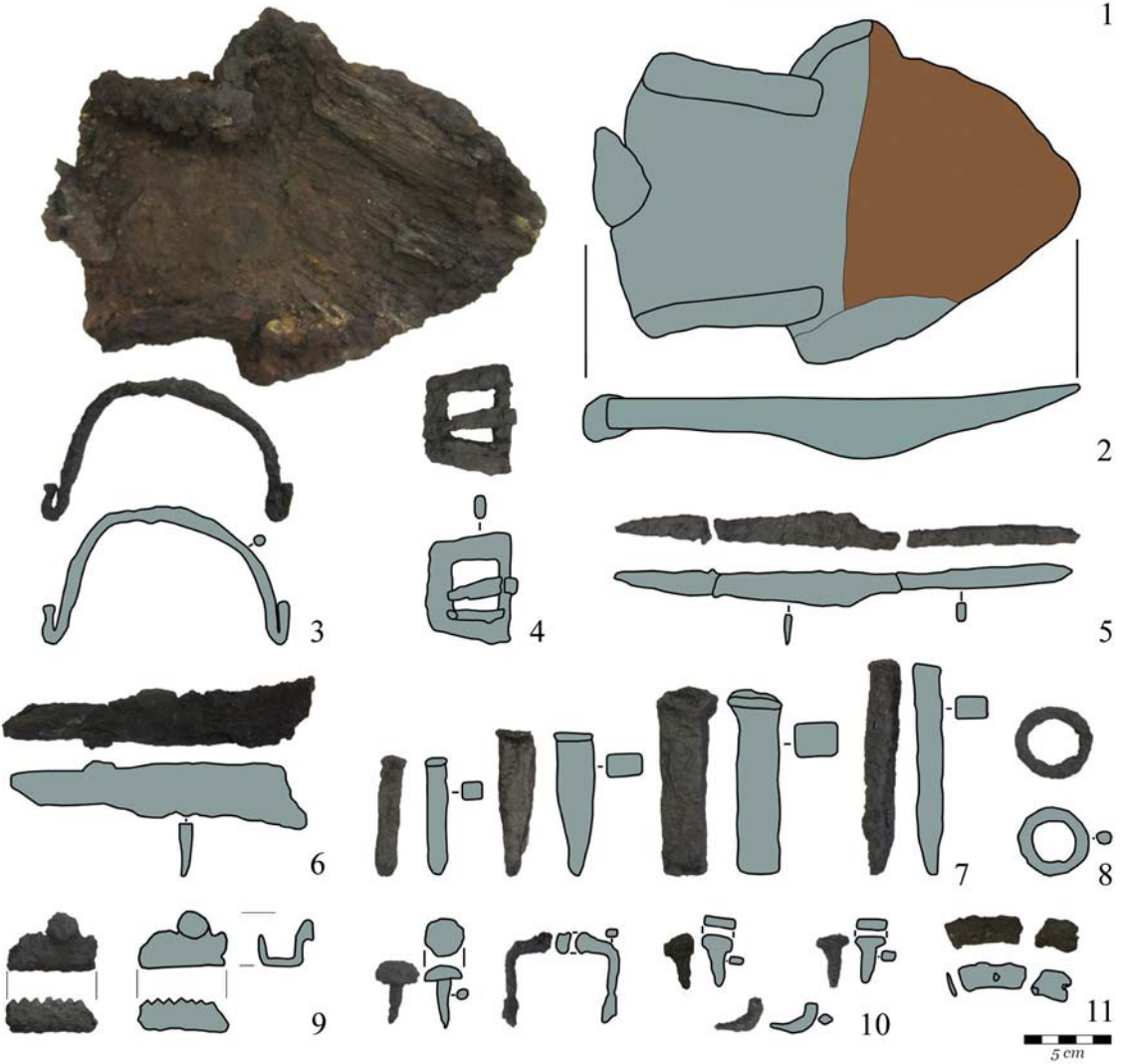
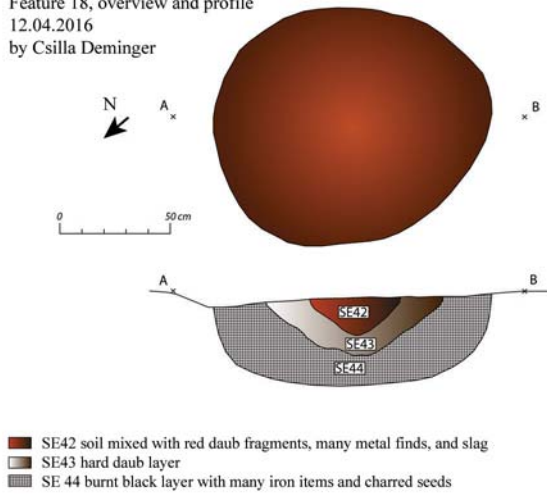


Fig. 8. Findspot of archaeobotanical sample No. 2 and the metal finds recovered from the related feature (©Bianka Gina Kovács, ©Csilla Deminger)

because it started at the same depth as Feature 11, a pit with 13th–14th-century material only 0.4 m away.⁵²

The last sample (Sample 2) was taken from Feature 18, a shallow pit with many metal objects in its fill (*fig. 8*). One of those was a slightly asymmetric medieval ploughshare⁵³ with a pile of corn on top.⁵⁴ Besides, the pit contained a fragmented coulter which, based on the cross-section of its stem, is also medieval,⁵⁵ and some relatively big iron fragments of perhaps a scythe in too poor condition to be classified to a type.⁵⁶ The small metal pieces in the assemblage could be identified as a four-part chisel set, a small bucket handle (some remains of the wooden bucket have likely also persisted corroded onto the ploughshare), an iron buckle, an iron hoop, four iron nails, fragments of an iron band, some small iron fragments and one of a serrated tool, perhaps a scratcher. This latter type first appeared in the territory of today's Hungary in the Late Árpád Age,⁵⁷ the oldest specimens coming from the archaeological record of villages destroyed during the first Mongol invasion.⁵⁸ Besides metal items, the fill of the pit contained many daub fragments with twig impressions, perhaps the remains of a nearby surface building. The size and content of the pit indicate that the objects were hidden there with intent and in a hurry; however, when that happened exactly cannot be determined because the assemblage only comprises metal finds, which, as the design of metal tools has always changed relatively slowly, have low dating value. The top of the feature was in level with the floor of the oven in the Árpád Age house only a few metres away; at the same time, the other 13th–14th-century features started 30–40 cm deeper, while Feature 29, dated to the 15th–16th centuries, ca. 30 cm higher. However, altitude alone is no convincing evidence in this case, especially as the top of the features outline a surface that was not flat but rose from the area of today's Kossuth Square in medieval times, just like today.⁵⁹ The 15th–16th-century owner of the plot was wealthy enough to drink from cups imported from Loštice (Czech Republic) and have a glazed tile stove in his house, which makes it unlikely that, in the case of an attack, he cared about hiding a bunch of agricultural iron tools. Therefore, the finds were likely interred sometime in the 13th–14th centuries, perhaps during the first Mongol invasion or after that, when the Csák kindred occupied the region.

Evaluation of the seed remains

Only two of the six wet-sieved samples, Samples 1 and 2, contained fruits and seeds.⁶⁰ Based on their findspots and the accompanying finds, both could be dated to the 13th–14th centuries. We attempted to reconstruct the one-time flora diversity, cultivation profile, and environment from the two samples.

Sample 1 contained 9,871 plant remains of 30 *taxa* – four times as much as Sample 2, which only contained 1,135 plant remains of thirteen *taxa* (*Table 2*). This proportion is characteristic of the species and seed concentration indices, too. The quantity of fruits and seeds varied by sample (*Table 1*). All plant remains were carbonised (charred), indicating that a relatively large quantity of seeds burned. Most were likely reduced to ashes, but some, having been heated in an oxygen-

⁵² Kovács 2018 33.

⁵³ Müller 1982 418.

⁵⁴ Kovács 2018 34. The finds from Feature 18 were inventoried under Inv. No. KDM 2016.13.18.1–20.

⁵⁵ Müller 1982 434–435.

⁵⁶ All iron artefacts recovered during the excavation were in extremely poor condition, probably because sometimes the area was under permanent water cover for a relatively long period. The scythe was perhaps a long one, representing a variant that first appeared in the territory of the Kingdom of Hungary in the 14th century (Müller 1982 497).

⁵⁷ Müller 1982 533–534.

⁵⁸ E.g., Dinnyés 2007 51.

⁵⁹ Kovács 2018 34.

⁶⁰ Besides, Sample 5 contained a single *Chenopodium* sp. seed.

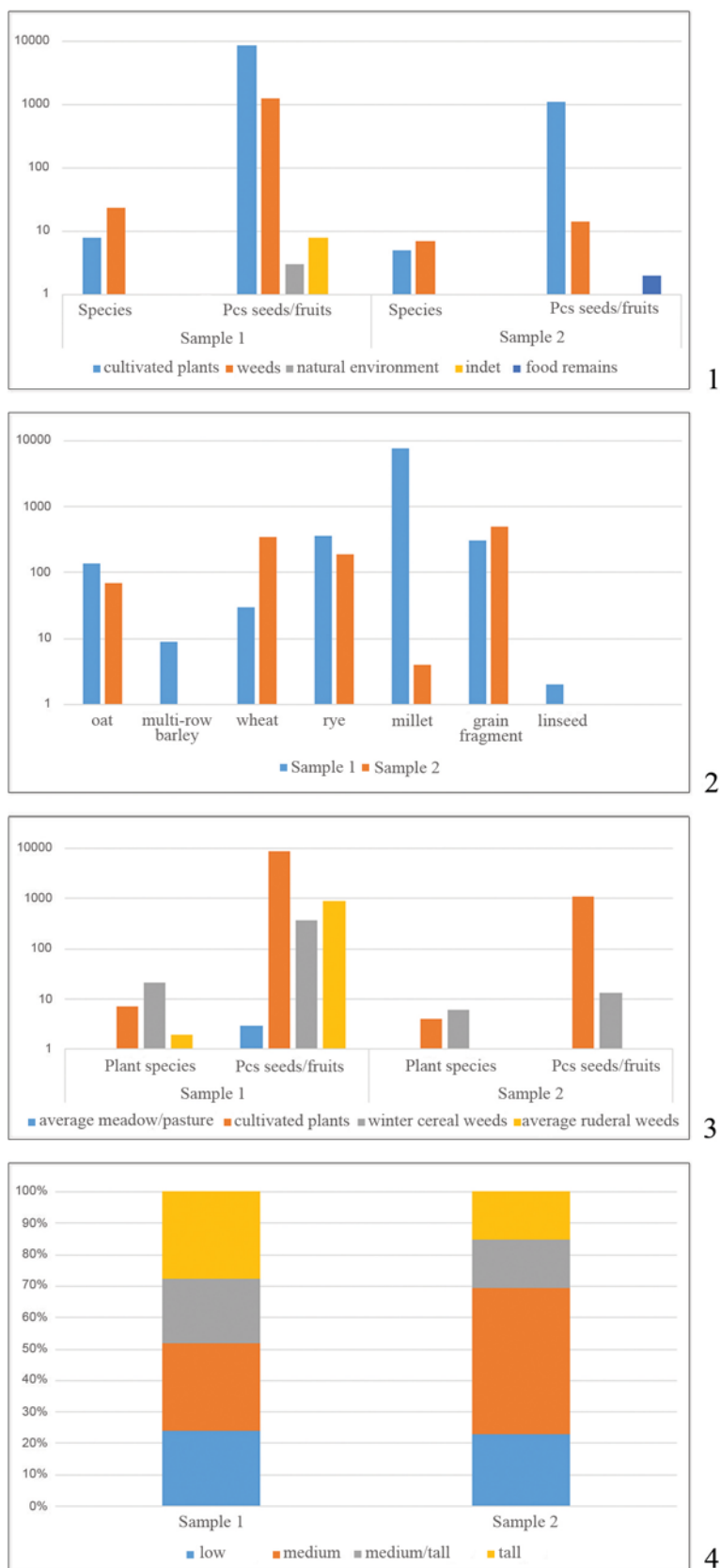


Fig. 9. Distributions of the archaeobotanical finds from Tata. 1. Anthropogenic distribution; 2. Species distribution; 3. Species distribution by habitat; 4. Species distribution by height (©Katalin Julianna Szilvási)

deprived environment, became gradually charred, which conserved them and protected them from the reducing activity of soil microorganisms while also leaving their identifying marks more or less intact. The best part of the sample consisted of cereal and cereal weed seeds, but some food remains (also all charred) were also identified. Perhaps the food had already been burnt during cooking and was dumped as waste to where it was found later.

In summary, the species diversity and quantity of the analysed material match the available medieval botanical record from the territory of today's Hungary.

Quantitative evaluation

The species identified include cultivated plants, weeds, and natural vegetation elements, which were gathered from the environment or got into the samples by chance (*fig. 9. 1*).

The species and seed number of cultivated plants in Sample 2 is much higher than in Sample 1 (8,581 seeds of eight species vs. 1,119 seeds of five species), and the numbers of weed species reflect a similar tendency: the weed diversity (including cereal and segetal weeds and ruderals) is exceptionally high in Sample 1 compared to Sample 2 (1,278 seeds of 23 species vs. 14 seeds of seven species). Natural vegetation elements only occur in Sample 1, and their number is exceedingly low (three seeds of a single species). Also, only Sample 1 contained non-identifiable (*indet.*) seed remains (8 pcs.), while exclusively Sample 2 included food remains (2 pcs.).

The cultivated plant remains allow one to learn about the economy and diet of the residents of the medieval village. As the sample abounded with them, even their order of importance can be estimated. Both samples contained cereal remains in relatively large quantities (the diaspores of which were exclusive in Sample 2). Sample 1 also comprised some fibre plant (flax, *Linum usitatissimum*) and breadseed poppy (*Papaver somniferum*) seeds (the latter does not appear on the diagram due to its low count).

The samples comprise various crop species in very diverse compositions and quantities (*fig. 9. 2*). Sample 1 is predominated by millet (*Panicum miliaceum*) with 7,745 seeds, followed by rye (*Secale cereal*) with 358 seeds, oat (*Avena sativa*) with 139 seeds, common wheat (*Triticum aestivum* subsp. *vulgare*) with 30 seeds, and multi(six?)-row barley (*Hordeum vulgare* ssp. *polystichum*) with nine seeds. The order is different, and some species (e.g., barley) do not occur in Sample 2. This sample is predominated by common wheat with 352 seeds and also contains 189 rye, 69 oats, and four millet seeds (*fig. 10*).

Qualitative (ecosociological) evaluation

The qualitative evaluation started with assorting and classifying the identified species based on their habitat requirements (*fig. 9. 3*), involving both species and the related diaspores in the analysis. It must be noted that some species (especially weeds) might appear in more than one habitat, while some can equally accompany winter and spring crops, segetal plants, and ruderals. As all weed seeds have been found among wheat, rye, and other cereal seeds, they were interpreted as related to them.

