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INSIGHT INTO THE REGIONAL DISTRIBUTION AND GEOGRAPHIC SETTING OF THE VINČA AND BUBANJ–SĂLCUŢA–KRIVODOL SETTLEMENTS IN THE CENTRAL BALKANS AND ITS IMPLICATIONS

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Abstract – The paper presents the results of research on the regional distribution and geographic setting of the 5th millennium BCE settlements in the Central Balkans. The research encompasses two successive archaeological cultures in the area between the Danube Valley and the upper course of the Južna Morava River and compares the regional distribution of the settlements and their topographic and pedological aspects. It has been concluded that the relocation occured on a regional level, meaning the abandonment or a reduced population of the regions which were densely populated during the Vinča culture. The emphasised dichotomy in the topographic type of the settlements with more or less equally distributed settlements compared to the altitude and an increased focus on soils unsuitable for cultivation suggest the utilisation of a wider range of local resources and a greater degree of mutual connections between the BSK settlements. The observed trends are interpreted in correlation with the previous knowledge on economic strategies of the population of the Central Balkans.

Key words – Vinča culture, Bubanj–Sălcuţa–Krivodol cultural complex, Central Balkans, regional settlement distribution, geographic setting, Late Neolithic/Early Eneolithic economy

Several papers have recently analysed and compared settlement patterns of the Vinča culture and Bubanj–Sălcuţa–Krivodol (henceforth BSK) cultural complex in the territories of the Morava Valley and eastern Serbia.[1] These studies have demonstrated that after the disintegration of the Late Neolithic (henceforth LN) settlement pattern in the Velika and Južna Morava Valley new locations were settled. Some of those sites were settled during the Early and Middle Neolithic but most of them were settled during the Early Eneolithic (henceforth EE) period for the first time. Furthermore, a large degree of continuity in the settling of sites after the new settlement pattern was established can be observed.[2]

The results presented in this paper were obtained as a consequence of the author's PhD thesis, which primarily sought to systematise a large amout of archaeological and geographical data on the 5th millennium BCE settlement sites in the Central Balkans.[3] Therefore, the aim of this paper is to investigate the regional settlement distribution and geographic setting in two successive periods in order to recognise the existing trends in the settlements systems and economies.

[1] Kapuran, Bulatović, Milanović 2018; Milanović, in press.
[2] Kapuran, Bulatović, Milanović 2018.
[3] Милановић 2017.

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Distribution, position and the economy of the Vinča culture settlements

The Vinča culture was widespread in the areas which gravitate towards the middle course of the Danube and the lower course of the Sava River and their tributaries, of which the valleys of Tisa, Drina and Morava are the most important. Such an area encompasses a number of present-day countries (Serbia, Montenegro, North Macedonia, Bulgaria, Romania and Hungary).[4] The periodisation of F. Holste, which was later supplemented by V. Milojčić,[5] and consists of the phases Vinča A–D, is the most common, as well as the periodisation proposed by M. Garašanin,[6] which divides the development of the Vinča culture into an earlier Vinča period and later Vinča period, meaning the phases Vinča–Tordoš I–II, the Gradac phase, and the phases Vinča Pločnik I–II.[7] The radiometric measurements from the sites in the regions of present-day Serbia indicate that the development of the Vinča culture incorporated a period between 5400/5300 and 4600/4500 BCE.[8]

It had previously been noted that a total of three types of Vinča culture settlements can be distinguished based on the geomorphological, hydrological and topographic characteristics of the terrain. The first type includes the settlements in the vicinity of large rivers, the second type includes settlements which were further away from the large rivers and the third type includes settlements which were established on steep, dominant and barely accessible hills or rocks, which could be easily defended.[9] The first two types are recorded on river terraces and gentle slopes, but also in the lowlands, erected on elevated terraces which were protected from flooding. The third type of settlements (the so-called hillfort/Gradina type), chronologically corresponds to the later phases of the Vinča culture (Vinča–Pločnik, i.e. Vinča C–D), and stands in correlation with a period of the spread of knowledge of metal, the disturbance of social relationships, greater perturbation and the outset of a shift in socio-economic relationships.[10]

The regional LN settlement patterns in the Central Balkans have not been thoroughly examined. The only exceptions are the studies conducted in central Serbia (region of northern Šumadija),[11] where the existence of nucleated LN settlements, the hierarchy of settlements and the differences in their functions have been registered,[12] and more recently, when the LN and EE settlement patterns in the Morava and eastern Serbia regions were analysed.[13] Based on the examples from the site in Opovo (region of Banat) for the Late Vinča (Vinča C–D) population,[14] for the Bronze Age population in the region of Šumadija,[15] and for the EE population in the central Balkans,[16] it had been assumed that the settling of the peripheral areas occured due to the process of the socio-economic transformation of the Neolithic societies, meaning the intensification of production and utilisation of resources.

In his study on Vinča culture, J. Chapman correlates the different population density of certain regions with the different potential of the settlement environment and distinguishes three topographic regions: lowland valleys, hill-country and uplands.[17] By erecting the settlements in high altitude areas and the exchange centres in the peripheries of the supply areas, direct control of resources was established.[18] Significant changes are noted at the transition from the early to the late phase of Vinča culture (phases III and IV according to Chapman), followed by the disappearance of large settlements (such as Selevac) and the dispersion of the population to what were peripheral areas up to that point, which subsequently facilitated the utilisation of the plough in the previous phase.[19] The settlements in those peripheral areas, away from main river watercourses, were characterised by a higher diversity

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[4] Глишић 1968; Garašanin 1979; Гарашанин 1984; Chapman 1981; Brukner 2003; Трипковић 2013.

[5] Milojčić 1949.

[6] Garašanin 1979.

[7] The periodisation of the Vinča culture is based on the stratigraphy of the eponymous site Belo Brdo in Vinča. For detailed overwiev refer to: Garašanin 1979, 149–153. For a more recent overwievs on the periodisation and chronology refer to: Chapman 1981; Schier 1995; 1996; Jovanović 1994; 2006; Borić 2009.

[8] Schier 1996; Borić 2009; Orton 2012; Tasić et al. 2015.

[9] Гарашанин 1973, 161.

[10] Гарашанин 1973, 72; see also: Трипковић 2013; Borić et al. 2018.

[11] Chapman 1990. A number of papers dealing with the individual aspects of the Vinča culture settlement patterns were published recently: Jerinić 1988; Ристић-Опачић 2005; Перић 2010; Arsić 2011; Милановић 2013; Милановић, Милојевић 2013; Obradović, Bajčev 2016; Kapuran, Bulatović, Milanović 2018.

[12] Chapman 1981; 1990.

[13] Милановић 2017.

[14] Tringham et al. 1985; 1992; Tringham 1992.

[15] Bankoff, Greenfield 1984.

[16] Милановић 2017.

[17] Chapman 1981, 50.

[18] Chapman 1981, 115.

[19] Chapman 1990, 40.

in the selection of both position and the surrounding resources. The introduction of the plough enabled the cultivation of larger parcels of land, an increase in population and the further expansion of the settlements towards the forested areas, as well as the cultivation of hard soil types such as *chernozem* and *vertisol*.[20]

R. Tringham considered the growth of population as a key factor in the disintegration of the Vinča culture, as the population reached the level of the carrying capacity of settlement's territory, which caused competition and inequality between households. Finally, such changes led to the abandonment of the LN settlements and the formation of smaller settlements in "marginal soils" during the late phase of the Vinča culture (Vinča D).[21]

The shortcoming of the models suggested by Chapman[22] and Tringham[23] relates to the chronology of the settling of large and long lasting sites such as Selevac, which, based on radiometric measurements, existed during the final phases of the Vinča culture as well,[24] and also relates to the duration of most of the other large settlements of the Vinča culture.[25] The latest research of the pedological capacities of the Neolithic settlements in the upper course of the Velika Morava River indicates that the affinity towards easily cultivated and fertile forest soils (*eutric cambisol*) existed during the Early/Middle and LN, and that no intensive utilisation of heavy types of soil (*vertisol*) has been recorded during the LN.[26]

Analysis of the economic potentials and utilised resources in certain micro-regions has given an insight into the economic strategies of the communities of the Vinča culture.[27] It is considered that during the LN the importance of the cultivation of cereals increased together with large cattle herding, while the recorded economic strategies indicate a mixed economy, which depended on the ecological potentials of the environment and the manner in which the people selected to organise production.[28]

Distribution, position and the economy of the BSK cultural complex settlements

The BSK cultural complex is a phenomenon spread over the western, mountainous regions of Bulgaria (from the Danube in the north to the area of Blagoevgrad in the south, and from the Bulgarian border with Serbia to the Isker and Vit valleys to the east) and in Romania (in Oltenia to the Olt River, smaller regions in western Muntenia and in north-eastern Banat). In eastern Serbia, the sites were registered from the Djerdap Gorge in the north to the state border to the south, with its western border lying approximately on the Južna Morava River. The sites on the left bank of the Zapadna Morava River (Poljna near Blagotin) and in the confluence area of the Zapadna, Južna and Velika Morava rivers (Panjevački Rit near Jagodina, Jazbine near Makrešani and Ciglarska Peć near Stalać) were also registered. It was noted that the influences of the BSK cultural complex spread to western Serbia as well (Družetić–Bodnjik near Koceljevo). Further, towards the south and west, settlements of this cultural complex were found in Kosovo, the Skopje Valley, Pelagonia, Aegean Greece and Albania. BSK bordered the settlements of the Kodžadermen–Gumelniţa–Karanovo VI (KGK VI) cultural complex in the east and the Tiszapolgár culture in the north.[29] The existing periodisations are based on the analysis of stylistic characteristics of pottery and the stratigraphic characteristics of the most important sites.[30] New radiometric measurements[31] fit well into previous insights on the absolute chronology of the BSK cultural complex.[32] According to the available radiometric measurements in western Bulgaria and Romania, L. Nikolova positioned the duration of the BSK cultural complex to a period between 4400 and 3800 BCE.[33]

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[20] Chapman 1990, 43.

