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Intra-site organisation and population size in the Cucuteni A3 settlement of Războieni–Dealul Mare

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Abstract. *In Romanian archaeology, the aspects related to demography are poorly presented. The present study combines the demographic data already known in the archaeological literature with geophysical surveys in order to obtain additional information relating to the social organization and population size. The research is focused on the Cucuteni A_3 settlement of Războieni–Dealul Mare, that has benefited over the years from several geophysical surveys. The results regarding the spatial organisation and the delineation of the living space are impressive. From the data obtained we can achieve some demographic information.*

Rezumat. *În arheologia românească, aspectele legate de demografia complexului Precucuteni-Cucuteni sunt slab abordate. Studiul de față combină datele de ordin demografic deja cunoscute cu cercetările geofizice pentru a obține informații suplimentare referitoare la organizarea socială a comunităților. Așezarea vizată este cea de la Războieni-Dealul Mare, încadrată cronologic Cucuteni A_3, care a beneficiat pe parcursul anilor de mai multe sondaje geofizice. Rezultatele sunt impresionante, fiind obținute planimetria sitului, precum și modul de delimitare a spațiului locuit. Datele obținute fac posibile și unele estimări de ordin demografic.*

Keywords: Cucuteni, demography, geophysics, social organisation.

Introduction

In Romanian archaeological literature the aspects about social organisation are poorly presented. The field research combined with geophysical surveys can provide useful information in rebuilding the social space. Since Precucuteni, a series of new typological elements emerged representing the starting point in the development of ideas and principles, especially the organization of social space[2].

Spatial configuration of the settlement and its use, key elements of social order, had a large impact on the behaviour of individuals, and therefore, in the way in which the social

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[2] MÜLLER, RASSMANN 2016, 1.

order was recreated. Based on these factors, the researchers believe that the spatial organization of the settlements is the result of cumulative effects and decisions taken by builders and individuals occupying these structures, thus supporting the existence of a preconceived plan[3]. Also, the layout of the dwellings with an orderly orientation, the presence of open spaces and common materials of construction claims the existence of a structured social space in which technical abilities and the social principles were passed to the next generation, as well as an area in which individual identities coexist with collective identities. Interactions between different social units, as well as the relations between them were strengthened through participation in the development of architectural works and by sharing the work and resources[4].

The information relating to the planimetry of Precucuteni-Cucuteni sites are limited due to the low number of investigated settlements. Starting from the few sites investigated we can talk about the existence of a preconceived plan of settlements, characterised by the arrangement of the dwellings and their orientation[5]. According to the information, available buildings were arranged in groups, rows, circles, or mixed[6].

Study area

The present study takes into account the Cucuteni A_3 settlement from Războieni–*Dealul Mare/Dealul Boghiu* (geographical coordinates: WGS 84: 47° 15′ 07″ lat. N, 27° 02′ 27″ long. E; STEREO 70: X = 654471.048, Y = 641163.201, Fig. 1).

Also known in the archaeological literature as Filiași–*Dealul Mare/Dealul Boghiu*, the first information about the site comes from Orest Tafrali, that, together with Emil Condurachi and Victor Manoliu conducted a series of archaeological excavations, speaking of the existence of house remains less than 0.5 m deep[7]. The investigations were continued in 1955 by N. Zaharia and N. Berlescu[8], and in 1984–1986 by D. Boghian and C. Mihai[9]. The site was located on a promontory with an absolute altitude of 185 m and relative height of 90 m, oriented NW–SE, at about 500 m from the village of Filiași, on the right bank of the Valea Oii river, left tributary of Bahluieț river, in the territory of Războieni village, Iași County, northeastern Romania[10].

[3] DÜRING 2006, 38.

[4] SOUVATZI 2013, 56–57.

[5] LAZAROVICI, LAZAROVICI 2007, 171.

[6] MONAH, CUCOȘ 1985, 44; POPOVICI 2000, 34–36.

[7] TAFRALI 1935-1936, 11–12, 51–54.

[8] BERLESCU 1955, 151–165.

[9] BOGHIAN 2004.

[10] BRIGAND *et alii* 2012, 5–32; NICU 2016, 76.

