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Author: Jan Romaniszyn, Jakub Niebieszczanski, Mateusz Cwaliński, Vitalii Rud, Ihor Kochkin, Przemysław Makarowicz

PL ISSN 0081-3834, e-ISSN: 2719-647X

DOI: <https://doi.org/10.23858/SA/75.2023.1.2873>

<https://rcin.org.pl/dlibra/publication/277407>

Jak cytować:

Romaniszyn, J., Niebieszczanski, J., Cwaliński, M., Rud, V., Kochkin, I., & Makarowicz, P. (2023). Rediscovering a Middle Bronze Age cemetery – the barrow necropolis in Pidhoroddyia, Western Ukraine. Sprawozdania Archeologiczne, 75(1), 283–298. <https://doi.org/10.23858/SA/75.2023.1.2873>

Jan Romaniszyn¹, Jakub Niebieszczanski², Mateusz Cwaliński³,
Vitalii Rud⁴, Ihor Kochkin⁵, Przemysław Makarowicz⁶

REDISCOVERING A MIDDLE BRONZE AGE CEMETERY – THE BARROW NECROPOLIS IN PIDHORODDYA, WESTERN UKRAINE

ABSTRACT

Romaniszyn J., Niebieszczanski J., Cwaliński M., Rud V., Kochkin I. and Makarowicz P. 2023. Rediscovering a Middle Bronze Age cemetery – the barrow necropolis in Pidhoroddyia, Western Ukraine. *Sprawozdania Archeologiczne* 75/1, 283-298.

The following article presents the archaeological reevaluation of the Middle Bronze Age Komarów culture cemetery of Pidhoroddyia in Western Ukraine in the Pre-Carpathian region. By examining scarce archival information from the pre-Second World War period, the Polish-Ukrainian research team brought to light evidence of a vast cemetery complex in Pidhoroddyia, consisting of 39 barrows. The applied combination of archaeological survey, drilling, and magnetometry prospection revealed aspects of the spatial arrangement of the Komarów culture necropolis, as well as details of the funeral architecture, which allowed associating the burial mounds with the known canon of Komarów culture rites. This study presents the results of the archival research, followed by non-invasive survey, and their potential for reevaluating the present state of knowledge regarding this barrow cemetery.

Keywords: Pidhoroddyia Barrow Cemetery, Middle Bronze Age, Geophysical survey, Landscape archaeology, Funerary architecture, Komarów culture

Received: 21.11.2021; Revised: 22.08.2022; Accepted: 25.06.2023

1 Faculty of Archaeology, Adam Mickiewicz University in Poznań, Poland. Uniwersytetu Poznańskiego str. 7, 61-614 Poznań; janrom89@wp.pl; 0000-0002-0562-7414

2 Faculty of Archaeology, Adam Mickiewicz University in Poznań, Poland. Uniwersytetu Poznańskiego str. 7, 61-614 Poznań; niebieszczanski@amu.edu.pl; ORCID: 0000-0002-2147-7620

3 Institute of Archaeology, Faculty of History, University of Gdańsk. Wita Stwosza str. 55, 80-308 Gdańsk; mateuszcalinski@gmail.com; ORCID: 0000-0001-5931-7932

4 Institute of Archaeology, National Academy of Sciences of Ukraine, Volodymyr Ivasiuk 12, 04210 Kyiv, Ukraine; rud.vitalii12@gmail.com; ORCID: 0000-0001-8087-2236

5 Faculty of History, Politology and International Relations, Vasyl Stefanyk Precarpathian National University, Shevchenka Str. 57, 76025 Ivano-Frankivsk, Ukraine; kochkin.i@gmail.com; ORCID: 0000-0002-6755-8602

6 Faculty of Archaeology, Adam Mickiewicz University in Poznań, Poland. Uniwersytetu Poznańskiego str. 7, 61-614 Poznań; przemom@amu.edu.pl; ORCID: 0000-0003-4452-7704

1. INTRODUCTION

In recent years, a joint Polish-Ukrainian expedition (a cooperation of Adam Mickiewicz University in Poznań, Ukrainian National Academy of Sciences in Kyiv and the Vasyl Stefanyk Precarpathian University in Ivano-Frankiv'sk) has conducted archaeological research in the Upper Dniester Basin (Makarowicz 2012; 2019; Makarowicz *et al.* 2013a; 2016a; 2016b; 2016c; 2017; 2018; 2019), which lies in the Pre-Carpathian area and stretches along the Carpathian Arc. One of the main tasks of this project is to create a complex catalogue of the barrow cemeteries attributed to the Komarów culture and dated to the 2nd millennium BC. As such, this research reconsiders the archives of excavations that took place at several sites during 1920s-1930s by Polish and Ukrainian archaeologists, including Tadeusz Sulimirski and Jarosław Pasternak – scholars from the Jan Kazimierz University in Lviv. One such site was Pidhoroddyia (Podgrodzie) located to the north of Rohatyn town in Ivano-Frankiv'sk oblast, Ukraine (Fig. 1).