[21] Tringham, Krstić 1990, 567–615; Tringham 1992. New absolute dates from the site near Opovo have indicated that the settlement had existed prior to the Vinča D period (Vinča C2–D1), meaning between 4860 and 4780 BCE, see: Orton 2012, 21, Fig 6. Such a dating does not disrupt the model that was suggested by R. Tringham, but it was pointed out that such a type of settlement (Opovo) could be interpreted in other ways, e.g. a settlement specialised in hunting, see: Borić 2015, 164.

[22] Chapman 1990.

[23] Tringham 1992.

[24] Cf. Orton 2012, Fig. 7.

[25] Cf. Borić 2009; Порчић 2010, 357; Orton 2012, 7.

[26] Obradović, Bajčev 2016, 73.

[27] Chapman 1981; Greenfield 1986; Bökönyi 1988; Tringham et al. 1985; 1992; Legge 1990; McLaren, Hubbard 1990; Russel 1993; 1998; Borojević 2006; Filipović, Tasić 2012; Filipović, Obradović 2013; Bulatović 2018; Filipović et al. 2019.

[28] Chapman 1981; Russel 1993; 1998; Borojević 2006; Orton 2008; 2010; 2012.

[29] Radu 2002; Nikolova 1999; Milanović 2012.

[30] Гарашанин 1973; Georgieva 1990; Nikolova 1999; Чохаджиев 2007.

[31] Bulatović, Vander Linden 2017; Bulatović, Vander Linden, Gori 2018.

[32] Boyadziev 1995; Nikolova 1999; Todorova 2003; Lazarovici 2006.

[33] Nikolova 1999; see also: Todorova 2003, 276–295.

B. Nikolov mentions more than 200 sites of the BSK cultural complex in the territories of the northwestern and the middle part of western Bulgaria,[34] while S. Čohadziev registered 53 sites in the Struma Valley.[35] Čohadziev notices the different disposition of sites in micro-regions compared to the previous period. The settlements on barely accessible and naturally fortified elevations are dominant, yet cave settlements, as well as settlements positioned on low river terraces, are recorded as well.[36] The settlements are equally spatialy distributed, smaller than in the previous period and no particular concentration of sites in any of the micro-regions was noticed.[37]

Based on the position of the BSK sites, N. Tasić noted several types of settlements. Aside from the naturally fortified settlements located on strategic positions (hillforts/Gradina type), lowland settlements, cave settlements and pile-dwelling settlements are registered as well.[38] The existence of different economic strategies of the communities which inhabited those settlements and the four basic economic components were pointed out (animal husbandry-nomadic, arable farming, mining-metallurgical and hunting-fishing). Also, some of the basic economic components were dominant in certain types of settlements,[39] which suggested the existence of settlements with a specialised economy.

Obvious trends in plant cultivation are not noticeable due to the small amount of data from the EE sites. New research at the site of Bubanj near Niš suggests that there was continuity in the spectrum of grown crops during the LN/EE transition and that the einkorn and emmer varients prevailed as the basic types of cereals, while the cultivation of other sorts of cereals and vegetables varied in the Central Balkans.[40] A significant shift in the representation of animal species compared to the settlements of the Vinča culture suggested the appearance of a new type of animal husbandry.[41] It was based primarily on the breeding of ovicaprines, but both cattle and pig were also very important in the EE, which suggests the existence of more versatile strategies of animal husbandry compared to the LN.[42]

Goals and methods

The basic goals of the paper are the analysis and comparison of the settlement distribution in certain regions of the Central Balkans, as well as the determination of the topographic and pedological characteristics of the settlement environments in two successive periods. Furthermore, a step forward has been made in terms of registering the existing trends and their interpretation in the scope of the current knowledge regarding the economic strategies of the population of the Central Balkans.

The research is based on a sample comprised of 144 sites, i.e. 142 settlements (Map 1–2 and Appendix). The mapping of the sites demonstrated that smaller or larger concentrations of sites are noticed in the following regions: 1. the lower course of the Velika Morava River and the course of Mlava River, 2. the upper course of the Velika Morava River and the lower course of the Zapadna Morava River, 3. the lower, 4. the middle, 5. and the upper course of the Južna Morava River and 6. eastern Serbia.

The regional distribution and geographic settings of the settlements were compared using the Geographic Informational System (GIS) (Global Mapper v15.1 and ArcMap 10.1). Territory within a 5 km radius from the site (the so-called catchment zone) has been observed, which is a common method in the spatial analysis of prehistoric settlements of farming communities.[43] The following parameters were examined: topography, site altitude and soil types in the vicinity of and in the wider area around the settlement.

In terms of a wider spatial plan, it was necessary to note the concentrations of the sites in certain micro-regions and regions. The distribution of approximately synchronous sites in six regions enabled an overall insight into the variability in population densities of different regions in both the periods. Nevertheless, those results should be taken under consideration with caution for at least two reasons. Primarily, those sites which could not be precisely located were not taken into consideration, which particularly refers to the LN sites in the middle course of the Velika Morava River (e.g. the vicinity of Svilajnac) and in the middle course of the Južna Morava River and its hinterland. The other

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[34] Николов 1975.

[35] Чохаджиев 2007, 60.

[36] Чохаджиев 2007, 60.

[37] Чохаджиев 2007, 60–61 and map 4.

[38] Tasić 1979; 1995.

[39] Tasić 1979; 1995.

[40] Filipović, in press.

[41] Bulatović 2018.

[42] Ostergaard 2005; Bulatović 2010; Булатовић 2012; Bulatović 2018.

[43] Cf. Higgs,Vita-Finzi 1972; Barker 1975; Dennell, Webley 1975; Clarke 1977; Renfrew, Bahn 2000.

reason relates to the small areas of the EE sites, which makes them barely detectable. Their precise location will be crucial in terms of a better understanding of the settlement patterns in the researched regions in the future.

Data on the sites' positions, respectively the latitude and longitude, were acquired using three basic methods. The first method involved those situations when sufficient data exists in literature, and therefore the positions of the sites were acquired from the existing topographic descriptions or the published plans of the sites.[44] The second method involved the collection of data by means of archaeological prospection, by going out into the field and locating the sites with a hand-held GPS device.[45] The third, less precise method, was applied in cases when the necessary data was lacking, and therefore the position of the site was reconstructed on the basis of the description of the location and the recognition of toponyms according to which the site is named on high-resolution topographical maps (1:25 000).[46]

Topographic features are focused on determining the altitude and form of relief of the sites.[47] The primary division relates to the flat settlements, settlements on slopes, settlements on plateaus of the elevations, settlements on plateaus of the dominant elevations (Gradina type) and settlements in caves. When determining a topographic type of a settlement, an attempt was made to differentiate sites on plateaus with lower elevations in relation to those on higher (dominant) elevations, the main criteria being the elevation of the site in relation to the surrounding terrain. A limit value of 20 m of elevation is taken, so that sites with values lower than 20 m were categorised into the first group, and those with higher values were categorised to the second.

Economic activities are closely related to the pedological features of the area. Hence, it is very important to determine the percentile representation of soil types around the settlement on a contemporary pedological map of Serbia.[48] Considering that the development of soil is a dynamic process and that the formation of pedological types depends on various factors, it is not completely clear how much the modern pedological cover matches the distribution of soil types in the past. However, most pedologists consider that *eutric cambisol* and *vertisol*, which are the most common soil types in the examined micro-regions of the Central Balkans, were formed by the end of the Pleistocene or the beginning of the Holocene (Boreal), while the alluvial types of soil were formed in large and small river valleys by cyclic sedimentation processes over a long period of time.[49]

It was assumed that alluvial types of soil were used for gardens (*fluvisol and humofluvisol*), along with forest types such as *eutric cambisol* and *luvisol* and *colluvial* types of soil in cases where they were registered in the immediate vicinity of the settlement (within a 1 km radius). If such soil types were documented in a wider area around the settlement (radius over 1 km) then they were marked as fields.

The favourable water-air regime and the high ecological value of the developed alluvial soils suited the cultivation of spring-grown crops.[50] The mentioned forest pedological types fall into the category of fertile and moderately fertile, easy to cultivate due to their mechanic composition and physical-chemical properties, and suited to the cultivation of winter-grown crops.[51] Deep, less skeletal *colluvium* is also convenient for cultivation.[52] In this sense, it was very important to determine the diversity and the prevalence of these types of soils in the immediate vicinity of the settlements.[53]

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[44] Bearing mark 1 in the tables with topographic characteristics of the settlements in the Appendix.

[45] Bearing mark 2. Such data from a number of sites in the lower course of the Južna Morava River originates from the projects of the Institute of Archaeology: *Archaeological prospection of the Aleksinac municipality* (2014–2016) and *Archaeological prospection of the lower course of the Južna Morava River* (2017–2018), refer to: Милановић, Милојевић 2013; 2016; Милојевић, Милановић 2016; Милојевић, Трајковић-Филиповић 2017. Likewise, certain locations in the middle and upper course of the Južna Morava River and the course of the Nišava River were prospected in the period between 2011 and 2016, refer to: Milanović, in press.

