Vorganjska peć u kontekstu sjevernojadranskoga neolitika

Sirovica, Filomena; Korić, Martina; Kačar, Sonja; Philibert, Sylvie; Perhoč, Zlatko; Mihelić, Sanjin

UDK 902
ISSN 1330-0644
Vol. 38/1
ZAGREB, 2021.

PRILOZI

Instituta za arheologiju u Zagrebu

Pril. Inst. arheol. Zagrebu
Str./*Pages* 1–104, Zagreb, 2021.

Pril. Inst. arheol. Zagrebu, 38/1/2021
Str./*Pages* 1–104, Zagreb, 2021.

Izdavač/*Publisher*
INSTITUT ZA ARHEOLOGIJU
INSTITUTE OF ARCHAEOLOGY

Adresa uredništva/*Address of the editor's office*
Institut za arheologiju/*Institute of archaeology*
HR–10000 Zagreb, Jurjevska ulica 15
Hrvatska/*Croatia*
Telefon/Phone ++385/(0)1 61 50 250
Fax ++385(0)1 60 55 806
e-mail: urednistvo.prilozi@iarh.hr
http://www.iarh.hr

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E-izdanja. Publikacija je dostupna u digitalnom obliku i otvorenom pristupu na
https://hrcak.srce.hr/prilozi-iaz
E-edition. The publication is available in digital and open access form at
https://hrcak.srce.hr/prilozi-iaz?lang=en

Naklada/Issued
400 primjeraka/400 copies

Prilozi Instituta za arheologiju u Zagrebu uključeni su u sljedeće indekse/
Prilozi Instituta za arheologiju u Zagrebu are included in following indices:
DYABOLA – Sachkatalog der Bibliothek – Römisch-Germanische Kommission des Deutschen Archaeologischen Instituts, Frankfurt a. Main
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SciVerse Scopus – Elsevier, Amsterdam

Pril. Inst. arheol. Zagrebu, 38/1/2021
Str./*Pages* 1–104, Zagreb, 2021.

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Vorganjska peć u kontekstu sjevernojadranskoga neolitika

Vorganjska peć cave site in the context of the Northern Adriatic Neolithic

Izvorni znanstveni rad
Prapovijesna arheologija

Original scientific paper
Prehistoric archaeology

UDK/*UDC* 903.3(262.3–18)(497.5 Baška)"634"

Primljeno/*Received*: 27. 10. 2020.
Prihvaćeno/*Accepted*: 20. 01. 2021.

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Vorganjska peć važno je prapovijesno pećinsko nalazište smješteno na padini brda Organ iznad Batomlja kraj Baške na otoku Krku. Sredinom 20. stoljeća ovo, kao i druga pećinska nalazišta na kvarnerskim otocima, počinje istraživati Vladimir Mirosavljević. Zahvaljujući rezultatima njegovih istraživanja Vorganjska peć, zajedno s Jami na Sredi na otoku Cresu te Velom špiljom na otoku Lošinju, postaje značajan izvor podataka o neolitiku Kvarnera i time neizostavni dio rasprava o tome razdoblju na istočnojadranskoj obali. Kako istraživanja nikad nisu u cijelosti objavljena, revizijsko arheološko iskopavanje provedeno je kao provjera davno prikupljenih podataka o načinima korištenja špilje tijekom prapovijesti. Rezultati istraživanja dali su uvid u stratigrafski slijed intaktnih prapovijesnih arheoloških depozita s nalazima koji pripadaju razdoblju ranoga i srednjega neolitika. Analiza stratifikacije i prikupljenih pokretnih arheoloških nalaza doprinosi širenju uvida u kompleksne mehanizme procesa neolitizacije istočnoga Jadrana te govori o nedvojbenom informativnom i interpretativnom značenju ovoga nalazišta za razmatranja problematike sjevernojadranskoga neolitika.

Ključne riječi: pećinsko nalazište, rani neolitik, srednji neolitik, sjeverni Jadran, keramika, litička tehnologija

Vorganjska peć is an important prehistoric cave site located on the slope of Organ hill above Batomalj near Baška on the island of Krk. The research of this site, as well as other cave sites on Kvarner islands, was initiated by Vladimir Mirosavljević in the mid-twentieth century. As the result of his research, Vorganjska peć, alongside Jami na Sredi on the island of Cres and Vela špilja on the island of Lošinj, became a significant source of data about the Neolithic of the Kvarner region and thereby an essential part of discussions about this period on the eastern Adriatic coast. Since this research was never fully published, the site was re-excavated in order to review previously obtained data about the cave usage in prehistory. The research results provided insight into the stratigraphic sequence of intact prehistoric archaeological deposits with Early and Middle Neolithic finds. The analysis of stratification and artefacts contributes to our knowledge of complex mechanisms of neolithisation of the eastern Adriatic and confirms the undeniable informative and interpretative significance of the site in the studies of the northern Adriatic Neolithic.

Key words: cave site, Early Neolithic, Middle Neolithic, northern Adriatic, pottery, lithic technology

UVOD

Arheološko nalazište Vorganjska peć smješteno je na padini brda Organ iznad Batomlja kraj Baške na otoku Krku (karta 1). Položaj predstavlja važno prapovijesno pećinsko nalazište koje je, zajedno s Jami na Sredi na otoku Cresu te Velom špiljom na otoku Lošinju, značajan izvor podataka o neolitiku Kvarnera i time neizostavni dio rasprava o tome razdoblju na istočnojadranskoj obali. Nalazi se na 251 m nadmorske visine, na sjevernoj strani vapnenačke visoravni koja s jugozapadne strane obrubljuje bašćansku dolinu. Riječ je o manjoj špilji koja je u novije vrijeme služila kao pastirsko sklonište (sl. 1). Čini ju jedna izdužena prostorija dimenzija oko 7 x 4 m s ulazom na sjeveroistoku. Danas se ispred ulaza nalazi manji plato podložan odronima s kojega se pruža pogled na sjeveroistočnu vapnenačku visoravan, bašćansko polje i široku bašćansku uvalu (sl. 2).

Od 1955. godine pećinska nalazišta smještena na kvarnerskim otocima, pa tako i Vorganjsku peć, počinje istraživati Vladimir Mirosavljević te svoje rezultate objavljuje u nekoliko navrata (Mirosavljević 1959; 1960; 1962; 1968; 1971). Na žalost, istraživanja u Vorganjskoj peći samo su djelomično objavljena (Mirosavljević 1962) kroz izbor iz prikupljenoga pokretnog arheološkog materijala među kojim se, uz ulomke keramičkih posuda, ističu i različiti predmeti od kosti i rožnjaka (Mirosavljević 1962: 179). Iz navedenih podataka može se iščitati da je riječ o nalazištu obilježenom pojavom ranoneolitičkih arheoloških ostataka s ulomcima keramičkih posuda koji imaju značajke impreso stila, dok depoziti s materijalom kasnijih faza neolitika nisu utvrđeni. V. Mirosavljević nalaze povezuje s horizontom koji naziva prvim kulturnim slojem obilježenim materijalom usporedivim s onim nađenim u takozvanom drugom sloju Jami na Sredi i sadržajem prvoga sloja u Veloj špilji (Mirosavljević 1962: 179, 193).[1] Iako se Vorganjska peć, zajedno s Jami na Sredi te Velom špiljom, ponekad spominje u razmatranjima istočnojadranskoga mezolitika (Batović 1978a; Benac 1978; 1987; Marijanović 2007: 18, 29; 2009: 124), V. Mirosavljević svojim istraživanjima u Vorganjskoj peći nije ustanovio ni mezolitičke depozite kao ni materijal koji bi pripisao tome razdoblju, pa je pitanje mezolitika na ovome položaju do danas ostalo otvoreno.[2] Kako istraživanja na nalazištu nikada nisu nastavljena, 2016. godine provedeno je arheološko iskopavanje kao provjera davno prikupljenih podataka o načinima korištenja špilje tijekom prapovijesti te je jedan od temeljnih ciljeva ovoga istraživanja bila revizija stratigrafskoga slijeda i njegovoga odnosa prema pokretnim arheološkim ostacima.[3]

1 Nešto kasnije u tekstu V. Mirosavljević prvi sloj Vorganjske peći izjednačava s drugim slojem Vele špilje, dok prvi sloj Vele špilje, kao i kod Jami na Sredi, pripisuje mezolitiku (Mirosavljević 1962: 204–205).

2 Jedini poznati materijal iz Vorganjske peći koji se veže uz ranija razdoblja prapovijesti par je strugala načinjenih od sivoga rožnjaka koja je ispred špilje našao V. Ribak iz Zagreba, a pripisana su musterijenu (Malez 1979: 224, 274).

3 Istraživanja pod vodstvom Filomene Sirovice provedena su u periodu od 22. listopada do 3. studenog 2016. godine. Izvedena su uz potporu Ministarstva kulture RH, u suradnji Istraživačkog i edukacijskog centra Processus Montanus i Arheološkog muzeja u Zagrebu.

INTRODUCTION

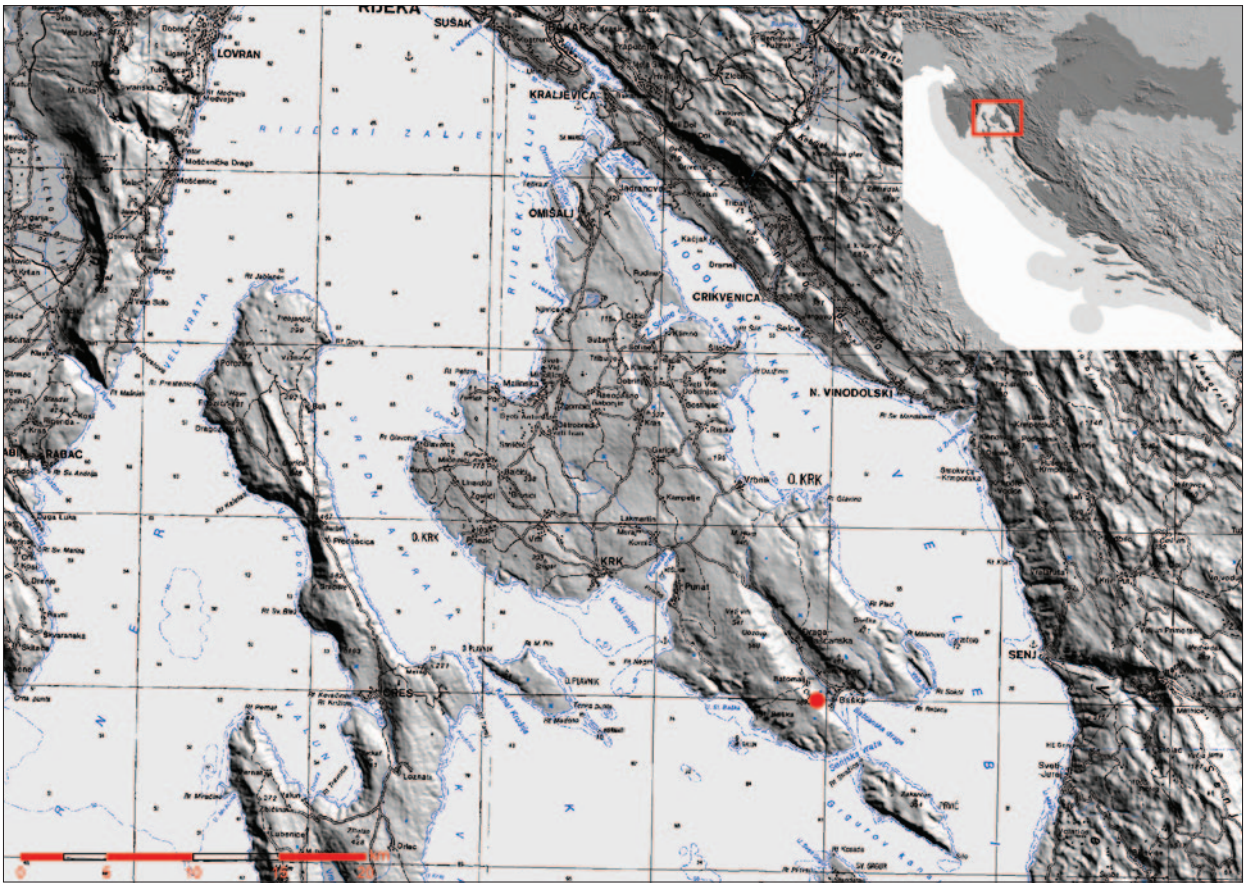
The archaeological site of Vorganjska peć is located on the slope of Organ hill above Batomalj near Baška on the island of Krk (Map 1). This important prehistoric cave site is, alongside Jami na Sredi on the island of Cres and Vela špilja on the island of Lošinj, a significant source of data about the Neolithic of the Kvarner region and thereby an essential part of discussions about this period on the eastern Adriatic coast. It is located 251 m above sea level, on the north side of the limestone plateau flanking the Baška valley from the south-west. It is a minor cave that served as a shelter for shepherds in the recent past (Fig. 1). It consists of one long chamber measuring 7 x 4 m, with entrance to the north-east. Today it opens onto a small plateau susceptible to landslides, with a view of the north-eastern limestone plateau, the Baška valley and the wide Baška bay (Fig. 2).

Vladimir Mirosavljević started investigating the cave sites of Kvarner islands, including Vorganjska peć, in 1955 and published the results on several occasions (Mirosavljević 1959; 1960; 1962; 1968; 1971). Unfortunately, the research of Vorganjska peć was only partially published (Mirosavljević 1962) as a selection of collected artefacts which, in addition to potsherds, included various bone and chert artefacts (Mirosavljević 1962: 179). The published data reveal that the site is marked by Early Neolithic archaeological remains containing potsherds with Impressed Ware features, while deposits with the material from the later phases of the Neolithic were not identified. V. Mirosavljević linked the finds with a horizon he referred to as the first cultural layer, marked by the material comparable to the finds from the so-called second layer at Jami na Sredi and the first layer at Vela špilja (Mirosavljević 1962: 179, 193).[1] Although Vorganjska peć is occasionally mentioned, together with Jami na Sredi and Vela špilja, in discussions of the eastern Adriatic Mesolithic (Batović 1978a; Benac 1978; 1987; Marijanović 2007: 18, 29; 2009: 124), V. Mirosavljević did not find Mesolithic deposits nor material he would attribute to this period in his research of Vorganjska peć, so the question of the Mesolithic at this site is yet to be resolved.[2] Since the research of the site was discontinued, archaeological excavation was conducted in 2016 in order to review previously obtained data about the cave usage in prehistory. One of the basic goals of this research was the revision of the stratigraphic sequence and its relation to the artefacts.[3]

1 Later in the text, V. Mirosavljević equates the first layer of Vorganjska peć with the second layer of Vela špilja, while he attributes the first layer of Vela špilja, as well as that of Jami na Sredi, to the Mesolithic (Mirosavljević 1962: 204–205).

2 The only known material from Vorganjska peć considered to belong to earlier prehistoric periods is a pair of grey chert scrapers found in front of the cave by V. Ribak from Zagreb, which were attributed to the Mousterian (Malez 1979: 224, 274).

3 The research led by Filomena Sirovica was conducted in the period from 22 October to 3 November 2016. It was carried out with the support of the Ministry of Culture of the Republic of Croatia in collaboration with the Processus Montanus Research and Education Centre and Archaeological Museum in Zagreb.



Karta 1 Položaj nalazišta Vorganjska peć (izradio: D. Tresić Pavičić; podloge: EU-DEM, produced using Copernicus data and information funded by the European Union; TK200, Geoportal)

Map 1 Position of Vorganjska peć (made by: D. Tresić Pavičić; base maps: EU-DEM, produced using Copernicus data and information funded by the European Union; TK200, Geoportal)

Sl. 1 Pogled na unutrašnjost Vorganjske peći (snimila: F. Sirovica)

Fig. 1 View of the interior of Vorganjska peć (photo by: F. Sirovica)

Sl. 2 Pogled prema bašćanskoj uvali s položaja Vorganjska peć (snimio: T. Ivančić)
Fig. 2 View of the Baška bay from the position of Vorganjska peć (photo by: T. Ivančić)

STRATIGRAFSKI SLIJED

Revizijskim arheološkim istraživanjima u unutrašnjosti Vorganjske peći istražene su dvije sonde ukupne površine oko 4,5 m^2. Kako bi bila smještena uz sondu V. Mirosavljevića, sonda 1, dimenzija oko 2,5 x 1 m, postavljena je na osnovi tlocrta priloženoga objavi dijela pokretnoga arheološkog materijala nađenog tijekom istraživanja provedenih sredinom 20. stoljeća (Mirosavljević 1962: 191) i situacije utvrđene na terenu. Istraživanjem je utvrđeno da su depoziti u sondi 1 poremećeni te da objavljeni tlocrt u potpunosti ne odgovara stvarnoj situaciji. Naime, 11 stratigrafskih jedinica utvrđenih u sondi 1, uz tanke površinske slojeve nastale boravkom ovaca u unutrašnjosti špilje, čine različiti tipovi depozita interpretirani kao zapune staroga iskopa. Dobiveni rezultati ukazuju da je iskop izvršen 1950-tih zahvatio znatno veći dio špilje od onoga naznačenoga na objavljenom tlocrtu te je obuhvatio i područje na koje je smještena sonda 1. Na osnovi utvrđene situacije moguće je pretpostaviti da su istraživanja V. Mirosavljevića obuhvatila površinu dimenzija oko 4 x 3 m što iznosi više od 40% ukupne površine špiljske unutrašnjosti.[4] Iz tog je razloga, oko 0,5 m južno od sonde 1, na prostoru za koji je utvrđeno da nije zahvaćen istraživanjima, smještena sonda 2 dimenzija 2 x 1 m (sl. 3). Ipak, odmah po uklanjanju površinskih slojeva, i ovdje su definirani vjerojatno recentni ukopi zapunjeni sedimentima u kojima je nađena znatna količina pokretnoga arheološkog materijala. Unatoč tome,

4 Ukupna površina okvirno je rekonstruirana na osnovi rezultata istraživanja i vidljivih promjena u visini današnje hodne površine. Slične promjene zabilježene su i u najdubljem, jugozapadnom dijelu pećine te je moguće da su i drugi dijelovi špilje u nekom trenutku bili podvrgnuti iskopu.

STRATIGRAPHIC SEQUENCE

During archaeological re-excavation of the interior of Vorganjska peć, two trenches of the overall surface of 4.5 m^2 were explored. In order to place it by the trench excavated by V. Mirosavljević, Trench 1, measuring 2.5 x 1 m, was positioned according to the ground plan included in the partial publication of the artefacts retrieved during the research conducted in the mid-twentieth century (Mirosavljević 1962: 191) and based on the situation at the site. The research found that the deposits in Trench 1 had been disturbed and that the published plan does not fully correspond to the situation at the site. Namely, 11 stratigraphic units identified in Trench 1 are, beside thin surface layers formed by sheep activities in the cave, different types of deposits interpreted as fillings from the previous excavation. The obtained results reveal that the trench from the 1950s covered a significantly larger proportion of the cave than indicated in the published plan, including the area of Trench 1. Based on the established situation, it is possible to assume that the research conducted by V. Mirosavljević covered the area of around 4 x 3 m, exceeding 40% of the total surface of the cave interior.[4] For this reason, Trench 2 measuring 2 x 1 m (Fig. 3) was positioned about 0.5 m to the south of Trench 1, in the area determined as not affected by previous excavation. However, after the removal of the surface layers, probably recent cuts filled with sediment containing a significant amount

4 The total area was approximately reconstructed based on excavation results and visible changes in the height of the current ground level. Similar changes were also observed in the deepest, south-western part of the cave, indicating the possibility that other parts of the cave were excavated at some point as well.

