Tivadar Vida, Daniel Winger (Volume editors), Szólád I: Das langobardenzeitliche Gräberfeld: Mensch und Umwelt

Ferenc Gyulai, Dénes Saláta, Ákos Pető
Results of the archaeobotanical analysis of anthropogenic sediment samples from Szólád

Römisch-Germanische Forschungen Band 76

https://doi.org/10.34780/8cp7-289c

Herausgebende Institution / Publisher:
Deutsches Archäologisches Institut

TIVADAR VIDA / DANIEL WINGER
(HERAUSGEBER)

SZÓLÁD I

DAS LANGOBARDENZEITLICHE GRÄBERFELD: MENSCH UND UMWELT

RGK

TIVADAR VIDA / DANIEL WINGER
(HERAUSGEBER)

SZÓLÁD I

RÖMISCH-GERMANISCHE FORSCHUNGEN

BAND 76

zugleich

MONUMENTA GERMANORUM ARCHAEOLOGICA HUNGARIAE

BAND 7

RÖMISCH-GERMANISCHE KOMMISSION
DES DEUTSCHEN ARCHÄOLOGISCHEN INSTITUTS ZU FRANKFURT A. M.

INSTITUT FÜR ARCHÄOLOGISCHE WISSENSCHAFTEN DER
EÖTVÖS LORÁND UNIVERSITÄT ZU BUDAPEST

INSTITUT FÜR ARCHÄOLOGIE, GEISTWISSENSCHAFTLICHES
FORSCHUNGSZENTRUM DES EÖTVÖS LORÁND FORSCHUNGSNETZWERKES
ZU BUDAPEST

UNGARISCHES NATIONALMUSEUM ZU BUDAPEST

RÖMISCH-GERMANISCHE KOMMISSION

INSTITUT FÜR ARCHÄOLOGISCHE WISSENSCHAFTEN DER
EÖTVÖS LORÁND UNIVERSITÄT

INSTITUT FÜR ARCHÄOLOGIE, GEISTWISSENSCHAFTLICHES
FORSCHUNGSZENTRUM DES EÖTVÖS LORÁND FORSCHUNGSNETZWERKES

UNGARISCHES NATIONALMUSEUM

Szólád I

Das langobardenzeitliche Gräberfeld: Mensch und Umwelt

HERAUSGEGEBEN VON

TIVADAR VIDA UND DANIEL WINGER

MIT BEITRÄGEN VON

KURT W. ALT, LÁSZLÓ BARTOSIEWICZ, UTA VON FREEDEN, ERIKA GÁL,
SÁNDOR GULYÁS, FERENC GYULAI, ISABELLE KOLLIG,
KYRA LYUBLYANOVICS, CHRISTIAN MEYER, MARK OPELT,
KÁROLY PENKSZA, ÁKOS PETŐ, DÉNES SALÁTA, TIM SCHÜLER,
PÉTER SKRIBA, BALÁZS PÁL SÜMEGI, PÁL SÜMEGI,
HEINRICH THIEMEYER, TÜNDE TÖRŐCSIK, TIVADAR VIDA UND
DANIEL WINGER

REICHERT VERLAG • WIESBADEN • 2022

XVI, 358 Seiten mit 187 Abbildungen, 4 Diagrammen, 29 Tabellen und 73 Tafeln

Bibliographische Information der Deutschen Nationalbibliothek

Die Deutsche Nationalbibliothek verzeichnet diese Publikation in der Deutschen Nationalbibliographie; detaillierte bibliographische Daten sind im Internet über <http://dnb.d-nb.de> abrufbar.

ISBN: 978-3-7520-0654-4

Redaktion: Hans-Ulrich Voß, Römisch-Germanische Kommission Frankfurt a. M.
Formalredaktion: Johannes Gier, Römisch-Germanische Kommission Frankfurt a. M.
Bildredaktion: Oliver Wagner, Römisch-Germanische Kommission Frankfurt a. M.
Satz: Susanne Biegert, Bonn
Druck: Bonifatius GmbH Druck – Buch – Verlag, Paderborn
Printed in Germany
Printed on fade resistant and archival quality paper (PH 7 neutral) • tcf

Inhaltsverzeichnis

ZUM GELEIT.
Von Eszter Bánffy und Kerstin Hofmann VII

VORWORT.
Von Tivadar Vida und Daniel Winger IX

BIBLIOGRAPHIE ZUM LANGOBARDENZEITLICHEN GRÄBERFELD SZÓLÁD. XV

DER WEITE BLICK DER AHNEN – LAGE UND AUSGRABUNG DES LANGOBARDENZEITLICHEN GRÄBERFELDES VON SZÓLÁD, KOMITAT SOMOGY, UNGARN.
Von Péter Skriba, Tivadar Vida und Daniel Winger 1

ENVIRONMENTAL HISTORY OF AN EMBAYMENT OF LAKE BALATON NEAR SZÓLÁD FROM THE LATE GLACIAL TO THE MIGRATION AGE.
By Sándor Gulyás, Tünde Törőcsik, Balázs Pál Sümegi and Pál Sümegi 19

ANALYSE DER PFLANZENRESTE EINER BLOCKBERGUNG AUS GRAB 13 VON SZÓLÁD: POLSTERUNG DES GRABES – REKONSTRUKTION DER LANDSCHAFT.
Von Károly Penksza 31

RESULTS OF THE ARCHAEOBOTANICAL ANALYSIS OF ANTHROPOGENIC SEDIMENT SAMPLES FROM SZÓLÁD.
By Ferenc Gyulai, Dénes Saláta and Ákos Pető 35

SZÓLÁD – ERGEBNISSE DER BODENKUNDLICHEN UNTERSUCHUNGEN 2007.
Von Heinrich Thiemeyer 47