Recent research were completed between 2010 and 2015 by the collective of the Arheoinvest Interdisciplinary Research Platform from the "Alexandru Ioan Cuza" University of Iași, using non-invasive methods (topography, geophysical surveys, aerial photos etc.).

Methodology

The methodology used is based on the combination of information from previous archaeological researches with geophysical surveys to identify the internal organization and development of the settlement. Starting from geophysical surveys carried out in mega-sites from Ukraine, in conjunction with data obtained from the excavations, K. Rassmann and his collaborators propose a classification of the identified traits, and discuss their role in the rebuilding of social organization and the estimation of past populations[11] (Figure 2).

Over the years the site from Războieni–*Dealul Mare* has benefited from several geophysical campaigns, various methods being used such as electrical resistivity of the soil, over an area of 0.6 ha, caesium-vapour magnetometry, over an area of 1.04 ha, and fluxgate magnetometry, over an area of 3 ha (Figure 3).

In addition to information related to planimetry, geophysical surveys may be useful in the demographic estimations, a method already used in Tripolye settlements as Petreni I (Tripolye C1)[12], Taljanky (Tripolye C1)[13] and Majdaneckoe (Tripolye C1)[14].

In archaeological literature, the criteria used in demographic estimations include the living space, with an area of 7–10 m^2 assigned to each individual[15], values accepted by D. Monah for the Cucuteni culture, presuming an average of 8 sqm[16], and the number of buildings identified, multiplied by an average value of 10 individuals per dwelling[17]. Starting from geophysical surveys, M. Porcič believes that a population estimate can be achieved by multiplying the total number of dwellings with the estimated average of household size, calculated by dividing the total area of the floor to a value of 7 m^2, the necessary space for an individual. By a simple proportional extrapolation, he argued that if a settlement was geophysically surveyed over 50% of its area, and a number of 40 houses were identified, then the total number of the houses could be doubled[18].

[11] RASSMANN *et alii* 2016, 31.

[12] RASSMANN *et alii* 2016, 59–64.

[13] RASSMANN *et alii* 2016, 32–39.

[14] RASSMANN *et alii* 2016, 39–44.

[15] CHAMBERLAINE 2006, 126–128.

[16] MONAH, CUCOȘ 1985, 48.

[17] MONAH, CUCOȘ 1985, 48; PREOTEASA 2014, 75.

[18] PORCIČ 2012, 171.

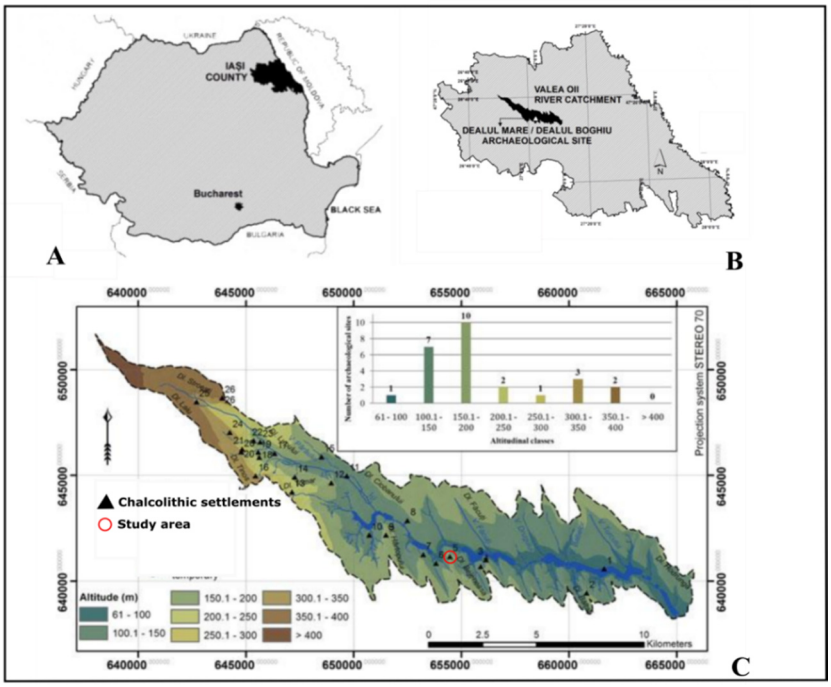

Figure 1. The location of the study area in Romania (A), Iași County (B) (Asăndulesei 2017), and the Valea Oii basin (C) (DTM and relative frequency of altitudinal classes (Nicu 2016)).

