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COMPLEX CHARACTERIZATION OF KURGANS IN THE CSANÁDI-HÁT REGION, HUNGARY

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Abstract: During the inventory of the mounds of the Körös-Maros National Park, the completre characterisation of those situated in the Csanádi-hát micro-region was conducted as well. We visited every existing and already destroyed prehistoric burial mound (most of them are Yamnaya kurgans from the Late Copper Age) based mainly on maps of the 18th and 19th centuries. We prepared a complete list of vascular plant species of each kurgan, except those ones where the total surface was ploughed. The investigated area covers 1039.41 km^2. 254 kurgans were documented. From these, 64 have been already carried away or destroyed (25.2% of the total number of mounds). We have evaluated the still existing 190 kurgan's recent stage (74.8%). 96 features (37.8%) from the total amount are used as arable fields, these were inadequate for botanical studies. On 94 mounds (37.0%), despite the annually changing agricultural utilization, different vegetation fragments were documented (forest-belts, alleys, roadside, channel banks, triangulation points, cemeteries, etc.). Several burial mounds are still preserved as fragments of the ancient loess meadow STEPPE and forest steppe vegetation. Some of the valuable plant species found during the study are: *Agropyron cristatum*, *Ajuga laxmannii*, *Carduus hamulosus*, *Chamaecytisus virescens*, *Glaucium corniculatum*, *Hylotelephium maximum*, *Inula germanica*, *Ornithogalum pyramidale*, *Papaver hybridum*, *Phlomis tuberosa*, *Ranunculus illyricus*, *Rosa gallica*, *Sternbergia colchiciflora*, *Vinca herbacea*. Despite the fact that nature and heritage protection laws provide national conservation for these kurgans, the practical operation of the legislative is not solved. For the long-term conservation of the special vegetation of kurgans it would be required to take out the entire surface of the most valuable mounds from agricultural production and maintain their habitat (abandonment of ploughing). With the introduction of the cross compliance system (common agricultural policy of European Union), forward-looking practical initiatives have already been taken.

Introduction

The most burial mounds in the Great Hungarian Plain were built by the people of the Yamnaya Culture from the East in the Late Copper Age, 3600–2700 BC (Ecsedy 1979, Horváth 2011, Gerling et al. 2012). These mounds are highly important from archaeological, paleoecological and cultural heritage perspectives, and are salient cultural element of the landscape. Through detailed and complex studies they provide information not only on the life history, archaeological heritage and customs of the people buried inside them, but also on the environment, the ancient flora and fauna and the geological formations that existed at the time of their construction (Pető and Barczi 2011, Barczi 2016). Data from these sites can augment and be contrasted with data from other archaeological environmental studies on the Hungarian Plain. In the 18th century, the number of kurgans on the Great Hungarian Plain was estimated to be around 40000 (Kiss 1999) or 25000 (Bede 2014), but many of them vanished in the past two centuries due to infrastructure development and agricultural practices. Only a few hundreds of them remain in good condition (Tóth 2011, Tóth et al. 2018), and many of them suffer the effects of ploughing and erosion. Hungary has laws to protect every kurgan, but in practice it is often problematic.

Mounds have a general, global role in the survival of ancient vegetation, which is mainly due to their special position and relatively steep slopes (Zólyomi 1969, Sudnik-Wójcikowska et al. 2011, Deák et al. 2016, Deák 2018).

The kurgans often preserved small but extremely valuable steppe, meadow steppe and forest steppe fragments (mainly Salvio nemorosae-Festucetum rupicolae and Agropyro cristati-Kochietum prostratae associations) in Hungary, too. These small grasslands – beside the ancient grasslands of balks, ramparts, cemeteries and loess walls – are the last witnesses of earlier dry grass loess landscapes. Their discovery and preservation is a priority task of nature conservation (Zólyomi 1969, Joó 2003, Tóth 2004, Herczeg et al. 2006, Csathó 2009, Deák et al. 2016, Deák 2018).

In this paper we would like to present the main results of complex research conducted on the mounds in the Csanádi-hát region (Békés County, Hungary).

Study area

The Csanádi-hát (Csanád ridge) is a small region in the eastern part of the Great Hungarian Plain, in the central part of Tiszántúl, in the Maros-Körös interfluve area. In a historical approach, the Csanádi-hát micro-region implies the eastern part of the pre-1950 Csanád County that is still part of Hungary; that is, the area to the north and east of Mezőhegyes. The study area is thus essentially the southern quarter of today's Békés County.

The region is a sedimentary alluvium plain covered by loess sludge (on the surface with infusion loess and sandy loess). Meadow chernozem soil is dominant. Its surface varies between 97 to 107 meters above sea level. By orthographic relief type it is a low floodless plain that is slightly sloping in direction to south-southwest. The geomorphological character is determined by Pleistocene rivers, river-arms and coastal dunes in rich forms in northwest-southeast axis. The deeper flats and the areas between the larger dunes are poorly drained (Dövényi 2010).