[46] Bearing mark 3.

[47] Topographic maps of the SFRY Military-Geographic Institute (ratio 1:25 000) were used.

[48] Information provided by the Institute of Soil Science in Belgrade, in the form of circular cut-outs from the pedological map of Serbia within a 5 km radius and the percentile representation of soil types.

[49] Antić, Jović, Avdalović 1980; Ćirić 1986.

[50] Antić, Jović, Avdalović 1980, 472–477; Ćirić 1986, 247–249; cf. Sherrat 1980.

[51] Antić, Jović, Avdalović 1980, 376–380, 416–423; Ćirić 1986, 211–214, 225–228; cf. Sherrat 1980.

[52] Ćirić 1986, 190–192.

[53] E.g., if the settlement had been located beside *fluvisol*, *eutric cambisol, luvisol* and *colluvium*, its residents would have had four different pedological types available for arable farming, which enabled a cultivation of different crops and increasing the chance of successful and better harvests.

Soil types and their distance from the settlement	Reconstruction of the representation of areas suitable for different economic activities
Fuvisol and humofluvisol within a 1 km radius	Gardens, forests and pastures
Eutric cambisol and luvisol within a 1 km radius	Gardens, forests and pastures in places
Fuvisol and humofluvisol within a 5 km radius	Fields, forests and pastures
Eutric cambisol and luvisol within a 5 km radius	Fields, forests and pastures in places
Vertisol and chernozem within a 5 km radius	Pastures, forests in places
Pseudogley, distric cambisol, calcocambisol, calcomelanosol and rendzina within a 5 km radius	Forests and pastures
Ranker, lithosol and regosol within a 5 km radius	Pastures and forests
Humogley and eugley within a 5 km radius	Swamps and forests
Arenosol and regosol on sand within a 5 km radius	Sands and pastures
Colluvium within a 1 km radius	Gardens, fields, forests and secondary depositions of stones
Colluvium within a 5 km radius	Fields, forests and secondary depositions of stones

Table 1. Reconstruction of the representation of areas suitable for gardens, fields, forests, pastures, swamps, sands and secondary stone deposits based on the representation of soil types and their proximity to settlements

Табела 1. Реконструкција заступљености површина погодних за баште, поља, шуме, пашњаке, мочваре, пешчаре и секундарна лежишта камена на основу заступљености земљишних типова и њихове близине насељима

Vertisol and *chernozem* were considered the optimal soil types for pastures,[54] followed by the undeveloped and less developed alluvium (*fluvisol and* especially *humofluvisol*),[55] *ranker*, *lithosol*, *regosol*[56] and *arenosol*[57] and to a lesser extent *pseudogley*, *distric cambisol*, *calcocambisol*, *calcomelanosol* and *rendzina*, which are particularly suitable for forest biocenosis.[58] It is important to register settlements that were, to a greater extent, oriented toward *vertisol* and *chernozem*, which were unfavourable for cultivation due to their physical-chemical properties during both the Neolithic and Eneolithic.[59] Such areas are mostly distinguished by low, grassy vegetation of an open type, that is, a biocenosis of meadows, which are particularly suitable for grazing.

The soil capacity analysis, as suggested, provided significant potentials for the reconstruction of economic activities and places of social focus in the surroundings of the settlements. Based on the vegetation that characterises certain pedological types, a reconstruction of the economic activities in the settlements was conducted (Tab. 1).[60] It was particularly important to determine which pedological types were represented within a 1 km radius of sites, which made it possible to identify settlements focused on a mixed economy, and those focused predominantly on arable farming or animal husbandry. Such analysis enabled the testing of the applicability of the intense farming model, in which the early farmers were skilled and maintained a high level of productivity. The farming was based on the formation of smaller parcels/gardens by intense cultivation, fertilisation and the creation of long-term farming conditions.[61] The model implies the integration of arable farming and animal husbandry, with the cattle grazing taking place in the vicinity of parcels intended for cultivation. That process enabled the fertilisation of gardens and a significant growth in yield, which was particularly important in terms of the cultivation of forest soils. Therefore, the basic parameters were the focus of settlement towards soil types in the immediate vicinity (within a 1 km radius) and the percentile

[54] Antić, Jović, Avdalović 1980, 337–349, 352–362; Ćirić 1986, 204–210.

[55] Antić, Jović, Avdalović 1980, 472–477; Ćirić 1986, 247–249.

[56] Antić, Jović, Avdalović 1980, 331–336; Ćirić 1986, 183–188, 197–200.

[57] Ćirić 1986, 188–190.

[58] Antić, Jović, Avdalović 1980, 320–331, 388–392, 396–408; Ćirić 1986, 194–197, 200–204, 215–221, 235–240.

[59] Contrary to that see: Chapman 1990, 43; Filipović et al. 2019, 1954–1955.

[60] For more detailed characteristics of pedological types refer to: Милановић 2017, 32–39, 70–73, with cited literature.

[61] Cf. Jones 2005; Bogaard 2004; 2005.

[62] The site is not taken into account in this paper.

representation of soil types around the settlement (within a 5 km radius), all of which enabled the classification of eight groups of settlements (Tab. 2).

Regional distribution of the LN and EE settlements

The most densely populated regions during the LN are those gravitating towards the course of the Velika Morava and Južna Morava rivers (Map 1; Tab. 3). A sparse settling of eastern Serbia is noted for this period, in contrast to the later period when the mentioned region is the most densely populated (Map 2; Tab. 3). On the other hand, the upper course of the Velika Morava River was sparsely settled during the EE according to existing data, and no sites were yet registered in the lower course of the Velika Morava River. The Paraćin and Ćuprija micro-regions in the upper course of the Velika Morava River were densely settled during the LN (39–43), and not a single site is registered in the Jagodina micro-region, while during the EE, only one site is located in the last mentioned area (Jagodina) (1), and no sites were registered in the first-mentioned areas (Paraćin and Ćuprija). In Šumadija, which was densely settled during the LN, only one EE location near Blagotin (2) is registered so far, and on the right bank of the lower course of the Južna Morava River, where dense settling was registered during the LN (44–51), no EE settlements are registered. Only at the site of Jazbine near Aleksinac, on the left bank of the lower course of the Južna Morava River, is there a possibility of the existence of an EE settlement, based on scarce surface finds.[62] Therefore, continuity in the settling is noted in the Južna Morava Valley, especially in the upper and middle course, in the Nišava Valley, in eastern Serbia and in the confluence zone of the Južna and Zapadna Morava rivers.

Groups	
1	Oriented towards fertile forest types of soil
2	Oriented towards fertile forest types of soil and alluvium to a lesser extent
3	Oriented towards fertile forest types of soil and alluvium to a greater extent
4	Oriented towards alluvium, fertile forest soils and soils unsuitable for cultivation
5	Oriented towards alluvium
6	Oriented towards fertile forest soils and soils unsuitable for cultivation
7	Oriented towards alluvium and soils unsuitable for cultivation
8	Oriented towards soil types unsuitable for cultivation

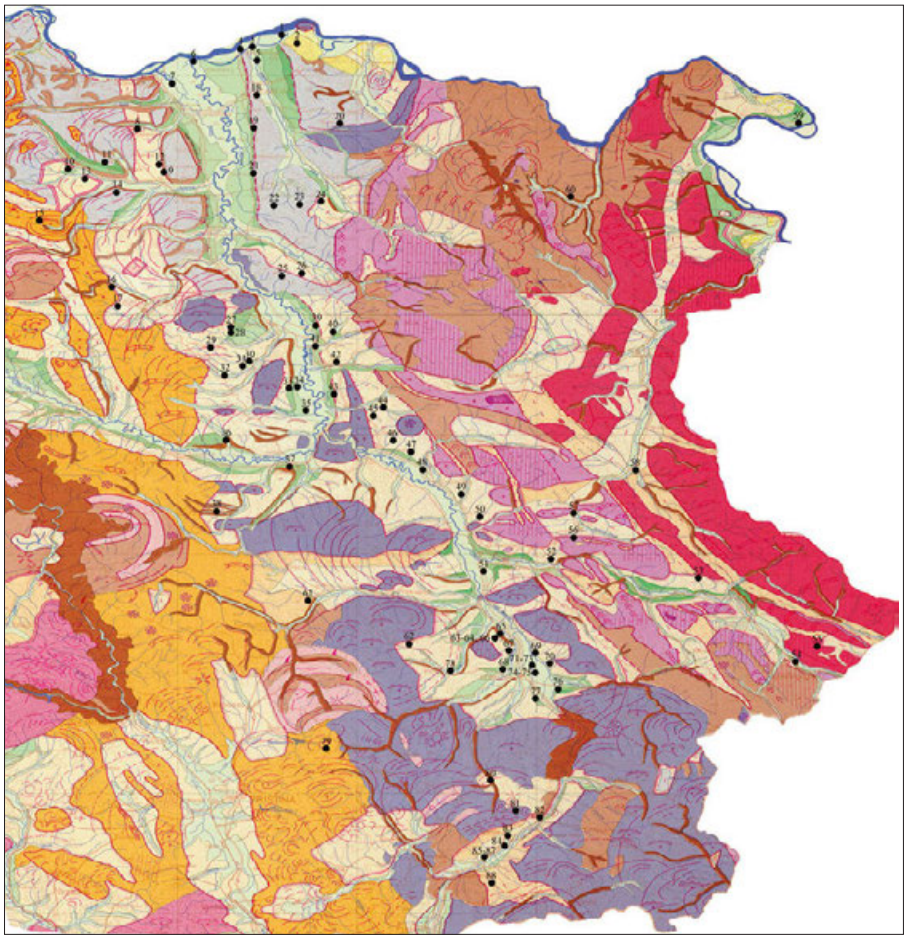
Table 2. The groups of settlements distinguished according to pedological analysis