KARTIERUNG DES MAGNETFELDGRADIENTEN ZUR ARCHÄOLOGISCHEN PROSPEKTION EINES GRÄBERFELDES BEI SZÓLÁD IM MÄRZ 2005 UND IM MÄRZ 2007.
Von Tim Schüler und Mark Opelt 55

GRABANLAGEN UND BEFUNDE IN DEM LANGOBARDENZEITLICHEN GRÄBERFELD VON SZÓLÁD.
Von Uta von Freeden 67
KATALOG UND TAFELN DER BEFUNDE VON SZÓLÁD.
Von Uta von Freeden 144

ANTHROPOLOGISCHE UNTERSUCHUNG DER MENSCHLICHEN SKELETTRESTE AUS DEM LANGOBARDENZEITLICHEN GRÄBERFELD VON SZÓLÁD.
Von Christian Meyer, Isabelle Kollig und Kurt W. Alt .. 253
ANTHROPOLOGISCHER KATALOG.
Von Isabelle Kollig und Kurt W. Alt 295

MAMMALIAN AND BIRD REMAINS FROM THE LANGOBARD PERIOD CEMETERY OF SZÓLÁD.
By Erika Gál 311

A HORSE SKELETON FROM THE LANGOBARD PERIOD CEMETERY OF SZÓLÁD: AN ARCHAEOZOOLOGICAL STUDY.
By Kyra Lyublyanovics 329

FISH REMAINS FROM THE LANGOBARD PERIOD CEMETERY OF SZÓLÁD.
By László Bartosiewicz 343

ORTSREGISTER 355

Results of the archaeobotanical analysis of anthropogenic sediment samples from Szólád

By Ferenc Gyulai, Dénes Saláta and Ákos Pető

INTRODUCTION

Archaeobotanical studies of Late Migration Period sites are a chance for a better understanding of the relationship between the contemporary population and its environment – more specifically the use of plants in everyday life[1]. Plant finds representing this period refer to a change in the agricultural knowledge. It seems that the highly developed Roman agriculture was replaced by a more modest plant production[2]. Although fragmentary, but certain antique traditions have survived in crop production and horticulture.

By the means of integrated archaeobotanical methods, plant remains with different taphonomy and conservation are used in conjunction in order to interpret human-plant interactions and to reconstruct given details of the environment in which these contemporary populations lived and buried their dead[3].

In opposition to settlement contexts plant remains recovered from graves and grave goods not only represent a selected part of the subsistence strategy, but also prestigious gifts that are of high significance in the social life of the community and therefore form part of the sacred actions of the funeral. Systematic archaeobotanical studies within this archaeological period focused earlier on Avar cemeteries[4], but the success of these attempts varied. In general, it can be stated that if a plant deposition is found in a Migration Period grave then it represents a significant archaeobotanical find, although plant giving and deposition in the graves in this particular era cannot be considered as a common or widely-spread habit. As an addition to the previously conducted archaeobotanical studies in this field the systematic analysis of Szólád–Kertek mögött was accomplished in order to reveal whether the Carolingian period funeral habits cover any conscious human action related to plant deposition or placement in the graves and coffins.

MATERIALS AND METHODS

The inventory of the analysed samples

Altogether 41 pieces of anthropogenic sediment samples were subjected to macro-archaeobotanical analysis. The total weight of the samples selected for wet sieving is 88.669 kg. The inventory of the analysed sample set is summarised in the following table *(tab. 1)*.

In addition to the bulk samples listed below further charcoal and wood remains were excavated from the graves. After the careful observation and selection of the samples only one sample was chosen for further xylotomical study *(tab. 2)*.

Macro-archaeobotanical analysis methods

The recovery of the carpological material followed the standard wet sieving procedure[5]. Bulk sediments samples were wet-sieved through a 1.0 and 0.5 mm mesh. Larger fragments of daub, ceramics, mollusk shells as well as pebbles were separated manually during the course of the sieving process, while the sorting of the sieved material was conducted under a binocular stereomicroscope at magnifications ranging from 10× to 50×.

1 Gyulai 2001, 2010; Pető et al. 2012.

2 Gyulai et al. in print. – Compare to the text from Gulyas et al. in this volume.

3 Charles et al. 2009; Pető / Kenéz 2018.

4 e. g. Krausz 2010; Rapan Papeša et al. 2015; Kenéz / Pető 2015; Tóth et al. 2019.

5 Kenward 1980.

Nr.	Grave Nr.	OBJ	STR	LK	Description	Location or origin of the samples within the grave	Notes	Sample weight prior to flotation [g]
1.	2	37	–	77	sediment sample	near bronze plaque with rivets	–	72
2.	3	95	–	86	sediment sample	near iron and bronze objects, around the waist	–	3485
3.	3	95	–	85	sediment sample	from the *in situ* recovery of a *sax* (short sword)	–	2070
4.	3	95	–	86	sediment sample	near iron and bronze objects, around the waist	–	3150
5.	3	95	–	79	sediment sample	from the *in situ* recovery of a *spatha*	–	792
6.	5	98	–	148	sediment sample	from the *in situ* recovery of a *spatha*	divided to five subsamples	10 035
7.	6	101	–	230	sediment sample	below belt buckle	–	66
8.	6	101	–	162	organic matter remains	below buckle	–	24
9.	6	101	–	229	sediment sample	from wooden pot	–	220
10.	6	101	–	231	sediment sample	from the coffin	–	184
11.	9	135	–	205	seeds	south to the coffin	above planum No. 5.	96
12.	9	135	–	274	sediment samples with seeds	in between knife and comb and around the comb (next to it, above it)	planum No. 9	476
13.	11	170	–	370,371	sediment sample	from the recovery of an iron knife,	divided to two subsamples, planum No. 6	7710
14.	13	106	–	232	sediment sample	near the horse skeleton	–	734
15.	13	106	–	243	sediment sample, organic matter remains	from coffin	–	58
16.	13	106	–	249	sediment sample	from coffin	–	3035
17.	13	106	–	250	sediment sample	from coffin	–	748
18.	13	106	–	251	sediment sample	western edge of the grave, in the horizon of the coffin, west of the coffin	–	1550
19.	13	106	–	252	sediment sample	eastern end of the grave pit	–	1035
20.	13	106	–	258	organic matter remains	ashy material with wood and timber remains from the bottom of the coffin	–	554
21.	13	106	–	266	sediment sample	at the side of the grave; from the layer covering the side of the burial chamber	–	92
22.	16	128	–	134	sediment sample (timber incl.)	from the beam	between planum No. 3. and 4.	346

