

Kristina Horvat

## Polje niže Vrcelja – nalazište ranog neolitika na benkovačkom području

Kristina Horvat  
Sveučilište u Zadru  
Filozofski fakultet  
Odjel za arheologiju  
Obala Petra Krešimira IV., br. 2  
HR, 23000 Zadar  
k.horvat.zd@gmail.com

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U članku se razmatraju rezultati zaštitnih arheoloških istraživanja na nalazištu Polje niže Vrcelja, nedaleko od Benkovca. Nalazište sadrži kasnoantički i neolitički horizont koji je pripisan *impresso* kulturi te mu je posvećen ovaj rad. Složena stratigrafska slika neolitičkog dijela kulturnog depozita datiranog radiokarbonskom analizom ukazuje na arheološki potencijal i važnost ovog nalazišta pri proučavanju i upotpunjavanju slike o neolitiku istočnog Jadrana, ali i potrebu za daljnjim sustavnim arheološkim iskopavanjem nalazišta te potrebu za interdisciplinarnim pristupom istraživanju.

*Cljučne riječi: Vrcelji, rani neolitik, impresso kultura, benkovačko područje, prapovijesni kanal, radiokarbonsko datiranje*

## Polje niže Vrcelja – an early Neolithic site in the Benkovac area

Kristina Horvat  
University of Zadar  
Faculty of Humanities and Social Sciences  
Department of Archaeology  
Obala Petra Krešimira IV., br. 2  
CROATIA, 23000 Zadar  
k.horvat.zd@gmail.com

UDC: 903 (497.5 Vrcelj) “634/652”  
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The article contains an examination of the results of rescue archaeological research at the Polje niže Vrcelja site, not far from the town of Benkovac. The site consists of Late Antique and Neolithic horizons. The latter, to which this work is dedicated, has been ascribed to the Impressed Ware culture. The complex stratigraphic Neolithic segment of the cultural deposits dated by radiocarbon analysis highlight the archaeological potential and importance of studying and supplementing the picture of the Neolithic in the Eastern Adriatic seaboard, as well as the need for more systematic archaeological excavations of the site and the need for an interdisciplinary approach to research.

*Key words: Vrcelji, early Neolithic, Impressed Ware culture, Benkovac area, prehistoric channel, radiocarbon dating*

## Uvod

U prilog dugom i kontinuiranom životu benkovačkog prostora, jednog od kulturno i povijesno najvažnijih područja sjeverne Dalmacije, odnedavno govori i nalazište na položaju Polje niže Vrcelja.<sup>1</sup> Riječ je o nalazištu otkrivenom i istraženom tijekom zaštitnih arheoloških iskopavanja u okviru radova na magistralnom plinovodu Gospić – Benkovac.<sup>2</sup> Istraživanjem su utvrđeni dijelovi kasnoantičkoga i neolitičkog horizonta pripisanog *impresso* kulturi, kojem je posvećen ovaj rad.

Polje niže Vrcelja nalazi se jugoistočno od današnjeg bukovičkog zaseoka Vrcelji, tristotinjak metara sjeverno od željezničke pruge i magistralne ceste Benkovac – Knin (sl. 1).<sup>3</sup> Riječ je o zanimljivoj mikrolokaciji smještenoj na plodnoj terasi južne padine bukovičke kose s koje se pogled preko perušičke kose pruža daleko na jug, obuhvaćajući u prvom planu obližnja polja smještena na dvjestotinjak metara nižoj nadmorskoj visini. U njezinoj se blizini nalazi nekoliko manjih izvora i povremenih jaruga koje uzdužnim pukotinskim kanalima otječu prema jugozapadu, prateći opći pad terena.

Takav položaj dobro odgovara već poznatim neolitičkim prostornim obrascima na širem ravnokotarskom području (karta 1),<sup>4</sup> gdje su pomno birane

## Introduction

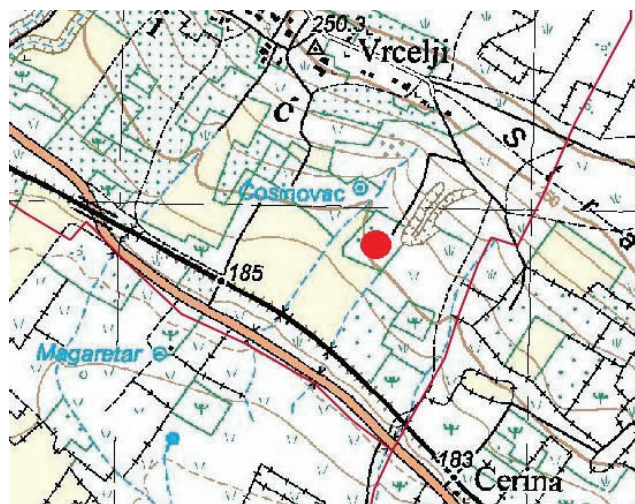
Long and continuous human habitation in the Benkovac area, one of the most culturally and historically important parts of northern Dalmatia, was recently also confirmed by the find-site of Polje niže Vrcelja.<sup>1</sup> This is a site discovered and researched during rescue archaeological excavations as a part of works on the natural gas main from Gospić to Benkovac.<sup>2</sup> Research has ascertained segments of Late Antique and Neolithic horizons; the latter, to which this work is dedicated, has been ascribed to the Impressed Ware culture.

Polje niže Vrcelja is situated south-east of the present-day hamlet of Vrcelji, near the village of Buković, roughly three hundred meters north of the railway line and the Benkovac-Knin highway (Fig. 1).<sup>3</sup> This is an interesting micro-location situated on a fertile terrace on the southern slope of the Bukovica slope, affording a view far south across the Perušić slope, encompassing the nearby fields which lay at an elevation approximately two hundred meters lower. There are several small fresh water springs and seasonal streams in the vicinity, which run off in creviced channels in a south-westerly direction, following the general slope of the terrain.

Such a position corresponds well to the already known Neolithic spatial patterns over the wider area of Ravni Kotari (map 1),<sup>4</sup> where carefully selected

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- 1 Nalazište je u konzervatorskoj studiji označeno kao AB 34 Polje niže Vrcelja (Weiwegh, Kezunović 2009, str. 14).
  - 2 Arheološko istraživanje provela je tvrtka *Kaducej* d. o. o. u suradnji s tvrtkom *Arheo Plan* d. o. o. u razdoblju od 13. prosinca 2010. do 15. siječnja 2011. godine. Istraživanja je vodio Nikša Vujnović, prof. povijesti i arheologije, a zamjenica voditelja bila je Tonka Matana, dipl. arheologu Josipu Burmazu i voditeljima istraživanja zahvaljujem na mogućnosti objave rezultata istraživanja, a djelatnicima tvrtke *Kaducej* d. o. o. na pomoći oko ustupljenog materijala.
  - 3 Lokalitet je pozicioniran na k. č. 574/1, 571/1, 9999/4, 572/2, 599, 603/1, 603/4, 605/1, 605/2, 605/3, 605/4, 605/5, 605/6, 1880/1, 1847, 605/7, 605/8, 605/9, 605/10, 605/11, 1835/1, 1847, 1876 katastarske općine Buković, odnosno između stacionaža 197+000 i 197+675 magistralne plinovodne trase Gospić-Benkovac.
  - 4 Karta 1. prikazuje sva neolitička nalazišta na benkovačkom području. Karta je izrađena na temelju dostupnih podataka iz stručne literature (Batović 1979; 1990), te muzejske dokumentacije i arheološkog materijala pohranjenog u Zavičajnom muzeju grada Benkovca. Od neobjavljenih neolitičkih lokaliteta čiji je materijal pohranjen u Muzeju na karti su navedene Brdine u Benkovcu i Brgud. Kolegi M. Čurkoviću, ravnatelju i kustosu Zavičajnog muzeja u Benkovcu, zahvaljujem

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- 1 The site is designated in the conservation study as “AB 34 Polje niže Vrcelja” (Weiwegh, Kezunović 2009, p. 14).
  - 2 Archaeological research was conducted by the firm *Kaducej* d. o. o. in cooperation with *Arheo Plan* d. o. o. from 13 December 2010 to 15 January 2011. The research was led by Nikša Vujnović, a professor of history and archaeology, while the assistant leader was Tonka Matana, an archaeologist. I would like to thank Josip Burmaz and the research leaders for allowing me to publish the research results, and the staff of *Kaducej* for their assistance involving the materials in question.
  - 3 The site is situated on cadastral plots 574/1, 571/1, 9999/4, 572/2, 599, 603/1, 603/4, 605/1, 605/2, 605/3, 605/4, 605/5, 605/6, 1880/1, 1847, 605/7, 605/8, 605/9, 605/10, 605/11, 1835/1, 1847, 1876, in the Buković cadastral municipality, and between chainage 197+000 and 197+675 of the Gospić-Benkovac natural gas main section.
  - 4 Map 1 shows all of the Neolithic sites in the Benkovac area. The map was compiled on the basis of available data from scholarly sources (Batović 1979; 1990), and museum documentation and archaeological materials stored in the Benkovac Local Heritage Museum. Out of the materials stored in the Museum, Brdine at Benkovac and Brgud are specified on the map.



Sl. 1. Topografski položaj nalazišta (<http://geoportal.dgu.hr>, 30. 03. 2015.)

Fig. 1. Topographic position of the site (<http://geoportal.dgu.hr>, 30 March 2015)

neolitičke lokacije najčešće smještene u neposrednoj blizini većeg plodnog zemljišta i izdašnjeg vrela kao ključnih determinanti i preduvjeta uspješnog društveno-ekonomskog neolitičkog života određenog upravo prirodnim realitetima.<sup>5</sup>

### Stratigrafija

Strategije istraživanja i metodologija iskopavanja ovog lokaliteta određene su vrstom istraživanja, primjereno zahtjevima lokaliteta i zatečenoj arheološkoj situaciji. Istraživanje sondažnog karaktera obuhvatilo je pojas širine 3 m na središnjoj osi plinovodne trase položene u pravcu sjeveroistok-jugozapad. Od ukupno 17 istraženih sondi ostaci neolitičkoga kulturnog sloja otkriveni su u samo tri sonde smještene u nizu na višem dijelu terase, gdje je manja količina arheološkog materijala zabilježena već prilikom pregleda terena (sl. 2).<sup>6</sup>

na mogućnostima uvida. Lokalitet Gradina u Zemunik Donjem istražio je 2014. g. Odjel za arheologiju Sveučilišta u Zadru, a objava lokaliteta je u tijeku (Marijanović, Horvat 2015).

- 5 Neolitička nalazišta Smilčić, Crno vrilo, Tinj (Podlivade), Lisičić pod Jarugom i Sikovo samo su neki od primjera takvih pozicija (Batović 1990, str. 27; Marijanović 2003, str. 45-46; Marijanović 2009, str. 12-13; Čondić 2012/2013, str. 96).
- 6 Pokusne sonde 1-6 iskopane su na strmom uzvišenju na početku kose, sonde 7-9 na terasi koja se spušta prema jugozapadu, a sonde 10-17 južno, sve do ceste Benkovac-Knin. Ukupna istražena površina iznosi 651,6636 m<sup>2</sup>. Prapovijesni sloj (neolitički) evidentiran



Karta 1. Položaj nalazišta Vrcelji u odnosu na ostala neolitička nalazišta šireg benkovačkog područja

Map 1. Position of the Vrcelja site in relation to other Neolithic sites in the wider Benkovac area

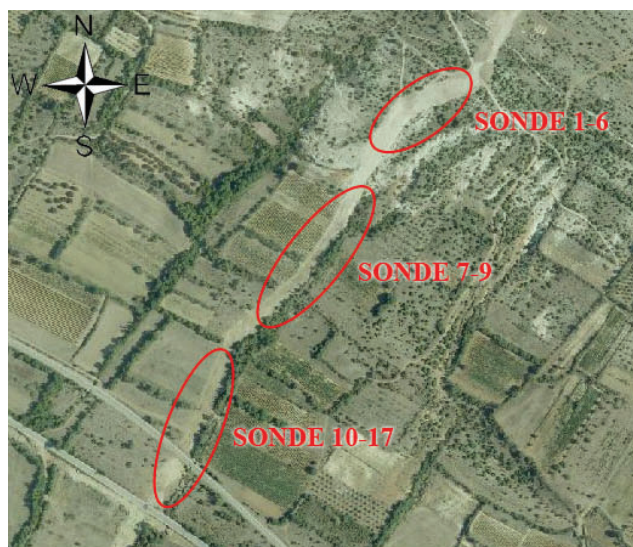
Neolithic sites were often situated in the immediate vicinity of large tracts of fertile land and a copious spring of water as the key determinants and prerequisites for successful Neolithic socio-economic life dictated by the realities of the natural environment.<sup>5</sup>

### Stratigraphy

The research strategy and excavation methodology at this site were dictated by the type of research suited to the demands of the site and the archaeological situation as found. Excavations of a test-trench character encompassed a 3-meter wide belt on the central axis of the gas-line route in a north-east to south-west direction. Out of the total 17 researched test trenches, the remains of the Neolithic cultural layer were discovered in only three trenches situated consecutively on the higher part of the terrace, where a small quantity of archaeological material was recorded already during a field inspection (Fig. 2).<sup>6</sup>

I would like to thank my colleague M. Čurković and the manager and curator of the Benkovac Local Heritage Museum for allowing me to view these materials. The Gradina site in Zemunik Donji was researched in 2014 by the University of Zadar Archaeology Department, and publication of the site is in progress (Marijanović, Horvat, 2015).