Табела 2. Групе насеља издвојене према педолошкој анализи

№	Region	Total no. of LN sites	Sites	Total no. of EE sites	Sites
1	The lower course of the Velika Morava River and the course of Mlava River	24	1–24	0	
2	The upper course of the Velika Morava River and the lower course of the Zapadna Morava River	22	25–45	4	1–4
3	The lower course of the Južna Morava River and the course of Nišava River	10	46–55	7	5–12
4	Eastern Serbia	4	56–60	32	13–43
5	The middle course of the Južna Morava River	19	61–79	6	44–49
6	The upper course of the Južna Morava River	9	80–88	5	50–54
	Total	88		54	

Table 3. The number of LN and EE sites in the researched regions

Табела 3. Број касноенеолитских и раноенеолитских насеља у истраживаним регијама



Map 1. Regional distribution of LN sites, extracted from the geomorphological map, Зеремски 1990, slightly modified

Карта 1. Регионална дистрибуција каснонеолитских локалитета, исечак са геоморфолошке карте: Зеремски 1990, незнатно модификовано

The LN settlement distribution in altitudinal zones

The settling of various landscapes during the LN ranges between altitudes of 50 and 946 m (Fig. 1). Based on the altitude, the group of sites between 201 and 300 m is the most numerous (40%), with a significant number of locations falling within the span between 50 and 100 m (9%), 101 and 200 m (25%), and 301 and 400 m (14%) (88% in total). In general, settlements are most often recorded in the area with altitudes between 101 and 400 m (61 settlements or 79%). The lowest altitudes (50–80 m) are characteristic of the locations positioned within the alluvial landscape of the Danube River (1, 3–6 and 59), while the highest locations (880 and 946 m) are situated in the mountainous hinterland of the fifth and sixth regions (79 and 81). The upland sites already existed during the early

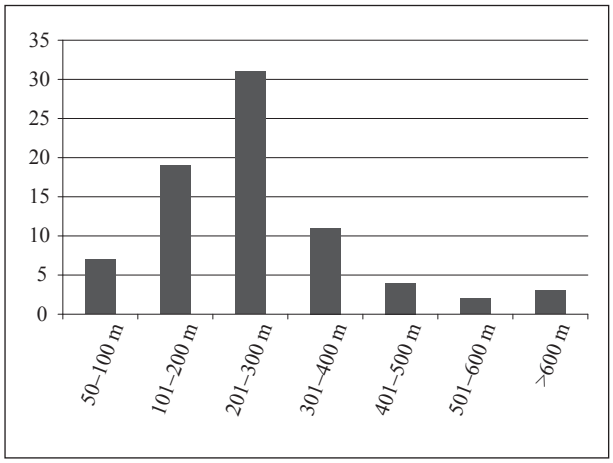


Fig. 1. The altitudes and number of LN settlements

Сл. 1. Надморске висине и број каснонеолитских насеља

Map 2. Regional distribution of EE sites, extracted from the geomorphological map, Зеремски 1990, slightly modified

Карта 2. Регионална дистрибуција раноенеолитских локалитета, исечак са геоморфолошке карте: Зеремски 1990, незнатно модификовано

Vinča and became more developed during the late Vinča, although the exact chronology has not been definitively determined in most cases, since either no archaeological research or only small-scale research has been conducted.

The EE settlement distribution in altitudinal zones

The settling of various landscapes during the EE ranges between altitudes of 45 and 690 m (Fig. 2). Similar to the LN, the most numerous group of settlement sites falls between the altitudes of 201 and 300 m (24.5%), with a significant number of locations falling within the span between 40 and 100 m (20.5%), 101 and 200 m (18.4%), 301 and 400 m (18.4%), and 401 and 500 m (14.3%). In general, the EE sites are rather equally distributed in the landscape with altitudes between

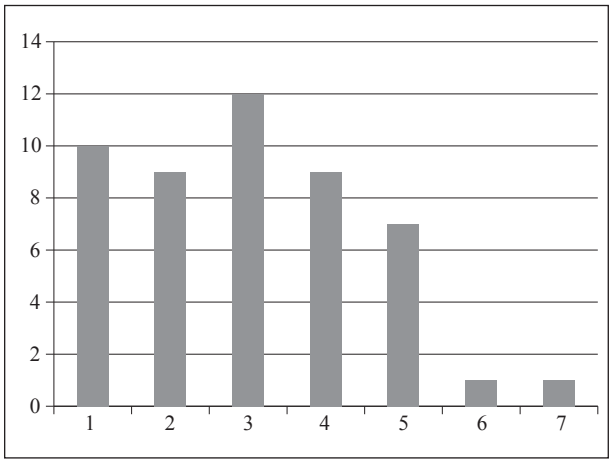


Fig. 2. The altitudes and number of EE settlements

Сл. 2. Надморске висине и број раноенеолитских насеља

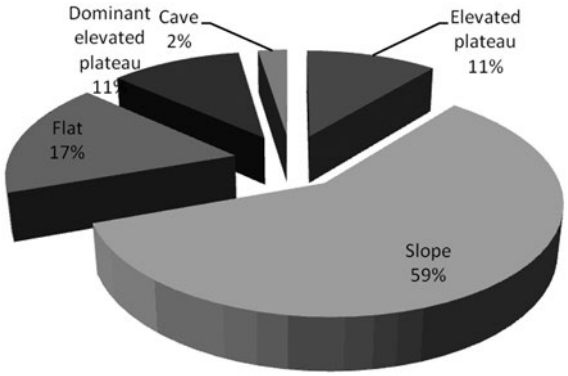


Fig. 3. Topography of LN settlements

Сл. 3. Топографија касноенеолитских насеља

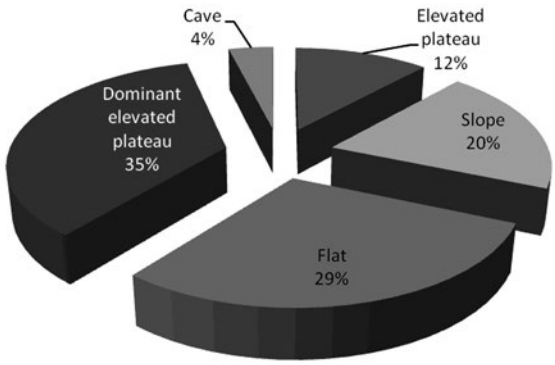


Fig. 4. Topography of EE settlements

Сл. 4. Топографија раноенеолитских насеља

40 and 500 m (47 settlements or 96% in total), compared to the LN sites. The lowest altitudes (40–70 m) are characteristic of the locations positioned within the alluvial landscape of the Danube River (28, 33–35, 37–40 and 43), and the highest altitude (690 m) is characteristic of a location in the mountainous hinterland of the sixth region (51).

Topography of the LN settlements[63]

The settlements positioned on the plateaus of the elevations are registered in the lowland alluvial landscapes of the first and second regions (11%) (Fig. 3). Those settlements were mostly located in marshy wetlands, and some are characterised by a significant number of Vinča settlement horizons (Selište near Kostolac, Orašje near Dubravica and Stublina near Supska) (4, 6 and 39). The positions on gentle slopes are dominant, as those were favoured locations for the establishment of settlements (59%), and remain unregistered solely in the confluence area of the Velika Morava and Mlava rivers and Danube River. The flat settlements (17%) remain unregistered solely in the third and sixth region, although many locations on gentle slopes in those regions are similar to the mentioned type of settlements. Such settlements are particularly numerous in lowland alluvial landscapes of the first, second and fifth regions. The settling of dominant elevations (11%) is unregistered in the third and fourth regions, and limited to certain micro-regions in the remaining regions. The most prominent characteristic of those settlements is the visual control of the surroundings (i.e. a viewshed). They are registered in the early Vinča, and became even more numerous during the late Vinča, although the exact chronology has not been definitively determined in most cases. The settling of caves is unconfirmed, but certain activities in Prekonoška pećina (56) and the plateau in front of a cave near Petrlaš (55) have been registered based on sparse surface pottery finds.

Topography of the EE settlements

Settlements positioned on the plateaus of dominant elevations (35%) and flat settlements (29%) were predominant during the EE, with a distinct minority of settlements in caves (4%) (near Zlot and Mokranje) (24 and 32) (Fig. 4). Settlements positioned on dominant plateaus of elevations are significantly more numerous and are registered in all of the regions. The flat settlements are far more represented during the EE, and quite often in the Danube region of eastern Serbia. Locations on slopes are rarely settled (20%), although, similar to the previous period, those are registered in all of the regions, while settlements positioned on the plateaus of elevations (12%) are almost equally represented as during the LN and registered in the second, third and fourth regions.

Pedology of the LN settlements

Forty-eight different combinations of soil types in the immediate vicinity (within a 1 km radius) of settlements were recorded in the LN (sample comprised of 87 settlements). As much as 97% of the settlements targeted at least one of the soil types suitable for culti-

[63] The Appendix presents topographic characteristics, altitudes and the method in which the sites were registered.