Fig. 1. The location of the Pidhoroddyia cemetery (red point) in the Upper Dniester Basin, western Ukraine

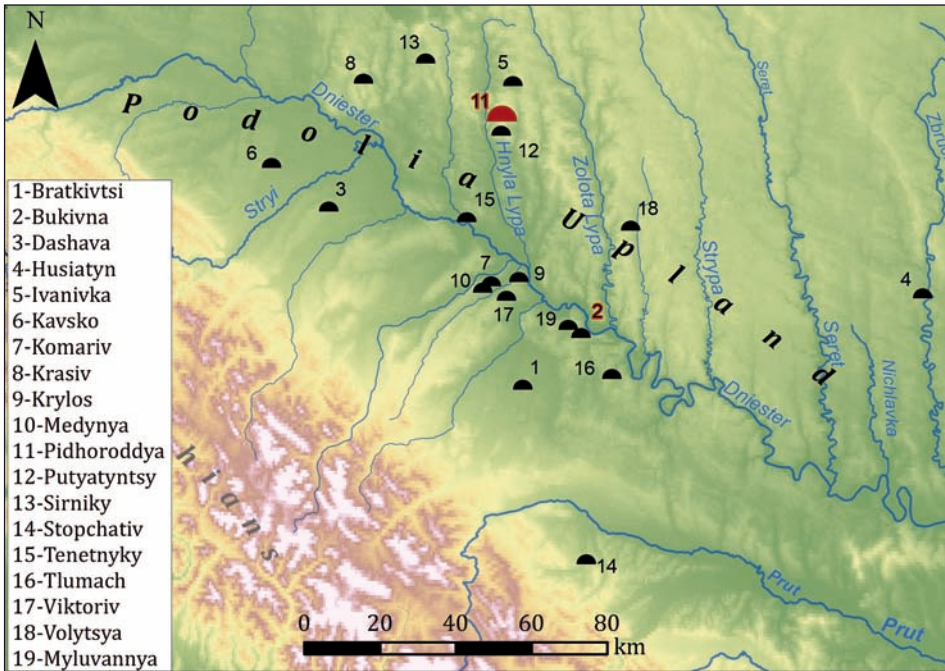


Fig. 2. Distribution of Komarów culture barrow cemeteries in the Upper Dniester Basin investigated by non-invasive methods

The aim of the following paper is to present the information collected to date regarding the Pidhoroddy barrow cemetery, and compare these data with the present state of knowledge regarding burial rites of the Komarów culture. Due to the almost perfect state of preservation, the discussed site is an excellent case study for investigations of spatial patterns in the distribution of prehistoric mounds, as well as considerations of the ritual life of past societies and archaeological landscape in general.

The barrows are situated within dense beech forest, which hinders access to the site and protects it from agriculture, industrialization, and urbanization (for a discussion of the role of forests in barrow preservation see, for example, Šmejda 2011, 123; Czebreszuk *et al.* 2013, 158). Also, the site in Pidhoroddy does not appear in the literature, and therefore is virtually unknown to illegal diggers and looters. As a result, the site lacks any traces of illicit digs, so common in other prominent Komarów culture sites in the region such as Komariv and Bukivna (Makarowicz *et al.* 2016a; 2016b, 76, 272; 2016c).

The barrow cemetery is located approximately 5 km north of the village of Pidhoroddy and 2 km east of Klischivna. When the Polish-Ukrainian team began this research, the only existing and available record of the site was that of Jarosław Pasternak, who wrote in 1930s: “Podgrodzie (Pidhoroddy), Stanisławów county: a barrow of the Komarów culture

with cremation grave” (Pasternak 1937, 109). To date, no archaeological materials from those excavations have been found; if there were any, it is likely they have been lost. The ‘rediscovery’ of this site was possible thanks to information from a local resident, who reported a single mound located near a forest pathway. Based on this knowledge, several surveys have been conducted since 2014, thus revealing other new barrows in the vicinity. To date, several dozen mounds have been found clustered within two major concentrations. The surveys led to creation of digital elevation models and plans followed by a geophysical prospection of the two main groups of mounds.