Sl. 3 Položaj sondi u odnosu na pretpostavljeni opseg istraživanja provedenih 1950-ih godina (izradili: F. Sirovica, D. Tresić Pavičić)
Fig. 3 Position of the trenches in relation to the presumed area of research conducted in the 1950s (made by: F. Sirovica, D. Tresić Pavičić)

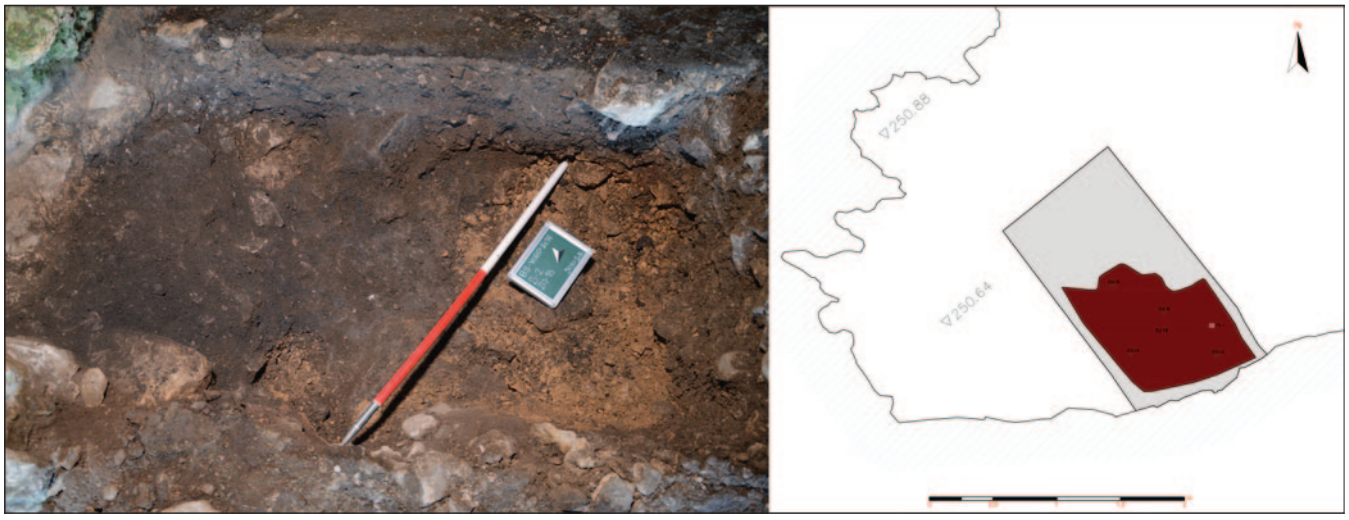
na manjem su prostoru ostali sačuvani intaktni prapovijesni depoziti s pokretnim arheološkim materijalom koji odgovara razdoblju ranoga i srednjega neolitika.

Gornji, mlađi sloj (sl. 4) ustanovljen je na površini od oko 0,6 m^2, volumena oko 0,15 m^3. Sastavljen je od mekoga i kompaktnoga glinastog praha svjetlije smeđe sive boje s nešto kamenja. U njemu je nađeno 28 ulomaka keramičkih posuda te 76 fragmentiranih životinjskih kostiju i jedan odbojak od rožnjaka. Među ulomcima keramičkih posuda ističe se ulomak danilske posude sa spiralnim ukrasom izvedenim udubljivanjem. Nađen je na samome kontaktu s donjim, starijim slojem nešto tamnije sivo smeđe boje. Stariji je sloj (sl. 5) sastavljen od mekoga i kompaktnoga glinastog praha s nešto kamenja. Utvrđen je na površini od oko 0,9 m^2, volumena oko 0,2 m^3. Tijekom njegova uklanjanja nađeno je 13 ulomaka keramičkih posuda, 182 fragmenta životinjskih kostiju, 6 fragmenata puževih kućica te ljuštura školjke čančice (*Cardium*). Rezultati istraživanja time pokazuju da je Vorganjska peć korištena ne samo tijekom ranoga, već i tijekom srednjega neolitika.

of artefacts were defined. Nevertheless, intact prehistoric deposits with artefacts dated to the Early and Middle Neolithic were preserved in a smaller area.

The upper, younger layer (Fig. 4) was identified on a surface of approximately 0.6 m^2, with a volume of around 0.15 m^3. It is composed of soft and compact lighter brown grey clayey silt with some stones. It yielded 28 potsherds, 76 fragments of animal bones and one chert flake. The most distinctive pottery find is a sherd from a Danilo style vessel with wide incised spiral decoration. It was found in the area of contact with the lower, older layer of somewhat darker grey brown colour. The older layer (Fig. 5) is composed of soft and compact clayey silt with some stones. It was identified in an area of approximately 0.9 m^2, with a volume of around 0.2 m^3. It yielded 13 potsherds, 182 animal bone fragments, 6 fragments of snail shells and a cockle shell (*Cardium*). The results of the research thereby show that Vorganjska peć was used not only in the Early, but in the Middle Neolithic period as well.

Sl. 4 Intaktni srednjoneolitički depozit (snimila i izradila: F. Sirovica)
Fig. 4 Intact Middle Neolithic deposit (photo and made by: F. Sirovica)



Sl. 5 Intaktni ranoneolitički depozit (snimila i izradila: F. Sirovica)
Fig. 5 Intact Early Neolithic deposit (photo and made by: F. Sirovica)

POKRETNI NALAZI

Istraživanjem su, uz različite uzorke organskih ostataka i sedimenata, prikupljeni i brojni ulomci keramičkih posuda, različiti ostaci faune i litički materijal. Veći dio nalaza moguće je pripisati razdoblju ranoga i srednjega neolitika, dok manji dio ulomaka keramičkoga posuđa upućuje na aktivnosti koje su u pećini vršene u kasnijim prapovijesnim razdobljima. U ovome radu prikazani će biti rezultati arheološke analize keramičkoga i litičkoga materijala koji se može vezati za razdoblje neolitika.

Keramika

Tijekom istraživanja nađen je ukupno 181 ulomak keramičkih posuda, mase 2,23 kg. Od ukupnoga broja ulomaka njih 36, odnosno 20% prikupljeno je tijekom istraživanja sonde 1, a čak 145, odnosno 80%, tijekom istraživanja u

ARTEFACTS

In addition to various samples of organic remains and sediments, the research yielded numerous potsherds, various faunal remains and lithic material. The majority of finds can be dated to the Early and Middle Neolithic period, whereas a minor percentage of potsherds points to activities that took place in the cave in later prehistoric periods. This paper presents the results of archaeological analysis of pottery and lithic material that can be attributed to the Neolithic period.

Pottery

A total of 181 potsherds, measuring 2.23 kg in weight, were recovered during the research. Out of the total number, 36 sherds, or 20%, were retrieved from Trench 1, and as many as 145, or 80%, from Trench 2. Only 41 sherds

sondi 2. Samo 41 ulomak nađen je u intaktnim neolitičkim depozitima sonde 2. Taj podatak važan je jer je istraživanjem utvrđeno da je u novije vrijeme područje sonde 1 u cijelosti, a sonde 2 značajnim dijelom prekopano. U tome kontekstu keramički materijal potvrđuje stratigrafski utvrđenu situaciju koja govori da nije riječ o istovremenim intervencijama te potvrđuje pretpostavku da su na prostoru sonde 1 izvedena arheološka istraživanja kojima je cilj bio prikupiti što veći uzorak arheoloških ostataka. S druge strane, velika količina materijala prikupljena tijekom istraživanja sonde 2 upućuje da su utvrđeni iskopi vjerojatno izvršeni s nekim drugim ciljem.

Određeni broj ulomaka moguće je spojiti te uzorak nakon spajanja broji 162 ulomka keramičkih posuda od čega manji dio, njih 11, vjerojatno pripada kasnijim razdobljima. Razdoblju neolitika pripisan je 151 ulomak, ukupne mase 2,14 kg, među kojima je izdvojen 21 obod te 4 ulomka dna posuda. Površine stijenki posuda uglavnom su neujednačene boje u različitim nijansama smeđe i sive te su često vanjska i unutarnja površina svjetlije boje, dok je središte nešto tamnije ili je vanjska površina svijetle boje, dok je unutrašnja tamna. Debljina stijenki posuda najčešće se kreće između 0,6 i 1 cm, no otprilike 5% ulomaka ima stijenke debljine između 1,1 i 1,5 cm. Kod nešto manje od 7% ulomaka stijenke su tanje od 0,6 cm, a otprilike u istome postotku javljaju se i ulomci kojima zbog oštećenosti debljinu stijenke nije bilo moguće odrediti.

Zbog prilične razlomljenosti keramičkoga materijala, koja iznosi 71 ulomak po kilogramu, nije bilo moguće cjelovitije rekonstruirati niti jednu posudu. S druge strane, ograničena je količina dijagnostičkoga materijala onemogućila punu analizu oblika i veličina posuda. Jasne kronološke odrednice utvrdive su za samo manji dio ulomaka većinom finije izrađenih keramičkih posuda sa specifičnim značajkama kao što su ukras ili profilacija. Time je na osnovi tek nekolicine ulomaka, uz neolitički keramički materijal, utvrđena i prisutnost posuda načinjenih tijekom nekoga od kasnijih razdoblja prapovijesti koje nisu uključene u ova razmatranja (T. 1: 1–3). Kako je većina materijala nađena u poremećenim depozitima te ne nosi jasna tipološko kronološka obilježja, prikupljeni materijal većim dijelom nije bilo moguće razdvojiti u skladu s dvjema utvrđenim fazama neolitika. Iz tog je razloga sav materijal s neolitičkim obilježjima obrađen zajedno.

Od ukupnog broja ulomaka pripisanih neolitiku, dijagnostički elementi posuda, odnosno obodi i dna, čine nešto više 16,6% uzorka. Ipak, u skladu s ustanovljenim značajkama te definiranim ograničenjima, na osnovi utvrđenih dimenzija te mogućih odnosa visina i promjera, jasno je definirana pojava lonaca i zdjela te malih posuda, odnosno šalica ili manjih zdjela. Od ukupnoga broja ulomaka, njih 38, odnosno 25,2%, nosi određena tipološka obilježja te je utvrđena prisutnost 23 lonca ili duboke zdjele, 13 zdjela te 2 manje posude.

Detaljniju analizu tipova posuda omogućili su prikupljeni ulomci oboda te su izdvojeni sljedeći oblici posuda:

– lonci ili duboke zdjele suženoga otvora (T. 1: 4–8);

were recovered from intact Neolithic deposits in Trench 2. This information is important because it was established that the entire area covered by Trench 1 and a significant proportion of the area of Trench 2 had been excavated recently. In this context, the ceramic material confirms the situation revealed by stratigraphy, which indicates that these were not contemporaneous interventions, and it also confirms the assumption that the area of Trench 1 was archaeologically excavated with a purpose of collecting the largest possible sample of archaeological remains. On the other hand, a large quantity of material recovered from Trench 2 implies that the earlier excavations were probably conducted with some other purpose.

After refitting, the sample contains 162 potsherds, a smaller amount of which, 11 of them, can probably be dated to later periods. A total of 151 sherds, measuring 2.14 kg in weight, were dated to the Neolithic period, from which 21 rims and 4 vessel base sherds were singled out. Vessel wall surfaces are mostly of uneven colour, in different shades of brown and grey, often with lighter outer and inner surface and somewhat darker core or with light outer and dark inner surface. Wall thickness of most vessels varies between 0.6 and 1 cm, whereas around 5% of the sherds have between 1.1 and 1.5 cm thick walls. Walls of slightly less than 7% of the sherds are thinner than 0.6 cm, while approximately the same percentage was too damaged to determine wall thickness.

Due to significant fragmentation of the material, amounting to 71 sherds per kilogram, it was not possible to do a fairly wholesome reconstruction of a single vessel. On the other hand, the limited amount of diagnostic material precluded comprehensive analysis of vessel shapes and sizes. Clear chronological markers can be determined for only a small number of sherds of mostly finer vessels with specific features such as decoration or distinctive shape. Apart from Neolithic material, vessels belonging to some of the later prehistoric periods, which were not included in this discussion (Pl. 1: 1–3), were also identified based on a small number of sherds. As most of the material was found in disturbed deposits and lacks clear typological and chronological features, the division of the collected material according to the two identified phases of the Neolithic was not possible. For this reason, all material with Neolithic traits was analysed together.

Out of the total number of sherds attributed to the Neolithic, diagnostic elements of the vessels, i.e. rims and bases, make up slightly over 16.6% of the sample. Nevertheless, in accordance with the identified features and defined limitations, based on their established dimensions and possible height to diameter ratios, the presence of pots and bowls as well as small vessels, i.e. cups or smaller bowls was distinctly identified. Out of the total number of sherds, 38 of them, or 25.2%, have specific typological features and 23 pots or deep bowls, 13 bowls and 2 smaller vessels were identified.

The collected rim sherds enabled a more detailed analysis of vessel types and the following vessel shapes were singled out:

– lonci ili duboke zdjele ravnoga otvora (T. 2: 1–6);
– otvorene zdjele (T. 2: 7–10);
– kuglaste zdjele (T. 3: 1–2);
– male posude (T. 2: 11).

Osim oboda, među dijagnostičkim materijalom zastupljena su i četiri ulomka dna. Dva ulomka pripadaju prstenastim dnima (T. 3: 3–4), jedno ravnom, dok posljednjem, zbog loše očuvanosti, nije moguće odrediti oblik (T. 3: 5).

Ručke i ušice potpuno izostaju, no na jednome ulomku vidljiv je dio kružne perforacije na stijenci posude (T. 1: 6). Otvor je nešto širi s vanjske strane pa je moguće pretpostaviti da je stijenka probijena iz toga smjera. Obično se smatra da su takve kružne perforacije služile za povezivanje ulomaka razlomljenih posuda (Batović 1962: 72; Hulina et al. 2012: 152), no mogle su se koristiti i za provlačenje uzice kojom je olakšano rukovanje posudom (Batović 1966: 60; Marijanović 2009: 72).

Ukrašeno je 14 ulomaka, odnosno 9,3% uzorka, no taj broj značajno će se smanjiti ako metličaste tragove na vanjskoj stijenci posude razumijemo kao funkcionalnu obradu površine.[5] Metličasto prevlačenje površine posude utvrđeno je na čak osam ulomaka među kojima je moguće razlikovati dvije vrste tragova: grublji s dubljim i širim tragovima (T. 4: 1–2) te fini s gustim linijama koje se tek blago naziru na površini (T. 4: 3–4). Mogu ih činiti paralelne vodoravne (T. 4: 3–4) ili okomite linije (T. 4: 2) ili kombinacija vodoravnih i okomitih linija koje čine svojevrsni mrežasti motiv (T. 2: 5; 4: 1).

S druge strane, dodatna obrada površine u vidu glačanja, odnosno dodatnoga zaravnjivanja stijenke posude, utvrđena je na 39 ulomaka, odnosno na njih 25,8%. Glačanje se može javiti na vanjskoj ili unutrašnjoj stijenci ili na obje stijenke posude. Jednako je često, na po 15 ulomaka ili 9,9% uzorka, utvrđeno glačanje obje ili samo vanjske stijenke posude, dok se glačanje unutrašnje stijenke javlja nešto rjeđe, na 9 ulomaka, odnosno 6% uzorka.

Među keramičkim materijalom nađeno je i šest ukrašenih ulomaka keramičkih posuda koji čine nešto manje od 4% cijelog uzorka. Na četiri ulomka ukras je izveden tehnikom utiskivanja koje je u dva slučaja rezultiralo narebrenim lučnim otiscima (T. 3: 5; 4: 5).[6] Ukras prekriva cijelu površinu oba ulomka, a sastoji se od gusto nanizanih, jednako usmjerenih otisaka.[7] Treći ulomak ukrašen utiskivanjem prekriven je manjim polumjesečastim otiscima koji

5 Pojava metličastih tragova na površini keramičkih posuda tumači se na više načina te su razmatrane mogućnosti njihove isključivo dekorativne uloge, npr. kao pokušaj imitacije košara od šiblja (Buršić-Matijašić 1994: 245; Jerbić Percan 2012: 11), ili njihove pretežno funkcionalne namjene, gdje teksturiranje vanjske stijenke olakšava rukovanje posudom ili poboljšava apsorpciju topline (Forenbaher, Kaiser 2006: 182; Hulina et al. 2012: 152; Vuković 2013: 669). Dodatno je uočeno da metličasti tragovi na posudi mogu poslužiti i kao priprema površine za nanošenje premaza (Vuković 2013: 664).

6 Tijekom istraživanja nađena je samo jedna ljuštura školjke, no riječ je upravo o čančici, odnosno školjci *Cardium* za koju se obično pretpostavlja da je korištena pri izvedbi specifičnih narebrenih, lučnih ukrasa na ranoneolitičkim keramičkim posudama.

7 Ulomci bi mogli pripadati istoj posudi, no kako su nađeni u odvojenim kontekstima i međusobno se ne spajaju, zasebno su obrađeni.

– pots or deep bowls with a narrowed opening (Pl. 1: 4–8);
– pots or deep bowls with a straight opening (Pl. 2: 1–6);
– open bowls (Pl. 2: 7–10);
– spherical bowls (Pl. 3: 1–2);
– small vessels (Pl. 2: 11).

Apart from the rims, the diagnostic material contains four base sherds. Two belong to ring bases (Pl. 3: 3–4), one to a flat base, while one is insufficiently preserved to determine the shape of the base (Pl. 3: 5).

Handles and lugs are completely absent from the material, but one sherd has a preserved part of circular perforation of the vessel wall (Pl. 1: 6). The opening is somewhat wider on the outer surface, so it can be assumed that the vessel wall was perforated from that direction. It is usually considered that the purpose of such circular perforations was to connect the fragments of broken vessels (Batović 1962: 72; Hulina et al. 2012: 152), but they might have also been used to pull through the chord that facilitated vessel handling (Batović 1966: 60; Marijanović 2009: 72).

Fourteen sherds, or 9.3% of the sample, were decorated, but this number is significantly reduced if we define brushing of outer vessel surfaces as functional surface treatment.[5] Brushing of vessel surfaces was recorded on as much as eight sherds, among which two different types of traces can be differentiated: coarse with deeper and wider lines (Pl. 4: 1–2) and fine with barely visible dense lines (Pl. 4: 3–4). They are composed of parallel horizontal (Pl. 4: 3–4) or vertical lines (Pl. 4: 2) or a combination of horizontal and vertical lines that comprise a net motif (Pl. 2: 5; 4: 1).

On the other hand, burnishing, i.e. additional smoothing of vessel walls was identified on 39 sherds or 25.8%. Burnishing may occur either on outer or inner vessel surface, or both. Burnishing on both or just the outer vessel surface was identified on an equal number of sherds, 15 of them or 9.9% of the sample while burnishing of the inner vessel surface is somewhat rarer and it was identified on 9 sherds or 6% of the sample.

The ceramic material contained six decorated potsherds, which is slightly less than 4% of the total sample. Four sherds were decorated using impression technique, which in two cases produced ribbed arched impressions (Pl. 3: 5; 4: 5).[6] The decoration covers the entire surface of both sherds and consists of densely arranged, equally oriented impressions.[7] The third sherd with impressed deco-

5 Brushing of vessel surfaces can be interpreted in a number of different ways, considering its purely decorative role, e.g. as an imitation of wicker baskets (Buršić-Matijašić 1994: 245; Jerbić Percan 2012: 11), or its predominantly functional purpose, wherein the texturing of the outer surface facilitated vessel handling or improved heat absorption (Forenbaher, Kaiser 2006: 182; Hulina et al. 2012: 152; Vuković 2013: 669). Additionally, brushing of vessel surfaces in preparation for applying slip has also been observed (Vuković 2013: 664).

