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**Photo Story****Dry grassland on ancient burial mounds – kurgans of the Carpathian basin***Photos and text by Balázs Deák*MTA DE Biodiversity and Ecosystems Research Group, Egyetem tér 1, H4032, Debrecen, Hungary; e-mail: [debalazs@gmail.com](mailto:debalazs@gmail.com)

The ancient burial mounds, so called 'kurgans', have been iconic landscape elements of the Eurasian steppe and forest steppe biomes for several millennia. Most of the kurgans were built during the Neolithic and the Iron age by steppic cultures such as the Yamnaya culture (3300–2600 BC), Scythians (900–100 BC) and Sarmatians (600 BC–400 AD). Even though many kurgans disappeared due to the landscape transformation activities such as agricultural intensification and the expansion of urban areas, there are still about 400,000–600,000 kurgans in Eurasia. They are located in the steppe and forest steppe biomes; their westernmost distribution range is in the alkali- and loess steppes of Hungary and their easternmost locality is in the semi-deserts of Mongolia. Kurgans are considered as 'sacred natural sites' as besides their inevitable cultural and historical importance they are also essential objects for nature conservation. In heavily transformed agricultural landscapes of Hungary and Ukraine steep slopes of the kurgans provide refuge for the last remnants of dry grasslands. In the lowlands of Hungary kurgans have an essential role in preserving loess vegetation, which were formed on fertile chernosemic soils especially adequate for agriculture. In spite of the increasing human influence in the landscape (ploughing, urbanisation, afforestation, establishment of roads and channels) kurgans still harbour a high biodiversity and many grassland specialist spe-

cies, thus highly contribute to the maintenance of landscape-scale diversity. By preserving these historical monuments, we can also ensure the protection of endangered habitats and our cultural heritage.

*Publications related to the topic:*

- Deák, B., Valkó, O., Török, P., Kelemen, A., Bede, Á., Csathó, A.I. & Tóthmérész, B. 2018. Landscape and habitat and filters jointly drive richness and abundance of grassland specialist plants in terrestrial habitat islands. *Landscape Ecology* 33: 1117-1132.
- Deák, B., Tölgyesi, C., Kelemen, A., Bátori, Z., Gallé, R., Bragina, T.M., Abil, Y.A. & Valkó, O. 2017. Vegetation of steppic cultural heritage sites in Kazakhstan – Effects of micro-habitats and grazing intensity. *Plant Ecology & Diversity* 10: 509-520.
- Deák, B., Valkó, O., Török, P. & Tóthmérész, B. 2016. Factors threatening grassland specialist plants - A multi-proxy study on the vegetation of isolated grasslands. *Biological Conservation* 204: 255-262.
- Deák, B., Tóthmérész, B., Valkó, O., Sudnik-Wójcikowska, B., Bragina, T.-M., Moysiyenko, I., Apostolova, I., Bykov, N., Dembicz, I. & Török, P. 2016. Cultural monuments and nature conservation: The role of kurgans in maintaining steppe vegetation. *Biodiversity & Conservation* 25: 2473-2490.

For more information, visit our research blog here: <https://deakvalko.blogspot.com/>, where we regularly report the new results related to the study of kurgans.





In many cases species-rich fragments of loess grasslands have been preserved on kurgans embedded in agricultural fields (top left - Szent Imre-kurgan; top right - Mondró-kurgán, bottom - Kéthalom-kurgan).



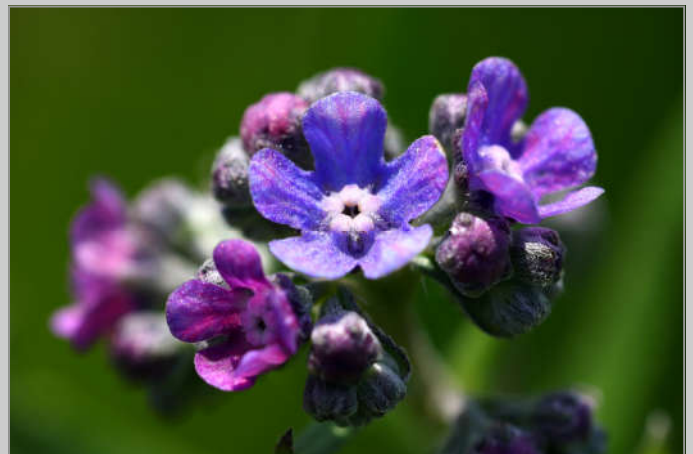
Kurgans were generally built in areas characterised by extended grasslands; however, some of them were built on river-banks (left - Sárga-kurgan situated in the extent grasslands of the Hortobágy puszta; right - Nyéki-kurgan which was built on the bank of the Köseley-river).



Even though kurgans were built several millennia ago, they still have an essential role in the everyday life of local people. The Filagória-kurgan (top) located in the courtyard of a farm. In many cases new cultures also used the kurgans as sacral places; a cemetery and a sanctuary on the Kálvária-kurgan (bottom).



Ploughing and building are one of the major threats on the vegetation of the kurgans. A geological tower on the top of the Bűrök-kurgan (left). And the almost completely ploughed Nagyhegyes-kurgan (right).



Kurgans of the Hungarian lowlands harbour many rare and protected grassland species such as the crested wheatgrass (*Agropyron cristatum*), woodland sage (*Salvia nemorosa*), tuberous Jerusalem sage (*Phlomis tuberosa*), red-flowered viper's grass (*Echium russicum*), Barrelier's bugloss (*Anchusa barrelieri*).