2. LOCATION OF THE SITE AND ITS INTERNAL ARRANGEMENT

The cemetery in Pidhoroddyia is located in western Ukraine in a region of Rohatyn Oppilia, being a part of the Podillia Upland (Makarowicz *et al.* 2016a, 419-420). Just as the latter, the area of the cemetery consists of flat topped hills, cut through in numerous places by deep ravines and gullies within the loess sediments. The main hydrological artery of this area is the Hnyla Lypa River and the site lies on its western side.

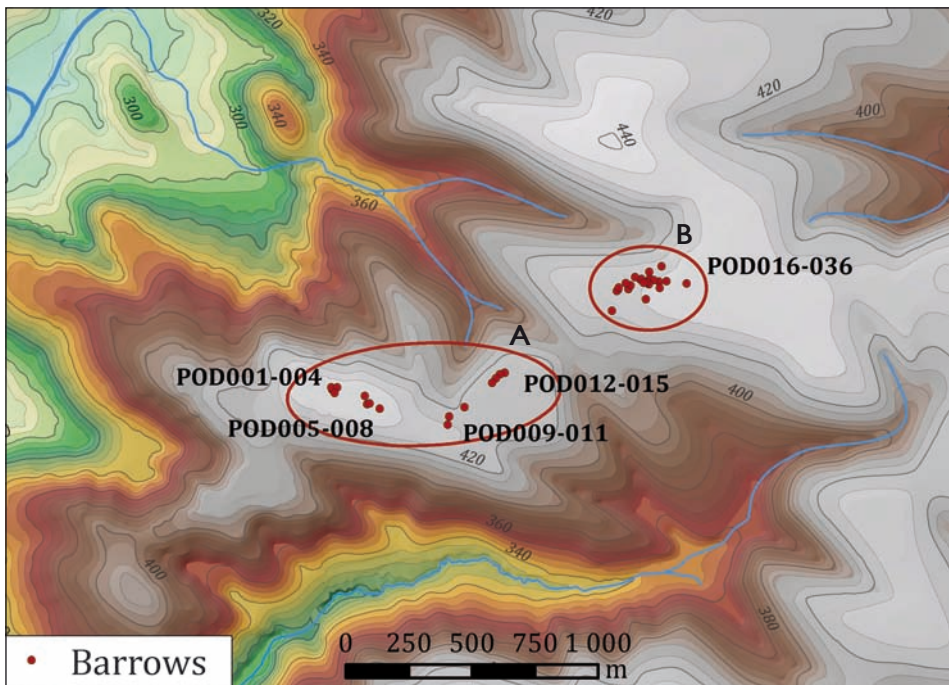


Fig. 3. Elevation map of the Pidhoroddyia barrow cemetery indicating the two main barrow clusters (A and B)

As in the case of other cemeteries of the Komarów culture in western Ukraine (see Makarowicz *et al.* 2018; 2019; Romaniszyn *et al.* 2021), the barrows in Pidhoroddyia are positioned on top of the flat summits. The linear and group-like arrangements follow the structural orientation of the hills. The altitudes on which the barrows are situated vary between 418 and 433 m a.s.l.

There are two concentrations of mounds: the first located on the south-western summit (cluster A) and the second on the north-eastern elevation (cluster B). The first of these comprises 15 barrows (mounds POD001 – POD015) that can be further divided into two groups – the north-eastern and the south-western ones. Within the latter a notable example of a linear alignment of mounds can be distinguished, composed of four barrows (POD012-015) oriented along SW-NE axis and stretched on a distance of approximately 80 m. With addition of barrows POD009-011 located to the south-west it can be assumed that this linear arrangement measures 800 m in total. The western part of cluster A consist of a concentration of eight mounds forming two separate groups (POD001-004 and POD005-008). The second cluster – B – contains 21 mounds in a much denser distribution than cluster A. Only scarce indications of a linear arrangement are observed in this area (*e.g.*, POD033-035) and as such this concentration has to be identified as a group-like organized funerary space. Also, the forest prospecting has revealed three other barrows on a remote summit located approximately 1 km north of Cluster B. These two clusters (A and B) are divided by a ravine/gully of steep slopes, carved by the seasonal tributary of the Hnyla Lypa River.

The monuments are differentiated in terms of diameter from 10 to even more than 20 m. One of the mounds, however, presents a peculiar type of construction – the double-mound located in cluster A (POD036). This particular barrow measures more than 24 m on the W-E axis. In terms of relative height, both clusters comprise barrows measuring between 0.3 to 1.8 m in height.