Accordingly, the number of winter cereal weeds is conspicuously high, likely bound up with the number of cereal seeds, and corroborates the image suggesting their preponderance. The identified species include annual yellow woundwort (*Stachys annua*), pearl millet (*Setaria glauca*), annual wall-rocket (*Diploaxis muralis*), tufted or blue vetch (*Vicia cracca*), black medick (*Medicago lupulina*), common corncockle (*Agrostemma githago*), cockspur (*Echinochloa crus-galli*), common wild oat (*Avena fatua*), field cow-wheat (*Melampyrum arvense*), sweet yellow clover (*Melilotus officinalis*), maple-leaved goosefoot (*Chenopodium hybridum*), green or bristly foxtail (*Setaria viridis* or *Setaria verticillata*), wild radish (*Raphanus raphanistrum*), red clover

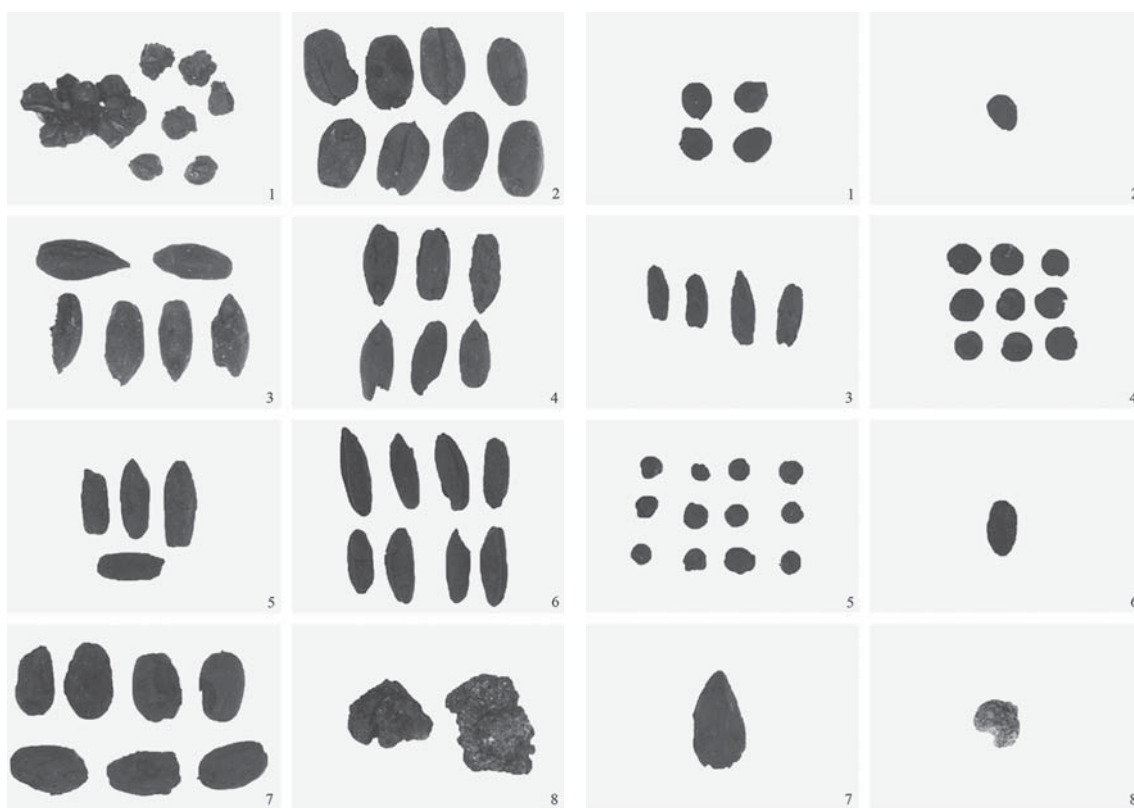


Fig. 10. Selection of cereals from the archaeobotanical: Sample 1: 1. Millet, 3. Rye, 5. Oat, 7. Wheat; Sample 2: 2. Wheat, 4. Rye, 6. Oat, 8. Grain porridge (©Katalin Julianna Szilvási)

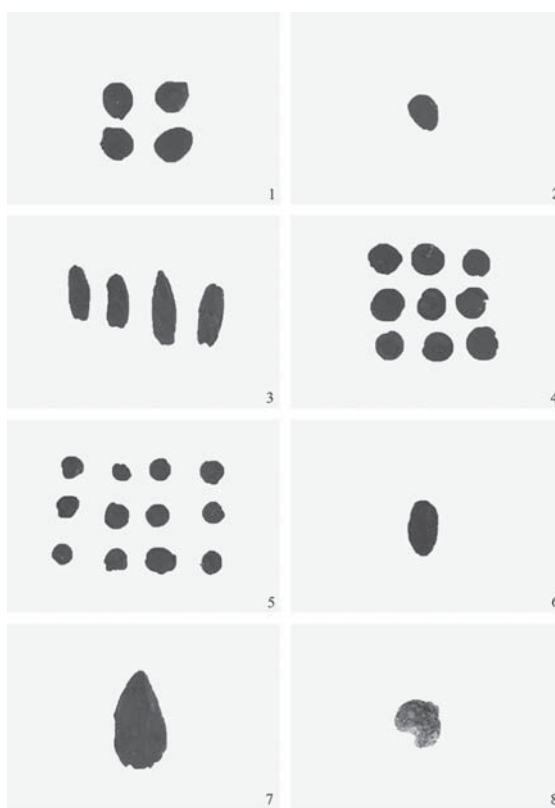


Fig. 11. Selection of weeds from the archaeobotanical: Sample 1: 1. Annual yellow woundwort, 2. Annual wall-rocket, 4. Maple-leaved goosefoot, 5. White goosefoot, 6. Annual meadow grass, 7. Linseed, 8. Breadseed poppy; Sample 2: 3. Common wild oat (©Katalin Julianna Szilvási)

(*Trifolium pratense*), marsh persicaria (*Polygonum mite*), lesser honeywort (*Cerinth minor*), wild buckwheat (*Fallopia convolvulus*), hare's-foot clover or oldfield clover (*Trifolium arvense*), spear saltbush or common orache (*Atriplex patula*), whitetop or hoary cress (*Lepidium draba*), bird's rape (*Brassica campestris*), yellow mignonette (*Reseda lutea*), and littlepod false-flax (*Camelina microcarpa*) (fig. 11).

The distribution and quantity of the weed seeds are very different in the two samples. Sample 1 contains seeds of 21 species, while Sample 2 only includes six. Several species appear in both samples, including annual yellow woundwort, annual wall-rocket, and common wild oat. However, most species are not present in Sample 2, and the ones appearing there (bristly foxtail, whitetop, common corncockle, and field cow-wheat) are missing from Sample 1; in summary, the species distribution reflected by the two samples is highly dissimilar. As for seed count, almost all species in both samples have only a few seeds. The only exception is maple-leaved goosefoot, 325 seeds of which were isolated in Sample 1. It must be noted that this weed equally appears in winter and spring cereal communities (millet, spring wheat, spring barley, oat) and those of segetal plants like breadseed poppy (*Papaver somniferum*) and flax (*Linum usitatissimum*) (fig. 11).

The ruderals (weed communities specific to trampled land and azonal soils) in the samples come from areas affected by human activity, like ditches, roadside and embankments, fallows, pens, and the vicinity of buildings, where the soil is rich in nitrogen (perhaps even manured). Both identified ruderal species indicate habitats with average water availability. White goosefoot (*Chenopodium*

album) seeds were present in both samples (and with a conspicuously high count, 907 pcs., in Sample 1), while annual meadow grass (*Poa annua*) was missing from Sample 2 (fig. 11).

Natural vegetation elements were represented by three lady's mantle (also known as lion's foot, *Alchemilla vulgaris* agg.) seeds in Sample 1.

Evaluation of the results

The ecological distribution of the identified plant species confirms the results of the quantitative assessment, outlining a typical palaeo-ethno ecological community dominated by plants cultivated and used by humans and their weeds and some occasional species coming from the natural environment.

Millet, the most characteristic porridge cereal of the Middle Ages, makes up the bulk of Sample 1. All seeds are charred, and some have been baked into a conglomerate. The charred, cleaned millet seeds (with no glumellas and germs) were probably processed (as the germ breaks off them during husking) and cooked into a porridge, which got burnt; they were most likely hulled on the spot. Interestingly, Sample 2 only contained a few pieces of millet.

Two different caryopses (a round and an elongated) of hexaploid wheat, a common cultivated wheat species today, were present in Samples 1 and 2. These likely represent two different ecotypes or species, providing important evidence of early plant breeding. That they occur in both samples in similar numbers suggests that they were cultivated in the area instead of having been brought there and that the crop played an important role in local subsistence. They are likely the remains of wheat cultivated and processed nearby.

The oat remains in both samples are hulled, which indicates that they might have been intended for consumption. In contrast, all the multi(six?)-row barley seeds in Sample 1 had their glumellas on, suggesting they were cultivated for fodder.

Based on the archaeobotanical database of Hungary,⁶¹ the identified species fit the image outlined previously about medieval agriculture. The proportion of the wheat and the rye in Sample 2 is 2:1, raising the possibility of the so-called 'mixed sowing' (*abajdóc, kétszeres* ['double'], *triticum mixtum*: a mixture of wheat and rye is sowed for a better yield), which was characteristic of medieval Hungary.

The many winter cereal weeds come from local cereal cultivation and processing. The spectrum includes both tall and low weed species, indicating that the crops were reaped low, probably with scythes (fig. 9. 4), and that the cleaning methods of the time (mainly winnowing and hand-sifting) were unsuitable for removing all unwanted seeds.⁶² The common corncockle and wild buckwheat, appearing in Sample 1, were likely widespread and stubborn weeds; both are present, admixed with the remains of cultivated species, in the archaeobotanical record of every culture from the Neolithic to the Late Middle Ages. The common corncockle, a *Secalietea* species, is a weed of Mediterranean origin, where it was present in both plainlands and mountains; it has spread throughout the entire globe by today.⁶³

The seeds of some medicinal and poisonous plants have also been identified in the archaeobotanical record of the site; the distinction between spices, medicinal herbs, and poisons was not as sharp as it is today. The breadseed poppy in Sample 1 was known as an oil-yielding

⁶¹ *Pósa – Gyulai 2019; Gyulai 2010.*

⁶² Before cooking them, the cereals were checked once more, grain by grain, to remove poisonous weed seeds and those that would add bad flavour to the food.

⁶³ Its population in the territory of Hungary had decreased significantly by today due to chemical control. Currently, the species is under nature conservation protection in the country (see Decree No. 13 of 2001 [May 9] of the Department of the Environment). *Soó – Jávorka 1951; Soó 1980.*

and a drug plant; its drug, opium, contains numerous alkaloids and has been in use for ages.⁶⁴ Common buckwheat germs contain saponin, a toxin affecting nerves and muscles; eating such cereals or feeding animals with them is very dangerous.⁶⁵

Evaluation of the wood record (Table 3)

More than four hundred charcoal fragments were isolated in Sample 6, taken from the ash layer in the Late Árpád Age (12th–13th-century) oven. Based on their anatomy, all come from oak species (*Quercus* sp.). The size of the charred wood remains in Sample 1, taken from the 13th–14th-century open fireplace, ranged 8–20 mm; most could be identified as common alder (*Alnus glutinosa*) (fig. 12).⁶⁶ Sample 2, collected from the fill of the 13th–14th-century pit, contained small charcoal fragments, of which three were suitable for anthracological analysis; based on their structure, all three could be assigned to the maple genus (*Acer* sp.). Sample 3, taken from the inside of a bottom fragment of a pot in a 14th-century layer, contained very tiny charred wood remains, unsuitable for identification due to their size. From the ash layer of Sample 4 (14th century), we were able to select small charred charcoal, of which eight remains were identified as belonging to the oak (*Quercus* sp.) genus. From Sample 5 (14th century), one remains was suitable for anthracological analysis and was identified as oak (*Quercus* sp.).

Altogether, five wood *taxa* were discovered and identified in the record. Of these, common alder (*Alnus glutinosa*) lives in wet habitats permanently affected by excess water and representing an environment rich in mineral nutrients. Among maples (*Acer* sp.) there are species that play a secondary role in maple-oak and hornbeam-oak forests, oak-elm-ash gallery forests, maple-ash ravine forests, beech forests, and montane alder galleries. The oak (*Quercus* sp.) genus also includes mesophilic species, dominant elements of the plant communities in our forests in wet riverside habitats and dry, warm southern slopes.

Based on the distribution and habitat requirements of the identified *taxa*, the medieval residents of Tata likely obtained the wood they needed for everyday life from nearby natural resources, thus optimising energy investment.

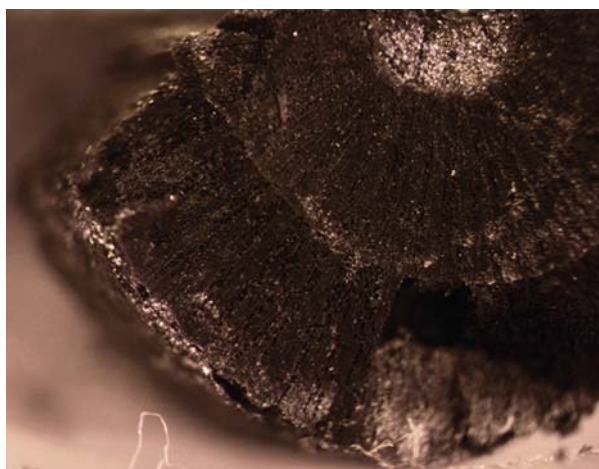


Fig. 12. Cross-section of common alder (*Alnus glutinosa*) from Sample 1 (ID 1.2). The size of the sample is 9 × 10 × 9 mm (©Máté Róbert Merkl)

⁶⁴ Gyulai – Kenéz 2018 82–84.

⁶⁵ Danert et al. 1981. Its toxins are ghitagoside and agrostemma acid. When not separated from cereal grains and ground, it caused the bread to have a bluish colour. In the case of severe poisoning, symptoms include stomach irritation, salivation, and vomiting, followed by circulatory failure, coma, and finally, death by respiratory paralysis. According to Rapaics 1934, it was not as abhorred in the old days as today: small quantities were baked in bread and made into *pálinka* (a kind of fruit brandy). Cereals contaminated with common buckwheat had to be cleaned before use, but this could not be done only by winnowing and sifting, and even sieving was only enough to reduce its quantity. This explains the relatively high incidence of common buckwheat seeds in cereal grain samples from archaeological periods.

⁶⁶ Based solely on anatomical characteristics, the possibility that the remains come from grey alder (*Alnus incana*) cannot be excluded either; however, according to our current knowledge, this species only appears in subalpine habitats, primarily in the Alps and the northern parts of Europe, which makes it likely that the wood is actually common alder, an autochthonous species in the area of the site.

*Tata and its surroundings from the building of the castle
to the end of the Middle Ages*

Changes in the landscape and the settlements. The estates of Tata Castle

It is possible that the Lackfi family had a palace in the place of the later castle already at the end of the 14th century; however, the construction of the building complex with a well-designed, regular layout and four corner towers can be linked with Sigismund of Luxembourg, who obtained the territory in 1397 and had his castle built there by 1409. Sigismund frequently visited Tata, often also receiving foreign envoys there. The proximity of the royal court promoted the development of the area,⁶⁷ bringing about several changes.