- 5 The Neolithic sites Smilčić, Crno vrilo, Tinj (Podlivade), Lisičić pod Jarugom and Sikovo are only some examples of such locales (Batović 1990, p. 27; Marijanović 2003, pp. 45-46; Marijanović 2009, pp. 12-13; Čondić 2012/2013, p. 96).
- 6 Test trenches 1-6 were excavated at a steep height at the beginning of a slope, trenches 7-9 on a terrace that



Sl. 2. Položaj istraženih sondi

Fig. 2. Position of the examined test trenches

Istraživanja su do kraja bila koncentrirana isključivo na tri spomenute sonde čiji je radni pojas proširen i međusobno povezan, pa je na taj način dobivena jedinstvena istraživačka cjelina ukupne dužine oko 160 m; neolitički kulturni sloj potvrđen je na ukupnoj dužini od oko 60 m. Kako je iskopavanjem utvrđeno da plinovodna trasa izravno prelazi preko neolitičkih slojeva, za čije dugotrajno i metodološki složeno arheološko iskopavanje nisu postojali uvjeti, iskopane su tri dodatne pokusne sonde 4 do 5 metara zapadno od istraživačke cjeline radi utvrđivanja granice rasprostiranja neolitičkih slojeva, odnosno izmjene plinovodne trase i očuvanja kulturnog depozita.<sup>7</sup> Pokusne sonde potvrdile su utvrđenu zapadnu granicu prapovijesnog sloja te omogućile djelomičnu izmjenu trase prema zapadu, na položaje gdje su iskopavanjem utvrđeni samo sterilni geološki slojevi.

Iskopavanjem započetim na središnjem dijelu istraživačke cjeline, neposredno ispod humusnog sloja, evidentiran je neolitički kulturni sloj sastavljen od tamnosive pjeskovite gline. Kulturni sloj prati opći pad terena od sjeveroistoka prema jugozapadu, a rasprostire se u pravcu sjeverozapad-jugoistok. U istom ga pravcu pružanja prate i manje nakupine amorfne kamenja, koje na dubini od desetak centimetara formiraju tri svojevrsne izdužene kompaktne cjeline (sl. 3). Među kamenim nakupinama utvrđena je veća količina raznovrsnog arheološkog materijala pripisana tipičnom repertoaru *impresso* kulture.

je u sondama 7-9 smještenima na k. č. 9999/4, 599, 603/1, 603/4, ukupne površine 484, 7872 m<sup>2</sup>.

7 Veličina dodatnih pokusnih sonda (18-20) iznosila je 4,5 x 1,5 m po sondi.



Sl. 3. Neolitički kulturni sloj s kamenim nakupinama, pogled prema sjeveru (foto: Goran Đurić, Kaducej d. o. o.)

Fig. 3. Neolithic cultural layer with stone accumulations, view toward north (photo: Goran Đurić, Kaducej d.o.o.)

Research works were entirely concentrated exclusively on the three aforementioned test trenches, with their working extent expanded and mutually linked, thus securing a research unit with a total length of approximately 160 m; the Neolithic cultural layer was confirmed over a total length of roughly 60 m. Once it was ascertained by means of these excavations that the natural gas line would cross directly over the Neolithic layers, for which conditions did not exist for long-term and methodologically complex archaeological excavations, three additional test trenches were dug 4 to 5 meters west of the research unit in order to establish the extent of the Neolithic layers and to move the gas line and preserve the cultural deposit.<sup>7</sup>

descends toward the south-west, and trenches 10-17 to the south, all the way to the Benkovac-Knin road. The total researched surface covers 651,6636 m<sup>2</sup>. The prehistoric layer (Neolithic) has been recorded in test trenches 7-9, situated on cadastral plots. 9999/4, 599, 603/1, 603/4, with a total surface area of 484,7872 m<sup>2</sup>.

7 The size of the additional test trenches (18-20) was 4.5 x 1.5 m per trench.

Kulturni sloj s kamenim nakupinama, definiranim neposredno uz njegovu zapadnu granicu rasprostiranja, u potpunosti je intaktan, zbog čega je kamene nakupine moguće promatrati kao originalne neolitičke strukture. Međutim, na temelju dosegnutog stupnja istraženosti, njihovom je tumačenju potrebno pristupiti s velikom rezervom. Nameće se ideja o urušavanju posve pretpostavljenog suhozidnog objekta ili ostatku neke vrste suhozidne ograde (ostatku ograđivanja) vezane uz sam zapadni rub nalazišta. S obzirom na padinski položaj, u obzir se može uzeti i interpretacija čitavog kulturnog sloja zajedno s kamenim nakupinama kao zapune većeg ukopa s odvodnom ili nekom drugom funkcijom, što će biti jasnije tek nakon provođenja sustavnih arheoloških istraživanja, odnosno dobivanja boljeg uvida u stratigrafiju nalazišta, raspored i prostorni odnos navedenih struktura.

Neposredno ispod opisanog sloja evidentiran još jedan neolitički sloj uočljiv po izrazito svijetloj boji i nešto manjoj količini keramičkoga, koštanoga i litičkog materijala istovjetnog sloju iznad njega. Kako predviđeni radovi nisu zahtijevali iskop dublji od 1 m, radi utvrđivanja ukupne dubine neistraženih kulturnih slojeva na razini potonjih slojeva iskopane su dvije manje pokusne sonde (sl. 4), čiji su profili otkrili čitav niz bogatih neolitičkih slojeva neujednačene debljine (sl. 5). U pokusnoj sondi 2, smještenoj na samom sjevernom kraju iskopa, kulturni su slojevi uslojeni do približno 1,2 m duboke sterilne zdravice, dok su slojevi u pokusnoj sondi 1, smještenoj nešto južnije, na središnjem dijelu iskopa (sl. 7), uslojeni do 2,8 m duboke sterilne zdravice.<sup>8</sup>

Neujednačen proces njihove stratifikacije, nedvojbeno uvjetovan jakim erozivno-akumulativnim djelovanjem, potvrđuju tanki šljunkoviti proslojci i geološki slojevi glinastog sastava, mjestimično izmijenjeni s najdublje pozicioniranim neolitičkim slojevima u pokusnoj sondi 1, u kojima je uz *impresso* materijal zabilježena i veća količina ugljena.<sup>9</sup>

Pripadaju li najdublje evidentirani neolitički slojevi intaktnim dijelovima neolitičkog nalazišta ili je možda riječ o njihovoj sekundarnoj poziciji, također uvjetovanoj jakim erozivnim procesima i odnošenjem materijala s viših dijelova kose, do novih, sustavno provedenih arheoloških istraživanja, ostaje otvoreno pitanje. Sudeći prema složenoj stratigrafskoj slici (sl. 6), današnjoj aktivnosti i značenju sezonskih bujica i erozivnih procesa u oblikovanju i korištenju čitave

Test trenches have confirmed the western boundary of the prehistoric layer and have facilitated a partial westward movement of the gas line, at a place where only sterile geological layers were found during excavations.

A Neolithic cultural layer composed of dark-gray sandy clay was recorded during excavations launched in the middle section of the research unit, immediately below the humus layer. The cultural layer follows the general grade of the terrain from north-east to south-west, and it extends in a north-west to south-east direction. Smaller accumulations of amorphous stones follow it in the same direction, and at a depth of roughly ten centimetres these form three peculiar elongated units (Fig. 3). A high quantity of diverse archaeological materials were ascertained among the stone accumulations, ascribed to the typical repertoire of the Impressed Ware culture.

The cultural layer with stone accumulations, defined immediately adjacent to the western boundary of its extent, is entirely intact, which is why the stone accumulations may be considered original Neolithic structures. However, based on the degree of research completed so far, their interpretation must be approached with a great deal of caution. An idea that imposed itself was the collapse of an entirely hypothesized stacked stone structure or the remainder of some type of stacked stone fence (the remainder of fencing) associated with the very western edge of the site. Given the sloped position, another interpretation which may be considered is that the entire cultural layer together with the stone accumulations are filler from a larger excavation that had a drainage use or some other function, and which will only become more clear after the completion of systematic archaeological research. The latter should provide greater insight into the site's stratigraphy and layout, as well as the spatial relations between the aforementioned structures.

Just below the layer described above, another Neolithic layer was registered. It is notable for its light-gray colour and somewhat lesser quantity of pottery, bones and lithics than the corresponding layer above it. Since the planned works did not require excavations deeper than 1 m, two smaller test trenches (Fig. 4) were dug in order to ascertain the total depth of the unexamined cultural layers at the level of the latter layers. The profiles of these trenches revealed an entire series of rich Neolithic layers of non-uniform thickness (Fig. 5). In test trench 2, situated at the very northern end of the excavation, the cultural layers were went down to sterile soil at a depth of approximately 1.2 m, while the layers in test trench 1, situated slightly to the south in the central portion of

8 Kako bi se do budućih iskopavanja ovi slojevi što bolje sačuvali, pokusna sonda 1 i neistraženi dijelovi prekriveni su geotekstilom i zatrpani zemljom.

9 Uzorak je poslan na radiokarbonsku analizu. Usporediti bilješku 34.



Sl. 4. Pogled na istočni profil pokusne sonde 1 i 2 (foto: Goran Đurić, Kaducej d. o. o.)

Fig. 4. View of the eastern profile of test trenches 1 and 2 (photo: Goran Đurić, Kaducej d.o.o.)

južne padine bukovičke kose, takva mogućnost nije isključena. Štoviše, ona se može promatrati kao indikativan smjerokaz u budućim istraživanjima ovog lokaliteta, koji na prvome mjestu zahtijeva interdisciplinarni pristup usmjeren utvrđivanju relacija između arheološkoga i paleoekološkog zapisa, ključnih za razumijevanje i interpretaciju neolitičkog života na ovoj mikrolokaciji.

U prilog navedenome govore i ostatci prapovijesnoga kanala otkrivenog nešto sjevernije od sloja s kamenim nakupinama (sl. 7).

Riječ je o ostacima kanala koji se rasprostire u pravcu istok-jugozapad, zbog čega ulazi u oba profila iskopa širokog 3 m. Širina kanala utvrđenog na dubini od oko 0,7 m uz istočni profil iznosi 1,35 m. Kanal se širi prema zapadnom profilu, koji prati u dužini od oko 7 m (sl. 7.), što ukazuje na njegovo daljnje rasprostiranje prema jugozapadu.<sup>10</sup> Uz uzdužnu stranu kanala utvrđen je niz amorfnog kamenja ukupne dužine oko 2 m, čija namjena i/ili veza s kanalom nije jasna.