6 A single shell was found during the research, a cockle, or *Cardium* shell which is usually assumed to have been used for making specific ribbed, arched motifs on Early Neolithic vessels.

7 It is possible that the sherds belong to the same vessel, but since they were found in separate contexts and could not be refitted, they were analysed separately.

su mogli biti izvedeni noktom ili nekom alatkom sličnoga presjeka (T. 2: 2). Na posljednjem ulomku utvrđen je samo dio utisnutoga ukrasa oštećen lomom. Ukrasi izvedeni utiskivanjem standardna su pojava na ranoneolitičkim nalazištima istočne obale Jadrana, a direktno usporedivi ukrasi prepoznatljivi su na ulomcima koja je tijekom svojih istraživanja Vorganjske peći našao V. Mirosavljević (Mirosavljević 1962: 188–190, T. VII: 1–7). Analogije im nalazimo i na drugim kvarnerskim neolitičkim nalazištima: Jami na Sredi (Spataro 2002: 53, Fig. 17: JNS7) i Veloj špilji (Spataro 2002: 62, Fig. 22: VJ 7, 64; 24: VJ 13).

Klasični danilski ukras izveden udubljivanjem jasno je utvrđen na samo jednome ulomku koji je ukrašen lijepo izvedenim spiralama oko kojih su gusto raspoređena blago zakrivljena, linijska udubljenja (T. 3: 1). Na površini ulomka, u udubljivanjem izvedenim ukrasima, utvrđeni su i loše očuvani tragovi crvene boje koji možda predstavljaju ostatke crvene inkrustacije. Ulomak ukrašen spiralama izvedenim u specifičnome danilskom stilu može biti usporediv s mnogim primjercima nađenim na području srednje Dalmacije, primjerice na nalazištima Bribir – Krivače (Korošec, Korošec 1974: T. XII; XIII; Forenbaher 2014: 43–56), Smilčić (Batović 1979: T. LXXXIV) ili s položaja Barice u Benkovcu gdje udubljenja često imaju crvenu ili bijelu inkrustaciju (Vujević, Horvat 2012: 44). Slično raspoređen ukras nalazi se i na ulomku keramičke posude pripisanome danilsko-vlaškom stilu s nalazišta Kargadur u Istri, gdje su na nekim ulomcima uočeni tragovi okera (Komšo, Čuka 2014: 88–89) te na nalazištu Sermin kraj Kopra, gdje su slični ulomci pripisani prijelazu iz srednjega u kasni neolitik (Snoj 1992: 92, T. 1: 3, 5). Među ulomke ukrašene udubljivanjem ubrojen je i ulomak izrazito oštećene vanjske stijenke. Iako je na njoj uočljiv motiv spirale, moguće je da je riječ o oštećenju koje je slučajno poprimilo takav oblik (T. 4: 6).

Nalazi litike

Litički materijal prikupljen istraživanjem izrazito je skroman i sastoji se od samo 13 nalaza. Na njih 11 tragovi obrade nisu utvrđeni i ne mogu se smatrati izrađevinama. Riječ je o deset fragmenta kalcita koji je čest u prirodnome špiljskom okruženju te jednom kvarcu koji je jednako tako, u prikladnim uvjetima, mogao biti formiran u špilji ili izvan nje. Samo dva nalaza litike načinjena su od rožnjaka i moguće ih je okarakterizirati kao izrađevine te je na njima provedena detaljna tipološko-tehnološka[8] i traseološka[9]

8 Tipološko-tehnološka analiza provedena je po principima operativne sheme i operativnog lanca (Leroi-Gourhan 1965; Inizan et al. 1999; Soressi, Geneste 2011).

9 Francuski termin *tracéologie* (engl. *traceology*) odnosi se na proučavanje svih fizičkih tragova na površini izrađevine, tj. obuhvaća analizu tragova uporaba (engl. *use-wear analysis*), ali i analizu tragova proizvodnje, posredno nastalih tragova (npr. tijekom transporta) i promjena uslijed post-depozicijskih procesa. Traseološka analiza provedena je na oba komada prema uobičajenim i dokazanim protokolima za analizu tragova uporabe koji se sastoje od kombiniranih metoda manjeg uvećanja (LPA) i većeg uvećanja (HPA). Nakon pionirskoga rada S. A. Semenova (1964), obrazložena je u mnogim referentnim radovima (Vaughan 1985; González Urquijo, Ibáñez Estévez 1994; Claud 2008; van Gijn 2010; Marreiros et al. 2015). Makroskopska i mikroskopska zapažanja zabilježena su stereo mikroskopom Nikon Z800 (6x–50x) i metalografskim mikroskopom s reflektirajućim svjetlom Nikon Eclipse LV150 (50x–200x). Fotografije su snimljene kamerom Nikon DS-Fi2 i softverom NIS.

ration is covered in smaller crescent-shaped impressions which may have been produced with a fingernail or a tool with similar cross-section (Pl. 2: 2). On the last sherd, only a part of the impressed decoration was detected, which was damaged by breakage. Impressed decoration is common at Early Neolithic sites of the eastern Adriatic coast and comparable decoration is found on potsherds recovered by V. Mirosavljević during his research of Vorganjska peć (Mirosavljević 1962: 188–190, Pl. VII: 1–7). Their analogies are also found at other Neolithic sites of the Kvarner region: Jami na Sredi (Spataro 2002: 53, Fig. 17: JNS7) and Vela špilja (Spataro 2002: 62, Fig. 22: VJ 7, 64; 24: VJ 13).

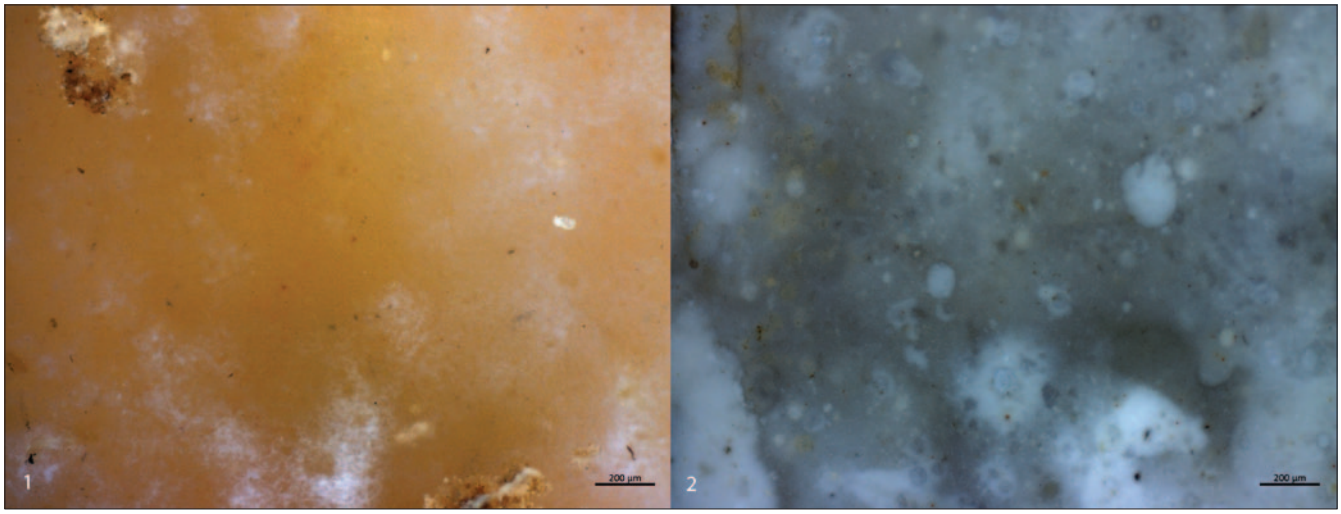
The classical Danilo-style wide incised decoration is confirmed only on one potsherd, decorated with finely formed spirals flanked by densely arranged, mildly curved wide incised lines (Pl. 3: 1). Wide incised decorations contain poorly preserved traces of red colour, possibly remains of red incrustation. This sherd with typical Danilo style spiral decoration is comparable to numerous examples found at central Dalmatian sites, such as Bribir – Krivače (Korošec, Korošec 1974: Pl. XII; XIII; Forenbaher 2014: 43–56), Smilčić (Batović 1979: Pl. LXXXIV) or Barice in Benkovac where wide incisions often contain red or white incrustation (Vujević, Horvat 2012: 44). Similarly arranged decoration is also found on a Danilo-Vlaška potsherd from the site of Kargadur in Istria, where traces of ochre were observed on some of the sherds (Komšo, Čuka 2014: 88–89) and at the Sermin site near Koper, where similar sherds were attributed to a transition from Middle to Late Neolithic (Snoj 1992: 92, Pl. 1: 3, 5). A sherd with a badly damaged outer wall was included among the material with wide incised decoration. Even though it has a visible spiral motif, it is possible that it is in fact damage that coincidentally resembles a spiral (Pl. 4: 6).

Lithic finds

The lithic material retrieved in the course of research is extremely sparse and comprises only 13 finds. Eleven do not show any traces of treatment and they cannot be considered as artefacts. They include ten fragments of calcite, commonly found in natural cave environment, and one quartz fragment, which also might have been formed in or outside the cave in appropriate conditions. Only two lithic finds were made of chert and can be identified as artefacts. They were subjected to a detailed typological, technological[8] and traceological[9] analysis, as well as pre-

8 Typological and technological analysis was conducted according to the principles of operational scheme and *chaîne opératoire* (Leroi-Gourhan 1965; Inizan et al. 1999; Soressi, Geneste 2011).

9 The French term *tracéologie* (Eng. traceology) refers to studying all physical traces on the surface of an artefact, i.e. it includes use-wear analysis, as well as the analysis of traces of production, traces that were created indirectly (e.g. in transport) and changes caused by post-depositional processes. Traceological analysis was carried out on both pieces according to the common and proven protocols for the use-wear analysis combining low-power approach (LPA) and high-power approach (HPA). After the pioneering work of S. A. Semenov (1964), it was explained in many reference works (Vaughan 1985; González Urquijo, Ibáñez Estévez 1994; Claud 2008; van Gijn 2010; Marreiros et al. 2015). The macroscopic and microscopic observations were made with a Nikon Z800 stereomicroscope (6x–50x) and a Nikon Eclipse LV150 metallographic microscope with reflected light (50x–200x). The photographs were taken with a Nikon DS-Fi2 camera and NIS software.



Sl. 6 Mikroskopska snimka nepripariranih površina izrađevina od rožnjaka:
1 U matriksu mikro-kriptokristalnog kvarca naziru se veoma sitni crvenkasti uklopci željeznoga oksida (vjerojatno hematita) i crni uklopci organske tvari. Veoma tanka bijela patina u početnoj fazi nastanka otkriva okruglaste forme koje upućuju na mikrofosile, vjerojatno planktonske foraminifere. Matriksu s malobrojnim uklopcima određena je mudstone tekstura (snimili: S. Kačar, G. Constans);
2 Mikroskopska snimka prikazuje patiniranu površinu izrađevine. Bijela patina, vidljiva na površini izrađevine, u razvijenoj je fazi nastanka i dobro ocrtava mikrofosile planktonskih foraminifera, uklopaka hematita i možda radiolarija. Gustoća uklopaka upućuje na mudstone do wackestone teksturu (snimili: S. Kačar, G. Constans)

Fig. 6 Microscopic image of unprepared surfaces of chert artefacts:
1 Very small reddish iron oxide (probably haematite) inclusions and black inclusions of organic matter are visible in the microcryptocrystalline quartz matrix. Very thin white patina in the initial phase of formation reveals spherical forms indicating microfossils, probably planktonic foraminifera. The matrix with rare inclusions exhibits mudstone texture (photo by: S. Kačar, G. Constans);
2 Microscopic image shows patinated surface of the artefact. White patina, visible on the artefact surface, is in the developed phase of formation with well-defined microfossils of planktonic foraminifera, haematite inclusions and possibly radiolaria. Density of inclusions indicates mudstone to wackestone texture (photo by: S. Kačar, G. Constans)

analiza te preliminarna analiza sirovine. Prva je izrađevina pronađena u danilskome sloju i u tipološko-tehnološkom smislu predstavlja odbojak. Druga je izrađevina nađena u sekundarnome kontekstu i potječe iz zapune recentnoga ukopa, a riječ je o malom sječivu, odnosno pločici.[10]

Oba nalaza izrađena su od svjetlopropusnoga rožnjaka voštanoga sjaja. Nodulna okorina na izrađevinama nije sačuvana, a pod mikroskopom je vidljiva mikrokvarcna osnova. Vidljive su razlike u boji, teksturi i strukturi (sl. 6). Odbojak je izrađen od svjetlopropusnoga rožnjaka žućkaste boje i homogene strukture te je samo mjestimično prekriven bjelkastom, relativno tankom i djelomično providnom patinom (sl. 7: 1). Sječivo je gotovo u potpunosti prekriveno bijelom gustom patinom te nije moguće odrediti njegovu izvornu boju (sl. 7: 2).

Izrazita sličnost rožnjaka od kojih su izrađevine načinjene ukazuje da sirovina vjerojatno potječe iz istoga izvora. Zabilježene značajke upućuju na strano porijeklo, a srodni rožnjaci zabilježeni su u Italiji, na predalpskome području

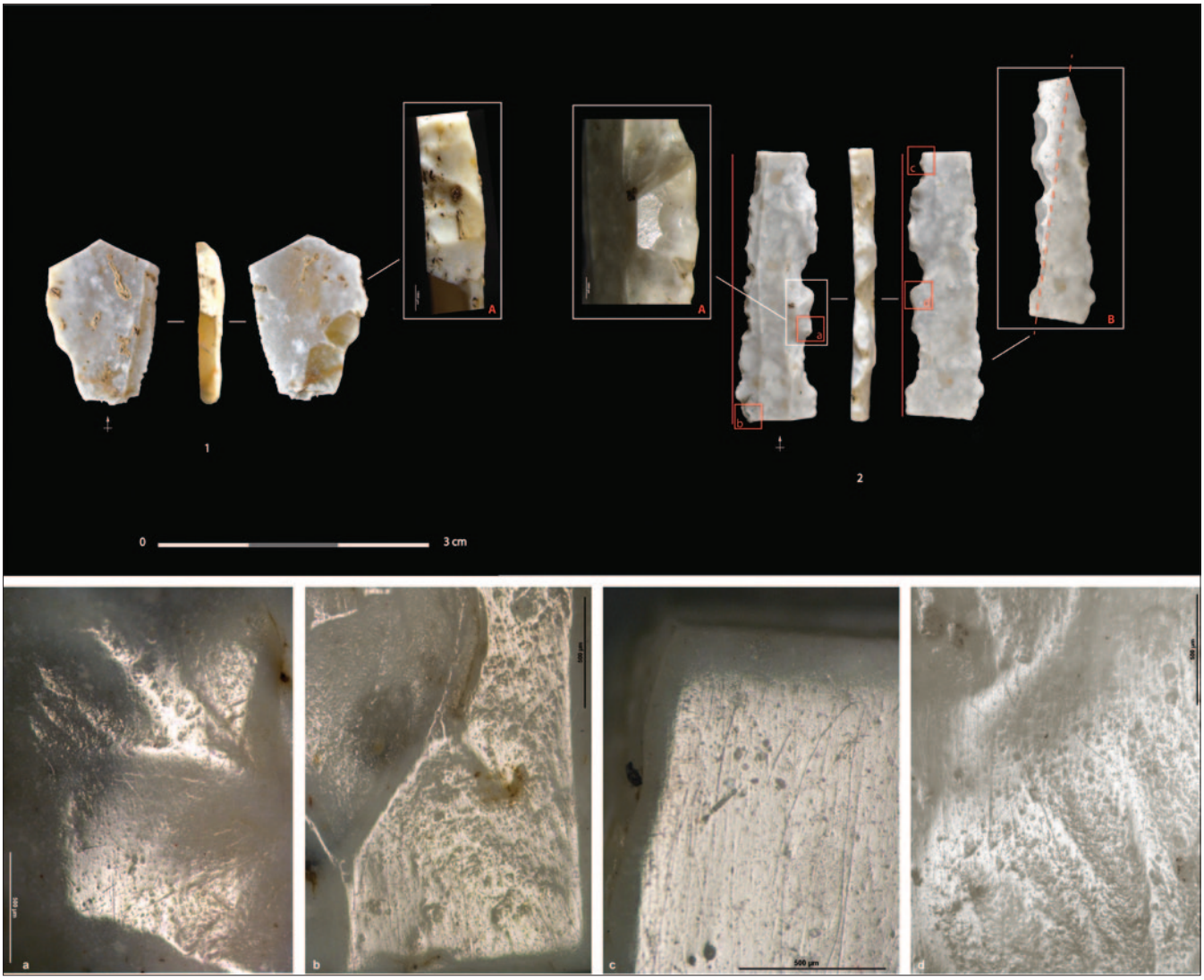
liminary analysis of raw material. The first artefact was found in Danilo layer and in typological and technological terms it represents a flake. The second artefact is a small blade, i.e. bladelet[10] found in a secondary context, a fill of a recent cut.

Both finds were made of translucent chert of waxy lustre. Nodular cortex was not preserved on the artefacts and microquartz matrix is visible under the microscope. Differences in colour, texture and structure are visible (Fig. 6). The flake is made of translucent yellowish chert of homogenous structure and is only partially covered with whitish, relatively thin and partially transparent patina (Fig. 7: 1). The blade is almost entirely covered with thick white patina and it is not possible to determine its original colour (Fig. 7: 2).

The distinct likeness of cherts the artefacts were made from indicates that the raw material probably came from the same source. Its features indicate foreign provenance and similar cherts are found in Italy, in the pre-Alpine area

10 Termin pločica (franc. *lamelle*; engl. *bladelet*) preporučeni je hrvatski naziv za manja i uža sječiva (Karavanić et al. 2015: 139) te se konvencionalno, ali ne i isključivo razgraničenje odnosi na širinu od oko 12 mm (Tixier 1963). Ipak, na neprikladnost tog temina u kontekstu neolitičke litičke proizvodnje već je upozoreno (Forenbaher, Perhoč 2015: 27, bilj. 5), a kako iz Vorganjske peći potječe samo jedan primjerak, u tekstu se koristi generički termin sječivo.

10 The term *pločica* (Fr. *lamelle*; Eng. bladelet) is a recommended Croatian term for small and narrow blades (Karavanić et al. 2015: 139) and conventional, but not exclusive differentiation refers to the width of around 12 mm (Tixier 1963). However, some authors already warned about the inappropriateness of this term in the context of the Neolithic lithic production (Forenbaher, Perhoč 2015: 27, fn. 5), and since only one example was found at Vorganjska peć, generic term *sječivo* (blade) is used in the text.