The entire area of this small region is located on the alluvial fan of the Maros river, and its most remarkable geomorphological formations are the riverbeds of the ancient Maros (Gazdag 1960, Gazdag 1964a, Kiss et al. 2014). The area is sloping evenly to the west, northwest and north. The banks of the riverbeds are accompanied by a series of heavily eroded (damaged) dunes formed by wind. The longer and more striated ridges can be found in the vicinity of Csanádapáca, Medgyesbodzás, Medgyesegyháza, Nagykamarás, Lőkösháza and Kevermes. The ratio of sand fraction is higher in the soil of these parts (Dövényi 2010).

The annual amount of sunshine is slightly over 2000 hours, with 810 hours in summer and 190 hours in winter. The average of annual temperature is 10.5 °C, the average of temperature during the vegetation period is 17.4 °C. The frost-free period lasts approximately 194 days. The annual precipitation is around 600 mm, with an average about 350 mm in the vegetation period. The prevailing wind is North, but South and Southeast winds are also common. The climate is moderately warm, moderately dry (Dövényi 2010).

The Csanádi-hát is a typical agricultural landscape. The natural vegetation is almost all destroyed, 89.2% of the area is arable field, and 5.9% is clear interior of the settlements (Dövényi 2010). In this fragmented landscape the narrow grassland stripes like road and railway verges and borderlines have often great importance to the remains of original flora and fauna (Csathó 2009, 2011).

Our paper includes the mounds of the following 21 recent settlements (with territorial extensions in hectare): Almáskamarás (1475 ha), Battonya (14571 ha), Csanádapáca (5130 ha), Dombegyház (5794 ha), Dombiratos (1830 ha), Elek (5490 ha), Kaszaper (3327 ha), Kevermes (4334 ha), Kisdombegyház (1261 ha), Kunágota (6396 ha), Lőkösháza (5202 ha), Magyarbánhegyes (3656 ha), Magyardombegyház (765 ha), Medgyesbodzás (3167 ha), Medgyesegyháza (6429 ha), Mezőhegyes (15543 ha), Mezőkovácsháza (6259 ha), Nagybánhegyes (4224 ha), Nagykamarás (4305 ha), Pusztaottlaka (1887 ha) and Végegyháza

(2893 ha). The total area of the settlements surveyed in 103938 ha (approximately 1040 km^2) and makes up 13% of the operation of the Körös-Maros National Park Directorate.

Research historical background

Regular archaeological research in the area started late, after World War II, but took off really only from the 1970s, as the museum system that emerged from the end of the 19th to the first half of the 20th century avoided this county, and there were hardly any other institutions with an antiquities collection (e.g. schools, private collections).

The first conscious rescue excavations took place during the interwar period, and were carried out by the archaeological school of Szeged (we could call them now 'experimental excavations'); the names of János Banner and Alajos Bálint mark the local research of this era (Bálint 1941).

During these works, from time to time mounds also came to the fore, such as the Meggyes-halom near Bánkút (Banner 1927), the Botos-halom near Nagykamarás (Banner 1926), the Templom-halom near Végegyháza (Bálint 1938) or the Templom-halom at Csanádapáca (Bálint 1939). It is a characteristic of the era that local landowners also excavated out of curiosity and passion, but mostly for treasure hunting. In the 1930s, this is how Zoltán Nagy excavated the Atilla-halom in Dombegyháza (Szatmári 2005).

There were no regular excavation projects in the area later either, so research remained incomplete. However, there were rescue excavations at a few individual mounds. In 1963, Katalin Nagy excavated the Barta-halom in Kevermes (Nagy 1968), Irén T. Juhász the Vizes-halom in Dombegyháza in 1968 (T. Juhász 1974), and József János Szabó the Atilla-halom at Dombegyháza in 1974 (Szatmári 2005). Also worth mentioning are the efforts of Ferenc Pelle, a teacher in Kevermes, who collected data on local history, rescued finds and carried out field surveys since the 1960s (Pelle 1965, Pelle 1978, Pelle 1981).

The registration processes of mounds started with archaeological field surveys. In the first half of the 1970s, János József Szabó prepared the archaeological topography of Battonya, listing 30 mounds (Szabó 1978). In the Csanádi-hát region, Dénes Virágh registered 61 mounds (Virágh 1979), László Szelekovszky 41 mounds (Szelekovszky 1999), the Institute of Archaeology of the Eötvös Loránd University only 4 mounds (ELTE 2001), while the so-called Kunhalom-program (2002) inventoried 29 mounds. In the course of other archaeological works, Imre Szatmári and Csaba Vágó identified 4 mounds in the area of Medgyesegyháza (Szatmári and Vágó 1993), and Attila Gyucha found 7 mounds in the administrative area of Elek (Gyucha 2000).

In the 1990s, Imre Szatmári – during the study of medieval churches – led several excavations on mounds, such as the ones at Medgyesegyháza-Dankó Tanya (Szatmári and Vágó 1993), the Meggyes-halom in Bánkút (Szatmári and Vágó 1993), and on Ferenc Fodor's mound (Fodor Ferenc halma) in Dombiratos (Szatmári 2005). In 2005, András Liska – also in connection with a medieval church – carried out rescue excavations at Vince Kisházi's mound (Kisházi Vince dombja) in the area of Kunágota called Biserica (Szatmári 2005).