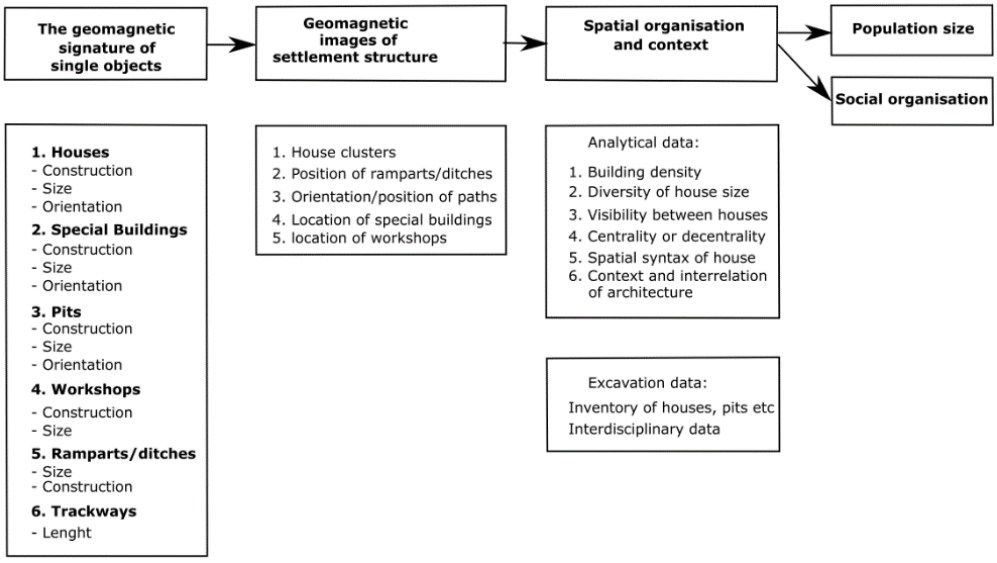

Figure 2. Overview of data from geophysics surveys (after RASSMANN *et alii* 2016, Fig. 4).

Figure 3. Areas surveyed by means of geophysical techniques (after Asăndulsei 2017, Fig. 5).

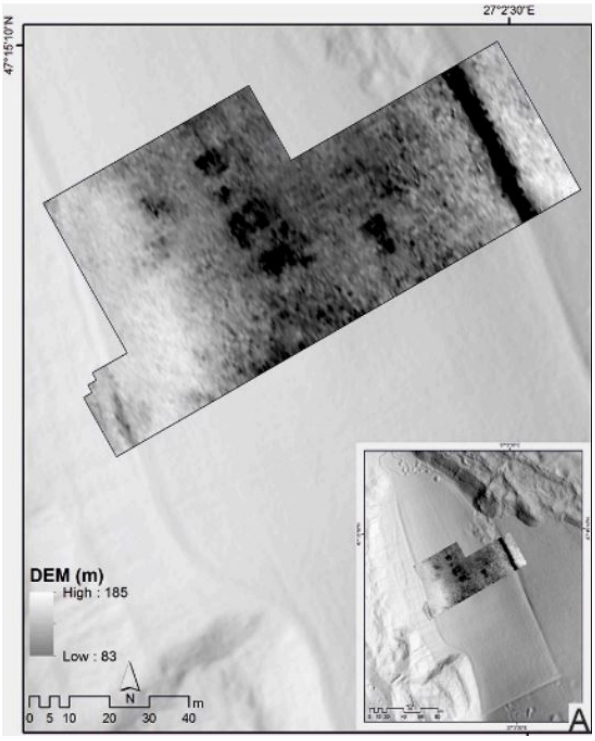

Figure 4. Interpreting the anomalies identified by geophysical surveys: soil electrical resistance measurements (Asăndulesei 2017).

Results and demographic estimations

Using soil electrical survey in the central part of the settlement, a series of 12 anomalies with a high resistance were identified, associated with archaeological structures, probably dwellings (Figure 4). These results were confirmed later by magnetometric surveys. Also, two linear anomalies identified could be attributed to the defensive system[19].