Ostatci prapovijesnoga kanala utvrđeni su i na južnom dijelu istraživačke cjeline, gdje su pronađeni ostatci kasnoantičkih struktura (sl. 8).

the excavation (Fig. 7), went down to sterile soil at a depth of 2.8 m.<sup>8</sup>

Their uneven stratification, undoubtedly caused by strong erosive/cumulative processes, are confirmed by the thin interstitial layers of gravel and geological layers with a clay composition, intermittently alternating with the most deeply set Neolithic layers in test trench 1, in which a large quantity of charcoal was noted alongside the Impressed Ware materials.<sup>9</sup>

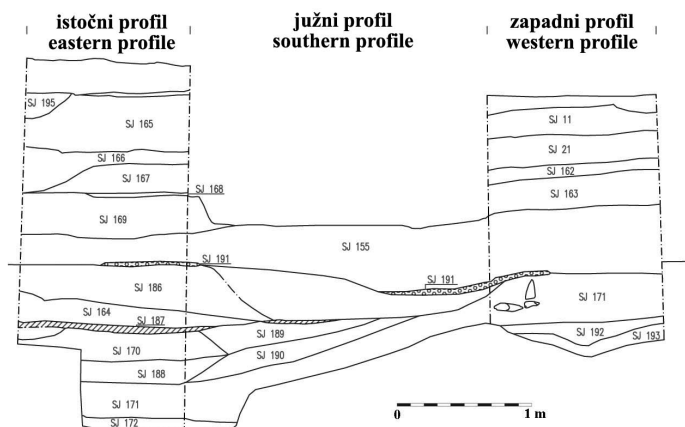
Whether the deepest recorded Neolithic layers belong to the intact portion of the Neolithic site or whether they are perhaps in a secondary position, also caused by intense erosion and movement of materials from higher parts of the slope will remain open questions until new, systematic archaeological research is conducted. Judging by the complex stratigraphic picture (Fig. 6.), the current activities and the significance of seasonal flooding and erosion in the formation and use of the entire southern face of the Bukovica slope,

10 Kanal je pravokutnog presjeka, a njegova dubina iznosi od 0,40 do 0,25 m.

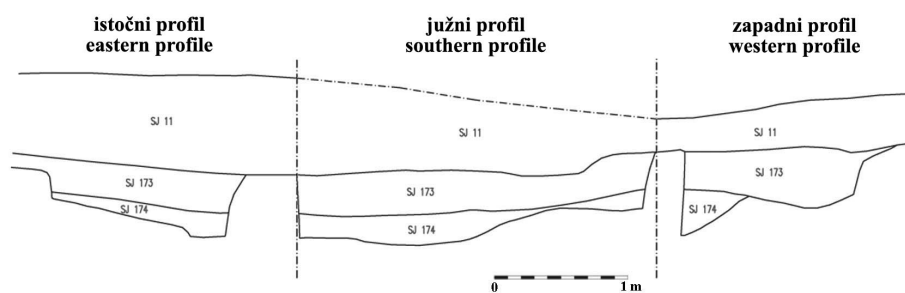
8 In order to preserve these in the best manner possible until future excavations, test trench 1 and the unexplored sections were covered with geotextile and covered with soil.

9 A sample was sent for radiocarbon analysis. Cf. note 34.

PROBNA SONDA 1 / TEST TRENCH 1



PROBNA SONDA 2 / TEST TRENCH 2



Sl. 5. Prikaz istočnog, južnog i zapadnog profila pokusne sonde 1 i 2  
 Fig. 5. Image of the eastern, southern and western profile of test trenches 1 and 2

Kanal vijugava oblika ulazi u profile iskopa, pa je definiran u dva odvojena segmenta. Manji segment kanala rasprostire se u pravcu sjeveroistok-jugozapad,<sup>11</sup> a veći segment, utvrđen neposredno ispod ostataka kasnoantičkih zidova (sl. 9), u pravcu sjeverozapad-jugoistok.<sup>12</sup>

U zapuni kanala pronađena je veća količina keramičkog materijala, životinjske kosti i nekoliko kremenih nalaza, koji u potpunosti odgovaraju repertoaru prikupljenom na sjevernom dijelu istraživačke cjeline. Sudeći po obliku i nalazima prikupljenim u zapuni, riječ je o istom kanalu koji je otkriven na sjevernom dijelu istraživačke cjeline, a koji svojim oblikom sugerira odvodnu ili drenažnu namjenu. Na ovom su dijelu terena uz kanal utvrđene dvije manje nakupine amorfnog kamenja, koje donekle nalikuju kamenim nakupinama definiranim na sjevernom dijelu istraživačke cjeline. Interpretacija kamenih nakupina i kanala zahtijeva daljnja istraživanja, u kojima poseban

such a possibility cannot be excluded. Moreover, it may be viewed as an indicator for future research into this site, which first and foremost dictates an interdisciplinary approach focused on establishing the relationship between archaeological and paleontological records crucial to an understanding and interpretation of Neolithic life at this micro-location.

The remains of a prehistoric channel uncovered slightly to the north of the layer with stone accumulations (Fig. 7) also back the above assertions.

These are the remains of a ditch that extends in the east to south-west direction, so that it enters the profiles of both 3 meter-wide excavations. The width of the channel ascertained at a depth of approximately 0.7 m along the eastern profile is 1.35 m. The ditch extends toward the western profile, which it follows over a length of approximately 7 m (Fig. 7), which indicates that it continues in a south-westerly direction.<sup>10</sup> Along the lengthwise side of the ditch, a series of amorphous stones have been ascertained with a length of approximately 2 m, but their purpose and/or link to the ditch is unclear.

11 Širina kanala uz istočni profil iznosi oko 0,95 m, a uz zapadni profil oko 1,40 m.

12 Širina kanala uz istočni profil iznosi oko 1,05 m, a uz zapadni profil oko 0,90 m. Kanal u presjeku ima oblik slova U. Njegova prosječna dubina uz zapadni profil iznosi 1 m, a uz istočni oko 0,5 m.

10 The ditch has a rectangular cross-section, and its depth is 0.4 to 0.25 m.



Sl. 6. Prikaz sjevernog dijela zapadnog profila iskopa  
 Fig. 6. Image of the northern section of the western excavation profile

naglasak treba biti stavljen na vodoravnu dimenziju nalazišta, odnosno otvaranje većih, međusobno povezanih cjelina neophodnih za dobivanje jasnijeg uvida u prostorne odnose otkrivenih struktura i njihovu namjenu.

Na kraju ostaje pitanje koji su razlozi potaknuli neolitičku zajednicu na odabir povišenog, ujedno i padinskog položaja koji je zahtijevao adaptaciju njegovim prirodno nametnutim zahtjevima i ograničenjima, o kojima svjedoče složena stratigrafska slika i ostatci kanala? Sudeći prema nekim drugim neolitičkim nalazištima otkrivenima na sličnim mikropozicijama, na kojima je suživot prirodnoga i kulturnoga potvrđen sustavnim arheološkim istraživanjima i egzaktnim interdisciplinarnim analizama,<sup>13</sup> čini se da velik dio odgovora na to pitanje kriju plodne terase bukovičke kose, okolni pašnjaci, vodene jaruge, izvori i šire bukovičko zaleđe, koji su mogli ne samo privući neolitičke zajednice, nego i trajno udovoljiti svim njihovim životnim prohtjevima. Iako su za izvođenje zaključaka potrebna daljnja istraživanja, te prikupljanje i analiza arheobotaničkih nalaza, arheozoološke i litičke građe i dr., prostorno-ekonomska perspektiva po kojoj mikrolokacija predstavlja izraz društveno-ekonomskih interesa i aktivnosti jedne neolitičke zajednice,<sup>14</sup> bez sumnje mora biti jedno od glavnih polazišta u daljnjim istraživanjima ovoga neolitičkog nalazišta.

The remains of the prehistoric ditch were also ascertained in the southern section of the research unit, where the remains of structures from Late Antiquity were found (Fig. 8).

The ditch, with meandering form, enters the excavation's profile, so it has been defined in two separate segments. The smaller segment extends in the north-east to south-west direction,<sup>11</sup> while the larger segment, established immediately beneath the remains of the Late Antique walls (Fig. 9), in the north-west to south-east direction.<sup>12</sup>

A considerable quantity of ceramics, animal bones and several stone articles was found in the ditch's fill, which entirely match to the materials gathered in the northern section of the research unit. Judging by the shape and the finds gathered in the fill, this is the same ditch that was uncovered in the northern part of the research unit, and its shape suggests a sewage or drainage function. Two smaller accumulations of amorphous stones were ascertained on this part of the terrain adjacent to the ditch, and they somewhat resemble the stone accumulations defined in the northern section of the research unit. An interpretation of the stone accumulations and the ditch require

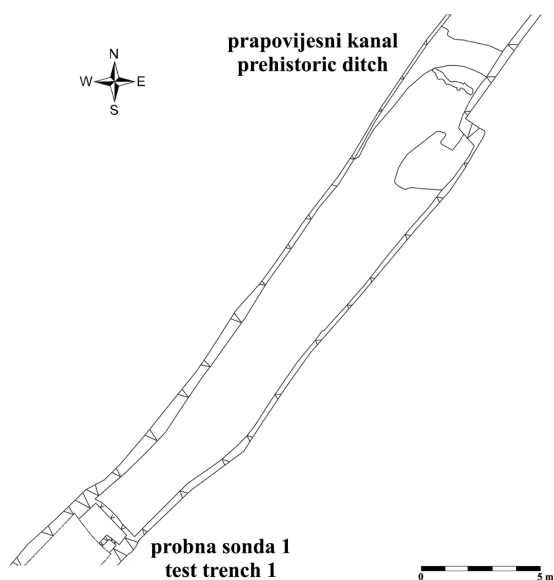
11 The width of the ditch along the eastern profile is ca. 0.95 m, and ca. 1.4 m along the western profile.

12 The width of the ditch along the eastern profile is ca. 1.05 m, and ca. 0.90 m along the western profile. The ditch has the shape of the letter *U* in cross-section. Its average depth along the western profile is 1 m, and ca. 0.5 m along the eastern profile.

13 Marijanović 2009.

14 Binford 1968; Higgs 1975; Higgs, Vita-Finzi 1972.





Sl. 7. Tlocrtni prikaz sjevernog dijela istraživačke cjeline s naznačenim položajem pokusne sonde 1 i prapovijesnog kanala

Fig. 7. Layout image of the northern section of the research unit with test trench 1 and the prehistoric ditch indicated

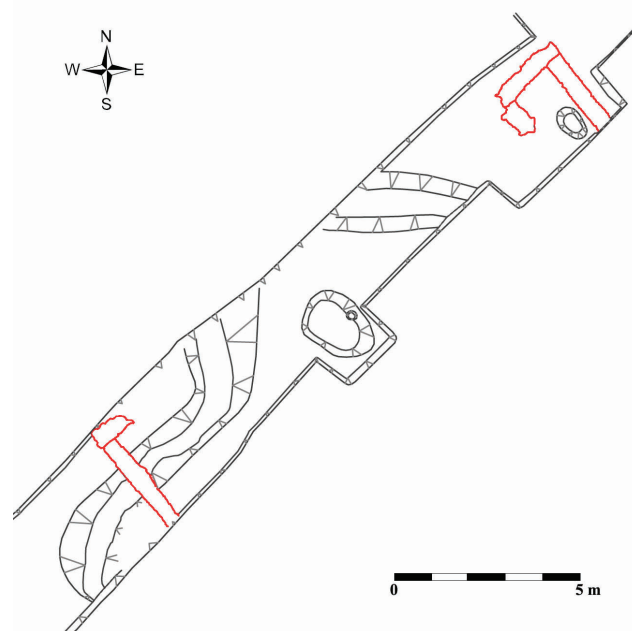
### Pokretni arheološki ostaci

Odgovore na neka pitanja vezana uz svakodnevni život, egzistencijalne potrebe, privredne i druge aktivnosti neolitičkih zajednica iz Vrcelja donekle otkriva prikupljena arheološka građa, među kojom su izdvojeni ostaci školjaka i kostiju,<sup>15</sup> keramički nalazi, kameni i kremeniti artefakti te ulomci kućnog lijepa.<sup>16</sup> Cjelokupan arheološki fundus, u kvantitativnom smislu primjeren istraženoj površini, odlikuje se jednostavnim i posve koherentnim kulturnim izrazom koji jasno ukazuje na jednu neolitičku kulturnu fazu vezanu uz sam kraj ranog neolitika na istočnom Jadranu.

