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Archaeobotanical components of grave goods in prehistoric tumuli 6 and 7 at the archaeological site of Kaptol-Gradci, near Požega (Croatia)

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Abstract – The Iron Age site of Kaptol-Gradci belongs to the south-eastern periphery of the Hallstatt cultural complex, dominated primarily by the Kaptol cultural group, and encompasses a hillfort settlement and necropolis. During the investigation campaigns organized to date, 25 tumuli have been identified and 17 of them investigated. This paper presents the first results of the analysis of plant remains from a Hallstatt necropolis in Croatia, from tumuli 6 and 7, identified as an integral part of the complex burial ritual. In both tumuli, the predominant finds were of cereal grains (83% in tumulus 6 and 96.9% in tumulus 7). Besides the cereal grains, a very small quantity of weeds representing accidental associations have also been identified, as well as remains of wild fruits collected in the countryside. On the basis of the first results obtained from the archaeological site of Kaptol-Gradci and the scarce archaeobotanical research into Hallstatt necropolises in Europe, the conclusion can be drawn that a potential pattern can be observed, an element of a complex burial ritual in which cereal grains (overwhelmingly dominant in terms of their relative proportions) played an important role, together with various fruit deposits, whose type and quantity probably depended on the season, their availability in the environment and/or the possibility of their storage/preservation.

Key words: burial rites, Croatia, carbonized plant remains, Hallstatt, Kaptol-Gradci, necropolis

Introduction

The Iron Age site of Gradci is situated in the Požega Valley, in the vicinity of the village of Kaptol (Fig. 1a). This region belongs to the south-eastern periphery of the Hallstatt cultural complex, dominated primarily by the Kaptol cultural group. The archaeological site of Kaptol is known above all for its richly furnished princely graves (discovered at the necropolis of Čemernica, Fig. 1b). Those were graves of warriors whose power and wealth were reflected in their weapons and equipment, which in this case included the northernmost finds of Greek helmets. The burial ritual observed at this necropolis complies with the wider framework of the Eastern Hallstatt circle: prominent people were cremated on a pyre together with diverse grave goods, and their remains were buried under burial mounds – tumuli. Depending on the importance and status of the deceased in the community, the grave mounds differed in size, structure and the quantity of grave goods (Potrebica 2006, 2013).

The site of Kaptol-Gradci (Fig. 1b) encompasses a hillfort settlement and a necropolis. Small-scale test-pit excavations, which confirmed the cultural and chronological affinity between the necropolises of Gradci and Čemernica, were carried out back in 1975 by a team from the Archaeological Museum in Zagreb, led by Ivan Mirnik (Vejvoda and Mirnik 1991). The first systematic excavation of this site began in 2000, performed by a team from the Department of Archaeology of the Zagreb Faculty of Humanities and Social Sciences and the Centre for Prehistoric Research, led by Hrvoje Potrebica (Potrebica 2002). During the investigation campaigns organized to date, 25 tumuli have been identified and 17 of them investigated. The necropolis of Gradci was enclosed by a kind of fortification, and located to the south of the hillfort of the same name, in

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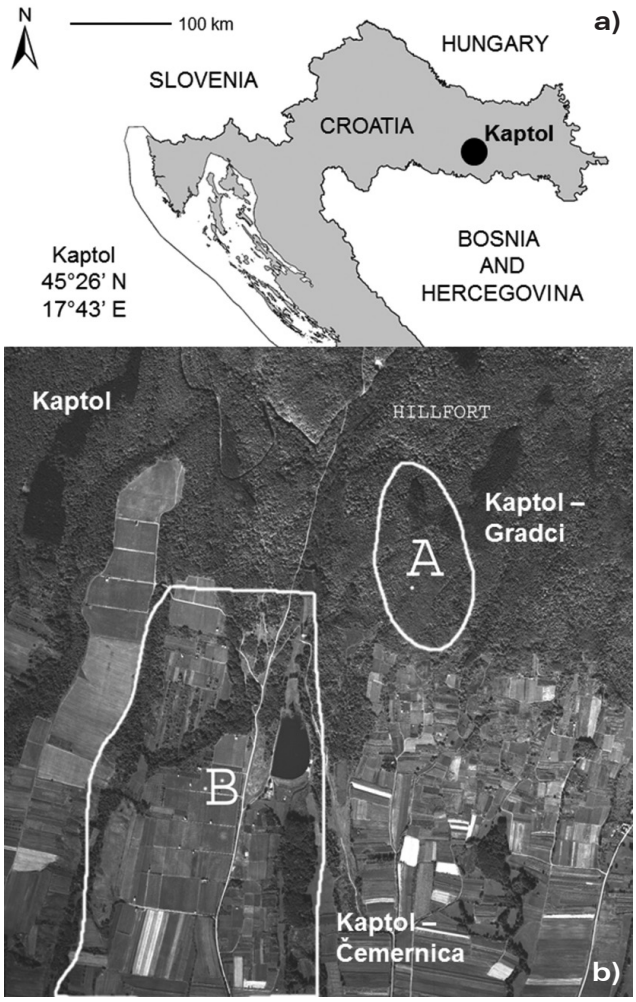