Based on written sources, the estates of the castle formed a single block in the 15th century. Three charters (written in 1440, 1449, and 1459, respectively) are known from the time when the castle belonged to the Rozgonyi family; these enlist the settlements belonging to the castle. The two most significant of these were Ótata ['Old Tata'] and Újtata ['New Tata'], two market towns next to the castle. Besides, all three documents mention Szentivánhegye, Szőlős, Szomód, and Grébics – these could be the core of the estate. Kovácsi and Agostyán puszta ['puszta' meaning 'abandoned/deserted settlement'] also belonged to the castle in 1440, while Naszály, Szentkirály, Sztancs, and Szentgyörgypuszta only appear in the 1449 charter.⁶⁸

Changes in the hydrological conditions of the area

Fundamental transformations took place in the hydrological conditions of the area during Sigismund's reign: Öreg-tó was likely created by impounding the Által-ér on his order as part of the construction of the castle complex. Current landmarks offer no help in determining the exact time of this work as the current dam was constructed only in the 18th century, within the frame of the water regulatory works designed by Mikoviny (mentioned above). Earlier hypotheses assumed that the lake might be Roman, but this seems unlikely as it appears in no source before the 15th century. Its earliest mention is in a letter by papal envoy Traversari, written in 1435; according to him, Sigismund 'went to Tata to fish and hunt, and had a large and splendid lake made for him for that purpose.' The lake appears in several documents after that, and later, Antonio Bonfini credited its construction to King Matthias.⁶⁹ Based on the Árpád Age finds discovered in the southern part of the lake during dredging works in 1972, the area had likely been inhabited before it was flooded.⁷⁰ The lake was more than a spectacle for the residents of the castle; it was also a fish pond. Fish ponds represented a profitable venture and a secure source of income that could match that of a landlord of a market town, while the maintenance costs were relatively low.⁷¹ A few sources offer indirect data on late medieval fishing in the lake, sharing details like that great sturgeons were also kept there.⁷² Besides, the impounding of the stream likely resulted in the emergence of new mill sites, too. Again, Bonfini provides evidence, according to whom, 'the running water stops down there in a lake about seven thousand steps wide. A row of nine mills stands along the stream. These all belong to the castle and cannot be separated from it

⁶⁷ As indicated by the presence in the market town of Ótata of diverse craftspeople (e.g., a goldsmith), clearly supplying the royal court. See *Schmidtmayer 2011* 200–202.

⁶⁸ *Schmidtmayer 2015* 240; *MNL OL DL* 13900; *MNL OL DL* 14284; *MNL OL DL* 15409.

⁶⁹ *Schmidtmayer 2011* 194; *Schmidtmayer 2015* 245–247.

⁷⁰ KDM Archaeological Data Archive 15–79.

⁷¹ *Ferenczi 2008* 348–349.

⁷² *Schmidtmayer 2011* 195; *Schmidtmayer 2015* 247.

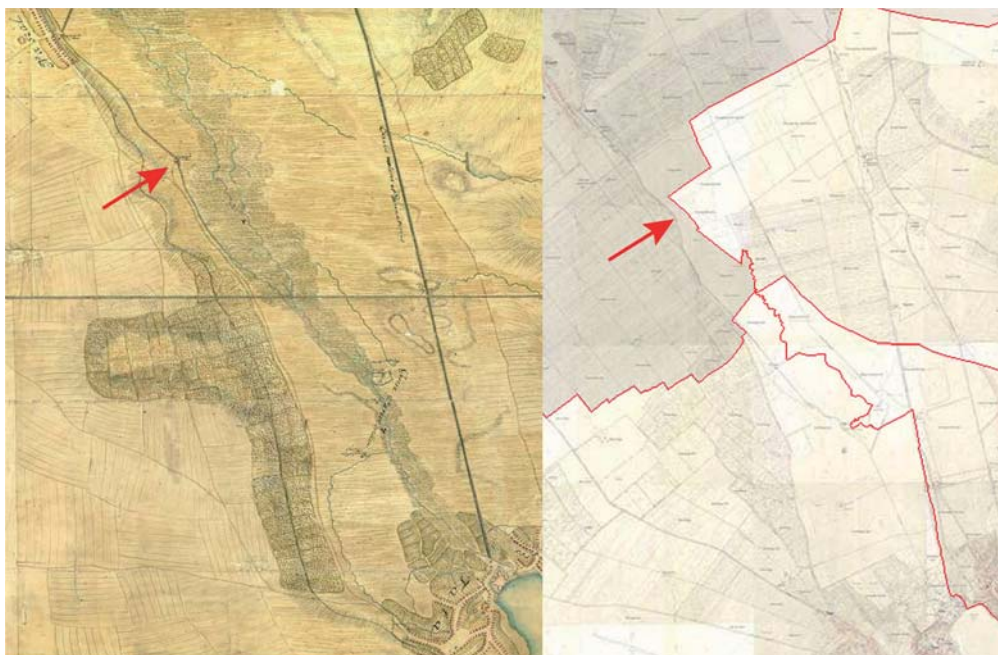


Fig. 13. The mill between Tata and Naszály on Sámuel Mikoviny's map and the modern border between the two settlements on a cadastral map

even in time of war.⁷³ However, the last statement is questionable as it supposes that the mills were situated within the walls of the castle, but another source from 1587, about a century later, explicitly says that 'all mills were situated outside the walls, so they built one within to secure supplying the soldiers even when the town is engaged in war.'⁷⁴ It is hard to believe that if more than one mill operated within the castle walls, the builders of the early modern fort walls did not take care of keeping them there, especially as the medieval moat was still open at the time (the mill mentioned in the 1587 document was also sited on the medieval walls).⁷⁵ Documents from the 15th century also mention mills in Újtata: King Albert donated two mills by the hot springs in Újtata (one of them next to the royal triple mill) to István Rozgonyi in 1439,⁷⁶ and a charter from 1443 also mentions a mill in Újtata.⁷⁷ The 1587 map of Tata Castle and its surroundings features three mills east of the castle, by the stream feeding the lake.⁷⁸ It is possible that at least some of the one-time mills in Újtata were sited on the stream fed by the springs in the territory of today's Angolkert [*Jardin Anglais*] because most 18th-century mills of the town are also situated there.⁷⁹ In 1502, Osvát Korlátkövi, castellan of Tata, had a mill built or rebuilt north of Naszály in an area belonging to Újtata at the time.⁸⁰ Albeit there is no precise description of the medieval borders of these settlements, we know that the early modern border between them was near the mill appearing between Tata and Naszály on the map by Mikoviny (mentioned above) (*fig. 13*). Thus, the mill mentioned in 1502 might also stood on the same spot.

⁷³ *Bonfini 1959 144.*

⁷⁴ *Bíró 1968.*

⁷⁵ The 2023 excavation in the area of the castle has confirmed the medieval origins of the walls of the mill; see *Bíró 1968 314.*

⁷⁶ *Körmendi 1968 407.*

⁷⁷ *Schmidt Mayer 2015 247.*

⁷⁸ *Bíró 1968 325.* Lake Cseke in the Angolkert was constructed only in the 18th century.

⁷⁹ *Stegmayer 2017 fig. 1.*

⁸⁰ *Schmidt Mayer 2015 241.*

Roads in the 15th century

Thanks to the marshland between Tata and the Danube, the roads crossing Tata, and the right to charge a toll, both Ótata and, a little later, Újtata had become market towns already before the castle was built there. As mentioned above, the role of the main road along the Danube was taken over by the Buda–Bánhida–Győr route after the first Mongol invasion. While related 14th-century sources are scarce, many 15th-century documents mention roads around Tata. Several envoys and travellers used the road passing Buda, Tata, and Győr at the time of the reign of Sigismund of Luxembourg, and Sigismund's *itinerarium* also contains information on more than one road in the area. According to a statement by the town of Komárom in 1445, 'everyone is free and safe to pass' the road leading to Fehérvár through Tata and Környe. According to a 1447 document, the Tata–Komárom road crossed Billeg (where a merchant was stopped). Besides, another road along the eastern edge of the marshes connected Újtata and Almás; passing the latter, it crossed Neszmély and led to Esztergom. The paths of the roads north of Tata were probably similar to the ones appearing on Mikoviny's map. Many lesser roads connecting the settlements in the area branched off and completed the road network backbone by the primary ones mentioned in written sources.⁸¹

Archaeological data

Identifying the estates of the castle using archaeological methods is sometimes problematic because many late medieval settlements lay in built-up areas of current settlements, which limits research possibilities considerably. Such sites can usually be explored in small areas in context with land development and constructions. This is the case with the two market towns, Ótata and Újtata: we have barely any information on the latter; only a mostly destroyed cemetery suggests that it was likely situated northeast of the castle, with a Franciscan monastery or a parish church devoted to the Holy Mary was somewhere at the crossroads of today's Ady Endre and Bartók Béla streets, i.e., in the area of the Capuchin church. Based on available research results, Ótata was situated south of the castle, in the area of today's Kossuth Square. The body of archaeological evidence related to this medieval town is less thin: the relics of the church building unearthed on the square and the cemetery parts excavated in the nearby streets (Fürdő and Nagykert streets) outline the positions of the three ecclesiastical buildings mentioned by written sources (the Benedictine Abbey, the Parish Church of St. Coloman, and the Chapel of the Holy Mary).⁸² Besides, remains of a medieval settlement have been identified at several places, the most significant being a late medieval building in Nagykert Street and some late medieval features next to Kossuth Square (*fig. 14*).⁸³ These excavations also yielded abundant find material.

Of the one-time villages of the castle, Szentivánhegye, lay in the current territory of Tata; archaeological research has only been carried out in the area of its church. Naszály and Szöllős were likely situated where Naszály and Vértesszőlős are today. We have no archaeological data on either of them, but the orientation of the Reformed church of Naszály (towards the east and not fitting into the street work of the village) and the Catholic church of Vértesszőlős (also facing east)⁸⁴ raise the possibility of their medieval origin – in which case, the related settlements must have also been nearby. The situation might be similar with Agostyán, the church of which is

⁸¹ For a detailed description of the local road network, see *Schmidtmayer 2011* 197–198.

⁸² Some identifications are still under debate; see the entry of Ótata in the Data Archive at the end of the study.

⁸³ *Kovács – Libor 2023* 229; *Kovács 2018*.

⁸⁴ While the current church of Vértesszőlős was only built in 1789–1792, a church is marked in the same spot on the respective map of the first Habsburg Military Survey.

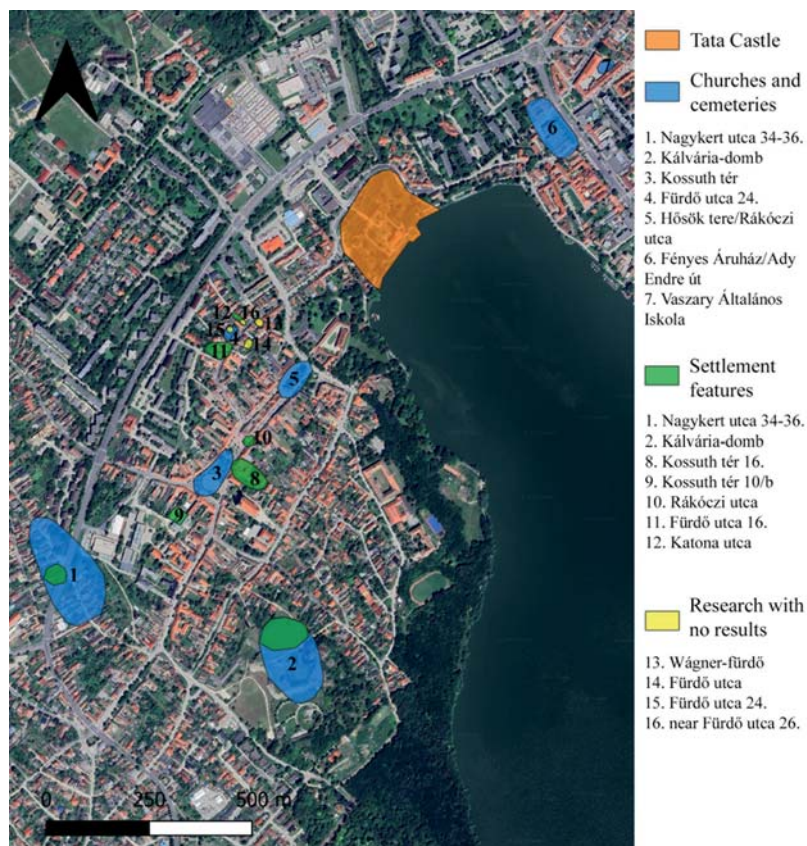


Fig. 14. Medieval archaeological remains in the downtown of Tata (©Bianka Gina Kovács)

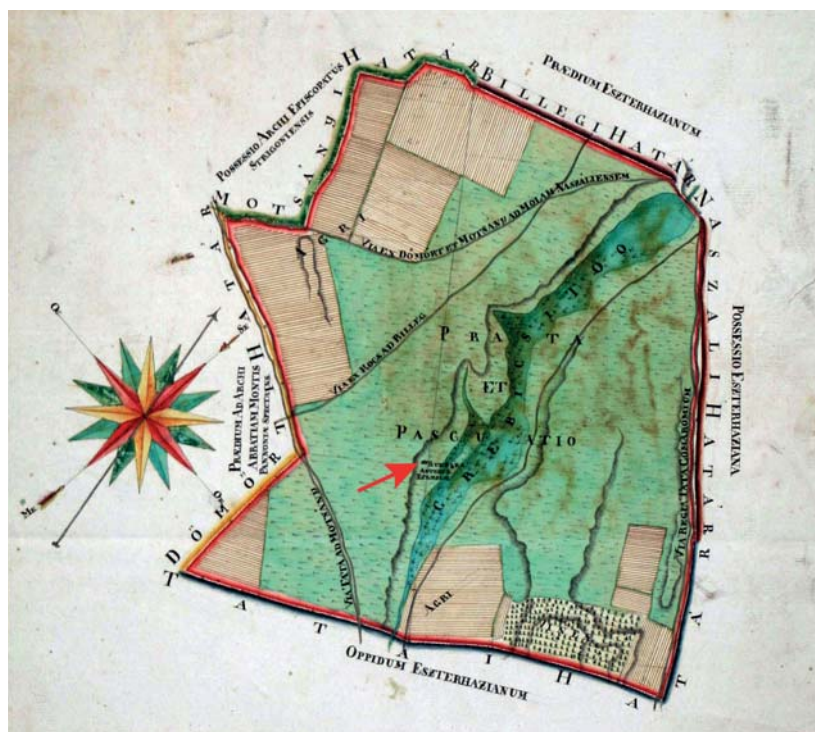


Fig. 15. Domanial map of Grébcispusztá from 1768 with the marking of a ruin church likely of medieval origin (*'rudera antique ecclesie'*) (source: Historical Collection of the Kuny Domokos Museum Inv. No. KDM 63.68.1)

situated on top of a small elevation and oriented east-west, with the sanctuary on the western side. According to 18th–19th-century maps, a church with a similar orientation also stood once in Dunaszentmiklós, the supposed place of the medieval Stancs village. However, in lack of archaeological research, the medieval origin of neither church can be confirmed even more as only the church of Agostyán appears in medieval written sources (mentioned in a charter in 1367).⁸⁵ Accordingly, there is no mention of the church of Kovácsi, but it was identified through archaeological research.⁸⁶ A multi-period site with a late medieval horizon has been registered on the southern outskirts of Szomód during a survey, but, as the collected find material is not available, this dating could not be confirmed.⁸⁷ The late medieval village was more likely in the built-up area of the current settlement.

After the wars of the Early Modern Period, some of the medieval settlements were not rebuilt at all or in a different place than before. The research of these settlements, usually situated on ploughlands outside the currently inhabited zones, progresses slowly due to the lack of land development projects in the respective areas; most of the known ones have been identified through surface find collecting surveys. The only exception is Kovácsi, where the settlement has yet to be unearthed, but the church, the graveyard cemetery, and the manor were explored in a planned excavation.⁸⁸ As the result of surface find collecting surveys, Grébics was located quite certainly, which the related toponym (Grébicspuszta, meaning ‘deserted Grébics’) corroborates. Albeit there is no mention of the church of Grébicspuszta, the ruins marked on the 1768 domanial map of the settlement perhaps belonged to that (*fig. 15*). The toponym Szentgyörgypuszta, marking a land in the administrative area of Környe today, gives a hint on the location of the medieval Szentgyörgy village; however, only Árpád Age sites have been registered there thus far. As 15th-century sources only mention the settlement as *puszta* [deserted] or land, it might be identified with some of the Árpád Age features.⁸⁹ Szentkirály is the only village that could not be identified convincingly thus far, and there is no data (e.g., a toponym) to help localise it. The data on the medieval settlements are presented in detail in the Data Archive at the end of this paper.

