

UNIVERZITET CRNE GORE

KOMISIJI MARDS

Predlažem Komisiji MARDS,

Predlog komisije za ocjenu podobnosti doktorske teze i kandidata sa nazivom „**Kontaminacija slatkovodnih ekosistema Crne Gore mikroplastikom: Prva zapažanja o pojavi, brojnosti, prostornim obrascima, identifikaciji i ekološkoj procjeni**“ kandidatkinje dr Nede Bošković u sastavu:

1. Dr Miljan Bigović, vanredni profesor Prirodno matematičkog fakulteta Univerziteta Crne Gore (naučna oblast- Organska hemija) – predsjednik komisije;
2. Dr Milica Kosović-Perutović, docent Metalurško-tehnološkog fakulteta Univerziteta Crne Gore (naučna oblast Opšta i neorganska hemija i zaštita životne sredine) – član komisije;
3. Dr Željko Jaćimović, redovni profesor Metalurško-tehnološkog fakulteta Univerziteta Crne Gore (naučna oblast: Neorganska hemija) – mentor.

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Datum i mjesto:

Podgorica, 28.09..2022. godinw

Ime i prezime:

Ž. Jaćimović
Neda Bošković

PRIJAVA TEME DOKTORSKE DISERTACIJE

OPŠTI PODACI O DOKTORANDU	
Titula, ime i prezime	Dr Neda Bošković
Fakultet	Centar za doktorske studije Univerziteta Crne Gore
Studijski program	Održivi razvoj
Broj indeksa	14/2021
Ime i prezime roditelja	Čedomir Bošković
Datum i mjesto rođenja	01.03.1993. godine u Nikšiću
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BIOGRAFIJA I BIBLIOGRAFIJA	
Obrazovanje	<p>Neda Bošković rođena je 01.03.1993. godine u Nikšiću u Crnoj Gori. Osnovnu školu „Ratko Žarić“ i srednju školu „Stojan Cerović“ u Nikšiću završila je sa odličnim uspjehom.</p> <p>2012. godine je upisala osnovne studije na Metalurško-tehnološkom fakultetu Univerziteta Crne Gore, studijski program Zaštita životne sredine u Podgorici. 2015. godine je završila osnovne studije sa prosječnom ocjenom 9.62 i stekla zvanje diplomirani inženjer zaštite životne sredine. Iste godine (2015) upisuje specijalističke studije na istom fakultetu i završava ih 2016. godine sa prosječnom ocjenom 10.00 čime stiče zvanje specijalista zaštite životne sredine.</p> <p>2016. godine upisuje Master studije Analitičar zaštite životne sredine, Departman za hemiju, biohemiju i zaštitu životne sredine na Prirodno-matematičkom fakultetu Univerziteta u Novom Sadu, Republika Srbija. Navedene studije završava 2017. godine sa prosječnom ocjenom 10.00 i stiče zvanje master - analitičar zaštite životne sredine.</p> <p>2018. godine upisuje doktorske studije Zaštita životne sredine, Centar za doktorske studije Univerziteta Crne Gore u Podgorici. Navedene doktorske studije završava 2022. godine sa prosječnom ocjenom 10.00 i stiče zvanje doktor nauka zaštite životne sredine.</p>
Radno iskustvo	<ul style="list-style-type: none"> - Pivara “Trebjesa” Nikšić (volontiranje, od 12.07.2014. do 12.09.2014. i od 01.07.2015. do 01.09.2015.) Pozicija: Pomoćnik EHS menadžeru (Enviroment specijalista); - Institut za javno zdravlje Crne Gore, Podgorica (pripravnički staž, od 15.01.2016. do 15.10.2016.);