Group	Total no. of settl.	Activities	Settlements	Regions
1	10	Predominantly arable farming, animal husbandry to a lesser extent	9, 11, 14, 20, 22–23, 25–26, 28 and 33	1 and 2
2	4	Predominantly arable farming, animal husbandry to a lesser extent	8, 10 and 12–13	1
3	8	Predominantly arable farming, animal husbandry to a greater extent	19, 34–35, 37, 39, 41, 65 and 68	1, 2 and 5
4	18	Arable farming and animal husbandry	7, 16, 21, 40, 49, 52, 54, 59, 61–64, 66–67, 69–70 and 76–77	1, 2, 3, 4 and 5
5	8	Arable farming and animal husbandry	6, 51, 71–75 and 78	1, 3 and 5
6	11	Animal husbandry, arable farming to a greater or lesser extent	2, 15, 17, 24, 27, 45–46, 50, 55, 79 and 81	1, 2, 3, 5 and 6
7	25	Predominantly animal husbandry, arable farming to a greater or lesser extent	1, 3–5, 18, 30-32, 36, 38, 42–44, 47–48, 57–58, 80, 82–88	1, 2, 3, 4 and 6
8	3	Predominantly animal husbandry and/or other activities	29, 53 and 56	2, 3 and 4

Table 4. The LN groups of settlements, their total number, the reconstruction of activities based on the pedological analysis, the settlements and regions in which they were registered

Табела 4. Групе локалитета у касном неолиту, њихов укупан број, реконструисане активности на основу педолошке анализе, насеља и регије у којима су констатовани

vation (Tab. 6). An orientation towards alluvial soil types is recorded at 72% of sites, and to fertile forest soil types at 59%. The majority of the sites in the immediate vicinity are characterised by the representation of soil types suitable for animal husbandry (55%).

Differences and similarities in the reconstructed economic activities based on the pedological analysis have enabled the classification of eight groups of settlements (groups 1–8) according to their soil potentials (Tab. 4).

The first group of settlements is oriented towards fertile and moderately fertile forest soils, which are easy to cultivate (over 43% of fertile forest soil types within a 5 km radius), and some of them are distinguished by the proximity of the *colluvial* soil, which could also be cultivated. The inhabitants of these settlements were primarily oriented towards arable farming and forest-related activities, and would have engaged in pig breeding in forests and small herds of cattle, sheep, and goats on surrounding glades.

The second group of settlements was oriented towards smaller areas of *alluvium* and highly represented forest soil types suitable for cultivation (*alluvium* between 3 and 20% and fertile forest soils over 60%). Considering the presence of two or three pedological types suitable for cultivation, the environment of these settlements was especially suitable for arable farming and, to a lesser extent, for animal husbandry.

The settlements which were, to a considerable extent, oriented towards *alluvial* and forest soils suitable for cultivation (altogether over 65%) are classified into the third group. Most of these settlements are characterised by a significant availability of different soil types suitable for arable farming, which could be manifested by the cultivation of various crops and different cultivation regimes. Due to the significant presence of alluvial vegetation in the vicinity of these settlements, conditions were also suitable for livestock breeding.

The fourth group consists of settlements whose environment provided almost equal conditions for arable farming and animal husbandry. The group consists of settlements oriented towards *alluvium*, fertile forests soil types (over 29% of *alluvium* and fertile forests soil types) with a lower (1–20%) or higher representation of soils unsuitable for cultivation (20–68%). Therefore, this group is characterised by potentials for the most diversified strategies in agriculture.

The fifth group consists of settlements which were situated on *alluvial* soil types. Therefore, they had favourable conditions for a mixed economy.

The settlements which were, to a greater or lesser extent, oriented towards fertile forest soils (over 15%)

Group	Total no. of settl.	Activities	Settlements	Regions
2	2	Predominantly arable farming, animal husbandry to a lesser extent	36 and 42	4
3	3	Predominantly arable farming, animal husbandry to a greater extent	3-4 and 38	2 and 4
4	12	Arable farming and animal husbandry	13-14, 27, 39-41, 44, 47-50 and 53	4, 5 and 6
5	3	Arable farming and animal husbandry	5, 37 and 45	3, 4 and 5
6	2	Animal husbandry, arable farming to a greater or lesser extent	7 and 35	3 and 4
7	19	Predominantly animal husbandry, arable farming to a greater or lesser extent	8, 10-12, 15-17, 19-21, 24, 28, 30-33, 46, 52 and 54	3, 4, 5 and 6
8	12	Predominantly animal husbandry and/or other activities	1-2, 9, 18, 22-23, 25-26, 29, 34, 43 and 51	2, 3, 4 and 6

Table 5. The EE groups of settlements, their total number, the reconstruction of activities based on the pedological analysis, the settlements and regions in which they were registered

Табела 5. Групе локалитета у раном енеолиту, њихов укупан број, реконструисане активности на основу педолошке анализе, насеља и регије у којима су констатовани

and soils unsuitable for cultivation (mostly towards *vertisol* and, to a lesser extent, towards *rankers*, *rendzinas, calcomelanosol* or *arenosol*) are classified into the sixth group. Hence, they were particularly suitable for animal husbandry and arable farming, to a greater or lesser extent.

The seventh, and most numerous, group consists of settlements that had particularly favourable conditions for animal herding but also for arable farming. The settlements were directed towards smaller (7–20%) or larger areas of *alluvium* (20–48%) and soil types unsuitable for cultivation (mostly *vertisol* and *chernozem*, *rankers*, *rendzinas*, *humogley*, *eugley* and/or *calcomelanosol*, to a lesser extent) (over 13%, and mostly over 40%).

The eighth group includes the site near the village of Cikot (29), whose chronology has not been precisely defined (LN or EE), the site between the villages of Osmakovo and Vranište (53), in the hinterland of the Nišava River, and the site in Prekonoška pećina (56), which was probably not a permanent settlement. These sites were directed towards meadow and forest biocenoses and did not have favourable conditions for arable farming.

Pedology of the EE settlements

Forty-one different combinations of soil types in the immediate vicinity of the settlements were recorded in the EE (sample comprised of 53 settlements). The orientation towards soil types suitable for cultivation was lower than in the case of the LN settlements and amounted to 77% (Tab. 6). The orientation towards the alluvial soil types was recorded at 74% of sites, and to fertile forest soil types at 36%. A significant number of settlements in the immediate vicinity are characterised by the representation of soil types suitable for animal herding (53%).

According to soil potentials, a total of seven groups (groups 2–8) of settlements can be distinguished (Tab. 5).

Settlements which could be classified into the first group, oriented only to fertile and moderately fertile forest soil types (*eutric cambisol* and *luvisol*), have not been recorded. Only two settlements (7 and 35) oriented towards such soil types are noticed, but those are classified into the sixth group, due to the high representation of meadow biocenoses in the immediate vicinity (over 53% within a 5 km radius).

The second group of settlements is directed towards smaller areas of *alluvium* and forest soil types suitable for cultivation (*alluvium* between 3 and 9%, fertile forest soils over 26%). Therefore, the environment of these settlements was particularly suitable for arable farming and, to a lesser extent, animal husbandry.

The settlements which were, to a considerable extent, oriented towards alluvial and forest soils suitable for cultivation (altogether over 57%) are classified into the third group. Due to the significant presence of

meadow vegetation in the vicinity of these settlements, there were also suitable conditions for animal herding.

The fourth group consists of settlements whose environment provided almost equal conditions for arable farming and animal husbandry. The group consists of settlements oriented towards *alluvium*, fertile forests soil types with a lower or higher representation of soils unsuitable for cultivation (over 16% of *alluvium* and fertile forests soil types, mostly over 30%, and over 11% of soils unsuitable for cultivation, mostly over 20%).

The fifth group consists of settlements which were situated on *alluvial* soil types, which had favourable conditions for a mixed economy.

The settlements which were oriented towards fertile forest soils (over 16%) and soils unsuitable for cultivation (*vertisol* and *calcomelanosol*, i.e. *vertisol* and *arenosol*) are classified into the sixth group. Therefore, those were particularly suitable for animal husbandry and arable farming, to a greater or lesser extent.

The seventh, and most numerous, group consists of settlements that had particularly favourable conditions for animal herding but also for arable farming. The settlements were directed towards smaller (3–10%) or larger areas of *alluvium* (10–30%) and soil types unsuitable for cultivation (mostly *vertisol* and *rankers*, *rendzinas*, *calcomelanosol*, *humogley*, *eugley, arenosol, distric cambisol, calcocambisol* and/or *pseudogley* to a lesser extent) (over 17%, and mostly over 50%).

The settlements which were oriented towards soils particularly suitable for animal herding and other activities are classified into the eighth group. Five settlements (out of twelve) (2, 18, 22, 29 and 34) were directed only towards vertisol (within a 1 km radius), and two settlements towards *vertisol* and *calcomelanosol*, i.e. *vertisol* and *rankers* (23 and 51). Their environment was particularly suitable for animal husbandry. Only one settlement (1) was oriented solely towards swamp vegetation (*humogely* and *eugley*). The sites near Bor in eastern Serbia had very good conditions for stockbreeding and forest-related activities, but smaller areas of fertile forest soils (1.7%) at slightly greater distances (1.3 and 1.6 km) could be cultivated. In addition, two sites (9 and 43) were directed towards forests and meadows, and smaller areas of colluvial soil types on one of them (9) could be cultivated, although such a possibility is unlikely.

