Circles and ceramics through the centuries: Characteristics of Neolithic Sopot culture settlements

Šošić Klindžić, Rajna; Kalafatić, Hrvoje; Šiljeg, Bartul; Hršak, Tomislav

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Krugovi i keramika kroz stoljeća: značajke naselja sopotske kulture

Circles and ceramics through the centuries: Characteristics of Neolithic Sopot culture settlements

Izvorni znanstveni rad
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U radu se prikazuju rezultati arheoloških istraživanja na osam nalazišta sopotske kulture na području sjeverno od Đakovštine. Nalazišta su u raznim stupnjevima istraženosti – od zračne daljinske prospekcije i rekognosiranja, do arheološkoga iskopavanja te primjene magnetometrijske metode. Istraživanjima se ustanovilo kako su nalazišta sopotske kulture mnogo većega opsega i mnogo kompleksnije strukture nego što se to dada smatrao te se predlaže reevaluacija dosadašnjih spoznaja. Sva su naselja omeđena s jednim ili više opkopa, osim naselja Đakovo – Grabrovac/Ciglana za kojega nije moguće utvrditi da li je imalo opkop, budući da je veći dio nalazišta uklonjen aktivnostima ciglane. Nalazi s osam naselja analizirani su tipološki i kronološki u kontekstu ostalih nalazišta sopotske kulture na području Slavonije.

Ključne riječi: sopotska kultura, naselja s opkopom, krajolik, geofizička istraživanja, periodizacija sopotske kulture, magnetometrija, mreža naselja

The paper presents the results of archaeological research at eight sites of Sopot culture in the area north of the town of Đakovo. The sites are in various stages of investigation – from aerial remote sensing and reconnaissance, to archaeological excavation and the application of the magnetic survey. It has been established through recent research that the sites of the Sopot culture are of a much larger scale and of a much more complex structure than previously thought, and it is proposed to re-evaluate the current interpretations. All settlements are enclosed by one or more ditches, except for the Đakovo – Grabrovac/Ciglana settlement for which it is not possible to determine whether it had a ditch, since most of the site was removed by the activities of the brickworks during the 20th century. The findings from eight settlements were analysed typologically and chronologically in the context of other sites of Sopot culture in Slavonia.

Key words: Sopot culture, enclosed settlements, landscape, geophysical research, Sopot culture periodization, magnetometry, settlement network
UVOD

U radu se obrađuju nalazišta sopotske kulture smještena u istočnoj Hrvatskoj, na sjevernome dijelu dakovačkoga ravnjaka, sjeverno od grada Đakova. Korištenjem integralnoga pristupa, uočeni su novi obrasci te su se ponovno valorirala prijašnja istraživanja kao i opažane pojave na odabranim nalazištima. Nalazišta su u različitim stupnjevima istraženosti – u okviru istraživanja uzoraka uzorkovanja te su obavljena rekognosiranja, a u nekim slučajevima i geofizička metoda magnetometrije (sl. 1).

U ediciji Praistorija jugoslavenskih zemalja, Neolit, s. Dimitrijević piše o naseljima ovalnoga oblika koja su utvrđena palisadom i opkopom, a smještena u nizinama bosuta (šopot, Orolik, privlaka, Otok), vuka (gaboš, Ostrovo) i Drave (hermanov vinograd) (Dimitrijević 1979: 270). S. Dimitrijević koristi termin “Wasserburg” za ovaj tip naselja. Pretpostavljavao je kako su u industriji smještena naselja s palisadom karakteristična za treći stupanj sopotske kulture u istočnoj Hrvatskoj i da se prema zapadu takav tip naselja javlja samo iznimno (Dimitrijević 1979: 272). Današnji uvid u neolitičke obrasce naseljavanja u zapadnoj Slavoniji potvrđuje korištenje palisada u formiranju naselja na sopotskim nalazištima (Ivanković 2013; 2014). Jedan dio ovdje predstavljenih nalazišta već su poznata kao sopotske kulture, ali uslijed malog opsega istraživanja nisu mogla biti prepoznata kao kompleks naseobinski i prostorni fenomeni o čemu će biti riječ u ovom radu.

INTRODUCTION

The paper deals with the sites of Sopot culture located in eastern Croatia, in the northern part of the Đakovo plain, north of the town of Đakovo. By using an integrative approach, new patterns were identified while previous research as well as observed phenomena at selected sites was re-evaluated. The sites are in various stages of investigation – at the sites of Prešlatinci – Ugljara, Tomošinci – Dubrava, Vukućevci, Gorjani – Topole, Satnica Dakovačka – Puștară Josipovac structures were observed by studying aerial imagery and the sites were surveyed for the purpose of their chronological attribution. Rescue excavation was carried out at the sites of Ivandvor – Suma Gaj i Đakovo – Grabrovac/Ciglana, while the site of Gorjani Kremenjača was systematically surveyed, excavated and subjected to geophysical magnetic survey (Fig. 1).

In the publication Praistorija jugoslavenskih zemalja, Neolit (Prehistory of the Yugoslav Lands, Neolithic) S. Dimitrijević writes about oval-shaped settlements enclosed by palisades and ditches, located in the lowlands of Bosut (Šopot, Orolik, Privlaka, Otok), Vuka (Gaboš, Ostrovo) and Drava (Hermanov vinograd) (Dimitrijević 1979: 270). S. Dimitrijević uses the term “Wasserburg” for this type of settlement. He assumed that the fortified settlements with ditches were characteristic of the third stage of Sopot culture in eastern Croatia and that in the west this type of settlement occurs only exceptionally (Dimitrijević 1979: 272). Today it is believed that the ditches around the settlements are also present in the very early stages of the established settlements, which can be dated to the earlier stages of the Sopot culture (Krnarčić Škrivanko 2003). Current insight into Neolithic settlement patterns in western Slavonia confirms the use of ditches in the formation of settlements at Sopot sites Vidoči – Glogovi, Ravnjaš (Mihaljević 2013; 2014b) and Kukunjevac – Brod (Ivanković 2013; 2014). Some of the sites presented here have already been recognized as Sopot culture sites, however, due to limited research it was impossible to identify them as complex settlement and spatial phenomena, which will be discussed in this paper.
NALAZIŠTA SOPOTSKE KULTURE U SJEVERNOJ ĐAKOVŠTINI
Preslatinci – Ugljara 1–2 (sl. 2–4)

Položaj: lokalitet se nalazi 600 m zapadno od centra naselja Preslatinci, na putu prema Pridvorje. Od potoka Kaznice udaljen je 600 m. Na povijesnome katastru (mapire.eu 2019) zabilježen je toponim Grac točno na mjestu krugova, dok je toponim Ugljara nešto sjevernije od lokaliteta. Na udaljenosti od 700-tinjak metara nalazi se više izvora. Današnja kompleksa kanalima i poljskim putem. Koordinate: E = 640650, N = 5026480; Preslatinci – Ugljara 1, 135,4 m n.v.; Preslatinci – Ugljara 2, 138,4 m n.v.

Prospekacija: Vidljiv je na najranijim satelitskim snimkama na Google Earth 29. 03. 2007., te se vidi na gotovo svim zračnim snimkama istoga portala. Snimke DGU s Geoportala (Geoportal 2019) potvrđuju ranije uočene krugove. Zračnim snimanjem potvrdili smo pretpostavku o dva kruga i dodatnim ograđenim područjem uz krug 1. Linija koja je vidljiva ispod krugova ostatak je puta koji je vidljiv na povijesnim kartama (mapire.eu 2019), ali i na snimci iz 60-tih godina prošloga stoljeća kad je još bio u upotrebi.

Preslatinci – Ugljara 1, istočni dvostruki krug. Dimenzije koju pokriva krug i prostor oko kruga su 169 x 228 m. Površina iznosi 3,1 ha. Širina jarka je 6 m. Sam krug je površine od 1,7 ha. Dimenzije kruga su 143 x 154 m. Širina unutarnjega jarka je 8 m. Relativna visina središnjega dijela u odnosu na obližnji teren je 1,4 m.

Preslatinci – Ugljara 2, zapadni jednostruki krug. Dimenzije kruga su 178 x 179 m. Površina iznosi 2,5 ha. Širina jarka je 9 m. Relativna visina središnjega dijela je 3,1 m.

Na lokalitetu su prikupljeni ulomci keramičkih posuda.

SOPOT CULTURE SITES IN THE NORTHERN ĐAKOVO REGION
Preslatinci – Ugljara 1–2 (Figs. 2–4)

Position: The site is situated 600 m west of the centre of the Preslatinci village, on the road to the village of Pridvorje. It is 0.6 km away from the Kaznica stream. The historical cadastral mapire.eu 2019 records the Grac toponym right at the location of the enclosures, while the Ugljara toponym is somewhat more to the north of the site. There are several springs about 700 m away from the site. Today they are cut off by canals and a field road. Coordinates: E = 640650, N = 5026480; Preslatinci – Ugljara 1, alt. 135.4 m; Preslatinci – Ugljara 2, alt. 138.4 m.

Prospection: The site was noted on the earliest satellite images on Google Earth from March 29, 2007, and is visible on almost all aerial photographs on the website. The SGA imagery from the Geoportal (Geoportal 2019) confirms the previously observed enclosures. Aerial photographs supported the assumption about the existence of two enclosures and the additional enclosed area near the enclosure 1. The line which can be seen below the enclosures represents the remains of a path visible on historical maps (mapire.eu 2019) but also photographs from the 1960s when it was still in use.

Preslatinci – Ugljara 1, eastern double enclosure. The dimensions of the enclosure and its outskirts measure 169 x 228 m. The surface area is 3.1 ha. The ditch is 6 m wide. The enclosure without the outskirts covers an area of 1.7 ha. The enclosure measures 143 x 154 m. The width of the inner ditch is 8 m. The relative height of the central part is 1.4 m regarding the surrounding terrain.

Preslatinci – Ugljara 2, western single enclosure. The enclosure measures 178 x 179 m. The surface area is 2.5 ha. The ditch is 9 m wide. The central part measures 3.1 m in relative height.
Fragments of ceramic vessels belonging to the Sopot culture according to their forms and decorations were collected at the site (Pl. 6: 2–4). Lithic artefacts and a large number of polished axes were also found. The type of decoration that was noted is fluting (Pl. 6: 3).

Bibliography: Marković 1985a: 12; 1994: 85, Pl. 13: 1–3; 2012: 62; Kalafatić, Šiljeg 2016: 113, 115–116; Šiljeg, Kalafatić 2015a: 135, 139, Fig. 7; Šiljeg et al. 2015: 358.

Satnica Đakovačka – Pustara Josipovac 1–2 (Figs. 5–7)

Position: The enclosures are located 2.3 km west of Satnica Đakovačka on a slope running northwest – southeast from the Krndija slopes towards the Kaznica stream. In the 18th century, a bridge over Kaznica stood below the enclosures. The road goes from Satnica and after the bridge it branches off towards Preslatinci, Gašinci and Selci. Satnica Đakovačka – Pustara Josipovac 1 coordinates: E = 644938, N = 5024385, alt. 110.9 m; Satnica Đakovačka – Pustara Josipovac 2 coordinates: E = 644758, N = 5024348, alt. 114.2 m.

Prospection: The site was observed on satellite imagery on Google Earth from August 5, 2013. Complexity was indicated by the photograph from June 4, 2017. All structures are visible on almost all aerial imagery on the Geoportal (2011, 2014–2017). Similar results were obtained by drone and camera recordings from aircraft.

Description: Satnica Đakovačka – Pustara Josipovac 1, eastern single enclosure. The area occupied by the outer enclosure is visible on 3.75 ha. The visible dimensions of the outer enclosure are 204 x 200 m. The ditch is 3 m wide.

Satnica Đakovačka – Pustara Josipovac 2, southern single enclosure. The area of the enclosure is 2.4 ha. Its dimensions are 192 x 163 m and the ditch is 5 m wide.

There are no drawings of the excavated material from
koji po oblicima i ukrasima pripadaju sopotskoj kulturi (T. 6: 2–4). Također su pronađeni i litički artefakti te velik broj glačanih sjekira. Od ukrasa je prisutno kaneliranje (T. 6: 3).

Literatura: Marković 1985a: 12; 1994: 85, T. 13: 1–3; 2012: 62; Kalafatić, Šiljeg 2016: 113, 115–116; Šiljeg, Kalafatić 2015a: 135, 139, sl. 7; Šiljeg et al. 2015: 358.