Fig. 1. Location of the village of Kaptol, near Požega (a), and the archaeological sites (b) of Kaptol-Gradci (A) and Kaptol-Čemernica (B) (adapted from Potrebica 2013).

its immediate vicinity (Potrebica 2011, 2013). The investigation has established that the site, situated near the top of one of the southern slopes of Mount Papuk, at an absolute altitude of 450 m, extends over more than 10 hectares (Potrebica 2004). The natural vegetation characteristic of the southern slopes of Papuk, or the wider area in which the site investigated is located, consists of sessile oak (*Quercus pretraea* Matt. Liebl. and downy oak (*Quercus pubescens* Willd.) (Samarđić 2010). However, the vegetation in the area of the actual site has been subject to strong anthropogenic influence and consists of a mosaic, mostly of forest and to a small extent of grassland vegetation. The forest vegetation comprises the remains of the natural forests of downy oak, and partly of cultivated conifer forest of Douglas fir (*Pseudotsuga menziesii* Mirb. Franco) and pine (*Pinus* sp.) (Potrebica, Šoštarić, field observations).

The necropolis at Gradci consists of tumuli containing wooden chambers of diverse dimensions; some of them were also walled in stone (for example, tumuli 1, 2, 6, 7, 10, 12, 14, 15, 16 and 17). In tumuli 10 and 15, remains of dromoi have been found. Only in tumulus 13 was there an incineration grave placed in a pit dug under the original ground level (Potrebica 2013). This site also contains the oldest grave units in the whole complex of archaeological sites surrounding Kaptol, roughly dated to the 8th c. BC (Potrebica 2013). As in the practice evidenced at the necropolis of Čemernica, here the deceased were also cremated and buried: some in urns, others not. Grave goods of pottery have been found under all the excavated tumuli (Potrebica 2011).

One of the most important grave units in the whole Kaptol complex is tumulus 6 (Fig. 2a), excavated in 2004 and 2005 (Potrebica 2005). This warrior tumulus is the largest discovered to date in the necropolis of Gradci. It is located roughly in the centre of the necropolis. It has been difficult to establish its precise dimensions due to its position on a slope, as well as the damage caused to it over time by land erosion and military exercises of some 40 years ago. The preserved height of the tumulus was 2.8 m, and its diameter was about 18 m. Early on during the excavation, a small cremation grave of 85 x 50 cm was discovered at the boundary between the northeast and southeast quadrants. The deceased had been cremated elsewhere; the grave contained a small quantity of soot, bones, a pottery vessel, an iron knife and a belt set of iron and bronze (Fig. 2b). Traces of organic backing were still visible on the bronze belt elements. Based on a typological comparison with the eastern Alpine region, the belt set can be dated to around 550 BC, when the practice of burials under tumuli was abandoned in Pannonia. The grave was placed on the surface of the original mound, and then covered with earth. The anthropological analysis suggests that it was a male grave (Potrebica 2005, 2011). In the central part of the tumulus, a heap of soot containing poorly-preserved bones was found, over which were placed fragments of a high-quality black-graphited pot and a small bowl, together with the lower part of a bronze multi-head pin and an iron bead (Potrebica 2005). It is believed that all the grave goods had been placed on top of a wooden chamber which was covered on all sides with a drystone structure, built of stones of various sizes (Fig. 2a) (Potrebica 2005, 2011). One part of the structure was made of amphibolite, a high-quality raw material resistant to atmospheric conditions, which is available on Mount Papuk. The investigation has established the presence of deep voids between the stones, created as water washed away the material, which allows the assumption that the stones used to lie over an unstable structure made of organic material which gradually decayed. Preliminary results of an anthropologic analysis carried out by Mario Šlaus indicate that grave 2 probably contained the remains of a man aged between 30 and 40 (Potrebica 2005). The large dimensions and complexity of the stone structure, whose width was around 5 m in some places, suggest that this was the grave of a prominent member of the community, or possibly a princely grave. In its north-eastern part, three iron spears and an iron sword were found, as well as cross-shaped bronze strap dividers (Fig. 2c) and a number of other elements of horse gear, two iron battle axes, and an iron belt set with bronze elements and a whetstone (Potrebica 2005, 2011). In the south-western part of the chamber there was a bronze sword, and to the north of it some bronze hemispherical strap dividers