In summary, the position of the 15th-century settlements around the castle could largely be reconstructed (*fig. 16*). The outlined image matches the tendency observed country-wide and is also corroborated by both archaeological and written sources: the number of settlements in the 15th century was way lower than in the preceding ones. The agricultural innovations in the 13th–14th centuries brought about changes in society and led to a concentration of settlements and the emergence of a permanent settlement network throughout the Kingdom of Hungary; this was accompanied by a skyrocketing of the number of churches from the 13th century.⁹⁰ As the part referring to the Győr diocese is missing from the papal tithe register compiled between 1332 and 1337, our knowledge of the ecclesiastical relations of the study area is disappointingly incomplete.⁹¹ However, another aspect must also be considered in the research of the area: by the 15th century, the inhabited zone in the marshland north of Tata seems to have shifted (or, better, retreated) to above ca. 120 m a.B.s.l. Based on the scarce written evidence available, researchers formulated a hypothesis that the frequency of floods and the extension of the flooded areas in the

⁸⁵ The data on the parishes of the Győr and Komárom deaneries, i.e., the area of the county south of the Danube, are almost completely missing from all 14th-century papal tithe registers; see *Györffy 1987* 440–441.

⁸⁶ *Petényi – Sabján 2003* 127–128.

⁸⁷ Julianna Kisné Cseh inspected Sites 2/2005 and 3/2005 in 2005.

⁸⁸ *Petényi 2010* 8–10.

⁸⁹ See the Szentgyörgy entry in the Data Archive at the end of this study.

⁹⁰ *Rácz 2019* 158.

⁹¹ *Tóth 2013* 87.



Fig. 16. The position of Tata Castle and the settlements in its domain in the Late Middle Ages (©Bianka Gina Kovács)

territory of the country increased in the Late Middle Ages.⁹² As part of that, the surface and water level of the marshes around Tata also grew, forcing the residents of several settlements (e.g., Sár village) to leave their homes for good. As a result, the settlements that had remained inhabited by the 15th century were mostly the ones that were rebuilt after the Ottoman occupation and still exist today.

General characteristics of the find material

Relatively large find material is only available from Ótata in the downtown of the current town; as for other settlements, mostly find collections from surface surveys offer some information (*fig. 17*). The bulk of the abundant find material recovered from the castle comes from early modern and modern contexts, but the number of medieval finds is also considerable (about 5000 fragments), which represents a reliable reference for the research of the nearby settlements. Pot fragments comprise the biggest part of the 15th–16th-century pottery record in both excavated assemblages and surface find collections. Most fragments come from yellowish, off-white pots tempered with coarse, often dark-grained sand and imitating types of the ‘Austrian ware’; their shoulders are often adorned with incised line or roll-stamped patterns. The proportion of yellowish-off-white pottery is relatively high in the record of coeval sites in the area of the Vértes and Gerecse Mountains, appearing there already in the Árpád Age. Late medieval pottery kilns where such pottery was produced once were discovered in the eastern part of the Gerecse and the northern part of the Vértes mountains; besides, provenience research at the turn of the 19th and 20th centuries has discovered natural clay deposits at the eastern feet of the Gerecse and the southern feet of the Vértes, which yielded high-quality material that could be fired to a yellowish ceramic (so-called refractory). As the vessels recovered from the area in focus feature minor differences in shape and decoration compared to the ones produced by the known workshops, such pottery was likely also produced somewhere near Tata.⁹³ No pottery kiln or refractory clay mine has been discovered in the study area thus far, but according to ethnographic data, the oral tradition in Agostyán holds that the local potters had found such a mine in the forest, but the count did not allow them to exploit it, and the place was forgotten with time.⁹⁴ Even mid-19th-century sources note that the ploughlands of Agostyán are very clayey.⁹⁵ Based on all these, some of the pottery workshops around Tata might have easily been located in the territory of the medieval villages at the feet of the Gerecse Mountains (e.g., Agostyán and Baj).

A smaller part of the pots in the pottery record is red; the design of these vessels is more varied, albeit most are made from clay tempered with gravel. Some feature a band rim with often a lid groove, a rim variant known otherwise from the area of Lake Balaton and eastern Transdanubia,⁹⁶ but the bulging variant characteristic of the yellowish-off-white pottery is also frequent. The shoulders of many are decorated with incised line patterns. Clays rich in iron oxide, yielding red ceramic, represent lower quality than refractory clay; their deposits were scattered all over the country.⁹⁷ The analysed pottery record likely includes the products of more than one local workshop. Red pots sometimes bear a simplified version of the roll-stamped patterns known from yellowish-off-white pottery, suggesting that they were imitating that higher-quality ware.⁹⁸

⁹² Rácz 2008 33.

⁹³ For detailed information, see Kovács 2021 253–267; Kovács 2022.

⁹⁴ Körmendi 1964 28.

⁹⁵ Fényes 1848 174; Pesty 1977 57.

⁹⁶ See Feld *et al.* 1989 180, figs. 5–6.

⁹⁷ Kresz 1960 303.

⁹⁸ Kovács 2021 259–260.

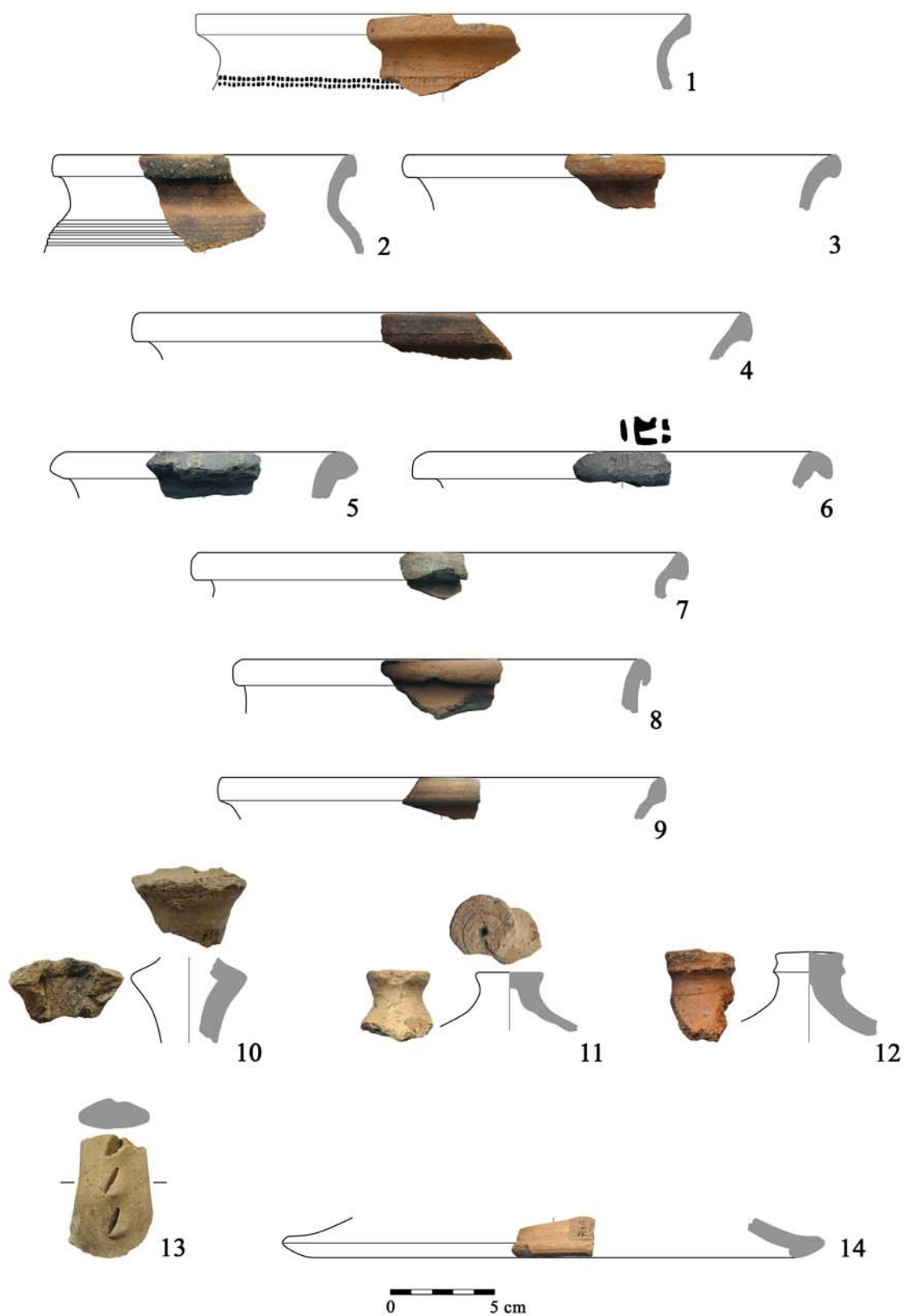


Fig. 17. Selection of 15th–16th-century finds from the study area. 1–14. Naszály-Grébicspuszta: Inv. No. KDM 71.4.1–8, 10–11, 13, 17. (©Zsóka Varga, ©Bianka Gina Kovács)

Lids also come in yellow and red pottery. The proportions of these two wares in the pottery record indicate that mainly local workshops, likely at least partly ones operating on the castle's own estates, supplied it with cooking vessels. A document from 1524 mentions that the potters in Deáki village supplied the kitchen of Sümeg Castle with vessels in exchange for tax relief.⁹⁹

The third group of pottery consists of grey, usually graphitic vessels. More than a hundred such fragments have been identified in the pottery record of the castle, making up almost 20% of medieval pots. Their proportion in Ótata is way lower (1%); besides, a single fragment is known from Szentivánhegye and Grébics, respectively.¹⁰⁰ An average household probably had no more than one or two such pots. Earlier, this type was unequivocally interpreted as imported from Austrian workshops, but recent research results have raised the possibility that some were actually produced in the Kingdom of Hungary, near the western borders.¹⁰¹ The material and quality of the grey vessels from Tata Castle are highly varied, and some do not contain graphite at all. While the provenance of the pieces has remained to be determined, all vessels have certainly arrived there as traded goods.

Tableware, including liquid containers and cups, also includes a yellow and a red group. Cups, however, show an even greater variety, reflecting the role the vessel type had in social representation. The pottery record of the castle comprises fine yellow and red cups with roll-stamp decoration, likely made in the Kingdom of Hungary,¹⁰² as well as ones imported from distant towns like Loštice (Czech Republic), Enns (Austria), Siegburg (Germany), and Waldenburg (Germany).¹⁰³ No foreign cup is known from any of the castle's estates except for a Loštice-type cup from Ótata,¹⁰⁴ suggesting that the imported pieces did not get into the villages. Even higher-quality stamped ware made in the territory of the country is only known from a noble environment, the excavated material of the manor in Kovácsi.¹⁰⁵

A considerable part of the find material obtained from Tata Castle consists of stove tiles. The high-quality flat and cup-shaped stove tiles found there can be linked with the presence of the royal court (of Sigismund of Luxembourg, Matthias, Vladislaus II, and Louis II),¹⁰⁶ but a few similar fragments are also known from the market town of Ótata.¹⁰⁷ Neither flat nor cup-shaped stove tile is known from any other settlement in the study area.

Metal finds were scarce both in and around the castle, and none came from surface find collecting surveys. The medieval artefacts found in the castle are connected with gastronomy (knife, fork, wine tap) and lightning (chandelier parts),¹⁰⁸ which cannot be compared to the find material of the market town. Naturally, knives also appear amongst the finds of Ótata, but those also include agricultural tools and clothing accessories (belt plates).¹⁰⁹

The fragments of a few Venetian cups are the most exquisite glass pieces in the record of Tata Castle,¹¹⁰ while the glass finds of the market town comprise mostly bottle and window

⁹⁹ Holl – Parádi 1982 110.

¹⁰⁰ Inv. Nos. KDM 81.233.1, KDM 71.4.4.

¹⁰¹ Feld 2008 310–311.

¹⁰² See Kovács 2021 267–270.

¹⁰³ Inv. Nos. KDM 68.20.603, 785, 1164, 1165, 1170.

¹⁰⁴ Kovács 2018 33, fig. 8.

¹⁰⁵ Inv. Nos. KDM 96.109.1, KDM 96.110.1, KDM 96.111.1, KDM 96.113.1.

¹⁰⁶ B. Szatmári 1974.

¹⁰⁷ Kovács 2018 34–35, fig. 8, 13.

¹⁰⁸ B. Szatmári 1974; László – Schmidt Mayer 2008 21, 56.

¹⁰⁹ Kovács 2018 37, fig. 13.

¹¹⁰ B. Szatmári 1974 46.

fragments.¹¹¹ Written sources mention more than one ‘palace’ and ‘manor’ in Ótata;¹¹² the find material recovered from a plot near the main square might have belonged to one of them.

There is one more artefact, the appearance of which amongst the finds of the market town is interesting. A carved bone plate fragment and a few potsherds were found in a small and shallow pit in the excavation of a plot next to Kossuth Square. A pit with late 15th–early 16th-century material cut through the related feature,¹¹³ which, therefore, must be older. By its shape and decoration, the bone carving was once part of a 15th-century saddle, representing a type the oldest specimens of which were made in the first half of the 15th century, at the time of the reign of Sigismund of Luxembourg.¹¹⁴ The decoration of the fragment includes vegetal motifs and the foot of an animal, perhaps a dragon. Similar saddles were often decorated with dragons; some believe their owners can be linked with the Order of the Dragon of Sigismund of Luxembourg.¹¹⁵ We do not know the name of the one-time owner of the plot where the bone plate fragment was discovered; however, some artefacts in the find material of the market town can likely be connected with the castle and its noble guests.¹¹⁶

No archaeobotanical record dated to the period in focus is known from the study area.¹¹⁷

Summary

The paper comprises an attempt to reconstruct the changes the building of a castle induced in the landscape. The study area, Tata, and its surroundings were situated next to the *Medium Regni*, the central part of the medieval Kingdom of Hungary, and important major routes; this setting fundamentally determined the direction of the region’s development. In the Árpád Age, the landscape was spotted with short- and long-lived villages, of which written sources only mention some. The archaeobotanical record of the period has allowed one to reach a basic understanding of the Árpád Age agrobiodiversity of the area of Tata, including several details of local agriculture on which documents remain silent. Cereal remains tell us about the range of cultivated species, their weeds, about the time of sowing (autumn), and the method of reaping (with scythes). The wood remains in the samples indicate oak forests and swamplands in the area. The pace of development increased only in the 14th century, partly because the estate became royal property then and partly due to societal changes induced by innovations in agriculture (the latter in accord with the processes taking place in other parts of the country at the time). As a result, the number of villages decreased, but the persisting ones became permanent. The castle was built in this setting in the early 15th century, bringing about even more changes in its surroundings. The most conspicuous ones, including the construction of the castle lake, concerned the hydrological conditions of the area. Based on the recovered find material, mostly the nearby workshops supplied the castle with everyday utensils; besides, some artefacts from the market town can be explained by the proximity of the royal castle. In summary, while the reconstructed processes fundamentally match the coeval tendencies in the country, the royal presence brought new, unique elements to the landscape and the archaeological record.

¹¹¹ Kovács 2018 35–37.

¹¹² See Györffy 1987 459 and porta registers (*MNL OL E 158*) at <https://adatbazisokonline.mnl.gov.hu/adatbazis/dikalis-osszeirasok>. [last accessed on 10. 10. 2023.]