Satnica Đakovačka – Pustara Josipovac 1–2 (sl. 5–7)
Položaj: Krugovi su smješteni 2,3 km zapadno od Satnice Đakovačke na padini koja u smjeru sjeverozapad – jugoistok od padina Krndije ide prema potoku Kaznica. U 18. st. ispod krugova stoji most preko Kaznice. Put ide od Satnice, a nakon mosta se račva prema Preslatincima, Gašincima i Selcima. Satnica Đakovačka – Pustara Josipovac 1 koordinate: E = 644938, N = 5024385, 110,9 m n.v.; Satnica Đakovačka – Pustara Josipovac 2 koordinate: E = 644758, N = 5024348, 114,2 m n.v.

Ivandvor – šuma Gaj (Fig. 8)
Of all the sites presented here, the site of Ivandvor – šuma Gaj has been researched the most in terms of excavated area. The excavation was carried out as part of the construction of the Vc highway. Part of the settlement of the Sopot culture was excavated and the remains of the circular ditch in two places were identified (Balen et al. 2009: 28, Fig. 8). In terms of shapes of ceramic vessels, S-profiled pots, pede-staled vessels and conical and biconical bowls are present the site. Very few finds can be found on the site's surface, unlike most other sites presented here. Nevertheless, the manner of baking and the appearance of fragments of ceramics, however small and without decoration, indicate the style of Sopot culture, which is also true for the lithic artefacts. Therefore, we consider it justifiable to classify this site in the group of sites presented here.

![Sl. 5 Satnica Đakovačka – Pustara Josipovac, tlocrt prema zračnim snimcima (izradila: K. Turkalj)](image1)

![Fig. 5 Satnica Đakovačka – Pustara Josipovac, layout based on aerial imagery (made by: K. Turkalj)](image2)

![Sl. 6 Satnica Đakovačka – Pustara Josipovac, Google Earth snimak 17. 03. 2019.](image3)

![Fig. 6 Satnica Đakovačka – Pustara Josipovac, Google Earth image, March 17, 2019](image4)
Prospekciona: Lokalitet je uočen na satelitskim snimkama na Google Earth od 05. 08. 2013. Na složenost je ukazivao i snimak od 04. 06. 2017. Sve strukture vidljive su na gotovo svim zračnim snimkama na Geoportalu (2011, 2014–2017). Slične rezultate dalo je i snimanje dromon i fotoparametom iz zrakoplova.

Deskripcija: Satnica Đakovačka – Pustara Josipovac 1, jednostruki istočni krug. Površina koju zauzima vanjski krug vidljiva je na 3,75 ha. Vidljive dimenzije vanjskoga kruga su 204 x 200 m. Jarak je širine 3 m.

Satnica Đakovačka – Pustara Josipovac 2, jednostruki južni krug. Površina kruga iznosi 2,4 ha. Dimenzije su 192 x 163 m, a jarak je širine 5 m.

S lokalitetom Satnica Đakovačka – Pustara Josipovac ne- ma crteža pokretnih nalaza. Na površini nalazišta može se pronaći vrlo malo nalaza za razliku od većine drugih ovdje predstavljenih lokaliteta. Istraživanja su provedena u sklopu izgradnje autoceste Vc na položaju Ivan- dvor – šuma Gaj. Istražen je dio naselja sopotske kulture, a utvrđeni su i ostaci kružnoga opkopa na dva mjesta (Balen et al. 2009: 28, sl. 8). Od oblika keramičkih posuda prisutni su lonci s-profilacije, posude na nogama te konične i bikonič-ne zdjele (Balen et al. 2009: 29). Keramika je rijetko ukrašena. Horn like handles are also present (Balen et al. 2009: Pl. 2: 3). Several fragments are decorated with circular indentations or incised lines (Balen et al. 2009: Pl. 1: 10; 4: 12; 5: 1).

Ivandvor – šuma Gaj (sl. 8)

Lokalitet Ivandvor – šuma Gaj istražen je u najvećoj površini od svih predstavljenih lokaliteta. Istraživanja su provedena u sklopu izgradnje autoceste Vc na položaju Ivandvor – šuma Gaj. Istražen je dio naselja sopotske kulture, a utvrđeni su i ostaci kružnoga opkopa na dva mjesta (Balen et al. 2009: 28, sl. 8). Od oblika keramičkih posuda prisutni su lonci s-profilacije, posude na nogama te konične i bikonič-ne zdjele (Balen et al. 2009: 29). Keramika je rijetko ukrašena. Horn like handles are also present (Balen et al. 2009: Pl. 2: 3). Such motifs, as Marković (1994) classified, are most common on fine ceramics (Balen et al. 2009: 29). Horn like handles are also present (Balen et al. 2009: Pl. 2: 3). Several fragments are decorated with circular indentations or incised lines (Balen et al. 2009: Pl. 1: 10; 4: 12; 5: 1).

Dakovo – Grabrovac/Ciglana

Iskopavanja 1981. godine utvrdila su pripadnost lokaliteta sopotskoj kulturi (Pavlović 1984). U kasnijim iskopavanjima istraženo je naselje sopotske kulture na površini od približno 1.000 m², a pronađeni keramički material, premaautoru, pripada stupnju Ib/II sopotske kulture po podjeli s. Dimitrijevića na osnovi nalaza bikoničnih posuda i posuda na šupljim nogama te posuda ukrašenih tehnikama urezivanja i ubadanja (Hršak 2010: 22). Tragovi kružnog opkopa nisu uočeni niti prilikom iskopavanja, niti na zračnim snimkama, što još uvijek ne isključjuje njihovo postojanje jer je uzvišenje na kojem se nalazio lokalitet potpuno iskopano u zadnjih pedeset godina za potrebe ciglance u Dakovu. Dinamika razgradnje lokaliteta vidljiva je i na mrežnim stranicama isp.u.mgipu.hr na snimkama nastalima prije 1968. godine na kojima se vidi cjelovito uzvišenje s mnogo malih, rascjepka-nih čestica, ali se ne uočavaju nikakve arheološke strukture.

Pronađeni su keramički i litički nalazi karakteristični za sopotsku kulturu – posude na nogama (T. 9: 1), bikonične zdjele (T. 8: 2, 4), rogolike ručke (T. 8: 5), mala posuda (T. 8: 6). Najčešći tip ukrasa je urezivanje tankih ravnih ili spiralnih...

(Balen et al. 2009: 29). Pottery is rarely decorated. On coarse ceramics, fingerprint tapes occur, while plastic applications are most common on fine ceramics (Balen et al. 2009: 29). Horn like handles are also present (Balen et al. 2009: Pl. 2: 3). Several fragments are decorated with circular indentations or incised lines (Balen et al. 2009: Pl. 1: 10; 4: 12; 5: 1).

Dakovo – Grabrovac/Ciglana

Excavations in 1981 established the site’s attribution to the Sopot culture (Pavlović 1984). Later excavations investigated the Sopot culture settlement on an area of approximately 1,000 m², and the author claims the found ceramic material belongs to Ib/II stage of Sopot culture as defined by S. Dimitrijević based on the findings of biconical vessels, vessels on hollow feet and vessels decorated with incision and puncturing techniques (Hršak 2010: 22). Traces of circular ditches have not been observed either during excavations or during aerial photography, which still does not exclude their existence, since the hill on which the site was located has been completely dug up in the last fifty years for the needs of the Dakovo brickyard. The site decomposition dynamics is also visible on ispu.mgipu.hr web site on footage recorded before 1968, which shows a complete hill with many small, fragmented land plots, but no archaeological structures are observed.

The fragments of pottery and lithic artefacts that were found are characteristic of the Sopot culture – vessels on foot (Pl. 9: 1), biconical bowls (Pl. 8: 2, 4), horn like handles (Pl. 8: 5), a small vessel (Pl. 8: 6). The most common type of decoration are thin straight or spiral motif incisions (Pl. 8: 1–3; 9: 3). One of the fragments contained combined shallow and deep incisions (Pl. 8: 4). Other observed decorations are small incisions in the shape of triangles forming bands or a band outline. (Pl. 9: 2). Such motifs Z. Marković (1994) classifies within the very end of the Sopot culture, i.e. the Eneolithic Seče culture (Marković 1994: 89, Pl. 19: 12–13), and he suggests that a similar motif also appears in the “Pepelana” type (Marković 1994: Pl. 17: 2).
Fig. 8  Ivandvor – Šuma Gaj, plan of the site (after: Balen et al. 2009)
motiva (T. 8: 1–3; 9: 3). Na jednoj umoloku je plitko urezivanje kombinirano s dubokim (T. 8: 4). Od ukrasa su također prisutni trokutasti mali ubodi koji formiraju trake ili formu trake (T. 9: 2). Takve motive Z. Marković (1994) svrstava u sam kraj sopotske kulture, odnosno u jewelličku Seče kulturno (Marković 1994: 89, T. 19: 12–13), a navodi da se sličan motiv se pojavljuje i u „Pepelana“ tipu (Marković 1994: T. 17: 2).

Vučevci – Lještica 1–2 i Kućište (sl. 9–11; T. 7: 1–12)

Položaj: Lokalitet Lještica 1 nalazi se 1,4 km od Vučevaca na gredi omeđenoj potocima Vučevača Joševica, Crna Bara i Kremenjača. Vučevci – Lještica 1 koordinate: E = 655053, N = 5023509, 112,2 m n.v. Opkop Vučevci – Lještica 2 nalazi se 250 m južnije od Lještica 1 blizu utoka V. Joševice u Crnu Baru. Koordinate za Vučevci – Lještica 2: E = 654830, N = 5023184, 108 m n.v.

Krug lokaliteta Kućište nalazi se 0,8 km zapadno od centra sela Vučevac, a juгоistočno od Lještica 1 oko 380 m. Leži na uzvišenju iznad potoka Vučevača Joševica. Nalazi se na najvišem dijelu uzvišenja koje je 3–4 metra više i nešto južnije položeno prema Jošavi. Koordinate su: E = 655530, N = 5023357, 109,2 m n.v.

Prospekcija: Lokalitet Lještica 1 uočen je na najranijim satelitskim snimkama na Google Earth 23. 08. 2007. a na složenost je ukazivao snimak iz 03. 12. 2015. Sve strukture vidljive su na gotovo svim zračnim snimkama na Geoportalu (2011, 2014–2017). Položaj Kućište je jasno vidljiv na google earth image from August 5, 2013. A analysis of SGA cyclical recordings confirmed the existence of all parts of this complex site. Aerial drone and aircraft surveys confirmed the existence of two circular ditches, and a third rectangular ditch that frames both circular ditches, as well as Lještica 2 and Kućište ditches.

Vučevci – Lještica 1–2 and Kućište (Figs. 9–11; Pl. 7: 1–12)

Position: The site of Lještica 1 is located 1.4 km from Vučevci on a ridge bounded by the streams of Vučevača Joševica, Crna Bara and Kremenjača. Vučevci – Lještica 1 coordinates: E = 655053, N = 5023509, alt. 112.2 m. Vučevci – Lještica 2 ditch is located 250 south of Lještica 1 near the confluence of V. Joševica into Crna Bara. Coordinates for Vučevci – Lještica 2: E = 654830, N = 5023184, alt. 108 m.

The enclosure of the site Kućište is located 0.8 km west of the centre of the Vučevac village, and about 380 m southeast of Lještica 1. It lies above the stream Vučevača Joševica, 3–4 metres below the top of the hill which is located slightly south towards Jošava. The coordinates are: E = 655530, N = 5023357; alt. 109.2 m.

Prospection: The site of Lještica 1 was observed on the earliest satellite images on Google Earth from August 23, 2007, while its complexity was indicated by the photograph from December 3, 2015. All structures are visible on almost all aerial images on the Geoportal (2011, 2014–2017). The location Kućište is clearly visible on the Google Earth image from August 5, 2013. An analysis of SGA cyclical recordings confirmed the existence of all parts of this complex site. Aerial drone and aircraft surveys confirmed the existence of two circular ditches, and a third rectangular ditch that frames both circular ditches, as well as Lještica 2 and Kućište ditches.

The site of Lještica 1 consists of tell surrounded by a larger circular ditch which is in turn bounded by an even larger rectangular ditch.

Description: Vučevci – Lještica 1 is a site with a triple ditch. The area occupied by the rectangular outer ditch is visible on 12.6 ha. The visible dimensions of the outer ditch are 310 x 363 x 182 m. The ditch is 24 m wide. The middle ditch is circular with a diameter of 326 m. The ditch is 21 m wide. The area is 6 ha. The inner enclosure covers an area of 1.4 ha. Its dimensions are 131 x 144 m. The inner ditch is 12 m wide. The ditch is surrounded by an elevation that rises 4 m relative to the environment, hence the site is considered to be tell.