Sl. 7 Izrađevine od rožnjaka:
1 Fragment oruđa na odbojku: A) detalj obrađenog ruba;
2 Malo sječivo – umetak srpa: A) makrotragovi na dorzalnoj strani – sjaj i zaobljenost na višekratno naoštravanom radnom rubu; B) ventralna strana sječiva s dijagonalno raspoređenim sjajem; a) mikropolitura od sječe savitljivih biljaka na negativu obrade; b) mikropolitura koja se s lijevog ruba dorzalne strane proteže na proksimalni prijelom; c) mikropolitura od sječe žitarica s abrazivnom komponentom vidljiva na distalnome kraju desnoga ruba ventralne strane i na prijelomu; d) mikropolitura od sječe žitarica na medijalnom dijelu radnoga ruba ventralne strane (fotografije su snimljene s uvećanjem od 50x; snimila: S. Philibert; izradile: S. Kačar, S. Philibert)

Fig. 7 Chert artefacts:
1 Flake tool fragment: A) Detail of a retouched edge;
2 Bladelet – sickle insert: A) Macro use-wear traces on dorsal face – gloss and rounding on resharpened edge; B) Diagonally distributed gloss on the ventral face of the bladelet; a) Soft plant polish on the retouch scar; b) Polish stretching from the left edge of dorsal face to the proximal fracture; c) Cereal polish with abrasive component visible on the right edge of distal face and on the fracture; d) Cereal polish on the medial part of the working edge of ventral face (photographs were taken with magnification of 50x; photo by: S. Philibert; made by: S. Kačar, S. Philibert)

i na Garganu (Perhoč 2020). Ipak, za preciznije određenje nužna su detaljnija geoarheološka ispitivanja istarskih i kvarnerskih neolitičkih inventara i korelacije s dobro istraženim zapadnojadranskim i sjevernotalijanskim rožnjačkim resursima. Istodobno, sustavna istraživanja izdanaka silicijskih stijena na području Kvarnera do sada nisu obavljena, a sudeći prema geološkoj karti (Mamužić 1973), rožnjaka na području Kvarnera ima jedino na otoku Lošinju.

and on Gargano (Perhoč 2020). Nevertheless, more precise determination requires a more detailed geoarchaeological research of the Istrian and Kvarner Neolithic inventories and their relation to the well-researched western Adriatic and northern Italian chert resources. At the same time, systematic research of outcrops of siliceous rocks in the Kvarner region has not yet been published and, according to the geological maps (Mamužić 1973), in this region cherts are found only on Lošinj island.

Odbojak dužine 18,2 mm, širine 12,8 mm i debljine 2,5 mm, gotovo je sasvim sačuvan. Na dorzalnoj strani vidljiv je jedan paralelni greben što ukazuje da je odbojak vjerojatno odbijen od jezgre za sječiva. Na lijevom rubu nalazi se marginalna, neizravna i strma obrada te se može reći da odbojak predstavlja fragment alatke (sl. 7: 1A). Na ventralnoj strani odbojka, povezano s proksimalnim dijelom, vide se dva negativa. To su tzv. transverzalni prijelomi s izvrnutim završetkom nastali kao rezultat izbačenoga udarca. Iz tog razloga proksimalni dio nije u potpunosti sačuvan, pa nije moguće utvrditi tip plohka. Osim prijeloma nastaloga udarcem, na odbojku nema vidljivih tragove uporabe.

Sječivo je sačuvano u svom medijalnom dijelu, u dužini od 30,9 mm. Široko je 10,7 mm i maksimalne debljine 2,8 mm. Tragovi tzv. transverzalnoga prijeloma na distalnom i proksimalnom dijelu upućuju na namjerno prelamanje, odnosno skraćivanje sječiva na segmente. Raspodjela tragova uporabe, sjaja i mikropolituре na način da prelaze na distalne i proksimalne dijelove sječiva, odnosno na prijelome, također ukazuje na namjerno skraćivanje (sl. 7: 2b–2c). Na taj način se umeci kalibriraju radi optimalnoga umetanja u dršku srpa.

Na oba radna ruba nalazi se nepravilna, izravna i polustrma obrada, no na desnome rubu vidljivi su i udupci. Takvi udupci od naoštravanja, čiji su negativi tek umjereno polirani, presijecaju intenzivno korištene zone te ukazuju na sekundarnu fazu korištenja radnoga ruba (sl. 7: 2A–2a), odnosno izmjene radnoga ruba koje su se odvijale u nekoliko faza ponovnoga oštrenja. Naglašena zaobljenost ruba, i dalje vidljiva na određenim mjestima, svjedoči o intenzivnoj uporabi. Može se zaključiti da je sječivo bilo korišteno sve dok radni rub nije potpuno otupio, odnosno postao neučinkovit. Uporabna zona pokriva radne rubove u čitavoj dužini od 30,9 mm. Na osnovi sačuvanih tragova nije moguće utvrditi je li sječivo umetnuto neobrađeno, no kako je područje lijevoga ruba tek neznatno izmijenjeno, moguće je pretpostaviti takav postupak.

Uz dodatnu obradu, na sječivu je vidljiv i karakterističnи sjaj srpa razvijen na oba radna ruba. Na lijevome rubu sjaj je invazivan i proteže se sve do dorzalnoga grebena te lagano slabi prema distalnom prijelomu. Isto je vidljivo i na ventralnoj strani što, iako nedovoljno jasno, upućuje na njegov dijagonalan raspored. Na desnome rubu sjaj srpa je jasno dijagonalno raspoređen sa sužavanjem prema proksimalnom prijelomu (sl. 7: 2B). Takav raspored rezultat je blago poprečnoga umetanja sječiva u dršku. Ravna mikropolitura povezuje se sa sječom žitarica (sl. 7: 2a–d), no brojne i dugačke strije, jamičasta površina i komete ukazuju da je žetva uključivala i abrazivnu komponentu (sl. 7: 2a–d). Naime, takvi tragovi upućuju da je sječivo bilo u kontaktu s abrazivnim materijalom kao što su nakupljene čestice prašine i zemlje te da je bilo dio srpa korištenoga za nisko rezanje stabljika u svrhu skupljanja slame (npr. za stoku i/ili gradnju kuća) ili za rezanje stabljika polegnutih na tlo (Clemente, Gibaja 1998).

The 18.2 mm long, 12.8 mm wide and 2.5 mm thick flake is almost completely preserved. One parallel ridge is visible on its dorsal side, indicating that the flake was probably knapped from a blade core. On the left edge, there is a marginal, indirect and abrupt retouch which suggests that the flake represents a tool fragment (Fig. 7: 1A). The ventral side of the flake, connected to the proximal part, has two visible removal negatives. These are the so-called hinge terminating bending fractures resulting from launched percussion. For this reason, the proximal part was not completely preserved and therefore it is not possible to determine the butt type. Apart from the fracture formed by percussion, there are no visible traces of use on the flake.

Regarding the blade, only its medial, 30.9 mm long part was preserved. It is 10.7 mm wide, with maximum thickness of 2.8 mm. Traces of the so-called bending fractures on distal and proximal part indicate intentional fracture, i.e. shortening of the blade into segments. The distribution of use-wear traces, gloss and polish in a way that they spread to distal and proximal parts of the blade, i.e. the fractures, also suggests intentional reduction (Fig. 7: 2b–2c). This way, the inserts are calibrated for optimal hafting into the sickle handle.

Both working edges display irregular, direct and semi-abrupt retouch, whereas the right edge also has visible notches. Such sharpening notches, whose negatives were only moderately polished, cut through the intensively used zones and indicate a secondary phase of use of the working edge (Fig. 7: 2A–2a), i.e. modifications of the working edge that occurred in several phases of resharpening. Strong rounding of the edge, still visible in some parts, bears witness to intensive use. It suggests that the blade was used until the working edge became completely blunt and inefficient. The zone of use covers working edges along the entire length of 30.9 mm. Based on preserved traces, it is not possible to determine whether the blade was blank when it was inserted, but since the left edge is only slightly modified, it can be assumed that it was.

Apart from additional retouch, the blade also displays characteristic sickle gloss on both working edges. On the left edge, the gloss is invasive and stretches all the way to the dorsal ridge, while it slightly decreases towards the distal fracture. The same is also visible on the ventral side, which, although insufficiently clearly, indicates that it was distributed diagonally. On the right edge, the sickle gloss is clearly diagonally distributed and narrows towards the proximal fracture (Fig. 7: 2B). Such distribution is the result of the blade being inserted slightly diagonally into the handle. The polish with flat topography is characteristic of cereal harvesting (Fig. 7: 2a–d), however, numerous long striations, holey surface and comets indicate cereal harvest polish with abrasive component (Fig. 7: 2a–d). Namely, such traces indicate the blade was in contact with abrasive material, e.g. accumulated dust and earth particles, and that it was a part of the sickle used in the low cutting of grain stalks for the purpose of collecting straw (e.g.

Iako je na osnovi samo jednoga i nedovoljno očuvanoga sječiva teško interpretirati proizvodnu tehniku, pravilnost rubova i dorzalnih bridova te ujednačena debljina upućuju na tehniku odlamanja pritiskom. Usporedba sa sječivima s drugih neolitičkih lokaliteta Kvarnera i Dalmacije išla bi u prilog toj tvrdnji. Naime, dalmatinski litički skupovi nalaza pokazuju da je glavna tehnika u proizvodnji sječiva tijekom čitavoga neolitika bila tehnika pritiskom (Forenbaher, Perhoč 2017; Mazzucco et al. 2018; Kačar 2019a; 2019b; Podrug et al. 2018; 2021). S druge strane, o neolitičkoj litičkoj proizvodnji na Kvarneru dostupno je jako malo podataka. Litički materijal iz Mirosavljevićevih iskopavanja nije objavljen, a dio je vjerojatno izgubljen (Müller 1994: 313). Tijekom novijih istraživanja neolitičkih slojeva u Veloj špilji na otoku Lošinju (Komšo et al. 2005) prikupljene su 33 izrađevine od lomljenoga kamena, među kojima i 13 sječiva. Sva sječiva načinjena su od visokokvalitetnoga, vrlo vjerojatno egzotičnoga rožnjaka, a njihove morfometrijske značajke upućuju na proizvodnju tehnikom pritiska (Kačar 2019b: 525–527).

Medijalni fragment sječiva iz Vorganjske peći, vjerojatno načinjenoga tehnikom pritiska na rožnjaku nepoznatoga porijekla, poprečno je usađeni umetak kompozitnoga srpa. Bio je obostrano i intenzivno korišten. Tragovi pokazuju da je umetak nakon uporabe jednoga radnog ruba izvađen, okrenut te ponovno umetnut u dršku radi korištenja drugoga radnog ruba. Postupak naoštravanja radnih rubova odvijao se u nekoliko ciklusa što je odraz dugoročne strategije održavanja s ciljem produljenja vijeka trajanja alatke. Na osnovi utvrđenih značajki moguće ga je usporediti s ranoneolitičkim sječivima tipa La Marmotta (Fugazzola Delpino et al. 1993) ili Karanovo I (Gurova 2018), ali i s ranoneolitičkim sječivima širega prostora zapadnoga Sredozemlja (Gassin et al. 2010; Ibáñez et al. 2008; Philibert et al. 2014; Mazzucco et al. 2016; Manen et al. 2019). Usporedbom sa srednjodalmatinskim sječivima, na kojima je pokazano da razlike u tragovima obrade ukazuju na razlike između ranoneolitičkih i srednjoneolitičkih žetvenih tehnologija (Mazzucco et al. 2018), vidljivo je da sječivo iz Vorganjske peći nije moguće uklopiti u razmatranu shemu. Naime, morfometrijski i tehnološki kriteriji upućuju na način proizvodnje impreso faze koju karakterizira izrada umetaka na manjim sječivima, blago poprečno umetanim u dršku (Mazzucco et al. 2018: 92–93). S druge strane, Mazzucco et al. (2018: 92–97) predlažu da je za danilsku fazu srednjodalmatinskoga neolitika karakteristična dugoročna strategija održavanja[11] pa bi značajke sječiva iz Vorganjske peći mogle ukazivati na razlike u tehnološkim praksama na području istočnoga Jadrana.

11 Tijekom danilske faze korištena su veća, često cijela sječiva umetana usporedno s drškom, dok su umeci impreso faze uglavnom jednokratno i svrsishodno korišteni (Mazzucco et al. 2018: 92–97).

for livestock and/or construction of houses) or used to cut stems laid on the ground (Clemente, Gibaja 1998).

Although it is difficult to interpret production technique based on a single insufficiently preserved blade, the regularity of edges and dorsal ridges, as well as even thickness indicate pressure flaking. Comparison with blades from other Neolithic sites in Kvarner and Dalmatia supports this claim. Namely, Dalmatian lithic assemblages show that pressure flaking was the dominant technique of blade production during the entire Neolithic period (Forenbaher, Perhoč 2017; Mazzucco et al. 2018; Kačar 2019a; 2019b; Podrug et al. 2018; 2021). On the other hand, very few data is available on the Neolithic lithic production of the Kvarner region. The lithic material from Mirosavljević's excavations remains unpublished and part of it is probably lost (Müller 1994: 313). Recent research of Neolithic layers in Vela špilja on Lošinj island (Komšo et al. 2005) yielded 33 lithic artefacts, including 13 blades. All blades were made from high-quality, most probably exotic chert and their morphometric characteristics indicate pressure flaking technique (Kačar 2019b: 525–527).

Medial fragment of the blade from Vorganjska peć, probably produced by pressure flaking from chert of unknown provenance, is an element of a composite sickle with diagonally hafted insert. It was bilaterally and intensively used. The traces show that after one working edge was used, the insert was taken out, turned and re-hafted so that the other working edge could be used. Sharpening of the working edges took place in several cycles, which reflects a long-term maintenance strategy with the purpose of extending the service life of the tool. Based on its features, it is comparable to Early Neolithic blades of La Marmotta (Fugazzola Delpino et al. 1993) or Karanovo I type (Gurova 2018), as well as to Early Neolithic blades from the wider western Mediterranean area (Gassin et al. 2010; Ibáñez et al. 2008; Philibert et al. 2014; Mazzucco et al. 2016; Manen et al. 2019). Comparison with the blades from central Dalmatia, on which it was proven that the differences in traces of retouching indicate differences between the Early and Middle Neolithic harvesting technologies (Mazzucco et al. 2018), shows that the blade from Vorganjska peć cannot be fitted into the considered scheme. Namely, the morphometric and technological criteria suggest production characteristic of the Impressed Ware phase, which is characterised by the production of inserts on smaller blades, slightly diagonally hafted into the handle (Mazzucco et al. 2018: 92–93). On the other hand, Mazzucco et al. (2018: 92–97) suggest that long-term maintenance strategy is characteristic of the Danilo phase of the central Dalmatian Neolithic[11] so the characteristics of the blade from Vorganjska peć could thereby indicate differences in technological practices in the eastern Adriatic.

11 During the Danilo phase, larger, often whole blades hafted parallel with the handle were used, while the inserts of the Impressed Ware phase were mostly used only once and for a specific purpose (Mazzucco et al. 2018: 92–97).

KRONOLOŠKI OKVIR

Na osnovi ulomaka keramičkih posuda impreso stila prikupljenih tijekom istraživanja V. Mirosavljevića, Johannes Müller ranoneolitičku fazu Vorganjske peći, kao i ostalih kvarnerskih nalazišta, pripisuje svom *Impresso* B stupnju koji smješta između 5800. i 5600. god. pr. Kr. (Müller 1991: 327; 1994: 182–185, 313). Ipak, sve veći broj radiokarbonskih datuma danas omogućuje preciznije kronološko pozicioniranje ranoga neolitika istočnoga Jadrana (Forenbaher, Miracle 2006a; 2014; Forenbaher et al. 2013; McClure et al. 2014; Podrug et al. 2014; McClure, Podrug 2016), a nova istraživanja otkrivaju i do sada nepoznatu aktivnost u Vorganjskoj peći tijekom srednjega neolitika koju potvrđuje ulomak posude ukrašen motivom spirale izvedene tehnikom udubljivanja. Korištena tehnika, kao i sam motiv karakteristična su pojava na danilskoj keramici posvjedočena na brojnim nalazištima istočne obale Jadrana (Korošec 1959: 73; Korošec, Korošec 1974: T. XXI: 2; Batović 1978b: sl. 3; Brusić 2008: T. XLV: 1–2; Vujević, Horvat 2012: T. X: 4; Marijanović, Horvat 2016: T. 4: 8; Horvat, Vujević 2017: sl. 4, T. 10). Ipak, istraživanja su rezultirala iznimno skromnim skupom nalaza što, zajedno s lošom očuvanošću prapovijesnih depozita uzrokovanom opsežnim recentnim zahvatima, onemogućuje donošenje preciznijih zaključaka o relativno kronološkoj slici Vorganjske peći. S druge strane, tijekom istraživanja nađeno je skoro 500 ulomaka različitih životinjskih kostiju, od čega je nešto više od polovice prikupljeno tijekom uklanjanja intaktnih prapovijesnih slojeva. Na uzorcima iz oba sloja provedena je radiokarbonska analiza čime su dobivena dva apsolutna datuma koja potvrđuju njihovo neolitičko porijeklo. Prvi datum pruža vremenski raspon od 5910±30 BP, odnosno 4844 – 4715 cal BC, dok drugi obuhvaća period od 6220±30 BP, odnosno 5298 – 5065 cal BC (tab. 1).[12]

Prvi datum dobiven je na uzorku iz sloja pripisanoga srednjem neolitiku te, u odnosu na apsolutne datume dobivene na nalazištima danilske keramike u Dalmaciji, odgovara samome kraju njegovoga trajanja. Usporedbom s datumima dobivenim na nedalekim neolitičkim nalazištima Istre, ponajprije iz Jačmice (Forenbaher, Miracle 2014: 131; Forenbaher et al. 2013: 591) i Trdačine (Forenbaher, Miracle 2014: 131) te Vele peći i Kargadura (Forenbaher et al. 2013: 591), dobivene na uzorcima iz slojeva s danilsko-vlaškom keramikom, može se uvidjeti da odgovara i rasponu trajanja danilsko-vlaške skupine koje apsolutni datumi produžuju čak do zadnje četvrtine 5. tis. pr. Kr., skoro pola stoljeća dulje u odnosu na pretpostavljeni kraj trajanja danilskoga stila u Dalmaciji. Utoliko je usporediv i s pojedinim datumima dobivenim na slovenskim nalazištima Trhlovca i Acijev Spodmol na kojima su izdvojeni slojevi obilježeni danilsko-vlaškom keramikom (Mlekuž 2010: 38–39).

Stariji datum, koji bi trebao predstavljati sloj s impreso keramikom, nekoliko je stoljeća mlađi od pretpostavljenoga kraja ranoga neolitika na istočnome Jadranu smještenog u sredinu 6. tis. pr. Kr. Razliku donekle umanjuju

12 Vrstu uzorka odredila je Mia Koščak kojoj ovom prilikom zahvaljujemo na pruženim podacima.

CHRONOLOGY

Based on Impressed Ware potsherds gathered by V. Mirosavljević, Johannes Müller attributed the Early Neolithic phase of Vorganjska peć, as well as of other Kvarner sites, to his Impressed Ware B phase dated between 5800 and 5600 BC (Müller 1991: 327; 1994: 182–185, 313). Today, however, the growing number of radiocarbon dates enables more precise chronological positioning of the eastern Adriatic Early Neolithic (Forenbaher, Miracle 2006a; 2014; Forenbaher et al. 2013; McClure et al. 2014; Podrug et al. 2014; McClure, Podrug 2016), while new research reveals hitherto unknown activity in Vorganjska peć during the Middle Neolithic which is confirmed by the potsherd with wide incised spiral decoration. The technique used, as well as the motif, is typical of Danilo style pottery and it is commonly found at numerous sites on the eastern Adriatic coast (Korošec 1959: 73; Korošec, Korošec 1974: Pl. XXI: 2; Batović 1978b: Fig. 3; Brusić 2008: Pl. XLV: 1–2; Vujević, Horvat 2012: Pl. X: 4; Marijanović, Horvat 2016: Pl. 4: 8; Horvat, Vujević 2017: Fig. 4, Pl. 10). However, the research yielded an exceptionally modest assemblage which, combined with poor level of preservation of prehistoric deposits caused by recent interventions, impedes reaching more precise conclusions about the relative chronology of Vorganjska peć. On the other hand, nearly 500 fragments of various animal bones were collected during the research, over half of which were recovered during the removal of intact prehistoric layers. Radiocarbon analysis was carried out on samples from both layers which yielded two absolute dates and confirmed their Neolithic origin. The first date provides the time range of 5910±30 BP, or 4844–4715 cal BC, while the second encompasses the period of 6220±30 BP, or 5298–5065 cal BC (Tab. 1).[12]

The first date was obtained from the layer attributed to the Middle Neolithic and, compared to the absolute dates obtained from Dalmatian sites with Danilo style pottery, it corresponds to its very end. When compared to the dates from the nearby Neolithic sites in Istria, primarily from Jačmica (Forenbaher, Miracle 2014: 131; Forenbaher et al. 2013: 591) and Trdačina (Forenbaher, Miracle 2014: 131) as well as Vela peć and Kargadur (Forenbaher et al. 2013: 591), obtained from the samples from layers with Danilo-Vlaška pottery, it is evident that it also corresponds to the time range of the Danilo-Vlaška group which is expanded by absolute dates as far as the final quarter of the 5th millennium BC, almost half a century longer compared to the presumed end of Danilo style in Dalmatia. Furthermore, it is comparable to the several dates from the Slovenian sites of Trhlovca and Acijev Spodmol, where the layers marked by Danilo-Vlaška pottery were determined (Mlekuž 2010: 38–39).