¹¹³ Kovács 2018 34, figs. 13, 15.

¹¹⁴ Somogyvári 2017 10.

¹¹⁵ Tarcsay 2023 33–36.

¹¹⁶ Like in Visegrád, some noble court members probably had houses in Tata, too; even a written source mentions such a property of Pippo Spano (*ZsO XIII. 567*).

¹¹⁷ Relatively big archaeobotanical samples were collected from the fill of the medieval moat of the castle, but all were taken from early modern and modern layers. Máté Merkl analysed this record.

Data Archive

This chapter enlists the important historical and medieval archaeological data on each investigated settlement, starting with Tata Castle and followed by the others in alphabetical order. The list does not include settlements that only appear in 13th–14th-century documents.

Tata Castle¹¹⁸

There are several overviews of the history of Tata Castle; the most recent ones are the PhD dissertation of Richárd Schmidtmayer and a brief survey in an architectural historical study by Olivér Gillich.¹¹⁹ The following summary is based primarily on these works. At the end of the 14th century, likely from 1389, the area of Tata was the property of István Lackfi, who, according to the available sources, started to build his main residence or a side residence there.¹²⁰ Sarolta Szatmári believed that a single-wing palace stood in place of Tata Castle at that time; however, neither the results of the excavations led by her nor her arguments have provided irrefutable evidence supporting this theory.¹²¹ Shortly after that, in 1397, the king (Sigismund of Luxembourg) accused István Lackfi of high treason, sentenced him to death, and confiscated his properties. Thus, the area became a royal property, where Sigismund had his castle built in no time: the oldest document he wrote from Tata is dated to 1409, which indicates the building complex was already standing at that time.¹²² Tata Castle was likely given to István Rozgonyi, *comes* of Temes, as a benefice in the early 1420s; there is no written proof of the donation, only indirect evidence in a forged charter from 1426. After the death of Sigismund, the Rozgonyis had their right to Tata renewed by Habsburg Albert in 1439. During the civil wars in the 1440s, another branch of the Rozgonyi family surfaced from the internal conflicts of the kindred as the owners of Tata Castle. King Matthias renewed the lien of the Rozgonyis in 1458 and 1459, but the building complex became royal property again in 1472.¹²³ At the end of his reign, Matthias gave Tata to his son, John Corvinus, who entered with the barons and prelates into a contract stating that after the death of the king, he could only keep the castles of Pozsony (Bratislava, Slovakia), Komárom, and Tata if he pays 40,000 *forints* to them. The new king, Vladislav II, confirmed this contract,¹²⁴ and Tata Castle became a royal property again shortly after, in 1493.¹²⁵ The parliament in Tata in 1510 is also connected to his reign; this event was exceptionally important in the life of the surrounding settlements.¹²⁶ The second building phase of Tata Castle can be connected with either Matthias or Vladislav II. It cannot be dated precisely; based on historical data, the construction works were carried out between 1472 and 1510. These did not alter the original layout of the building complex but only completed it.¹²⁷ This period, the 15th and the early 16th century, was the heyday of the castle.

After the Battle of Mohács, a military function was added to the formerly representative building. The Ottomans occupied it first in 1529, only to give it immediately to their vassal,

¹¹⁸ IVO site ID No. 32378.

¹¹⁹ Schmidtmayer 2015; Gillich 2019. Besides, among others, Sarolta Szatmári, the leading archaeologist of the excavations, also delved into the topic (see, e.g., B. Szatmári 1974; B. Szatmári 1975; Szatmári-Bíró 1977; B. Szatmári 1979; B. Szatmári 1982). For a detailed description of the early research history, see Schmidtmayer 2015 9–10.

¹²⁰ Schmidtmayer 2015 206.

¹²¹ B. Szatmári 1974 50–51; Gillich 2019 59.

¹²² Schmidtmayer 2015 36, 183.

¹²³ Schmidtmayer 2015 47, 99; Gillich 2019 53–54.

¹²⁴ Neumann 2010 66–67.

¹²⁵ Schmidtmayer 2015 109.

¹²⁶ Neumann 2010 78–79.

¹²⁷ Gillich 2019 62–63.

Szapolyai. During the 1543 military campaign, the Ottomans occupied the small forts in the region one by one, and the garrison of Tata handed over the castle without a fight; next, the Ottomans seriously damaged and left it. A longer Ottoman occupation started in 1558, which ended with the army of Eckhard Salm reconquering the castle in 1566. As the defensive facilities of the building complex were highly outdated at the time, an outer defence line comprising a rondel, bastions, and a moat was constructed around it (based on written sources) between the 1550s and 1586.¹²⁸ Independent of these constructions, the castle changed hands multiple times during the 16th century.¹²⁹ The building complex became ruined in the wars and no longer held an important role in the military conflicts of the following centuries.¹³⁰ The last Ottoman occupation lasted from 1683 to 1685.¹³¹ After the wars, the castle and the estate became the property of the Esterházy family, who remained owners until 1945. The current look of the building complex is the result of 18th–19th-century transformations connected to the Esterházys.¹³²

Initially, the castle was a side residence of the king for a long time. According to the available sources, Sigismund visited Tata twenty-five times during his life, and the castle was a venue of diplomatic events more than once.¹³³ When owned by the Rozgonyis, the Tata Castle was likely the main residence of the family.¹³⁴ King Matthias visited Tata less frequently than Sigismund: he only stopped there seven times to rest during hunts and travels, which indicates a decrease in the significance of the place. In the short time of John Corvinus's ownership, the castle could serve as the centre of the related estate; after that, when it became a royal property again, it became again a side residence of the king.¹³⁵ Vladislav II visited Tata quite often, altogether fourteen times, and the castle served as the venue of a parliament during his reign. The importance of the place decreased again at the time of Louis II, who, according to written sources, only visited the castle twice.¹³⁶

The castle was first investigated, with relatively small trenches, by Endre Bíró in 1962;¹³⁷ however, the bulk of the information available on it comes from the systematic excavations led by Sarolta Szatmári in 1965–1972, focusing on the medieval building complex and its moat. Parallel with the excavations, the reconstruction of the castle also started. Szatmári published her most important findings in numerous studies¹³⁸ but the vast find material has remained unpublished. The most recent excavations in the area of the castle started in 2023; Mihály Giber and his team focused on the Ottoman Period gateway and mill. The results of the project are yet to be published.¹³⁹

¹²⁸ Buzás 2010 93; B. Szatmári 1974 48; Bíró 1968; Bíró 1979 189.

¹²⁹ Tóth 1998.

¹³⁰ Gillich 2019 55, 64.

¹³¹ Bíró 1979 199.

¹³² Gillich 2019 57.

¹³³ Gillich 2019 53.

¹³⁴ Schmidt Mayer 2015 208–214.

¹³⁵ Gillich 2019 54.

¹³⁶ Neumann 2010 78–79.

¹³⁷ The excavation was carried out in the context of water pipe network construction works. Endre Bíró opened six trenches to investigate the area concerned, including the row of pillars in front of the lakeside wing, the chapel, the southwestern wing, the moat, and the rondel. The fieldwork was scarcely documented (Bíró 1963 76; Bíró 1970).

¹³⁸ B. Szatmári 1971; B. Szatmári 1974; B. Szatmári 1975; Szatmári-Bíró 1977; B. Szatmári 1979; B. Szatmári 1982.

¹³⁹ Bianka Gina Kovács participates in the projects as a consultant.

Agostyán [1440: *Abosthyan*]

The settlement first appears in a perambulation in 1343 as the property of Miklós, son of Domonkos, and Pál Tulok, son of Péter. Pál Tulok is mentioned in multiple documents in the following period, and a 1352 charter reports that he had killed Miklós, son of Domonkos and entered into an inheritance contract with his son and widow. The ownership of the settlement remained disputed, concluding in a litigation in 1366, which ended in the division of the estate in 1367. The related charters report on meadows, pastures, forests, vineyards, a castle site, and a church. Documents from the rest of the century mention the settlement multiple times, always in the context of its ownership.¹⁴⁰ The Tulok family likely died out in the early 15th century, and the village became the king's property. After that, it is only mentioned in 1440 as one of the estates belonging to Tata Castle; Queen Elisabeth donated it to Kelemen of Újtata in the same year. The settlement appears in 1489 already as the property of the Kovácsi family.¹⁴¹ According to the 1541 porta register, the village was still owned by a noble family and inhabited (the source mentions three houses and two new, six poor, and ten abandoned ones);¹⁴² after that, it disappears from the sources. It was only resettled in the 1730s.¹⁴³

No medieval settlement site is known in the territory of the recent village. Éva Vadász and Gábor Vékony found a medieval pottery fragment (amongst other finds) on Hárshegy on the southern outskirts of Agostyán,¹⁴⁴ besides, the collection of the Kuny Domokos Museum in Tata holds a medieval vessel collected on the site and donated to it.¹⁴⁵ The castle mentioned by written sources could not be located yet.

Grébics [1440: *Gerebech*, 1449: *Gerebich*, 1459: *Gerebech*]

Grébics first appears in documents from 1237–1240 as a neighbour of Tömörd and a dwelling of royal equerries. The 1284 and 1291 perambulations of Billeg and Moca, respectively, also mention the village. After that, it appears next only in a 15th-century document as an estate of Tata Castle.¹⁴⁶ Based on the 1541 porta register, it was still inhabited at the time (with four houses, seven poor, and two new ones, and two serfs);¹⁴⁷ it likely became deserted in the second half of the century. A manor stood in the place, Grébicspuszta ['deserted Grébics'] in the Modern Period,¹⁴⁸ and the related domonial map features a ruin marked '*rudera antique ecclesie*', perhaps the remains of the medieval church of the one-time settlement (*fig. 15*).¹⁴⁹ This building does not appear anymore on later maps.

During a surface find collecting survey, Éva Vadász and Gábor Vékony registered in an elongated, about 800 m long spot the traces of a late medieval¹⁵⁰ settlement covering a hilltop on the outskirts of Naszály, along the dirt road connecting the northwestern corner of Lake Asszony and Felső-Grébics, south of the modern manor, along the southwestern bank of the wide Grébicsi víz ['Grébics Water'].¹⁵¹ This site can likely be identified as the late medieval Grébics village.

¹⁴⁰ See *Tóth 2013* 89–90 for details.

¹⁴¹ *Schmidtmayer 2015* 241.

¹⁴² Porta registers (*MNL OL E 158*) at <https://adatbazisokononline.mnl.gov.hu/adatbazis/dikalis-osszeirasok>.

¹⁴³ *Fényes 1848* 174; *Pesty 1977* 55–57.

¹⁴⁴ Inv. No. KDM 71.33.24. The site is not registered in IVO.

¹⁴⁵ Inv. No. KDM 51.384.1. The vessel was not found upon checking the find material.

¹⁴⁶ *Schmidtmayer 2015* 240–242.

¹⁴⁷ *MNL OL E 158*, 95–107.

¹⁴⁸ *Fényes 1848* 191.

¹⁴⁹ *Schmidtmayer 2013* 55.

¹⁵⁰ KDM Archaeological Data Archive 158-69; IVO site ID No. 44649 Felső-Grébics-puszta 1 (source: IVO database, <https://www.oeny.hu/oeny/ivo/lelohely?azon=44649>).

¹⁵¹ Inv. Nos. KDM 71.4.1–19.

They also found two other medieval sites, a 13th–14th-century and an Árpád Age one, at 800 and 1500 m distances in the north, respectively.¹⁵²

Kovácsi birtok [1440: *Kowachy*]

The settlement first appears in written sources in the 14th century, the 1343 perambulation of Agostyán and documents from 1364, 1379, 1388, and 1389, in context with its owners, the Kovácsi family.¹⁵³ It is only mentioned in a 1440 charter as the propriety of Tata Castle. Csánki supposed that the village was partially owned by the castle and partially by a noble family; it is a question, however, if Tata's 'ownership' was actually only a legal claim.¹⁵⁴ Various members of the Kovácsi family also appear in 15th-century documents, the latest of which is dated to 1489, when the Kovácsi manor was seemingly pawned for some time by Mihály Újszászi, castellan of Komárom.¹⁵⁵ No 16th-century mention is known of the settlement, which disappeared completely from written sources after that.

The one-time Kovácsi was located at the Öregkovács-domb [Öregkovács Hill] on the eastern outskirts of the recent Baj village. Sándor Petényi unearthed there an Árpád Age round church with a 15th–16th-century manor house in its vicinity. The excavation did not cover the settlement surrounding the church, and the extent of the medieval settlement was not determined either.¹⁵⁶

Naszály [1449: *Naztan*]

The first written mentions of Naszály are dated to the second half of the 13th century: the settlement appears in the 1269 perambulation of Sárszék and the 1284 perambulation of Billeg. It was the joint property of István *de genere* Csák and the abbey of Tata back then.¹⁵⁷ Later, in the mid-15th century, it is mentioned as an estate belonging to Tata Castle. In 1502, Oszkár Korlátkövi had a mill built above Naszály in the territory of Újtata;¹⁵⁸ this is the last mention of the settlement in the 16th century. It only appears again in the 1635 porta register as a newly (re)settled estate of the castle; half a household was recorded there in 1639, and four households in 1648.¹⁵⁹

No archaeological site is known in the built-up area of the current settlement. Two Árpád Age sites were located west of it, along the Naszály–Grébicsi-vízfolyás (a stream), during surface find collecting surveys in 1968 and 2012.¹⁶⁰ Moreover, the 1968 surveys resulted in identifying several Árpád Age sites, with a ca. 300 m long settlement with 11th–14th-century find material and the traces of a relatively large stone building (perhaps a church) among them, at Almáspuszta on the northern outskirts of the village.¹⁶¹

For the sites around Grébicspuszta, see Grébics.

¹⁵² IVO site ID No. 44651 Felső-Grébics-puszta 2; 44659 Billegi csatornaórség, temető [Billegi channel guard, cemetery] (source: IVO database, <https://www.oeny.hu/oeny/ivo>).

¹⁵³ *Tóth 2013* 93–94.

¹⁵⁴ *Schmidt Mayer 2015* 240–242, see also *Csánki 1985* 505.

¹⁵⁵ *Petényi – Sabján 2003* 129–132.

¹⁵⁶ *Petényi 2010* 8–10; IVO site ID No. 26736, Öregkovács-hegy (source: IVO database, <https://www.oeny.hu/oeny/ivo/lelohely?azon=26736>).

¹⁵⁷ *Györffy 1987* 443.

¹⁵⁸ *Schmidt Mayer 2015* 241.

¹⁵⁹ Porta registers (E 158) at <https://adatbazisokonline.mnl.gov.hu/adatbazis/dikalis-osszeirasok>.

¹⁶⁰ IVO site ID No. 44637 Tatai út melléke 2, 80271 Nyúl-hegy.

¹⁶¹ KDM Archaeological Data Archive 158-79. The six sites mentioned in the field diary have not been registered in IVO. The find material recovered from them is currently part of the collection of the Kuny Domokos Museum, under Inv. Nos. KDM 70.12.1–14, KDM 70.13.1–12, KDM 71.45.8–12, KDM 71.51.6–9, KDM 71.56.3–7, KDM 71.57.1–4, KDM 71.59.8–11, and KDM 71.62.7–9.