Vučevci – Lještica 2, southern single enclosure. The area of the enclosure is 0.98 ha. The dimensions are 120 x 104 m and the ditch is 10 m wide. It does not rise from the surrounding terrain. It is intersected by a recent canal and a field road.

Vučevci – Kućišta, single enclosure of 1.4 ha. The dimensions of the enclosure are 140 x 116 m. The width of the ditch is 6 m. It is barely elevated from the surrounding terrain.

Fragments of ceramic vessels belonging to the Sopot culture according to their shape and decorations (Pl. 7: 1–12) were collected at the site. Lithic artefacts were also found.

Bibliography: Siljeg, Kalafatić 2015: 135, 137, Fig. 4; 2016: 213, 217, Fig. 8.

Tomasanci – Dubrava 1–3 and Gradina 1–3 (Figs. 12–14)

Position: The site is located 2.5 km east of the centre of Tomošanci. It lies on the southern slope of the ridge which
Fig. 9 Vučevci – Lještica and Kućište, layout based on aerial imagery (made by: K. Turkalj)

Fig. 10 Vučevci – Lještica and Kućište, Google Earth image, August 5, 2013
...continues to the eastern slopes of Krndija. To the south of the site is a source that is nowadays directed into a canal that runs through the site towards the channelized stream Velika Osatina. Position is provided for every single part of the site. Tomašanci – Dubrava 1, coordinates: E = 652821, N = 5028910, alt. 97.3 m n.v.; Tomašanci – Dubrava 2 coordinates: E = 652623, N = 5028908, 96.2 m n.v.; Tomašanci – Dubrava 3 coordinates: E = 652598, N = 5028781, 99.4 m n.v.; Tomašanci – Gradina 1 coordinates: E = 652679, N = 5028577, 101.9 m n.v.; Tomašanci – Gradina 2 coordinates: E = 652759, N = 5028480, 105.8 m n.v.; Tomašanci – Gradina 3 coordinates: E = 652730, N = 5028407, 105.8 m n.v.

Prospekcija: Uočen je na najranijim satelitskim snimcima na Google Earth 23.08.2007. te je vidljiv na gotovo svim zračnim snimcima na Geoportalu (2011, 2014–2017). Analiza cikličkih snimanja DGu-a potvrdila je postojanja svih dijelova ovoga složenog lokaliteta. Zračnim snimanjem (dron i zrakoplov) potvrdili smo pretpostavku o dva veća kruga, tri manja i dijelom pravokutnoj građevini. Linija koja je vidljiva istočno od lokaliteta je cesta koja je išla od Đakova prema Osijeku. Cesta se vidi na povijesnim kartama (mapire.eu) ali i na snimci iz 60-tih godina prošloga stoljeća kad je još bio u upotrebi.

Politoko: Tomašanci – Dubrava 1, istočni jednostruki krug površine 2.4 ha. Dimenzije kruga su 170 x 179 m, a širina jarka je 14 m. Na terenu se vidi lagano uzvišenje koje je...
zabilježeno i na Hrvatskoj osnovnoj karti (HOK) list Krndija 6 H 27-46 mjerila 1:5000.

Tomašanci – Dubrava 2, sjeverni jednostruki krug površine 0,44 ha. Dimenzije kruga su 75 x 77 m, a širina jarka je 2,4 m. Krug je najjasnije vidljiv na snimci DGU-a u bliskom infracrvenom spektaru (NIR) iz 2011. Ne ističe se reljefno na terenu.

Tomašanci – Dubrava 3, jednostruki južni krug površine 2,2 ha. Dimenzije kruga su 165 x 172 m, a širina jarka je 12,4 m. Krug je presječen poljskim putem i kanalom koji ide uz put. Vidljivo je lagano uzvišenje.

Tomašanci – Gradina 1, sjeverni jednostruki krug površine 0,17 ha. Dimenzije kruga su 51 x 42 m, a širina jarka iznosi 3 m. Leži uz kanal koji počinje na mjestu izvora, pa je zapadna strana nejasna.

Tomašanci – Gradina 2, središnji objekt pravokutnoga tlocrta, vidljiv je samo njegov istočni dio. Vidljiva površina iznosi 0,45 ha, a dužina 80 m. Širina jarka je 3,3 m. Uz njega možemo vezati srednjovjekovnu keramiku s lokaliteta.

Tomašanci – Gradina 3, južni jednostruki krug površine 0,21 ha. Dimenzije kruga su 54 x 49 m, a širina jarka je 1,4 m. Krug je sličan Gradini 1, a moguć ulaz nalazi se na istočnoj strani.

Na lokalitetu su prikupljeni ulomci keramičkih posuda koji po oblicima i ukrasima pripadaju sopotskoj kulturi (T. 6: 1, 5–6). Također su pronađeni i litički artefakti. Kaneliranje je prisutno na lokalitetu Tomašanci – Dubrava s jednim kamadom (T. 6: 5).

Literatura: Šiljeg, Kalafatić 2016: 213, 215, sl. 5.

Tomašanci – Dubrava 2, northern single enclosure of 0.44 ha. The dimensions of the enclosure are 75 x 77 m and the width of the ditch is 2.4 m. The enclosure is most clearly visible on the SGA image from 2011 in the near infrared (NIR) spectre. It does not stand out in the terrain.

Tomašanci – Dubrava 3, southern single enclosure of 2.2 ha. The dimensions of the enclosure are 165 x 172 m and the width of the ditch is 12.4 m. The enclosure is intersected by a field path and a canal that runs along the road. A slight elevation is visible.

Tomašanci – Gradina 1, northern single enclosure of 0.17 ha. The dimensions of the enclosure are 51 x 42 m and the width of the ditch is 3 m. It lies along the canal starting at the source, so the western outline is unclear.

Tomašanci – Gradina 2, the central object with rectangular floor plan, visible only in its eastern part. Visible area is 0.45 ha, its width is 64 m and its length is 80 m. The ditch is 3.3 m wide. Medieval pottery from the site can be associated with it.

Tomašanci – Gradina 3, southern single enclosure of 0.21 ha. The dimensions of the enclosure are 54 x 49 m and the width of the ditch is 1.4 m. The enclosure is similar to Gradina 1 and a possible entrance is on the east side.

Fragments of ceramic vessels belonging to the Sopot culture according to their shape and decorations (Pl. 6: 1, 5–6) were collected at the site. Lithic artefacts were also found. Fluting was observed on a single pottery fragment from the site Tomašanci – Dubrava (Pl. 6: 5).

Bibliography: Šiljeg, Kalafatić 2016: 213, 215, Fig. 5.
Sl. 13  Tomašanci – Dubrava i Gradina, Google Earth snimak 03. 12. 2015.
Fig. 13  Tomašanci – Dubrava and Gradina, Google Earth image, December 3, 2015

Sl. 14  Tomašanci – Dubrava i Gradina, snimak DGU infrared, 2011.
Fig. 14  Tomašanci – Dubrava and Gradina, SGA infrared image, 2011
Gorjani – Topole (sl. 15–17; T. 5: 1–4)

Položaj: Krug je smješten na padini koja od Gorjana (118 m n.v.) pada prema istoku. Od sela je udaljen 2 km istočno, dok 240 m južnije protječe potok Zmajevac. Koordinate za lokalitet Gorjani – Topole su E = 648363, N = 5029475, 109,5 m n.v.

Prospekcija: Uočen je na najranijim satelitskim snimkama na Google Earth 23. 08. 2007., gdje su vidljivi dijelovi tri opkopa. Na kasnijim snimkama Google Earth-a opkopi su slabije vidljivi, ali se jasno raspoznaje površina kruga kao tamnija u odnosu na okolno tlo. Na slican način se vidi na zračnim snimkama na Geoportalu (2011, 2014–2017) te na snimkama dronom i iz zrakoplova.

Deskripcija: Gorjani – Topole, trostruki krug. Pretpostavljena površina koju zauzima vanjski krug je oko 1,15 ha. Vidljiv je samo mali dio, pa je računanje izvedeno na osnovi polumjera s centrom u unutarnjem krugu (r = 60 m). Širina jarka je 2 m. Dimenzije srednjega kruga su 113 x 90 m. Jarak je širine 4,2 m, a površina iznosi 0,82 ha. Unutarnji krug zauzima površinu od 0,14 ha. Dimenzije kruga su 45 x 37 m. Unutarnji jarak je širine 5 m.

Rekognosciranjem su prikupljeni keramički i litički nalazi. U lomci keramike pripadaju sopotskoj kulturi (T. 5: 1–4). Južnije od kruga pronađeni su i ulomci keramike koji pripadaju Starčevoj kulturi (T. 10: 1–6).

Gorjani – Kremenjača (sl. 18–22; T. 1–4)

Lokalitet je smješten na padini koja od Gorjana (n/v 118 m) pada prema istoku. Od sela je udaljen 2 km istočno, dok 240 m južnije protječe potok Zmajevac. Koordinate za lokalitet Gorjani – Kremenjača (centar najmanjega kruga) su E = 648363, N = 5029475, od 115 do 108 m n.v. (raspon za cijeli lokalitet).

Gorjani – Topole (Figs. 15–17; Pl. 5: 1–4)

Position: The enclosure is located on a slope which slopes east from Gorjani (alt. 118 m). It is 2 km east of the village while the Zmajevac stream flows 240 m to the south. Coordinates for Gorjani – Topole site are E = 648363, N = 5029475, alt. 109.5 m.

Prospection: It was observed on the earliest satellite imagery on Google Earth from August 23, 2007, where parts of the three ditches are visible. The ditches are less visible on later images, but the enclosure surface is clearly identified as darker than the surrounding soil. It is similarly visible on aerial imagery on the Geoportal (2011, 2014–2017) and those recorded by drones and aircraft.

Description: Gorjani – Topole, triple enclosure. The area occupied by the outer enclosure is approximately 1.15 ha, with only a small part being visible; therefore, the calculation is based on the radius centred in the inner enclosure (r = 60 m). The width of the ditch is 2 m. The dimensions of the middle enclosure are 113 x 90 m. The ditch is 4.2 m wide and the area of the enclosure is 0.82 ha. The inner enclosure covers an area of 0.14 ha. Its dimensions are 45 x 37 m. The inner ditch is 5 m wide.

Ceramic and lithic findings were collected during reconnaissance. The pottery fragments belong to the Sopot culture (Pl. 5: 1–4). South of the enclosure, fragments of pottery belonging to the Starčevo culture were also found (Pl. 10: 1–6).
Fig. 16  Gorjani – Topole, Google Earth image, August 23, 2007

Fig. 17  Gorjani – Topole, oblique photograph (photo: H. Kalafatić, June 10, 2015)
Deskripcija: Gorjani – Kremenjača 1, trostruk vanjski krug. Površina koju zauzima vanjski krug vidljiva je na 20-tak ha. Vidljive dimenzije vanjskoga kruga su 430 x cca 400 m. Jarak je širine 7 m. Srednji krug zauzima površinu od 10 ha. Dimenzije kruga (dužina snimljenog dijela) je 240 m, a širina jarka je 4,5 m. Gorjani – Kremenjača, unutarnji dvoustruki krug. Površina kruga iznosi 2,4 ha. Dimenzije vanjskoga opkopa su promjera 180 m te je jarak širine 7,3 m. Promjer unutarnjeg opkopa je 138 m, dok je jarak širine 3 m.

Položaj na kojem se provode istraživanja zove se Kremenjača, što je toponim koji u nizinskim predjelima s geološkim kasnim formacijama na površini uglavnom upućuje na arheološki lokalitet zbog površinskih nalaza kamenih izradevina („kremen“). Spominje se u arheološkoj literaturi (Dimitrijević 1968; Minichreiter 1992) kao neolitičko (starčevo i sopot) nalazište, ali objave materijala nije bilo. Iskopavanja na lokalitetu započela su 2015. godine. Na širokome području oko mjesta iskopavanja, na poljima, pronalazi se veća količina prapovijesne keramike i litičkih izradevina te komada kućnoga ljepa.