3. GEOPHYSICAL PROSPECTION AND THE FUNERARY ARCHITECTURE OF THE BARROWS

The good state of preservation of the mounds in Pidhoroddyia provided an opportunity to conduct the geophysical investigations by the means of magnetometry. Despite the densely forested area within which the barrows are located it was possible to conduct the survey of 0.55 ha covering 10 mounds divided into two groupings: POD012-POD015 (Fig. 4) and POD031-POD036 (Fig. 5). In order to reveal the internal structure of the monuments as well as to search for accompanying features in the area, a Bartington® GRAD601 flux-gate magnetometer was used. The survey was held in a grid net of squares 20 × 20 m with parallel method of sampling along the traverses. In each polygon, the traverses were separated by distance of 0.05 m and the measurement along transects were taken each 0.25 m.

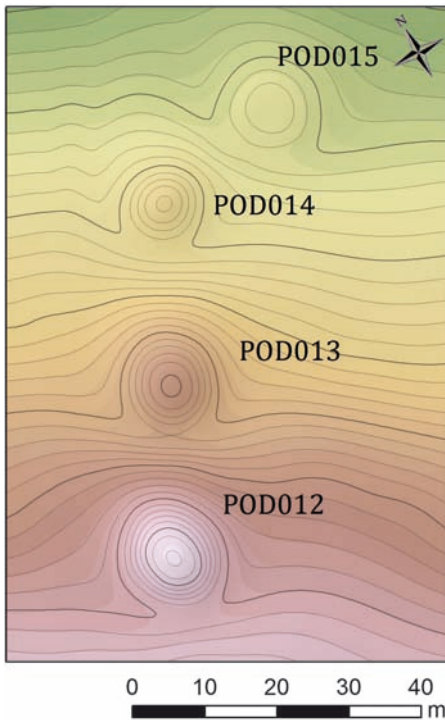


Fig. 4. The NE section of the Cluster A barrows in Pidhoroddy

The results were processed in the GeoPlot 3.0 software with application of following tools: Zero Mean Grid, Zero Mean Traverse, Despik and Interpolation. In order to compare the results of geophysical prospection with the topographical models, the magnetic maps were georeferenced in the ArcGIS software and superimposed on each other. Final magnetograms were also clipped to the range of $-5/5$ nT in order to detect slight differences in magnetic field of the research area.

Additionally, in order to verify interpretation of the magnetic maps, a series of geological drillings were conducted, also in order to reveal the stratigraphy of the mounds. A 10 cm-wide auger for loess sediments was used in each of the drills, while their depth varied in accordance to the level of natural soil (loess profile). The soundings evidenced the lithological structure of the mounds, which is strictly related to the geological background (Romaniszyn *et al.* 2021).

The deposits building up the barrows were

mainly loess (silt/clays fractions) with an addition of organic matter. This organic contamination is one of the most visible differences in terms of lithology between the anthropogenic and natural deposits in the area of the cemetery. The topmost layers of the mounds (mainly first 20-40 cm) comprised illuvially depleted horizons which are characteristic for the pedological processes ongoing in forested conditions (Hildebrandt-Radke *et al.* 2019).

The geophysical prospection in the first polygon, covering Barrows POD012 to POD015 in Cluster A, comprised five measurement grids, arranged in an L-shape (Fig. 6). As it is positioned slightly off the main alignment of mounds (NE-SW), POD015 required widening the grid to the east. In contrast to the remaining three mounds (POD012 – POD014), it is weakly discernible in the resulting image. Gradient values obtained over the mound do not differ substantially from those in its vicinity, and the picture is distorted by the presence of features yielding high-amplitude dipolar anomalies (probably modern ferrous waste). This situation might be explained by the relatively low profile of the mound, which resulted in complete illuviation and depletion of organic matter in its composition. Furthermore, the SW section of the mound (where the dipolar anomalies are located) was disturbed by a nearby path.