and basket-shaped pendants, as well as bronze bits that belong to another set of horse gear, which was found together with two more iron axes. A further two iron swords and a bronze situla lay by the northern edge of the chamber. The situla contained parts of a bowl-shaped helmet, elements of a wagon, small bronze rectangular plates with holes along the edges (possibly elements of armour?), the handle and elements of the scabbard of the above-mentioned bronze sword, a number of iron rings, an iron bead damascened with bronze, and a number of other metal objects. In the centre of the chamber, and especially in its north-western part, around 30 more pottery vessels of diverse shapes were found (cups, bowls, pots). Several pots were decorated with tin lamellas, and one bore a decoration consisting of embossed bronze plates. The bottom of the chamber was covered with a thick yellow coat, which contained traces of the wooden logs of which the chamber had been constructed. Based on the typology of metal and pottery finds, this grave can be dated to the end of the 8th or the beginning of the 7th c. BC (Potrebica 2011).

Tumulus 7 (Fig. 2d) was explored during 2005. It is somewhat smaller, and located immediately below tumulus 4. The excavation revealed a drystone structure of rather regular square shape, with a southwest-northeast orientation. Outside the south-western wall and on the north-eastern wall of the structure, two whetstones were found. The central chamber was not covered with stones; its interior was filled with earth and layers of soot and pottery sherds, while a large fragment of a deeper biconical bowl and a stone blade lay at the bottom of the chamber. In the north-western corner, there was a pot covered with two small bowls and used as an urn (Fig. 2e and 2f). Small pieces of bronze, possibly the remains of a fibula, were discovered next to it. Apart from these, no other metal items were identified. Tumulus 7 most probably belongs to period Ha C2, that is to the period between 650 and 500 BC (Potrebica 2005).

Kaptol is also important as the only Hallstatt necropolis in Croatia to have been the subject of systematic archaeobotanical research. Samples have been taken from 15 investigated tumuli, with only the results of the analysis of samples from tumulus 1 published to date (Šoštarić et al. 2007); those represent an entirely atypical context and are not applicable in the interpretation of burial rituals.

As regards the Hallstatt cultural complex, published archaeobotanical finds are generally very rare. Of the well-known and excavated archaeological sites, the available literature presents archaeobotanical finds only from the site of Sopron-Burgstall (Jerem and Facsar 1985, Jerem et al. 1985). However, those finds primarily refer to the settlement, and two graves from the Late Iron Age (the La Tène Culture).

During the excavation campaigns of 2004 and 2005, samples for archaeobotanical analysis were taken from various parts of tumuli 6 and 7, with the aim of learning as much as possible about the burial ritual. This paper presents the first results of the analysis of plant remains from a Hallstatt necropolis in Croatia, as an integral part of the complex burial ritual. In view of the fact that the carbonized plant remains are the key traces – and, for the time being, the only traces – of ritual activities taking place during cremation, we believe that these results will contribute to a better understanding of burial customs not only in southern Pannonia, but also in the whole Hallstatt cultural complex.