Onomastic research in the area can be said to be very poor (Hévvízi 1980), although some mound names can be found in published collections or unpublished manuscripts. First, we must mention the collection of toponyms by Frigyes Pesty from 1864 (Pesty 1983), and later the analysis of the geographical names of Medgyesegyháza and Battonya were published as well (Hévvízi 1993, Hévvízi 2006). The toponyms of Kevermes are available in a manuscript (Pelle 1981).

The history of botanical research on the Csanádi-hát region was reviewed by Virók (2006) and Tóth (2012). The flora of the former Csanád County was studied in detail by Lajos Thaisz (Thaisz 1902, 1905), but his main work on the area was, unfortunately, left in manuscript

(Thaisz 1905). An important milestone in the botanical research of the landscape is the discovery and description of the Tompapusztai-löszgyep loess grassland near Battonya (Csathó 1986, 2005), which is one of the most valuable surviving stands of the Pannonian loess meadow steppe grasslands.

In other parts of the Maros-Körös interfluves (Central Tiszántúl region), numerous studies were carried out on the flora and vegetation of the mounds (Penksza and Kapocsi 1998, Barczi 2003, Kispál 2004, Vona and Penksza 2004, Herczeg et al. 2006, Détár 2012).

The flora of the kurgans within the Csanádi-hát had hardly been investigated before our surveys, only a few sporadic published data in the literature were found (Jankó 1887, Szelekovszky 1996, and after our study: Bozó 2018). A detailed flora list about Temető-halom near Medgyesegyháza was published by Csathó (2008).

Only sporadic published data are available for the fauna of the mounds, too (Merkl et al. 2014).

Material and methods

According to their origin, mounds can be classified as burial sites and sacred points of nomad people (kurgans) in prehistory (Yamnaya Culture) and later in the Roman Age (Sarmatians). This survey includes only the kurgans of the Yamnaya Culture (without tells or other types of mounds).

The Yamnaya Culture (with their mound-graves) were nomadic people who built large burial mounds during the Late Copper and Early Bronze Age. Eastern Hungary is the westernmost extent of the Yamnaya Culture, which is best known from the steppe zone of Eurasia. Their burial mounds can be found along the banks of defunct rivers and at some points of higher elevation on the plain (Ecsedy 1979, Pető and Barczi 2011).

During our investigations we applied complex multidisciplinary approaches using methods from more disciplines.

In the course of investigation we used and processed the data of local historical literature, archaeological literature, museum repositories, historical sources and other archival documents (Bede 2014).

Handmade maps from the 18th and 19th centuries and modern printed maps provide the primary dataset for the geomorphological and landscape historical research. From these sources landscape changes of the last two and a half centuries were documented and mapped. To study the geomorphology and environmental history of the Csanádi-hát region, manuscript maps are indispensable (Figure 1), in which the area – as a former chamber estate – is very rich, the most significant of which are the works depicting Battonya and its surroundings Gazdag 1964b, MOL térképtára I–II. 2006, Lakos 1976–1979, Lakos and Dóka 1978–1988).

Each identified mound was ground controlled and their major characteristics were recorded during which their condition, the vegetation cover and its quality were described. Central coordinates were taken by GPS, and their relative heights and diameters were estimated. In accordance with the original research goal, natural protection aspects prevailed in the course of these surveys (Bede 2014).

Field observations and data from historical records are organized into a uniform format. ArcGIS 10 was used to map the data.

All the mounds were assigned to only one administration unit (settlement); in case the area of the mound covered several settlement boundaries, then it was assigned to the settlement where its largest part falls into.

Figure 1. The Barta-halom kurgan (between Mezőhegyes, Tótkomlós, Nagyér and Ambrózfalva settlements) with four boundary sign on a handmade map from the 18th century (MOL S. 11. 80)

1. ábra A Barta-halom négy település (Mezőhegyes, Tótkomlós, Nagyér és Ambrózfalva) határán, rajta négy határdombbal egy 18. századi kéziratos térképen (MOL S. 11. 80)

Certainly, mounds that are classified as significant take priority and this indicates that 'there is still something to be rescued'. We developed a seven-level system (from 1 to 7), in which *significant* mounds belong to categories No. 1, 2 and 3, *non-significant* ones to No. 4 and 5, while categories No. 6 and No. 7 represent *completely destroyed* mounds.

Category No. 1. These are the most valuable mounds and are remarkable archaeological sites as well as fundamental landmarks.

Category No. 2. Mounds belonging to this category are covered with evenly distributed grass of low value, or are quite important landmarks.

Category No. 3. Mounds of significant landscape value, exceeding the height of 1.1 m, and mounds important from archaeological or historical terms were included in this category. These are usually prominent sites, such as Medieval Age churches, cemeteries were established on top of them.

Category No. 4. This is the category for the mounds without substantial natural and landscape value. Most of their surface is ploughed, but their protection may be facilitated by features located on or near them (e.g. triangulation point, dirt road, roadside, tree line, woods, grass-margin, canal-margin, etc.).

Category No. 5. Mounds that have no substantial landscape value, in general lower than 1 m, and their whole area is cultivated. A lot of them are expected to be ploughed out completely in the near future.

Category No. 6. These are mounds that have already been ploughed out or spoiled, i.e. their exposed surface feature has been completely destroyed. However, it is important to register them because the primary burials and other related subsurface features may still be intact.