The older date, which should represent the layer with Impressed Ware, is several centuries younger than the presumed end of the Early Neolithic in the eastern Adriatic dated in the middle of the 6th millennium BC. This discrep-

12 The sample material was determined by Mia Koščak and we would like to take this opportunity to thank her for the data provided.

Oznaka uzorka / Sample ID	SJ / SU	Vrsta uzorka / Sample material	Oznaka Laboratorija / Lab ID	BP	Cal BC (68,2% vjerojatnost / probability)	Cal BC (95,4% vjerojatnost / probability)	Pripadnost / Attribution
BS-VORP_U25	18	Zub / tooth, *Bos taurus*	Beta-479247	6220 ± 30	5286–5077	5298–5065	Impresso
BS-VORP_U21	19	kost / bone, *Ovis/Capra*	Beta-508328	5910 ± 30	4825–4727	4844–4715	Danilo

Tab. 1 Radiokarbonski datumi dobiveni na uzorcima iz neolitičkih depozita (izradila: F. Sirovica)
Tab. 1 Radiocarbon dates obtained from the Neolithic deposit samples (mady by: F. Sirovica)

datumi dobiveni na nalazištu Vrcelji kod Benkovca (Horvat 2015: 23) te na Pokrovniku (McClure et al. 2014: 1033–1035) koji trajanje impreso ločarije u Dalmaciji produžuju do 5400. ili 5300. god. pr. Kr. Ipak, datum odgovara onom dobivenom na nalazištu Konjevrate (McClure et al. 2014: 1035; Podrug et al. 2014), ali i osporavanom datumu iz Vižule (Chapman, Müller 1990: 130; Forenbaher, Kaiser 2006: 203–207; Forenbaher et al. 2013: 597) te datumu s nalazišta Tinj – Podlivade (Chapman, Müller 1990: 130; Chapman et al. 1996: 186) koji ima relativno veliko standardno odstupanje. Sva tri datuma u više su navrata argumentirano osporavana (Forenbaher, Kaiser 2006: 203–207; Forenbaher et al. 2013: 597; Korić, Horvat 2019), što nužno dovodi u pitanje i datum dobiven na uzorku iz Vorganjske peći. U tom je kontekstu potrebno istaknuti da, iako oskudne, neolitičke depozite bilo je moguće jasno definirati što onemogućuje pretjeranu sumnju u primarni položaj uzorka. S druge strane, morfološke specifičnosti pećine kao depozicijskoga bazena mogle su uzrokovati neprimijećeni poremećaj prilikom ili nakon njihova taloženja. Utoliko, prihvatimo li vjerodostojnost datuma dobivenoga na uzorku iz Vorganjske peći, rezultati ovoga istraživanja mogu značajno doprinijeti razmatranju još uvijek otvorenih pitanja o rasponu trajanja impreso keramike na istočnoj obali Jadrana.

RASPRAVA: VORGANJSKA PEĆ I NEOLITIK SJEVERNOGA JADRANA

Neolitik se na istočnom Jadranu javlja na samom početku 6. tis. pr. Kr. i veže se uz karakterističnu impreso keramiku koja se javlja na širem perijadranskom prostoru, od otoka Krfa u Jonskom moru do južne Istre. Impreso keramika istočnoga Jadrana pokazuje prilično ujednačene značajke i nalazi iz Vorganjske peći uklapaju se u već poznatu sliku. To je posebno vidljivo u odnosu na pojedine tipove posuda te ukrašavanje utiskivanjem posvjedočeno na brojnim nalazištima ranoga neolitika duž istočnojadranske obale. Ipak, zanimljivost Vorganjske peći prilično je kasni apsolutni datum dobiven na uzorku iz ranoneolitičkoga konteksta, pa rezultati ovoga istraživanja doprinose razmatranju je somewhat reduced by the dates obtained from the sites of Vrcelji near Benkovac (Horvat 2015: 23) and Pokrovnik (McClure et al. 2014: 1033–1035), which extend the duration of Impressed Ware in Dalmatia to 5400 or 5300 BC. Nevertheless, the date corresponds to the one obtained from the site Konjevrate (McClure et al. 2014: 1035; Podrug et al. 2014), but also to the disputed date from Vižula (Chapman, Müller 1990: 130; Forenbaher, Kaiser 2006: 203–207; Forenbaher et al. 2013: 597) and from the site of Tinj – Podlivade (Chapman, Müller 1990: 130; Chapman et al. 1996: 186), which has a relatively high standard deviation. All three dates were argued against on several occasions (Forenbaher, Kaiser 2006: 203–207; Forenbaher et al. 2013: 597; Korić, Horvat 2019), which necessarily also brings into question the date obtained from the sample from Vorganjska peć. It is necessary to point out in this context that, although scarce, it was possible to precisely define Neolithic deposits, which does not leave much doubt about the primary position of the sample. On the other hand, morphological particularities of the cave as a depositional pool could have caused an unobserved disturbance during or after their deposition. If we accept the date yielded by the sample from Vorganjska peć, the results of this research can significantly contribute to consideration of as yet unanswered questions about the duration of Impressed Ware on the eastern Adriatic coast.

DISCUSSION: VORGANJSKA PEĆ AND THE NORTHERN ADRIATIC NEOLITHIC

In the eastern Adriatic, the Neolithic starts at the beginning of the 6th millennium BC and it is characterised by Impressed Ware which is present in the wider Adriatic area, from the island of Corfu in the Ionian Sea to southern Istria. The eastern Adriatic Impressed Ware displays quite uniform features and the finds from Vorganjska peć fit into the existing picture. This is especially apparent with regard to particular types of vessels and impressed decoration found on numerous Early Neolithic sites along the eastern Adriatic coast. Nevertheless, what makes Vorgan-

njima dužine trajanja impreso stila na istočnome Jadranu. Dodatno, Vorganjska peć pripada sjevernome području rasprostiranja impreso keramike koje se može pratiti do južne Istre, pa dobiveni datum ponovo otvara problematiku istodobne pojave impreso stila i danilsko-vlaške keramike (Bonsall et al. 2013: 149–151; Forenbaher, Kaiser 2006: 205–206; Forenbaher, Miracle 2006b: 508; Forenbaher et al. 2014: 603–604; McClure et al. 2014: 1035–1036). Iako se tradicionalno smatra regionalnom varijantom danilskoga stila, prema trenutno poznatim datumima danilsko-vlaška keramika javlja se nešto ranije te traje u rasponu od 5600. pa sve do 4300. god. pr. Kr. (Forenbaher et al. 2013: 604). Datum za impreso fazu Vorganjske peći utoliko govori o mogućnosti višestoljetnoga paralelnog trajanja impreso i danilsko-vlaškog stila na relativno malome prostoru. Takva situacija mogla bi uzrokovati i već razmatranu mogućnost pojave keramike različitih stilova u istome kontekstu (Bonsall et al. 2013: 149–151; Forenbaher, Kaiser 2006: 205–206; Forenbaher, Miracle 2006b: 508; Forenbaher et al. 2014: 603–604; McClure et al. 2014: 1035–1036), no u Vorganjskoj peći takva situacija nije utvrđena, a depoziti s keramikom ranoneolitičkih i srednjoneolitičkih značajki jasno su odvojeni.

Problematika danilsko-vlaškog stila mora se uključiti i u razmatranje značajki srednjoneolitičke keramike s ovoga položaja. Razlike u odnosu na tipičnu danilsku keramiku s dalmatinskih nalazišta uglavnom se svode na učestalost pojedinih oblika te gotovo potpuni nedostatak slikanoga ukrasa na keramici danilsko-vlaškog stila (Forenbaher, Kaiser 2006: 201; Hulina et al. 2012: 151). Ipak, oskudna keramička građa iz Vorganjske peći nema izražene srednjoneolitičke značajke koje ovdje prepoznajemo tek u motivu spirale. Kako se on u razmatranom periodu javlja na čitavome području istočnoga Jadrana, Vorganjsku peć, ali i druga kvarnerska nalazišta obilježena pojavom srednjoneolitičkoga keramičkog materijala nije moguće sa sigurnošću povezati s danilskim ili danilsko-vlaškim stilom.

Ipak, izrazitijom značajkom Vorganjske peći možemo smatrati metličaste tragove kakvi su ustanovljeni na osam ulomaka, odnosno 5,3% cijeloga uzorka. Taj specifični vid obrade površine na istočnoj se obali Jadrana javlja već u ranome neolitiku te je zabilježen na nekoliko danas poznatih nalazišta koja su uglavnom smještena na području Dalmacije: Gudnja na Pelješcu (Batović 1979: 509; Marijanović 2005: 31, T. III: 5), Vrcelji kraj Benkovca (Horvat 2015: 22), Crno Vrilo (Marijanović 2009: 79, 199, T. XXXVII), položaj Koinka kraj Sikova (Čondić 2014: 101) te Vaganačka pećina (Forenbaher, Vranjican 1985: 8). Na području sjevernoga Jadrana, metličasti tragovi u kontekstu ranoga neolitika spominju se na nalazištu Kargadur u Istri (Komšo 2006a: 115). Tijekom srednjega neolitika primijećena je izrazitija pojava metličastih tragova, no oni se sada javljaju na nalazištima smještenim gotovo isključivo na području Istre te tršćanskog i slovenskog Krasa, pa se čini da je upravo metličaste tragove moguće smatrati značajkom danilsko-vlaške skupine. Najjužnije nalazište srednjoneolitičke keramike s metličastim tragovima za sada je Vaganačka pećina

jska peć interesting is a rather late absolute date obtained from the sample from its Early Neolithic context, which makes the results of this research a valuable contribution to the studies of the duration of Impressed Ware in the eastern Adriatic. In addition, Vorganjska peć belongs to the northern area of distribution of Impressed Ware which can be tracked to southern Istria, so the date obtained again raises the question of the concurrent appearance of Impressed Ware and Danilo-Vlaška pottery (Bonsall et al. 2013: 149–151; Forenbaher, Kaiser 2006: 205–206; Forenbaher, Miracle 2006b: 508; Forenbaher et al. 2014: 603–604; McClure et al. 2014: 1035–1036). Although traditionally considered a regional variant of Danilo style, according to the currently known dates, the Danilo-Vlaška pottery appears somewhat earlier and lasts from 5600 to 4300 BC (Forenbaher et al. 2013: 604). The date for the Impressed Ware phase of Vorganjska peć thus indicates a possibility of a centuries-long simultaneous existence of Impressed Ware and Danilo-Vlaška style in a relatively small area. This might be the cause of the previously considered possibility of appearance of pottery of different styles in the same context (Bonsall et al. 2013: 149–151; Forenbaher, Kaiser 2006: 205–206; Forenbaher, Miracle 2006b: 508; Forenbaher et al. 2014: 603–604; McClure et al. 2014: 1035–1036), however, such situation was not identified in Vorganjska peć, where the deposits containing pottery with Early and Middle Neolithic features are distinctly separated.

The issue of the Danilo-Vlaška style must also be included in consideration of the characteristics of Middle Neolithic pottery from this site. The differences in relation to the typical Danilo pottery from Dalmatian sites mostly come down to the frequency of particular shapes and nearly complete lack of painted decoration on Danilo-Vlaška pottery (Forenbaher, Kaiser 2006: 201; Hulina et al. 2012: 151). Still, scarce ceramic material from Vorganjska peć does not display distinct Middle Neolithic features except for the spiral motif. Since this motif appears in the entire eastern Adriatic in the observed period, Vorganjska peć, as well as other Kvarner sites with Middle Neolithic pottery, cannot be tied to Danilo or Danilo-Vlaška styles with certainty.

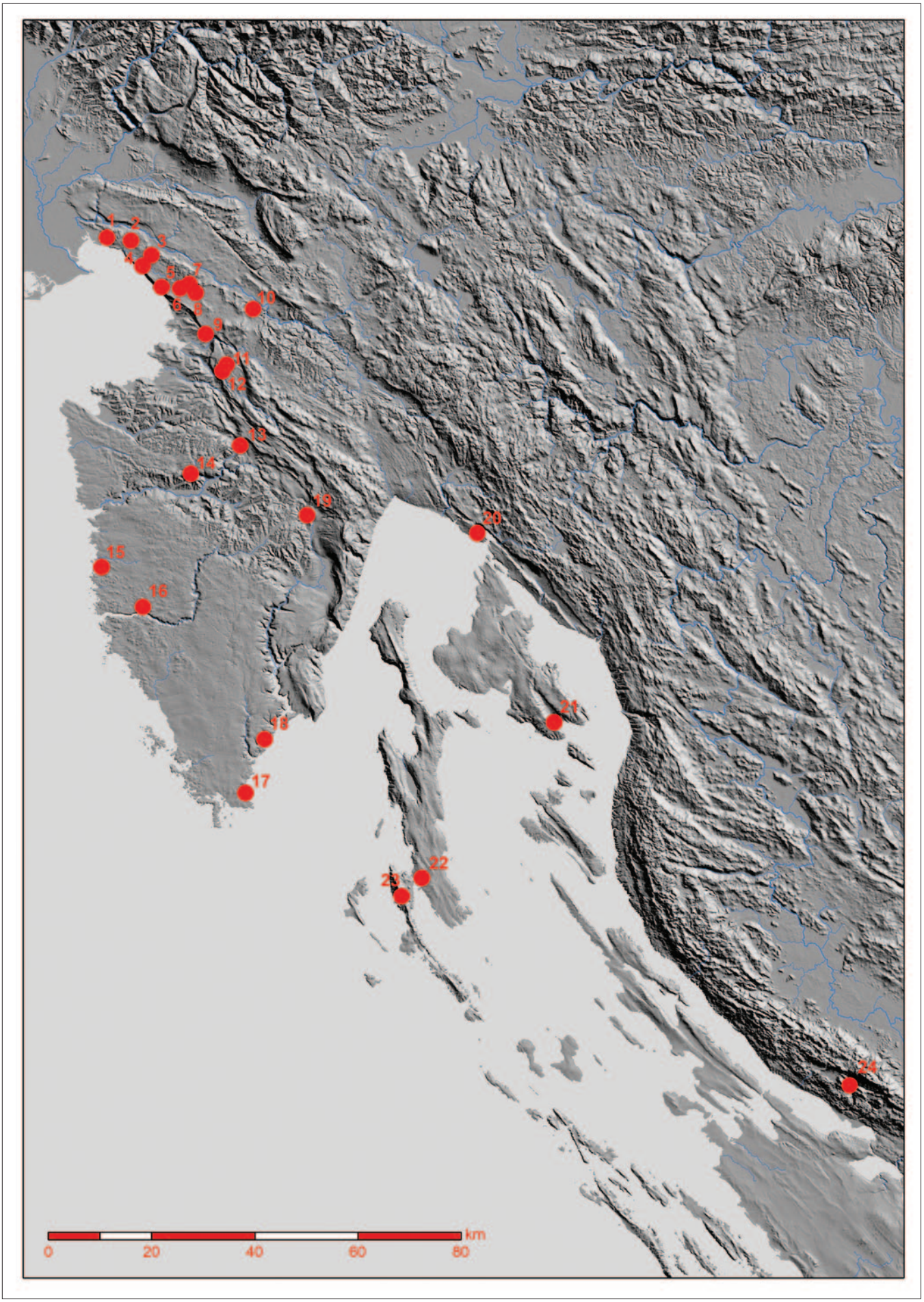
Nevertheless, the traces of brushing, identified on eight sherds, or 5.3% of the entire sample, can be considered a distinctive feature of Vorganjska peć. This specific type of surface treatment appears on the eastern Adriatic coast already in the Early Neolithic and was recorded on several well-known sites, mostly in Dalmatia: Gudnja on Pelješac peninsula (Batović 1979: 509; Marijanović 2005: 31, Pl. III: 5), Vrcelji near Benkovac (Horvat 2015: 22), Crno Vrilo (Marijanović 2009: 79, 199, Pl. XXXVII), Koinka near Sikovo (Čondić 2014: 101) and Vaganačka pećina (Forenbaher, Vranjican 1985: 8). In the northern Adriatic area, brushed surface pottery in the context of the Early Neolithic is reported for the site of Kargadur in Istria (Komšo 2006a: 115). During the Middle Neolithic, a more frequent appearance of brushed surfaces was noted, but almost exclusively in Istria and in Trieste and Slovenian Karst so it appears that

na Velebitu, no iako keramika pokazuje sličnosti s materijalom danilsko-vlaške skupine, ukupni skup nalaza s ovoga nalazišta nije moguće bliskije povezati s danilsko-vlaškim stilom (Forenbaher, Vranjican 1985: 8–9). Na području Kvarnera, keramičke posude s metličastim tragovima spominju se u Jami na Sredi (Mirosavljević 1959: 164), Veloj špilji (Mirosavljević 1968: 48) te gradini Solin kraj Rijeke (Starac 2009: 414), no trenutna razina objavljenosti provedenih istraživanja ne omogućuje detaljnije sagledavanje značajki kvarnerske srednjoneolitičke građe te njezino pripisivanje određenome stilu. Područje rasprostiranja danilsko-vlaškog stila obuhvaća Istru te tršćanski i slovenski Kras (Barfield 1972: 188; Biagi, Voytek 1994: 64; Forenbaher, Miracle 2006b: 526–528), pa ako se metličasti tragovi prihvate kao srednjoneolitička pojava karakteristična za danilsko-vlaški stil, može se pretpostaviti njegov izrazitiji utjecaj na područje Kvarnera koji će možda biti moguće pratiti duž cijeloga sjevernog Jadrana (karta 2; tab. 2).