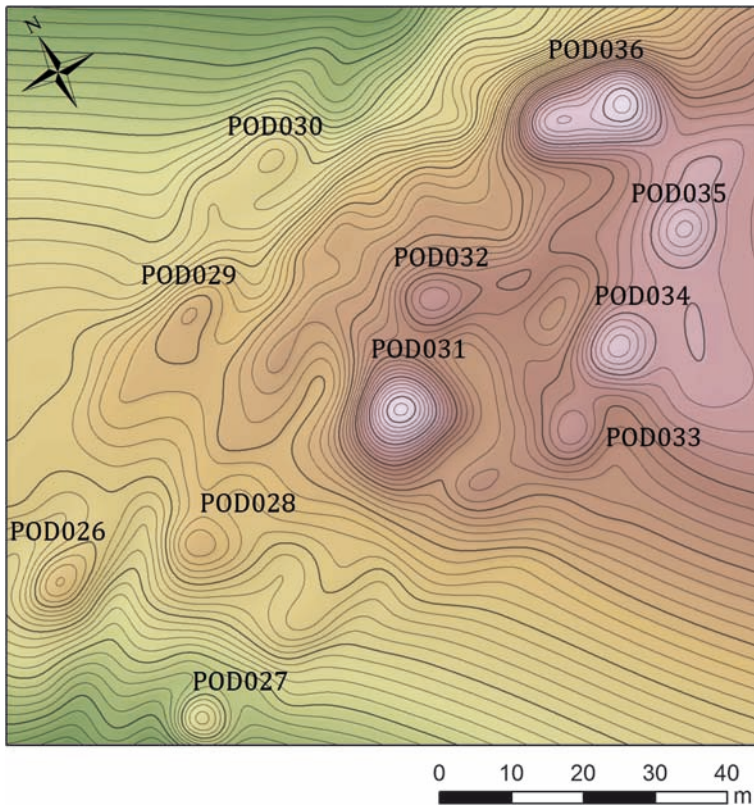


Fig. 5. The central-NE section of the Cluster B barrows in Pidhoroddyia

The remaining barrows are characterized by slightly increased magnetization values (actually gradient of magnetic flux density) in comparison with the background. This most probably results from their specific lithology, consisting of rich organic material seen in the drilled profiles from the mounds. Additionally, Barrows POD012 and POD013 revealed the presence of anomalies that might reflect burial chambers. The former is characterized by the presence of a large, kidney-shaped magnetic anomaly registered on the southern side of the mound's centre with corresponding, albeit barely noticeable magnetic low to the north. A similar feature was found in POD013; however, in this case it is smaller and slightly weaker magnetically. This is indicative of considerably magnetized residues of a structure made of stone or, more likely, burnt timber. The latter seems more probable as the previous excavations of the Komarów culture burial mound in the Upper Dniester Basin have not revealed evidence of purposely built stone structures that would consist of ferromagnetic minerals, nor the availability of such lithic material has been confirmed in the region (Łanczont *et al.* 2002). On the other hand, burnt timber structures were recorded in the

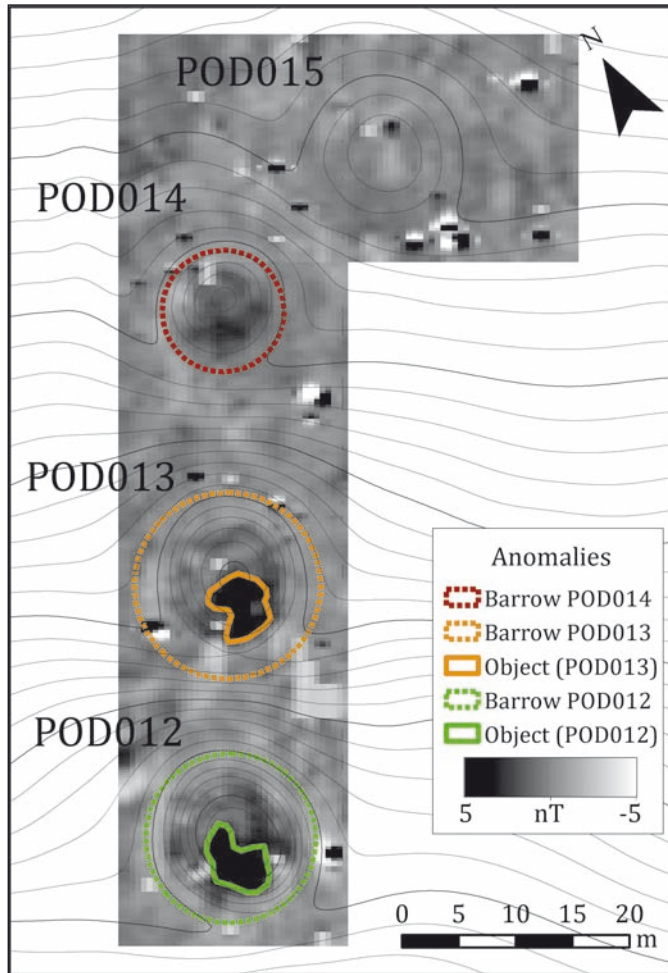


Fig. 6. Magnetic map of the NE section of Cluster A with imposed contour lines symbolizing height. Discussed features are marked with coloured lines

past both geophysically and through excavations in several Komarów culture mounds (*cf.* Romaniszyn *et al.* 2021). It is also possible that this particular anomaly was produced by a concentration of organic matter (*i.e.*, the backfill of a feature) with enhanced magnetic susceptibility. The spaces between the barrows are abundant in dipolar anomalies of high amplitudes, often non-normally polarized, thus they should be treated as modern metal waste or other objects not related to the barrows.

