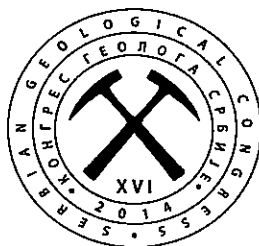


**Српско геолошко друштво
Serbian Geological Society**

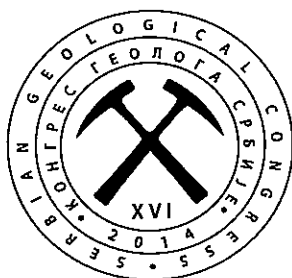
**Програм
XVI Конгреса геолога Србије**



**Programme
of the XVI Serbian Geological Congress**

**ОПТИМАЛНО ИСТРАЖИВАЊЕ И ОДРЖИВО
КОРИШЋЕЊЕ ГЕОЛОШКИХ РЕСУРСА**

**OPTIMAL RESEARCH AND SUSTAINABLE USAGE OF THE
GEOLOGICAL RESOURCES**



XVI КОНГРЕС ГЕОЛОГА СРБИЈЕ

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22. Maj / 22. May 2014

Регистрација / Registration	09.00-11.00
Свечано отварање и поздравни говори / Opening ceremony – welcome addresses Председавајући / Chairs: Aleksandar Grubić, Marko Komac, Vladica Cvetković, Aleksey A. Vashkevich, Zoran Stevanović Uvodni referat / Introductory speech: Zoran Stevanović	11.00-12.00
Коктел добродошлице, ручак / Cocktail, Lunch	12.00-14.00
Plenarni referati – Sala I (do recepcije) Plenary reports – Hall I (next to reception desk)	
SKETCH OF THE ĐERDAP'S AREA GEOLOGY Aleksandar Grubić	14.00-14.30
ONEGEOLOGY – GEOSCIENCE DATA AT THE TOUCH OF A BUTTON Marko Komac, Francois Robida, Tim Duffy	14.30-15.00
STANJE I POTENCIJALI MINERALNIH RESURSA ISTOČNE SRBIJE STATUS AND POTENTIAL OF MINERAL RESOURCES OF EASTERN SERBIA Rade Jelenković	15.00-15.30
O KENOZOJSKOM MAGMATIZMU SRBIJE – REČIMA KOJE RAZUME SVAKI GEOLOG ABOUT CENOZOIC MAGMATISM IN SERBIA – BY WORDS UNDERSTANDABLE TO EVERY GEOLOGIST Vladica Cvetković	15.30-16.00
pauza	
СТРАТИГРАФИЈА, ПАЛЕОНТОЛОГИЈА И ТЕКТЕНИКА STRATIGRAPHY, PALAEOLOGY AND TECTONICS – Sala I (do recepcije) Hall I (next to reception desk)	
Председавајући / Chairs: Tudor Berza, Nenad Banjac	
RHODOPE EVOLUTION IN THE HEART OF BALKAN GEOLOGY Ivan S. Zagorchev	16.30-17.00
THE LAKE PANNON – SERBIAN SIDE OF THE STORY Dejan Radivojević, Imre Magyar, Marten ter Borgh, Ljupko Rundić	17.00-17.15
STABLE ADRIA AND THE EXTERNAL DINARIDES: TECTONIC MODELS IN THE CONTEXT OF JURASSIC-CRETACEOUS PALEOMAGNETIC RESULTS Emő Márton, Vlasta Čosović, Alan Moro	17.15-17.30
MAJOR PHASES OF NEOGENE-QUATERNARY TECTONIC EVOLUTION OF THE SOUTH-EASTERN PART OF PANNONIAN BASIN Ivan Dulić, Snežana Marjanović, Vladislav Gajić, Goran Bogicević	17.30-17.45
ПРЕЛИМИНАРНИ РЕЗУЛТАТИ О РЕЦЕНТНОЈ ТЕКТОНСКОЈ АКТИВНОСТИ ИНТЕРНИХ ДИНАРИДА НА ОСНОВУ ФОКАЛНИХ МЕХАНИЗАМА ЗЕМЉОТРЕСА PRELIMINARY RESULTS ON RECENT TECTONIC ACTIVITY OF THE INTERNAL DINARIDES BASED ON FOCAL MECHANISMS OF EARTHQUAKES Ana Mladenović, Branislav Trivić, Vladica Cvetković, Radmila Pavlović	17.45-18.00
RAZVOJ ASIMETRIČNIH BASENA: JARANDOLSKI BASEN ARCHITECTURE OF ASYMMETRICAL SEDIMENTARY BASINS: JARANDO BASIN Nevena Andrić, Vladimir Simić, Dragana Životić	18.00-18.15
ПАЛЕОМАГНЕТСКИ РЕЗУЛТАТИ И РЕЗУЛТАТИ МЕРЕЊА АНИЗОТРОПИЈЕ МАГНЕТСКЕ СУСЦЕПТИБИЛНОСТИ МИОЦЕНСКИХ СЕДИМЕНАТА ЦЕНТРАЛНЕ И ЗАПАДНЕ СРБИЈЕ PALEOMAGNETIC AND MAGNETIC ANISOTROPY RESULTS FROM MIOCENE SEDIMENTS OF CENTRAL AND WESTERN SERBIA Vesna Lesić, Emő Márton, Vesna Cvetkov, Slobodan Knežević, Dragana Tomić	18.15-18.30
RETSKI KAT GORNJE JABLANICE NA ZLATIBORU (JZ SRBIJA) THE RETIAN OF GORNJA JABLANICA (ZLATIBOR Mt., SW SERBIA) Darivojka Ljubović-Obradović, Divna Jovanović, Rodoljub Gajić	18.30-18.45