Category No. 7. These mounds are completely demolished, including their primary burials as well. Most frequently the mound as a whole, together with the rise underneath, has been quarried. It also occurs, generally in towns, that a mound was levelled, its previous location was filled and built upon.

Research has been conducted since the early 2000s, with the most intensive field surveys being carried out between 2008 and 2011, but collecting floristic data is still ongoing.

We prepared a complete list of vascular plant species of each kurgan, except those mounds where the total surface was ploughed. For each plant species, we also characterized the abundance of the species on the mound using a relative scale.

Results

Geomorphological character

The mounds of the Csanádi-hát region lie in the largest number and density on the banks along the larger watercourses and on the long stretching ridges (on the alluvial fans of the abandoned old Maros riverbeds between Kevermes and Csanádapáca) (Gazdag 1960, Kiss et al. 2014).

We find the mounds consistently along larger riverbeds (e.g. Száraz-ér, Cigányka-ér, Hatházi-ér, Kutas-ér, Hajdú-völgy, Birka-völgy). They do not appear, however, in the higher, flood-free areas between the valleys, because these table-like areas were not used by mound-building cultures. The lack of mounds is the most spectacular "on the Mezőhegyesi-hát (Mezőhegyes ridge) and the alluvial surfaces of Magyarbánhegyes–Nagybánhegyes.

From the point of view of settlement history, the importance of ancient channels cannot be emphasized enough (Lakatos 1972). Since the prehistoric ages, local communities were able to reach the central areas of the Maros-Körös interfluves along them (MRT 10), mound-building pastoralists grazed their animals there, and Late Bronze Age cultures discovered new opportunities by building their fortifications and establishing settlements in these areas (Szeverényi et al. 2017). This was enabled not only by the water resources of the valleys, but also the strategic location of the dunes flanking the ancient channels, as settlements were always established on the highest ground, and the ancient routes also followed these old riverbeds.

Natural condition survey

We have field surveyed altogether 254 kurgans (Figure 2). We did not register mounds in Magyarbánhegyes, Magyardombegyház and Nagybánhegyes settlements.

The mean height of the 195 mounds with relative height data is 1.2 m, the average diameters are 55 m and 32 m. The biggest mound is the Tatár-halom (Figure 3), a boundary point between Lőkösháza and Sânmartin (Szentmárton), it shows 6.4 m height.

The primary goal of the survey was to map mounds of natural protection and landscape value, and to search for previously unknown ones. Therefore, while registering the mounds, we surveyed their current natural conditions and also considered their archaeological and landscape archaeology viewpoints.

The numerous and various natural, historical and landscape values of the mounds make the establishment of specific categories necessary for classifying them. Since the primary goal of the survey was to map previously unknown mounds valuable from natural protection and landscape perspectives, the classification by their significance was governed by this aspect as well. The establishment of a value-classification is inevitable prior to protection works, for it facilitates in the prioritization of mounds (Tóth 1996). In fact, for launching the actual protection we must be aware of the most important and the most endangered mounds that are in most need of protection. In practice, abandonment of thousands of low and ploughed kurgans is unrealistic, and maybe it generates serious conflicts.