The second part of the survey took place within Cluster B, which consists of 21 mounds. However, due to the dense vegetation, the prospection included only six of them (POD031 – POD036), located in the N-central part of the group (Fig. 7).

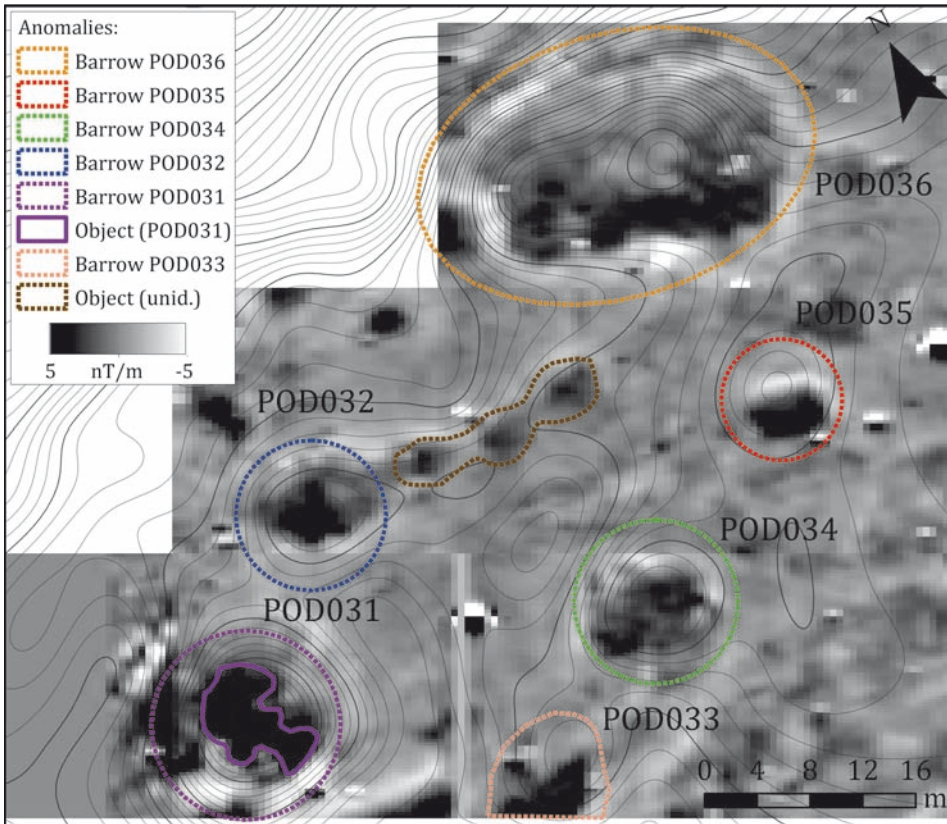


Fig. 7. Magnetic map of Cluster B with imposed contour lines symbolizing height. Discussed features are marked with coloured lines

The majority of the prospected monuments are characterized by the bands of negative values at their circumference. On one hand these signals may be regarded as magnetic lows linked to much more focused magnetic highs visible over the inner parts of the mounds which by the sheer mass of heaped up material generate considerable anomalies. On the other hand, one has to take into consideration the sudden increase of the height over the ground on which the instrument is held when approaching and then ascending the more sizable mounds with steeper slopes (*cf.* Smekalova and Bevan 2002; Makarowicz *et al.* 2017). The enhanced magnetism over the mounds, clearly indicated by strong magnetic highs, most likely originates from the mixed sediments of loess and organic matter (like turf blocks) that were additionally subjected to firing activity, thus increasing the magnetism in relation to the adjacent loess detritus (Makarowicz *et al.* 2017; Romaniszyn *et al.* 2021; see also Schmidt 2009, 10-11; Strózyk 2019). The presence of sediments more susceptible to magnetism may also explain the sharp changes of magnetic flux gradient

over the mounds; for example, soils enriched with specific iron oxides compounds produce pronounced dipolar anomalies, like that recorded at Pidhoroddyia (see Hildebrandt-Radke *et al.* 2018). On the other hand, one should consider surrounding ditches as a probable reason for the occurrence of such an anomaly (*cf.*, Mazurkevych *et al.* 2009), however there is no evidence for the presence of such features in the funerary rites of the Komarów culture (Makarowicz *et al.* 2016a).