Do sada su na lokalitetu otkopane četiri sonde, tri dimenzija 5 x 5 m i jedna 10 x 5 m. U jednoj sondi (sonda 1; sl. 18) pronađeni su ostaci brončanodobne keramike, a u ostalima nalazi i objekti sopotske kulture. Ostaci objekata koje preliminarno interpretiramo kao kuće pronađeni su u dvije

Description: Gorjani – Kremenjača 1, triple outer enclosure. The area occupied by the outer enclosure is visible on about 20 ha. The visible dimensions of the outer enclosure are 430 x approx. 400 m. The ditch is 7 m wide. Central circle occupies the area of 10 ha. The length of the recorded part of the enclosure is 240 m and the width of the ditch is 4.5 m. Gorjani – Kremenjača, inner double enclosure. The area of the enclosure is 2.4 ha. The dimensions of the outer ditch are 180 m in diameter and the ditch is 7.3 m wide. The inner ditch diameter is 138 m and the ditch is 3 m wide.

The position where excavations are carried out is called Kremenjača, which is a toponym that, in lowland areas with Quaternary deposits, mainly refers to an archaeological site due to the surface findings of lithic artefacts (Croatian kremen – flint). It was mentioned in archaeological literature (Dimitrijević 1968; Minichreiter 1992) as a Neolithic (Starčevo and Sopot) site, but no material has been published. Excavations at the site began in 2015. In the wider area in the fields around the excavation site, large amounts of prehistoric pottery, lithic artefacts and pieces of daub are found.

So far, four trenches (three having dimensions 5 x 5 m and one measuring 10 x 5 m) have been excavated at the site. Remains of Bronze Age pottery have been found in one of the excavation trenches (Trench 1; Fig. 18), while artefacts and features of Sopot culture have been identified in the others. The remains of the features that are preliminary in-
terpreted as houses were found in two trenches (Fig. 18). The 2016 and 2019 excavations were conducted at cadastral plot 1372/2 Gorjani, at the position of Kremenjača. A 10 x 5 m trench was opened. An object containing layers of burnt daub, compacted yellow loess and post holes extends over almost the entire excavated surface. The layers of compacted loess, burnt daub and layers of charcoal occur on several levels, suggesting that the feature has been rebuilt several times. The feature is rectangular in shape, extending in the southwest – northeast direction. The orientation of the features is also confirmed by the results of the magnetic survey, which shows that most of the features are of this orientation.

### RADIOCARBON DATING RESULTS

So far, four samples have been dated from the Gorjani – Kremenjača site by 14C AMS dating method. The dates range from 5016 to 4486 cal BC (Tab. 1). The samples for dating were taken from the debris SU 27 (beta 515335, bone), layer SU 38 (Beta 515333, tooth), post hole dug into SU 27 SU 30 (beta 515334, tooth) and from the 2 m deep geological core sample from central trench (beta 515332, charcoal). The oldest date comes from the debris SU, while the youngest was taken from the burnt daub debris intersecting it, which is in accordance with the stratigraphic relations of the settlement.

| Beta - 515332  | 5980 ± 30 BP | 4946 – 4787 cal BC |
| Beta - 515333  | 5920 ± 30 BP | 4849 – 4717 cal BC (93.8%) |
| Beta - 515334  | 5720 ± 30 BP | 4682 – 4633 cal BC (10.9%) |
| Beta - 515335  | 6040 ± 30 BP | 5016 – 4844 cal BC |

Tab. 1  Radiocarbon dating results

**KREMENJACA – GEOFIZIČKA Istraživanja**

Prva geofizička istraživanja pokrila su površinu od 8.000 m² na području oko sonde magnetometrijskom metodom 2016. i 2017. godine. Na tri manja područja provedena su i istraživanja niskofrekvenckijom elektromagnetskom metodom. Rezultati su pokazali prisutnost veće količine spaljenih struktura te arheoloških objekata poput jama koje sadrže komade spaljene gline (Mušić et al. 2016). Snimanje magnetometrijskom metodom nastavljeno je 2018. godine, kada je tvrtka Eastern Atlas snimila površinu od 6.3 ha (Meyer, Hypiak 2019: sl. 19).

Snimanje 2018. je provedeno sa sedam senzora Foster fluxgate gradiometara. Förster FEREX CON650 fluxgate gradiometer records the vertical changes of the earth's magnetic field vertical components with an accuracy of 0.1 nt (Nanotesla) (Meyer, Hypiak 2019). To the east of the enclosure are the outlines of another
Fig. 19  Gorjani – Kremenjača, 2018 magnetic survey (made by: C. Meyer and V. Hypiak)
Sl. 20  Gorjani – Kremenjača, interpretacija magnetometrijskoga mjerenja 2018. godine (izradili: C. Meyer i V. Hypiak)

Fig. 20 Gorjani – Kremenjača, 2018 magnetic survey interpretation (made by: C. Meyer and V. Hypiak)
Istočno od kruga nalaze se obrisi drugoga, međutim zbog male zahvaćene površine nije uključen u interpretaciju i tek se treba potvrditi budućim istraživanjima (sl. 20). Osim centralnoga kruga koji je zahvaćen u cijelosti, vidljiv je segment kružnoga opkopa koji se sastoji od nekoliko kanala te vanjskoga opkopa s tri do četiri kanala s unutarnje strane (sl. 19–20). Svi se krugovi radijalno šire jedni od drugih, što navodi na preliminarnu interpretaciju o njihovoj istovremenosti. Sve su se sonde nalazile na području izvan centralnoga kruga, a sadržavale su nalaze sopotske kulture što potvrđuje (u kombinaciji s površinskim nalazima) pripadnost najvećega dijela struktura izvan centralnoga kruga sopotskoj kulturi.

**Fig. 21** Gorjani – Kremenjača, terrain model (made by: M. Mađerić)

**NALAZI**

U ovome radu predstavljamo nalaze s površinskih i slojeva koji su još potpuno ili djelomično bili zahvaćeni oranjem s lokaliteta Gorjani – Kremenjača.

Redukcijsko pečenje i uglačane bikonične posude pojavljuju se na svim lokalitetima i u svim fazama sopotske kulture. Keramičke posude su izrazito fragmentirane te je vrlo mali udio ukrašenih komada. Broj dijagnostičkih komada i onih kojima se može odrediti tip posude također je vrlo mali u odnosu na ukupan broj nalaza. Od tipova se pojavljuju s-profilirani lonci (t. 1: 1, 3, 5), zatim konične zdjele (t. 1: 2) kao i bikonične zdjele (t. 1: 6; 2: 1–3).

**Ukrasi**

Keramika grube površine uglavnom je neukrašena, a dominantan ukras su plastične trake izvedene utiskivanjem prsta na obodu posude (T. 1: 1, 3; 2: 7). Plastične aplikacije

**ARTIFACTS**

In this paper, we present findings from surface and layers still completely or partially affected by ploughing from the Gorjani – Kremenjača site.

Reduction firing and polished biconical vessels are present on all sites and in all phases of the Sopot culture. Ceramic vessels are highly fragmented and there is a very small proportion of decorated pieces. The number of diagnostic pieces and those that can be used to determine the type of vessel is also very small relative to the total number of findings. Some of the types are S-profiled pots (Pl. 1: 1, 3, 5), conical (Pl. 1: 2) and biconical bowls (Pl. 1: 6; 2: 1–3).

Decorations

The pottery with coarse surface is mostly undecorated, with the dominant decoration being bands with impressed fingers on the perimeter of the vessel (Pl. 1: 1, 3; 2: 7). Three
se javljaju na glačanoj ili djelomično glačanoj keramici (T. 1: 5). Od ukraša u površini na jako uglačanoj keramici crne boje i djelomično uglačanoj keramici dva najučestalija načina izvedbe na lokalitetu Gorjani – Kremenjača su trake izvedene kombinacijom urezivanja i ubadanja te kanelure. Trake izvedene kombinacijom ubadanja i urezivanja vrlo su karakteristične za sopotsku kulturu, a njihova se pojava često tumači kao rezultat utjecaja vinčanske kulture, dok se u nekim slučajevima determiniraju kao vinčanski, a neka da i kao oboje (Dimitrijević 1968: t. X–XII). Ti ornamenti se u slojevima s lokaliteta Gorjani – Kremenjača nalaze na pet ulomaka (t. 3: 1–5). U literaturi se navode kao karakteristične za Ib/II stupanj (spiralne trake) te III stupanj (trokutaste trake s ubodima). Takve se trake nalaze na i lokalitetima Bapska, Ervenica, Novi Perkovci – Krčavina, Sopot (tab. 2). Kombinacija urezivanja i ubadanja je i tehnika kojom je izveden motiv na ukrašenome predmetu koji se tradicionalno interpretira kao žrtvenik, a čemu se na ovome mjestu ne možemo deciderirano prikloniti (sl. 22). Kaneliranje je prisutno na lokalitetu Gorjani – Kremenjača u slojevima koji su predmet ovoga rada s pet ulomaka (T. 4: 2–6).

NASELJA S OPKOPIMA

O naseljima s opkopom se i dalje govori kao o srednjoeuropskome fenomenu povezanom uz mjesta posebne namjene i simbolike unatoč sve brojnijim objavama takvih lokaliteta na skoro čitavom području Europe (primjerice Pasztor et al. 2015). Ovdje prezentirani lokaliteti i pokretni nalazi kao i otkopane strukture ne ukazuju na mjesto posebne simbolike, već na mjesto uobičajenoga, naseobinskog karaktera.

Jasno je kako situacija u istočnoj Hrvatskoj nije u potpunosti istovjetna onoj u Donjoj Austriji i Bavarskoj, ali i slabe i malobrojne tragove naseljenosti na takvim lokalitetima u srednjoj Europi možemo interpretirati na više načina. Tako uz uobičajenu interpretaciju o ritualnoj funkciji, malobrojnost nalaza možemo povezati s razinom očuvanosti arheoloških struktura ili kraćim periodom naseljavanja te ostalim socijalno-okolišnim faktorima. Jedan od lokaliteta u ovde predstavljenoj mreži je upravo toga tipa, lokalitet Satnica dimensional applications are present on polished and partly polished ceramics (Pl. 1: 5). Of the surface decorations on heavily polished black ceramics and partially polished ceramics, the two most common types at the Gorjani – Kremenjača site are bands made of a combination of incising and puncturing and fluting. Bands made of a combination of incising and puncturing are very characteristic of Sopot culture, and their occurrence is often interpreted as the result of the influence of Vinča culture, while in some cases they are defined as Vinča and sometimes as both (Dimitrijević 1968: Pls. X–XII). Such ornaments are found on five fragments from Gorjani – Kremenjača layers (Pl. 3: 1–5). In literature they are determined as characteristic of Ib/II stage (spiral bands) and stage III (triangular bands with incisions). Such bands can also be found at the sites Bapska, Ervenica, Novi Perkovci – Krčavina, Sopot (Tab. 2). The combination of incising and puncturing is also a technique used to create a motif found on a decorative object traditionally interpreted as altar, though we cannot decidedly endorse this claim at the moment (Fig. 22). At the site of Gorjani – Kremenjača fluting is present on five fragments from layers discussed in this paper (Pl. 4: 2–6).

ENCLOSED SETTLEMENTS

Settlements with ditches are still referred to as a Central European phenomenon related to places of special purpose and symbolism, despite the increasing number of such sites in almost all of Europe (e.g. Pasztor et al. 2015). The sites presented here and archaeological artefacts, as well as excavated structures do not indicate a place of special symbolism but a place of ordinary settlement character.

It is clear that the situation in Eastern Croatia is not exactly the same as in Lower Austria and Bavaria, but scarce traces of habitation in such settlements in Central Europe can be interpreted in many ways. Therefore, in addition to the usual interpretation of ritual function, the scarcity of findings can be associated with the level of preservation of archaeological structures or a shorter period of settlement and other social and environmental factors. One of the sites in the network presented here is of this type, i.e. the site
Dakovačka – Pustara Josipovac. Iako su kružne strukture jasno vidljive na snimkama, površinski nalazi su, iako indikativni za smještaj u sopotsku kulturu, vrlo oskudni i rijetki.

Veličina lokaliteta

Veličina nalazišta bi trebala potaknuti ponovno promatrajanje ostalih već istraženih lokaliteta sopotske kulture i utvrditi je li riječ o stvarno utvrđenim dimenzijama ili, zbog veličine koja je izmaknula vidnome polju, stvarna veličina nije moga niti biti uočena i utvrđena.