In the northewestern part of the settlement, the caesium-vapour magnetometry identified a series of anomalies considered dwellings (Figure 5A), with different sizes ranging from 10 to 13 m length and 5 to 7 m width. In addition to the dwellings, the settlement defensive system was identified, probably formed by two ditches and a palisade[20].

In the final stage, the surveys were extended to an area of about 3 ha, using fluxgate magnetometry (Fig. 5B). Previous results were confirmed, furthermore it was found that the settlement extended towards southeast. The new sector of the settlement seems to have been delineated by three smaller curvilinear anomalies, considered ditches or palisades[21].

The geophysical investigations carried out at Războieni–*Dealul Mare* present a unique situation connected with the settlement planimetry. Initially, the settlement seems to have been founded in the NNE part of the hill, with a semicircular arrangement of dwellings, with a higher density in the SW sector. The settlement seems to be protected by a defensive system made up of two ditches and most likely a palisade. We cannot exclude the possibility of making the defensive system before founding the settlement, a situation encountered in the case of Hăbășești settlement, where the ditches were dug by 120 individuals in 40 days[22].

The length of the two ditches was about 105 m with between 2 and 4 m width and a distance between them of approximately 10–15 m[23]. The total area of the northern sector was approximately one hectare, with an estimated 26 to 33 dwellings, arranged in three or four rows, with an average of 50 sqm and an area of 320 sqm for each construction, values close to those encountered at Trușești and Hăbășești settlements[24]. Taking into account the criteria accepted in archaeological literature, hypothetically, we can talk about a population size of about 260–330 individuals for the northern sector.

Following the demographic growth, the settlement expanded to SSE, over an area of 1.3 ha. The dwellings in this sector are arranged in three rows, separated by two trackways. A possible 24 to 27 dwellings were identified, with an average area of 70 sqm and a total

[19] BALAUR 2011, 48; ASĂNDULESEI 2017, 9, 41, 9.

[20] ASĂNDULESEI 2017, 10–11.

[21] ASĂNDULESEI 2017, 12.

[22] DUMITRESCU 1954, 220.

[23] Information provided by the collegues from the Arheoinvest Platform.

[24] PREOTEASA 2014, 68.

Figure 5. Interpreting the anomalies identified by geophysical surveys:
A: total magnetic field measurements; B: fluxgate gradiometer survey (Asandulesei 2017).

space of 480 sqm dedicated to each structure. Unlike the northern sector, the dwellings outside the fortified area were delineated by three small ditches or perhaps a system of palisades[25]. Using the methodology proposed by M. Porcič[26] and taking into account the fact that the settlement space doubled, the number of individuals also probably doubled.

The planimetry of the settlement, provided by the geophysical surveys, presents two interesting situations. Firstly, the two ditches are divided by two access ways, representing perhaps the trackways, continued among the dwellings. Secondly, there are two dwellings between the ditches, with approximately equal sizes (Fig. 5B), considered by the author of the surveys part of a complex defensive system (bastions) or observation points[27], a similar situation being encountered in the Cucuteni A-B settlement of Traian–*Dealul Fântânilor*[28]. Also, in this sector there are large structures with a special character, such as those encountered in the Tripolye area[29].

Concluding remarks

The geophysics survey proves to be an useful tool in the study of settlements. The research at Războieni–*Dealul Mare* led to the identification of the settlement planimetry and also tracing its evolution. The presence of dwellings on both parts of the defensive system can support at least two phases of evolution. The total area of the settlement was about 2.5 ha with an area of 400 m^2 for each dwelling. This way of organizing the settlement, with trackways, with well-defined buildings arranged according to a certain plan, with the existence of large-scale works suggests a social organization based on the existence of rules that allows a better interaction between members. Also, the presence of the two trackways suggests a close relationship between the two sectors of the settlement.

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[25] ASĂNDULESEI 2017, 12.

[26] PORCIČ 2012, 171.

[27] ASĂNDULESEI 2017, 12.

[28] BEM 2007.

[29] ASĂNDULESEI 2017, 15; RASSMANN *et alii* 2016, 29–54.

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