Skupini najmanje zastupljenih artefakata pripada kameno oruđe, među kojim je u tipološkom i funkcionalnom smislu moguće izdvojiti sljedeće oblike: dvije kamene kugle, dva četvrtasta brusa (T. 1. 2-3), četiri kamena oblutka, žrvanj od krupnozrnatog pješčenjaka

15 Analiza arheozoološkog materijala i ljuštura mekušaca nije provedena.

16 Riječ je o ukupno četiri ulomka, od kojih se na jednom naziru tragovi otisaka pruća. Kućni lijep pronađen je u subhumusnom sloju na sjevernom djelu istraživačke cjeline, na kojem su utvrđene kamene nakupine.



Sl. 8. Tlocrtni prikaz segmenta južnog dijela istraživačke cjeline na kojem su utvrđeni ostatci kasnoantičkih struktura (označeni crvenom bojom), prapovijesni kanal i kamene nakupine

Fig. 8. Layout image of a segment of the southern section of the research unit on which the remains of structures from Late Antiquity (indicated in red), the prehistoric ditch and stone accumulations were ascertained

further research, in which particular emphasis should be placed on the horizontal dimensions of the site, meaning the opening of larger, mutually linked units essential to obtain a clearer insight into the relations between the structures found and their purpose.

In the end, the question remains as to the reasons which prompted the Neolithic community to choose an elevated, but also sloped location which required adaptation to its naturally imposed requirements and limitations, to which the complex stratigraphy and remains of the ditch testify. Judging by certain other Neolithic sites discovered at similar micro-locations, at which coexistence between nature and culture was confirmed by systematic archaeological research using interdisciplinary analysis,<sup>13</sup> it would appear that a major part of the answer to that question lies in the fertile terraces of the Bukovica slope, the surrounding pastures, water-bearing gullies and springs, and the wider Bukovica hinterland, which not only attracted people but also met all long-term living requirements of Neolithic inhabitants. Even though further research, as well as the gathering and analysis of

13 Marijanović 2009.



*Sl. 9. Prapovijesni kanal utvrđen ispod kasnoantičkih zidova (foto: Goran Đurić, Kaducej d. o. o.)*  
*Fig. 9. Prehistoric ditch ascertained beneath the Late Antique walls (photo: Goran Đurić, Kaducej d. o. o.)*



*Sl. 10. Fossil puža Campanile giganteum (foto: Borko Rožanković, Kaducej d. o. o.)*  
*Fig. 10. Campanile giganteum snail fossil (photo: Borko Rožanković, Kaducej d.o.o.)*

archaeobotanical, archaeozoological, lithic and other finds, are necessary before drawing any conclusions, the spatial-economic perspective by which a micro-location expresses the socio-economic interests and activities of a Neolithic community<sup>14</sup> must doubtlessly be one of the primary points of departure for further research into this Neolithic site.

#### **Movable archeological remains**

The answers to some questions tied to the everyday life, existential needs, economic and other activities of the Neolithic communities from Vrcelji are to a certain extent revealed by the gathered archaeological materials, among which the remains of shells and bones,<sup>15</sup> pottery finds, stone and flint artefacts and fragments of household daub<sup>16</sup> stand out. The entire body of archaeological materials, which corresponds to the examined surface in the quantitative sense, is characterized by a simple and entirely coherent cultural countenance that clearly indicates a Neolithic cultural phase tied to the very end of the early Neolithic in the eastern Adriatic seaboard.

Stone implements belong to the group of least present artefacts, among which it is possible to typologically and functionally distinguish the following

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- 14 Binford 1968; Higgs 1975; Higgs, Vita-Finzi 1972.
  - 15 An analysis of archaeozoological materials and mollusc shells was not conducted.
  - 16 There are a total of four fragments, of which traces of stick imprints can be discerned on one. The household daub was found in the sub-humus layer on the northern part of the research unit, at which the stone accumulations were ascertained.

(T. 1. 1), sjekiru jezičastog tipa i kameni tučak.<sup>17</sup> Posebnu pozornost privlači upravo kameni tučak, artefakt stožastog oblika, zaobljenog vrha i odlomljenog donjeg dijela (T. 1. 5), kojemu je analogiju moguće pronaći na nalazištu Crno vrilo.<sup>18</sup> Riječ je o predmetu koji je vjerojatno služio za fino usitnjavanje zrnate hrane ili za drobljenje korijenja i lisnatog bilja.<sup>19</sup> Izniman nalaz, a ujedno i dosad nezabilježen na neolitičkim nalazištima, je eocenski, tzv. gigantski fosil puža vrste *Campanile giganteum* (sl. 10, T. 1. 4).<sup>20</sup> Radi li se o slučajnosti ili o predmetu koji je bio dio kulturnog repertoara neolitičke zajednice, nažalost nije jasno.

Analizom litičkog materijala obuhvaćena su ukupno 163 kremenala nalaza (T. 2.-3.). Na osnovi tehnoloških značajki među kremenim je artefaktima moguće prepoznati jedanaest tehnoloških tipova.<sup>21</sup> Apsolutna dominacija odbojaka i odbojaka s okorinom (T. 3) jasno ukazuje na početne faze proizvodnje koje su se, sudeći prema korištenju lokalnog rožnjaka, sirovine i danas poznate na užem području lokaliteta, možda odvijale i u okvirima samog lokaliteta.<sup>22</sup> U tipološkoj analizi izdvojen je tek manji broj kremenih primjeka, među kojima su posebno zanimljiva sječiva s obradom na jednom rubu ili dva ruba te sječiva s tragovima *sickle gloss*, koja su povezana s poljodjelskim aktivnostima.<sup>23</sup> Veći broj alata izrađen je na odbojcima na kojima su najviše zastupljena dubila, obično povezana s obradom drvenih ili koštanih predmeta.<sup>24</sup>

Kvantitativno najbrojniju skupinu prikupljene arheološke građe čine keramički nalazi, koji su u potpunosti pripisani ulomcima keramičkih posuda.<sup>25</sup> Na

forms: two stone balls, two whetstones (P. 1. 2-3), four stone cobbles, a grindstone made of coarse-grain sandstone (P. 1. 1), a tongue-shaped axe and a stone pestle.<sup>17</sup> The latter is particularly noteworthy; it is an artefact with a conical shape and rounded tip with the lower part broken off (P. 1. 5), which has an analogy with a find from the Crno vrilo site.<sup>18</sup> This is an item which was probably used to finely grind down grain or to crush roots and leafy plants.<sup>19</sup> An exceptional find, otherwise until now not recorded at Neolithic sites, is an Eocene, so-called giant fossil snail of the species *Campanile giganteum* (Fig. 10, P. 1. 4).<sup>20</sup> Unfortunately, it is unclear as to whether this is coincidental or an item that was part of the cultural repertoire of the Neolithic community.

The lithic analysis encompassed a total of 163 flint finds (P. 2. 3). Based on the technological features, it is possible to recognize eleven technological types among the flint artefacts.<sup>21</sup> The absolute predominance of flakes and flakes with cortex (P. 3) clearly indicates the initial phases of production which, judging by the use of local chert, a raw material known in the narrower area around the site even today, may have even proceeded within the boundaries of the site itself.<sup>22</sup> Only a small number of flint specimens were set aside in the typological analysis, among which a blade with retouch on one or both edges and a blade with traces of sickle gloss, which are associated with agricultural activities.<sup>23</sup> A higher number of tools were retouched on flakes, among which most are burins, normally associated with the working of wood or bone articles.<sup>24</sup>

The quantitatively most numerous group of gathered archaeological materials consists of pottery finds, which have been entirely ascribed to ceramic

17 Nijedan od navedenih predmeta nije sačuvan u cijelosti.

18 Marijanović 2009, T. II, 3.

19 Marijanović 2009, str. 53.

20 Herak 1960, str. 366, 374, sl. 188, 6.

21 Zastupljene su: jezgre (2 kom.), sječiva (19 kom.), prvotno sječivo (1 kom.), drugotno sječivo (1 kom.), pločice (18 kom.), krhotine (10 kom.), okrhci (2 kom.), odbojčići (33 kom.), prvotni odbojak (3 kom.), drugotni odbojak (30 kom.) i odbojci (44 kom.). Tehnološki tipovi razvrstani su prema modificiranom popisu tehnoloških tipova za neolitik i eneolitik s prapovijesnog nalazišta Slavča (Šošić, Karavanić 2004, str. 23-25).

22 Potrebno je napomenuti da su na velikom broju kremenih artefakata vidljivi tragovi nastali kao posljedica izlaganja kremenala vatri.

23 Korona 2009, str. 156.

24 Od ostalih kategorija zastupljeni su: fragment zarubljenog sječiva, komadić s obradom, odbojak s cjelovitom obradom, udupci i jedno grebalo.

25 Ukupno je prikupljen i obrađen 5031 ulomak neolitičke keramike, težine 58,104 kg (Vujnović, Matana 2011, str. 37). Zbog velike razlomljenosti keramičkog materijala 1275 ulomaka nije ušlo u analizu.

17 Not one of these items has been wholly preserved.

18 Marijanović 2009, P. II, 3.

19 Marijanović 2009, p. 53.

20 Herak 1960, pp. 366, 374, Fig. 188, 6.

21 Present are: cores (2.), blades (19), primary blade (1), secondary blade (1), bladelets (18), chips (10), small chips (2), small flakes (33), primary flakes (3), secondary flakes (30) and flakes (44). The technological types have been classified according to the modified list of technological types for the Neolithic and Eneolithic from the Slavča prehistoric site (Šošić, Karavanić 2004, pp. 23-25).

22 It should be noted that traces resulting from exposure to fire are visible on a high number of the flint artefacts.

23 Korona 2009, p. 156.

24 Of the remaining categories, present are: a fragment of a truncated blade, a retouched piece, a fully retouched flake, notches and one endscraper.

temelju tehnoloških obilježja, prije svega fature posuda, keramičke je nalaze moguće podijeliti u dvije osnovne kategorije: grubu keramiku i finu keramiku. Gruba keramika glavni je nositelj općih svojstava kulturne slike nalazišta i uvjerljivo dominantna keramička skupina, kojoj pripada više od 95 % prikupljene keramičke građe. Ta je keramika izrađena od gline s većom količinom primjesa amorfnog vapnenca i kvarcita, koji do izražaja podjednako dolaze i u presjeku i na površini stijenki. Keramika je ujednačeno pečena, čvrstih stijenki, u nijansama smeđe i crvenkastosmeđe boje, tek rijetko crne ili oker boje. Svijetlo-tamne varijacije vanjske površine posude dobivene neujednačenim pečenjem evidentirane su na samo nekoliko keramičkih ulomaka. Površina posuda grube keramike u pravilu je dobro zaravnana, a zatim glačana i premazana.<sup>26</sup> Glačanje je uglavnom prisutno na obje stijenke, dok je premazivanje pretežno vezano uz vanjsku stijenku posude. U ukupnom fundusu grube keramike glačanu površinu ima oko 50 % ulomaka, a glačanu i premazanu oko 30 % ulomaka.