Određivanje veličine lokaliteta često je bilo u direktnoj vezi s opsegom iskopavanja. Lokaliteti se moraju promatrati u kontekstu svakodnevnoga života koji je bio mnogo kompleksniji i sličniji današnjem, nego što je generalni pogled na neoličku naselja, čak i u profesionalnim krugovima. Naselja čije dimenzije iskaču iz prosjeka često se u literaturi interpretiraju kao naselja posebne namjene (primjerice Pasztor et al. 2015). Nova istraživanja ukazuju na potrebu za promjenom percepcije prosjечно dimenzije neoličkoga lokaliteta i kako u tome kontekstu trebamo reevaluirati naše postojeće spoznaje o već istraženim lokalitetima. Primjerice, opkopi naselja na lokalitetu Gorjani – Kremenjača nisu vidljivi iz zraka, odnosno dok se nije započelo s iskopavanjem te snimanjem magnetometrijskom metodom nije niti bio prepoznat kao lokalitet sopotske kulture s opkopom a prepostavljena veličina je također bila mnogo manja.

Položaj i interpretacija nalazišta

Opkopi naselja na lokalitetu Gorjani – Kremenjača nisu vidljivi iz zraka, odnosno dok se nije započelo s iskopavanjem te snimanjem magnetometrijskom metodom nije niti bio prepoznat kao lokalitet sopotske kulture s opkopom. Mišljenja smo da ovaj lokalitet nije u tome usamljen i da je potrebno primijeniti integrirani pristup koristeći sve raspoložive metode, uključujući pokušaj primjene objećenih obrazaca i analogija na reevaluaciju poznatih lokaliteta sopotske kulture. Prije svega se to odnosi na ukupnu veličinu lokaliteta. Ako se potvrdi pretpostavka o pripadnosti vanjskoga okopa sopotskoj kulturi, to znači da se naselje proteže na površini od približno 20 ha, a da se pri tome niti po čemu ne ističe u smislu standardnoga pokretnog i nepokretnog materijala karakterističnoga za sva naselja sopotske kulture. Lokaliteti uočeni analizom crnih snimaka također svjedoče o posve drugačijem izgledu i veličini sopotskih naselja neoličkoga razdoblja. Ako se potvrdi pretpostavka o neprepoznalosti opkopa, to znači da se je on nepokojen i da je prema izgledu, veličina nalazišta bi trebala potaknuti ponovno promatrajanje veličine lokaliteta. Ako se potvrdi pretpostavka o neprepoznalosti opkopa, to znači da se je on nepokojen i da je prema izgledu, veličina nalazišta bi trebala potaknuti ponovno promatrajanje veličine lokaliteta.

Funkcija jarka i okopa u neolitiku

Funkcija raznih tipova jarka i palisada oko neoličkih naselja uvijek je bila, pa i danas je također predmet velikoga znanstvenog interesa i rasprave. Oni se interpretiraju na najrazličitije načine – najčešće kao obrambeni, ali i kao ekonomski, vodoodporni, odvodni itd. B. Marijanović (2017) u svojoj objavi lokaliteta Pokrovnik donosi i najnoviji pregled Satnica Dakovačka – Pustara Josipovac. Although circular structures are clearly visible in the imagery, surface findings, albeit indicative of the Sopot culture, are very scarce and rare.

The size of the sites

The size of the sites should encourage reconsideration of other sites of Sopot culture already excavated and determine whether their dimensions are really established or, due to its large dimensions, the actual size could not even be observed and determined.

Determining the size of the site was often directly related to the extent of the excavation. The sites must be viewed in the context of daily life that was much more complex and similar to today than is the general view of Neolithic settlements, even in professional circles. Settlements whose dimensions rise out of average are often interpreted in the literature as special-purpose settlements (e.g. Pasztor et al. 2015). New research points to the need to change the perception of the average dimensions of a Neolithic site and how in this context we need to re-evaluate our existing insights on sites already excavated.

The position and interpretation of the sites

The ditch system of the settlement at the Gorjani – Kremenjača site is not visible from air, i.e. until excavation and magnetic survey began, it was not even recognized as enclosed Sopot culture site. We believe this site is not an isolated example of this circumstance and it is necessary to apply an integrated approach, using all available methods, including attempting to apply observed patterns and analogies in re-evaluating known Sopot culture sites. This firstly pertains to the total size of the site. If the assumption that the external ditch belongs to the Sopot culture is confirmed, it would mean that the settlement extends over an area of approximately 20 ha, without being in any way different in terms of standard material characteristic of all settlements of Sopot culture. The sites observed in the analysis of aerial imagery also testify to the completely different appearance and size of the Sopot settlements from those described in the literature thus far (Kalafatčić, Šiljeg 2018). We believe that the sites of Gorjani – Topole and Gorjani – Kremenjača should be viewed as a part of the same agglomeration because of their mutual distance (approximately 400 m from current edges) and because of the concentration of surface findings between the two positions.

The function of enclosures and ditches and in the Neolithic

The function of various types of ditches and palisades around Neolithic settlements has always been and still is a subject of great scientific interest and debate. They are interpreted in a variety of ways – most often in terms of defensive purposes, but also economy, water supply, drainage etc. B. Marijanović (2017) in his publication of the Pokrovnik site also provides the most recent overview of interpretations of the function of fences and ditches in Neolithic settlements. J. Robb also provides an overview of the interpre-
interpretacija funkcije ograda i opkopa u neolitičkim nase-
ljima. Pregled interpretacije opkopa i ograda u naseljima na
mediteranskom prostoru donosi i J. Robb (2007: 93). Njihova
je uloga istovremeno mogla biti i simbolička, pa s jedne
strane označavaju granicu zajednica prema okolini, a s druge
glagalošavaju zajedništvo i pripadnost zajednici (Tripković
2013: 219). Simbolična uloga nije u opirci s obrabenom
ulogom jarka i palisada. Izgradnja jarka je znatan društeni
podvig s obzirom da zahtjeva ogromne napore cijele zajed-
nice (Tripković 2013: 216).

Razvoj tehnika daljinske interpretacije i njihova sve lak-
ša dostupnost u drugoj polovici 20. stoljeća, kao i kombi-
niranje s geofizičkim metodama prospekcije površine tla,
znajušo su unaprijedile arheološke spoznaje o naseljenosti
krajolika kroz ljudsku povijest. Posebno izražajni tipovi
struktura uočljivi pri daljinskoj interpretaciji su jarki i opkopi
svih vrsta.

Na njihovu (ne)vidljivost utječe (bez)brojni faktori kao
što su vlažnost tla, intenzivnost poljoprivrede obrade,
godišnje doba kad se snima ili promatra određeni prostor.
Posebno je zanimljivo istaknuti kako se među mnogim na-
seljima sopotske kulture otkrivenim daljinskom interpreta-
cijom zadnjih godina ne nalazi i Gørjani – Kremenjača, jedna od najvećih
poticaja za objedinjavanjem

Neolitički naselja izvan istočne Hrvatske, na podjednaku zaposjednutost prostora cijele Slavonije, a
ne samo nizinskih područja uz rijeke.

Već od prve faze daljinskih istraživanja prapovijesnoga
krajolika istočne Hrvatske, uočen je fenomen neolitičkih
telova okruženih jarkom i smještenih u neposrednoj blizini
jednog drugoga (Kalafatić, Šiljeg 2018). O fenomenu je kao o
jednoj eksplicitnoj pojavi preliminarno izvješteno već 2015.
godine (Šiljeg, Kalafatić 2015a; 2015b; 2016; Šiljeg et al. 2015:
358). Daljnji tok istraživanja kroz godine i veći broj novoot-
krivenih pojava istoga karaktera pokazali su kako nije riječ o
nimakama ili znimakama u pozicioniranju i rasporedu neolitičkih naselja, već da su više riječ o pravilu. Usputeno s rastom broja
novootkrivenih prapovijesnih, i pogotovo, neolitičkih naselja,
rastao je među njima i broj višestrukih kružnih naselja.

Veći broj novootkrivenih kružnih naselja bio bi važan
podatak sam po sebi, ali kada se tome pridoda otkriće kako
takva naselja često javljaju u paru ili čak po tri, i to na
relativno pravilnim i ujednačenim udaljenostima koje variraju
od 3.5 do 4.8 kilometra do susjednoga naselja, slika mreže
neolitičkih naselja postaje znatno kompleksnija.

Nalazišta su međusobno udaljena od 3,4 km do 6,1 km,
načešće manje od 5 km. Udaljenost od lokaliteta Preslatici
– Ugljare do Gørjani – Kremenjača iznosi 8 km; od Gørjani

2 Ovdje govorimo o udaljenosti određenoj prije intenzivnih magnetome-
trijskih istraživanja provedenih na lokalitetu Gørjani – Kremenjača.

tation of ditches and fences in Mediterranean settlements
(2007: 93). At the same time, their role could be symbolic,
on the one hand marking the boundary of the community
towards the environment, and on the other consolidating
the community and developing sense of belonging to the
community (Tripković 2013: 219). The symbolic role is not in
opposition to the defensive role of ditches and palisades.
Building a ditch is a significant social feat given that it re-
quires tremendous effort by the entire community (Tripković
2013: 216).

The development of remote sensing techniques and
their accessibility in the second half of the 20th century,
as well as combining them with other geophysical methods
of soil surface prospecting, have greatly enhanced archaeolo-
gical knowledge of the landscape settlement throughout
human history. Particularly notable types of structures vi-
sible in remote interpretation are ditches and trenches of
all kinds.

Their (in)visibility is affected by a number of factors such
as soil moisture, the intensity of agricultural cultivation, the
season when a particular area is recorded or observed. It is
particularly interesting to point out that Gorjani – Kreme-
inja, one of the largest Sopot culture sites of this paper, is
not discovered by remote interpretation in recent years. It
was this “invisibility” that was one of the main incentives for
bringing together the results of multiple research groups
and approaches. An additional impetus was the proximity of
the enclosed settlement Gorjani – Topole, located 700 m east2
do site of Kremenjača.

The network of settlements presented here at the edge of
the Dacian plain differs in its location on the gentle hills
and in their foothills from the Sopot settlements along the
watercourses, mainly the rivers Vuka, Bosut and Karašica,
which indicates equal occupation of the entire Slavonia and
not only lowland areas along rivers.

Ever since the first phase of remote sensing of the pre-
historic landscape of Eastern Croatia, the phenomenon of
Neolithic tells surrounded by ditches and located in close
proximity to each other has been observed (Kalafatić, Šiljeg
2018). The phenomenon as an explicit occurrence was pre-
liminary reported as early as 2015 (Šiljeg, Kalafatić 2015a;
2015b; 2016; Šiljeg et al. 2015: 358). Further research over the
years and a greater number of newly discovered instances
of the same type has shown that these are not exceptions in
the positioning and arrangement of Neolithic settlements
but rather a rule. In parallel with the increase in the num-
ber of newly discovered prehistoric and especially Neolithic
settlements, the number of multiple enclosed settlements
also grew.

A larger number of newly discovered circular settle-
ments would be important information in itself, but when
added to the finding that such settlements often occur in
pairs or even in groups of three, at relatively regular and
uniform distances varying from 3.5 to 4.8 kilometres be-
etween the neighbouring settlements, the image of the Neolit-
hic settlement network becomes much more complex.

The sites are 3.4 km to 6.1 km away from each other,
usally less than 5 km. The distance between the sites of
Preslatici – Ugljare and Gorjani – Kremenjača measures 8
63

The ditch width estimates obtained by remote interpretation may differ from the actual trench dimensions. It is therefore necessary to study currently the most explored ditch at the eponymous site Sopot. The excavated ditch is nearly 6 meters wide and was dug 3 meters into sterile soil, ending at a relative depth of 6 meters (Krznarić Škrivanko 2003: 63). The claim that settlements with ditches occur only in lowlands and wetlands (Dimitrijević 1979: 272) should be complemented with the results of recent research showing a different picture. Ditches occur equally in lowland settlements as well as elevated settlements such as Ivandvor, Štrbinac and Ravnjaš (Balen et al 2009: 28; Durman 1982: 33; Migotti, Leleković 2012: 16; Mihaljević 2013). During the construction of fortification systems, the advantages of the terrain and a natural barrier were used, so the settlement on Sopot probably used one branch of Bosut river as part of the defence system.