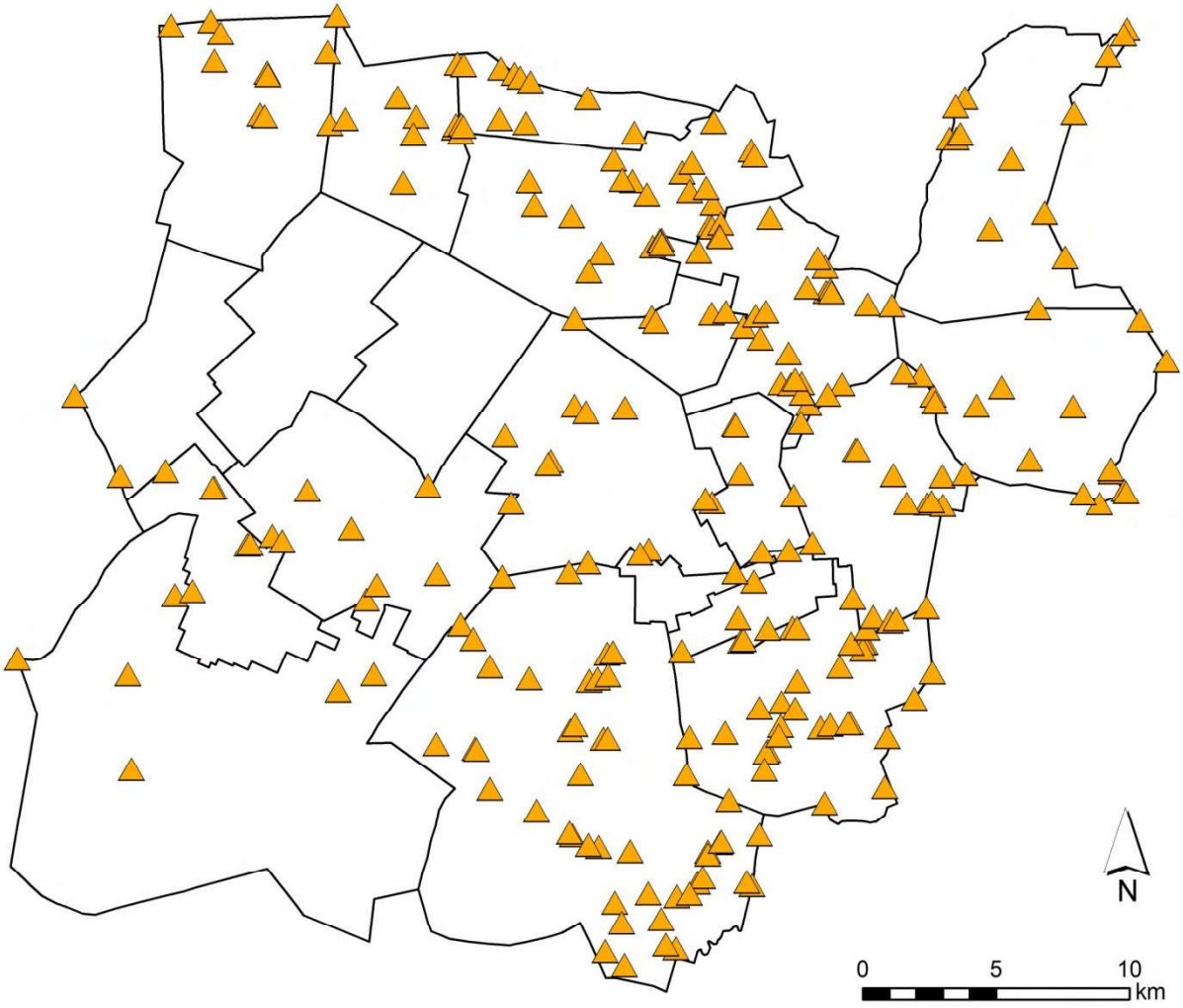

Figure 2. The surveyed mounds in the Csanádi-hát region
2. ábra A Csanád-hát felmért halmai

Figure 3. The Tatár-halom (between Lőkösháza and Sânmartin/Szentmárton) is the highest kurgan of the study area (photo by Á. Bede)
3. ábra A Tatár-halom (Lőkösháza és Szentmárton/Sânmartin határán) a vizsgálati terület legmagasabb kurgánja (Bede Á. felvétele)

Category No. 1. In total there are 21 of these sites, which is 8.3% of the total amount.
Category No. 2. There are 21 sites in this category comprising 8.3% of the total amount.
Category No. 3. Their number is 42, and that is 16.5% of the total amount.
Category No. 4. 32 of this type were mapped equalling 12.6% of all sites.
Category No. 5. There are 74 sites, which is 29.1% of the total amount.
Category No. 6. There are 47 sites in this category making up 18.5% of the total amount.
Category No. 7. 17 mounds of this type were found, accounting for 6.7% of the total amount.

The number of significant mounds (Categories No. 1 to 3) is 84 (33.1%), the amount of insignificant ones (Categories No. 4 and 5) is 106 (41.7%), while 64 mounds are considered to be entirely destroyed (Categories No. 6 and 7) (25.2%). Certainly, the categorization of a given mound may be altered if new botanical, archaeological, and/or historical, etc. data emerges.

On the Csanád-hát region, Category No. 1 and Category No. 2 mounds – the most valuable ones – make up nearly one-fifth of all existing kurgans, which is outstandingly good considering the proportions of other regions (Bede 2014). Many of these barrows still have relatively intact (less degraded) remnants of ancient loess grassland on their surface.

Floristical survey

We performed a botanical status check of 190 still existing kurgans in the area of the Csanádi-hát region (74.8% of all known mounds). Of these, 96 (37.8% of the total) are utilized as arable land, and were therefore unsuitable for more detailed botanical studies. However, on 94 mounds (37.0% of the total), we also documented vegetation other than the annually changing arable cultures (forest strips, rows of trees, ditch slopes, canal banks, farmsteads, concrete triangulation points, cemeteries, etc.).

With the exception of mounds that had been ploughed all over their entire surface, a complete flora list was compiled for all the stemmed plants on all the mounds. Several mounds still preserve fragments of ancient loess steppe, meadow steppe and forest steppe vegetation. Some of the species found on mounds that have floristic or natural protection value are: *Agropyron cristatum*, *Ajuga laxmannii*, *Androsace elongata*, *Asperula cynanchica*, *Carduus hamulosus*, *Centaurea scabiosa* subsp. *spinulosa*, *Chamaecytisus virescens*, *Dianthus pontederae*, *Elymus hispidus*, *Fragaria viridis*, *Glaucium corniculatum*, *Hylotelephium maximum*, *Inula germanica*, *Lavatera thuringiaca*, *Melica altissima*, *Ornithogalum pyramidale*, *Papaver hybridum*, *Phlomis tuberosa*, *Potentilla recta*, *Ranunculus illyricus*, *R. pedatus*, *Rosa gallica*, *Stachys recta*, *Sternbergia colchiciflora*, *Teucrium chamaedrys*, *Thalictrum minus*, *Thesium dollineri*, *Viola ambigua*, *Vinca herbacea*.