Most of the mounds appear on the magnetic map as anomalies with positive centres and negative circumferences. However, in case of the Barrows POD031 and POD036, further features can be distinguished. In the case of an elongated anomaly within the extent of POD036, the analysis of magnetic plan revealed only slightly raised values of magnetization, that might be related to higher content of organic matter, it could equally, however, be a manifestation of the overall anomaly produced by the double mound, with the magnetic high on the southern slope of the embankment (see discussion of Romaniszyn *et al.* 2021 for the interpretation of the double mound's magnetogram). With respect to POD031, the magnetic high of the main anomaly is positioned in the very centre of the tumulus, while the magnetic low to the north is barely visible (the pronounced and extensive negative signal immediately to the south and the east most likely results from an adjacent feature, located just beyond the southern limit of the grid). This suggests induced magnetization from a quite large and deeply buried feature (*cf.*, Schmidt 2009, 10-12). Similar to the previously discussed anomalies in POD012 and POD013, it can be hypothesized that the signal stems from deposits of burnt organic material, such as a wooden construction or the remains of a hearth of some kind (*cf.*, Makarowicz *et al.* 2017; Schneiderhofer *et al.* 2017).

In addition to these anomalies, several others were recorded in the spaces between the barrows. Especially intriguing are the anomalies visible between POD032 and POD036. These are normally magnetized circular signals of approximately 7 nT each, appearing in three spots arranged along an E-W axis. These anomalies occur along a slight ridge over a dozen centimeters high. Due to the specific topography of their position, it seems unlikely that they reflect pits (*cf.*, Król and Niebieszczański 2019) containing anthropogenic backfill. Perhaps these anomalies reflect the position of minor barrows accompanying POD032, which have undergone erosion over time and thus are currently indiscernible in the relief of the land. This however needs further research, *i.e.*, drillings in order to verify the lithology of the anomalies' position.

4. THE PIDHORODDYA BARROW CEMETERY IN THE CONTEXT OF KOMARÓW CULTURE BURIAL RITES

Data acquired from the Pidhoroddyia cemetery can be associated with the so-called Komarów burial rite canon (Makarowicz 2012; 2019; Romaniszyn 2015; 2018). Considering the modern literature, the Komarów culture is primarily known from its barrow-grave

cemeteries (Romaniszyn 2015, 37). This culture is treated as a part of the Trzciniac Cultural Circle (TCC – Makarowicz 2010) – a macrostructural formation that developed in the 2nd millennium BC in the borderland between Western and Eastern Europe, stretching roughly between the Oder and Dniro River Basins. The necropolis in Pidhoroddyia is set within the northern part of the Upper Dniester group of this culture (Fig. 2). This concentration embraces the Dniester springs in the west and reaches the eastern borders of Podilla to the east. Within its extent, the most prominent cemeteries are Komariv and Bukivna (Sulimirski 1936; 1939; 1964; 1968, 105-121; Siwkówna 1937; Rogozińska 1959; Makarowicz *et al.* 2013a; 2013b; 2016b, 37-97, 261-350; Lysenko *et al.* 2015; Makarowicz 2019). The site in Pidhoroddyia is located approximately 60 km north/northwest from the latter. The archival sources indicate the presence of other Komarów culture cemeteries in this area. For example, similar sites are reported in the publications of J. Pasternak from the 1930s, such as the cemetery in Janczyn (present day Ivanivka), situated 7 km north of Pidhoroddyia. The excavations revealed a mound with two burials accompanied by artifacts (Sulimirski 1935, 23; Rogozińska 1959, 111). Approximately 9 km south from Pidhoroddyia, another barrow cemetery was discovered in Putyatyntsy during the construction of a railway. Cremated bones and two bronze pins, both characteristic of the Komarów culture, were collected during the excavations of one of the burial mounds (Sulimirski 1968, 144). It is highly probable that the cemeteries in the area of Pidhoroddyia were much larger than their presently observed extent indicates. Perhaps, the barrows formed a vast necropolis complex, similar to those in Bukivna, Komariv, and Krasiv (Makarowicz *et al.* 2016b, 37-07, 261-368; 2019).