Table 1. Inventory of the sediment samples subjected to macro-archaeobotanical (carpological) analysis.

Nr.	Grave Nr.	OBJ	STR	LK	Description	Location or origin of the samples within the grave	Notes	Sample weight prior to flotation [g]
23.	16	128	–	96	charcoal and timber remains	from the land of the tomb	between planum No. 3. and 4.	122
24.	16	128	–	351,352	sediment sample	near a stone located at the pelvis, next to the bag	divided to three subsamples, planum No. 6	9710
25.	17	129	–	139	bones with an organic residue	south-western edge of the grave pit	above planum No. 5.	306
26.	17	129	–	–	sediment sample	right side of the chest	planum No. 5 (I.)	496
27.	17	129	–	–	sediment sample	at the chest	planum No. (II.)	2610
28.	17	129	–	–	sediment sample	at the chest	planum No. (III.)	1295
29.	17	129	–	–	sediment sample	sediment above the skull	between planum No. 4. and 5. (IV.)	1835
30.	17	129	–	–	sediment sample	at the skull	planum No. 5 (V.)	1150
31.	21	172	–	270	sediment sample	below the comb	planum No. 5	38
32.	22	168	–	301	sediment sample	inside a ceramic pot	planum No. 5	3115
33.	22	168	–	378	timber, organic matter remains	at the middle of the left shin	between planum No. 6. and 7.	46
34.	25	185	–	174	sediment sample	from the recovery of a leather object with silver lining, between the femurs	divided to two subsamples, planum No. 5	5870
35.	25	185	–	175	sediment sample	from the recovery of silver fibula, between the legs	divided to two subsamples, planum No. 5	5645
36.	25	185	–	176	sediment sample	from the recovery of bone comb, next to the left leg	planum No. 5	6650
37.	26	186	–	66	sediment sample	from the recovery of iron knife, pearl and amulet, between the legs	planum No. 4 (1.)	2665
38.	31	201	–	68	sediment sample from pottery	above the coffin, near the head, inside a ceramic pot	between planum No. 1. and 2.	1555
39.	45	258	4	–	sediment sample	in the eastern edge of the grave	–	2010
40.	45	258	4	18	sediment sample from pottery	in the eastern edge of the grave, inside a ceramic pot	planum No. 3.	2395
41.	45	258	4	322	sediment sample	from the *in situ* recovery of sword	divided to three subsamples	4624
							Sum:	88 669

Table 1 (cont.). Inventory of the sediment samples subjected to macro-archaeobotanical (carpological) analysis.

Grave Nr.	OBJ	STR	LK	Description	Location or origin of the samples within the grave	Notes	Sample weight prior to flotation [g]
2	37	–	–	wood remain	in the grave	–	–

Table 2. Inventory of the wood (xylotomical) samples subjected to macro-archaeobotanical analysis.

The recovered plant remains were identified on the basis of the works of Schermann[6], Radics[7], Cappers et al.[8], Brecher[9] and Jacomet[10], as well as on a modern plant reference collection. The nomenclature of the scientific plant names of the cultivars follows van Zeist[11] and the modern grouping summarised by Zohary et al.[12], while the wild plant names are given according to Király[13].

An alphabetical taxon list was produced based on the identification of the plant remains. Based on the absolute counting and the raw sample weight, the density of the archaeobotanical material within the samples were also calculated (cf. *Tab. 3*). Besides the archaeobotanical remains, the amount of other remains, just like fragmented charcoal, mollusk shells, bone fragments and other non-organic inclusion were given on a semi-quantitative scale (cf. *Appendix 1*).

During the qualitative evaluation of the archaeobotanical record the ecological system developed by Jacomet et al.[14] on the basis of Ehrendorfer[15] and Ellenberg[16] was used as follows:

1.1. = submerse aquaceous plants,
1.2. = floating pondweeds,
1.3. = diverse aquaceous plants,
2.1. = reeds,
2.2. = high sedge,
2.3. = watershore pioneers,
3. = diverse waterside plants,
3.1. = marshland plants,
3.2. = wet perennials,
4.1. = wet fragmented forest,
4.2. = fringing forests,
5. = fresh and light mixed forest,
6. = shady forest,
7.1. = cleared forest,
7.2. = average forestside,
7.3. = dry forestside,
8.1. = wet meadow,
8.2. = moderate meadow,
8.3. = arid meadow,
9.1. = cultivated plants,
9.2. = root-crop weeds,
9.3. = cereal-crop weeds,
10.1. = humid ruderal plants,
10.2. = moderate ruderal plants,
10.3. = arid ruderal plants
Diverse = non-classifiable.