Procjene širine opkopa dobivene daljinskom interpretacijom mogu se razlikovati od stvarnih dimenzija opkopa. Zato je poučno proučiti dosad najistraženiji opkop na eponimnom lokalitetu Sopot. Na njemu je istražen jarak širine skoro 6 m te je bio 3 m ukopan u zdravicu, pri čemu završava na relativnoj dubini od 6 m (Krznarić Škrivanko 2003: 63). Tvrdnju kako se naselja s opkopima javljaju samo u nizinama i močvarnim krajevima (Dimitrijević 1979: 272) treba nadopuniti rezultatima recentnih istraživanja koja pokazuju drugačiju sliku. Opkopi se javljaju podjednako u nizinskim naseljima kao i naseljima na uzvisinama poput Ivandvora, Štrbinaca i Ravnjaša (Balne et al. 2009: 28; Durman 1982: 33; Migotti, Leleković 2012: 16; Mihaljević 2013). Prilikom izgradnje fortifikacijskih sustava korišteni su prednosti terena i prirodne barijere, pa je tako naselje na Sopotu vjerojatno iskorišteno jedan rukavac Bosuta kao dio obrambenoga sustava.
Na cijelom nizu lokaliteta uočava se i manji krug u središtu naselja ili tammija kružna površina (Mirkovci, Klisa, Slakovci, Tordinci… (Kalafatić, Šiljeg 2018)) čiji karakter i svrhu je u ovome trenutku teško procjenjivati te pobliže odrediti. S. Dimitrijević je na lokalitetima Sopot i Otok uočio nedostatak kućnih podova/kuća u gornjim horizontima na središnjem dijelu naselja, pa zaključuje kako je centralni dio tih sopotskih naselja imao funkciju trga (Dimitrijević 1968: 47). Magnetometrijski snimak lokaliteta Gorjanci – Kremenjača pokazuje središnji prostor naselja izdvojen pretpostavljenom krupnom palisadom (sl. 19).

Osim izdvojenih prostora u središtu lokaliteta, određeni broj sopotskih lokaliteta ima višestruke, koncentrične, blisko položene jake. Na nekim su oni utvrđeni daljinskom interpretacijom (Klisa, Vrbica, Gladovo, Andrijaševci) (Kalafatić, Šiljeg 2018), a na drugim je to dokazano geofizičkim istraživanjima, i to na lokalitetu Sopot (Krznarić Škrivanko 2014: 381–382) i na lokalitetu Gorjani – Kremenjača (sl. 19–20). Situacija s Kremenjača je posebno zanimljiva jer se ta kružna palisadni jarki na sredini dotočan čak i dvosti doprinos njihovom zaštitnom i održavanju.

Potreba za dodatnom zaštitom, izdvajanjem ili kontrolom prostora oko sopotskih naselja posebno se očituje na lokalitetima Gat, Privlaka, Klisa (Kalafatić, Šiljeg 2018) kao i na ovdje predstavljenim lokalitetima Kremenjača i Vučevići gdje su naselja okružena opkopom dodatno zaštićena/ograđena još jednim, puno većim, vanjskim opkopom. Na Kremenjači se vidi više takvih opkopa, pa zasad možemo pretpostaviti da se radi o više faza proširenja naselja ili pak o ciljanom planskom koncentričnom razdvajanju centra naselja od ostalih dijelova koje je provedeno odmah pri izgradnji naselja.

Već sada možemo govoriti o bar dva osnovna tipa vanjskih opkopa. Prvome tipu pripadali bi vanjski opkopi ovalnog ili kružnog tlocrta kao što to vidimo u Klisi, Gatu, Markušiću, Korodvaru i na Gorjanima – Kremenjači. Situacija u Gorjanima, gdje se prostor koji zauzima vanjski opak poklapa na polotou Kremenjača značajno približava kružnom naselju na polotou Topole, snažno sugerira da je riječ o istome vanjskom opkopu. Drugi tip karakterizira vanjski pravokutni opak koji je uočen u Privlaci (Kalafatić, Šiljeg 2018) i Vučevicima (sl. 9–11). Broj ovakvih neolitičkih lokaliteta s dodatnim vanjskim opkopom vrlo vjerojatno će se s protekom vremena dodatno povećati, budući da je sadašnji broj takvih lokaliteta više odraz praznine u istraživanju nego stvarnoga stanja. Primjeri dijeli srednje Europe od Mađarske s lokalitetima Polgár – Csőszhalom, Belvárdgyula, Személy I i II, do Njemačke i lokaliteta poput Kóthegeihendorf i Schmiedorf I – II, da spomenu samo najpoznatije, pokazuju kako to nije neobična pojava (Laterski, Nebelsick 2003: 439, 454, 482; Bertók, Gáti 2014: 88–89). Gustoća takvih naselja s vanjskim opkopom zasad se pokazuje najvećom na području istočne Slavonije.

Rezultati dosadašnjih daljinskih istraživanja u istočnoj Hrvatskoj također potvrđuju postojanje više od dva neolitička kružna naselja u neposrednoj blizini. Takav je i ovdje predstavljen lokalitet Tomašinci – Dubrave koji se sastoji od barem tri dijela, od kojih je svaki izdvojen kružnim opkopom.

A smaller enclosure in the centre of the settlement or a darker circular surface can be observed at a number of sites (Mirkovci, Klisa, Slakovci, Tordinci… (Kalafatić, Šiljeg 2018)) whose character and purpose is difficult to estimate and closely determine at the moment. S. Dimitrijević noticed the lack of house floors/houses in the upper horizons of the central part of the settlement at the Sopot and Otok sites, and concluded that the central part of these settlements had the function of a square (Dimitrijević 1968: 47). Magnetometric image of the Gorjani – Kremenjača site shows the central area of the settlement separated by a supposed circular palisade (Fig. 19).

In addition to the isolated areas at the centre of the sites, a number of Sopot sites have multiple, concentric, closely laid ditches. Some were determined by remote interpretation (Klisa, Vrbica, Gladovo, Andrijaševci) (Kalafatić, Šiljeg 2018) and others by geophysical research, i.e. the sites of Sopot (Krznarić Škrivanko 2014: 381–382) and Gorjani – Kremenjača (Figs. 19–20). The situation at Kremenjača is especially interesting because, according to currently available images, such multiple ditches (Figs. 19–20) extend segmentally, as petals around the centre of a flower.

The need for additional protection, segregation and/or control of the area around the Sopot settlements is particularly evident at the sites Gat, Privlaka, Klisa (Kalafatić, Šiljeg 2018) as well as the sites Kremenjača and Vučevići presented here, where the settlements enclosed with a ditch are additionally protected/enclosed with another, much larger, outer ditch. There are more such ditches visible at Kremenjača, so currently we may assume that these are several phases of settlement expansion or a targeted planned concentric separation of the centre of the settlement from other parts, which was carried out immediately during the construction of the settlement.

Already, we can talk about at least two basic types of external ditches. The outer ditches of an oval or circular floor plan, as observed in Klisa, Gat, Markušica, Korodvar and Gorjanci – Kremenjača would belong to the first type. The situation in Gorjani, where the area occupied by the external ditch at the position of Kremenjača significantly approaches the circular settlement at the position of Topola, strongly suggests that it is the same settlement complex. The second type is characterized by an outer rectangular ditch as observed in Privlaka (Kalafatić, Šiljeg 2018) and Vučevići (Figs. 9–11). The number of such Neolithic sites with an additional external ditch is likely to further increase over time, as the current number of such sites is more a reflection of the void in the research than the actual situation. Examples across Central Europe, from Hungary with its sites Polgár – Csőszhalom, Belvárdgyula, Személy I and II to Germany and sites such as Kóthegeihendorf and Schmiedorf I – II, to name only the most famous, show that this is not an uncommon occurrence (Laterski, Nebelsick 2003: 439, 454, 482; Bertók, Gáti 2014: 88–89). The density of such settlements with an outer ditch is currently proving to be the highest in the area of eastern Slavonia.
pom. To ne znači nužno da su sva obližnja kružna naselja egzistirala istovremeno, ali svakako ukazuje na kompleksnost strukture neolitičkih naselja na koju moramo računati. Primjera višestrukih obližnjih naselja ima i na prostoru potisne kulture u Mađarskoj, npr. na lokalitetu Ocsöd – Kováshalom. Na njemu postoji nekoliko jezgr naselja koje preražastaju u telove (Link 2006: 112).

S. Dimitrijević također uočava takav tip naselja i naglašava nejasan odnos između bliskih, a odvojenih sopotskih naselja, te komentira kompozicije naselja u obliku vijenca. Kao mogući razlog takvoj organizaciji naselja navodi društvene parametre (”različite rodovske grupacije”) (Dimitrijević 1979: 72).

**Materialna kultura i problem stupnjevanja**

Sva ovde opisana nalazišta pripadaju pojavama koja se naziva sopotskom kulturom. Kao što je poznato, i danas su glavni kriterij (često i jedini) određivanja pripadnosti neke kamenodobne kulture oblik i ukras na keramičkim posudama. Kronološku i regionalnu podjelu sopotske kulture izradio je S. Dimitrijević (1968), a dodatno razradio Z. Marković (1994; 2012). Iako je pripadnost određenom tipu kulture, koji su određeni prema S. Dimitrijeviću, često kritizirana i proglasađena neadekvatnom, još uvijek se nije našla odgovarajuća zamjena te još uvijek predstavlja standard i jedinu relativnu kronologiju unutar koje se materijal predstavlja prilikom objave nekoga lokaliteta, pa tako i u suvremenim objavama.

Predložena kronologija prema Z. Markoviću je sljedeća: oko 5000. god. pr. Kr. i malo prije – Ražište tip, pa „tek iza toga“ pojava traka s ubodima i urezima (po S. Dimitrijeviću faze IB i II), iako se u ranijim radovima smatrao da upravo tada počinje Ražište tip sopotske kulture (Marković, Botić 2008: 22). Prije toga stav je bio da je riječ o ranoj fazi prijelaza Ia na Ib stupanj (Marković 1985b: 52; 1994). U novijim radovima se Ražište tip (ili samo Ražište) datira na sam početak Vinča A (Jakucs et al. 2016; Botić 2018).

Zbog toga smo odlučili sazeti i usporediti postojeće objavljene radiokarbonske datume kao i tipove ukraša s lokaliteta u Slavoniji te ih pokušati usporediti s nalazima s ovde predstavljenih lokaliteta. Mišljenje smo da prije nego sagledamo postojeće podatke kao cjelinu kako ih ne bismo trebali odbacivati kao zastarjele, nepouzdanije ili pogrešne. S obzirom da imamo podatke o apsolutnim datumima s dva lokaliteta, a površinske nalaze na svim lokalitetima, odlučili smo navesti sve tipove ukraša koji se pojavljaju na finoj keramici i prepoznatljive oblike kao što su posude na nozi, virjetica, lopata, „žrtvenika“ te ih staviti u kontekst radiokarbonskih datuma gdje je to bilo moguće.

Raspored naselja, njihova veličina kao i generalna sličnost arheološkoga materijala upućuju nas da ih pokušamo sagledati kroz međusobne sličnosti, prije svega u obliku naselja i arheološkoj gradi. Također treba sagledati mogućnost da stratigrafija lokaliteta nije odraz linernoga taloženja i ravnomjerne akumulacije materijala u svim pretpostavljenim fazama. Ustanovljeno je kroz niz istraživanja, uključujući the lithic circular settlements in the immediate vicinity. Such is the site of Tomašanci – Dubrave, which consists of at least three parts, each separated by a circular ditch. This does not necessarily mean that all the adjacent circular settlements existed contemporarily, but it certainly points to the complexity of the structure of Neolithic settlements that we must take into consideration. There are also examples of nearby multiple settlements in the area of Tisa culture in Hungary, for example at the site Ocsöd – Kováshalom. There are several settlement cores there that grow into tells (Link 2006: 112).

S. Dimitrijević also notes this type of settlement and emphasizes the unclear relationship between close but separate Sopot settlements, and comments on the compositional density of the settlement in the form of a wreath. He cites social parameters as a possible reason for such settlement organization (”different kinship affiliations“) (Dimitrijević 1979: 72).

**Material culture and the problem of periodization**

All of the sites described here belong to a phenomenon called the Sopot culture. As is well known, even today the main (and often the only) criterion for determining the attribution of a stone-age culture is the shape and decoration on ceramic vessels. The chronological and regional division of the Sopot culture was established by S. Dimitrijević (1968) and further elaborated by Z. Marković (1994; 2012). Although attribution to a particular type of culture, as defined by S. Dimitrijević, has often been criticized and declared inadequate, a suitable replacement has not yet been found and it still represents the standard and the only relative chronology within which the material is presented when publishing a site, including contemporary publications.

The proposed chronology according to Z. Marković is as follows: approximately 5000 BC and somewhat earlier – Ražište type, and “just after that” the appearance of bands with incisions and punctures (phases IB and II, according to S. Dimitrijević), although the authors of earlier works believed that this is when Ražište type of the Sopotska kultura begins (Marković, Botić 2008: 22). Previously, the prevailing view was that this was precisely the early phase of the transition from IA to IB stage (Marković 1985b: 52; 1994). In recent papers Ražište type (or simply Ražište) is dated to the very beginning of Vinča A (Jakucs et al. 2016; Botić 2018).