	<ul style="list-style-type: none"> - NVO Ekološki pokret "Ozon" u Nikšiću (volontiranje, od 13.08.2017. do 13.11.2017.). Pozicija: Saradnik u projektima; - Centar za bezbjedonosna, sociološka i kriminološka istraživanja Crne Gore, "Defendologija" Nikšić (volontiranje, od 23.01.2018. u toku). Pozicija: Stručno lice za obavljanje poslova zaštite na radu; - Univerzitet Crne Gore, Institut za biologiju mora, Kotor (01.11.2019. – 31.10.2021.). Pozicija: naučni istraživač; - Nacionalni institut za biologiju mora, Morska biološka postaja, Piran, Slovenija (01.02.–30.03.2020; 18.09.-18.11.2021). Pozicija: naučni istraživač.
NASLOV PREDLOŽENE TEME	
Na službenom jeziku	Kontaminacija slatkovodnih ekosistema Crne Gore mikroplastikom: Prva zapažanja o pojavi, brojnosti, prostornim obrascima, identifikaciji i ekološkoj procjeni
Na engleskom jeziku	Contamination of freshwater ecosystems of Montenegro with microplastics: First observations on occurrence, abundance, spatial patterns, identification and ecological assessment
Objasnenje teme	
<p>Naziv disertacije "Kontaminacija mikroplastikom slatkovodnih ekosistema Crne Gore: Prva zapažanja o pojavi, prostornim obrascima, identifikaciji, brojnosti, distribuciji i ekološkoj procjeni" upućuje na ekološko stanje odabranih slatkovodnih ekosistema (rijeka i jezera) u pogledu sadržaja mikroplastike u površinskim sedimentima Crne Gore sa aspekta kvaliteta sedimenta kao važne ekosistemske cjeline.</p> <p>Plastični ostaci unutar slatkovodnih sistema su nedavno postali tema proučavanja (Eriksen et al., 2013). Interesovanje za proučavanje mikroplastike u slatkovodnim ekosistemima kontinuirano se povećava u cilju proširenja znanju o pojavi, izvorima i sudbini mikroplastike u rijekama i jezerima (Wagner et al., 2014; Lagarde et al., 2016; Zhang et al., 2016; Mani et al., 2016; Wang et al., 2017; Besseling et al., 2017; Lahens et al., 2018; Campanale et al., 2019). Slatkovodni ekosistemi su značajni prirodni resursi koji imaju važnu ulogu u transportu mikroplastike. Široko rasprostranjeno prisustvo mikroplastike u slatkovodnim ekosistemima ugrožavaju životnu sredinu, s obzirom da se mikroplastika može distribuirati i uticati na organizme (Fossi et al., 2016; Jin et al., 2018).</p> <p>Izvori zagađenja slatkovodnih ekosistema Crne Gore pripadaju uglavnom industrijskoj i komunalnoj kanalizaciji, izlivanjima iz postrojenja za prečišćavanje otpadnih voda, kao i disperznim izvorima poput: poljoprivrednih aktivnosti, navodnjavanja, oticanja atmosferskih padavina, poplava itd. Treba istaći da do nedavno u Crnoj Gori ispitivanje prisustva mikroplastike u životnoj sredini nije bio predmet interesovanja i proučavanja, te nijesu postojali podaci i saznanja o istom. Danas postoje značajni naučni doprinosi u ispitivanju prisustva mikroplastike u morskom ekosistemu crnogorskog primorja (Bošković et al., 2021, 2022a, 2022b), ali ne postoje istraživanja mikroplastike u slatkovodnim ekosistemima Crne Gore.</p> <p>Imajući u vidu navedeno, ova disertacija ima za cilj da na sveobuhvatan način, po prvi put, evaluira nivo zastupljenosti, dinamiku kretanja, karakterizaciju i izvore mikroplastike u slatkovodnim ekosistemima Crne Gore kao i da procjeni zagađenost ispitivanih lokaliteta sa stanovišta prisustva mikroplastike u sedimentima. Predmetna analiza predstavljaće osnov za kreatora legislativa u Crnoj Gori u cilju iznalaženja adekvatnih rješenja za unapređenje i očuvanje životne sredine, kao i poštovanja principa održivog razvoja.</p>	