Xylotomy methods

The xylotomic examination of the selected samples began with the unpacking of the wood material, documentation, and visual inspection. Fresh surface sections were cut on the most suitable specimens with the help of a razor blade. The surface sections were designed to follow the main anatomical directions. The cut pieces were stabilised in sand for the duration of the study. Sample setup was followed by stereomicroscopic analysis (Zeiss Discovery V8) and documentation of the samples by microphotography (ToupCam 2s, ToupView). Identification of the samples was based on anatomical and taxonomic features.

6 Schermann 1966.
7 Radics 1998.
8 Cappers et al. 2006.
9 Brecher 1960.
10 Jacomet 2006.
11 van Zeist 1984.
12 Zohary et al. 2012.
13 Király 2009.
14 Jacomet et al. 1989.

RESULTS

Results of the archaeobotanical analysis

The analysed samples weigh a total of 88.669 kilograms *(tab. 1)*. The samples represent 11 different graves and derive from various parts of them, including also a few vessel contents.

The archaeobotanical record of the relatively high sample amount is low, both quantitatively and qualitatively. Altogether 277 pieces of archaeobotanical remains were recovered from 41 samples. In addition, a single food remain was also brought to light *(Appendix 1)*. Most of the samples did not contain any carpological remains, there density value is 0 n/kg and therefore they can be considered sterile (at least from the archaeobotanical point of view) *(tab. 3)*. Seed and fruit remains derive from 7 samples, the highest density was measured in grave 9.

All specimens were recovered in an uncharred state, their condition varied between poor and acceptable. Identification traits were noticeable. This observation opens up the possibility that the recovered botanical specimens derive from the seed bank of the soil material. However, since they were recovered together with other organic archaeological remains (e. g. wood, leather etc.), which show similar taphonomic traits the seeds could also be considered as parts of the archaeobotanical record. In this latter case it has to be assumed that the microclimatic conditions of the graves are responsible for their taphonomy.

The only charred remain is an extremely small (1–2 mm) food remain from grave 6. (OBJ 101; LK 231). Based on its morphological features it is assumed that it was made of finely grounded cereal material. This might indicate that the remain derives from the inner part of a bread-like food source. The signal that the food remain transmits, and its recovery does not allow any further conclusions on how it entered the grave. Neither its contamination, nor its conscious deposition can be confirmed. Neither other flotation remains nor any further archaeological observation support the interpretation of this find.

The recovered 277 pieces cover 11 different plant taxa. Except for the epidermal fragment of a *Poa annua* L. caryopsis, these are all seeds.

It is important to note that no harvested cultural taxa / species was recovered from the samples.

The species found, without exception, are weed species of cereals sown in autumn and spring, as well as weeds of ruderal and degraded (trampled) territories. Most of the identified plants are high or medium-high-growing annual weeds, however there are also a few perennials amongst them (such as *Convolvulus arvensis* L. or *Sambucus nigra* L.). With regard to their distribution, the recovered weeds are either cosmopolitan or species with an Eurasian and Mediterranean ecological distribution. The dominant species in the record is the *Chenopodium album* L., which is a common, nitrophilous weed occurring in human-disturbed areas. This is also true for the both *Sambucus* species, which occurs at trampled and degrade sites (e. g. ditches, roads, in the vicinity of buildings etc.). According to their environmental demand, these species refer to general environmental conditions and moderate water supply. Weeds of cereal species in the recovered assemblage include the *Melilotus officinalis* ([L.] Pall.), the *Poa annua* (L.), *Chenopodium hybridum* (L.), the *Heliotropum europaeum* (L.).

These plant species, grouped according to their environmental requirements and demands transmit important information on the possible condition of the former environment of the site, which may have been quite degraded and weedy.

Results of the xylotomic analysis

The sample can be divided into two different specimen assemblages. The first one consists of two wood specimens with an approximate size of 4 × 8 × 25–40 mm. Their conservation is considered to be subfossil, not charred. Both specimens are poorly preserved, therefore adequate cuts for the taxonomic identification were hard to establish *(fig. 1)*. Based on the observable identification traits it is assumed that the specimens represent coniferous species[17].

The second subsample consists of 8 wood specimens with an approximate size of 15 × 20 × 10 mm. Their preservation is extremely poor, they were probably conserved through metal infusion. Due to the extremely poor condition of the samples the anatomic features could hardly be examined. The only thing that can be stated with certainty is that the samples derive from deciduous species[18].

15 Ehrendorfer 1973.
16 Ellenberg 1979.
17 Babos 1994; Schoch et al. 2004; Molnár et al. 2007.
18 Babos 1994; Schoch et al. 2004; Molnár et al. 2007.

Nr.	Grave Nr.	OBJ	STR	LK	Location or origin of the samples within the grave	Sample weight prior to flotation [kg]	Amount of archaeo-botanical remains [n]	Density [n/kg]
1.	2	37		77	near bronze plaque with rivets	0.072	0	0
2.	3	95		86	near iron and bronze objects	3.485	0	0
3.	3	95		85	from the *in situ* recovery of a *sax* (German sword)	2.070	0	0
4.	3	95		86	near iron and bronze objects	3.150	0	0
5.	3	95		79	from the *in situ* recovery of a *spatha*	0.792	0	0
6.	5	98		148	from the *in situ* recovery of a *spatha*	10.035	0	0
7.	6	101		230	below belt buckle	0.066	0	0
8.	6	101		162	below buckle	0.024	0	0
9.	6	101		229	from wooden pot	0.22	1	4.54
10.	6	101		231	from the coffin	0.184	4	21.73
11.	9	135		205	south to the coffin	0.096	59	614.58
12.	9	135		274	in between knife and comb	0.476	202	424.36
13.	11	170		370,371	from the recovery of an iron knife	7.710	0	0
14.	13	106		232	near the horse skeleton	0.734	0	0
15.	13	106		243	from coffin	0.058	0	0
16.	13	106		249	from coffin	3.035	0	0
17.	13	106		250	from coffin	0.748	0	0
18.	13	106		251	western edge of the grave, in the horizon of the coffin	1.550	0	0
19.	13	106		252	eastern end of the grave pit	1.035	0	0
20.	13	106		258	ashy material with wood and timber remains from the bottom of the coffin	0.554	0	0
21.	13	106		266	at the side of the grave	0.092	0	0
22.	16	128		134	from the beam	0.346	0	0
23.	16	128		96	from the beam	0.122	0	0
24.	16	128		351,352	near a stone located at the pelvis	9.710	0	0
25.	17	129		139	south-western edge of the grave pit	0.306	0	0
26.	17	144			right side of the chest	0.496	0	0
27.	17	129			at the chest	2.610	0	0
28.	17	129			at the chest	1.295	0	0
29.	17	129			sediment above the skull	1.835	3	1.634
30.	17	129			at the skull	1.150	0	0
31.	21	172		270	below the comb	0.038	0	0