Unatoč skromnom keramičkom fundusu, na osnovi tipičnih dijagnostičkih ulomaka u repertoaru grube keramike moguće je izdvojiti sljedeće oblike: lonce, zdjele, zdjelice i plitice.<sup>27</sup> Među loncima su zastupljeni duboki, jajoliki lonci ravnog ili suženog otvora (T. 4. 1, 3). Njihov je obod katkad zadebljan, a kod nekih primjeraka i dodatno ukrašen u tipičnoj *impresso* maniri (T. 4. 5; T. 5. 4). U skupini zdjela ističe se veća tipološka raznovrsnost oblika, pa je moguće izdvojiti sljedeće tipove zdjela i njihove varijante:

- duboke zdjele loptastog recipijenta, uvučenog gornjeg dijela i oboda blago izvijenog prema van
- plitke i duboke poluloptaste zdjele, uvučenog gornjeg dijela (T. 4. 6)
- poluloptaste zdjele zadebljanog oboda s unutrašnje strane (T. 4. 8)
- kalotaste zdjele (T. 4. 2)
- bikonične zdjele (T. 4. 4).<sup>28</sup>

U skupini zdjelica, koja je od prethodne kategorije tipološki odvojena na osnovi manjih dimenzija,

vessels.<sup>25</sup> Based on the technological features, above all the facture of the vessels, the pottery finds can be divided into two basic categories: coarse pottery and fine pottery. Coarse pottery is the primary exemplar of the general properties of the site's cultural picture and convincingly the dominant pottery group, to which 95% of the gathered pottery finds belong. This pottery was made of clay with a high quantity of amorphous limestone and quartzite additives, which come to the fore equally in both the cross-section and on the vessel surfaces. The pottery was uniformly fired, with firm walls and colours running from brown to reddish brown nuances, and only rarely black or ochre. Light-dark variations on the external surface of the vessel obtained by non-uniform firing were only registered on a few potsherds. The surfaces of the coarse-ceramic vessels were generally nicely flattened, and then polished and coated.<sup>26</sup> Polishing was generally present on both walls, while the coating is generally linked to the external vessel walls. In the total body of coarse pottery, roughly 50% has a polished surface, while approximately 30% of the fragments is polished and coated.

Despite the modest body of pottery finds, based on the typical diagnostic fragments in the repertoire of coarse pottery, it is possible to distinguish the following shapes: pots, bowls, dishes and saucers.<sup>27</sup> Among the pots, there are deep, oval pots with flat or tapered mouths (P. 4. 1, 3). Their rims are thick, while on some they are additionally adorned in the typical Impressed Ware manner (P. 4. 5; P. 5. 4). The diversity of styles is noteworthy in the group of bowls, so it is possible to distinguish the following types and their variants:

- deep bowls with a spherical recipient, inwardly drawn upper section and slightly outwardly bent rim
- shallow and deep semi-spherical bowls, with inwardly drawn upper section (P. 4. 6)
- semi-spherical bowls with a thickened rim on the inside (P. 4. 8)
- calotte-shaped bowls (P. 4. 2)

26 Pod pojmom "premazivanje" podrazumijeva se nanošenje razrijeđenog sloja gline. Riječ je o tehničkom efektu, odnosno premazu nanošenom u svrhu sprječavanja poroznosti posude (Batović 1966, str. 56).

27 Pod dijagnostičke ulomke izdvojeni su ulomci oboda (331), dna (107), drški (13), bradavičastih aplikacija (14) te ukrašeni ulomci (59). Riječ je o ukupno 516 ulomaka, odnosno oko 10 % ukupnog keramičkog fundusa.

28 Zdjele bikonične profilacije učestalije su u razdoblju srednjeg neolitika, kada postaju jedan od vodećih oblika (Batović 1979, str. 541; Vujević, Horvat 2012, T. VII, 1-2).

25 A total of 5,031 Neolithic potsherds were gathered and processed, weighing 58,104 kg (Vujnović, Matana 2011, p. 37). Due to high fragmentation of the pottery materials, 1,275 sherds were not analyzed.

26 The term "coating" implies application of a diluted layer of clay. This is a technical effect, a coating applied for the purpose of preventing vessel porosity (Batović 1966, p. 56).

27 Diagnostic fragments included fragments of rims (331), bases (107), handles (13), wart-like applications (14) and adorned fragments (59). There were a total of 516 fragments, or approximately 10% of the total pottery.

izdvojeni su poluloptasti (T. 4. 7) i konični oblici. Među pliticama, čija je osnovna tipološka odlika plitka forma, zastupljeni su poluloptasti oblici. Jedna izrazito plitka posuda ravnog, po rubu proširenog dna, također je uvrštena u kategoriju plitica. Osim tipičnih *impresso* oblika, pronađen je i jedan ulomak posude sa zaobljenim recipijentom i višim cilindričnim, razgrnutim vratom kakav dosad nije poznat u tipologiji ranog neolitika (T. 6. 1).

Uz uobičajena ravna dna (T. 5. 6) ponekad blago proširenih rubova i niska prstenasta dna (T. 5. 2, 5), pronađena je jedna viša šuplja cilindrična noga kojoj je tipološku analogiju moguće pronaći tek u keramičkoj produkciji srednjeg neolitika (T. 6. 2), u kojem ovakve noge postaju uobičajena pojava.<sup>29</sup> Malobrojni primjerci drški tipološki se mogu pripisati trakastom (T. 5. 1) i tunelastom tipu, a na nekim se posudama umjesto njih javljaju veće stožaste i bradavičaste aplikacije, od kojih je jedna dvostruko oblikovana i uzdužno perforirana (T. 8. 4). Manje kružne perforacije izvedene su uglavnom s vanjske strane stijenke (T. 5. 3), a među njima je posebno zanimljiv ulomak sa sačuvanim korijenom trakaste drške, na čijem je mjestu nakon puknuća napravljena perforacija također s vanjske strane posude (T. 5. 3).

Ukrasni sustav grube keramike čini svega 59 ukrašenih ulomaka, odnosno oko 1,3 % ukupnoga keramičkog fundusa. Među tehnikama ukrašavanja zastupljene su sve tipične *impresso* tehnike, uz dominaciju utiskivanja (T. 7. 2-3; T. 8. 1-3). Najzastupljeniji su otisci ruba nenarebrene školjke (T. 8. 1), zatim otisci ruba narebrene školjke (T. 8. 2) te otisci nokta (T. 8. 3).<sup>30</sup> Ukrasi izvedeni urezivanjem zastupljeni su na ukupno deset ulomaka, i to u vidu kraćih plitkih ureza, koji su vjerojatno prekrivali veći dio posude, te u vidu dužih vodoravno i/ili koso postavljenih ravnih linija. Kratki urezi zastupljeni su i na jednom zadebljanom obodu lonca, dok je ostalih šest ukrašenih oboda ukrašeno žigosanjem ovalnog predmeta (T. 7. 1; T. 8. 5). Tehnika žigosanja zastupljena je na još devet posuda, čija je vanjska strana vjerojatno u cijelosti bila prekrivena gustim trokutastim ili ovalnim otiscima (T. 4. 5; T. 5. 4).<sup>31</sup> Dva ulomka ukrašena su štipanjem. Kod jednog je ulomka riječ o tipičnom štipanju (simetrično

- biconical bowls (P. 4. 4).<sup>28</sup>

In the group of bowls, which has been typologically separated from the preceding category based on the smaller dimensions, semi-spherical (P. 4. 7) and conical shapes were distinguished. Among the saucers, in which the basic typological feature is the shallow form, semi-spherical forms are present. One quite shallow vessel with a flat bottom that expands at the edges has also been included in the saucer category. Besides typical Impressed Ware forms, an additional vessel fragment was found with a rounded recipient and a higher, cylindrical jutting neck which was until now unknown in the typological of the early Neolithic (P. 6. 1).

Besides the customary flat bottoms (P. 5. 6) sometimes with slightly expanded edges and low ring-shaped base (P. 5. 2, 5), a high hollow cylindrical foot was found, to which a typological analogy can only be found in the pottery production of the middle Neolithic (P. 6. 2), in which such foot sections became a customary phenomenon.<sup>29</sup> The few examples of handles can be typologically ascribed to the ribbon (P. 5. 1) and tunnel type, while on some vessels, larger conical and wart-like applications appear, of which one is doubly rendered and longitudinally perforated (P. 8. 4). Smaller circular perforations were generally done from the external side of the walls (P. 5. 3), while among them a fragment with the preserved base of a ribbon handle is particularly interesting, as a perforation was made at its position after the fracture, also on the external side of the vessel (P. 5. 3).

The decoration system on the coarse pottery consists of only 59 decorated potsherds, or approximately 1.3% of the total pottery materials. Among the decoration techniques, all of those typical of Impressed Ware are present, with domination of impressing (P. 7. 2-3; P. 8. 1-3). The most common are imprints of ribbed shells (P. 8. 1), followed by imprints of the edges of ribbed shells (P. 8. 2) and fingernail imprints (P. 8. 3).<sup>30</sup> Decorations rendered by engraving are present on a total of ten potsherds, as short shallow incisions, which probably covered most of the vessel,

29 Korošec 1959, T. XCVI, 1-7; Batović 1962, sl. 30, 1-3; Vujević, Horvat 2012, sl. 7.

30 Otisci izvedeni utiskivanjem ruba nenarebrene školjke (najčešće dagnje) evidentirani su na ukupno 23 ulomka, otisci izvedeni rubom narebrene školjke (srčanke) evidentirani su na ukupno 4 ulomka, a otisci noktom na 3 ulomka.

31 Iako je tehnika žigosanja podudarna tehnikama utiskivanja i ubadanja, za razliku od njih ona podrazumijeva ukrašavanje posebno pripremljenih instrumenta koji

28 Bowls with biconical profile were more frequent in the middle Neolithic, when they became one of the leading shapes (Batović 1979, p. 541; Vujević, Horvat 2012, P. VII, 1-2).

29 Korošec 1959, P. XCVI. 1-7; Batović 1962, Fig. 30, 1-3; Vujević, Horvat 2012, Fig. 7.

30 Imprints made by pressing down the edges of furrowed shells (mostly from mussels) were registered on a total of 23 potsherds, imprints rendered by the edge of furrowed shells (cockles) were registered on a total of 4 potsherds, while fingernail imprints were registered on 3 potsherds.

postavljenim otiscima dva prsta), dok je kod drugog ulomka riječ o plićem ukrasu izvedenom kraćim potezima prstiju po svježoj glini (T. 8. 6). Metličasti ukras, inače karakterističan za područje Istre,<sup>32</sup> zabilježen je na jednom manjem keramičkom ulomku (T. 6. 4).

Skupinu fine keramike čini samo nekoliko keramičkih ulomaka izrađenih od fine pročišćene gline u kojoj se nazire samo sitni kristalni vapnenac. Ova je keramika jednolično pečena, tankih stijenki crne boje i glačane površine bez ukrasa. Njezine oblike nije bilo moguće utvrditi zbog malobrojnih fragmentiranih keramičkih ulomaka.

### Kronometrijsko datiranje i značenje nalazišta

Uz keramički fundus, u kojemu se uz uobičajene i već dobro poznate keramičke oblike ranog neolitika javljaju i pojedini oblici tipološki srodni keramičkoj produkciji tipičnog danilskog izraza (npr. visoka šuplja cilindrična noga i posude bikonične profilacije), u prilog vremenskom pozicioniranju nalazišta Polje niže Vrcelja pred sam kraj ranog neolitika govore i dva dostupna radiokarbonska datuma.<sup>33</sup> Prvi, stratigrafski vezan uz najdublje pozicionirane neolitičke slojeve u pokusnoj sondi 1, nalazište datira u vremenski raspon od 5540-5460 cal BC, odnosno od 5400-5390 cal BC,<sup>34</sup> a drugi, stratigrafski vezan uz neolitički kulturni sloj evidentiran ispod humusnog sloja na središnjem dijelu istraživačke cjeline, u vremenski raspon od 5520-5350 cal BC.<sup>35</sup>

Kako su uz razvojnu dinamiku, odnosno početak i kraj neolitika na području istočnog Jadrana, trajanje njegovih kronoloških faza i prelazak između pojedinih

and also as longer horizontal and/or slanted straight lines. Short incisions are also present on one thickened pot rim, while the remaining six decorated rims were adorned by stamping with an oval object (P. 7. 1; P. 8. 5). The stamping technique is present on an additional nine vessels, on which the external side was probably entirely covered with thick triangular or oval imprints (P. 4. 5; P. 5. 4).<sup>31</sup> Two fragments were decorated by pinching. On one fragment this entailed typical pinching (symmetrically set imprints of two fingers), while on another fragment it was a shallower decoration rendered by shorter finger gestures on fresher clay (P. 8. 6). The brushed decoration, otherwise typical in the territory of Istria,<sup>32</sup> was recorded on a smaller potsherd (P. 6. 4).

The fine pottery group consists of only a few potsherds made of very refined clay in which only tiny crystal sandstone can be discerned. This pottery was uniformly fired, with thin black walls and polished, undecorated surfaces. Their shapes could not be ascertained due to the few fragmented potsherds.