Of the plant species found on kurgans, eight are under legal protection (*Ajuga laxmannii*, *Carduus hamulosus*, *Inula germanica*, *Ornithogalum pyramidale*, *Phlomis tuberosa*, *Ranunculus illyricus*, *Sternbergia colchiciflora*, *Vinca herbacea*).

It is striking that the few known regional actual occurrences of pioneer species, once weed-like plant species (partly archaeophytes), which have become regionally rare and endangered in the landscape (Sallainé Kapocsi et al. 2012), are found in a significant proportion on the mounds. For instance *Caucalis platycarpos*, *Glaucium corniculatum*, *Papaver hybridum*.

Kurgans with outstanding botanical significance include: Tatár-halom, Bemi (Lőkösháza–Szentmárton/Sânmartin), Temető-halom (Medgyesegyháza), Balta-kereszt-halom (Battonya), Hármashatár-halom (Dombegyház–Kevermes–Kisiratos/Dorobanți), Négyeshatár-halom (Dombegyház–Nagyiratos/Iratoșu–Kisiratos/Dorobanți), Trianoni-halom (Dombegyház–Tornya/Turnu), and the two kurgans of the Serbian cemetery in Battonya.

On a number of mounds, native (primarily *Prunus spinosa*) and alian invasive (e.g. *Robinia pseudoacacia*, *Lycium barbarum*, *Juglans regia*) woody shrubs cause nature conservation problems.

14 kurgans are standing in the country border – as a connected grassland line – between Hungary and Romania. These are 14.9% of the mounds which have persistent vegetation in the Csanádi-hát region.

The detailed analysis and evaluation of botanical results has not yet been carried out; we intend to do that later on.

Some cultural aspects

Through the names of the mounds we gain a better understanding of historical changes (e.g. the subsequent owners of a given mound), hence, we emphasize the importance of the originality of the toponyms. In the Csanádi-hát region 85 mounds have original names (33.5%), while 169 do not have (66.5%). It is important to note that we did not propose name to any mound, only names found in original sources and identified during surveys were used. We do not share the view that mounds without known names must be labeled because a many times the name has not been searched for. In the long run it is unadvisable to name unknown mounds, for if the historical name of a given mound was eventually found out it would be rather difficult to change the widely used, already registered, fake name.

Certain mounds are associated with legends, superstitious observations or treasure stories (Bede 2014), for example for the Targyi-halom and Botos-halom in Nagykamarás (Banner 1926) or the Cikó-halom and Balta-kereszt-halom in Battonya (Hévvízi 2006). A noteworthy folk tradition around Dombegyház says that Atilla, the king of Huns is buried under the so-called Atilla-halom (Radnai 1981).

The full mapping and topographical investigation proves that the phenomenon known as the ‘peacock-eye kurgan formation’ (Radnai 1967, Radnai 1981, Szelekovszky 1999, Szelekovszky 2005) does not actually exist; there are many more kurgans – of different sizes – in the area, which were not taken into account when drawing the three concentric circles, and there are also points inserted into the circles, which are not mounds (Figure 4).

Ferenc Pelle thought to discover geometric and numerical systems in the location of the kurgans around Kunágota (Pelle 2011), but these are only the creations of a rich fantasy. These theories will enter the history of landscape research as historical curiosities.

Discussion

We have relevant new results from archaeological topographical aspect, because we surveyed 254 kurgans (Bede 2014), and the previous cadastres and field works registered much less mounds in the Csanádi-hát region: Dénes Virágh (1979) 61 mounds (24.0% of total), László Szelekovszky (1999) 41 mounds (16.1% of total), the Institute of Archeology of the Eötvös Loránd University (ELTE 2001) only 4 mounds (1.6% of total) and the Kunhalom-program (2002) 29 mounds (11.4% of total) documented.

The investigation also brought a lot of novelties for onomatology (Bede 2014), because in fact there are many more kurgans have names than in the previous cadastres show (Virágh 1979, Szelekovszky 1999, ELTE 2001, Kunhalom-program 2002).

Based on the investigations, it can be stated that the mounds of the Csanádi-hát region are consistently found in the largest number and density along the larger watercourses (Száraz-ér, Cigányka-ér, vicinity of Battonya and Dombegyház) and on long stretching ridges (on the alluvial fans of the abandoned riverbeds of the Maros river between Kevermes and Csanádapaca).