<p style="text-align: center;">ХИДРОГЕОЛОГИЈА HYDROGEOLOGY</p> <p style="text-align: center;">Sala II – sprat iznad recepcije Hall II – floor above reception</p>	
Председавајући / Chairs: Petar Milanović, János Szanyi	
<p>О ПОТРЕБИ ФОРМИРАЊА НОВЕ НАЦИОНАЛНЕ МРЕЖЕ ЗА МОНИТОРИНГ ПОДЗЕМНИХ ВОДА У СРБИЈИ</p> <p>ON THE NEED TO SET UP A NEW NATIONAL GROUNDWATER MONITORING NETWORK IN SERBIA</p> <p>Zoran Stevanović, Vesna Ristić Vakanjac, Saša Milanović</p>	16.20-16.45
<p>HIDROGEOLOŠKE SPECIFIČNOSTI KARSTA I NJIHOVE POSLEDICE</p> <p>CONSEQUENCES OF HYDROGEOLOGICAL PARTICULARITIES IN KARST</p> <p>Petar Milanović</p>	16.45-17.00
<p>THE SUSTAINABLE USE OF GEOTHERMAL ENERGY AT UNIVERSITY OF SZEGED</p> <p>János Szanyi, Balázs Kóbor, Tamás Medgyes</p>	17.00-17.15
<p>ODREĐIVANJE GARANTOVANOG PROTICAJA NA KARSTNIM VRELIMA SA VELIKIM SEZONSKIM OSCILACIJAMA / DETERMINATION OF GUARANTEED DISCHARGE (FLOW) AT KARST SPRINGS WITH LARGE SEASONAL FLUCTUATIONS</p> <p>Saša Milanović, Ljiljana Vasić, Tina Dašić</p>	17.15-17.30
<p>KARAKTERIZACIJA KARSTNE IZDANI NA OSNOVU REZULTATA VREMENSKIH SERIJA – NA PRIMERU IZVORIŠTA NEMANJA I SVETA PETKA</p> <p>KARST AQUIFERS CHARACTERISATION ON THE RESULTS OF TIME SERIES – CASE EXAMPLES OF NEMANJA AND SVETA PETKA SOURCES Igor Jemcov</p>	17.30-17.45
<p>INTEGRISANO KORIŠĆENJE HIDROGEOTERMALNIH RESURSA U OBJEKTIMA INDUSTRIJSKE NAMENE-PRIMER OBJEKAT KOMPANIJE „DOKA SERB“ U ŠIMANOVcima</p> <p>INTEGRATED USE OF HYDROGEOTHERMAL RESOURCES IN THE INDUSTRIAL FACILITIES- CASE STUDY “DOKA SERB” COMPANY IN ŠIMANOVCI</p> <p>Dejan Milenić, Đuro Milanković, Ana Vranješ</p>	17.45-18.00
<p>ХИДРОГЕОЛОШКИ ИСТРАЖИВАЊА ЗА ОБЕЗБЕДУВАЊЕ НА ПОДЗЕМНА ВОДА ЗА ПОТРЕБИТЕ НА „СКИ ЦЕНТАР ВОДНО“</p> <p>HYDROGEOLOGICAL INVESTIGATIONS FOR THE PROVISION OF GROUNDWATER AT THE SKI RESORT OF MAVROVO</p> <p>Nikola Dimov, Marko Markov, Elizabeta Raleva, Stojan Mihailovski, Vladimir Kostovski</p>	18.00-18.15
<p>МЕЛИОРАТИВНА ХИДРОГЕОЛОШКА ИСТРАЖИВАЊА ЈУЖНЕ ВАРДАРСКЕ ДОЛИНЕ</p> <p>MELIORATIVE HYDROGEOLOGIC INVESTIGATIONS OF THE SOUTH VARDAR VALLEY</p> <p>Zlatko Ilijovski, Stojan Mihailovski, Marko Markov, Nikola Dimov</p>	18.15-18.30
<p>SANACIJA I ZATVARANJE HAVARISANE BUŠOTINE D-7 LOKALITET KREMENICA-MEDŽITLIJA (BITOLJ – MAKEDONIJA)</p> <p>REMEDYING AND PLUGGING OF BLOWN-OUT WELL D-7 IN THE KREMENICA-MEDŽITLIJA AREA (BITOLA, MACEDONIA)</p> <p>Dimitar Petrov, Silvana Pesovska, Marinko Eftimov</p>	18.30-18.45
<p>HIDROGEOLOŠKE KARAKTERISTIKE, REŽIM ISTICANJA I BILANS VODA BELOG VRELA (VRELO TOLIŠNICE, SRBIJA) / HYDROGEOLOGICAL CHARACTERISTICS AND DISCHARGE REGIME OF WHITE SPRING (SOURCE OF THE TOLISNICA RIVER, SERBIA)</p> <p>Marina Čokorilo Ilić, Vesna Ristić Vakanjac, Sibela Oudech, Dušan Polomčić, Dragoljub Bajić</p>	18.45-19.00
<p>OSNOVNE KARAKTERISTIKE IZDANSKOG TOKA KARSTNIH VODA SVRLJIŠKIH PLANINA I SUVE PLANINE / GENERAL CHARACTERISTICS OF KARST GROUNDWATER FLOW OF SVRLJIŠKE PLANINE MT. AND SUVA PLANINA MT.</p> <p>Branislav Petrović</p>	19.00-19.15
<p>HIDROGEOLOŠKE STRUKTURE KOSTOLACKOG UGLJONOSNOG BASENA</p> <p>HYDROGEOLOGICAL STRUCTURE OF COAL BASIN IN KOSTOLAC</p> <p>Željko Kljajić, Branimir Lazić, Miloško Lazić, Olivera Krunić</p>	19.15-19.30
<p>POTENCIJAL ZA EKSPLOATACIJU PODZEMNIH VODA DIJELA KAPINA POLJA-NIKŠIĆ</p> <p>POTENTIALITY FOR GROUNDWATER EXPLOITATION OF THE KAPINA POLJA PART- NIKŠIĆ</p> <p>Slavko Hrvačević</p>	19.30-19.45

