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**05TH**  
INTERNATIONAL  
SCIENTIFIC  
CONFERENCE

METHODOLOGY & ARCHAEOMETRY

Zagreb, 30<sup>th</sup> November – 1<sup>st</sup> December 2017

## IMPRESSUM

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# 05TH

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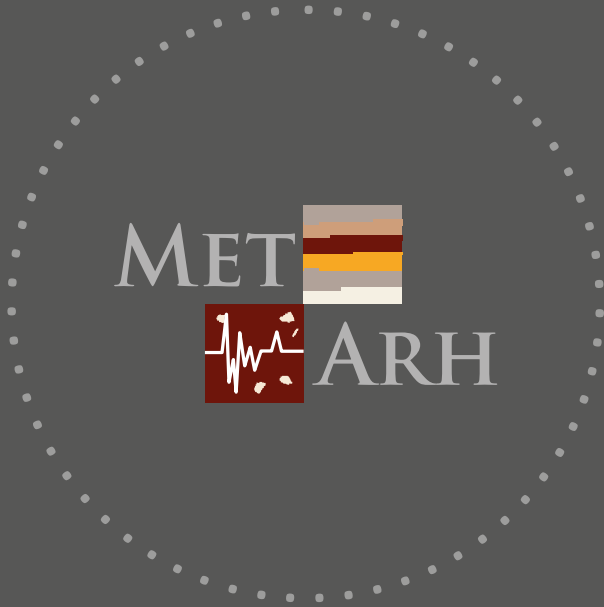
METHODOLOGY & ARCHAEOOMETRY

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## CONFERENCE METHODOLOGY & ARCHAEOMETRY

The scientific conference *Methodology and Archaeometry* is being organised by the Department of Archaeology, Faculty of Humanities and Social Sciences since 2013. The goal of the conference is to entice interdisciplinarity, critical thinking, new insights and approaches as well as new theoretical frameworks in contemporary archaeological science.

Coverage of a wide spectrum of themes and scientific disciplines has resulted in papers and discussions that promote scientific issues in the fields of methodology, documentation and interpretation of archaeological data.

The interdisciplinary character of the conference brings together archaeologists and researchers from other scientific disciplines with whom archaeologists collaborate closely; and who – through their work, projects and ideas – promote new insights about Interpretation of the human life in the past.

### Section Methodology

Obtaining and collecting data is the essential part of the archaeological research process. How we collect and interpret data defines the validity of our interpretation. We use different techniques, approaches and tools which help us to reconstruct the past processes and to give more objective and comprehensive picture of the past. Contemporary interpretation tools alleviate and speed the data collection and also provide us with countless possibilities of interpretation, protection and presentation of archaeological sites and the landscapes encompassing them.

### Section Archaeometry

Having in mind limited information we obtain from archaeological excavations and from the classification of archaeological material, cooperation with other scientific disciplines becomes unnecessary, to obtain as much information as possible on the conditions and the way in which the humans lived in the past. Contemporary archaeology is a very heterogeneous discipline encompassing interest groups focussed on various periods, regions, theoretical frameworks and methodological techniques. Aside from the description of mechanical and physical features of a specific artefact or material, various archaeometrical analyses help us to direct our scientific focus to questions regarding the ways and features included in the social and cultural life of people who made, used, exchanged and discarded those objects. Cooperation with the natural sciences provides answers to many questions, but it also demands an additional level of caution when selecting adequate scientific analysis for a specific archaeological problem. It also demands a continuous cooperation of a specific expert and an archaeologist from sample collection to the final interpretation.



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*PROGRAMME*

## PROGRAMME

Thursday, 30<sup>st</sup> November

9:00 – 9:20

Opening

## KEY-NOTE LECTURES

Chair: Ina Miloglav

9:20 – 9:50

Predrag Novaković

Methodological challenges in 'hostile' environments of preventive archaeology

9:55 – 10:25

Darja Grosman

Structural and architectural survey – Why talk about it?