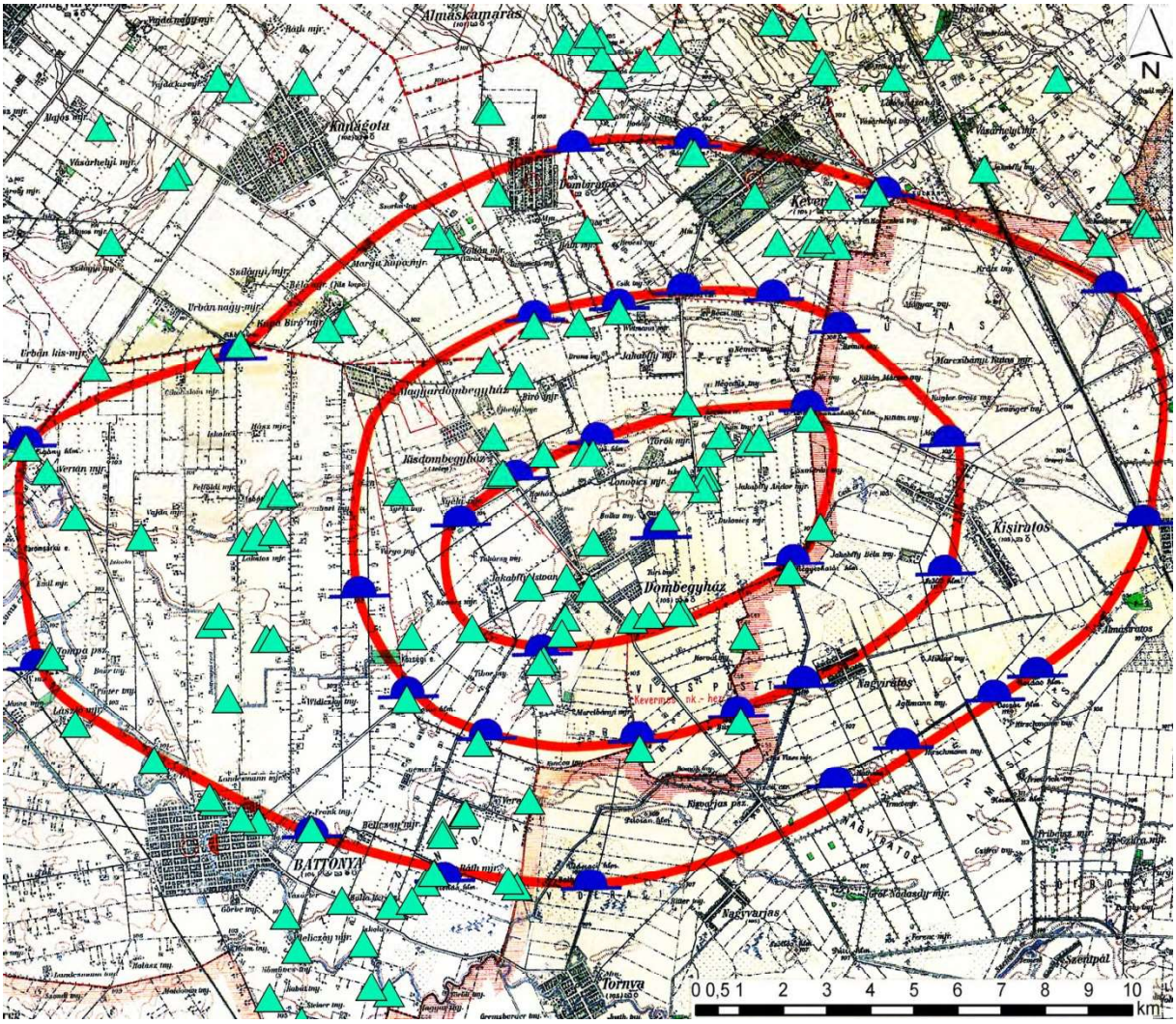

Figure 4. The 'peacock-eye kurgan formation' near Dombegyház appeared several times in publications; the existence of this formation was clearly refuted by our topographical investigation (on the map the semicircular sings: kurgans based on Szelekovszky 2005; the triangles: kurgans surveyed by us)

4. ábra A szakirodalomban többször megjelent dombegyházi „pávaszemes kunhalom-alakzat", amelynek létezését topográfiai vizsgálatunk egyértelműen megcáfolta (a félkörrel jelölt halmok Szelekovszky 2005 alapján; az általunk felmért halmok háromszöggel jelölve)

The morphometrical data (height and diameters) of the kurgans are fully consistent with other mounds' size in the central part of the Tiszántúl region (Bede 2014).

The vegetation valuable from floristical aspects on the mounds could have subsisted because, owing to their size, steepness or boundary marking, isolated location, they could not be ploughed. The most dangerous issue to the most significant mounds is often not cultivation, but bush-growing, weeding, as well as presumably fertilizers seeping into the soil.

In spite of their small size mounds are often particularly rich habitats with regard to vascular plant species. The concentration of rare weed species (partly archaeophytes) on the kurgans is also of outstanding importance; in addition to the presence of dry, more open surfaces, the probably relative poverty of the barrows in pesticides may also contribute to the presence of these species.

It is noteworthy that in the case of *Glaucium corniculatum*, which was discovered during our survey as well, a 19th-century source points out that the Barta-halom (Jankó 1887) is the only site where the species can be found in the vicinity of Tótkomlós (Figure 1).

In 2013, Ottó Merkl and his research team carried out a beetle fauna study on a few kurgans of the Csanádi-hát region. Several rare forest steppe beetle species were attested in

these small habitats (Merkl et al. 2014). Their results confirm that mounds can play a significant role in the conservation of fauna as well.