23 Maj / 23 May	
НАФТНА ГЕОЛОГИЈА И ГЕОФИЗИКА PETROLEUM GEOLOGY AND GEOPHYSICS - Sala I (do recepcije) Hall I (next to reception desk)	
Председавајући / Chairs: Ivan Dulić, V.A. Kosmynin	
KOLGAN TERRIGENOUS FORMATION OF RUSSIAN PLATFORM: SEDIMENTATION PRECONDITIONS OF HYDROCARBON POTENTIAL Kosmynin V.A., Kuzmin D.A.	9.00-9.30
SPECIAL ASPECTS OF SEISMIC FACIES ANALYSIS IN CLINOFORM'S COMPLEX Yr.Filippovich, O.Zaharova, V. Ananiev, T.Olneva	9.30-9.45
PRIMENA TEHNOLOGIJE BUŠENJA MALIM PREČNIKOM (SLIM HOLE) ZA ISTRAŽIVANJE KOMPLEKSNIH LEŽIŠTA UGLJOVODONIKA APPLICATION SLIM HOLE DRILING TECHNOLOGY (SLIM HOL) RESEARCH COMPLEX LOCKS OF HYDROCARBONS Milan Lončarević, Zoran Rakić	9.45-10.00
EXPERIENCE IN APPLICATION OF THE CONCEPTUAL MODELS OF THE FIELDS DEVELOPED BY THE COMPANY GAZPROM NEFT Redina S.A., Kurmanov P.U	10.00-10.15
UNCONVENTIONAL OIL AND GAS – EFFICIENT WORKFLOWS FOR EXPLORATION RISK AND RESOURCE ASSESSMENTS, AN EXAMPLE FROM ALASKA (USA) Darko Spahić, Bjorn Wygrala	10.15-10.30
RESERVOIR CHARACTERIZATION USING STOCHASTIC AND DETERMINISTIC SEISMIC INVERSION Shestakova G.M., Zakharova O.A., Timoshenko A.A	10.30-10.45
PROSPECTIVE RESOURCES AS A CENTRAL IMPORTANCE REPLACEMENT OF RESOURCE POTENTIAL РЕСУРСЫ СЗ – ПЕРВООЧЕРЕДНАЯ ВОЗМОЖНОСТЬ ВОСПОЛНЕНИЯ РЕСУРСНОЙ БАЗЫ Ekaterina Egorova	10.45-11.00
СЕЙСМОРАЗВЕДКА И ЭЛЕКТРОРАЗВЕДКА В 3D: КОМПЛЕКСИРОВАНИЕ ГЕОФИЗИЧЕСКИХ МЕТОДОВ ДЛЯ ПОВЫШЕНИЯ ЭФФЕКТИВНОСТИ ПРОГНОЗА КОЛЛЕКТОРОВ Kubishta I.I. Pavlovskiy J.V	11.00-11.15
ANALIZA I OBRADA KAROTAŽNIH MERENJA ZA POTREBE IZRADE SEIZMIČKE INVERZIJE I PROGNOZE PETROFIZIČKIH PARAMETARA NA OSNOVU 3D SEIZMIČKIH PODATAKA WELL LOG PROCESSING AND ANALYSIS FOR SEISMIC INVERSION AND PREDICTING OF PETROPHYSICAL PARAMETERS DISTRIBUTION Stevan Doroškov, Aleksandar Ristović	11.15-11.30
Председавајући / Chairs: Miroslav Starčević, Aleksandar Ristović	pauza
GEOMAGNETIC INVESTIGATIONS OF THE ORE DEPOSITS AT LOCATION PRIJEPOLJE, SERBIA Spomenko J. Mihajlović, Miroslav Starčević	12.00-12.15
PRIMENA GEOELEKTRIČNIH ATRIBUTA I PSEUDO 3D INTERPRETACIJA PODATAKA DOBIJENIH UKRŠTENIM KVADRATNIM RASPOREDOM U KLASTIČNOM DEPOZICIONOM SISTEMU THE APPLICATION OF GEOELECTRICAL ATTRIBUTES AND PSEUDO 3D INTERPRETATIONS OF DATA OBTAINED BY CROSS-SQUARE DISTRIBUTION IN A CLASTIC DEPOSITIONAL SYSTEM Branislav Sretenović, Ivana Vasiljević, Vesna Cvetkov, Bojan Brodić	12.15-12.30
СТАНДАРДИЗАЦИЈА ПОПРАВКИ ПРИ РАЧУНАЊУ ГРАВИМЕТРИЈСКИХ АНОМАЛИЈА У СРБИЈИ STANDARDIZATION IN REDUCTION FOR CALCULATION OF GRAVITY ANOMALIES IN SERBIA Ivana Vasiljević, Snežana Ignjatović, Branislav Sretenović, Oleg Odalović	12.30-12.45
ГЕОМАГНЕТСКИ ПРЕМЕР НА ТАЧКАМА ДРУГОГ РЕДА РЕПУБЛИКЕ СРБИЈЕ GEOMAGNETIC SECOND ORDER SURVEYS AT SERBIA D.Andrejić, D. Popeskov, M. Mihajlić	12.45-13.00
ПРАЋЕЊЕ ПРОМЕНА ГЕОМАГНЕТСКОГ ПОЛЈА, ПАРАМЕТАРА АТМОСФЕРЕ И ЗЕМЉОТРЕСА У ПРОЈЕКТУ FP7 BLACKSEAHAZNET	