10:30 – 11:00

Coffe break (Library Foyer)

Chair: Predrag Novaković

11:00 – 11:20

Vujadin Ivanišević &amp; Aleksandar Stamenković

The GIS Platform of Caričin Grad (Justiniana Prima)

11:25 – 11:45

Silva Sabkova

Identifying a relict cultural landscape. The Lower Danube Limes in Bulgaria

11:50 – 12:10

Lujana Paraman &amp; Dinko Tresić Pavičić

St. Elijah's hill above Trogir- monitoring and documenting of complex site endangered by contemporary stone exploitation

12:15 – 12:35

Luka Gruškovnjak

Surface visibility of archaeological record

12:40 – 13:00

Coffe break (Library Foyer)



Chair: **Darja Grosman**

13:00 – 13:20

**Esmeralda Agolli**

The archaeological research in Albanian prehistory: a striking challenge between space explorations and narratives of the past

13:25 – 13:45

**Tomislav Hršak & Marko Dizdar**

Can we really see what lies beneath the ground without a shovel? Expectation vs reality – experience from the excavation of the Late Bronze and Early Iron Age and Roman cemetery in Batina

13:50 – 14:10

**Maja Grgurić**

Drone – a new member of the archaeological team (using a drone in photogrammetry)

14:15 – 14:35

**Maja Kaleb & Roko Surić**

Implementation of methodology and archaeometry in the case of Veruda shipwreck near Pula, Croatia

14:40 – 15:00

**Hrvoje Vulić**

Statistical indicators for obligatory use of metal detectors on metal age archaeological excavations

15:05 – 16:00

Lunch break

16:00 – 17:00 **Poster presentation** in the Library Foyer

**Dragana Antonović & Momir Vukadinović**

Pinga 2 at Mali Šturac: archaeological and geophysical investigation of ancient mining

**Vidan Dimić**

The (Re)construction and Usage of Mining Hammerstones from Copper Mining site of Prljuša - Mali Šturac: Experimental archaeology

**Jesús Gámiz Caro, Laura Vico Triguero & Alberto Dorado Alejos**

The technology changes in the pottery productions of the Neolithic from south Iberian Peninsula: The transition from Middle Neolithic to Late Neolithic in Los Castillejos (Montefrío, Granada)

**Silvia Amicone, Maja Gori, Emil Podrug, Giulia Recchia, Helena Tomas & Ivan Šuta**

Characterising Cetina pottery technology. Petrographic analyses from the Poliakuš and Vučevica tumuli in Central Dalmatia.



### Ariadne Kostomitsopoulou Marketou

A colours workshop in the ancient aegean world: an archaeometric approach to the material remains of a late Hellenistic-early Roman pigment production site (Kos, Greece)

### Lorenza La Rosa

Interdisciplinarity and Environmental Studies: assessing the impact of pottery production on the environment

### Miroslav Vuković

Image based modeling of archaeological artefacts

### Katarina Gerometta & Robert Matijašić

Roman centuriation in the Vrsar municipality (Istria, Croatia): preliminary LiDAR data

### Antonia Vodanović & Ivan Huljev

"To cast away the evil" - Ethnoarchaeological Research on Apotropaic Marks in Shepherd's Village Podglogovik at Biokovo Mountain

Afternoon programme:

18:00 – Visit to the Archaeological Museum in Zagreb

- conservation and preparation workshop, Museum depository and permanent exhibitions
- temporary exhibition *Recycle, ideas from the past*

20:00 – Mingling in Kôta caffe bar, Medulićeva 20

## Friday, 1<sup>st</sup> December

Chair: Jacqueline Balen

10:00 – 10:20

Branko Mušič, Tajana Sekelj-Ivančan, Sibila Borojević Šoštarić, Igor Medarić, Barbara Horn, Stanko Ružičić & Tomislav Brenko

TransFER – Iron production along the Drava River in the Roman period and the Middle ages: Creation and transfer of knowledge, technologies and goods. The case studies of Virje and Velike Hlebine

10:25 – 10:45

Nikola Vukosavljević & Zlatko Perhoč

Circulation of lithic raw material at the end of Pleistocene: the view from Kopačina Cave (island of Brač, Dalmatia, Croatia)

10:50 – 11:10

Selena Vitezović

The typology is dead, long live the typology: problems of typological classifications in pre-historic bone industries



11:15 – 11:35

Ana Đuričić

Neolithic ash pits from the site of Pavlovac – Čukar – function and interpretation

11:40 – 12:00

Milica Tapavički-Ilić & Jelena Anđelković Grašar

Experimental archaeology – *pro et contra*

12:05 – 12:35

Coffe break (Library Foyer)