For this reason, we decided to summarize and compare the existing radiocarbon dates that are published as well as the types of ornaments from Slavonian sites and try to compare them with the findings from the sites presented here. We believe that we should not dismiss existing data as out-dated, unreliable or misleading before evaluating them as a whole. Since we have data on absolute dates from two sites, and surface finds from all sites, we decided to list all the types of decoration appearing on fine ceramics and recognizable shapes such as vessels on pedestals and “altar” fragments and put them in context of radiocarbon dates where possible.

The distribution of the settlements, their size and the general similarity of the archaeological material suggest that we should observe them through mutual similarities, firstly in terms of settlement form and archaeological material. Consideration should also be given to the possibility that site stratigraphy does not reflect linear deposition and uniform accumulation of material at all assumed stages. It has been established through a series of studies, including
jući ono koje ovdje predstavljamo, kako već oko 5000. god. pr. Kr. postoji razgranata mreža utvrđenih naselja sopotske kulture na širem prostoru Slavonije (Kalafatić, Šiljeg 2018), vjerojatno u sličnom rasteru kao ovdje predstavljena u zapadnoj Đakovštini. U tablici 2 prikazane su vrste ukrasa koje se pojavljuju na ovih osam lokaliteta, lokalitetima na kojima se još pojavljuje te relativna i apsolutna kronologija pojedinačnih lokaliteta (Tab. 2).

**Tipovi ukrasa koji se javljaju su:** trake izvedene kombinacijom ukrasa i ubodnja (Gorjani – Kremenjača), kružne udubljenje, incizije i ukrasi od uboda / punctures Đakovo – grabrovac/Ciglana, Ivandvor, preslatinci – u gljara, gorjani – Kremenjača, Ivandvor, spletanica – Dubrava), punctures Đakovo – grabrovac/Ciglana) (tab. 2).

Kaneliranje je, uz ubodne i ukrase od uboda, drugi najčešći tip ukrasa na lokalitetu Gorjani – Kremenjača, a pojavljuje se i na lokalitetima Preslatinci – Ugljara, Tomašanci – Dubrava, Prešlatinci – Ugljara, Ivandvor, spletanica – Dubrava, Koprivnica, Breg – Seče, Pepelane. Znani trend vinčanske učvrstivanja se javlja u slavonskim područjima, a potječe iz nekih lokaliteta koja su većinom uziroma s datacijom poznatim preko poznatih virtualnih izvora. 

Tab. 2 Pojava ukrasa zabilježenih na obrađenim lokalitetima

| Crtez ukrasa / Drawing of decoration | Tip ukrasa / Type of decoration | Ovdje publicirani lokaliteti na kojima se pojavljuje ukras / Sites with respective decoration occurrences, published here | Relativna datacija lokaliteta iz literature / Relative dates of the sites according to the bibliography | Literatura / Bibliography |
|-------------------------------------|--------------------------------|-----------------------------------------------------------------|-------------------------------------------------|----------------------------|
| Kružna udubljenja / Circular indentations | Gorjani – Kremenjača, Ivandvor, Preslatinci – Ugljara | Otok, Klokotčević, Štrbinci, Bapska, Sopot, Hermanov Vinograd | III | marković 2012 |
| Kanelure / Fluting | Gorjani – Kremenjača, Preslatinci – Ugljara, Tomašanci – Dubrava | Ervenica, Bapska, Klokotčević, Slavča, Ravnjaš, Novi Perkovci – Krčavina | III | Dimitrijević 1968, marković 2012 |
| Ubodno-urezane trake / Incised punctures bands | Gorjani – Kremenjača | Sopot, Novi Perkovci – Krčavina, Golinci – Seline, Zupanja – Duboško Košino, Bapska, Ervenica, Kneževi Vinograd, Klokotčević, Hermanov Vinograd | bez datacije / Without datation | Dimitrijević 1968 |
| Ravn, kružni i spiralni plitki urezi / Straight, circular and spiral shallow incisions | Đakovo – Grabrovac/Ciglana | Novi Perkovci – Krčavina, Golinci – Seline, Otok, Zupanja – Duboško Košino | III | Dimitrijević 1968 |
| Trake od uboda / Punctures | Đakovo – Grabrovac/Ciglana | Novi Perkovci – Krčavina, Kopručki Breg – Seče, Pepelane | III | Dimitrijević 1968 |

Types of occurring decorations are: bands created through combination of incising and puncturing (Gorjani – Kremenjača), circular indentations (Preslatinci – Ugljara, Gorjani – Kremenjača, Ivandvor – Šuma Gaj), “horn-like” handles (Gorjani – Kremenjača, Đakovo – Grabrovac/Ciglana, Ivandvor), spiral and straight shallow incisions (Ivandvor – Šuma Gaj, Đakovo – Grabrovac/Ciglana, fluting (Gorjani – Kremenjača, Preslatinci – Ugljara, Tomašanci – Dubrava), puncturing (Đakovo – Grabrovac/Ciglana) (Tab. 2).

Fluting, along with incised and punctured bands, is the second most common type of decoration at the Gorjani – Kremenjača site, and appears at the Preslatinci – Ugljara and Tomašanci – Dubrava sites. Regarding fluting, S. Dimitrijević states: This trend of Vinča influence reached only Samatovci and Klokotčević, therefore, approximately to the line Osijek – Slavonski Brod. In the western areas, for example, in the Pozega basin, development moves solely along the course of local habits, and the site groups of the middle and early stages are almost indistinguishable (Gradac-Pašnjak kod Peternica). Such attachment to traditional formation, such evolutionary static, makes it much more difficult to accurately attribute particular sites located in the area west of Slavonski Brod (Dimitrijević 1979: 282). The material published here deviates from this statement. Furthermore, fluting is also present at the site of Novi Perkovci – Krčavina (Marković, Botić 2008: PI. 2: 1, 6). Single fragments containing fluting are also mentioned at the sites Nova Gradiska – Slavča and Ravnjaš (Mihaljević 2013: 56, 80, 88; 2014a).
Circular indentations – one fragment containing circular indentations was found at the site of Kremenjača (PL. 4: 1), while an almost identical decoration is present at Ivanđvor – šuma Gaj (Balen 2009: PL. 1: 10) and Preslatinci – Ugljara (published under the name of Drenje – Ugljara: Marković 1994). A fragment from Preslatinci, beside circles, exhibits zigzag bands surrounding it. Z. Marković (1994) dates the site to the phase IV of the Sopot culture. S. Dimitrijević classifies that type of decoration (with zigzag bangs) as belonging to phase II (PL. 48: 1–3), but also phase III of the Sopot culture (PL. 49: 1–2, 1. without zigzags, 2. with zigzags) and states that circular indentations are characteristic of the Sopot culture, beginning from its phase Ib to the end of the final phases. Findings of fragments with circular indentations from Otok, Klokočević (Dimitrijević 1968: Fig. 11: 3–4; PL. IV: 14; VI: 8–9; VII: 2, 9; VIII: 5), Štrbinac (Marković 1982: T. 2: 3) and from Hermanov vinograd (Šimić 2008: 28, cat. no. 12) are cited as belonging to phase Ib–II. Likewise, the finding from Bapska is dated to the transition from phase Ib to phase II of the Sopot culture (Dimitrijević 1968: Fig. 11: 4). According to S. Dimitrijević, a fragment from Sopot (1979: PL. XLIX: 1) is characteristic of phase III, as well as a fragment from Bapska (Dimitrijević 1979: PL. XLIX: 2). At the sites of Golomala and Drenje (Preslatinci), decorations in the form of deeper grooved zigzag lines were found in combination with indentations (Marković 2012: 62). It is unclear what additional criteria for the attribution of the site Preslatinci (Drenje) to phase IV of the Sopot culture were, because aside from the described fragments, only a handle connecting a brim and neck of a vessel is shown, which cannot be enough for determination to a certain phase. Almost identical fragments with indentations from Bapska are assigned to the phase II by S. Dimitrijević (1979: PL. XLVIII: 1). Type found at Klokočević, which Dimitrijević assigns to the phase II is identical to the type from Preslatinci – Ugljara assigned to phase IV by Z. Marković.

The various interpretations of the site of Ivanđvor – šuma Gaj from the publications following the original should be noted here (Balen 2009). In literature it is mentioned as an early phase Sopot culture site (Ib–II/Ražište) (Jakus et al. 2016: Tab. 4), but it is also mentioned in association with Eneolithic phase Sopot IV (Marković 2012: 62; Mihaljević 2013: 34). The original publication clearly states the range of radiocarbon dates, followed by drawings of the material and its attribution to the phases of S. Dimitrijević (Balen et al. 2009).

The incised and punctured bands occur at the Gorjani – Kremenjača site, though fragments traditionally dated earlier than phase Ib do not. At the Škoko /Ražište site, motifs of shallow incised spiral and circular lines occur, which could date the Gorjani – Kremenjača later than Šako /Ražište. On the other hand, both motifs occur at the site of Novi Perkovi – Krcavina (Marković, Botić 2008: 20). From this we can conclude that both motifs continue through different typological stages. Thus, the findings from the upper layers of the Gorjani – Kremenjača site are assigned to the classical, phase II of the Sopot culture (Z. Marković) or phase Ib/II (S. Dimitrijević), but attributions to later and earlier phases are also possible. Due to the obvious lack of chronological and typological framework within which certain phases of Sopot culture would be divided,
Vršekruši tanki urezi s lokaliteta Đakovo – Grabrovac/ Ciglana (T. 9: 3) imaju najbolju analizu na lokalitetu No- vi Perkovci – Krčavina (Marković, Botić 2008: T. 1: 1; 8: 4; 9: 6). Uzorak iz zemlje (Z-3799) iz koje potječe ulomak keramike (Marković, Botić 2008: T. 9: 6) datiran je u razdoblje 4900– 4540 BC (kalibracija 68.2 %) (Marković, Botić 2008: 17).

Jedan od prijedloga kako započeti rješavanje problema nedostatka adekvatne kronologije i tipologije sopotske kulture je krenuti od postojećih podataka kao i podataka o kojima postoji konsenzus istraživača. Također treba imati na umu da često determinaciju nekoga lokaliteta određuje odabrati istraživača o tome koje će elemente slikovno prikazati i istaknuti, a koje eventualno zanemariti. Stoga prikazu- jemo raspon datuma sopotske kulture dostupan na području Međurječja, kao i raspon određenoga ukrasa s lokaliteta na kojem se pojavljaju, a koji imaju radiokarbonске datume.

Do sade je na području Međurječja poznato 94 datuma koji pripadaju po kriteriju starosti ili tipu keramičkog materijala sopotske kulturi (sl. 25). Od toga je 48 datuma s nesigurnošću od 50 godina ili manje (sl. 26) (Obelić et al. 2004; Balen, Potrebica 2006; Marković, Botić 2008; Balen et al. 2009; Krznači Škrivanko 2011; Čataj, Janeš 2013; Mihaljević 2014a; 2014b; Miklik Lukuz 2014; Burić 2015; Botić 2017; 2018). Na slici 25, bez ambicije da ulazimo u detaljnije kronološke rasprave, prikazujemo niz 94 radiokarbonске 14C datuma s 21 lokaliteta s područja Međurječja. Iz navedeno- ga rasporeda datuma vidljivo je kako se na lokalitetima koji su nedvojbeno prepoznati kao oni koji sadrži nalaze sopot- ske kulture nižu u slijedu između 5400 i 4000. god. pr. Kr. Pri tome je većina u rasponu od 5200. do 4400. god. pr. Kr. (sl. 26). Ako se u obzir uzmu svi datumi ili samo datumi s većom preciznošću, vidljivo je kako je distribucija ista, odnosno da se cjelokupni raspon datuma sopotske kulture ne mijenja, s iznimkom datuma s iznimno velikim rasponom s lokaliteta Dubovo Košno.

Datumi govore o dugotrajnom naseljavanju tijekom sopotske kulture svakoga položaja koji je datiran, a isti tipovi ukrsava pojavljuju se u arheološkoj zapisu kao svjedoci raznih razina i/ili trajanja kroz dugi vremenski period. Sopot- ska kultura sa svim svojim karakteristikama poput oblika posuda, ukrsava i tipa naselja pojavljuje se na prostoru čita- ve Slavonije barem od 5200 cal BC. Ti rani datumi kulture rasprostiru se na čitavome području Slavonije (Županja – Dubovo Košno, Donji Miholjac – Vrancari (nema objavljenih nalaza, spominje se i korenskova kultura, ali i sopotski nalazi (Dizdar, Tonč 2016)), Radovanci, Nova Gradiška – Slavča, Novi Perkovci – Krčavina, Golinci. Od 21 datiranoga lokaliteta sopotske kulture, osam ih ima datume starije od 5000 cal BC, što je

Such situations are common and inevitable.