Ótata [1440, 1449: *Otata*, 1459: *Thata*]

Sarolta B. Szatmári and, more recently, Richárd Schmidt Mayer summarised the medieval history of the settlement;¹⁶² therefore, only a brief overview based on their work is presented here. The toponym ‘Tata’ first appears in the 1093 property register of the Abbey of Pannonhalma in context with the Benedictine abbey.¹⁶³ The earliest settlement core (in the area of today’s Kossuth Square) could have emerged next to this abbey (somewhere in the area of today’s Fürdő or Nagykert streets).¹⁶⁴ Due to excellent conditions, already two ‘Tata’ settlements, Ótata [‘Old Tata’] and Újtata [‘New Tata’], existed in the area in the 13th century; besides, Alsófalu and Felsőfalu were likely also in their vicinity.¹⁶⁵ All villages were the abbey’s property until 1254 when the Csák kindred occupied the area of Tata. King Charles I obtained the area from them in an exchange of land in 1326.¹⁶⁶ A major figure of the period, Tamás of Csór, castellan of Csókakő, was donated a palace and a mill site in the settlement next to the Benedictine abbey.¹⁶⁷ Ótata was granted market town rights in the second half of the 14th century, likely between 1357 and 1387.¹⁶⁸ The area could be donated to the Lackfi family in the second half of the 14th century, who made it to their estate centre. After the family fell from favour in 1397, the estate became the property of Sigismund of Luxembourg, who had the castle, serving as a royal side residence, built there in a short time; this step – as indicated by the fact that from 1402, Újtata also appears in sources as a market town – fundamentally determined the later development of the region.¹⁶⁹ The settling of the Franciscan order shortly later, in the first half of the 15th century, also reflects the increasing importance of the town.¹⁷⁰ For about fifty years in the mid-15th century, the owner of the castle and its estates was the Rozgonyi family.¹⁷¹ King Matthias took back from them the castle, together with Ótata and Újtata, in 1472, and it remained a royal property until 1526, save for a short period when John Corvinus owned it. That it was the venue of the parliament in 1510 also shows the importance of the castle and the settlement; this event also promoted the development of the market towns. This fruitful period ended in the mid-16th century, when, as a result of the devastation caused by the Ottoman army, the region became practically deserted, the Benedictine abbey and the Franciscan monastery ceased to exist, and life in the towns became reduced for many decades until their revival in the 17th century.¹⁷² The last document to mention the two settlements is the 1541 porta register, where they appear as Tata (with 28 households, seven poor and twelve deserted ones, one owned by the overseer of the castle, seven *domus dominorum*, as well as a household and six poor ones owned by the abbey) and Tótváros (with 12 households, eight poor, five deserted, and four new ones, as well as four owned by the overseer of the castle).¹⁷³ Tata appears next in the 1635 porta register as occupied (with eight households, 27 serfs, and three deserted).¹⁷⁴

¹⁶² For a detailed history of the town, see B. Szatmári 1979, Szatmári 2004, and a recent work by Schmidt Mayer (Schmidt Mayer 2011).

¹⁶³ F. Romhányi 2000 66; Schmidt Mayer 2011 192.

¹⁶⁴ Szatmári 2004 37.

¹⁶⁵ B. Szatmári 1979 139.

¹⁶⁶ Schmidt Mayer 2011 192.

¹⁶⁷ Györffy 1987 459; Tóth 2013 94–95.

¹⁶⁸ Szatmári 2004 34.

¹⁶⁹ Schmidt Mayer 2011 192.

¹⁷⁰ B. Szatmári 1979 167.

¹⁷¹ Schmidt Mayer 2011 192, 195–196.

¹⁷² B. Szatmári 1979 148–150.

¹⁷³ MNL OL E 158, 95–107.

¹⁷⁴ Porta registers (MNL OL E 158) at <https://adatbazisokonline.mnl.gov.hu/adatbazis/dikalis-osszeirasok>.

The remains of the medieval Ótata are under the built-up area of Tata today. While systematic excavations were conducted in Tata Castle for decades, the market town was researched in only a few trenches of considerable size (*fig. 14*).

The medieval parish church of Ótata was localised under Kossuth Square, the current main square of the town. While the attempt of Sándor Petényi in 1994 to find the ruins in test trenches remained unsuccessful,¹⁷⁵ Richárd Schmidt Mayer excavated the area in 2015 and discovered the foundations of a late medieval church transformed into Baroque style, with some 17th–18th-century graves and a crypt around them. Based on written sources, this church, devoted to St. Blaise [*Balázs*] served the community populating the town after its devastation in the Ottoman Period. However, the original church building was a late medieval one with a polygonal sanctuary, which Schmidt Mayer identified, based on its size and the lack of medieval burials around it, as the Chapel of the Holy Mary (a building appearing in several late medieval documents) instead of the medieval parish church.¹⁷⁶

Archaeological monitoring was conducted in limited areas on a plot east of Kossuth Square, first by Sarolta Szatmári in 1974 and recently by Bianka Gina Kovács in 2016. The fieldworks brought Late Árpád Age and late medieval settlement features to daylight.¹⁷⁷ Settlement features have also been identified in another plot southwest of the main square,¹⁷⁸ while Sándor Petényi found an almost complete Late Árpád Age pot and medieval potsherds while monitoring gas pipe construction-related earthworks in the northeastern part of the square (at the start of Rákóczi Street) in 1994.¹⁷⁹ Simultaneously, Julianna Kisné Cseh unearthed fourteen graves at the Hősök Square-side end of Rákóczi Street. Traces indicating a cemetery there had also been found in Hősök Square before: according to a report from 1913, human bones and the remains of old Hungarian garments, hair pins, combs, and diverse jewellery items were discovered during the landscaping works carried out within the frame of the reconstruction of the place; regrettably, neither the finds nor any description or image of them have persisted.¹⁸⁰

Also in context with the 1994 gas pipeline construction, Julianna Kisné Cseh unearthed an Árpád Age house and a furnace in Fürdő Street, north of Kossuth Square. Research had already been conducted earlier in plots of the street: in 1976, Sarolta Szatmári carried out an excavation under No. 16, bringing to light a section of a Roman road, plenty of 13th–15th potsherds, and a late medieval pot which was found upside down with the skeleton of a kitten within. Simultaneous research in Katona Street also yielded medieval pottery in abundance.¹⁸¹

Also, in 1976, a rescue excavation was carried out in the Wagner-fürdő [bath]; according to historical tradition, this building was originally the so-called Burgundia Mill of the Benedictine order.¹⁸² However, the research did not identify any trace of medieval constructions there.¹⁸³ Fürdő Street is also important because, according to historical tradition, the Benedictine abbey was in the vicinity. Stone carvings and the gravestone of tailor Márton Szabó and his wife, with two skeletons underneath, were discovered during the construction of a cellar there in 1912. The Byzantine pectoral reliquary cross donated to the collection of the local museum had likely been also found there. Based on that, the area has been accepted to have been the place of the

¹⁷⁵ *Kisné Cseh – Petényi 2004* 12–13.

¹⁷⁶ *Schmidt Mayer 2016* 268–269.

¹⁷⁷ *Kisné Cseh – Petényi 2004* 17; *Kovács 2018*.

¹⁷⁸ Tata, Kossuth tér 10/b.

¹⁷⁹ Inv. Nos. KDM 2017.3.1–9.

¹⁸⁰ *Kisné Cseh – Petényi 2004* 10–11. They were probably the remains of a modern cemetery.

¹⁸¹ *Kisné Cseh – Petényi 2004* 18.

¹⁸² *Rados 1964* 127.

¹⁸³ *Kisné Cseh – Petényi 2004* 17–18.

Benedictine abbey for more than a century.¹⁸⁴ Several unfurnished graves were disturbed on the plot while digging a lime pit in 1964; regrettably, only a short written report is available on the discovery.¹⁸⁵ To authenticate the site, Sándor Petényi opened exploratory trenches on the courtyard of the plot under No. 24, the opposite plot, and the street before the plot under No. 26. He only found modern features and find material, thus failed to confirm the location of the medieval abbey.¹⁸⁶

During the construction of Május 1. Road in 1979, two houses were demolished on the plots under 34 and 36 Nagykert Street, revealing the detail of a graveyard cemetery with eighty graves. Based on the grave goods, the cemetery could have been in use already in the 11th century, but 13th–14th-century artefacts have also been recovered from the burials. About one in every three graves was a built one; the relatively high proportion of built graves is characteristic of the cemeteries of Benedictine abbeys, which raised the possibility that the Abbey of Tata could be near this site. Besides the graves, the excavation on the plots brought to light the remains of a relatively large (probably medieval) building and medieval pits.¹⁸⁷

Several Árpád Age sites which cannot be connected with any settlement mentioned in written sources have been identified on the outskirts of Tata during surface find collecting and site authentication surveys: János László found an Árpád Age site north of the built-up area in 2009, while Melinda Koller discovered an Árpád Age, three 13th–14th-century, and a small Árpád Age and late medieval site in 2015–2016 during surface find collecting surveys on its northern outskirts.¹⁸⁸ Similar surveys yielded two more sites along the Fényes-patak¹⁸⁹ in 2020, as well as the scattered traces of a medieval settlement in the area of Asszony-tó [Lake Asszony] on the western outskirts of the town in 1968¹⁹⁰ and a late medieval site west of it in 2019.¹⁹¹ Several Árpád Age settlement sites are known in the area of the industrial park on the southern and southwestern outskirts of the settlement; excavated features (the remains of an oven and a house) are known from one,¹⁹² while two more were likely inhabited, even if with only low intensity, both in the Árpád Age and the Late Middle Ages.¹⁹³

The dredging works of Öreg-tó in 1972 also brought to light Árpád Age finds in the southern shore zone around the estuary of the Által-ér. At least a part of these were certainly washed and

¹⁸⁴ See *Kovács – Libor 2023* 233 for details.

¹⁸⁵ KDM Archaeological Data Archive 97–73.

¹⁸⁶ *Kisné Cseh – Petényi 2004* 13–14.

¹⁸⁷ *Kovács – Libor 2023*.

¹⁸⁸ IVO site ID No. 73465 Mocsai úti-dűlő, 90111 Mocsai úti-dűlő II, 90113 Komáromi-útmenti-dűlő, 90115 Mikoviny-árokától DNy-ra, 90117 Mikoviny-árokától ÉK-re; 92047 Réti-major (source: IVO database, <https://www.oeny.hu/oeny/ivo>).

¹⁸⁹ IVO site ID No. 97331 Fényes-patak I, 97333 Fényes-patak II (source: IVO database, <https://www.oeny.hu/oeny/ivo>).

¹⁹⁰ *Kisné Cseh – Petényi 2004* 18.

¹⁹¹ IVO site ID No. 95127 Miklósi-határ (source: IVO database, <https://www.oeny.hu/oeny/ivo/lelohely?a-zon=95127>).

¹⁹² IVO site ID No. 54102 Hereföldek, 59796 Site 1/1998, 64374 Bánhidai úti dűlő I, 64382 Bánhidai úti dűlő II, 73469 Halasi-tó, 90107 Káposztás-völgy, 34594 Tervezett ipari park [Future Industrial Park] Site I, 34595 Tervezett ipari park [Future Industrial Park] Site II, 34598 Tervezett ipari park [Future Industrial Park] Site IV, 34659 Tervezett ipari park [Future Industrial Park] Site V, 34664, Tervezett ipari park [Future Industrial Park] Site IX. Árpád Age sites were registered during the survey in the early 2000s, but more recent surface find collecting surveys did not confirm the presence of this horizon at 64378 Kisles II and 64380 Kisles I (source: IVO database, <https://www.oeny.hu/oeny/ivo>).

¹⁹³ IVO site ID No. 34597 Tervezett ipari park [Future Industrial Park] Site III, 34660 Tervezett ipari park [Future Industrial Park] Site VI, 34661 Tervezett ipari park [Future Industrial Park] Site VII, 34662 Tervezett ipari park [Future Industrial Park] Site VIII (source: IVO database, <https://www.oeny.hu/oeny/ivo>).

deposited there by water, but it cannot be excluded either that the area had been inhabited before having been flooded during the construction of the lake.¹⁹⁴ In a rescue excavation in 1968, Éva Vadász and Gábor Vékony found a few early medieval potsherds at the lagoon south of the lake,¹⁹⁵ and in 1969, Gábor Vékony also collected some medieval fragments in the area of Pálma Szálló [Hotel Pálma] by Cseke-tó [Lake Cseke], east of Öreg-tó.¹⁹⁶

Stancs [1449: *Stanych*]

The name of Stancs first appears in charters in the 13th century. The settlement was the property of Bors *comes*, who, according to a 1225 confirmation charter by King Andrew II, donated his vineyard there to the Cistercian Abbey of Borsmonostor. Shortly later, before 1233, Bors *comes* sold the village to the Csák kindred. Based on 13th–14th-century documents, the settlement was situated between Agostyán, Szomód, Almás, Neszmély, and Tardos;¹⁹⁷ today Dunaszentmiklós occupies these parts. The name ‘Szentmiklós’ first appears in charters at the end of the 14th century both as a personal name (1382, 1838: Mihály Szentmiklósi) and as a toponym, referring to an illegally taken ploughland of the Benedictine Abbey of Tata (1382, 1383: *Zenthmiklosfeulde*). However, according to the respective sources, this land lay within the borders of Tata at the time,¹⁹⁸ which makes its identification with Stancs village questionable, especially as the latter is mentioned in its original name amongst the estates of Tata Castle even in the 15th century.¹⁹⁹ There is no available information on the later history of the settlement.

Julianna Kisné Cseh localised the only medieval site known in the current built-up area of Dunaszentmiklós during a surface find collecting survey in 2006. The site lies in the southwestern part of the settlement, on top of a ridge along a former watercourse west of Tatai Road.²⁰⁰ The present church of the village was built in the early 20th century, but an east-west oriented church building is marked in the area of the current cemetery both on the maps of the Habsburg Military Surveys and a cadastral map.²⁰¹ It was perhaps the church mentioned by Elek Fényes, built by the Germans resettling the village in the 1730s;²⁰² its orientation, however, raises the possibility of its medieval origin.

In 1870, a hoard from perhaps the time of the first Mongol invasion was found in the area, likely on the outskirts of the settlement. It comprised two Kyiv-type pectoral crosses, two processional crosses, and a cross base, most of which could be dated to the 12th century. The finds are kept in the collection of the Hungarian National Museum.²⁰³

Based on the above, there likely was a medieval settlement in the place of the built-up area of today’s Dunaszentmiklós, and that settlement is probably identical to the medieval Stancs village mentioned in several documents.

¹⁹⁴ KDM Archaeological Data Archive 153–79.

¹⁹⁵ KDM Archaeological Data Archive 100–73.

¹⁹⁶ KDM Archaeological Data Archive 99–73.

¹⁹⁷ *Györffy 1987* 405; *Tóth 2013* 89; *PRT I* 778; *PRT II* 496; *Csánki 1985* 516.

¹⁹⁸ *Tóth 2013* 90, 95–96.

¹⁹⁹ *Schmidtmayer 2015* 240; *MNL OL DL* 14284.

²⁰⁰ *Kisné Cseh 2006* 11; IVO site ID No. 56180 (source: IVO database, <https://www.oeny.hu/oeny/ivo/lelohely?azon=56180>).

²⁰¹ First Habsburg Military Survey (1782–1785), Second Habsburg Military Survey (1819–1869), cadastral maps (19th century). Source: maps.arcanum.hu, last accessed on 30.01.2023.

²⁰² *Fényes 1848* 182–183.

²⁰³ *Lovag 1994* 191, II-5, 6, 13, 19.

Szentgyörgy [1449: *Zenthgewrg*]

The toponym first appears in 14th-century sources: King Sigismund donated his estate called Szentgyörgyteleke to palatine István Lackfi in 1389.²⁰⁴ It was enlisted amongst the estates of Tata Castle in the 15th century,²⁰⁵ but it was no longer mentioned later; it was likely deserted already in the 15th century.