### Chronometric dating and significance of the site

Besides the pottery materials, which includes not only the customary and already well-known pottery forms of the early Neolithic but also individual shapes that are typologically related to the pottery production typical of Danilo expression (e.g. the high, hollow cylindrical foot and vessels with biconical articulation), the chronological specification of the Polje niže Vrcelja site to the end of the early Neolithic is also backed by the two available radiocarbon dates.<sup>33</sup> The first, stratigraphically linked to the most deeply positioned Neolithic layers in test trench 1, places the site within a chronological range of 5540-5460 cal BC, or 5400-5390 cal BC,<sup>34</sup> while the second,

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ostavljaju negativ umjetne, a ne prirodne tvorevine (Marijanović 2009a, str. 226).

- 32 Riječ je o tipu keramike koji autori svrstavaju u razdoblje od neolitika do srednjeg brončanog doba (Čović 1983, str. 112; Buršić-Matijašić 1990, str. 255; Forenbaher, Kaiser 2006, str. 177; Čuka 2009, str. 19-21). Na području sjeverne Dalmacije metličasto ukrašavanje vrlo je rijetko (Forenbaher, Vranjican 1985, str. 8).
- 33 Radiokarbonska analiza obavljena je u Beta Analytic Radiocarbon Dating Laboratory, Miami (Florida). Datumi su kalibrirani pomoću krivulje INICIAL 04.
- 34 (Beta 293840) 6520±40 BP; 2 Sigma kalibracija: Cal BC 5540 do 5460 (Cal BP 7490 do 7410) i Cal BC 5400 do 5390 (Cal BP 7450 do 7340), 1 Sigma kalibracija Cal BC 5490 do 5740 (Cal BP 7440 do 7420). Analiza je obavljena na uzorku drvenog ugljena.
- 35 (Beta-293835) 6480±50 BP; 2 Sigma kalibracija: Cal BC 5520 do 5350 (Cal BP 7470 do 7300), 1 Sigma kalibracija: Cal BC 5480 do 5460 (Cal BP 7430 do 7410), Cal BC 5440 do 5420 (Cal BP 7390 do 7370) i Cal BC 5410 do 5380 (Cal BP 7360 do 7330). Analiza je obavljena na uzorku životinjske kosti.

- 31 Although the stamping technique complemented the impressing and stippling, as opposed to the latter two it implied decoration of specially prepared instruments which left a recessed imprint of an artificial rather than natural object (Marijanović 2009a, p. 226).
- 32 This is pottery type that the authors classified to the period from the Neolithic to the middle Bronze Age (Čović 1983, p. 112; Buršić-Matijašić 1990, p. 255; Forenbaher, Kaiser 2006, p. 177; Čuka 2009, pp. 19-21). Brushed decoration was very rare in northern Dalmatia (Forenbaher, Vranjican 1985, p. 8).
- 33 Radiocarbon analysis was conducted in the Beta Analytic Radiocarbon Dating Laboratory, Miami (Florida). The dates were calibrated with the help of a INICIAL 04 curve.
- 34 (Beta 293840) 6520±40 BP; 2 Sigma calibration: Cal BC 5540 to 5460 (Cal BP 7490 to 7410) and Cal BC

neolitičkih kultura još uvijek vezana brojna otvorena pitanja,<sup>36</sup> novi radiokarbonski datumi iz Vrcelja veoma su značajni. Oni znatno pridonose boljem razumijevanju i interpretaciji dinamike i karaktera njegova razvoja, ali i promatranju užih regionalnih razvojnih posebnosti, kojima na području istočnog Jadrana i njegova zaleđa još nije posvećena dostatna pozornost.

Kako to pokazuju dostupni radiokarbonski datumi iz Rašinovaca<sup>37</sup> i Pokrovnika,<sup>38</sup> rani neolitik na području sjeverne i srednje Dalmacije započinje oko 6000 cal BC. Njegovoj završnoj fazi na istom su području pripisana neolitička nalazišta Crno vrilo, Konjevrate i Pokrovnik, koja su rezultatima radiokarbonskih analiza datirana u okvirni vremenski raspon između 5800 i 5500 cal BC.<sup>39</sup> Tipološki i stilski čisti srednjoneolitički (danilski) stil javlja se tek dva stoljeća kasnije, oko 5300 cal BC, o čemu svjedoče datumi iz Danila Bitinja,<sup>40</sup> Pokrovnika<sup>41</sup> i Barica u Benkovcu.<sup>42</sup> Dosadašnji vremenski jaz koji odgovara prijelaznom razdoblju između ranoga i srednjega neolitika, upotpunjavanju upravo novi radiokarbonski datumi iz Vrcelja. Oni prije svega potvrđuju da *impresso* kultura na tom području traje barem do 5400 cal BC, čime je napravljen novi korak prema preciznijem definiranju ukupnoga vremenskog raspona starijeg neolitika sjeverne i srednje Dalmacije. Ujedno, precizna datacija ovog nalazišta postaje veoma značajna u kontekstu otvorenih pitanja koja se tiču kontinuiranoga razvojnog slijeda između ranoga i srednjega neolitika, odnosno proučavanja sadržaja koji karakteriziraju završni stupanj *impresso* kulture i početni stupanj danilske kulture. Kako to pokazuje prikupljena keramička građa, uz spomenute tipološke srodnosti dviju kultura, iznimno su značajne i pojave u ukrasnom sustavu, kao jedna od ključnih poveznica između tih dvaju kulturnih entiteta.

stratigraphically linked to the Neolithic cultural layer recorded beneath the humus layer in the central section of the research unit, within the chronological range of 5520-5350 cal BC.<sup>35</sup>

Since many questions are still associated with the developmental course, meaning the onset and close of the Neolithic in the eastern Adriatic seaboard, the duration of its chronological phases and the transition between individual Neolithic cultures,<sup>36</sup> the new radiocarbon dates from Vrcelji are quite significant. They substantially contribute to a better understanding and interpretation of the tempo and character of its development, as well as the observation of narrower regional specificities, to which not enough attention in the eastern Adriatic and its hinterland has been dedicated.

As shown by the available radiocarbon dates from Rašinovci<sup>37</sup> and Pokrovnik,<sup>38</sup> the early Neolithic in northern and central Dalmatia began at around 6000 cal BC. The Neolithic sites of Crno vrilo, Konjevrate and Pokrovnik have been ascribed to its closing phase in this same territory, as the radiocarbon analysis results from those sites were dated within a general chronological range between 5800 and 5500 cal BC.<sup>39</sup> The typologically and stylistically pure middle Neolithic (Danilo) style only appeared two centuries later, at around 5300 cal BC, to which the dates from Danilo Bitinja,<sup>40</sup> Pokrovnik<sup>41</sup> and Barice in

36 Forenbaher, Kaiser 1999; Forenbaher, Kaiser 2005; Forenbaher, Kaiser 2006; Marijanović 2007; Forenbaher *et al.* 2013; McClure *et al.* 2014.

37 PSU-5612/ UCIAMS-127394: 6005-5895 cal BC (Podrug *et al.* 2014, Tab. 1.).

38 PSU-5293/UCIAMS-116205: 6025-5965 cal BC (McClure *et al.* 2014, Tab. 1).

39 Naselje na Crnom vrilu datirano je okvirno između 5800-5600 BC (Marijanović 2009, str. 114), a nalazišta u Konjevratima (PSU-5291/UCIAMS-116203: 5630-5535 cal BC) i Pokrovniku (OxA-17125: 5615-5585 cal BC) nešto ranije (McClure *et al.* 2014, Tab. 1).

40 OxA-14449: 5341-5330 cal BC, OxA-15764: 5305/5195 cal BC (Moor *et al.* 2007, str. 21).

41 PSU-4960/UCIAMS-106477: 5310-5215 cal BC (Podrug *et al.* 2014, Tab. 1)

42 Beta-327216: 5210-5000 cal BC (Marijanović 2012, Tab. 1).

5400 to 5390 (Cal BP 7450 to 7340), 1 Sigma calibration Cal BC 5490 to 5740 (Cal BP 7440 to 7420). The analysis was conducted on a charcoal sample.

35 (Beta-293835) 6480±50 BP; 2 Sigma calibration: Cal BC 5520 to 5350 (Cal BP 7470 to 7300), 1 Sigma calibration: Cal BC 5480 to 5460 (Cal BP 7430 to 7410), Cal BC 5440 to 5420 (Cal BP 7390 to 7370) and Cal BC 5410 to 5380 (Cal BP 7360 to 7330). The analysis was conducted on a sampling of animal bones.

36 Forenbaher, Kaiser 1999; Forenbaher, Kaiser 2005; Forenbaher, Kaiser 2006; Marijanović 2007; Forenbaher *et al.* 2013; McClure *et al.* 2014.

37 PSU-5612/ UCIAMS-127394: 6005-5895 cal BC (Podrug *et al.* 2014, Pl. 1).

38 PSU-5293/UCIAMS-116205: 6025-5965 cal BC (McClure *et al.* 2014, Pl. 1).

39 The settlement in Crno vrilo has been roughly dated between 5800-5600 BC (Marijanović 2009, p. 114), while the site in Konjevratima (PSU-5291/UCIAMS-116203: 5630-5535 cal BC) and Pokrovnik (OxA-17125: 5615-5585 cal BC) were dated somewhat later (McClure *et al.* 2014, Pl. 1).

40 OxA-14449: 5341-5330 cal BC, OxA-15764: 5305/5195 cal BC (Moor *et al.* 2007, p. 21).

41 PSU-4960/UCIAMS-106477: 5310-5215 cal BC (Podrug *et al.* 2014, Pl. 1)

Naime, analizom keramike na nalazištu starijega i srednjeg neolitika u Pokrovniku utvrđeno je postupno smanjenje/postupan nestanak *impresso* ukrasa na keramici od nižih (*impresso*) prema višim (danilskim) slojevima.<sup>43</sup> Ti se podatci mogu povezati sa skupovima neukrašene keramike prikupljene na nekim drugim nalazištima datiranim na sam kraj ranoga i početak srednjeg neolitika (npr. na Đurđevoj gredi,<sup>44</sup> Spili u Nakovani,<sup>45</sup> Vaganačkoj pećini na Velebitu<sup>46</sup>),<sup>47</sup> kojima nalazište Polje niže Vrcelja, s tek 1,3 % ukrašene *impresso* keramike, dobro odgovara. Riječ je o tzv. prijelaznom horizontu između *impresso* kulture i danilske kulture, obilježenom postupnim nestankom *impresso* ukrasa, odnosno potpunim nedostatkom ukrasa na keramici (tzv. *horizont neukrašene lončarije*<sup>48</sup>). Iako se ideja o postojanju takvog prijelaznog horizonta čini vrlo zanimljivom, jasno definiranje svih sadržaja koji karakteriziraju kasni stupanj ranoga i inicijalni stupanj srednjega neolitika na području sjeverne i srednje Dalmacije, pa i ostatku istočnojadranskog prostora, zahtijeva daleko veći broj istraženih lokaliteta, s precizno datiranim stratigrafskim jedinicama kasnog stupnja *impresso* i ranog stupnja danilske kulture te preciznu analizu keramičkog materijala. Pritom je nužno veću pozornost posvetiti ukrasnom sustavu, kao jednom od ključnih argumenata u rekonstrukcijama unutarnjih razvojnih mijena. Prostor sjeverne Dalmacije, na kojem je do danas evidentiran velik broj nalazišta ranoga i srednjeg neolitika, u tom pogledu bez sumnje nudi velike mogućnosti, kako to uostalom potvrđuje i neolitičko nalazište na položaju Polje niže Vrcelja.