MONITORING OF EARTHQUAKES, GEOMAGNETIC FIELD AND ATMOSPHERE PARAMETER IN FP7 BLACKSEAHZNET PROJECT Milena Cukavac, Strachimir Cht. Mavrodiev, Lazo Pekevski, Spomenko J. Mihajlovic	13.00-13.15
PRIMENA SEIZMIČKE INVERZIJE I MULTIATRIBUTIVNE ANALIZE PRI INTERPRETACIJI 3D SEIZMIČKIH PODATAKA KIKINDE 2013 THE APPLICATION OF SEISMIC INVERSION AND MULTIATTRIBUTE ANALYSIS FOR INTERPRETATION OF 3D SEISMIC DATA KIKINDA 2013 Janko Sovilj	13.15-13.30
ЕКОНОМСКА ГЕОЛОГИЈА И РУДНА ЛЕЖИШТА ECONOMIC GEOLOGY AND ORE DEPOSITS – Sala I (do recepcije) Hall I (next to reception desk)	
Председавајући / Chairs: Rade Jelenković, Vladimir Simić	
GEOLOGY AND MINERALIZATION OF THE NEW COOPER AND GOLD DISCOVERY SOUTH OF BOR – TIMOK MAGMATIC COMPLEX Miodrag Banješević, Duncan Large	16.30-17.00
GENERALNI OSVRT NA MINERALNU EKONOMIJU U SAVREMENIM USLOVIMA ODRŽIVOG RAZVOJA GENERAL REVIEW OF MINERAL ECONOMY IN MODERN CONDITIONS OF SUSTAINABLE DEVELOPMENT Radule Tošović	17.00-17.15
ZNAČAJ PRIMENE MODERNOG I EFIKASNOG MENADŽMENTA LJUDSKIH RESURSA U MINERALNOM SEKTORU THE IMPORTANCE OF MODERN AND EFFECTIVE HUMAN RESOURCE MANAGEMENT IN THE MINERAL SECTOR Radule Tošović	17.15-17.30
ОДРЖИВО ПЛАНИРАЊЕ АГРЕГАТА У ЈУГОИСТОЧНОЈ ЕВРОПИ - ЗАШТО И КАКО SUSTAINABLE AGGREGATES PLANNING IN SOUTHEAST EUROPE – WHY AND HOW? Vladimir Simić, Dragana Životić, Nevena Andrić, Zoran Miladinović	17.30-17.45
GEOLOŠKE KARTE KAO PODLOGE ZA ODRŽIVO PLANIRANJE SNABDEVANJA AGREGATIMA (NA PRIMERU REPUBLIKE HRVATSKE) GEOLOGICAL MAPS AS BACKGROUND FOR SUSTAINABLE AGGREGATE SUPPLY PLANNING (EXAMPLE OF THE REPUBLIC OF CROATIA) Vladimir Simić, Slobodan Miko, Boris Kruk, Željko Dedić, Dragana Životić, Nevena Andrić, Zoran Miladinović	17.45-18.00
МИНЕРАЛОГИЈА, КРИСТАЛОГРАФИЈА, ПЕТРОЛОГИЈА И ГЕОХЕМИЈА MINERALOGY, CRYSTALLOGRAPHY, PETROLOGY AND GEOCHEMISTRY Sala II – sprat iznad recepcije Hall II – floor above reception	
Председавајући / Chairs: Vesna Matović, Suzana Erić	
THE ORIGIN OF VOLCANIC SECTION OF THE VARDAR OPHIOLITIC ZONE: A COMPARATIVE PETROLOGICAL AND GEOCHEMICAL STUDY OF LATE-CRETACEOUS VOLCANICS FROM MACEDONIA WITH THEIR JURASSIC COUNTERPARTS FROM BALKANS Prelević Dejan, Simon Wehrheim, Božović Milica, Rolf Romer, Blažo Boev	9.00-9.30
СТАРОСТ ВАРИСЦИЈСКИХ ГРАНИТОИДА ИСТОЧНЕ СРБИЈЕ ОДРЕЂЕНА LA ICP-MS U-Pb МЕТОДОМ НА ЦИРКОНИМА LA ICP-MS U-Pb ZIRCON DATING OF VARISCAN GRANITOIDS IN EASTERN SERBIA Kristina Šarić, Suzana Erić, Vladica Cvetković, Irena Peytcheva, Dragan Jovanović, Aleksandar Pačevski	9.30-9.45
MINERAL BEJKERIT KAO CEMENT U RASEDNOJ BREČI U DIJABAZIMA (MRČIĆI, DIVČIBARE) MINERAL BAKERITE AS A CEMENT IN FAULT BRECCIA IN DIABASE (MRČIĆI, DIVČIBARE) Nebojša Vasić, Đorđe Simić, Vladimir Simić, Predrag Dabić, Suzana Erić, Ilija Brčeski, Violeta Gajić, Predrag Vulić	9.45-10.00
KARAKTERISTIKE SUBKONTINENTALNOG OMOTAČA ISPOD JUGOISTOČNOG DELA LIBIJE CHARACTERISTICS OF THE SUBCONTINENTAL MANTLE BENEATH SOUTHEASTERN LIBYA Maša Radivojević, Suzana Erić, Salah M. Turki, Marinko Toljić, Vladica Cvetković	10.00-10.15
GEOHEMIJA SAVREMENIH SEDIMENATA TISE I ĐERDAPSKOG JEZERA GEOCHEMICAL CHARACTERISTICS OF SURFACE SEDIMENTS FROM TISZA RIVER AND DJERDAP LAKE Milica Kašanin-Grubin, Nebojša Vasić, Snežana Štrbac, Dragoman Rabrenović, Vidojko Jović, Ilija Brčeski	10.15-10.30

PALEOZOIC OPHIOLITES OF THE DELI JOVAN MTS. (EASTERN SERBIA) Dragan Milovanović, Dušan Bjelotomić, Emin Memović	10.30-10.45
COMPOSITION OF ZONAL GARNETS FROM THE GARNETITE EXOSKARN OF THE ORE FIELD ROGOZNA (ROGOZNA MTS, SOUTHERN SERBIA) Danica Srećković-Batočanin, Nada Vasković, Stanoje Milutinović, Veroljub Ilić, Zoran Nikić	10.45-11.00
МИНЕРАЛОШКЕ, ПЕТРОЛОШКЕ И ГЕОХЕМИЈСКЕ КАРАКТЕРИСТИКЕ ЛИГНИТА ПОЉА РАДЉЕВО У КОЛУБАРСКОМ БАСЕИ MINERALOGY, PETROLOGY AND GEOCHEMISTRY OF LIGNITE IN THE RADLJEVO FIELD, THE KOLUBARA BASIN (SERBIA) Adam Dangić, Branislav Simonović, Dimitrije Dimitrijević, Spasenka Gajinov, Marko Babović, Jelena Milošević	11.00-11.15
CRNI KREČNJACI SA CRNIM ROŽNACIMA DONJE KREDE U SEVERNOM DELU KARPATO-BALKANIDA ISTOČNE SRBIJE (IZMEĐU ŽAGUBICE I MALOG KRŠA) BLACK LIMESTONE WITH BLACK CHERTS OF LOWER CRETACEOUS AGE IN NORTHERN CARPATHO-BALKANIDES (EAST SERBIA, BETWEEN ŽAGUBICA AND MALI KRŠ) Nebojša Vasić, Darivorka Ljubović-Obradović, Jastin Van der Torn, Danica Srećković-Batočanin, Dragana Davidović, Branislav Avramović	11.15-11.30
ХИДРОГЕОЛОГИЈА HYDROGEOLOGY Sala II – sprat iznad recepcije Hall II – floor above reception	pauza
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GEOLOŠKO-HIDROGEOLOŠKE KARAKTERISTIKE LAJTOVAČKIH KREČNJAKA NA LOKALITETIMA "KREČANSKE JAME" I "PUARIŠTE" KOD LEŽIMIR GEOLOGICAL-HYDROGEOLOGICAL CHARACTERISTICS OF THE LEITHA LIMESTONE ON THE "KREČANSKE JAME" AND "PUARIŠTE" SITES, NEAR LEŽIMIR Milovan Rakijaš, Ljupko Rundić, Slobodan Knežević, Marija Kukavica	12.00-12.15
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OKRUGLI STO: Zakonska regulativa i licenciranje geologa ROUND TABLE: Legislation and licencing of geologists Sala I (do recepcije) / Hall I (next to reception desk)	18.00-19.30