The settlement was likely situated somewhere on the outskirts of Környe, in the land called Szentgyörgypusztá today. Surface find collecting and authentication surveys in the 2000s and 2010s have identified several Árpád Age settlements in this area, north of the modern farmstead²⁰⁶ and in the territory of the industrial park.²⁰⁷

Szentiván [1440, 1449: *Zenthiwanhegye*, 1459: *zenthIwanhege*]

The Szentiván toponym first appears in a land exchange charter by King Charles I confirming that the king exchanged four of his castles and their domains in the Vértes area (Gesztes, Csókakő, Csesznek, and Bátorkő) for two castles and the related estates of the Csák kindred in Tolna County. Szentiván is mentioned there amongst the king's possessions, as it likely belonged to Gesztes at the time.²⁰⁸ In the 15th century, the settlement was mentioned as an estate of Tata Castle; it likely merged with the town as it does not appear in later sources.²⁰⁹

Ákos Kiss started rescue excavations in 1956 in the context of the expansion of a stone quarry on Kálvária Hill in the southern part of Tata. Later, Alán Kralovánszky and, after him, Endre Bíró continued the fieldwork, revealing the foundations of a late medieval three-nave church, the sanctuary of which has been built into the still-standing chapel refurbished by Jakab Fellner. They also unearthed several 15th–16th-century graves southwest of the church building (the quarry later destroyed that area) and partial houses in the western zone of the investigated area. As the documentation of their fieldwork went missing, Sarolta Szatmári and Sándor Petényi conducted an authentication excavation on the site in 1994, confirming that the layout reconstruction of the church was correct and bringing more late medieval graves to daylight.²¹⁰ The church was identified as the Church of St. John the Baptist, the parish church of the village of Szentiván.²¹¹

Szentkirály [1449: *Zenthkyral*]

The toponym only appears in the 1449 charter, and no further information is available on it. It likely merged with Tata later.²¹²

Identifying the settlement is impossible as there is no known land with a similar name in the administrative area of Tata. It was likely one of the Árpád Age sites on the outskirts of the town.

Szomód [1440, 1449, 1459: *Zmold*]

The name of the settlement appears first in a 1225 charter where King Andrew II confirms that Bors *comes* donated land to the Abbey of Borsmonostor. The abbey was given land and a meadow

²⁰⁴ Tóth 2013 94; Schmidtmayer 2015 206.

²⁰⁵ Schmidtmayer 2015 240–242.

²⁰⁶ IVO site ID No. 73017 Szentgyörgypusztai temető, 28845 Közép-dűlő, 73021 Közép-dűlő (source: IVO database, <https://www.oeny.hu/oeny/ivo>).

²⁰⁷ IVO site ID No. 90101 Liskai-dűlő, 59482 Szentgyörgypusztá-Rikkantó, 59481 Szentgyörgypusztá-Kövecses dűlő, 57958 Ipari Park [Industrial Park] Site 1/2005, 57963 Ipari Park [Industrial Park] Site 5/2005 (source: IVO database, <https://www.oeny.hu/oeny/ivo>).

²⁰⁸ Tóth 2013 94; Schmidtmayer 2015 226.

²⁰⁹ Schmidtmayer 2015 240–242.

²¹⁰ Kiss 1957 48; Kiss 1958 52; Bíró 1959 69; Petényi – Szatmári 1997 111.

²¹¹ Schmidtmayer 2011 195.

²¹² Schmidtmayer 2015 242.

next to the *grangia* and the orchard they established, as well as a mill next to the manor of the Abbey of Tata, a mill site, and a forest. Shortly after, still before 1233, Bors *comes* sold the estate to Pócs of the Csák kindred. A charter dated 1237–1240 mentions the village as a neighbour of Füzitő, while the 1269 perambulation of Sár mentions it as the joint property of Ugrin, son of Pócs, and the provost of Majk. The settlement had many owners in the 14th century: it was the joint property of Tamás and Péter, sons of Farkas son of Frank Szécsényi of the Kancsics family,²¹³ while in 1349, it appears again as owned by the provost of Majk, while in 1364, it was already a possession of palatine Miklós Kont.²¹⁴ It was listed amongst the estates of Tata Castle in the 15th century.²¹⁵ The village was still inhabited during the census made for the 1541 porta register (with six households, fifteen poor and four abandoned ones, as well as one belonging to the overseer);²¹⁶ it became abandoned likely when the whole region was deserted shortly later, as the 1570 tax register of the Esztergom *sanjak* enlists it already as deserted.²¹⁷ Mátyás Bél mentions the fish pond of the village and a mill sited on it and connects the ruins in the area to King Matthias.²¹⁸ According to the description by Elek Fényes, the pond had already been drained in the mid-19th century.²¹⁹ Frigyes Pesty believes that the settlement had its own parish church from 1660.²²⁰

A medieval site was found east of the built-up area during the 1968 surface find collecting survey; the 2008 test excavation there brought to light features of an Árpád Age settlement, likely destroyed during the first Mongol invasion.²²¹ Another site was also identified on the eastern outskirts of the recent village during the 1968 survey,²²² while both that and the 2005 inspection yielded traces of several medieval settlements along the Árendás-patak south of the built-up area,²²³ including an Early Árpád Age and a 12th–13th-century site on the northern bank of the westward-flowing watercourse.²²⁴ László Ferenczi believes that the Cistercian *grangia* and mill, mentioned in 13th-century charters, must be somewhere in the vicinity of the two latter sites.²²⁵ The remains of the late medieval village are probably under the current village; however, the archaeological evidence of that has yet to be found.

Szólós [1440, 1449, 1459: *Zewles*]

A Szólós village in Komárom County appears already in 13th-century sources, but it cannot be the settlement in the focus of our study as it was situated north of the Danube. The Szólós in question only appears in charters in the 15th century and exclusively in context with the estate

²¹³ Györffy 1987 456–457.

²¹⁴ Csánki 1985 154.

²¹⁵ Schmidt Mayer 2015 240–242.

²¹⁶ MNL OL E 158, 95–107.

²¹⁷ Fekete 1943 172.

²¹⁸ Bél 1989 80–81.

²¹⁹ Fényes 1848 187.

²²⁰ Pesty 1977 213.

²²¹ Kisné Cseh 2009 298–299; IVO site ID No. 60254 Tókút (source: IVO database, <https://www.oeny.hu/oeny/ivo/lelohely?azon=60254>).

²²² IVO site ID No. 63560 Bocska-hegy (source: IVO database, <https://www.oeny.hu/oeny/ivo/lelohely?azon=63560>). The site is registered as late medieval, but the inventoried find material is Árpád Age and 18th-century (Inv. No. KDM 71.48.3–6).

²²³ IVO site ID No. 63574 Árendás patak III, 50990 Site 1/2005, 50992 Site 2/2005, 50994 Site 3/2005 (source: IVO database, <https://www.oeny.hu/oeny/ivo>). The archaeologist, specialised in prehistory, who identified the sites reports on a late medieval horizon on Sites 2 and 3/2005; this could not be confirmed due to a lack of find material.

²²⁴ IVO site ID No. 63590 Szomódi-vízfolyás, 63594 Sóstó 2005 (source: IVO database, <https://www.oeny.hu/oeny/ivo>). The latter is registered as a late medieval settlement, but its find material is Árpád Age (Inv. No. KDM 70.9.23–25).

²²⁵ Ferenczi 2010 128, figs. 4–5.

of Tata Castle. Its name indicates that it was a dwelling of royal service people.²²⁶ Based on the 1541 porta register, the settlement was still inhabited then (with eight households, six pors, five deserted, and a new one),²²⁷ but became abandoned during the Ottoman Period, and the 1570 Ottoman tax register mentions it as already deserted.²²⁸ Mátyás Bél reports that the abandoned village had been resettled by Slovaks seventy years before he collected data on the region (that is, around the mid-17th century),²²⁹ while Frigyes Pesty believes that the repopulation started around 1670, and the place had been deserted before that.²³⁰

Only one medieval site is known in the area of the current village: sewer pipe construction works disturbed a west-east oriented grave in front of 15 Széchenyi Street. The grave finds included a grape bunch pendant earring, based on which the archaeologist inspecting the discovery dated the feature to the 10th century.²³¹

Remains of an Early Árpád Age cemetery were unearthed during the construction of Motorway M1 on the western outskirts of the village. No excavation could be conducted on the site, as the archaeologists inspecting it could only observe disturbed graves with an east-west orientation and collect two S-terminalled braid rings, based on which they suspected that a relatively small cemetery had been destroyed in the area.²³²

Several Árpád Age sites have been registered along the Által-ér on the southern outskirts of the current village. Some were partially excavated, but the recovered find materials have yet to be evaluated.²³³

During a site inspection in 2005, Julianna Kisné Cseh registered a settlement site with Árpád Age and late medieval horizons on the northern outskirts of the current village in Homokidűlő, on the southern bank of the small stream arriving from Lake Barabás and discharging into the Által-ér.²³⁴ No related find material was found in the collection of the museum, and the identification of the site as Szőlős village mentioned by medieval documents is highly doubtful.

Újtata [1440: *Wytata*, 1449: *Vytata*]

The medieval history of the settlement is intertwined with that of Ótata; therefore, its high points are presented there.

The late medieval Újtata was probably situated somewhere in the area of today's Tóváros district of Tata. However, this area has not been explored at all, and no medieval features are known from there. Sarolta Szatmári excavated a child's grave on Ady Endre Street (the main street) in 1970,²³⁵ and there are some accounts of graves that have been disturbed during the construction of Fényes Áruház (a shopping centre), but these were destroyed without professional

²²⁶ *Schmidtmayer 2015* 241.

²²⁷ *MNL OL E 158*, 95–107.

²²⁸ *Fekete 1943* 183.

²²⁹ *Bél 1996* 105.

²³⁰ *Pesty 1977* 216.

²³¹ *Vadász 1971* 82; IVO site ID No. 50536 M1 autópálya [Motorway M1] (source: IVO database, <https://www.oeny.hu/oeny/ivo/lelohely?azon=50536>).

²³² *Vadász 1971* 82; IVO site ID No. 50532 M1 autópálya [Motorway M1] (source: IVO database, <https://www.oeny.hu/oeny/ivo/lelohely?azon=50532>).

²³³ IVO site ID No. 50546 Pusztaremeteség, 57966 Tüskés 1, 57961 Vasútvonal mente 1, 57964 Vasútvonal mente 2, 57962 Felső-Réti-föld 1, 101292 Vasútvonal mente 4. Excavated sites: 50538 M1-es műút 2, 57959 Tüskés 2, 59695 Vasútvonal mente 3, 70123 Hosszú-dűlő.

²³⁴ IVO site ID No. 51009 Site 9/2005. The site is registered to Tata, but its polygon is marked in the administrative area of Vértesszőlős (source: IVO database, <https://www.oeny.hu/oeny/ivo/lelohely?azon=51009>).

²³⁵ Based on a drawing found amongst the personal notes of Sarolta Szatmári.

excavation and documentation.²³⁶ Based on the above, the Franciscan monastery or the parish church devoted to the Holy Mary could have been standing once in the area. Two 15th-century potsherds got into the museum's collection from the courtyard of the Capuchin church and convent north of the Fényes Áruház;²³⁷ according to local tradition, the Capuchin monks arrived in Tata in 1734 and built their convent near the one-time Franciscan monastery. The data collection published by Adolf Mohl includes a report on that in 1882, the start of the Budai-utca (Budai Street, today: Ady Endre Road) between the Capuchin church and Menich's pharmacy was dug up in preparation of the planting of trees, and "vast foundations were discovered" during the works.²³⁸ The described area today is the place in front of Fényes Áruház. East of that, in the courtyard of the Vaszary School, the remains of a building with a polygonal ending but not oriented east-west were discovered; these were largely destroyed later during the construction of the one-time barracks and the school.²³⁹ Richárd Schmidtmayer believes the remains may have belonged to the modern Chapel of St. Joseph.

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²³⁶ *Szatmári 2004* 37.

²³⁷ Inv. no KDM 81.244.1–2: side fragment of a yellow pot and a red, pierced pitcher handle fragment.

²³⁸ *Mohl 1906* 92–94.

²³⁹ *KDM Data Archive Inv. No. 2024.25*

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	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Total (kg)
Feature no.	12	18	1	1	1	1	
Stratigraphic unit	SE-85	SE-44	SE-04	SE-04	SE-04	SE-30	
Date of sampling	08.04.2016.	13.04.2016.	07.04.2016.	07.04.2016.	07.04.2016.	08.04.2016.	
Pre-processing weight (kg)	0.93	0.406	0.568	0.564	1.136	1.362	4.966
Description of sample	cereal and ash in a fireplace	cereal and ash in a ploughshare	ash layer	ash layer	ash layer	ash layer	
Dating	Late Árpád Age (13th–14th century)	Late Árpád Age (13th–14th century)	14th century	14th century	14th century	Late Árpád Age (12th–13th century)	
Accompanying finds							
Charcoal	Charcoal (0.5–30 mm): 6 g	Charcoal (small, max d=7 mm): 157 g		Charcoal (small, 1–5 mm): 0.01 g	Charcoal (small, 1–5 mm): 0.5 g	Charcoal (small, 2–20 mm): 2 g	
Weight of charcoal powder and sand		354 g					
Weight of daub, no charcoal			11 g	24 g	25 g	75 g	
Weight of seed and daub fragments		22 g					
Pottery vessel fragments (2 side, 1 bottom)			3 pcs.				
Pottery vessel fragment (side and bottom)				1 pc.	2 pcs.		
Great ramshorn (Planorbis corneus) shells						1 pc.	
Bone (fishbone?)					1 pc.		
Daub fragments						85 g	
Calcined bone fragments (5, 20 mm)						2 pcs.	