Tab. 3. Density of the archaeobotanical material.

Nr.	Grave Nr.	OBJ	STR	LK	Location or origin of the samples within the grave	Sample weight prior to flotation [kg]	Amount of archaeo-botanical remains [n]	Density [n/kg]
32.	22	168		301	at the waist	3.115	0	0
33.	22	168		378	at the middle of the left shin	0.046	7	152.173
34.	25	185		07/174	from the recovery of a leather object with silver lining	5.870	0	0
35.	25	185		07/175	from the recovery of silver fibula	5.645	0	0
36.	25	185		176	from the recovery of bone comb	6.650	0	0
37.	26	18		07/66	from the recovery of iron knife, pearl and amulet	2.665	0	0
38.	31	201		68	above the coffin, near the head	1.555	0	0
39.	45	258	4	?	in the eastern edge of the grave	2.010	0	0
40.	45	258	4	18	in the eastern edge of the grave	2.395	2	0.835
41.	45	258	4	322	from the *in situ* recovery of sword	4.624	0	0

Tab. 3 (cont.). Density of the archaeobotanical material.

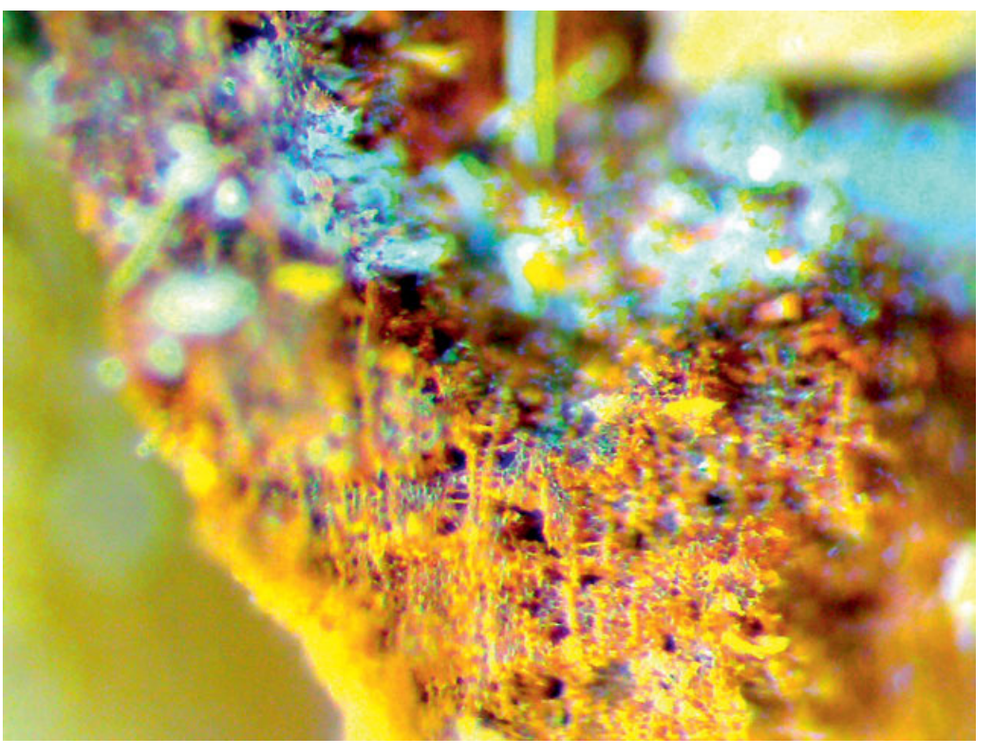

Fig. 1. Macroscopic view of the timber material recovered from Grave Nr. 2 of the cemetery in Szólád.

A BRIEF DISCUSSION

In contrast to anthropogenic sediment samples deriving from settlement context, samples related to burials and examined specifically for archaeobotanical purposes are less frequently producing significant amounts of archaeobotanical material. In general, if plant material is placed in a burial by conscious human action then those usually represent finds with outstanding significance. Examples for these are the raisin (grape) finds that were found in an Avar Period grave at Dunaszentgyörgy–Kaszás-tanya archaeological site[19] or the food remain that was excavated also in a Late Avar Period grave at Petőfibánya–Iskola utca 5[20]. However, these cases occur sporadically and randomly. Systematic and extended archaeobotanical surveys of cemeteries in the subjected archaeological period usually end up with negative results[21].

In the case of the Szólád site, significant plant remains that could be directly linked to funeral practices could not be detected. The recovered and identified plants are all weeds. Neither the seeds nor the remains of any cultivated species, nor of any harvested or highly prestigious plants, were found. The negative results point out that – based on the examined graves only – plants probably did not form important part of the funeral practices within this particular Carolingian cemetery. However, the identified weed species shed some light on the possible environmental conditions of the cemetery. It can be assumed that the area was heavily disturbed during the use of the cemetery. Anthropogenic impacts led to the spread of weed and ruderal associations and to the occurrence of other disturbance-tolerant species, so their seeds could accidentally fall into the pit when the graves were opened.