DISTRIBUTION OF TRACES ELEMENTS IN THE GRAPES FROM THE TIKVES AREA WITH A SPECIAL REFERENCES TO DISTRIBUTION OF Ni, Fe, Cu and Cr

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Key words: trace elements, grapes, Tikves

ABSTRACT

The paper presents the geochemical research for the presence of the elements in traces in grapes produced in the Tikves area (Republic of Macedonia), and in the same time the spatial distribution of the elements nickel, iron and chrome is presented. A special note is given to the elements nickel, iron, copper and chrome in order to present the anthropogenic influence which appears from the work on the metallurgy of nickel and iron which is found in this region and the appliance of means for plant protection. The average values of the elements in traces in the grapes from the Tikves area are in (mg/kg) (Li-0.020; Be-0.002; B-28; Na-8; Mg-300; Al-49; P-5588; Ca-490; Ti-0.94; V-0.011; Cr-0.184; Mn-4.0; Fe-14; Co-0.012; Ni-0.145; Cu-7.1; Zn-2.5; Ga-0.029; Ge-0.001; As-0.157; Sr-3.7; Mo-0.019; Pd-0.0005; Ag-0.009; Cd-0.002; Sn-0.012; Sb-0.065; Cs-0.031; Ba-0.64; Tl-0.002; Pb-0.66; Bi-0.026; Th-0.001). From the conducted research it could be concluded that a certain increase in the concentration of iron, nickel, copper and chrome is noted in the eastern part of the region, and it is as a consequence of the anthropogenic activities

INTRODUCTION

Vineculture and wine in Tikves area have a rich historical past and long tradition. They constitute the core industries of the population of the whole region.

The history of vines in this region goes back to more than two millennia, and that something can be seen from the numerous remnants of the past (archaeological artifacts in archeological sites such as: Stobi Eudarist, Belgrade, Antigone, Demir blackberry etc.), written documents, photographs, stories, as well as folk songs, customs and other works (Cvijich, 1906).

Ancient Macedonians who lived in these areas with great love and piety cultivated this culture, and the god of wine was one of the most desirable deities. Grapes and wine were cult food items that are used during celebrations. Today in the area around Tikves can still be found numerous archaeological artifacts with representations of grapes and vines. But an even greater number of archaeological artifacts that were taken in the past of this region today are in the museums in Belgrade, Sofia and elsewhere.

Viticulture as an important branch of agriculture continued to flourish in the Middle Ages as witnessed by numerous entries from many historians and travel writers, but three miniatures from the middle of X century found in this region present the three stages of processing the grapevine. During the early Middle Ages in the cultivation of vines of great

importance was the application of the "Codex Kotor " by which with the law it was regulated the cultivation of this crop , and non-compliance with these provisions was punishable by law . In the second half of the XVI century when the territory of Tikves was ruled by the brothers Dejanovik, twenty villages with fields and vineyards were donated to the Mount Athos monasteries Hilendar and Panteleimon. It should be noted that in the Middle Ages the best producers of grapes and wines were at the monastery property, and the method of preparing the wine was kept in an utmost secrecy. Today, when we talk about viticulture in Macedonia, it immediately reminds us of the Tikves area, the Tikves grapes and wine which is mentioned in numerous native Macedonian folk songs. Today the Tikvesh wine area is one of the most important, both in Macedonia and the Balkans (Elenov, 1986) .

Results which refer to the determination of the elements in tarces in the wine produces in the winetrade in Tikves area, as well as the rest of the wine regions in Republic of Macedonia can be found in the papers by: Julijana Cvetkovic, Sonja Arpadjanb, Irina Karadjova, Trajce Stafilov. (2002), Trajče Stafilov, Irina Karadjova (2009), Irina Karadjova, Julijana Cvetkovic, Trajce Stafilov, Sonja Arpadjan (2007), Irina Karadjova, Sonja Arpadjan, Julijana Cvetkovic and Trajce Stafilov (2004), Julijana Cvetković, Trajče Stafilov, Dragan Mihajlović (2001), Krste Tasev, Irina Karadjova, Sonja Arpadjan, Julijana Cvetkovic, Trajce Stafilov (2004, 2006, 2005). Also, the results which refer to the geological, pedo-genetical and geo-chemical characteristics in the region Tikves and its surrounding can be found in the papers by: Blazo Boev et all (2005) and Trajce Stafilov et all (2008).

METHODS

Terrain methods of research

Field research methods are very important research activity of which depends greatly on further research results, and of course the performance of the final conclusions. In this Master work these methods are renamed in full in order to:

- detailed insight on the field that is the subject of research,,
- drafting outreach activities,
- sampling of grapes while GPS positioning, packaging and labeling samples,
- photographing the developed profiles in soil horizons from which the samples are collected,
- record owners of vineyards whose grapes are collected soil samples and samples of wines,
- sampling of wines are produced at home conditions, packinglabeling.

Laboratory methods of research

- Preparation of soil samples for geochemical and wine pursuits representation makroelementite and trace elements (ISO-11466);
- Determination of the macroelements and trace elements by applying the methods of ICP-MS.