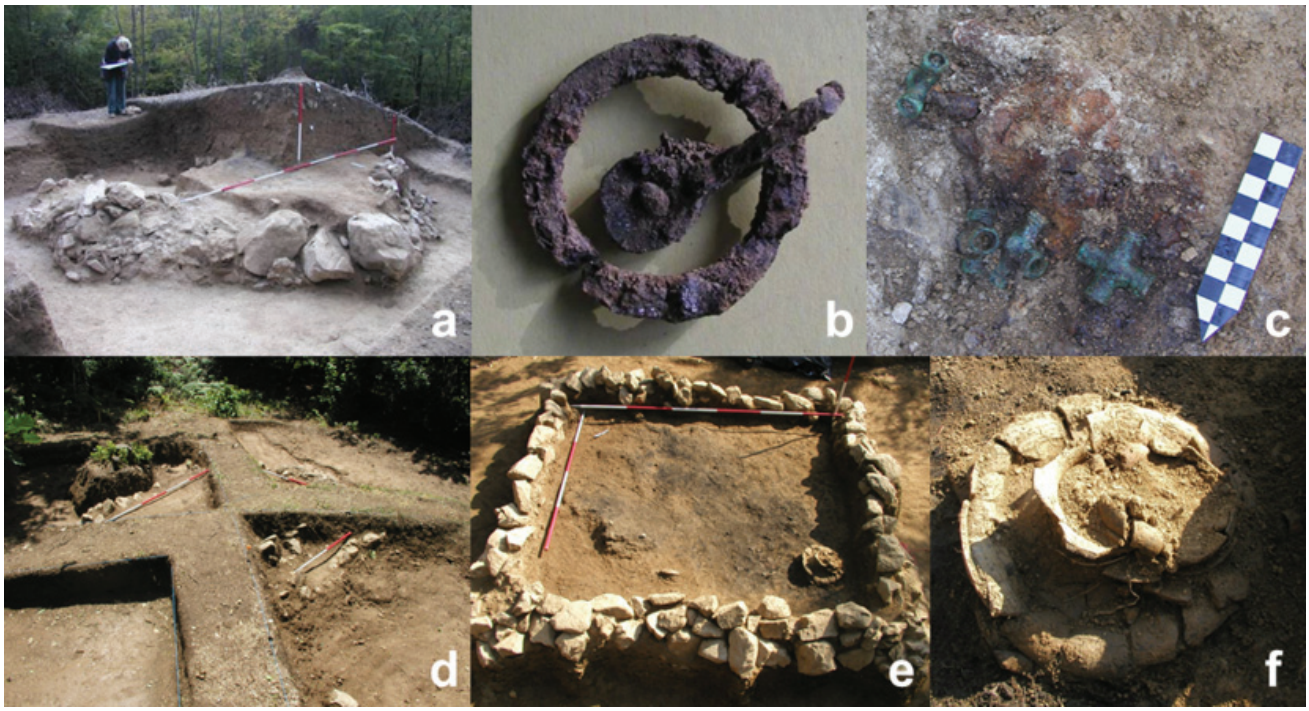

Fig. 2. Tumuli at archaeological site of Kaptol-Gradci investigated during the excavation campaign: a) tumulus 6, b) an element of a belt set of iron and bronze and c) bronze strap dividers from horse gear from tumulus 6; d) tumulus 7, e) chamber of tumulus 7 with the position of the pot, f) pot covered with two small bowls; it was used as an urn.

Tab. 1. Carbonized plant remains from tumulus 6 at Kaptol-Gradci archaeological site; SU – stratigraphic unit, QU – quadrant, PN – vessel, HF – heavy fraction; C – cultivated plant – cereals, WF – wild fruit, W – weed/ruderal plant.

		SU 49	**SU 71**	**SU 72**	**SU 78**	**SU 78/77**	**SU 82**	**SU 83**	**SU 85**	**SU 96**	**SU 97**	**PN 77**	**PN 98**	**PN 99**		**∑**
	QU	SW	SE	SE	NW, NE	NW	NE	SE	SE	NW	NW, NE	NE	NE	NE		
TAXA / QUANTITY (L) OF SAMPLES FOR FLOTATION		10	20	10	155	10	10	20	10	10	160	12	3	2.5	HF	**432.5**
Hordeum vulgare L.	C										5				1	**6**
Triticum aestivum L.	C										6				1	**7**
Triticum dicoccon Schrank	C				8	5	1	1	1	6	222				1	**245**
Triticum monococcum L.	C										2					**2**
Triticum spelta L.	C						1			1	16					**18**
Triticum dicoccon/spelta	C				5	3		1		2	66					**77**
Triticum cf. *aestivum*	C										4					**4**
Triticum cf. *dicoccum*	C				11				1	9	153					**174**
Triticum cf. *monococcum*	C				1	1					9					**11**
Triticum cf. *spelta*	C					1					26					**27**
Triticum sp.	C				34	16				27	478				4	**559**
Cerealia	C				27	13	2	2		69	674				2	**789**
Cornus mas L.	WF				4					4	5					**13**
Corylus avellana L.	WF		33	5	218					3	10	9	26	9	4	**317**
Malus sylvestris Mill.	WF				3											**3**
Prunus spinosa L.	WF										1					**1**
cf. *Sorbus aria* (L.) Crantz. /*torminalis* (L.) Crantz.	WF				1											**1**
Bromus secalinus L.	W										4					**4**
Bromus cf. *secalinus*	W										2					**2**
Plantago lanceolata L.	W				11						7					**18**
Polygonum aviculare L.	W	1	2		9	2					2					**16**
Polycnemum arvense L./*majus* A. Braun	W	1														**1**
Plantago sp.					2						4					**6**
cf. *Bromus* sp.											1					**1**
Apiaceae					1						2					**3**
Poaceae						1					5					**6**
Indet.			6		30	3					5			1		**45**
Total:		**2**	**41**	**5**	**496**	**44**	**4**	**4**	**2**	**44**	**1710**	**9**	**26**	**10**	**13**	**2356**