Table 1. Processed soil samples from Tata, 16 Kossuth Square. ©Katalin Julianna Szilvási

Latin name	English name	Remain type	Condition	Habitat ecogroup	Family	Habitat/distribution
<i>Avena sativa L.</i>	oat	nude caryopsis (<i>caryopsis nuda</i>)	charred	9.1.	<i>Poaceae</i> (grasses, pázsitfűfélék)	-
<i>Avena sativa L.</i>	oat	hulled caryopsis (<i>cum caryopse corticata</i>)	charred	9.1.	<i>Poaceae</i> (grasses, pázsitfűfélék)	-
<i>Agrostemma githago L.</i>	common corncockle	seed	charred	9.3.	<i>Caryophyllaceae</i> (pink/carnation family, szegfűfélék)	Eurasian
<i>Alchemilla vulgaris agg.</i>	lady's mantle, lion's foot	acorn	charred	8.2.		Euro-siberian
<i>Avena fatua L.</i>	common wild oat	nude caryopsis (<i>caryopsis nuda</i>)	charred	9.3./9.2.	<i>Poaceae</i> (grasses, pázsitfűfélék)	Eur-asian- (Mediterranean)
<i>Brassica cf. campestris L.</i> (<i>syn. Brassica rapa L.</i> <i>subsp. campestris</i>)	bird's rape	seed	charred	9.3.	<i>Brassicaceae</i> (mustards/crucifers/ cabbage family, káposztafélék)	European- Mediterranean
<i>Camelina microcarpa Andr.</i>	littlepod false-flax	seed	charred	8.3./9.3.	<i>Brassicaceae</i> (mustards/crucifers/ cabbage family, káposztafélék)	Eurasian- continental
<i>Cerealia (Secale/ Triticum/Hordeum)</i>	cereals	caryopsis fragment (szemtőredék)	charred	9.1.	<i>Poaceae</i> (grasses, pázsitfűfélék)	
<i>Cerintho minor L.</i>	lesser honeywort	nutlet	charred	8.2./9.3.	<i>Boraginaceae</i> (borage/ forget-me-not family, borágófélék)	Pontic- Mediterranean
<i>cf. Atriplex patula L.</i>	spear saltbush or common orache	seed	charred	9.2./10.1./ 10.3.	<i>Amaranthaceae</i> (amaranth family, disznóparéjfélék)	European circumpolar- (Mediterranean)
<i>Chenopodium album L.</i>	lamb's quarters, goosefoot, melde	seed	charred	10.2./9.3./ 9.2.	<i>Chenopodiaceae</i> (goosefoots, libatopfélék)	Eurasian- (Mediterranean)
<i>Chenopodium hybridum L.</i>	maple-leaved goosefoot	seed	charred	9.2./9.3.	<i>Chenopodiaceae</i> (goosefoots, libatopfélék)	Eurasian- (Mediterranean)
<i>Diptlotaxis muralis (L.) DC.</i>	annual wall-rocket	seed	charred	9.3./10.3.	<i>Brassicaceae</i> (mustards/crucifers/ cabbage family, káposztafélék)	Eurasian-sub- Mediterranean
<i>Echinochloa crus-galli (L.) P. B.</i>	cockspur	nude caryopsis (<i>caryopsis nuda</i>)	charred	9.2./10.1.	<i>Poaceae</i> (grasses, pázsitfűfélék)	cosmopolitan
<i>Fallopia convolvulus (L.) A. Löve</i>	wild buckwheat	nutlet	charred	9.3.		Eurasian- Mediterranean
<i>Hordeum vulgare L.</i> <i>ssp. polystichum</i> (<i>cf. tetrastichum</i>)	multi-row barley	hulled caryopsis (<i>cum caryopse corticata</i>)	charred	9.1.	<i>Poaceae</i> (grasses, pázsitfűfélék)	-
<i>Lepidium draba L.</i>	whitetop, hoary cress	seed	charred	9.2./9.3./ 10.2.		Eurasian- Mediterranean
<i>Linum usitatissimum L.</i>	flax, linseed	seed	charred	9.1.	<i>Linaceae</i> (lenfélék)	-
<i>Medicago lupulina L.</i>	black medick	seed	charred	8.2./9.2./ 9.3.	<i>Fabaceae</i> (legume family, pillangósvirágúak)	Eurasian- Mediterranean
<i>Melampyrum arvense L.</i>	field cow-wheat	seed	charred	9.3.		European- (Mediterranean)
<i>Melilotus officinalis (L.) Pall.</i>	sweet yellow clover	seed	charred	8.2./9.3.	<i>Fabaceae</i> (legume family, pillangósvirágúak)	Eurasian- Mediterranean

Table 2. Archaeobotanical remains from Tata, 16 Kossuth Square. s=summer-flowering; w=winter; per=perennial; s/w=summer/winter; w/per= winter/perennial (©Katalin Julianna Szilvási)

Height	Classification of Flowering Plant	Effects	Sample 1		Sample 2		Total
			Count	Note	Count	Note	
medium/ tall	s	Source of iron, manganese, and zinc. Sedative, diuretic, anti-rheumatic. It can also be used as a bath. It reduces uric acid.	137		68		205
medium/ tall	s	Source of iron, manganese, and zinc. Sedative, diuretic, anti-rheumatic. It can also be used as a bath. It reduces uric acid.	2				2
medium	w				1		1
medium	per		3				3
tall	s		1		5		6
tall	s		5				5
short	w		1				1
			307		601		908
medium	per		1				1
medium	s	Source of vitamin C	1				1
medium	s		907		1		908
medium	s		325				325
short	s		1		2		3
tall	s		2				2
medium/ tall	s		1				1
medium/ tall	s		9				9
medium	per	To improve spleen and liver function and purify blood. External use: for face.			1		1
tall	s	Prevents arteriosclerosis and blood clots. For constipation and rheuma. Softens skin.	2				2
short	s		10				10
short	s	Poisonous			2		2
tall	w		5				5

Latin name	English name	Remain type	Condition	Habitat ecogroup	Family	Habitat/distribution
<i>Panicum miliaceum L.</i>	millet	nude caryopsis (<i>caryopsis nuda</i>)	charred	9.1.	<i>Poaceae</i> (grasses, pázsitfűfélék)	Eurasian
<i>Papaver somniferum L.</i>	breadseed poppy	seed	charred	9.1.	<i>Papaveraceae</i> (poppy family, mákfélék)	-
<i>Poa annua L.</i>	annual meadow grass	caryopsis nuda (csupasz szemtermés)	charred	10.2.	<i>Poaceae</i> (grasses, pázsitfűfélék)	cosmopolitan
<i>Polygonum cf. mite</i>	marsh persicaria	seed	charred	2.3./8.1./9.2./ 9.3./10.1.	<i>Polygonaceae</i> (knotweed family, keserűfűfélék)	
<i>Raphanus raphanistrum</i>	wild radish, white charlock, jointed charlock	seed	charred	9.3./10.2.	<i>Brassicaceae</i> (mustards/crucifers/ cabbage family, káposztafélék)	
<i>Reseda lutea L.</i>	yellow mignonette	seed	charred	9.3./10.2.	<i>Resedaceae</i> (rezeda-félék)	South-Eurasian-Mediterranean
<i>Secale cereale L.</i>	rye	nude caryopsis (<i>caryopsis nuda</i>) fragment	charred	9.1.	<i>Poaceae</i> (grasses, pázsitfűfélék)	-
<i>Setaria lutescens</i> (Weigel) Hubbard (syn. <i>S. glauca</i>)	yellow foxtail	nude caryopsis (<i>caryopsis nuda</i>)	charred	9.2./9.3.	<i>Poaceae</i> (grasses, pázsitfűfélék)	cosmopolitan
<i>Setaria verticillata (L.) R. et Sch.</i>	bristly foxtail	nude caryopsis (<i>caryopsis nuda</i>)	charred	9.2./9.3.	<i>Poaceae</i> (grasses, pázsitfűfélék)	cosmopolitan
<i>Setaria viridis (L.) PB./ verticillata (L.) R. et Sch.</i>	bristly foxtail	nude caryopsis (<i>caryopsis nuda</i>)	charred	9.2./9.3.	<i>Poaceae</i> (grasses, pázsitfűfélék)	Eurasian
<i>Stachys annua L.</i>	annual yellow woundwort		charred	8.1./9.2./ 9.3.	<i>Lamiaceae</i> (mint/ deadnettle/sage family, árvacsalánfélék)	sub-Mediterranean-European
<i>Trifolium arvense L.</i>	hare's-foot clover, oldfield clover	seed	charred	9.3.	<i>Fabaceae</i> (legume family, pillangósvirágúak)	Eurasian-(Mediterranean)
<i>Trifolium pratense (L.) Kelch</i>	red clover	seed	charred	8.2./9.3.	<i>Fabaceae</i> (legume family, pillangósvirágúak)	Eurasian-(Mediterranean)
<i>Triticum aestivum L. subsp. vulgare (Vill.) MacKey</i>	wheat	nude caryopsis (<i>caryopsis nuda</i>)	charred	9.1.	<i>Poaceae</i> (grasses, pázsitfűfélék)	-
<i>Vicia cracca L.</i>	tufted vetch, cow vetch, blue vetch	seed	charred	9.3./8.1.		European circumpolar
Cereal semolina porridge	semi-coarse semolina (d=7 mm)	fragment	charred			
Indet.	not determinable	fragment	charred	diverse	diverse	
Total (remains)						
Total (species)						
Seed concentration						
Proportion (Sample 4/1)						

Continuation of Table 2.

Height	Classification of Flowering Plant	Effects	Sample 1		Sample 2		Total
			Count	Note	Count	Note	
medium	s		7745	of that 10 pcs. burnt into a conglomerate	4		7749
tall	s	Main ingredient is morphine (pharmaceutical industry). The most powerful analgesic. Codeine: not a drug, but has harmful effects when used long-term. Cough suppressant (paralyses). Narcotine: relieves bronchospasm, does not paralyse. Papaverine: antispasmodic. For stomach cramps, kidney stones, intestinal spasms, menstrual cramps, gallstones. In the past the immature poppy head was given to children for calming them down and put them to sleep, but it is harmful!	1				1
short	w		1				1
			1				1
			1				1
medium	w/per		1				1
tall	s/w		358		189		547
medium/ tall	s		4				4
medium	s				1		1
medium	s		6				6
short	s	Its tea is effective against respiratory diseases. In the past it was used for epileptic seizures and colds.	7		1		8
short	s		1				1
short	w		1				1
medium/ tall	s/w		30	of that 24 oval and 6 round	352	of that 337 oval and 14 round	382
tall	per		1				1
					2		2
			8	+ 14 g seed fragments		+ 22 g daub and seed fragments	8
			9 886		1 230.00		11 116
			30		13		
			10613.98		2795.57		
			32.26		23.01		

Sample No.	ID	Type	Latin name	English names	Count	Note
1.	1.	Charcoal		charcoal	1346	Assorted small fragments.
	1.1.	Charcoal	<i>Alnus glutinosa</i>	common alder	1	Sample size 19 × 8 × 6 mm, examined section size 11 × 6 × 6 mm, diffuse-porous, aggregate rays. Sample condition: good.
	1.2.	Charcoal	<i>Alnus glutinosa</i>	common alder	1	Sample size 10 × 9 × 9 mm, examined section size 7 × 8 × 9 mm, diffuse-porous, aggregate rays. Sample condition: good.
	1.3.	Charcoal	<i>Alnus glutinosa</i>	common alder	1	Sample size 20 × 5 × 5 mm, examined section size thin section 10 × 5 × 5 mm, diffuse-porous, without heartwood. Alternate <i>phylloaxis</i> (discernible bud remain). Sample condition: good.
	1.4.	Charcoal	<i>Alnus glutinosa</i>	common alder	1	Sample size 12 × 9 × 5 mm, examined section size 9 × 9 × 5 mm, diffuse-porous, aggregate rays. Sample condition: good.
	1.5.	Charcoal	<i>Alnus glutinosa</i>	common alder	1	Sample size 17 × 9 × 7 mm, examined section size 9 × 9 × 5 mm, diffuse-porous, aggregate rays. Sample condition: good.
	1.6.	Charcoal	<i>Alnus glutinosa</i>	common alder	1	Sample size 12 × 6 × 6 mm, examined section size 8 × 6 × 6 mm, diffuse-porous, aggregate rays. Sample condition: good.
	1.7.	Charcoal	<i>Alnus glutinosa</i>	common alder	1	Sample size 20 × 8 × 3 mm, examined section size 11 × 8 × 3 mm, diffuse-porous, aggregate rays. Sample condition: good.
	1.8.	Charcoal	<i>Alnus glutinosa</i>	common alder	1	Sample size 16 × 5.5 × 5.5 mm, examined section size 9 × 5.5 × 5.5 mm, diffuse-porous, aggregate rays. Sample condition: good.
	1.9.	Charcoal	<i>Alnus glutinosa</i>	common alder	1	Sample size 8 × 6 × 4 mm, diffuse-porous, aggregate rays. Sample condition: good.
	1.10.	Charcoal	<i>Alnus glutinosa</i>	common alder	1	Sample size 10 × 5 × 5 mm, thin section 4 × 5 × 5 mm, diffuse-porous, aggregate rays. Sample condition: good.
	1.11.	Charcoal	<i>Alnus glutinosa</i>	common alder	1	Sample size 9 × 6 × 6 mm, diffuse-porous, aggregate rays. Sample condition: good.
	1.12.	Charcoal	<i>Alnus glutinosa</i>	common alder	1	Sample size 8 × 6 × 5 mm, diffuse-porous, aggregate rays. Sample condition: good.
	1.13.	Charcoal	<i>Alnus glutinosa</i>	common alder	1	Sample size 16 × 8 × 4 mm, thin section 10 × 5 × 4 mm, diffuse-porous, aggregate rays. Sample condition: good.
	2.	Charred caryopsis	<i>Panicum miliaceum</i>	millet	8	
	3.	Charred caryopsis fragment	<i>Cerealia</i>	cereal	2	
	4.	Charred seed fragment	<i>Chenopodium sp.</i>	goosefoot	5	
2.	1.	Charcoal	<i>Charcoal</i>	charcoal	27	Small piece.
	1.1.	Charcoal	<i>Acer sp.</i>	maple	1	Sample size 1 × 2 × 2 mm, diffuse-porous, pores widely spaced with frequent twin vessels. Sample condition: good.
	1.2.	Charcoal	<i>Acer sp.</i>	maple	1	Sample size 1 × 3 × 2 mm, diffuse-porous, with twin vessels. Sample condition: good.
	1.3.	Charcoal	<i>Acer sp.</i>	maple	1	Sample size 1 × 2 × 1 mm, diffuse-porous, with twin vessels. Sample condition: good.
	2.	Charred caryopsis fragment	<i>Cerealia</i>	cereal	94	Small fragments.
	3.	Charred caryopsis	<i>Triticum aestivum</i>	common wheat	1	
	4.	Iron fragment		iron fragment	8	

Sample No.	ID	Type	Latin name	English names	Count	Note
3.	1.	Bone fragment		bone fragment	2	
	2.	Daub		daub	8	
	3.	Snail shell fragment		snail shell fragment	2	
	4.	Seed	<i>Portulaca oleracea</i>	common purslane, little hogweed	1	Perhaps contamination.
	5.	Charcoal		charcoal	12	Small piece.
	6.	Metal sheet fragment		metal sheet fragment	1	
4.	1.	Daub		daub	5	
	2.	Bone fragment		bone fragment	4	
	3.	Iron fragment		iron fragment	2	
	4.	Charcoal		charcoal	34	Small pieces with oak remains amongst them.
	5.	Eggshell fragment		eggshell fragment	1	
5.	1.	Daub		daub	13	
	2.	Charcoal		charcoal	110	Small, only a few mm; based on cross- and radial sections, mostly oak.
	2.1.	Charcoal	<i>Quercus sp.</i>	oak	1	Sample size 1 × 2 × 0,2 mm, ring-porous. Sample condition: good. Too small for species identification.
	3.	Bone fragment		bone fragment	4	
	4.	Charred seed fragment	<i>Chenopodium sp.?</i>	goosefoot	1	Highly fragmentary; based on size and shape, perhaps a goosefoot species.
6.	1.	Charcoal		charcoal	426	Assorted small fragments with many bark fragments; mostly oak.
	1.1.	Charcoal	<i>Quercus sp.</i>	oak	1	Sample size 6 × 4 × 2 mm, examined section size 5 × 4 × 1 mm, ring-porous, earlywood and latewood are easy to distinguish. Sample condition: good.
	1.2.	Charcoal	<i>Quercus sp.?</i>	oak	1	Sample size 9 × 3 × 2 mm, thin section 4 × 3 × 2 mm, ring-porous, earlywood and latewood are easy to distinguish. Sample condition: good.
	1.3.	Charcoal	<i>Quercus sp.</i>	oak	1	Sample size 10 × 3 × 1 mm, thin section 8 × 3 × 1 mm, ring-porous, earlywood and latewood are easy to distinguish. Sample condition: good.
	1.4.	Charcoal	<i>Quercus robur</i>	oak	1	Sample size 10 × 3 × 1 mm, thin section 5 × 3 × 1 mm, ring-porous, earlywood and latewood are easy to distinguish. Sample condition: good. A single tree ring is discernible on the section.
	2.	Daub		daub	30	
	3.	Bone fragment		bone fragment	2	
	4.	Fish scale		fish scale	1	
					2171	

Table 3. Wood remains from Tata, 16 Kossuth Square. (©Maté Róbert Merkl)