An issue that directly affects the mounds is the conservation and practical protection of the loess grasslands along the country border. With the accession of Romania to the European Union, the state border band has lost its strategic importance in some degree. On the Partium side, several kilometres of the valuable grasslands are ploughed to benefit from the thin but long land. Without the control of the authorities, serious damage has already occurred in a short time (within a few years) due to abuses. Another problem is that previously there had been regular mowing along the state border so that shrubs and trees (e.g. *Prunus spinosa*, *Robinia pseudoacacia*, *Lycium barbarum*) do not hinder visibility and field control. Mowing has now become irregular or even abandoned. In addition, the negative effects of the current migration pressure (treading, littering, installing sentry boxes, etc.), and the possible establishment of a fence would lead to unpredictable damage to nature. All these problems also occur in the entire Békés County – and certainly in the other – sections of the border. Therefore, nature conservation authorities must take action to save loess vegetation of the borderline, which is still in good condition and that represents one of the longest contiguous Pannonian loess meadow steppe remains in the world. It is imperative to have legal, territorial protection through the designation of the most important sections as protected natural areas of national importance and provide Natura 2000 status for them (Csathó 2009, Bede 2014).

Despite the fact that nature and heritage protection laws provide national conservation for these kurgans, the practical operation of the legislative is not solved. For the long-term conservation of the special vegetation of kurgans it would be required to take out the entire surface of the most valuable mounds from agricultural production and maintain their habitat management.

The long-term preservation of ploughed mounds would be ensured the best way by the intentional or spontaneous regeneration of grassland with methodical annual reaping (Tóth 1988, Kiss 1999, Csathó 2005, Valkó et al. 2018). An important practical step forward was the introduction of a system of cross-compliance for land-based subsidies in 2010 (common agricultural policy of European Union; cross compliance system; GAEC: Good Agricultural and Environmental Condition), which allowed the removal of certain major barrows from cultivation (Árgay et al. 2013, Rákóczi and Barczi 2014). As a result of the regulation 47 mounds were withdrawn from intensive cultivation on the Csanádi-hát region, with an average of 22 m radius and 0.1380 ha area per mound (based on Rákóczi 2016). The system of requirements provides another opportunity for the long-term preservation of the condition of the kurgans and for the regeneration of their surface and vegetation to some level (Rákóczi and Barczi 2017, Botos et al. 2019).

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A CSANÁDI-HÁT HALMAINAK KOMPLEX JELLEMZÉSE

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[2]Körös-Maros Nemzeti Park Igazgatóság, 5540 Szarvas, Anna-liget 1.

Kulcsszavak: halmok (kurgánok, kunhalmok), tájrégészet, Alföld, löszvegetáció, botanikai felmérés

Összefoglalás: A Körös–Maros Nemzeti Park Igazgatóság működési területén található halmok (kurgánok, kunhalmok) kataszterezése és felmérése közben a csanádi-háti kurgánok komplex jellemzésére is sor került. Elsősorban a katonai felmérések és a 18–19. századi kéziratos térképek alapján felkerestünk minden fennálló és már elpusztított régészeti korú halomsírt (a kurgánok többségét a Jamnaja-entitás közösségei emelték a késő rézkorban). A teljes felszínükön szántottak kivételével az összes halomról a hajtásos növények tekintetében teljességre törekvő flóralista készült. A felmért 21 települése összkiterjedése 1039,41 km^2. Összesen 254 kurgánt dokumentáltunk. Ezek közül 64-et már elszántottak vagy elhordtak (ez az összes halom 25,2%-át jelenti). A Csanádi-hát halmai legnagyobb számban és sűrűségben következetesen a nagyobb vizek mentén, valamint a hosszan elnyúló oromvonulatokon találhatók. Elvégeztük a ma is létező 190 kurgán állapotfelmérését (ez az összes halom 74,8%-a). Ezek közül 96 (a regisztrált halmok 37,8%-a) teljes területét szántóföldként hasznosítják, ezért ezek a részletesebb növénytani vizsgálatokra alkalmatlanok voltak. 94 halmon (a regisztráltak 37,0%-án) azonban az évenként változó agrárkultúrákon kívül egyéb növényzetet is dokumentáltunk (erdősávot, fasort, földútszélt, csatornapartot, tanyatelket, háromszögelési betonpontot, temetőt stb.). Több halom a mai napig őrzi az ősi lösznövényzet fragmentumait. Néhány természetvédelmi vagy florisztikai szempontból értékes előkerült növényfaj: taréjos búzafű (*Agropyron cristatum*), szennyes ínfű (*Ajuga laxmannii*), horgas bogáncs (*Carduus hamulosus*), halvány zanót (*Chamaecytisus virescens*), vörös szarumák (*Glaucium corniculatum*), nagy varjúbab (*Hylotelephium maximum*), hengeres peremizs (*Inula germanica*), nyúlánk sárma (*Ornithogalum pyramidale*), korcs mák (*Papaver hybridum*), macskahere (*Phlomis tuberosa*), selymes boglárka (*Ranunculus illyricus*), parlagi rózsa (*Rosa gallica*), vetővirág (*Sternbergia colchiciflora*), pusztai metény (*Vinca herbacea*). A halmok megőrzéséhez hosszú távú természetvédelmi stratégia szükséges (például a művelés felhagyása, élőhely-kezelés). Az Európai Unió közös agrárpolitikájában megvalósított kölcsönös megfeleltetés bevezetése is egy ilyen előremutató, gyakorlati kezdeményezésként értékelhető.