## Zaključak

Iako je istraživanjem lokaliteta Polje niže Vrcelja obogaćena arheološka karta benkovačke regije i upotpunjena slika i predodžba o neolitiku istočnog Jadrana, nameće se potreba za daljnjim istraživanjima sustavnog karaktera. Definiranje karaktera nalazišta, kamenih struktura i kanala samo su neka od prioritarnih pitanja koja predstavljaju polazište i poticaj te velik izazov budućim istraživanjima ovog lokaliteta, značajnog u pogledu definiranja kulturnih sadržaja kasne faze *impresso* kulture i rane faze danilske

Benkovac attest.<sup>42</sup> The previous chronological gap which corresponded to the transitional period between the early and middle Neolithic is now filled with the new radiocarbon dates from Vrcelji. They above all confirm that the Impressed Ware culture in this area lasted at least until 5400 cal BC, which constitutes a new step toward the more precise definition of the total chronological range of the older Neolithic in northern and central Dalmatia. At the same time, the precise dating of this site becomes quite significant in the context of the open questions pertaining to continuous development between the early and middle Neolithic, i.e., the study of the content that characterizes the final phase of Impressed Ware culture and the initial stage of the Danilo culture. As shown by the gathered pottery materials, alongside the aforementioned typological similarities between the two cultures, the features of the decoration system are also exceptionally important as a key link between these two cultural entities.

Namely, an analysis of the pottery at the older and middle Neolithic site in Pokrovnik has established a gradual reduction/disappearance of Impressed Ware adornments on pottery from the lower (Impressed Ware) to higher (Danilo) layers.<sup>43</sup> These data may be linked to groups of unadorned pottery gathered at certain other sites dated to the very end of the early and the onset of the middle Neolithic (e.g. at Đurđeva greda,<sup>44</sup> Spila u Nakovani,<sup>45</sup> Vaganačka pećina on the Velebit massif<sup>46</sup>)<sup>47</sup> to which the Polje niže Vrcelja site, with only 1.3% Impressed Ware decorated pottery, corresponds quite well. This is the so-called transitional horizon between the Impressed Ware and Danilo cultures, characterized by the gradual disappearance of Impressed Ware decoration, i.e., the complete absence of decoration on pottery (the so-called undecorated pottery horizon).<sup>48</sup> Even though the idea of the existence of such a transitional horizon seems very interesting, the clear definition of all content which characterizes the late stage of the early Neolithic and the initial phase of the middle Neolithic in northern and central Dalmatia, as well as the rest of the eastern Adriatic seaboard, requires a far higher number of researched sites, with precisely dated stratigraphic

43 McClure *et al.* 2014, str. 1030.

44 Forenbaher, Vujnović 2013, str. 17.

45 Forenbaher, Kaiser 2010, str. 27.

46 Forenbaher, Vranjican 1985, str. 8.

47 Svi raspoloživi radiokarbonski datumi za tu keramičku vrstu na navedenim nalazištima međusobno su vrlo bliski i datiraju je oko 5600. god. pr. Kr. (Forenbaher, Vujnović 2013, str. 17).

48 Forenbaher, Vujnović 2013, str. 17-18.

42 Beta-327216: 5210-5000 cal BC (Marijanović 2012, Pl. 1).

43 McClure *et al.* 2014, p. 1030.

44 Forenbaher, Vujnović 2013, p. 17.

45 Forenbaher, Kaiser 2010, p. 27.

46 Forenbaher, Vranjican 1985, p. 8.

47 All available radiocarbon dates for this pottery type at these sites were mutually quite similar and have been dated to roughly 5600 BC (Forenbaher, Vujnović 2013, p. 17).

48 Forenbaher, Vujnović 2013, pp. 17-18.



kulture. Uz potrebu za odgovarajućim odmakom od istraživačkih pristupa i strategija orijentiranih isključivo stilsko-tipološkim i kronološkim okvirima, nužno je postavljanje ambicioznijih ciljeva, ostvarivih jedino uz pomoć interdisciplinarnog pristupa, koji se nameće kao jedna od glavnih smjernica u budućim istraživanjima.\*

units of the late stage of Impressed Ware and the early stage of the Danilo culture and a precise analysis of pottery materials. Herein much greater attention must be dedicated to the decoration system, as one of the key arguments in reconstructions of internal developmental changes. Northern Dalmatia, in which a high number of early and middle Neolithic sites have been registered thus far, doubtlessly has great prospects in this regard, as indeed confirmed by the Neolithic site at Polje niže Vrcelja.

### Conclusions

Although research into the Polje niže Vrcelja site has enriched the archaeological map of the Benkovac region and enhanced the picture and notions of the Neolithic in the eastern Adriatic seaboard, it imposes the need for further research with a systematic character. Definition of the nature of the site, its stone structures and ditches are only some of the priority questions that serve as a point of departure and impetus – as well as a great challenge – to future research into this site, so vital in the sense of defining the cultural content of the late phase of the Impressed Ware culture and the early phase of the Danilo culture. Along with the need for an appropriate move away from research approaches and strategies oriented exclusively toward stylistic-typological and chronological frameworks, it will be necessary to set ambitious objectives, achievable only by means of an interdisciplinary approach, which imposes itself as one of the primary pillars of future research.

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\*Crteži / Drawings:

Iva Marochini (T. / P. 1, 4-7)

Sonja Kačar (T. / P. 2)

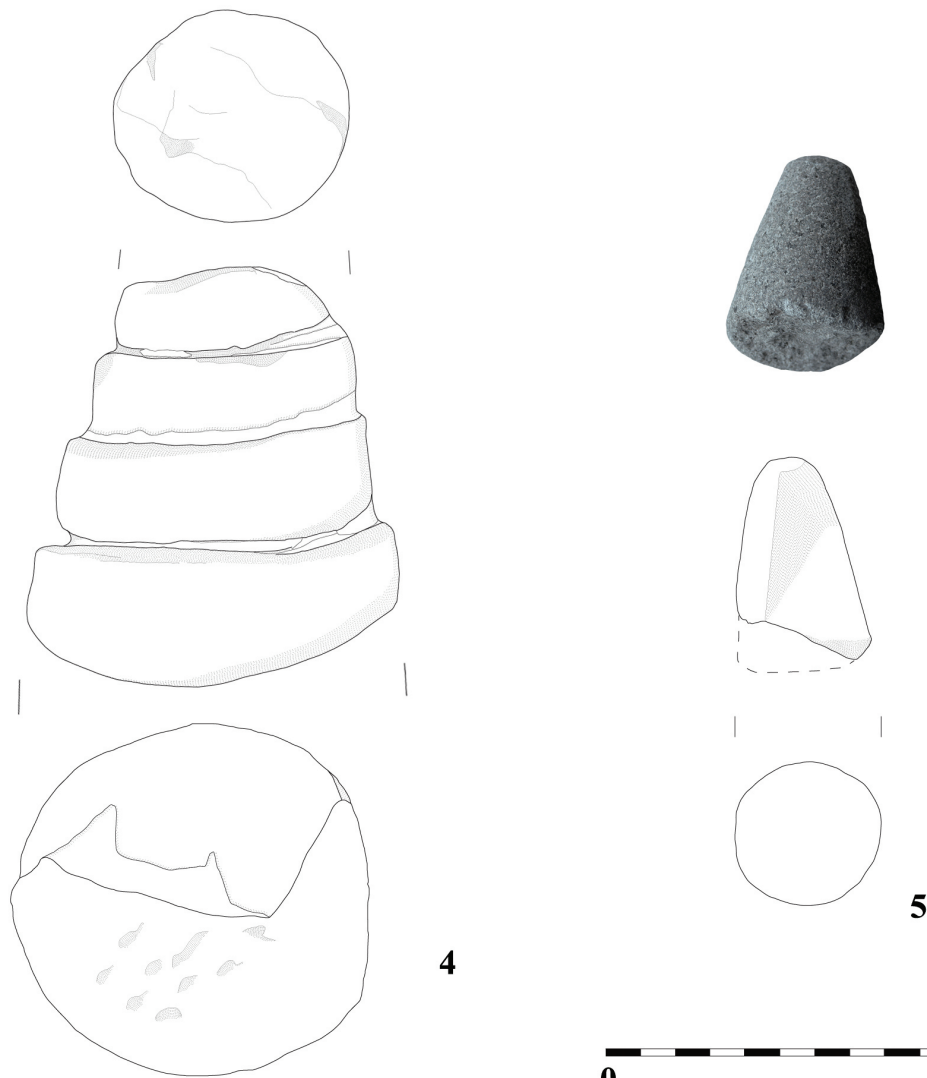
Zoran Bakić (T. / P. 3)

Fotografije / Photographs:

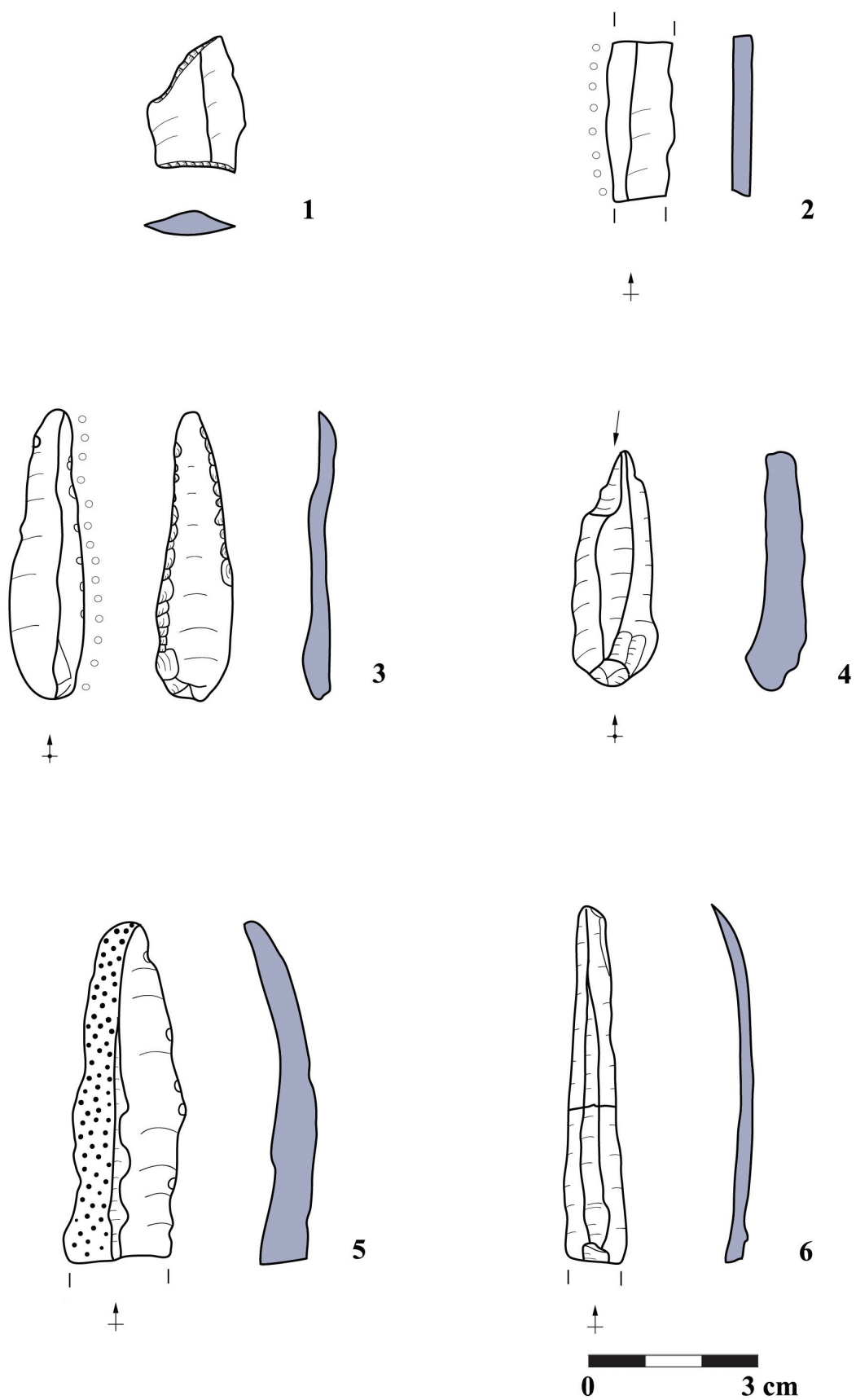
Borko Rožanković (T. / P. 1, 6-8)

Mate Parica (T. / P. 3)