Discussion

Analysis of the regional distribution of settlements during the two successive periods demonstrates that the entire settling strategy during the second half of the 5th millennium BCE was focused on the copper-rich region of eastern Serbia. The same region was quite sparsely settled during the LN, which is similar to the trends recorded in the southern parts of the Balkan Peninsula.[64] It has been noted that the locations which were inhabited during the LN were evidently avoided and that new locations were selected for settling, even in those regions where a continuity of settling is registered. In all of the researched regions, only the site of Gradac near Zlokućani yielded data on settling in both periods, whereby the EE settlement was established on a previously uninhabited part of the site.

It can be concluded that BSK settlements are fewer (53 compared to 87 Vinča settlements), more dispersed and archaeologically less detectable, so the decline in the population seems very possible, as already indicated.[65] Single-layered sites and the relocation of settlements within the micro-region are dominant, which suggests that the concept of long-term inhabitancy of the same location had lost its significance.[66] The reasons behind that probably originate from a different economic focus of the EE settlements, although the quite realistic possibility that the LN locations were intentionally avoided due to certain norms and/or beliefs should also be taken into consideration.

Lowland valleys, hill-country and uplands were settled during both periods. The largest number of LN sites was established at altitudes between 50 and 400 m, with the dominant group of locations established at altitudes between 201 and 300 m. The settling of the mountainous hinterland of the fifth and sixth regions probably started during the early Vinča, yet it is more definitively confirmed during the late Vinča. During the EE, the largest number of sites was established at altitudes between 40 and 500 m, yet with relatively equally distributed sites in comparison to the altitudes (Fig. 5). The low altitude locations in the alluvial landscape along

[64] Cf. Demoule, Perlès 1993, 407.

[65] Borić 2015; Милановић 2017.

[66] Милановић 2017, 307. A similar conclusions regarding the LN settlements histories in the central Balkans have been highlighted by B. Tripković (2013, 246–247), and a similar processes have been observed in Greece (Demoule, Perlès 1993) and in the Carpathian Basin (Parkinson, Yerkes, Gyucha 2004; Link 2006; Parkinson et al. 2010).

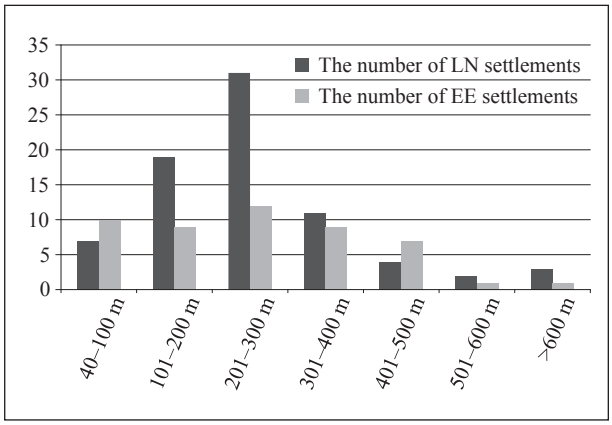


Fig. 5. Comparison of the altitude of LN and EE settlements

Сл. 5. Поређење надморских висина насеља у касном неолиту и раном енеолиту

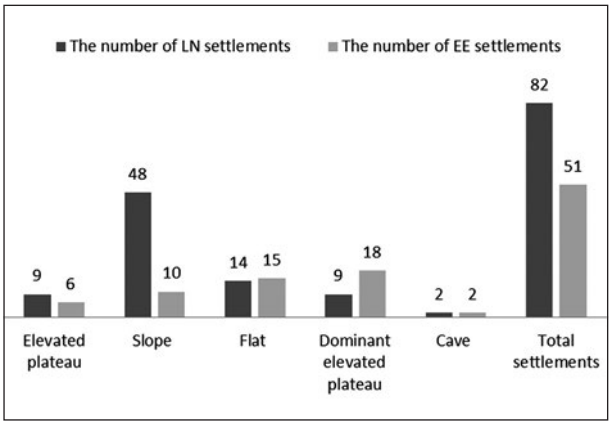


Fig. 6. Comparison of the topographic characteristics of LN and EE settlements

Сл. 6. Поређење топографских одлика насеља у касном неолиту и раном енеолиту

the Danube River were inhabited during both periods, and there was a noticeable increase in the number of such sites in the EE. Bearing in mind that the sites of the BSK cultural complex in Bulgaria are registered at altitudes of up to 1,270 m,[67] it is expected that settlements in high mountainous landscapes are to be found in the territory of Serbia as well.

The choice of settlement position during the EE was somewhat more equalised compared to the LN, and the increased representations of flat settlements and settlements positioned on dominant elevations are quite particular (Fig. 6). Different affinities towards the selection of settling locations during the EE are registered: flat positions, elevated plateaus or slopes in the lowlands or in the contact zone of lowlands and hill-country, on the dominant and naturally protected plateaus of elevations (hill-forts i.e. Gradina type) or in hidden caves in the hill-country or in the contact zone of hill-country and uplands. The necessity for safe locations, the tendency towards visual domination over the landscape and the control of communications (including the confluences and gorges) and local resources are reflected in the settlement pattern in which the dominant elevated plateaus, which were naturally and/or artificially protected, prevail.

It can be concluded that the LN settlements were mostly established in the immediate vicinity of main watercourses, meaning the vicinity of alluvial types of soils. During that period, settlements were also established in the micro-regions distant from the main watercourses and were focused towards fertile forest types of soil suitable for cultivation. Those two types also encompass the settlements established on dominant elevations (Gradina type), which, according to the division by M. Garašanin, represent a distinct, third type of LN settlements.[68] Furthermore, this research has shown that only certain EE hill-fort settlements were established in the *hinterlands* and focused solely towards types of soil suitable for pastures.

Based on soil potentials, a total of eight groups of settlements were distinguished.

The first group of settlements, oriented only towards fertile forest soils suitable for cultivation, is represented by 11% in the LN, while similar settlements were not noted in the EE (Tab. 4–5). Also, the second and third groups, into which settlements predominantly oriented towards soils suitable for cultivation are classified, are more frequent in the LN (14% versus 9%). The fourth and fifth groups, characterised by equally good conditions for both activities, are fairly uniform in both periods (30% versus 28%). The sixth group, directed towards animal husbandry and cultivation of fertile forest soil types, is significantly more represented in the LN (13% versus 4%). The seventh group, which is mainly

[67] Чохаджиев 2007, 38.

[68] Cf. Гарашанин 1973, 72. Only one hill-fort settlement, away from watercourses and focused towards those types of soils which were not suitable for cultivation, has been recorded (Čuka near Cikote in the second region), although it remains unclear whether the location should be ascribed to the LN or EE.

oriented towards animal herding and cultivation of alluvial soil types, is more frequent in the EE (29% versus 36%). It is particularly important that the eighth group of settlements, which did not have favourable conditions for cultivation, is far more represented in the EE (3% versus 23%).

Furthermore, the LN settlements of a predominantly agricultural character (groups 1–3) were concentrated in the hinterland of the lower and upper course of the Velika Morava River, along the right bank of the upper course of the Velika Morava River and in the middle course of the Južna Morava River. The settlements in which livestock farming played a more important role (groups 6–8) are represented in all the regions, and such settlements were particularly numerous in the zone of the confluence of the Mlava and Danube rivers, in the hinterland of the lower and upper course of the Velika Morava, on the right bank of the upper course of the Velika Morava and the lower course of the Južna Morava, in the hinterland of the Nišava River and in the upper course of the Južna Morava. The EE settlements of predominantly agricultural character (groups 2 and 3) are represented in eastern Serbia (the Danube region) and in the zone of the confluence of the Zapadna and Južna Morava rivers. The settlements in which animal herding played a more important role (groups 6–8) are represented in all the regions, and those were particularly numerous in eastern Serbia, in the Nišava Valley and in the upper course of the Južna Morava River.

Soil capacity analysis has showed that a significant level of continuity was represented during the EE, although certain novelties are noticed. The continuity relates to the settlements' focus towards those types of soils which allowed a mixed economy. A greater diversity of soil types surrounding the EE settlements has been noted, i.e. slightly smaller number of soil type combinations in a significantly smaller sample (Tab. 6). The main difference between these two periods is that almost all of the LN settlements were directed towards at least one of the soil types suitable for arable farming, although in the EE the number of such settlements is significant as well. A lack of the first group, as well as a reduced representation of the second and third groups and a significant increase in the number of the eighth group of settlements has been noted (Tab. 4–5). All of the aforementioned strongly suggests the reduced importance of arable farming and the increased role of animal herding. Furthermore, a lack of settlements orientated towards solely fertile forest soils (the first group), a shortage of settlements directed towards fertile forest and other soil types (the second, third and sixth groups), as well as a significant representation of settlements directed towards alluvium and fertile forest soil types (the fourth group), indicates certain shifts in terms of arable farming strategies. These changes relate primarily to the continuation of previously established strategies in the cultivation of moist fertile alluvial soil types and, in particular, a combination of alluvial and forest cultivation, while avoiding relying only on the cultivation of forests soil types. This suggests a tendency to reduce the risk of an unsuccessful harvest by relying on the cultivation of two or three different soil types. This

Data on LN and EE settlements and soils around the settlements/Period	LN	EE
Total sites	87	53
The numb. of combinations of soil types within a 1 km radius of the settlements	48	41
The percentile representation of the settlements oriented towards soils suitable for cultivation	97%	77%
The percentile representation of the settlements oriented towards alluvium	72%	74%
The percentile representation of the settlements oriented towards fertile forest types	59%	36%
The percentile representation of the settlements oriented towards soils suitable for pastures (vertisol, chernozem and ranker)	55%	53%