I litički skup nalaza, iako skroman, govori u prilog izuzetne važnosti Kvarnera u razumijevanju smjerova kretanja i interakcija prapovijesnih populacija. Naime, nedavna istraživanja pokazuju da je početak neolitika u Dalmaciji usko povezan sa širenjem garganskog rožnjaka iz jugoistočne Italije (Forenbaher, Perhoč 2015; 2017; Mazzucco et al. 2018; Podrug et al. 2018; Forenbaher 2019; Kačar 2019a; 2019b; Perhoč 2020). S druge strane, tijekom ranoga neolitika istarski lokaliteti oslanjaju se isključivo na lokalna ležišta rožnjaka (Codacci 2004: 159; Komšo 2006a: 116; 2006b; Komšo et al. 2008: 134–136; Andreasen 2009: 56–57), odnosno nisu dio garganske distribucijske mreže (Kačar 2019b: 504–525, 537–540). To bi moglo upućivati da neolitičke grupe Istre i Dalmacije nisu dio iste *koiné*, a privid njihovoga jedinstva proizlazi iz načina ukrašavanja keramike (Kačar 2019b: 543–544). Prema dostupnim, iako ograničenim podacima, čini se da garganski rožnjak nije stigao do sjevernoga Jadrana. Od srednjega neolitika istarski se poluotok vjerojatno uključuje u sjevernotalijansku mrežu distribucije rožnjaka s predalpskoga prostora (Komšo et al. 2008: 136; Kačar 2019b: 539) koja se, prema trenutno dostupnim podacima, razvija oko 5300. god. pr. Kr. (Starnini et al. 2018). Granica između garganske i predalpske distribucijske mreže mogla je biti upravo na Kvarneru, no nedostatak petrografskih analiza te sličnost garganskog i predalpskog rožnjaka za sada takve tvrdnje ostavljaju na razini pretpostavke (Kačar 2019b: 525; Perhoč 2020). Uz to, na osnovi trenutne razine istraženosti moguće je primijetiti i razlike u načinima distribucije rožnjaka između Dalmacije i Istre. Naime, dalmatinski skupovi nalaza pokazuju manjak elemenata koji nastaju tijekom primarne redukcije (komadi s okorinom, deblji i veći odbojci), no prisutnost odbojaka nastalih redukcijom jezgre, kršja, pokojega komada s okorinom i komada nastalih dotjerivanjem (krestasta sječiva, odbojci od dotjerivanja jezgre, sječiva od dotjerivanja jezgre, okružci), upućuje na *in situ* proizvodnju sječiva (Mazzucco et al. 2018: 91; Kačar 2019a; 2019b; Podrug et al. 2018; 2021). Izrađevine na stranim rožnjacima nađene u Istri isključivo su gotovi proi-

the brushed surface pottery can be considered a specific feature of the Danilo-Vlaška group. Vaganačka pećina on Velebit is currently the southernmost site with the finds of Middle Neolithic brushed pottery, but although the pottery exhibits some similarities with the material of the Danilo-Vlaška group, the overall assemblage of finds from this site cannot be tied to the Danilo-Vlaška style (Forenbaher, Vranjican 1985: 8–9). In Kvarner, ceramic vessels with brushed surfaces were also found at Jami na Sredi (Mirosavljević 1959: 164), Vela špilja (Mirosavljević 1968: 48) and Solin hillfort near Rijeka (Starac 2009: 414), but the current amount of published research does not enable a more detailed consideration of the characteristics of the Kvarner Middle Neolithic material and its attribution to a particular style. For now, Istria and Trieste and Slovenian Karst are considered to be the areas of distribution of the Danilo-Vlaška style (Barfield 1972: 188; Biagi, Voytek 1994: 64; Forenbaher, Miracle 2006b: 526–528), and therefore if the brushed surface pottery is accepted as the Middle Neolithic phenomenon typical of the Danilo-Vlaška style, we can assume it's more pronounced influence on Kvarner area, which will perhaps be possible to track along the entire northern Adriatic (Map 2; Tab. 2).

Although modest, the lithic assemblage also attests to exceptional importance of Kvarner in understanding the routes of movement and interactions of prehistoric populations. Namely, recent research shows that the beginning of the Neolithic in Dalmatia is closely related to the spread of Gargano chert from south-eastern Italy (Forenbaher, Perhoč 2015; 2017; Mazzucco et al. 2018; Podrug et al. 2018; Forenbaher 2019; Kačar 2019a; 2019b; Perhoč 2020). On the other hand, Istrian sites relied exclusively on local chert deposits during the Early Neolithic (Codacci 2004: 159; Komšo 2006a: 116; 2006b; Komšo et al. 2008: 134–136; Andreasen 2009: 56–57), i.e. they were not part of the Gargano distribution network (Kačar 2019b: 504–525, 537–540). This could imply that the Neolithic groups of Istria and Dalmatia did not belong to the same *koiné*, whereas the impression of their unity arises from the types of pottery decoration (Kačar 2019b: 543–544). According to the available, although limited data, it appears that the Gargano chert did not reach northern Adriatic. From the Middle Neolithic period, the Istrian peninsula was probably included in the north Italian chert distribution network from the pre-Alpine area (Komšo et al. 2008: 136; Kačar 2019b: 539) which, according to the currently available data, developed around 5300 BC (Starnini et al. 2018). The boundary between the Gargano and the pre-Alpine distribution network might have been in Kvarner, but for now this is only speculation due to the lack of petrographic analyses and the similarity between the Gargano and pre-Alpine chert (Kačar 2019b: 525; Perhoč 2020). In addition, based on the current state of research, one can also notice the differences in the ways of chert distribution between Dalmatia and Istria. Namely, Dalmatian assemblages lack elements which occur in the course of primary reduction (pieces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Broj na karti / No. on Map	Nalazište / Site	Literatura / Bibliography
1	Grotta del Mitreo	Stacul 1972: Fig. 10: 9; Montagnari Kokelj, Crismani 1997: Fig. 36: 339
2	Grotta dell'Ansa	Marzolini 1977: Fig. 10: 1
3	Grotta Azzura	Cannarella, Cremonesi 1967: Fig. 5: 4
4	Jama na Dolceh	Barfield 1999: 40
5	Grotta della Tartaruga	Cannarella, Redivo 1981: Fig. 6: 35–36, 49; 8: 5, 9
6	Grotta degli Zingari	Gilli, Montagnari Kokelj 1996: Fig. 6: 2; 8: 8; 9: 19, 21, 23
7	Riparo di Monrupino	Bertoldi 1996: Fig. 4: 1–2; 7: 66; 13: 169; 14: 181
8	Grotta dei Ciclami	Gilli, Montagnari Kokelj 1992: Fig. 6: 9, 15–16; 7: 20, 28; 8: 32; 9: 41, 44, 48, 49; 12: 80; 13: 83, 87; 16: 107
9	Grotta delle Gallerie	Gilli, Montagnari Kokelj 1993: Fig. 11: 44–45; 12: 47–48
10	Mala Triglavca	Budja et al. 2013: Fig. 5: 5
11	Acijev spodmol	Turk et al. 1992: T. 1: 1, 7, 22; 2: 5; 3: 3
12	Podmol pri Kastelcu	Turk et al. 1993: T. 1: 5, 12–13
13	Jačmica	Jerbić Percan 2012: 15
14	Laganiši	Komšo 2006a: 230
15	Garbinovica	Čuka 2015: 19–21; T. 19: 124, 127–128
16	Limska gradina	Baćić 1976: 34
17	Kargadur	Komšo 2006b: 115–116
18	Pradišel kod Pavičine	Baćić 1972: T. 8–9; Mihovilić 1987: T. 2: 3
19	Pupićina peć	Forenbaher, Kaiser 2006: 176–177
20	gradina Solin	Starac 2009: 414
21	Vorganjska peć	–
22	Jami na Sredi	Mirosavljević 1959: 164
23	Vela špilja	Mirosavljević 1968: 48
24	Vaganačka pećina	Forenbaher, Vranjican 1985: 8

Karta 2 / Tab. 2

Nalazišta na kojima je, na osnovi objavljenoga materijala, utvrđena pojava metličastih tragova na vanjskim stijenkama srednjoneolitičkih keramičkih posuda (izradili: D. Tresić Pavičić, M. Korić; podloge: EU-DEM, produced using Copernicus data and information funded by the European Union; WISE rivers, European Environment Agency (EEA))

Map 2 / Tab. 2

Sites where, based on published material, finds of Middle Neolithic vessels with brushed outer surfaces were unearthed (made by: D. Tresić Pavičić, M. Korić; base maps: EU-DEM, produced using Copernicus data and information funded by the European Union; WISE rivers, European Environment Agency (EEA))

zvodi (obrađena i neobrađena sječiva te bifacijalne strelice s trnom), a ista je situacija utvrđena i u Veloj špilji na Lošinju (Kačar 2019b: 522–527). Dvije izrađevine iz Vorganjske peći ne mogu značajnije doprinijeti tim raspravama, no bitno je istaknuti da prisutnost odbojka ne govori *a priori* o lokalnoj proizvodnji i može biti rezultat uvoza. S druge strane, nepotpuni lanac operacija utvrđen na špiljskim lokalitetima može biti rezultat specifične funkcije nalazišta. Ipak, tek će buduća istraživanja pokazati je li riječ o različitim načinima distribucije ili je istovremeno riječ i o različitim centrima distribucije. Ako su centri distribucije različiti, uključivanje (dijela) sjevernoga Jadrana u sjevernotalijansku mrežu razmjene nakon 5300 god. pr. Kr. možda je u nekoj mjeri povezano i sa širenjem danilsko-vlaškog stila. Ipak, potpunije razumijevanje dinamike i mehanizama širenja neolitičkih tekovina te smjerovi migracija i interakcija neolitičkih populacija zahtijevaju daljnja istraživanja kako Kvarnera, tako i čitavoga sjevernog Jadrana.

ZAKLJUČAK

Arheološko istraživanje u Vorganjskoj peći bilo je ograničenoga opsega te je njime utvrđen u znatnoj mjeri narušen stratigrafski slijed, no prikupljeni podaci doprinose razmatranjima problematike neolitika na sjevernome Jadranu. To se prije svega odnosi na podatke o kronološkom smještaju neolitičkih depozita koji prikazuju jednu prilično kasnu pojavu impreso stila na Kvarneru, upućujući istodobno na dugotrajno preklapanje s prostorno bliskim danilsko-vlaškim stilom. Neovisno o vremenskome preklapanju, stratifikacija Vorganjske peći pokazuje jasno odvajanje ranoneolitičkoga i srednjoneolitičkoga depozita. S druge strane, pojava metličastih tragova na vanjskim stijenkama posuda mogla bi govoriti o izrazitijem utjecaju danilsko-vlaškog stila na keramiku Vorganjske peći koja je ovdje mogla trajati tijekom obje faze neolitika.

Prikupljeni podaci ne pružaju jasne odgovore na pitanja načina i razloga korištenja ovoga prostora u razmatranome razdoblju. Njezina mala površina i relativna nedostupnost upućuju na povremeno korištenje, odnosno vjerojatni diskontinuitet uporabe kakav je utvrđen u mnogim pećinama s neolitičkim arheološkim depozitima (Montagnari Kokelj 2001: 247). Iz tog je razloga već razmatrana pretpostavka da skup pokretnoga arheološkog materijala nađen u takvim kontekstima vrlo vjerojatno ne predstavlja puni skup proizvoda pojedine zajednice (Montagnari Kokelj 2001: 247; McClure et al. 2014: 1035). Dodatno, razmatrana je i mogućnost povezanosti namjene takvih objekata s određenim stočarskim aktivnostima kakve su više puta utvrđene na istodobnim i istovrsnim nalazištima (Boschian, Montagnari-Kokelj 2000: 348–350; Mlekuž 2003: 145–146; Boschian 2006: 159) te za kakve je i sama u novije vrijeme služila. S druge strane, nalaz sječiva sa sjajem srpa može se smatrati indirektnim pokazateljem poljoprivrednih djelatnosti zajednice koja

with cortex, thicker and larger flakes), but the presence of flakes produced by core reduction, debris, occasional pieces with cortex and pieces resulting from core renewal (crested blades, core renewal flakes, core renewal blades, core tablets), indicates *in situ* blade production (Mazzucco et al. 2018: 91; Kačar 2019a; 2019b; Podrug et al. 2018; 2021). All artefacts from Istria made from non-local cherts are finished products (retouched and unretouched blades and bifacial arrow points with a tang), and the same situation was also established in Vela špilja on the island of Lošinj (Kačar 2019b: 522–527). The two artefacts from Vorganjska peć cannot significantly contribute to these discussions, but it is important to point out that the presence of a flake does not necessarily indicate local production as they may have been imported. On the other hand, an incomplete *chaîne opératoire* which was established at cave sites may have resulted from their specific function. Nonetheless, only further research will show whether we are talking about different modes of distribution or different centres of distribution as well. In case of different distribution centres, inclusion of (a part of) the northern Adriatic in the north Italian exchange network after 5300 BC is perhaps to some extent also related to the spread of the Danilo-Vlaška style. Nevertheless, a more thorough understanding of the dynamics and mechanisms of spread of Neolithic novelties as well as routes of migrations and interactions of Neolithic populations require further research of Kvarner and the entire northern Adriatic.

CONCLUSION

Although archaeological investigation of Vorganjska peć was limited in scope and it established a significantly disturbed stratigraphic sequence, the acquired data contribute to the discussions of the northern Adriatic Neolithic. This primarily refers to data on chronological determination of Neolithic deposits, which suggest a rather late emergence of Impressed Ware in Kvarner, at the same time indicating a long-term overlap with a spatially close Danilo-Vlaška style. Regardless of the temporal overlap, the stratification of Vorganjska peć shows clear separation between the Early and Middle Neolithic deposits. On the other hand, the appearance of brushing of outer vessel surfaces might attest to a more pronounced influence of Danilo-Vlaška style on pottery from Vorganjska peć which could have been present here during both phases of the Neolithic.

The obtained data do not provide clear answers as to how and for what purpose the site was used in the observed period. Its small surface area and relatively inaccessible location indicate occasional use, i.e. probable discontinuity of use which was also established in numerous caves with Neolithic archaeological deposits (Montagnari Kokelj 2001: 247). The assumption that artefact assemblages found in such contexts probably do not represent complete sets of products produced by individual communities has therefore already been discussed (Montagnari Kokelj 2001: 247;

koristi Vorganjsku peć (prema Gassin et al. 2010; Ibáñez et al. 2008; Mazzucco et al. 2016; 2018) što otvara nova pitanja o načinima korištenja širega prostora u razdoblju neolitika te pruža mogućnost očekivanja trajnijeg i kontinuirano korištenoga naselja na otvorenom negdje u plodnoj bašćanskoj dolini.

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McClure et al. 2014: 1035). Additionally, the possibility of correlation between the purpose of such features and certain herding activities, which were identified a number of times at the sites belonging to the same period and type (Boschian, Montagnari-Kokelj 2000: 348–350; Mlekuž 2003: 145–146; Boschian 2006: 159) and for which it was used in more recent times, was also considered. On the other hand, the find of the blade with sickle gloss can be considered an indirect marker of agricultural activities of a community that used Vorganjska peć (according to Gassin et al. 2010; Ibáñez et al. 2008; Mazzucco et al. 2016; 2018), which raises new questions about the ways the wider area was used in the Neolithic period and allows us to expect a more permanent and continuously used open-air settlement somewhere in the fertile Baška valley.

IZVORI / SOURCES

Copernicus data and information (EU) – https://land.copernicus.eu/imagery-in-situ/eu-dem/eu-dem-v1.1 (pristupljeno 25. 10. 2020.)
Geoportal – https://geoportal.dgu.hr/ (pristupljeno 24. 10. 2020.)
WISE rivers, European Environment Agency (EEA) – https://www.eea.europa.eu/ (pristupljeno 20. 10. 2020.)

BIBLIOGRAPHY / LITERATURA

Andreasen, N. H. 2009, Early farmers on the coast: lithic procurement strategies of colonists in the eastern Adriatic, in: *Mesolithic Horizons*, Vol. 1, Papers presented at the Seventh International Conference on the Mesolithic in Europe, Belfast 2005, McCartan S., Schulting R., Warren G., Woodman P. (eds.), Oxbow Books, Oxford, 53–59.

Baćić, B. 1972, Pradišelski rt – eneolitski lokalitet, *Arheološki pregled*, Vol. 14, 32–35.

Baćić, B. 1976, Limska gradina (Istra) – neolitski lokalitet, *Arheološki pregled*, Vol. 18, 34–37.

Barfield, L. H. 1972, The first Neolithic cultures of North Eastern Italy, in: *Die Anfänge des Neolithikums vom Orient bis Nordeuropa, Teil VII: Westliches Mittelmeergebiet und Britische Inseln*, Schwabedissen H. (ed.), Böhlau Verlag, Köln – Wien, 182–217.

Barfield, L. H. 1999, The Moser Collection in the Naturhistorisches Museum, Vienna, *Atti della Società per la Preistoria e Protostoria della Regione Friuli-Venezia Giulia*, Vol. XI, 19–62.

Batović, Š. 1962, Neolitsko nalazište u Smilčiću, *Diadora*, Vol. 2(1960–1961), 31–116.

Batović, Š. 1966, *Stariji neolit u Dalmaciji*, Arheološko društvo Jugoslavije, Arheološki muzej Zadar, Beograd – Zadar.

Batović, Š. 1978a, Origines du Néolithique à l'Adriatique et les rapports avec la Mediterranée occidentale, *Godišnjak Centra za balkanološka ispitivanja*, Vol. XVI, 45–60.

Batović, Š. 1978b, Bribir u prapovijesti, in: *Novija i neobjavljena istraživanja u Dalmaciji*, znanstveni skup, Vodice, 10.–13. V. 1976, Rapanić Ž. (ed.), Izdanja Hrvatskog arheološkog društva 3, Hrvatsko arheološko društvo, Split, 9–24.

Batović, Š. 1979, Jadranska zona, in: *Praistorija Jugoslavenskih zemalja. II: Neolitsko doba*, Benac A. (ed), Akademija nauka i umjetnosti Bosne i Hrecegovine, Sarajevo, 473–635.

Benac, A. 1978, Les thèses fondamentales sur l'origine du Néolithique dans les Balkans et les régions avoisinantes, *Godišnjak Centra za balkanološka ispitivanja*, Vol. XVI, 9–20.

Benac, A. 1987, Quelques aspects de la Néolithisation dans les Balkans du nord-ouest, in: *Premières communautés paysannes en Méditerranée occidentale*, Actes du colloque international du C.N.R.S., Montpellier, avril 1983., Guilaine J., Courtin J., Roudil J.-L., Vernet J.-L. (eds.), CNRS Éditions, Paris, 335–341.

Bertoldi, F. 1996, Il Riparo di Monrupino nel Carso Triestino, *Atti della Società per la Preistoria e Protostoria della Regione Friuli-Venezia Giulia*, Vol. IX, 137–170.

Biagi, P., Voytek, B. A. 1994, The Neolithisation of the Trieste Karst in North-Eastern Italy and its neighbouring countries, *Jósa András Múzeum Évkönyve*, Vol. 36, 63–73.

Bonsall, C., Mlekuž, D., Bartosiewicz, L., Pickard, C. 2013, Early farming adaptations of the Northeast Adriatic Karst, in: *The Origins and Spread of Domestic Animals in Southwest Asia and Europe*, Colledge S., Conolly J., Dobney K., Manning K., Shennan S. (eds.), UCL Institute of Archaeology Publications 59, Left Coast Press, Walnut Creek, 145–160.

Boschian, G. 2006, Geoarchaeology of Pupićina Cave / Geoarheologija Pupićine peći, in: *Prehistoric herders of northern Istria: The archaeology of Pupićina cave. Volume 1 / Pretpovijesni stočari sjeverne Istre: Arheologija Pupićine peći. 1. svezak*, Monografije i katalozi Arheološkog muzeja Istre 14, Miracle P. T., Forenbaher S. (eds.), Arheološki muzej Istre, Pula, 123–162.

Boschian, G., Montagnari-Kokelj, E. 2000, Prehistoric Shepherds and Caves in the Trieste Karst (Northeastern Italy), *Geoarchaeology: An International Journal*, Vol. 15(4), 331–371. https://doi.org/10.1002/(SICI)1520-6548(200004)15:4<331::AID-GEA3>3.0.CO;2-H

Brusić, Z. 2008, *Pokrovnik – naselje iz neolitika*, Muzej grada Šibenika, Šibenik.

Budja, M., Ogrinc, N., Žibrat Gašparič, A., Potočnik, D., Žigon, D., Mlekuž, D. 2013, Transition to farming – transition to milk culture: Mala Triglavca case study, *Documenta Praehistorica*, Vol. XL, 97–118. https://doi.org/10.4312/dp.40.9

Buršić-Matijašić, K. 1994, La ceramica a striature in Istria, *Atti della XXIX riunione scientifica, Preistoria e protostoria del Friuli-Venezia Giulia e dell' Istria*, Trieste 28-30.9.1990, Istituto Italiano di Preistoria e Protostoria, Firenze, 247–260.