RESULTS

The results of the geochemical research of the presents of elements in traces in grapes produced in Tikves area are presented in Table 1:

Table 1. Presence of elements in traces in the grapes in Tikves area (method ICP-MS in mg/kg)

Elements (mg/kg)	Min	Median	Max
Li	0.007	0.020	0.062
Be	0.003	0.002	0.001
B	7	28	37
Na	3.7	8.0	17.7
Mg	174	300	417
Al	21	49	96
P	3077	5588	7527
Ca	279	490	743
Ti	0.36	0.94	1.11
V	0.007	0.011	0.030
Cr	0.061	0.184	1.384
Mn	1.4	4.0	7.6
Fe	5	14	66
Co	0.009	0.012	0.048
Ni	0.050	0.145	1.124
Cu	1.8	7.1	119.1
Zn	1.6	2.5	10.5
Ga	0.015	0.029	0.057
Ge	0.001	0.001	0.001
As	0.008	0.157	2.136
Sr	1.4	3.7	7.4
Mo	0.001	0.019	0.103
Pd	0.001	0.0005	0.003
Ag	0.002	0.0092	0.072
Cd	0.001	0.0024	0.034
Sn	0.031	0.012	0.128
Sb	0.005	0.065	1.043
Cs	0.016	0.031	0.159
Ba	0.216	0.64	1.504
Tl	0.001	0.002	0.006
Pb	0.136	0.66	10.05
Bi	0.002	0.026	0.276
Th	0.001	0.0016	0.003

From the presented results in table 1 it could be concluded that certain concentrations of the elements in traces are within the frames of the published values for other regions in the world (Kabata- Pendias, 2000)