Table 6. Comparison of data on LN and EE settlements and soils within a 1 km radius of the territory

Табела 6. Поређење података о насељима из касног неолита и раног енеолита и земљиштима унутар територије полупречника 1 км

conclusion does not support the model according to which dry farming (i.e. rainfall dependent) was created a significant amount of time after the development of horticulture on alluvial soils in temperate Europe,[69] because certain long-lasting Vinča settlements (for example 9, 15 and 24) were directed only towards fertile forest soils.[70]

It is indicative that numerous long lasting Vinča settlements, as well as BSK settlements, were directed towards alluvial soils and heavy soil types suitable for pastures (group 7) (Tab. 4–5, Tab. 6), which points to the great importance of animal husbandry in agriculture.[71] Furthermore, EE settlements distant from fluvial deposits and fertile forest soils (group 8) indicate the settling of the peripheral areas and communities that were oriented towards animal husbandry, hunting and the procurement of raw materials for stone tools, copper minerals etc., which could subsequently be exchanged for farming products.[72]

It has been proved that the intense farming model was suitable for both periods, according to the analysis of soil potentials, as suggested. It can be concluded that settlements focused on animal husbandry existed during the LN and EE, but such a practice is less noticeable during the LN. It follows that arable farming and animal husbandry in the LN villages were more integrated in the everyday life of the community, which was a common practice in the researched regions.

Finally, groups of LN settlements in the neighbouring micro-regions and regions, which can be considered complementary in terms of soil capacity, are noted (compare 39 and 41 with 42 and 43, as well as 8–14 with 1–5, 15, 17–18, or 28 with 29–32). The same pattern is even more evident in the EE (compare 3–4 with 1–2) and especially indicative when the utilisation of resources of different ecological zones is considered, i.e. the geographic setting of the settlements within one micro-region and between neighbouring micro-regions. For instance, the site of Bubanj in the village of Novo Selo near Niš (5) is situated on an elevated plateau in a wide alluvial plain (altitude of 198 m, elevation of 15 m). The neighbouring site of Velika Humska Čuka (7) (the distance between the two sites is 8.7 km and the sites are characterised by a mutual visual communication) is positioned far from the alluvial formations, situated near a smaller area of a fertile forest, pedological cover suitable for cultivation, significant areas with meadow and forest vegetation and deposits of quality flint (Kremenac flint mine) and copper.[73] The site is located deep in the *hinterlands*, on a plateau of a dominant hill (altitude of 455 m, elevation over 100 m). A similar pattern was noted in the region of eastern Serbia, where two groups of settlements in neighbouring micro-regions, which can be considered as economically complementary and cooperative, were observed. The first group of settlements, whose environment was particularly suitable for arable farming, was formed in a wide plain of the Danube River (38–42), at altitudes between 40 and 50 m, within significant areas of alluvial and fertile forest soil types. The settlements of the second group were recorded north and south of Negotin (28–35), featuring very good conditions for livestock herding (sites 29 and 34 are especially striking since those are oriented solely to the vertisol soil type). These settlements were formed in different ecological zones, in the plains of the Timok (28) and the Danube rivers (33–35), at altitudes between 50 and 70 m, and in the hilly region south of Negotin (29–32), on dominant elevated plateaus at, altitudes between 90 and 220 m.

Conclusion

This research indicates the regional and micro-regional relocation of settlements, i.e. the colonisation of more marginal environments and a drop in population levels from the mid-5th millennium BCE onwards in the Central Balkans. The EE settlements were more equally distributed in terms of the altitude and topography, characterised by an emphasised dichotomy in terms of topography (flat/hill-fort sites) and an orientation towards a wider range of local resources, i.e. a diversity of soil types is recorded, which suggests a greater interconnection between the EE settlements. New strategies were introduced in arable farming, which was reflected in the tendency to settle contact zones of alluvial and hilly landscapes that were characterised by fertile farming land (alluvium and fertile forest types). The agriculturally marginal highlands became extensively settled and more pastoral in nature.[74] The increase in the number of settlements focused on soils unsuitable for cultivation confirms the earlier assumptions regarding the increased significance of animal

[69] Cf. Sherrat 1980, 314–319, Fig 2.
[70] Cf. Obradović, Bajčev 2016.
[71] Милановић 2018.
[72] Cf. Sherratt 1997.
[73] Милановић 2017; Milanović, in press.
[74] Cf. Sherrat 1981; Greenfield 2010.

husbandry and the existence of economically specialised and cooperative settlements during the EE.[75] In that period, all of the topographic types of settlements within the group of settlements primarily focused on soils unsuitable for cultivation have been recorded. Therefore, this research has indicated that the settlements of the BSK cultural complex (and not the late Vinča settlements) in the peripheral areas, distant from main watercourses, are characterised by a more versatile selection of the location of settlements and the surrounding resources.[76] Accordingly, the settling of the peripheral areas during the EE occured due to the process of socio-economic transformation of the Neolithic societies, meaning the intensification of production and utilisation of resources and innovations in metallurgy, arable farming and animal husbandry. Furthermore, a high level of control over communications and local resources, integration, specialisation, complementary and cooperative functions in the economies of neighbouring settlements in certain micro-regions, as well as a groups of settlements in neighbouring micro-regions have been recorded.

Translated by Ognjen Mladenović

[75] Cf. Tasić 1979; 1995.

[76] Contrary to Chapman 1990 and Tringham 1992.

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УВИД У РЕГИОНАЛНУ ДИСТРИБУЦИЈУ И ГЕОГРАФСКИ ПОЛОЖАЈ ВИНЧАНСКИХ И БУБАЊ–САЛКУЦА–КРИВОДОЛ НАСЕЉА НА ЦЕНТРАЛНОМ БАЛКАНУ И ЊЕГОВЕ ИМПЛИКАЦИЈЕ

Кључне речи – винчанска култура, Бубањ–Салкуца–Криводол културни комплекс, централни Балкан, регионална дистрибуција насеља, географски положај насеља, каснонеолитска/раноенеолитска економија

У раду су представљени резултати истраживања регионалне дистрибуције и географског положаја насеља из 5. миленијума пре н. е. на централном Балкану. У обзир је узето 144 локалитета, тј. 142 насеља која припадају винчанској култури и Бубањ–Салкуца–Криводол (БСК) културном комплексу на простору од Подунавља до горњег тока Јужне Мораве. Њихово мапирање помоћу Географског информационог система (ГИС) показало је да се мање или веће концентрације насеља могу уочити у шест регија данашње Србије. Посматрана је територија полупречника 5 km од локалитета и испитивани су: регионална дистрибуција насеља, надморске висине, топографске одлике и земљишни типови у непосредној близини и у ширем ареалу око насеља.

Анализа регионалне дистрибуције насеља у два сукцесивна периода показала је да је читава стратегија насељавања у другој половини 5. миленијума пре н. е. била усмерена ка бакром богатој регији источне Србије, која је у касном неолиту била ретко насељена, што је веома слично тренду констатованом у јужним областима Балканског полуострва. Може се закључити да су БСК насеља мање бројна, раштркана и археолошки слабије видљива, те је популациони пад, као што је раније сугерисано, у раном енеолиту врло могућ.

Раноенеолитска насеља су равномерније распоређена према надморским висинама и топографији, одликује их наглашена дихотомија у топографији (насеље на равном / насеље на платоу доминантног узвишења), а евидентирана је усмереност ка ширем дијапазону локалних ресурса, што је сугерисало већу међусобну повезаност између насеља у раном енеолиту. Нове стратегије се уводе у земљорадњу, што се огледа у насељавању контакт зоне између алувијалног и брдовитог предела, а одликују их два или више плодних земљишних типова. Насељавају се раније периферне области погодне за развој пасторалне економије. Пораст броја насеља усмерених ка земљиштима непогодним за култивацију потврђује раније претпоставке о увећаном значају сточарства и постојању економски специјализованих и кооперативних насеља у раном енеолиту. Ово истраживање је указало на то да се насеља БСК културног комплекса (а не она из касних фаза винчанске културе) у тим маргиналним областима, удаљеним од главних водотокова, одликују разноврснијим избором за положај насеља и околним ресурсима. Према томе, насељавање периферних области током раног енеолита јавља се услед процеса друштвено-економске трансформације неолитских друштава, што подразумева интензификацију производње и коришћења ресурса, као и иновације у металургији, земљорадњи и сточарству. Штавише, уочен је висок ниво контроле над комуникацијама и локалним ресурсима – интеграција, специјализација, комплементарне и кооперативне функције у економији суседних насеља у одређеним микрорегијама и група насеља у суседним микрорегијама.

Appendix.

Topographic characteristics, altitudes and methods by which the sites were registered

Прилог.