Material and methods

During the archaeological excavations of 2004 and 2005, archaeologists took samples for archaeobotanical analysis from various parts of both tumuli: 44 samples were taken from tumulus 6 (in total, 432.5 litres of earth), and 38 samples were taken from tumulus 7 (in total, 40 litres of earth). Samples were taken from all parts of the grave chambers where remains of combustion products were noticed. The stratigraphic units of the combustion products in fact consist of soot and ashes brought from the pyre on which the body of the deceased was cremated. In some places this material had been scattered on the bottom of the burial chamber. Then the remains of the deceased, in a ceramic urn, were placed at the bottom of the wooden chamber, as in tumulus 7, or, as in tumulus 6, in some organic recipient (a bag of leather or textile, a wooden vessel or a woven basket) of which there are no remains. Then in both cases a stone wall was built around the wooden chamber and over this construction an earth mound was raised. The strata from which the samples were taken are exclusively layers from the burial chamber and are stratigraphically completely distinct from the fill of the tumulus and the surroundings. Because this is a single layer, there is no vertical stratigraphy, and the minimal, very irregular and variable, thickness of the layer (from 0 to a maximum of 4 cm) did not enable any vertical archaeobotanical sampling.

The majority of these archaeological samples were floated at the site, pottery, metal, bones, and similar other finds being separated, while the remaining material was packed for archaeobotanical analysis. The flotation was performed in the standard fashion using a flotation device (cf. Pearsall 2000), with light fractions separated using two sieves, of 1 and 0.5 mm. Thus, from each sample, one heavy and two light fractions of various quantities were separated, and examined individually, but for the purpose of interpreting the result they were considered a single sample. Some of the heavy fractions contained a lot of coarse, dry sediment, which made the initial analysis more difficult, and occasionally called for additional dry sieving. Wet sieving was avoided to the maximum extent possible, bearing in mind the mechanical fragility of carbonized remains. The quantity of samples for flotation varied between 10 and 160 litres (Tabs. 1 and 2). The contents of the vessels were not floated at the site, but were taken to the laboratory immediately after the vessels were recovered.

Plant remains were separated from the samples and identified using a binocular magnifier (magnification 10–40´) and various identification manuals (Beijerinck 1947, Cappers et al. 2012, Jacomet 2006, Kohler-Schneider 2001) and the carpological collection (still being assembled) of the Division of Botany at the Zagreb Faculty of Sciences. They have been recorded and stored in the Division of Botany of the Zagreb Faculty of Sciences, where they are available for inspection. The nomenclature of the families identified has been harmonized with Nikolić (2015).

Results

From tumulus 6, a total of 44 samples have been analysed; 24 of these contained plant remains, while 20 samples contained no such findings. In total, 2356 carbonized plant

Tab. 2. Carbonized plant remains from tumulus 7 at Kaptol-Gradci archaeological site; SU – stratigraphic unit, QU – quadrant, PN – vessel; C – cultivated plant – cereals, Co – cultivated plant – oil crop, WF – wild fruit, W – weed/ruderal plant.