The only exception is the bread crumb found in the coffin of grave 6. It can be assumed that this remain entered the grave while the funereally practice occurred, however it cannot be adjudged whether food was placed consciously into the coffin and in that case the bread crumb is a remainder of that, or whether it just accidentally fell in the coffin.

BIBLIOGRAPHY

Babos 1994
K. Babos, Faanyagismeret és fafaj-meghatározás restaurátoroknak (Wood Anatomy and Taxonomy for Restorer) (Budapest 1994).

Brecher 1960
Gy. Brecher, A magismeret atlasza. Fontosabb termesztett növények és gyomnövények magvai (Atlas of Knowledge of Seeds. Seeds of Cultivated Plants and Weeds) (Budapest 1960).

Cappers et al. 2006
R. T. J. Cappers / R. M. Bekker / J. E. A. Jans, Digital Seed Atlas of the Netherlands (Barkhuis 2006).

Charles et al. 2009
M. Charles / A. Crowther / F. Ertug / C. Herbig / G. Jones / J. Kutterer / C. Longford / M. Madella / U. Maier / W. Out / H. Pessin / D. Zurro, Archaeobotanical Online Tutorial 2009. http://archaeobotany.dept.shef.ac.uk/ (account suspended: 05.07.2021).

Ehrendorfer 1973
F. Ehrendorfer, Liste der Gefäßpflanzen Mitteleuropas (Stuttgart 1973).

Ellenberg 1979
H. Ellenberg, Zeigerwerte der Gefäßpflanzen Mitteleuropas. Scripta Geobotanica 9 (Göttingen 1979).

Gyulai 2001
F. Gyulai, Archaeobotanika. A kultúrnövények története a Kárpát-medencében a régészeti-növénytani leletek alapján (Archaeobotany. History of the Cultivated Plants in the Carpathian Basin Based on Archaeobotanical Finds) (Budapest 2001).

Gyulai 2010
F. Gyulai, Archaeobotany in Hungary. Seed, Fruit, Food and Beverage Remains in the Carpathian Basin from the Neolithic to the Late Middle Ages. Archaeolingua Main Ser. 21 (Budapest 2010).

Gyulai et al. in print
F. Gyulai / O. Heinrich-Tamáska / D. Saláta / Á. Kenéz / N. Ftaimi / M. Molnár / Á. Pető, Results of the Archaeobotanical Analysis of Anthropogenic Sediment Samples from the Excavations at Keszthely-Fenékpuszta between 2009 and 2017. Castellum Pannonicum Pelsonense 8 (Budapest, Keszthely, Leipzig in print).

Jacomet 2006
S. Jacomet, Plant economy of the Northern Alpine Lake Dwelling area 3500–2400 B.C. cal. In: S. Karg / R. Baumeister / H. Schlichtherle / D. E. Robinson (eds), Economic and Environmental Changes during the 4th and 3rd Millenia B.C. Proceedings of the 25th Symposium of the EAA Sept. 2004 in Bad Buchau, Germany. Environmental Arch. 11,1, 2006, 64–83.

19 Kenéz / Pető 2015.
20 Tóth et al. 2019.
21 Rapan Papeša et al. 2015; Krausz 2010.

Jacomet et al. 1989
S. Jacomet / Ch. Brombacher / M. Dick, Archäobotanik am Zürichsee. Ackerbau, Sammelwirtschaft und Umwelt von neolithischen und bronzezeitlichen Seeufersiedlungen im Raum Zürich. Ber. Zürcher Denkmalpfl. 7 (Zürich 1989).

Kenéz / Pető 2015
Á. Kenéz / Á. Pető, Szőlőmaradványok egy avar fegyveres férfi sírjából Dunaszentgyörgy–Kaszás-tanya lelőhelyről (Grape remains from the grave of an Avar warrior at Dunaszentgyörgy–Kaszás-tanya archaeological site [Tolna county, Hungary]). In: A. Türk (ed.), Hadak Útján XXIV. A népvándorláskor fiatal kutatóinak XXIV. konferenciája. Studia ad Archaeologiam Pazmaniensia Vol. 3.1. A PPKE BTK Régészeti Tanszék kiadványai – MTA BTK Magyar Őstörténeti Témacsoport Kiadványok (Budapest, Esztergom 2015) 691–706.

Kenward et al. 1980
H. K. Kenward / A. R. Hall / A. K. G. Jones, A tested set of techniques for the extraction of plant and animal macrofossils from waterlogged archaeological deposits. Science and Arch. 22, 1980, 3–15.

Király 2009
G. Király, Új Magyar füvészkönyv. Magyarország hajtásos növényei. Határozókulcsok (The new book of herbs. Plant species of Hungary. Identification keys). Aggteleki Nemzeti Park Igazgatóság (Jósvafő 2009).

Krausz 2010
E. Krausz, Ember és táj kapcsolata két avar kori lelőhely fitolitelemzésén keresztül (Relation of Humans and the Environment Based on the Phytolith Analysis of Two Avar Period Archaeological Sites). Szakdolgozat, Szent István Egyetem, Mezőgazdaság- és Környezettudományi Kar, Környezet- és Tájgazdálkodási Intézet (Gödöllő 2010).

Molnár et al. 2007
S. Molnár / I. Peszlen / A. Paukó, Faanatómia (Wood anatomy). (Budapest 2007).