Топографске одлике, надморске висине и метод којим су налазишта евидентирана

	LN Site	Topography/Altitude (m)	Method
1.	Hrastova Humka, Kličevac	Elevated plateau/68–69	1
2.	Ladne Vode, Rečica	Dominant elevated plateau/324	1
3.	Čair, Kostolac	Elevated plateau/70–80	3
4.	Selište, Kostolac	Elevated plateau/72	3
5.	Lugovi, Drmno	Flat site/74–78	3
6.	Orašje, Dubravica	Elevated plateau/72	1
7.	Lipe, Smederevo	?/71	3
8.	Staro Selo, Selevac	Slope site/130–180	1
9.	Medvednjak, Grčac	Slopes and elevated plateaus/160–200	3
10.	Jablanica, Medjulužje	Slopes and elevated plateaus/250–300	3
11.	Ive, Kusadak	?/?	3
12.	Krnjevski Put, Grčac	?/?	3
13.	Kućerine, Jagnjilo	?/?	3
14.	Šiljakovac, Ratari	?/?	3
15.	Dizaljka, Lipovac	Slopes and elevated plateaus/300	2
16.	Rajac, Donje Grbice	Slope site/250	1
17.	Divostin	Slope site/303–313	1
18.	Minine Vode, Požarevac	Slope site/150	3
19.	Poljana, Požarevac	Slope site/?	1
20.	Staričino, Kobilje	Slope site/?	3
21.	Centar Sela, Simićevo	Slope site/100	1
22.	Konjušica, Viteževo	Slope site/190	3
23.	Zbegovište-Selište, Oreškovica	Dominant elevated plateau/209–211	3
24.	Belovode, Veliko Laole	Slope site/190	1
25.	Čair, Dobre Vode	Slope site/250	3
26.	Buljićka Bara, Veliki Popović	Elevated plateau/207	3
27.	Jaruge, Lozovik	Slope site/?	3
28.	Crkvine, Lozovik	Slope site/?	3
29.	Čuka, Cikot	Dominant elevated plateau/356	3
30.	Batal Njive, Medojevac	Flat site/170	3
31.	Gradina, Loćika	Elevated plateau/195–200	3
32.	Ciganski potok, Tečić	?/?	3
33.	Livade and Sastavci, Svojnovo	Slope sites/145–157	3
34.	An, Svojnovo	Flat site/127	3
35.	Selište, Varvarin	Flat site/140	3
36.	Šljivik, Stragari	Elevated plateau/190–200	1
37.	Lazarev Grad, Kruševac	Elevated plateau/161	1
38.	Vitkovo, Aleksandrovac	Slope and flat site/300–320	2
39.	Stublina, Supska	Elevated plateau, slope and flat site/?	1
40.	Kraljevo Polje, Ivankovac	Slope site/150	1
41.	Briketnica, Ćuprija	Flat site/120–125	1
42.	Motel-Slatina, Paraćin	Slope site/160–190	2
43.	Slatina-Turska Česma, Drenovac	Slope and flat site/140–150	2
44.	Lukićki Breg, Vitoševac	Slope site/230–260	2
45.	Šetka, Ražanj	Slope site/230–258	2
46.	Crnokalačka Bara, Rujište	Slope and flat site/278–288	2
47.	Srednje Polje, Bradarac	Slope site/203–210	2
48.	Drugo Okno, Aleksinac	Slope site/203–224	2
49.	Neine Njive, Katun	Slope site/199–236	2
50.	Dubrava, Velepolje	Slope site/206–207	2
51.	Mustajbegovo Polje, Pasipoljana	Flat site/186	2
52.	Radačje, Malča	Slope site/280–310	2
53.	Stranje, Osmakovo-Vranište	Slope site/460–500	2
54.	Obrenovac, Srećkovo	Slope site/430–460	1
55.	Petrlaška Pećina, Dimitrovgrad	Plateau in front of the cave/?	2
56.	Prekonoška Pećina, Prekonoga	Cave/700	1
57.	Timakum Majus, Niševac	Flat site/355	2
58.	Dubrava 1, Knjaževac	Slope site/230–240	1
59.	Zbradila, Korbovo	Flat site/50	1
60.	Rudna Glava	Slope site (copper mine)	1
61.	Šanac, Pločnik	Slope site/300	2
62.	Kremen, Mačina	Slope site/350–400	1
63.	Kućište, Čekmin	Slope site/207	1
64.	Sastanci, Čekmin	Slope site/206	1
65.	Selište, Čekmin	Slope site/209	1
66.	Ševarike, Čekmin	Slope site/206–207	1
67.	Na Kamen, Priboj	Slope site/250	1
68.	Selište, Vinarce	Slope site/223–234	1
69.	Gradac, Zlokućane	Dominant elevated plateau/264	2
70.	Prkljivica, Gornja Slatina	Slope site/270	1
71.	Izvor, Bobište	Flat site/222	1
72.	Putište, Bobište	Flat site/223	1
73.	Sastanci, Bobište	Flat site/223	2
74.	Selište, Bratmilovce	Flat site/225	1
75.	Božja Bara, Mrštane	Flat site/224–225	1
76.	Vranja Noga, Gornji Guberevac	Dominant elevated plateau/300–320	1
77.	Progon, Mala Grabovnica	Dominant elevated plateau/260–270	1
78.	Jezero, Bojnik	Flat site/240	1
79.	Redžov Vis, Tulare	Dominant elevated plateau/946	1
80.	Semensko Drvo, Golemo Selo	Dominant elevated plateau/520	1
81.	Goleme Livade, Tesovište	Slope site/880	1
82.	Dva Brata, Ranutovac	Dominant elevated plateau/420–425	2
83.	Rašina Okućnica, Vranje	Slope site/412	2
84.	Donje Vranje, Vranje	Slope site/383	2
85.	Gumnište, Donji Pavlovac	Slope site/390	2
86.	Čukar, Donji Pavlovac	Slope site/390	2
87.	Kovačke Njive, Donji Pavlovac	Slope site/392	2
88.	Kačamačke Njive-Slatina, Klinovac	Slope site/520	1
Total sites			89
Total settlements			87

	EE Site	Topography/Altitude (m)	Method
1.	Panjevački Rit, Jagodina	Flat site/115	1
2.	Blagotin, Poljna	Slope site/?	1
3.	Ciglarska Peć, Stalać	?	1
4.	Jazbine, Makrešane	Dominant elevated plateau/166	1
5.	Bubanj, Novo Selo	Elevated plateau/198	2
6.	Kremenac, Rujnik	Slope site (flint mine)	3
7.	Velika Humska Čuka, Hum	Dominant elevated plateau/455	2
8.	Kod Železničkog Mosta, Prosek	Flat site /215	2
9.	Gradac, Ostrovica	Elevated plateau/285	2
10.	Gradac, Begov Most	Slope site/320–340	2
11.	Pirotska Tvrđava, Pirot	Elevated plateau/380	2
12.	Strošena Češma, Dimitrovgrad	Slope site/440–460	3
13.	Rosulja-Višnjar, Rgošte	Flat site/220	1
14.	Čuka, Rgošte	Dominant elevated plateau/284	1
15.	Bolvan, Rgošte	Dominant elevated plateau/362	1
16.	Škodrino Polje, Jelašnica	Flat site/205-210	2
17.	Vrelo, Čitluk	Dominant elevated plateau/400	2
18.	Piskavica and Šumlatica, Lasovo	Elevated plateau (necropolis?) and slope settlement/400-430	1
19.	Banjska Stena, Gamzigradska Banja	Dominant elevated plateau/180	1
20.	Beligovo, Gamzigradska Banja	Elevated plateau/189	1
21.	Imanje Z. Brzanović, Gamzigrad	Slope site/180	1
22.	Petronj 2, Gamzigrad	Dominant elevated plateau/340	1
23.	Imanje Petrujkića, Donja Stopanja	Flat site/350	1
24.	Lazareva Pećina, Zlot	Cave site/291	1
25.	Kučajna, Bor	Slope site/380	1
26.	Kmpije, Bor	Elevated plateau/390	1
27.	Čoka Lu Balaš, Krivelj	Dominant elevated plateau/520	1
28.	Železnička Stanica, Tamnič	?/60-70	1
29.	Grabar-Svračar, Smedovac	Dominant elevated plateau/210	1
30.	Vrkalj-Ćetaće, Kovilovo	Dominant elevated plateau/146	1
31.	Kapu Djaluluj, Veljkovo	Dominant elevated plateau/94	1
32.	Kamenolom and Potkapina, Mokranje	Dominant elevated plateau/170 and cave/135-150	1
33.	Metriž, Srbovo	Flat site/70	1
34.	Ideće, Prahovo	Flat site/52	1
35.	Fabrika Superfosfata, Prahovo	Flat site/50	1
36.	Duge Livade, Šarkamen	Flat site/252	1
37.	Brzi Prun, Grabovnica	Flat site/40	3
38.	Donja Strana, Velesnica	Flat site/45-50	3
39.	Korbovo, Vajuga	Flat site/45	1
40.	Pesak, Vajuga	Flat site/45	1
41.	Pontes, Kostol	Elevated plateau/?	1
42.	Veliki Gradac, Donji Milanovac	?	1
43.	Lepenski Vir, Boljetin	Slope site (necropolis and settlement?)/60-70	1
44.	Gradac, Zlokućane	Dominant elevated plateau/264	2
45.	Donje Polje, Bratmilovce	Flat site/223	1
46.	Iza Hotela Grozd, Vlasotince	Flat site/250	1
47.	Kale, Grdelica	Dominant elevated plateau/361	2
48.	Rujkovac, Medvedja	Slope site/?	1
49.	Dački Rid, Donja Slatina	Dominant elevated plateau/261	1
50.	Kameni Plato, Priboj Vranjski	Dominant elevated plateau/380	1
51.	Antin Čukar, Vranje	Dominant elevated plateau/690	2
52.	Bare, Lučane	Slope site/440	1
53.	Gradište, Končulj	Dominant elevated plateau/475	1
54.	Porta Manastira Sv. Prohor Pčinjski	Slope site/440	2
Total sites			56
Total settlements			53