		SU 83	**SU 85**	**SU 92**	**SU 92, PN 204**	∑
	QU	SW	NE	NE, SE, SW, NW	NW	
TAXA / QUANTITY (L) OF SAMPLES FOR FLOTATION		10	20	10		**40**
Hordeum vulgare L.	C			2		**2**
Triticum dicoccon Schrank	C	3		24		**27**
Triticum spelta L.	C			4		**4**
Triticum cf. *dicoccum*	C		7	36		**43**
Triticum cf. *monococcum*	C		1	1		**2**
Triticum cf. *spelta*	C			13		**13**
Triticum sp.	C	5	2	103		**110**
Cerealia	C	11	28	376		**415**
Brassica cf. *rapa* L.	Co/WF			1		**1**
Cornus mas L.	WF			1		**1**
Corylus avellana L.	WF				2	**2**
Plantago lanceolata L.	W			2		**2**
Poa annua	W			4		**4**
Poa cf. *annua* L.	W			5		**5**
Polygonum aviculare L.	W			1		**1**
Polygonum sp.				3		**3**
Poaceae				1		**1**
Indet.				4		**4**
Total:		**19**	**38**	**581**	**2**	**640**

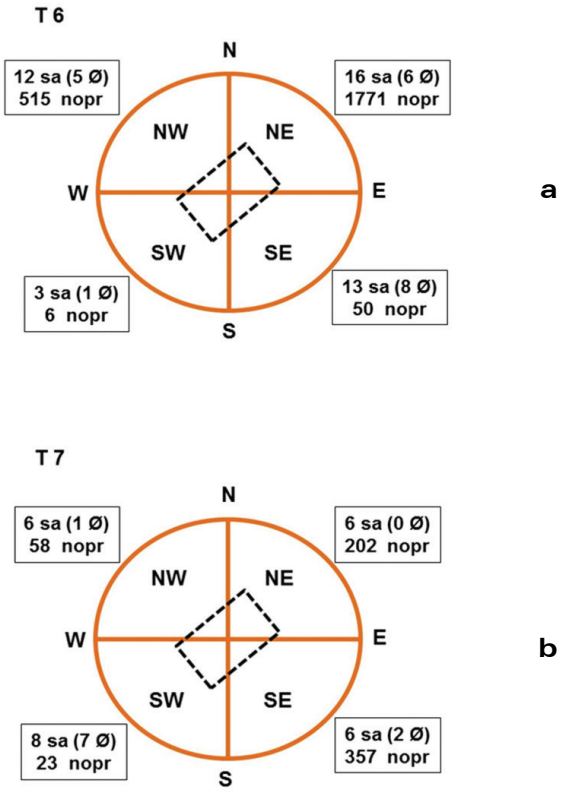

Fig. 3. Comparison of tumuli 6 (T6) and 7 (T7) at Kaptol-Gradci with a view to the number of archaeobotanical samples (sa), number of discovered plant remains (nopr) and their position within the tumuli chambers; Ø – number of samples with no findings.

remains were separated, and 2311 (98%) of them were identified (Tab. 1). The total number of samples from tumulus 7 was 38; of these, 26 were analysed (while 12 samples did not contain a complete label): 16 of them contained plant remains, while 10 resulted in no such findings. A total of 640 carbonized plant remains were separated, and 636 (99%) of them identified (Tab. 2).

Both tumuli that were investigated contained a burial chamber set in a southwest-northeast orientation. In view of the fact that samples were taken from various quadrants, that is, from various parts of the chambers, a comparison of finds by quadrants was made (Fig. 3). The aim was to examine whether there was any similarity in terms of quantity and distribution of various finds, including the archaeobotanical, and whether any consistency or pattern can be observed in the organization of the interior of the burial chambers. In tumulus 6, the north-eastern quadrant contained the most abundant and diverse finds, while in tumulus 7 it was the south-eastern quadrant.

In both tumuli, the overwhelmingly predominant finds were of cereal grains (Figs. 4a and 4b): in tumulus 6 they made up 83% of the finds, and in tumulus 7 no fewer than 96.9% (Fig. 5). Besides the cereal grains, a very small quantity of weeds representing accidental associations have also been identified, as well as remains of wild fruits collected in the countryside (Figs. 4c and 4d): in tumulus 6 these made up 14.5% of the finds, and in tumulus 7 only 0.6%.