Cannarella, D., Cremonesi, G. 1967, Gli scavi nella Grotta Azzurra di Samatorza nel Carso triestino, *Rivista di Scienze Preistoriche*, Vol. XXII(2), 281–330.

Cannarella, D., Redivo, B. 1981, La Grotta della Tartaruga: livelli a ceramica - nota preliminare, *Atti della Società per la Preistoria e Protostoria della Regione Friuli-Venezia Giulia*, Vol. IV, 45–71.

Chapman, J. C., Müller, J. 1990, Early Farmers in the Mediterranean Basin: The Dalmatian Evidence, *Antiquity*, Vol. 64(242), 127–134. https://doi.org/10.1017/S0003598X00077371

Chapman, J. C., Shiel, R. S., Batović, Š. 1996, *The Changing Face of Dalmatia: Archaeological and Ecological Studies in a Mediterranean Landscape*, Leicester University Press, London.

Claud, E. 2008, *Le statut fonctionnel des bifaces au Paléolithique moyen récent dans le Sud-Ouest de la France: Étude tracéologique intégrée des outillages des sites de La Graulet, La Conne de Bergerac, Combe Brune 2, Fonseigner et Chez-Pinaud / Jonzac*, Unpublished PhD thesis, Université Sciences et Technologies - Bordeaux I, Bordeaux.

Clemente, I., Gibaja, J.-F. 1998, Working processes on cereals: an approach through microwear analysis, *Journal of Archaeological Science*, Vol. 25(5), 457–464. https://doi.org/10.1006/jasc.1997.0214

Codacci, G. 2004, Il sito neolitico di Vižula: analisi tipologica dell'industria litica, *Histria archaeologica*, Vol. 33(2002), 143–193.

Čondić, N. 2014, Neolitičko nalazište u Sikovu, *Diadora*, Vol. 26–27(2012–2013), 93–116.

Čuka, M. 2015, Prapovijesna keramika iz pećine Garbinovice kod Poreča: probno arheološko istraživanje iz 2013. godine, *Histria Archaeologica*, Vol. 45(2014), 5–62.

Forenbaher, S. 2014, Neolitico dell'Adriatico Orientale / Eastern Adriatic Neolithic, in: *Adriatico senza confini: via di comunicazione e crocevia di popoli nel 6000 a.C. / The Adriatic, a sea without borders: communication routes of populations in 6000 BC*, Visentini P., Podrug E. (eds.), Civici Musei di Udine, Museo Friulano di Storia Naturale, Udine, 43–56.

Forenbaher, S. 2019, Trans-Adriatic contacts and the transition to farming, *Euroasian Prehistory*, Vol. 15 (1–2), 25–46.

Forenbaher, S., Kaiser, T. 2006, The Pottery of Pupićina Cave / Lončarija Pupićine peći, in: *Prehistoric herders of northern Istria: The archaeology of Pupićina cave. Volume 1 / Pretpovijesni stočari sjeverne Istre: Arheologija Pupićine peći. 1. svezak*, Monografije i katalozi Arheološkog muzeja Istre 14, Miracle P. T., Forenbaher S. (eds.), Arheološki muzej Istre, Pula, 163–224.

Forenbaher, S., Miracle, P. T. 2006a, The spread of farming in the Eastern Adriatic, *Documenta Praehistorica*, Vol. XXXIII, 89–100. https://doi.org/10.4312/dp.33.10

Forenbaher, S., Miracle, P. T. 2006b, Pupićina Cave and the Spread of Farming in the Eastern Adriatic / Pupićina peć i širenje zemljoradnje na istočnom Jadranu, in: *Prehistoric herders of northern Istria: The archaeology of Pupićina cave. Volume 1 / Pretpovijesni stočari sjeverne Istre: Arheologija Pupićine peći. 1. svezak*, Monografje i katalozi Arheološkog muzeja Istre 14, Miracle P. T., Forenbaher S. (eds.), Arheološki muzej Istre, Pula, 483–530.

Forenbaher, S., Miracle, P. T. 2014, Širenje zemljoradnje na istočnom Jadranu u svjetlu novih radiokarbonskih datuma, *Diadora*, Vol. 26–27(2012–2013), 117–133.

Forenbaher, S., Perhoč, Z. 2015, Lithic artifacts from Nakovana (Pelješac): continuity and change from early Neolithic until the end of Prehistory, *Prilozi instituta za arheologiju u Zagrebu*, Vol. 32, 5–74.

Forenbaher, S., Perhoč, Z. 2017, Lithic Assemblages from Nakovana (Croatia). Raw Material Procurement and Reduction Technology from the Early Neolithic until the End of Prehistory, *Journal of Mediterranean Archaeology*, Vol. 30(2), 189–211. https://doi.org/10.1558/jmea.35405

Forenbaher, S., Vranjican, P. 1985, Vaganačka pećina, *Opuscula Archaeologica*, Vol. 10, 1–21.

Forenbaher, S., Kaiser, T., Miracle, P. T. 2013, Dating the East Adriatic Neolithic, *European Journal of Archaeology*, Vol. 16(4), 589–609. https://doi.org/10.1179/1461957113Y.0000000038

Fugazzola Delpino, M. A., D'Eugenio, G., Pessina, A. 1993, La Marmotta (Anguillara Sabazia, RM): scavi 1989 – un abrito perilacustre di età neolitica, *Bullettino di paletnologia italiana*, n.s. II Vol. 84, 181–304.

Gassin, B., Bicho, N., Bouby, L., Buxó, R., Carvalho, A. F., Clemente, I., Gibaja, J. F., González, J., Ibañez, J. J., Linton, J., Marinval, P. H., Marquez, B., Peña-Chocarro, L., Perez Jorda, G., Philibert, S., Rodriguez, A., Zapata, L. 2010, Variabilité des techniques de récolte et traitement des céréales dans l'Occident méditerranéen au Néolithique ancien et moyen: facteurs environnementaux, économiques et sociaux, in: *Économie et société à la fin de la Préhistoire: Actualité de la recherche*, Actes des 7e Rencontres méridionales de Préhistoire récente tenues à Bron (Rhône), les 3 et 4 novembre 2006, Beeching A., Thirault E., Vital J. (eds.), Documents d'Archéologie en Rhône-Alpes et en Auvergne 34, Publications de la Maison de l'Orient et de la Méditerranée, Lyon, 19–37.

Gilli, E., Montagnari Kokelj, E. 1992, La Grotta dei Ciclami nel Carso Triestino (materiali degli scavi 1959–1961), *Atti della Società per la Preistoria e Protostoria della Regione Friuli-Venezia Giulia*, Vol. VII, 65–162.

Gilli, E., Montagnari Kokelj, E. 1993, La Grotta delle Gallerie nel Carso Triestino, *Atti della Società per la Preistoria e Protostoria della Regione Friuli-Venezia Giulia*, Vol. VIII, 121–194.

Gilli, E., Montagnari Kokelj, E. 1996, La Grotta degli Zingari nel Carso Triestino (Materiali degli scavi 1961–1965), *Atti della Società per la Preistoria e Protostoria della Regione Friuli-Venezia Giulia*, Vol. IX, 63–126.

González Urquijo, J. E., Ibáñez Estévez, J. J. 1994, *Methodologia de análisis funcional de instrumentos tallados en silex*, Cuadernos de Arqueología 14, Universidad de Deusto, Bilbao.

Gurova, M. 2018, Flint assemblages in the context of cultural transition during the 6th millennium BC: a case study from Bulgaria, *Bulgarian e-Journal of Archaeology*, Vol. 8(2), 113–143.

Horvat, K. 2015, Polje niže Vrcelja – nalazište ranog neolitika na benkovačkom području, *Vjesnik za arheologiju i historiju dalmatinsku*, Vol. 108, 9–35.

Horvat, K., Vujević, D. 2017, Pokrovnik – materijalna kultura neolitičkog naselja, *Prilozi Instituta za arheologiju u Zagrebu*, Vol. 34, 45–81.

Hulina, M., Forenbaher, S., Miracle, P. 2012, Prapovijesna keramika iz unutrašnjeg dijela Pupićine peći, *Histria Arhaeologica*, Vol. 42(2011), 137–184.

Ibáñez, J. J., Clemente Conte, I., Gassin, B., Gibaja, J. F., González Urquijo, J., Márquez, B., Philibert, S., Rodríguez Rodríguez A. 2008, Harvesting technology during the Neolithic in South-West Europe, in*: 'Prehistoric Technology' 40 Years Later: Functional Studies and the Russian Legacy*, Proceedings of the International Congress Verona (Italy), 20-23 April 2005, Longo L., Skakun N. (eds.), British Archaeological Reports, International Series 1783, Archaeopress, Oxford, 183–195.

Inizan, M-L., Redouron-Balinger, M., Roche, H., Tixier, J. 1999, *Technology and terminology of knapped stone*, Préhistoire de la pierre taillée 5, Cercle de Recherches et d'Etudes Préhistoriques Maison de l'Archéologie et de l'Ethnologie, Nanterre.

Jerbić Percan, K. 2012, Prapovijesna keramika iz pećine Jačmice, *Histria arhaeologica*, Vol. 42(2011), 5–86.

Karavanić, I., Vukosavljević, N., Sošić Klindžić, R., Težak-Gregl, T., Halamić, J., Bošnjak Botica, T., Nahod, B. 2015, *Pojmovnik kamenog doba*, Sveučilište u Zagrebu, Filozofski fakultet, Institut za hrvatski jezik i jezikoslovlje, Zagreb.

Kačar, S. 2019a, Impressed Ware blade production of Northern Dalmatia (Eastern Adriatic, Croatia) in the context of Neolithisation, *Documenta Praehistorica*, Vol. XLVI, 352–374. https://doi.org/10.4312/dp.46.22

Kačar, S. 2019b, *Les sociétés mésolithiques de l'arc adriatique oriental: des origines à la néolithisation, de l'Istrie aux côtes épirotes / Mezolitička društva istočnog Jadrana: od početka do neolitizacije, od Istre do obala Epira*, Unpublished PhD thesis, Université Toulouse, Sveučilište u Zagrebu, Toulouse – Zagreb.

Komšo, D. 2006a, Kargadur – eine Siedlung aus dem frühen- und mittleren Neolithikum Istriens, *Mitteilungen der Berliner Gesellschaft für Anthropologie, Ethnologie und Urgeschichte*, Vol. 27, 111–118.

Komšo, D. 2006b, Pećina Laganiši, *Hrvatski arheološki godišnjak*, Vol. 2(2005), 228–230.

Komšo, D., Čuka, M. 2014, Kargadur, in: *Adriatico senza confini: via di comunicazione e crocevia di popoli nel 6000 a.C. / The Adriatic, a sea without borders: communication routes of populations in 6000 BC*, Visentini P., Podrug E. (eds.), Civici Musei di Udine, Museo Friulano di Storia Naturale, Udine, 86–89.

Komšo, D., Miracle, P. T., Boschian, G. 2005, Vela spila (Lošinj), *Hrvatski arheološki godišnjak*, Vol. 1(2004), 172–175.

Komšo, D., Andreasen, N. H., Forenbaher, S. 2008, Les premiers agriculteurs, pasteurs et pêcheurs en Istrie (Croatie) à travers les industries lithiques, *Etudes Balkaniques-Cahiers Pierre Belon*, Vol. 15, 125–143.

Korić, M., Horvat, K. 2019, Tipološke i stilske karakteristike keramičkih nalaza ranog neolitika iz Konjevrata, *Diadora*, Vol. 32(2018), 1–27.

Korošec, J. 1959, *Neolitska naseobina u Danilu Bitinju, istraživanja u 1953. godini: Prilozi*, Jugoslavenska akademija znanosti i umjetnosti, Zagreb.

Korošec, J., Korošec, P. 1974, Bribir i njegova okolica u prapovijesno doba, *Diadora*, Vol. 7, 5–34.

Leroi-Gourhan, A. 1965, *Le geste et la parole II: La mémoire et les rythmes*, Bibliothèque Albin Michel, Paris.

Malez, M. 1979, Paleolitsko i mezolitsko doba u Hrvatskoj, in: *Praistorija jugoslavenskih zemalja. I: paleolitsko i mezolitsko doba*, Benac A. (ed.), Akademija nauka i umjetnosti Bosne i Hrecegovine, Sarajevo, Sarajevo, 195–295.

Mamužić, P. 1973, *Osnovna geološka karta SFRJ 1: 100 000, tumač za list Lošinj*, Institut za geološka istraživanja, Savezni geološki zavod, Zagreb – Beograd.

Manen, C., Perrin, T., Raux, A., Binder, D., Le Bourdonnec, F.-X., Briois, F., Convertini, F., Dubernet, S., Escallon, G., Gomart, L., Guilaine, J., Hamon, C., Philibert, S., Queffelec, A. 2019, Le sommet de l'iceberg? Colonisation pionnière et néolithisation de la France méditerranéenne, *Bulletin de la Société préhistorique française*, Vol. 116(2), 317–361.

Marijanović, B. 2005, *Gudnja, višeslojno prapovijesno nalazište*, Dubrovački muzeji, Arheološki muzej, Dubrovnik.

Marijanović, B. 2007, Neka pitanja ranog neolitika istočnog Jadrana, *Archaeologia Adriatica*, Vol. I, 7–54.

Marijanović, B. 2009, *Crno vrilo 1*, Sveučilište u Zadru, Zadar.

Marijanović, B., Horvat, K. 2016, Početci naseljavanja na području Zemunika, in: *Zemunik u prostoru i vremenu*, Faričić J., Dundović Z. (eds.), Sveučilište u Zadru, Zadar, 48–67.

Marreiros, J. M., Gibaja Bao, J. F., Ferreira Bicho, N. (eds.) 2015, *Use-Wear and Residue Analysis in Archaeology*, Springer, Cham, New York. doi: 10.1007/978-3-319-08257-8

Marzolini, G. 1977, I rinvenimenti preistorici nella Grotta dell'Ansa di San Pelagio, *Atti della Società per la Preistoria e Protostoria della Regione Friuli-Venezia Giulia*, Vol. III, 19–45.

Mazzucco, N., Gibaja, J. F., Pessina, A., Ibáñez, J. J. 2016, Reconstructing Harvesting Technologies through the Analysis of Sickle Blades: A Case-Study from Early-Middle Neolithic Sites in Northeastern Italy, *Lithic technology*, Vol. 46(1), 75–92. https://doi.org/10.1080/01977261.2016.1149654

Mazzucco, N., Guilbeau, D., Kačar, S., Podrug, E., Forenbaher, S., Radić, D., Moore, A. 2018, The Time is Ripe for a Change: The Evolution of Harvesting Technologies in Central Dalmatia During the Neolithic Period (6th Millennium cal BC), *Journal of Anthropological Archaeology*, Vol. 51, 88–103. https://doi.org/10.1016/j.jaa.2018.06.003

McClure, S., Podrug, E. 2016, Villages, Landscapes and Early Farming in Northern Dalmatia, in: *Fresh Fields and Pastures New: Papers Presented in Honor of Andrew M. T. Moore*, Lillios K. T., Chazan M. (eds.), Sidestone Press, Leiden, 117–144.

McClure, S. B., Podrug, E., Moore, M. T. A., Culleton, B., Kennet, J. D. 2014, AMS ^{14}C Chronology and Ceramic Sequences of Early Farmers in the Eastern Adriatic, *Radiocarbon*, Vol. 56(3), 1019–1038. https://doi.org/10.2458/56.17918

Mihovilić, K. 1987, Pregled prahistorije Istre od starijeg neolitika do početka romanizacije, in: *Arheološka istraživanja u Istri i Hrvatskom primorju*, Znanstveni skup Pula, 15–18. rujna 1982, Jurkić V. (ed.), Izdanja Hrvatskog arheološkog društva 11, Hrvatsko arheološko društvo, Pula, 49–63.

Mirosavljević, V. 1959, Jamina Sredi, prilog prethistorijskoj kulturi na otoku Cresu, *Arheološki radovi i rasprave*, Vol. 1, 131–174.

Mirosavljević, V. 1960, Prethistorijski objekti na otoku Cresu, *Ljetopis Jugoslavenske Aakademije znanosti i umjetnosti*, Vol. 64, 204–218.

Mirosavljević, V. 1962, Impresso-cardium keramika na otocima Cresa, Lošinja i Krka, *Arheološki radovi i rasprave*, Vol. 2, 175–211.

Mirosavljević, V. 1968, Vela spilja, prethistorijsko nalazište na otoku Lošinju, *Arheološki radovi i rasprave*, Vol. 6, 27–60.

Mirosavljević, V. 1971, Jamina Sredi dans l'ile de Cres, in: *Epoque prehistorique et protohistorique en Yougoslavie: Recherches et résultats*, Comité national d'organisation du VIII Congrès international des sciences préhistoriques et protohistoriques, Novak G. (ed.), Société archéologique de Yougoslavie, Beograd, 102–105.

Mlekuž, D. 2003, Early herders of the Eastern Adriatic, *Documenta Praehistorica*, Vol. XXX, 139–151. https://doi.org/10.4312/dp.30.8

Mlekuž, D. 2010, Od voznih redov k vlakom: Datiranje prehoda iz mezolitika v neolitik v kraških jamah, *Argo*, Vol. 53(1), 34–40.

Montagnari Kokelj, E. 2001, Some comments on the Vlaška Group or "Gruppo dei Vasi a Coppa" of the Trieste Karst in the light of recent dana, *Preistoria Alpina*, Vol. 34(1998), 245–251.

Montagnari Kokelj, E., Crismani, A. 1997, La Grotta del Mitreo nel Carso Triestino, *Atti della Società per la Preistoria e Protostoria della Regione Friuli-Venezia Giulia*, Vol. X, 7–98.

Müller, J. 1991, Die ostadriatische Impresso-Kultur: Zeitliche Gliederung und kulturelle Einbindung, *Germania*, Vol. 69(2), 311–358.

Müller, J. 1994, *Das ostadriatische Frühneolithikum. Die Impresso-Kultur und die Neolithisierung des Adriaraumes*, Prähistorische Archäologie in Südosteuropa 9, Wissenschaftsverlag Volker Spiess, Berlin.

Perhoč, Z. 2020, *Rohmaterial für die Produktion von Steinartefakten im Spätjungpaläolithikum, Mesolithikum und Neolithikum Dalmatiens (Kroatien)*, Unpublished PhD thesis, University of Heidelberg, Heidelberg.

Philibert, S., Briois, F., Manen, C., Gibaja, J., Gassin, B. 2014, Use-wear analysis of early Neolithic industry of Peiro Signado: a pioneer implantation in south France, in: *International Conference on Use-Wear Analysis: Use-Wear 2012*, Marreiros J., Bicho N., Gibaja J. (eds), Cambridge Scholars Publishing, Cambridge, 642–651.

Podrug, E., McClure, S. B., Moore, A. M. T., Culleton, B. J., Kennett, D. J. 2014, New AMS ^{14}C dates for the Neolithic of Northern Dalmatia (Croatia), in: *Preistoria e Protostoria del Caput Adria*, XLIX Riunione Scientifca dell' Istituto Italiano di Preistoria e Protostoria (IIPP), 8-11 ottobre 2014, Udine, poster.

Podrug, E., McClure, S., Perhoč, Z., Kačar, S., Reed, K., Zavodny, E. 2018, Rašinovac kod Ždrapnja (Sjeverna Dalmacija) – nalazište ranog neolitika, *Archeologia Adriatica*, Vol. 12, 47–97. https://doi.org/10.15291/archeo.3023

Podrug, E., McClure, S., Kačar, S., Perhoč, Z., Reed, K., Tykot, R. H., Marguš, D., Mazzucco, N., Guilbeau, D., Jović, J., Ilijanić, N., Miko, S., Ivkić, I., Hajek Tadesse, V., Karp, A. 2021, Krivače – rezultati arheološkog iskopavanja srednjoneolitičkog naselja i geološkog istraživanja paleojezera u Bribirsko-ostrovičkom polju (sjeverna Dalmacija), *Obavijesti Hrvatskog Arheološkog Društva*, Vol. LI, in press.