The situation is further complicated by the attributions of findings as imports – which are determined as such usu- ally based on the subjective judgment of researchers as to how much a finding is “finer”, “more special”, “more Vinča- like” or “more Lengyel-like”, so Vinča imports or intrusions into one of the Sopot sites are often mentioned (e.g. Sama- tović, Ervenica: Dimitrijević 1979: 282), imports of Sopot and Lengyel vessels to Vinča sites like Bapska (Dimitrijević 1979: 306) or both import and imitation of Vinča ideals at the sites of Bapska, Otok and Samatović (Dimitrijević 1979: 282) are often mentioned.

Multiple thin incisions from the site of Đakovo – Grabro- vac/Ciglana (Pl. 9: 3) are most closely analogous with the site of Novi Perkovci – Krčavina (Marković, Botić 2008: Pl. 1: 1; 8: 4; 9: 6). The sample from a pit (Z-3799) which yielded a pottery fragment (Marković, Botić 2008: Pl. 9: 6) is dated to a period 4900–4540 BC (calibration 68.2 %) (Marković, Botić 2008: 17).

One of the suggestions as to how to begin addressing the problem of the lack of an adequate chronology and typ- ology of Sopot culture is to start from existing data as well as data on which there exists consensus among researchers. It should also be borne in mind that often the determination of a particular site is dictated by the choice of a researcher as to which elements to depict and highlight pictorially, and which to ignore. Therefore, we present the range of dates of the Sopot culture available in the interfluve region, as well as the range of certain ornaments from the sites where they appear and which have radiocarbon dates.

So far the interfluve area yielded 94 dates which belong to the Sopot culture according to age and type of ceramic material (Fig. 25). Of those 94 dates, 48 are dates with un- certainty of 50 years or less (Fig. 26) (Obelić et al. 2004; Ba- len, Potrebica 2006; Marković, Botić 2008; Balen et al. 2009; Krznači Škrivanko 2011; Čataj, Janeš 2013; Mihaljević 2014a; 2014b; Miklik Lukuz 2014; Burić 2015; Botić 2017; 2018). On the interfluve, without ambition to enter into more detailed chrono- logical discussions, we show a series of 94 radiocarbon 14C dates from 21 sites in the interfluve region. The given arrangement shows that in sites that are undoubtedly re- cognized as those containing findings of Sopot culture, the dates are sequenced between 5400 and 4000 BC. Most of them range from 5200 to 4400 BC (Fig. 26). If all dates or only dates with greater precision are taken into account, it can be seen that the distribution remains the same; that is, the entire range of dates of the Sopot culture does not change, with the exception of dates with an extremely large range from the Dubovo Košno site.

The dates indicate the long settlement during the Sopot culture of each position that is dated, and the same types of decoration appear in the archaeological record as testa- ment of different stages and/or duration over a long period of time. Sopot culture with all its characteristics, such as the shape of vessels, decorations and type of settlement, has been appearing in the entire Slavonia since at least 5200 cal BC. These early dates of the culture are spread throughout Slavonia (Županja – Dubovo Košno, Donji Miholjac – Vran- cari (no published findings, Korenovo culture and also So- pot findings are mentioned (Dizdar, Tonč 2016)), Radovanci, Nova Gradiška – Slavča, Novi Perkovci – Krčavina, Golinci.
više od trećine lokaliteta, pa smatramo da ne treba govoriti o slaboj zastupljenosti sopotskih nalaza prije toga datuma. Ukraši na keramičkim posudama koji se pojavljuju na tim ranim lokalitetima su raznovrsni, a koji se i inače pojavljuju na lokalitetima sopotske kulture: bikonični oblici s aplikacijama na lokalitetima Radovanci (Balen, Potrebica 2006: 25), bikonični oblici na lokalitetu Županja – Dubovo Košno (Marijan 2006: 50), Golinci – Selište (Cataj, Janč 2013: T. 5: 7–10); rogolike ručke na lokalitetima Županja – Dubovo Košno (Marijan 2006: 50), Radovanci (Balen, Potrebica 2006: 23), Golinci – Selište (Cataj, Janč 2013: T. 5: 10), trake izvedene kombinacijom uboda i ureza na lokalitetima Novi Perkovi – Krčavina (Marković, Botić 2008), Županja – Dubovo Košno (Marijan 2006: 50), Golinci – Selište (Cataj, Janč 2013: T. 3: 2–5), Pogorč – Ražište (Marković 2012), tanke urezane linije ravne, kružne ili spiralne na lokalitetima Županja – Dubovo Košno (Marijan 2006: 50), Novi Perkovi – Krčavina, Pogorč – Ražište (Marković 2012).

ZAKLJUČAK

Iz dosadašnjih israživanja možemo zaključiti: – slične pojavu pojavljuju se na čitavome području današnje Slavonije, najkasnije od 5000 cal. BC; – keramički oblici i ukraši u vrlo se sličnome obliku javljaju na tome čitavom prostoru s različitim varijacijama u pojavnosti, a naselja svojom veličinom, organizacijom te materijalnom kulturom naselja ukazuju na dugotrajnost i društvenu kompleksnost.

Ukraši na posudama te radiokarbonski datumi ne prate relativnu kronologiju S. Dimitrijevića. S druge strane, svi radiokarbonski datumi s lokaliteta Gorjani – Kremenjača i Ivandvor

CONCLUSION

Based on the existing studies, we can conclude: – similar phenomena occur in the entire area of present-day Slavonia, no later than 5000 cal. BC; – pottery shapes and decorations occur in a very similar form throughout the whole area with different variations in appearance, and settlements, i.e. their size, organization and material culture of settlements, indicate longevity and social complexity.

The decorations on the vessels and the radiocarbon dates do not adhere to the relative chronology of S. Dimitrijević. On the other hand, all these decorations are present on...
sl. 25 Radiokarbonski datumi sopotske kulture s prostora Međurječja (Obelić et al. 2004; Balen, Potrebica 2006; Marković, Botić 2008; Balen et al. 2009; Krznarić Škrivanko 2011; Čataj, Janeš 2013; Mihaljević 2014a; 2014b; Miklik Lozuk 2014; Burić 2015; Botić 2017; 2018)

fig. 25 Sopot culture radiocarbon dates from the interfluve area (Obelić et al. 2004; Balen, Potrebica 2006; Marković, Botić 2008; Balen et al. 2009; Krznarić Škrivanko 2011; Čataj, Janeš 2013; Mihaljević 2014a; 2014b; Miklik Lozuk 2014; Burić 2015; Botić 2017; 2018)
sl. 26  Radiokarbonski datumi sopotske kulture s prostora Međurječja samo s negisurnošču od 50 godina ili manje (Obelić et al. 2004; Balen, Potrebica 2006; Marković, Botić 2008; Balen et al. 2009; Krznarić Škrivanko 2011; Čataj, Janeš 2013; Mihaljević 2014a; 2014b; Miklik Lozuk 2014; Burić 2015; Botić 2017; 2018)

Fig. 26  Radiocarbon dates only with uncertainty of up to 50 years from the interfluve area (Obelić et al. 2004; Balen, Potrebica 2006; Marković, Botić 2008; Balen et al. 2009; Krznarić Škrivanko 2011; Čataj, Janeš 2013; Mihaljević 2014a; 2014b; Miklik Lozuk 2014; Burić 2015; Botić 2017; 2018)

su ti ukrasi prisutni na gotovo svim lokalitetima i predstavljaju standardan repertoar unutar sopotske kulture. Prema postoječim objavama gotovo svi ukrasi se mogu javiti u raznim fazama i različiti ih istraživači i smatraju indikativnim za različite faze, na primer kružnih udubljenja koja se pojavljaju kao indikator stupnja od Ib do Iv. Stoga smatramo da nije neopravdano promatrati pojavu sopotske kulture otprilike simultano na čitavome području rasprostiranja.

Dugotrajnost naselja nije neobičajena pojava. Većina naselja u Slavoniji danas egzistira na istome ili sličnom po-

almost all sites and represent a standard repertoire within the Sopot culture. According to existing reports, almost all decorations can occur in different stages and are considered by different researchers to be indicative of different phases, as we can see from the example of circular indentations appearing as an indicator of phases Ib to IV. Therefore, we believe that it is not unjustified to observe the emergence of Sopot culture approximately simultaneously over the entire area of distribution.

Settlement longevity is not an uncommon occurrence. Most settlements in Slavonia today have existed in the same or similar position for the last 500 years (e.g. Presla-
ložaju posljednjih 500 godina (poput Preslatinaca, Satnice, Tomašanaca, Gorjana (Marković 1976)). Prilikom terenskih pregleda, keramika od prije 100 godina nalazi se zajedno sa suvremenim porculanom, staklom, plastikom. Pri tome niti ne pokušavamo kronološki razdvojiti te nalaze te se ne ističe kao neobičnost da se nalaze u istoj asocijaciji. Možda je slična situacija i s nalazima iz raznih faza sopotske kulture, odnosno da u arheološkome zapisu imamo nalaze koji pripadaju dužem razdoblju, odnosno da vidimo samo zadnju fazu u dugotrajnome životu naselja s primjesama prethodnoga života. Postojeća tipologija ne prati apsolutnu kronologiju, no to ne znači da tipologiju treba odbaciti, nego klasificirati tipove posuda i ukraša sa svih do sada istraženih lokaliteta te probati izrati novu tipološku listu. Nadamo se kako smo u ovome radu krenuli upravo u tome smjeru.

tinci, Satnica, Tomašanci, Gorjani (Marković 1976)). During field surveys, the ceramics from 100 years ago can be found together with contemporary porcelain, glass or plastic. In doing so, we do not even attempt to chronologically separate these findings and it does not stand out as unusual for them to be in the same association. Perhaps the situation is similar with the findings from different phases of the Sopot culture; that is, in the archaeological record we have findings that belong to a longer period, i.e. we only see the last phase in the long life of the settlement with the admixtures of previous occupation phases. The existing typology does not adhere to an absolute chronology, although that does not mean that the typology should be discarded, but rather that the types of vessels and ornaments from all the sites explored so far should be re-classified and that a new typological list be attempted. We hope that in this paper we have taken steps exactly in that direction.
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T. 1  Gorjani – Kremenjača, nalazi sopotske kulture (izradila: M. Rončević)
Pl. 1  Gorjani – Kremenjača, Sopot culture finds (drawning by: M. Rončević)
T. 2  Gorjani – Kremenjača, nalazi sopotske kulture (izradila: M. Rončević)

Pl. 2  Gorjani – Kremenjača, Sopot culture finds (drawing by: M. Rončević)
T. 3  Gorjani – Kremenjača, nalazi sopotske kulture (izradila: M. Rončević)

Pl. 3  Gorjani – Kremenjača, Sopot culture finds (drawing by: M. Rončević)
Gorjani – Kremenjača, nalazi sopotske kulture (izradila: M. Rončević)

Gorjani – Kremenjača, Sopot culture finds (drawing by: M. Rončević)
T. 5  Gorjani – Topole, nalazi sopotske kulture (izradila: M. Rončević)
Pl. 5  Gorjani – Topole, Sopot culture finds (drawing by: M. Rončević)
Pl. 6  Preslatinci – Ugljara and Tomašanci – Dubrava, Sopot culture finds (drawing by: M. Rončević)
T. 7 Vučevci, nalazi sopotske kulture (izradila: S. Čule)

Pl. 7 Vučevci, Sopot culture finds (drawing by: S. Čule)
T. 8  Đakovo – Grabrovac/Ciglana, nalazi sopotske kulture (izradila: M. Rončević)
Pl. 8  Đakovo – Grabrovac/Ciglana, Sopot culture finds (drawing by: M. Rončević)
T. 9  Đakovo – Grabrovac/Ciglana, nalazi sopotske kulture (izradila: M. Rončević)
Pl. 9 Đakovo – Grabrovac/Ciglana Sopot culture finds (drawing by: M. Rončević)
T. 10 Gorjani – Topole, nalazi starčevačke kulture (izradila: M. Rončević)
Pl. 10 Gorjani – Topole, Starčevo culture finds (drawing by: M. Rončević)