Pető et al. 2012
Á. Pető / Á. Kenéz / O. Herendi / F. Gyulai, A késő avar kor növényhasznosítási és tájgazdálkodási potenciáljának értékelése egy dél-alföldi telepen végzett mikro- és makro-archaeobotanikai vizsgálat tükrében (Assessment of potential plant exploitation and land use of the Late Avar period in the light of micro- and macroarchaeobotanical analyses of an archaeological site in Southeastern Hungary). In: A. Kreiter / Á. Pető / B. Tugya (eds), Környezet – Ember – Kultúra. A természettudományok és a régészet párbeszéde. Magyar Nemzeti Múzeum Nemzeti Örökségvédelmi Központ 2010. Október 6–8-án megrendezett konferenciájának tanulmánykötete (Budapest 2012) 181–194.

Pető / Kenéz 2018
Á. Pető / Á. Kenéz (eds), Régészeti növénytan. Leletek, módszerek és értelmezés. Archaeobotanikai Kézikönyv (Archaeobotany. Finds, methods and interpretation. Handbook for archaeobotanical research). Régészet és Természettudományok (Archaeology and Natural Sciences) 2. Archaeolingua Alapítvány (Budapest 2018).

Radics 1998
L. Radics, Gyommaghatározó (Weed Seed Identification). (Budapest 1998).

Rapan Papeša et al. 2015
A. Rapan Papeša / Á. Kenéz / Á. Pető, Arheobotanička analiza uzoraka iz kasnoavarodobnih grobova iz Nuštra (istočna Hrvatska). The Archaeobotanical Assessment of Grave Samples from the Avar Age Cemetery of Nuštar (Eastern Croatia). Prilozi Inst. Arh. Zagrebu 32, 2015, 261–288.

Schermann 1966
Sz. Schermann, Magismeret I–II (Knowledge of Seeds). (Budapest 1966).

Schoch et al. 2004
W. Schoch / I. Heller / F. H. Schweingruber / F. Kienast, Wood anatomy of central European Species. www.woodanatomy.ch (last access: 28.05.21).

Tóth et al. 2019
Z. Tóth / Á. Kenéz / Zs. Lisztes-Szabó / A. Csík / Á. Pető, Régészeti és archaeobotanikai adatok Heves megye késő népvándorláskori kutatásához Petőfibánya–Iskola utca 5. lelőhely sírjainak vizsgálata alapján (Archaeological and archaeobotanical data on the Late Migration Period of Heves county through the analysis of graves excavated at Petőfibánya–Iskola utca 5. archaeological site). In: Á. H. Szilasi (ed.), AGRIA LII. Az Egri Dobó István Vármúzeum Évkönyve. Ann. Mus. Agriensis (Eger 2019) 291–307.

van Zeist 1984
W. A. van Zeist, List of names of wild and cultivated cereals. Bull. Sumerian Agriculture 1, 1984, 8–16.

Zohary et al. 2012
D. Zohary / M. Hopf / E. Weiss, Domestication of Plants in the Old World. The origin and spread of domesticated plants in Southwest Asia, Europe, and the Mediterranean Basin (Oxford 2012).

REFERENCES OF FIGURES

Fig. 1: Dénes Saláta. – *Tables 1–3:* Compiled by Ákos Pető.

APPENDIX 1

Scientific name	Remain type	Condition	Ecological group	Grave Nr. 6. 101/229	Grave Nr. 6. 101/231	Grave Nr. 9. 135/205	Grave Nr. 9. 135/274	Grave Nr.17. 129/IV.	Grave Nr.22. 168/378	Grave Nr.45. 258/18	Sum
Ajuga chamaepitys (L.) Schreb.	seed	non-charred	(9.3.)			1	9				10
Ajuga chamaepitys (L.) Schreb.	seed fragment	non-charred	(9.3.)			2	9				11
Chenopodium album L.	seed	non-charred	(9.2., 9.3., 10.2.)			16	20				36
Chenopodium album L.	seed fragment	non-charred	(9.2., 9.3., 10.2.)			12	34				46
Chenopodium hybridum L.	seed	non-charred	(9.2., 9.3.)				2				2
Chenopodium hybridum L.	seed fragment	non-charred	(9.2., 9.3.)				2				2
Convolvulus arvensis L.	seed	non-charred	(9.3.)			1	7		1		9
Heliotropium europaeum L.	nutlet	non-charred	(9.2., 9.3.)			1	1		1		3
Medicago lupulina L.	seed	non-charred	(8.2., 8.3., 9.2.)				1				1
Melilotus officinalis (L.) Pall.	seed	non-charred	(8.2., 9.3.)				13				13
Poa annua L./pratensis agg.	caryopsis epidermis	non-charred	(10.2., 8., 8.2.)				1				1
Sambucus ebulus L.	drupe seed	non-charred	(7.1., 10.2.)	1	2	2	14	2	3	2	26
Sambucus nigra L.	drupe seed	non-charred	(7.1., 10.2.)			4	13				17
Sambucus spec.	drupe seed fragment	non-charred	(7.1., 10.2.)		1	7	10	1	2		21
Stachys annua L.	nutlet	non-charred	(8.1., 9.2., 9.3.)			5	39				44
Stachys annua L.	nutlet fragment	non-charred	(8.1., 9.2., 9.3.)			8	27				35
Ételmaradvány	fragment (d = 1,2 mm)	charred	–		1						1
			Sum	1	4	59	202	3	7	2	278