Chair: Nikola Vukosavljević

12:35 – 12:55

Martina Dubolnić Glavan

Velebit Highlands vs. Ravni Kotari Lowlands- different approaches in field survey

13:00 – 13:20

Kelly Kouzeli

The contribution of scientific analysis to the study and preservation of monuments. The case of the ancient theater of Delphi (Greece)

13:25 – 13:45

Andreja Sironić, Damir Borković, Jadranka Barešić, Ines Krajcar Bronić,

Alexander Cherkinsky & Ljiljana Kitanovska

Radiocarbon dating of mortar: Case study of the Aqueduct in Skopje

13:50 – 14:10

Dubravko Gajski & Katarzyna Dzięgielewska-Gajski

Spectral reflectance of archaeological artefacts

14:15 – 14:35

Josipa Marić, Željana Bašić, Ivan Jerković, Ivana Kružić, Frane Mihanović

& Šimun Anđelinović

Forensic Facial Reconstruction of the mummified remains of St. Nicolosa Bursa

14:40

Closing

## *ABSTRACTS*

## P O S T E R S

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### Pinga 2 at Mali Šturac: archaeological and geophysical investigation of ancient mining

**P**inga 2 is located on the north-eastern border of the zone of copper mineralization and prehistoric mining works as well at the Prljuša site at Mali Šturac, the lowest peak of Rudnik mountain in central Serbia. In its immediate neighborhood, there is a mine shaft which has been excavated since 2014 and dated, according to pottery finds in the Early Eneolithic Bubanj-Hum I culture. The exploration of Pinga 2 was undertaken to determine whether it is the trace of prehistoric or later mining from the Roman or Medieval Age.

Pinga 2 is a funnel-shaped surface depression, 18 meters long and 14 meters wide. The research was started with a small trench (3x2m) in the central part of the pinga. Only one layer of humus mixed with large stones was detected in the trench. The excavation was suspended at a depth of 1.8 m and followed by geophysical measuring. Geoelectric scanning in the central part of Pinga 2 revealed a thick layer, almost 10m deep, composed of large stone material. This layer leans on a border rock almost vertically descending to the bottom. Another archaeological excavation was undertaken on the eastern border of the Pinga 2. The excavation revealed the steep rock representing the edge of the pinga. Along the top of this rock a narrow eleven meters long track carved in the rock was discovered, connecting two entrances into mining shafts. The waste stone material from these shafts was thrown into the central part of the pinga infilling it and probably covering earlier mining works.

During excavations archaeological material was not found, but the appearance of mining works and the absence of malachite in surrounding rock indicate that the works certainly do not originate from the time of the Early Eneolithic as the neighbouring mine at Mala Šturca.

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### The (Re)construction and Usage of Mining Hammerstones from Copper Mining site of Prljuša - Mali Šturac: Experimental archaeology

**T**he Rudnik mountain in central Serbia is famous for its ore richness, in particular of malachite (carbonate copper ore), whose deposits were recognized and exploited from prehistory up to modern times. Archaeological remains show clear traces of mining activities during the Roman and especially medieval period, when there was an important mining centre on the mountain. Recent excavations at the site of Prljuša – Mali Šturac uncovered rich material remains showing exploitation of malachite during the Eneolithic period. Over 15 objects were discovered (mining shafts) which constitute the structure of this site. Beside other archaeological finds, the quantity of mining hammerstones is very impressive. It is estimated that over 2000 tools are scattered on the site, clearly demonstrating the intensity of mining activities on this location during the Eneolithic times and conspicuous mining potential the mountain possesses.



During the archaeological research, 688 hammerstones were discovered and analysed (478 of them are from recent excavation campaigns). Based on their analysis, hypotheses were made regarding their manufacture and use. In summer 2017, experimental (re)construction was undertaken on three basic types of these tools, as a complementary segment to functional and typological analyses. The goal of the experimental research was to gather as much data as possible which would serve as a comparative filter for testing previously raised hypotheses and research questions related to the manufacture and usage modes of this category of mining tools. Obtained results enabled a more complete understanding of the prehistoric mining technology on this site, as well as reconstruction of the chaîne opératoire from the raw material procurement and production, to the use, damage and discard of hammerstones.

Jesús Gámiz Caro, Laura Vico Triguero & Alberto Dorado Alejos

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### Peninsula: The transition from Middle Neolithic to Late Neolithic in Los Castillejos (Montefrío, Granada)

In this research paper we will present the results of the archeometrical analysis of pottery dated to Middle and Late Neolithic period from the archaeological site of Los Castillejos (Montefrío, Granada).