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Pregled istraživanja

Plastične proizvode, koje se dobijaju najčešće iz sirove nafte, koristi većina društava širom svijeta, a njihova proizvodnja je dramatično porasla od njihovog početnog komercijalnog razvoja 1950-ih (Rios Mendoza and Balcer, 2018). Plastika je zbog svojih dobrih osobina (izdržljiva, otporna, postojana, laka, jeftina) značajno smanjila primjenu i korišćenje tradicionalnih materijala kao što su staklo, metal, koža, papir ili drvo (Rios Mendoza and Balcer, 2018). Zagađenje plastičnim ostacima se distribuira od pola do pola, od Arktika do Antarktika (Waller et al., 2017; Kanhai et al., 2018), i predstavlja veliku zabrinutost društvene i naučne zajednice. Plastične čestice manje od 5 mm nazivaju se mikroplastika (Thompson et al., 2004; Wang et al., 2019). Mikroplastika je podjeljena u dvije klase: primarnu i sekundarnu mikroplastiku. Primarna mikroplastika predstavlja proizvode koji se proizvode i koriste u rasponu veličine mikroplastike, a primjenu nalazi kao sirovina za izradu plastičnih proizvoda, u kozmetičkim i hemijskim industrijama, kao abrazivni medijum za pjeskarenje kao i vlakna koja se koriste u tekstilnoj industriji (Brovne et al., 2011; Simon-Sánchez et al., 2019). Sekundarna mikroplastika potiče od degradacije većih plastičnih predmeta tokom različitih fizičkih, hemijskih i bioloških procesa u životnoj sredini pri čemu se velika plastika razgrađuje na sitne čestice poput mikroplastike (Barnes et al., 2009). Budući da plastični predmeti koji su već prisutni u prirodnom okruženju mogu ostati tamo decenijama, njihova fragmentacija će proizvesti ogromne količine mikroplastike, čak i ako se zagađenje plastikom smanji ili zaustavi (Barnes et al., 2009; Simon-Sánchez et al., 2019). Koristi se više od 5000 vrsta sintetičkih polimera, a 80% ukupnih plastičnih polimera čine polipropilen (PP), polietilen (PE), polivinilhlorid (PVC), polietilen tereftalat (PET) i polistiren (PS) (Plastics, 2017; Tavşanoğlu et al., 2020).

Prisustvo i postojanost mikroplastike je prepoznat problem koji se javlja u vodenoj sredini poslednjih 15 godina (Thompson et al., 2009; Andradi, 2011; Cole et al., 2011; Wright et al., 2013). Mikroplastika je zastupljena u svim vodenim ekosistemima (okeani, mora, rijeke i jezera) (Rios Mendoza and Balcer, 2018). Međutim, većina studija izvještava o prisustvu mikroplastike u morskim ekosistemima, dok saznanja o prisustvu i uticaju mikroplastike u slatkovodnim ekosistemima, koji predstavljaju značajne prirodne resurse i koji podržavaju život ljudi, ekonomski razvoj i usko su povezani sa ljudskim blagostanjem i vodenim organizmima, su ograničena (Moore et al., 2011; Carpenter et al., 2011; Eerkes-Medrano et al., 2015; Horton et al., 2017; Fahrenfeld et al., 2019).

Interesovanje za proučavanje mikroplastike u slatkovodnim ekosistemima se povećava od 2013. godine (Eriksen et al., 2013). Ispitivanje prisustva mikroplastike u slatkovodnim ekosistemima nastoji da zatvori jaz u znanju o pojavi, izvorima i sudbini mikroplastike (Mani et al., 2016; Dris et al., 2018; Lahens et al., 2018; Campanale et al., 2019). Akumulacija mikroplastike u slatkovodnim ekosistemima naglašava sveprisutnost ovog oblika zagađenja (Moore et al., 2011; Zbiszevski and Corcoran 2011; Wagner et al., 2014; Scherer et al., 2017; Turner et al., 2019).

Studije ukazuju da slatkovodni ekosistemi igraju važnu ulogu u transportu mikroplastike. Slatka voda se smatra jednim od glavnih izvora mikroplastike u mora i glavnim transportnim vektorom plastičnog otpada iz kopnenih izvora (Iannilli et al., 2020), pa je proučavanje slatkovodnih ekosistema od velikog značaja za identifikaciju izvora zagađenja, dinamike, disperzije, akumulacija i sudbine mikroplastike (Dusaucy et al., 2021). Široko rasprostranjeno prisustvo mikroplastike u slatkovodnim ekosistemima ugrožava životnu sredinu, s obzirom da se mikroplastika može distribuirati i uticati na vodene organizme narušavajući njihov lanac ishrane i utičajući na biodiverzitet (Fossi et al., 2016). Slatkovodni ekosistemima su u direktnijem i češćem kontaktu sa ljudima, u odnosu na mora i okeane (Jiang et al., 2020). Mikroplastika se u vodenim ekosistemima pojavljuje u vidu različitih oblika poput filamenta/vlakna, filmova,

fragmenta, sfera/peleta. u različitim bojama i različitim tipovima polimera. Mikroplastika u slatkovodnim ekosistemima može da adsorbuje različite vrste postojanih organskih zagađivača (Rios Mendoza et al., 2017) i teških metala (Nakashima et al., 2012) iz životne sredine i istovremeno može desorbovati plastifikatore ili druge aditive koji su ugrađeni u plastične proizvode (Fries et al., 2013).