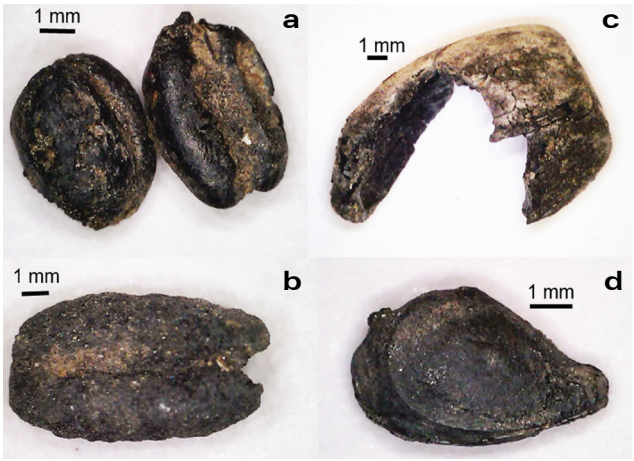

Fig. 4. Carbonized plant remains from tumulus 6 at archaeological site Kaptol-Gradci: a) common wheat (*Triticum aestivum*), b) spelt (*Triticum spelta*), c) common hazel (*Corylus avellana*), d) apple seed (*Malus sylvestris*).

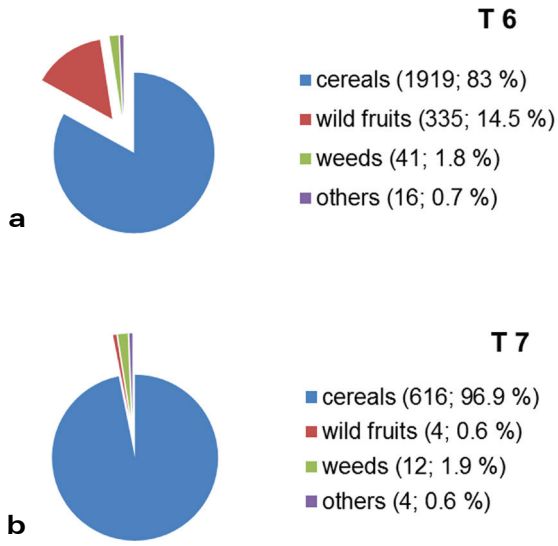

Fig. 5. Overview of finds of individual plant groups (total number and percentage) from tumuli at archaeological site Kaptol-Gradci: a) tumulus 6, b) tumulus 7.

Given that the preserved carbonized remains were in rather poor condition, the majority of cereal grains could be identified at the level of the group *Cerealia* (large-grained cereals) or of the genus *Triticum* (wheat). In tumulus 6, 41.1% of the finds belonged to the group *Cerealia,* and 29.1% to the genus *Triticum*, while in tumulus 7 the order of the proportions was the same, but the percentages were somewhat different: *Cerealia* 67.4%, *Triticum* 17.9% (Fig. 6). Of the cereal grains identified at the level of species, in both tumuli the most numerous find was emmer (*Triticum dicoccum*); it made up 21.8% of the finds in tumulus 6, and 17.9% of those in tumulus 7.

Discussion

The total quantity of carbonized plant remains recovered from the two tumuli differs: there were 2356 finds in

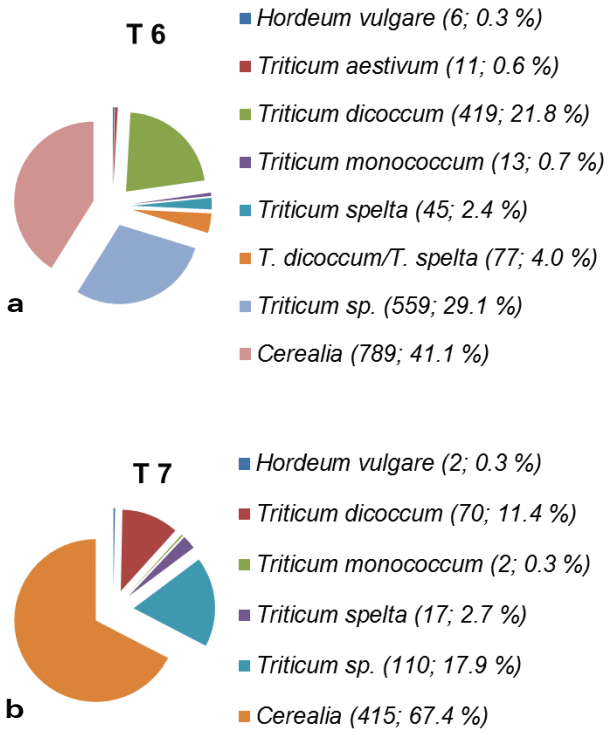

Fig. 6. Overview of finds (total number and percentage) of individual plant families within the group of cereals from tumuli at archaeological site Kaptol-Gradci: a) tumulus 6, b) tumulus 7.