Through stereomicroscopy and XRD we have been able to sort the pottery in to separate chrono-cultural periods, which are divided by a hiatus of around 600 years. On the one hand, this hiatus shows the end of Middle Neolithic and on another hand the beginning of the Late Neolithic, the deep technological and typological changes in pottery production are also evident. We interpret these cultural changes as a consequence of demographic transfer from others areas of Andalucía. This evidence is show with the appearance of the “cazuelas carenadas”, with the increase of the pottery volume and the changes in ceramics decoration. In addition of these changes, there is an increase in agricultural activities and changes in the preference of the domestic animals. This event will be the basis of the development of a Copper Age society from the southeast of the Iberian Peninsula, which will eventually result in a stratified society managed by the elites.

Silvia Amicone<sup>1</sup>, Maja Gori<sup>2</sup>, Emil Podrug<sup>3</sup>, Giulia Recchia<sup>4</sup>, Helena Tomas<sup>5</sup> & Ivan Šuta<sup>6</sup>

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### Characterising Cetina pottery technology. Petrographic analyses from the Poliakuš and Vučevica tumuli in Central Dalmatia

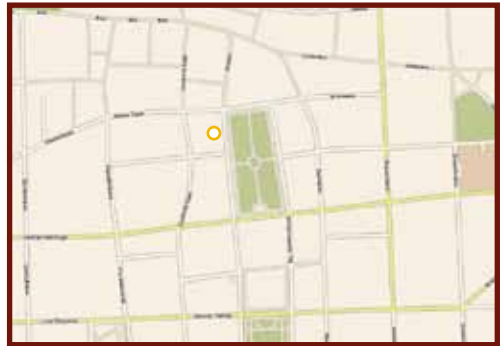
The proposed poster presents the preliminary results of archaeometric analyses carried out in the framework of the Cultural Encounters across the Adriatic and Ionian seas. 2500-2000 BC and the CeVaS-Cetina Valley Survey projects. These represent the first petrographic analyses undertaken on Early Bronze Age Cetina-type pottery from Dalmatia.

## NAVIGATION

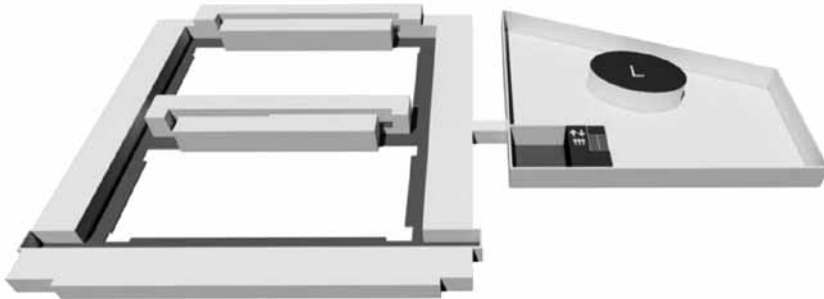
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Trg Nikole Šubića Zrinskog 19  
[www.amz.hr](http://www.amz.hr)

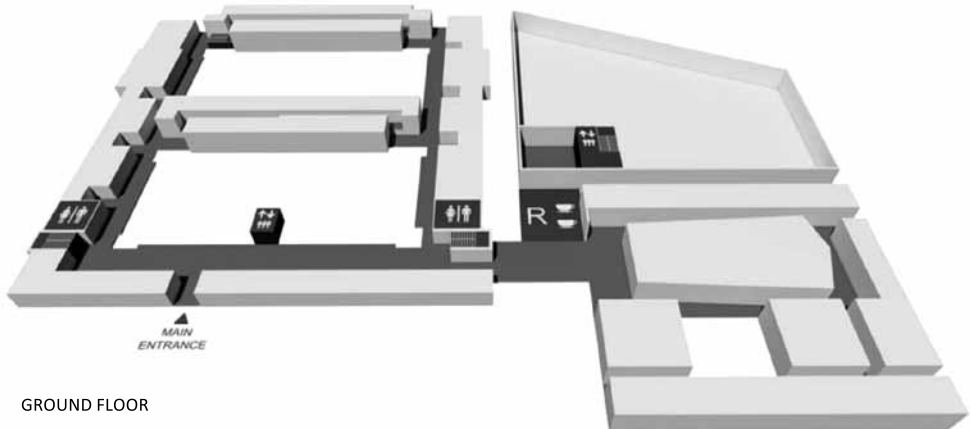
- KÔTA CAFÉ BAR  
Medulićeva 20  
[www.kotabar.hr](http://www.kotabar.hr)