APPENDIX 2

No.	Straw	Wood fragment and powder	Charcoal fragment and powder	Bone fragment	Mollusk shells and fragments	Insect fragments	Daub	Rust	Bronze fragments	Glass pearls	Leather (?)	Clay fragments	Grave No.	OBJ	STR	LK	Amount of archaeo-botanical remains [n]	Sample weight prior to flotation [g]
1.	xx								xx				2			77	0	72
2.	x	xx											3	95		86	0	3485
3.	x	xxx						x					3	95	85	85		2070
4.	x	xx						x	x				3	95	86	86		3150
5.	xxx							xxx					3 (?)			79		792
6.	x			xxx	xx			x					5	98	148	148		10035
7.	x												6	101		230		66
8.			x								xxx		6	101		162		24
9.	xx				x								6	101		229	1	220
10.	x				x								6	101		231	4	184
11.	x				x								9	135		205	59	96
12.	xx				x	x							9	135		274	202	476
13.	x	xx			xxx			x					11	170		370,371		7710
14.	x			x	x								13	106		232		734
15.					x								13	106		243		58
16.	x		x	xxx	x								13	106		249		3035
17.			x	xxx	x								13	106		250		748
18.			x	x	xx			x					13	106		251		1550
19.					xx							xx	13	106		252		1035
20.			x	xxx	x								13	106		258		554
21.					x								13	106		266		92
22.			xx		x								16	128		134		346
23.			xxx										16	128		96		122
24.	x	xxx	x	xxx	x				x		x		16	128		351,352		9710
25.	xx			xxx						x			17	129		139		306
26.	x		x	xxx	x								17	144				496
27.	x			xxx	x					x			17	129				2610
28.	xx			xxx	x								17	129				1295
29.	x			xx	x								17	129			3	1835
30.	x			xxx				x	x				17	129				1150
31.													21	172		270		38
32.					xxx								22	168		301		3115
33.	x		x		x								22	168		378	7	46
34.	x				xx				x		xx		25	185		07/174		5870
35.	x	x		x	x			x					25	185		07/175		5645
36.	x				xx								(?)	185	176	176		6650
37.	x	x		x								xx	26	18		07/66		2665
38.				x	x		x						31	201		68		1555
39.	x			x	x								45	258	4			2010
40.	x				x								45	258	4	18	2	2395
41.		xxx		x				xxx					45 (?)			322		4624
																Sum	**278**	**88669**

Legend: x very few; xx few; xxx moderate; xxxx plenty; xxxxx very plenty.

ABSTRACT

A Langobard period cemetery was excavated in 2013 at Szólád–Kertek mögött archaeological site. The site is located near the settlement of Szólád in the vicinity of the southern shore of Lake Balaton. During the excavation, systematic sampling of anthropogenic sediment for the grave infill and from various grave goods was carried out. These samples were subjected to archaeobotanical analysis. Both carpological and wood and charcoal remains were examined. Samples deriving from burial contexts yielded very sparse archaeobotanical remains. Plant remains that could be directly linked to any of the burial practices could not be detected. All plant remains represented weed species. Neither the seeds nor the remains of any cultivated species, nor of any harvested or highly prestigious plants, were found. Based on the examined graves, it seems that plants probably did not form an important part of the funeral practices within this particular Langobard period cemetery.

ZUSAMMENFASSUNG

Neben der Siedlung Szólád am Südufer des Plattensees wurde am Fundort Szólád–Kertek mögött ein Gräberfeld aus der Langobardenzeit ausgegraben. Bei der Freilegung wurden systematisch Proben aus der Auffüllung der Gräber bzw. von den einzelnen Grabbeigaben genommen. Das gesammelte anthropogene Sedimentmaterial wurde einer archäobotanischen Untersuchung unterzogen, die sich sowohl auf die karpologischen Überreste (Korn- und Fruchtfunde) als auch die Holz- und Holzkohlenreste erstreckte. Die Proben aus den Bestattungskontexten lieferten außerordentlich wenig archäobotanisches Material. In keinem der Gräber des Fundortes konnten so bedeutende pflanzliche Überreste nachgewiesen werden, dass sie in irgendwelcher Weise auf das Bestattungsritual hätten bezogen werden können. Bei allen nachgewiesenen pflanzlichen Resten handelt es sich um Unkräuter. Es fanden sich weder Kulturarten noch gesammelte oder Kerne oder Reste von prestigeträchtigen Früchten. Das scheinbar negative Ergebnis lenkt die Aufmerksamkeit darauf, dass in diesem langobardenzeitlichen Gräberfeld – zumindest aufgrund der untersuchten Gräber – den Pflanzen als „Wegzehr“ keine Bedeutung im Kontext ritueller Praktiken am Grab beigemessen wurde.

ÖSSZEFOGLALÁS

A Balaton déli partjának szomszédságában elhelyezkedő Szólád település melletti domboldalon, a Kertek mögött lelőhelyen egy langobard kori temető. A feltárás során a sírok betöltéséből, illetve az egyes sírmellékletekből szisztematikus mintavétel valósult meg. A begyűjtött antropogén üledékanyagot régészeti növénytani vizsgálatnak vettettük alá, amelynek során mind a karpológiai maradványok (mag- és terméseletek), mind a fa- és faszénmaradványok megvizsgálásra kerültek. A temetkezési együttesekből származó minták rendkívül kisszámú archaeobotanikai anyagot szolgáltattak. A szóládi lelőhely esetében nem tudtunk kimutatni egy sírból sem olyan jelentős növényi maradványt, amely valamilyen úton összeköthető lenne a temetkezési rituáléval. A megtalált növényi maradványok mind gyomok. Sem kultúrfaj, sem gyűjtögetett vagy nagy presztízsűnek ítélhető növényi termés magja, maradványa nem került elő. A látszólagos negatív eredmény ráirányítja a figyelmet arra, hogy ebben a langobard kori temetőben – a megvizsgált sírok alapján legalábbis – nem tulajdonítotak jelentőséget a növényi alapú túlvilági „útravalóknak”.