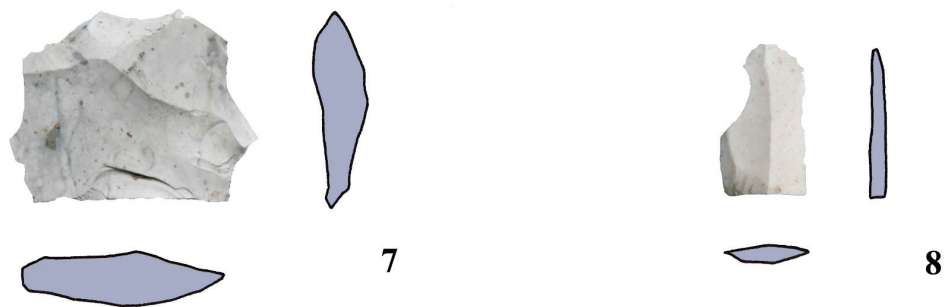
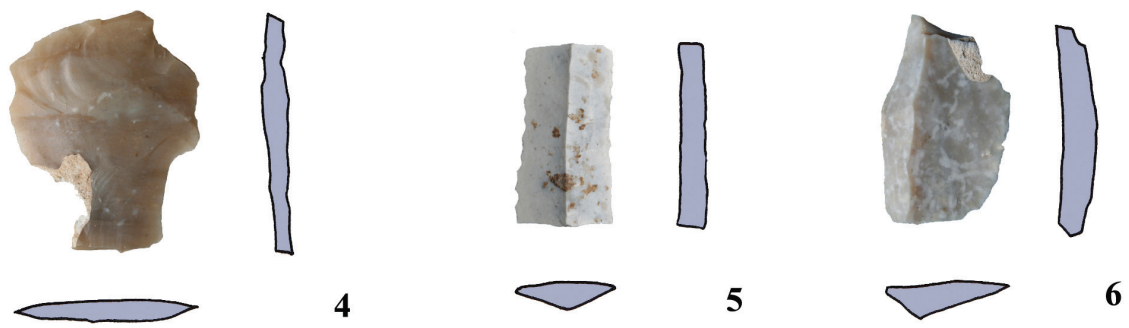
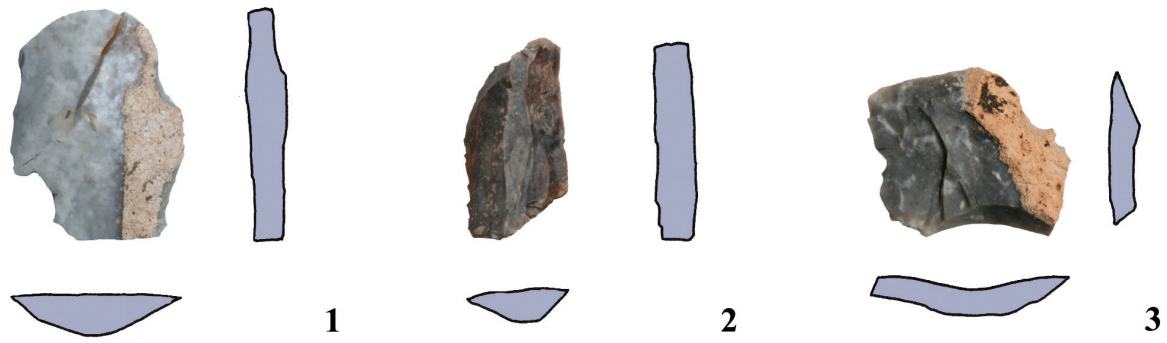
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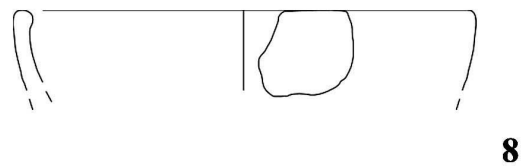
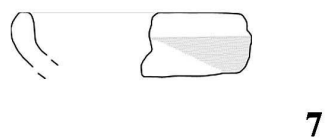
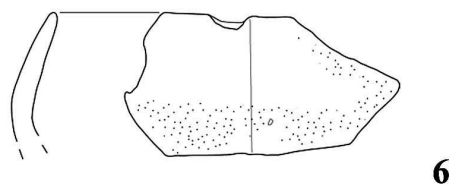
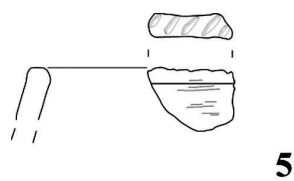
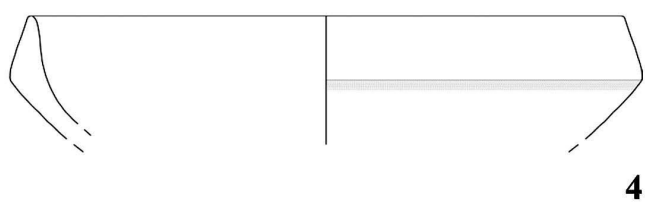
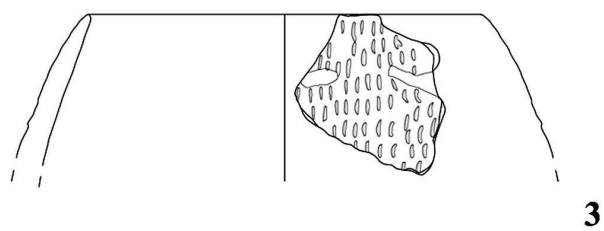
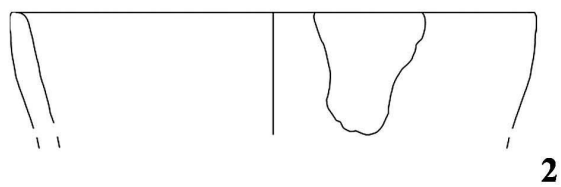
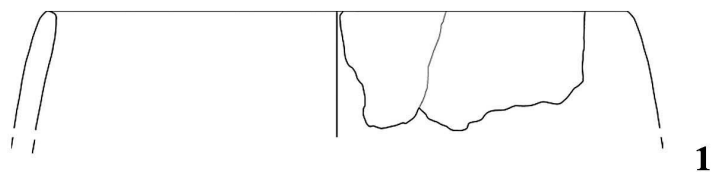
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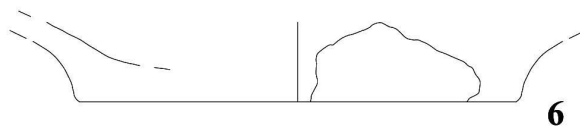
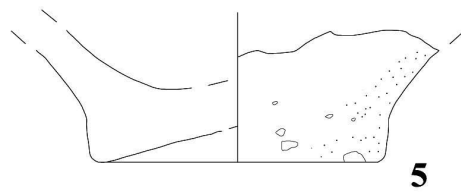
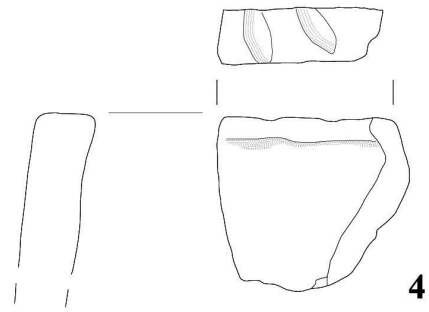
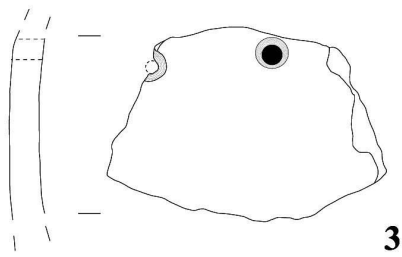
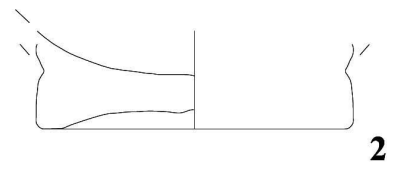
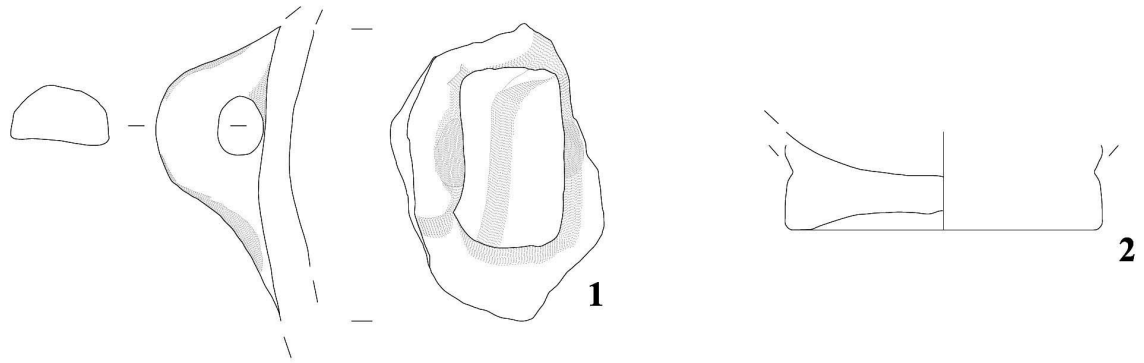
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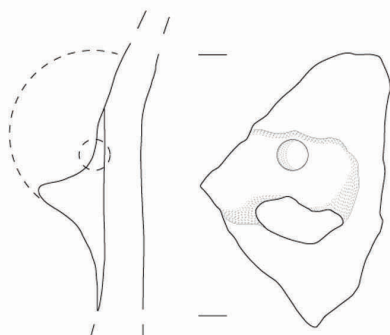
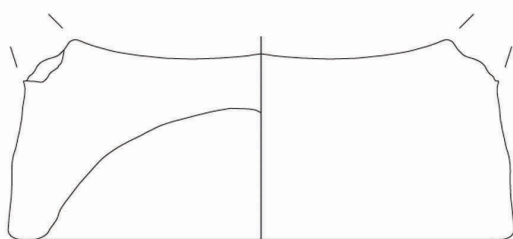
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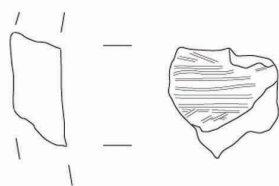
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T. 6 / P. 6



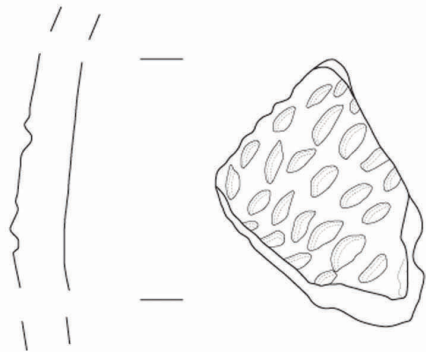
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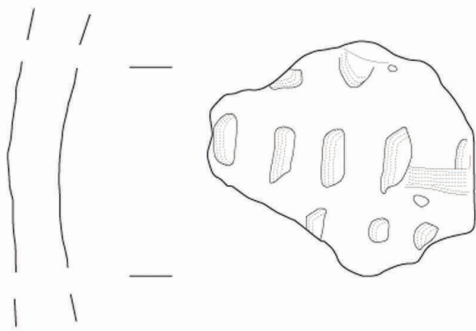
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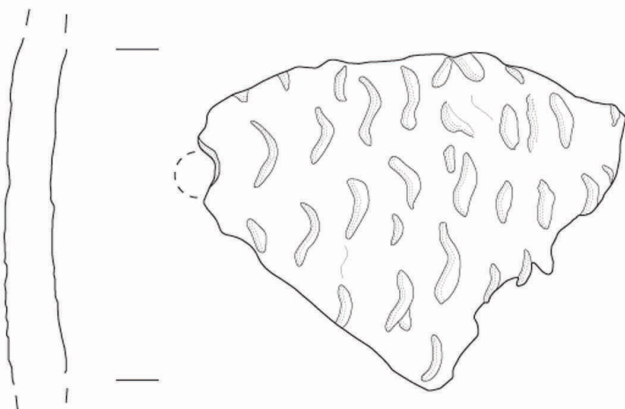
T. 7 / P. 7



1



2



3





T. 8 / P. 8



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