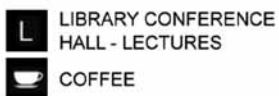
## GROUND PLAN



2ND FLOOR



GROUND FLOOR

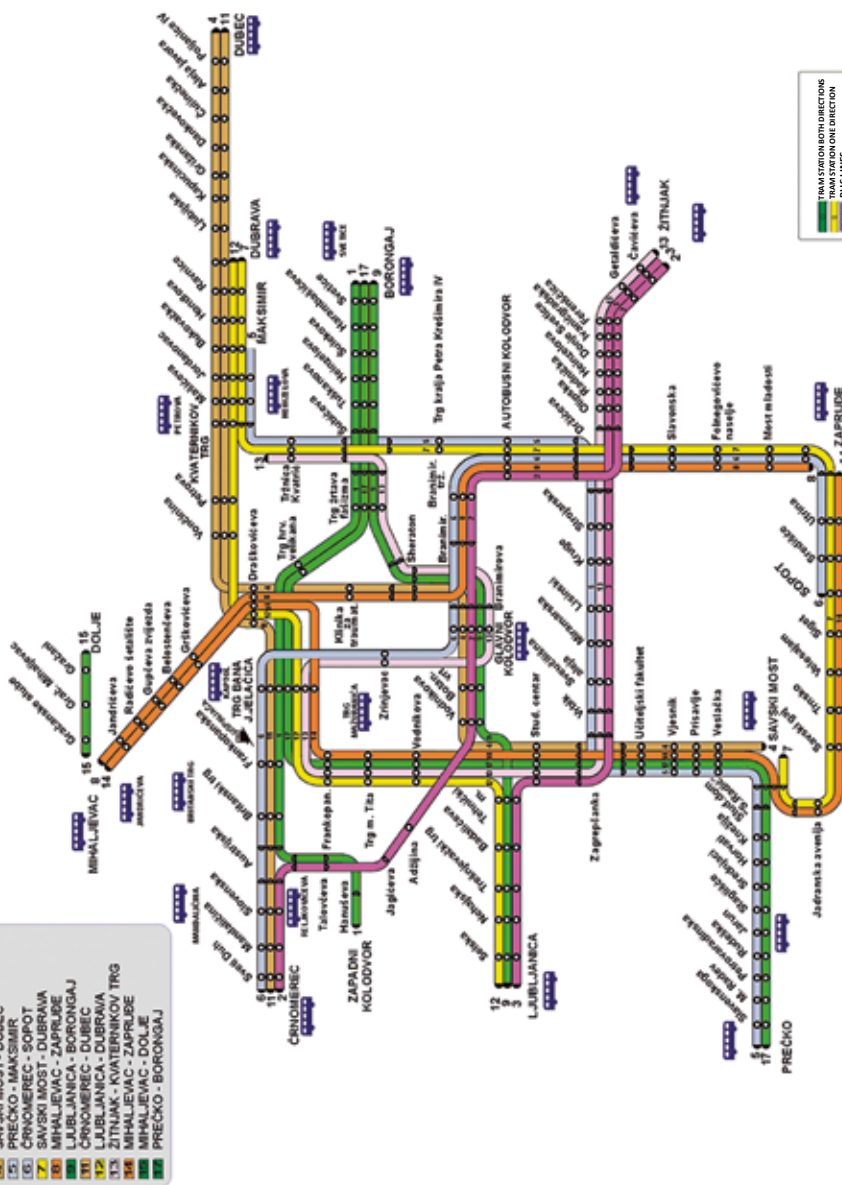


The lectures will be held at the Conference hall on the 2<sup>nd</sup> floor of the Faculty Library - on the right of the main entrance of the Faculty building.