tumulus 6, and 640 in tumulus 7; but the quantity of finds depends on the sampling strategy, quantity of sediment available for sampling, state of preservation, and various unforeseen factors. Much more important than the total quantity of finds is their composition and the representation of individual plant families, and in that respect the two tumuli exhibit a high degree of similarity. In both tumuli, cereal grains were absolutely predominant and equally poorly preserved, resulting in most of them being identified only at the level of large-grained cereals (*Cerealia*), or at the level of the genus (*Triticum,* or wheat). Among those cereal grains that had been preserved well enough to allow their identification at the level of species, in both tumuli the most frequent was emmer (*Triticum dicoccum*) (Tabs. 1 and 2; Figs. 5 and 6). In addition to cereal grains, associated weeds have also been identified, but those are accidental additions, and in the context of burial rituals they have no crucial significance. However, the appearance of so-called fruit deposits (hazelnuts, apples, Cornelian cherry) is very important: these certainly did not end up in the burial chamber by chance; actually, they are the only archaeobotanical finds in the three vessels from tumulus 6 (Tab. 1) and the one from tumulus 7 (Tab. 2). The remains of cereal grains cannot be associated so obviously with specific vessels. They were scattered over the burial chambers, together with pottery sherds. For plant remains to be preserved in a carbonized state, they need to be burned with a limited oxygen supply, and pottery vessels present themselves as an acceptable explanation. Grains and fruits were probably put in vessels and placed on the funeral pyre as gifts, or offerings, during some complex burial ritual. Still, while the fruit deposits in the two tumuli investigated can be associated with specific vessels, the same cannot easily be said of the cereals, allowing for the possibility that they were placed directly on the pyre, or that the body of the deceased was laid on top of scattered grains and/or grain ears. This could explain the relatively high percentage of cereal grains that were not only damaged, but also deformed.

The distribution of finds within the burial chambers and individual quadrants of the two tumuli investigated display no similarity or regularity. The samples were not evenly taken from all parts of the burial chambers, but from all the parts where the remains of combustion products were noticed. The archaeobotanical analysis of tumulus 1 at the same site (Šoštarić et al. 2007), from which archaeobotanical samples were taken evenly from all parts of the burial chamber, showed that the non-carbonised plant remains that are preserved in the conditions of this site represent recent contamination. For this reason, in the sampling the archaeologists focused only on carbonised plant remains. Tumuli at this site will not give us any indication of whether fresh, not burned, plant goods were placed in the graves. Nevertheless, we wanted to find out if there was any consistency or pattern in the internal arrangement of carbonised plant remains, i.e, of those that were most probably burned on the pyre together with the deceased.

In tumulus 6, the majority of finds were recovered from the north-east quadrant of the chamber, where the predominant finds were of cereal grains, and where there were also fruit deposits (Fig. 3a). In the north-west quadrant of tumulus 6, the quantity of finds was significantly lower, but the remains of various wild fruits were present in significant number. In tumulus 7, the south-eastern quadrant contained the most abundant archaeobotanical finds (Fig. 3b), primarily cereal grains. Cereal grains were also present in the north-east quadrant, where their number was smaller but still significant, while a few fruit deposits were recorded in the north-east and north-west quadrants.

The only available archaeobotanical research into Hallstatt necropolises is that of the site of Sopron (Jerem and Facsar 1985, Jerem et al. 1985). In view of the fact that those finds came primarily from a settlement, they cannot be compared to this context. Graves are very specific units; they do not reflect everyday life, especially not in the cases of the graves of powerful and prominent people. Archaeobotanical samples were also taken from two graves at the site of Sopron, but those originate from the Late Iron Age (La Tène Culture), and thus they cannot be directly compared, either. Nonetheless, it is worth mentioning that a large quantity of remains of plums (*Prunus domestica*) used as fruit deposits were recovered among other finds from those graves that consisted mainly of elements of natural vegetation.

On the basis of the first results obtained from the archaeological site of Kaptol-Gradci and the scarce archaeobotanical research into Hallstatt necropolises in Europe, the conclusion can be drawn that a potential pattern can be observed, as an element of a complex burial ritual in which cereal grains (dominant in terms of proportions) played an important role, together with various fruit deposits, whose

type and quantity probably depended on the season, their availability in the environment and/or the possibility of their storage/preservation.

No conceptual consistency or regularity in the distribution of plant remains within a burial chamber could be observed. Several vessels contained only fruit deposits, but it is difficult to ascertain whether this distribution was accidental or deliberate.

Acknowledgements

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