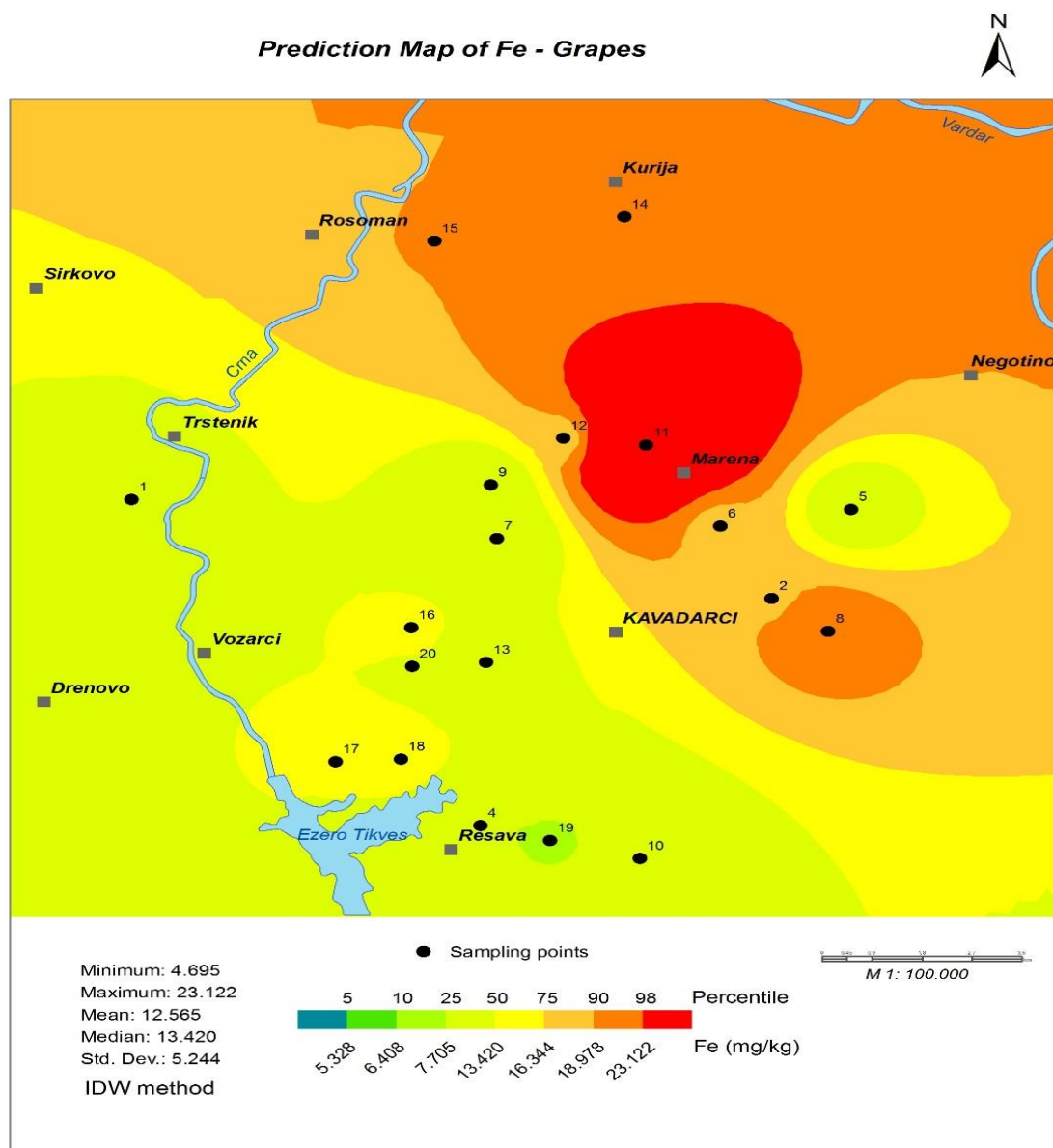


Fig.1. Map of iron distribution in the grapes from Tikves area

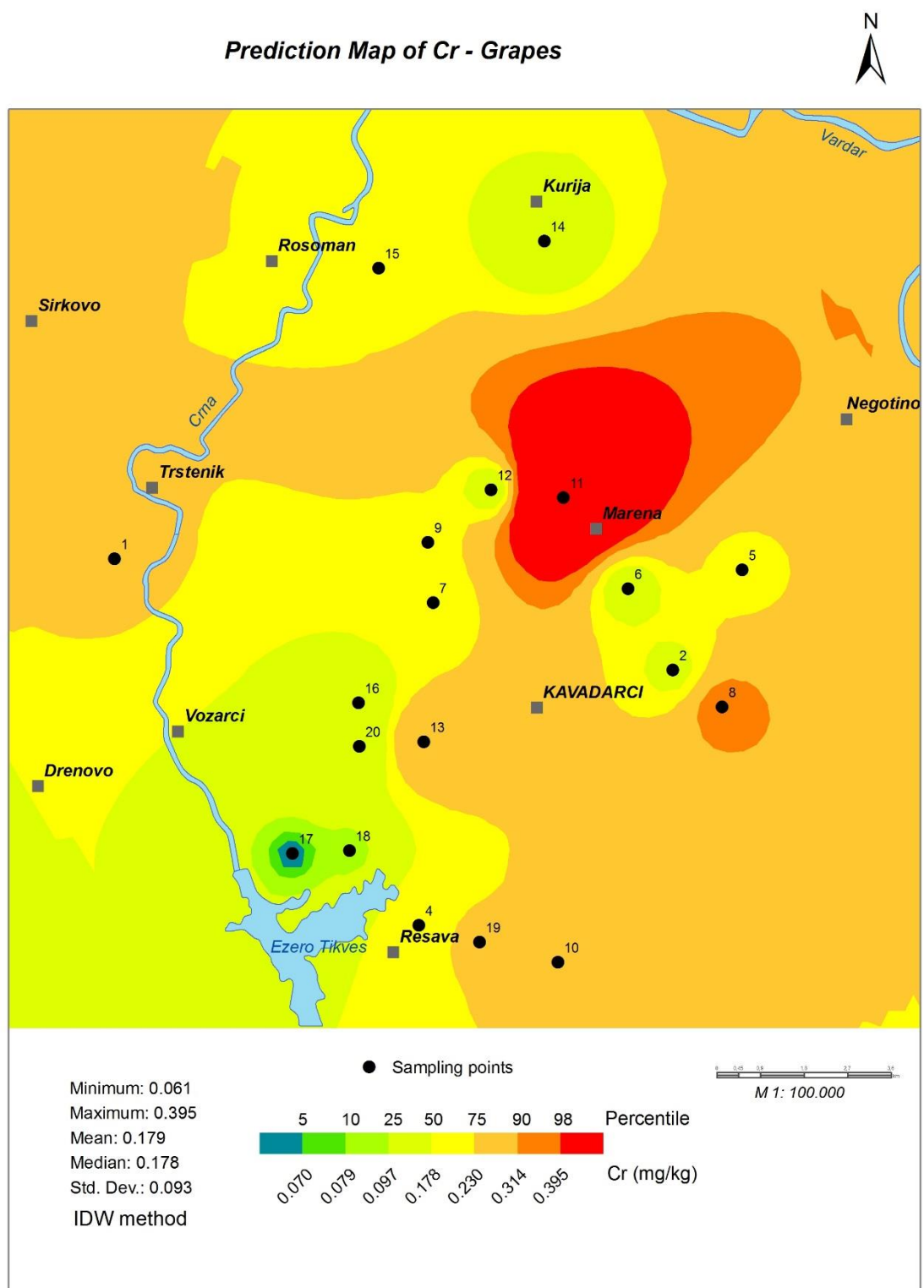


Fig.2. Map of chrome distribution in the grapes of Tikves area

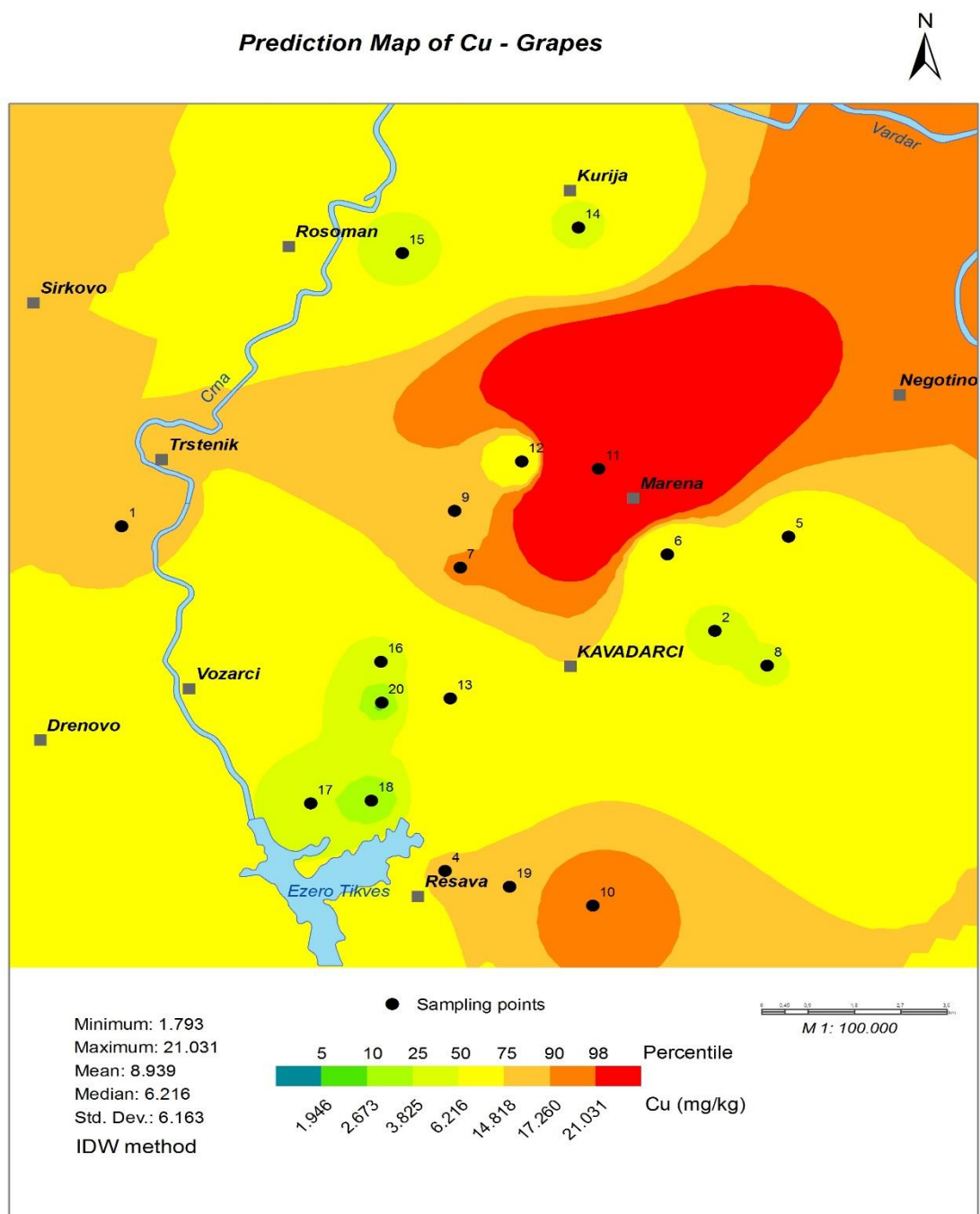


Fig.3. Map of copper distribution in the grapes of Tikves area

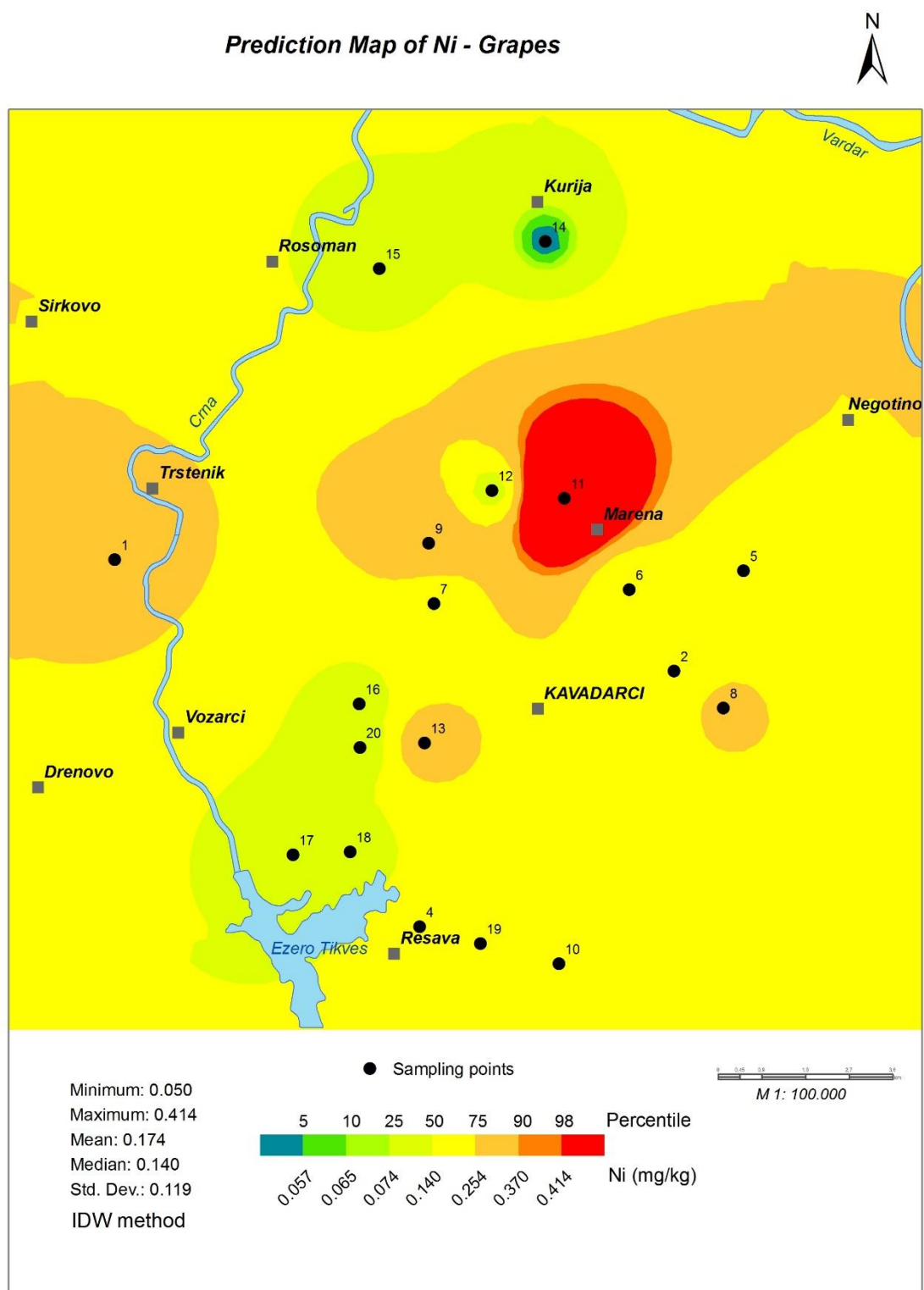


Fig.4. Map of nickel distribution in the grapes of Tikves area

For determination of the anthropogenic impact on the metallurgy of the production of nickel located in winery and the anthropogenic impact on the use of protective resources in the production of grapes made geochemical maps of the distribution of iron, nickel, chromium and copper (Fig. 1, 2, 3, 4). From the presented geochemical maps it can be concluded that the environment of the village Marena (eastern part of the area winery) is with higher concentrations of nickel, iron, chromium and copper. Increased concentrations of iron, nickel and chromium are the result of emissions of dust containing elevated concentrations of these elements as a result of the metallurgy of nickel (Boev et al., 2013). Increased concentrations of copper in the long-lasting effect on the use of funds for protection of plants containing copper.

CONCLUSION

Conducted geochemical studies suggest that in certain regions (near the village of Marena) appear elevated concentrations of iron, nickel, chromium and copper in which the grapes are produced in winery and they are increasing due to anthropogenic activities (metallurgy, use of means of plant protection). It should also be noted that these increased concentrations do not exceed the allowable values for these elements in grapes and that these values are within normal.

ACKNOWLEDGEMENT

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