These types of Komarów culture cemeteries are located in the upper parts of the landscape – a characteristic clearly observable in every funeral site (Romaniszyn 2015, 41; Makarowicz *et al.* 2019). Therefore, it is not a coincidence that the Pidhoroddyia necropolis was erected on the highest summits in the area. In some sites, mounds are scattered along the ridges for more than a dozen kilometres, thus forming unique ‘barrow landscapes’ (Fontijn 1996; Bourgeois 2013; Makarowicz *et al.* 2018; 2019). Similar to the well-known cemeteries in Bukivna and Komariv (Makarowicz *et al.* 2016b, 37-226, 261-350; 2019), the one in Pidhoroddyia comprises linear and group-linear arrangements of mounds. Some interpretations treat such necropolis organization as a manifestation of lineage and kinship (Makarowicz *et al.* 2016d, 149; 2018). For instance, studies of the chronology of barrow alignments in Bukivna (Makarowicz *et al.* 2016b, 149; 2018) indicated their emergence over a relatively short time span (around 200 to 250 years; Makarowicz *et al.* 2016d). Each site in the Upper Dniester Basin comprises such alignments: in Bukivna (Groups I, III, IV), Dashava (Barrows 140-146 and 147-150), Komariv and Myluvannia (Barrows 280-293 and 307-311, respectively) (Makarowicz *et al.* 2016b: 37-226, 261-350; 2019). The other form of organization is a group-like agglomeration of mounds, such as those in Dashava (the remaining mounds), Vikniany (Barrows 95-101), Myluvannia (Barrows 255-271), and Tenetnyky (Makarowicz *et al.* 2016b, 419-502). This phenomenon is not

restricted only to this region, as similar patterns appear throughout the “upland” areas of the TCC (Makarowicz 2010, 207-219). Comparable organization was identified in the barrow cemetery in Netishyn in Volhynia, where the mounds formed both grouped (Group I) linear concentrations as well as clustered arrangements (Groups IV and VII) (Berezanska and Samoljuk 2004). On the other side of the Dniester – close to the Carpathian Arc in northern Romania and Moldova – we observe the same patterns in barrow distribution and clustering. Linear-group arrangements were recorded, for example, in Adâncata, Volovăț, Horodnic de Jos, and in Medvezha (Dergachev and Sava 1984, 98-108; Ignat 2003, 159-164; Niculiță 2010; 2015, 139-140, 152-173; Romaniszyn *et al.* 2017).

One of the most spectacular examples of a cemetery arrangement comes from central Ukraine and is located in Kolosivka village (Khmelnyskyi Oblast), where 22 groups of mounds were distinguished (Gamchenko 1930; Lysenko and Lysenko 2018). These clusters consist of alignments spreading over considerable distances on one hand and group-like arrangements focused within much more confined areas on the other. The clustering of barrows into groups and alignments is not restricted to the Komarów culture, as it is recorded throughout vast areas of Europe during the Middle Bronze Age (see e.g., Bourgeois 2013; Krištuf and Švejcar 2015). Importantly, the form and internal structure of the barrow cemeteries should not be regarded as serving only a funeral purpose, as they most likely also constituted social and symbolic values (Górski 1996; Garwood 2007; De Reu 2012; Bourgeois 2013; Makarowicz *et al.* 2019).

An important feature is the presence of a double-barrow (POD036) in the cemetery of Pidhorodnya which was discussed in a separate study (Romaniszyn *et al.* 2021). Despite its morphological similarity to the mound 6/I/2014 in Bukivna, the magnetic appearance shows no connection in the possible occurrence of the complex structure under the mound. The double mound from the Bukivna cemetery comprised a mortuary house, ritually burned and manifested by the presence of strong magnetic signals that the magnetogram of barrow POD036 lacks (Romaniszyn *et al.* 2021). Therefore, it perhaps comprise another type of construction, not detectable by the means of magnetometry survey.

5. CONCLUSIONS

The ‘rediscovered’ cemetery consists of specific mound arrangements characteristic of the Komarów culture habitus. Based on the results of field activities and analyses, it seems that the barrows recorded there are the remnant of a vast cemetery that once spanned the summits of the hills along the Hnyla Lypa River. The observed structures are analogous in terms of sizes, arrangement, and their position in the landscape to other similar Komarów culture sites in the Upper Dniester Basin. The barrow lines or their groupings and clear preference for constructing the mounds in the higher areas of the landscape, indicate that the use of the cemetery had a function that was not only funerary, but was a part of a much wider social and symbolic act.

The geophysical prospection points to the presence of a complex sepulchral architecture in some of the mounds. The comparison between the magnetic maps of barrows POD012, POD013 and POD031 in Pidhoroddyia and for example Bukivna's mound 6/I/2014 provides further evidence for the possible existence of a complex funerary objects within the former mounds (Romaniszyn *et al.* 2021). This is supported by the archival study of Pidhoroddyia, which contains remarks on traces of cremation recorded on the site.

The cemetery in Pidhoroddyia is a valuable source of information due to its excellent state of preservation. Despite the laconic archive data, it was possible to rediscover this site through non-invasive methods. As such, it should serve as an example to follow, even though little information was available. In the future, perspectives obtainable from excavations, for example, may provide more detailed data on the burial rites and chronology of this particular Komarów culture cemetery.

Acknowledgments

This study was funded by the National Science Centre, Poland under the grant no. 2018/31/B/HS3/01326, PI: Przemysław Makarowicz.

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