Semenov, S. A. 1964, Prehistoric technology: An experimental study of the oldest tools and artefacts from traces of manufacture and wear, Cory, Adams & Mackay, London.

Snoj, D. 1992, Sermin, *Varstvo spomenikov*, Vol. 34, 91–106.

Soressi, M., Geneste, J.-M. 2011, The History and Efficacy of the *Chaîne Opératoire* Approach to Lithic Analysis: Studying Techniques to Reveal Past Societies in an Evolutionary Perspective, in: *Reduction Sequence, Chaîne Opératoire and Other Methods: The Epistemologies of Different Approaches to Lithic Analysis*, Tostevin G. B. (ed.), PaleoAnthropology, Special Issue, PaleoAnthropology Society, University of Pennsylvania Museum, Philadelphia, 334–350. doi:10.4207/PA.2011.ART63

Spataro, M. 2002, *The First Farming Communities of the Adriatic: Pottery Production and Circulation in the Early and Middle Neolithic*, Società per la preistoria e protostoria della regione Friuli-Venezia Giulia Quaderno 9, Edizioni Svevo, Trieste.

Stacul, G. 1972, Scavo nella Grotta del Mitreo presso San Giovanni al Timavo, *Atti dei Civici Musei di Storia ed Arte di Trieste*, Vol. 7(1971–1972), 35–60.

Starac, R. 2009, Gradina Solin, *Hrvatski arheološki godišnjak*, Vol. 5(2008), 413–416.

Starnini, E., Biagi, P., Mazzucco, N. 2018, The beginning of the Neolithic in the Po Plain (northern Italy): Problems and perspectives, *Quaternary International*, Vol. 470(B), 301–317. https://doi.org/10.1016/j.quaint.2017.05.059

Tixier, J. 1963, *Typologie de l'Epipaléolithique du Maghreb*, Mémoires du Centre de Recherches anthropologiques et préhistoriques et ethnographiques 2, Arts et métiers graphiques, Paris.

Turk, I., Bavdek, A., Perko, V., Culiberg, M., Šercelj, A., Dirjec, J., Pavlin, P. 1992, Acijev spodmol pri Petrinjah, Slovenija, *Poročilo o raziskovanju paleolita, neolita in eneolita v Sloveniji*, Vol. XX, 27–48.

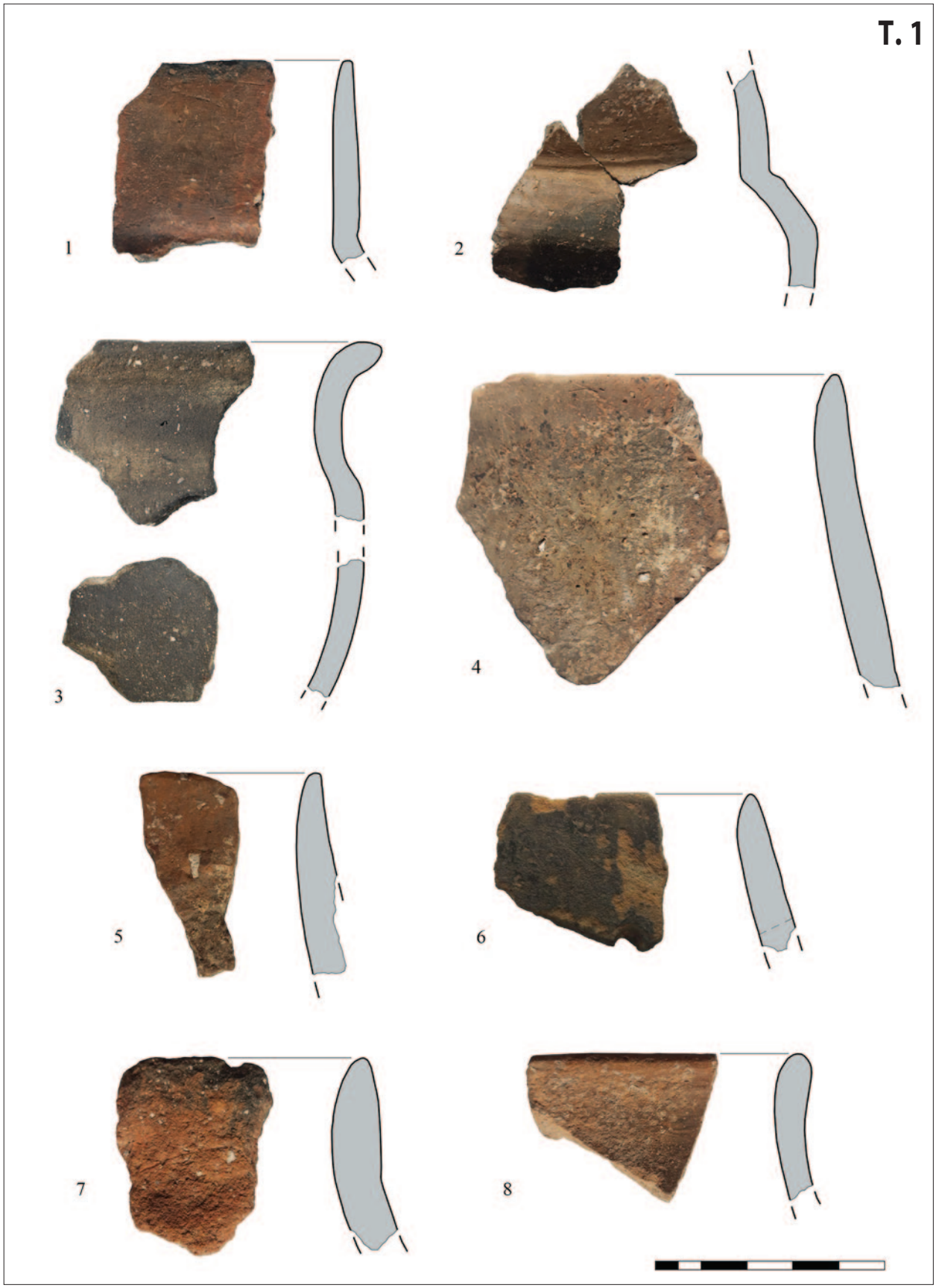
Turk, I., Modrijan, Z., Prus, T., Culiberg, M., Šercelj, A., Perko, V., Dirjec, J., Pavlin, P. 1993, Podmol pri Kastelcu – novo večplastno arheološko najdišče na Krasu, Slovenija, *Arheološki vestnik*, Vol. 44, 45–96.

van Gijn, A. 2010, *Flint in Focus*, Sidestone press, Leiden.

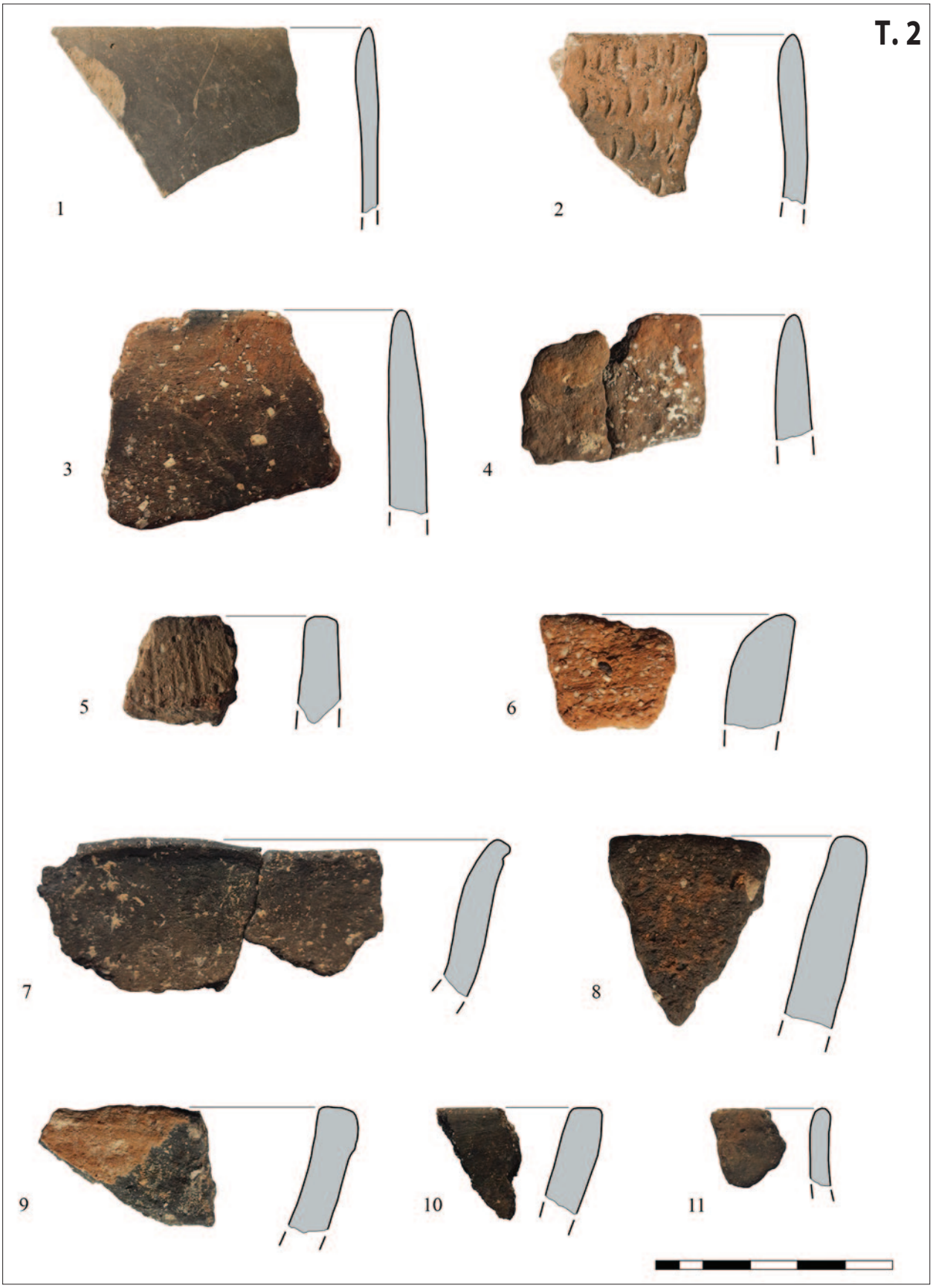
Vaughan, C. P. 1985, *Use-wear analysis of flakes stone tools*, The university of Arizona Press, Tucson.

Vujević, D., Horvat, K. 2012, Kulturna slika danilskog naselja na Baricama, *Archaeologia Adriatica*, Vol. VI, 31–65.

Vuković, J. 2013, Deskripcija nasuprot interpretaciji: odnos tradicionalne i savremene arheologije prema problemu impreso-barbotin ranog neolita, *Etnoantropološki problemi*, Vol. 8(3), 657–679.

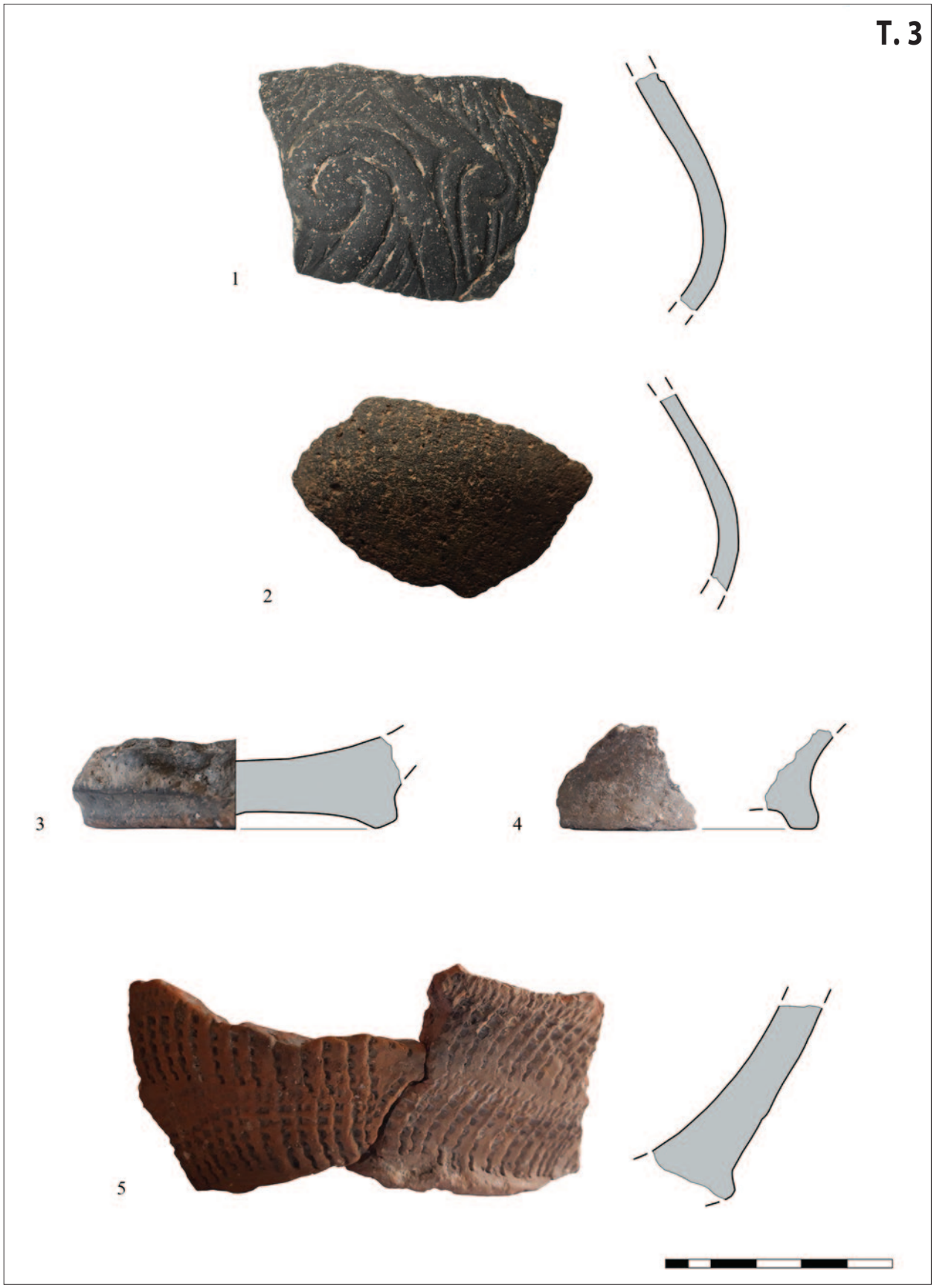


T. 1 Ulomci keramičkih posuda s nalazišta Vorganjska peć (crteži: M. Galić, M. Korić; snimili: M. Korić, I. Krajcar)
Pl. 1 Potsherds from Vorganjska peć (drawn by: M. Galić, M. Korić; photo by: M. Korić, I. Krajcar)



T. 2 Ulomci keramičkih posuda s nalazišta Vorganjska peć (crteži: M. Galić, M. Korić; snimili: M. Korić, I. Krajcar)
Pl. 2 Potsherds from Vorganjska peć (drawning: M. Galić, M. Korić; photo by: M. Korić, I. Krajcar)

T. 3



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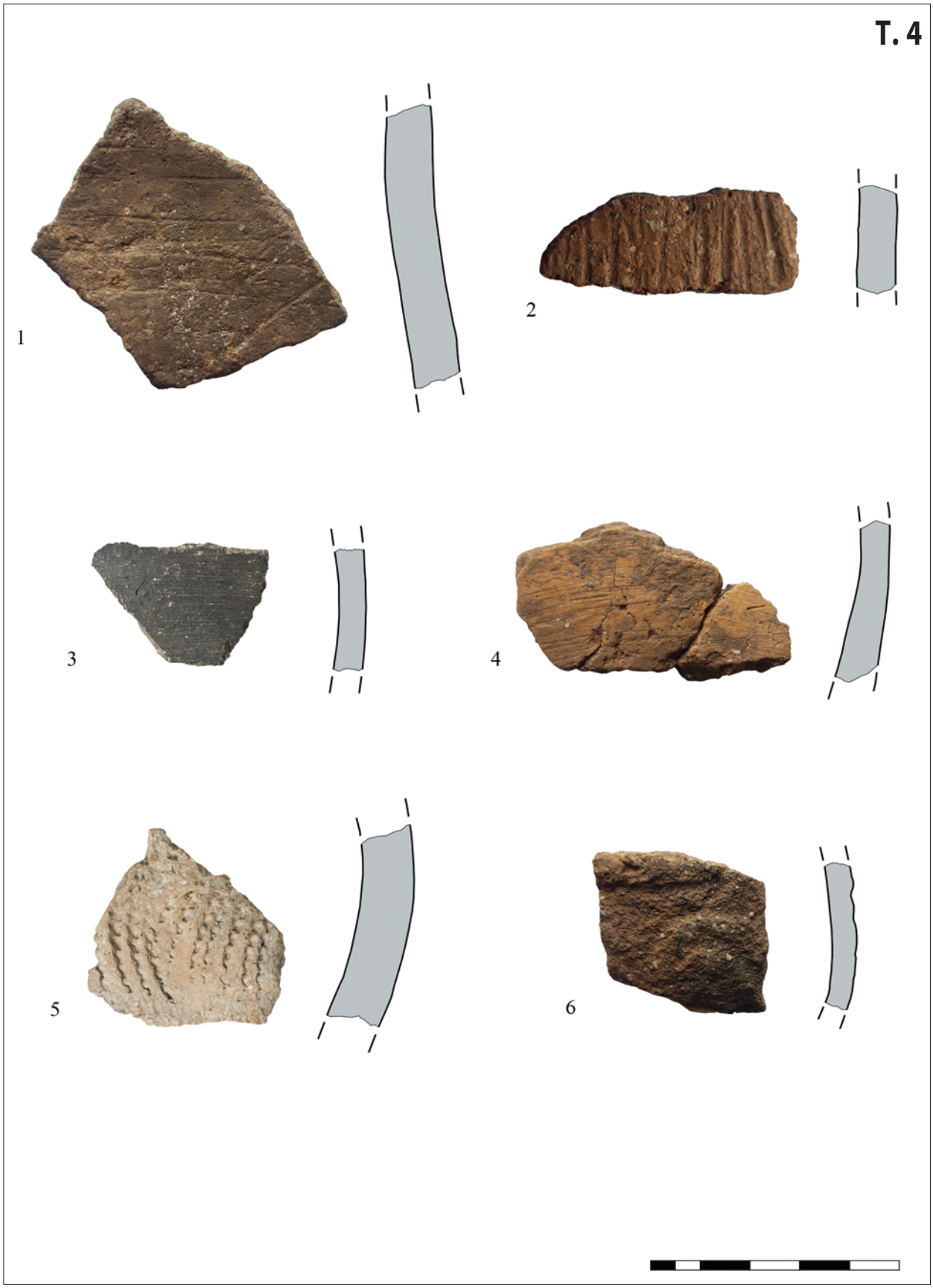
Pl. 3 Potsherds from Vorganjska peć (drawning: M. Galić, M. Korić; photo by: M. Korić, I. Krajcar)



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Pl. 4 Potsherds from Vorganjska peć (drawning: M. Galić, M. Korić; photo by: M. Korić, I. Krajcar)