## ZAGREB MUNICIPAL TRANSIT SYSTEM (ZET)

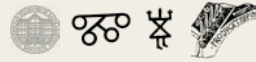
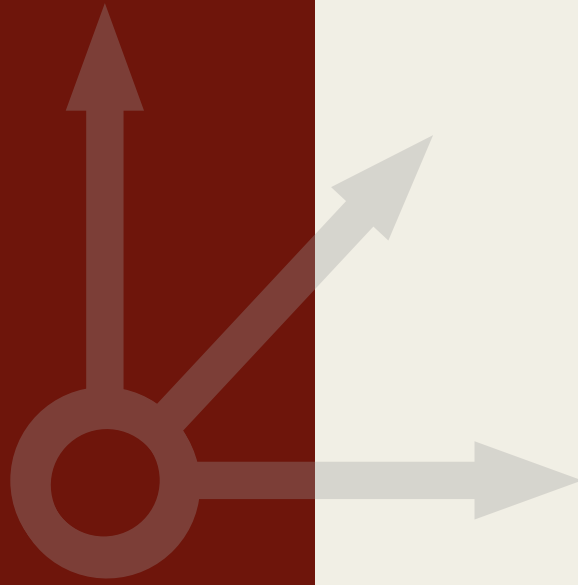
<http://www.zet.hr/>





## TRAM SCHEDULE

LINE NUMBER	TERMINAL	D E P A R T U R E						T I M E		
		MONDAY - FRIDAY			SATURDAY			SUNDAY		
		FIRST	LAST	EVERY	FIRST	LAST	EVERY	FIRST	LAST	EVERY
1	Zapadni kolodvor	4:42	23:29	12 - 19 min						
	Borongaj	4:51	23:20							
2	Črnomerec	4:42	23:20	8 - 13 min	4:44	23:15	10 - 16 min	5:33	23:29	15 - 20 min
	Savišče	4:44	23:30		4:49	23:32		5:40	23:37	
3	Ljubljana	4:03	23:30	12 - 16 min						
	Savišče	4:50	00:16							
4	Savski most	4:49	23:26	9 - 14 min	4:52	23:43	9 - 15 min	5:41	23:29	12 - 19 min
	Dubce	4:38	23:26		4:30	23:20		5:42	23:11	
5	Prečko	4:48	23:28	10 - 15 min	4:55	23:21	11 - 15 min	5:46	23:18	12 - 16 min
	Maksimiri	4:51	23:31		4:56	23:22		5:39	23:11	
6	Črnomerec	4:44	23:30	6 - 13 min	4:44	23:23	8 - 13 min	5:40	23:24	9 - 17 min
	Sopot	4:49	23:29		4:48	23:28		5:47	23:14	
7	Savski most	4:49	00:19	7 - 12 min	4:48	00:12	9 - 15 min	5:47	00:11	11 - 16 min
	Dubrava	3:56	23:26		3:57	23:20		4:56	23:21	
8	Mihaljevac	4:42	23:20	15 - 17 min						
	Zaprude	4:42	23:20							
9	Ljubljana	4:07	23:25	8 - 14 min	4:09	23:26	9 - 17 min	5:06	23:30	10 - 17 min
	Borongaj	4:41	23:57		4:43	00:00		5:40	00:05	
11	Črnomerec	4:38	23:38	6 - 12 min	4:45	23:21	8 - 17 min	5:39	23:23	11 - 17 min
	Dubce	4:43	23:18		4:45	23:25		5:40	23:22	
12	Ljubljana	3:56	23:28	7 - 11 min	4:02	23:20	8 - 15 min	5:02	23:16	9 - 17 min
	Dubrava	4:39	00:12		4:46	00:04		5:46	00:00	
13	Žitnjak	4:52	23:53	12 - 19 min	4:41	23:24	11 - 22 min	5:45	23:21	12 - 18 min
	Kvaternikov trg	4:32	23:35		4:52	23:23		5:45	23:22	
14	Mihaljevac	4:40	23:30	8 - 14 min	4:40	23:20	7 - 12 min	5:40	23:32	8 - 12 min
	Zaprude	4:37	23:33		4:45	23:19		5:45	23:07	
15	Mihaljevac	4:30	23:23	11 - 12 min	4:30	23:23	11 - 12 min	5:38	23:23	11 - 12 min
	Dolje	4:41	23:34		4:41	23:34		5:50	23:34	
17	Prečko	4:46	23:15	7 - 12 min	4:45	23:17	9 - 15 min	5:42	23:18	9 - 15 min
	Borongaj	4:43	23:23		4:53	23:25		5:50	23:26	



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