Jezeru predstavljaju ponore za mikroplastični otpad u poređenju sa okeanima, koji su podložni globalnom velikom dometu i transportu iz više slivova (Hidalgo-Ruz et al., 2012; Hardesti et al., 2017). Mikroplastika je pronađena u sedimentima jezera, sa inputima povezanim sa urbanizacijom, industrijskim aktivnostima i uticaju otpadnih voda (Turner et al., 2019).

Rječni sedimenti, funkcionišu kao ponori za mikroplastiku i deluju kao izvor za dalju mobilizaciju (Liro et al., 2020). Zabilježena su značajna opterećenja rječnih sedimenta mikroplastikom širom svijeta, što ukazuje da se veliki dio plastičnih zagađivača taloži i akumulira u korita rijeka (He et al., 2021). Studije ukazuju da urbani slatkovodni rječni sedimenti su mogući rezervoari za mikroplastiku i izvori mikroplastike u morskim ekosistemima (Peng et al., 2018).

Na prisustvo i distribuciju mikroplastike u jezerima i rijekama utiče više sila koje modifikuju njihovo prisustvo i transport, među njima su: klimatske varijable (površinske struje vođene vjetrom, oluje, poplave, oticanje), geomorfološke karakteristike (dubina vode, razvoj obalnog područja), antropogene aktivnosti (zakup brana, turizam, ribarstvo) i trofičko stanje (stepen zagađivanja) (Fischer et al., 2016; Meng et al., 2020; Alfonso et al., 2020).

Plastika je veoma postojana naročito u vodenoj sredini pa se procenjuje da će biti potrebno više stotine godina da se degradira i stoga će se vjerovatno akumulirati u vodenim sedimentima (Turner et al., 2019). Sedimenti svjedoče o istorijskoj inkorporaciji mikroplastike (Matsuguma et al., 2017; Willis et al., 2017). Površinski sedimenti su krajnje mjesto transporta mikroplastike u slatkovodnim ekosistemima (Turner et al., 2019).

Crna Gora ima specifičnu hidrologiju. Crna Gora je bogata i rijekama i jezerima. Teritorija Crne Gore je podjeljena na dva sliva: Crnomorski (Dunavski) sliv i sliv Jadranskog mora. Crnomorski basen pokriva 52% teritorije, a sliv Jadranskog 48% teritorije. Najveći dio jadranskog sliva pripada slivu Skadarskog jezera koji obuhvata rijeke Moraču, Zetu i Cijevnu, a Skadarsko jezero drenira rijeka Bojana koja se uliva u Jadransko more. Glavne rijeke crnomorskog (dunavskog sliva) su Piva, Tara, Lim, Ibar i Čehotina (Pešić et al., 2020).

Cilj i hipoteze

Glavni naučni cilj istraživanja je određivanje kvaliteta slatkovodnih ekosistema, na osnovu sadržaja mikroplastike u površinskim sedimentima crnogorskih rijeka i jezera, primjenom jedinstvenog multidisciplinarnog pristupa koji uključuje savremenu i jedinstvenu metodu određivanja mikroplastike koja se po prvi put sprovodi u slatkovodnim ekosistemima Crne Gore. Sa tim u vezi, disertacija u svom temelju ima slijedeće ciljeve:

- Odrediti sadržaj mikroplastike u površinskim sedimentima slatkovodnih ekosistema u Crnoj Gori;
- Utvrđivanje obima zagađenja mikroplastikom;
- Identifikovati potencijalnu mikroplastiku u sedimentima rijeka i jezera primjenom FTIR spektroskopije;
- Identifikovati prostorne distribucije mikroplastika u rječnim i jezerskim sedimentima;
- Definirati izvore, transportne puteve i sudbinu mikroplastike u slatkovodnim ekosistemima Crne Gore;
- Procijeniti linearnu zavisnost uticaja parametara poput: područja i sezone uzorkovanja na koncentraciju mikroplastike u uzorcima površinskog sedimenta u rijekama i jezerima;
- Procijeniti ekološko stanje odabranih slatkovodnih ekosistema u pogledu sadržaja mikroplastike u površinskim sedimentima;

- Procijeniti potencijalni uticaj kvaliteta sedimenta kao važne ekosistemske cjeline, u domenu kontrole zdravlja ekonomski značajnih vrsta riba koje se koriste u ljudskoj prehrani;
- Procijeniti ulogu sedimenta kao rezervoara i sekundarnog izvora mikroplastike u slatkovodnim ekosistemima.

Osnovna hipoteza zasnovana je na primjeni jedinstvene metodologije određivanja prisustva mikroplastike, koja treba da omogući dobijanje pouzdanih i reprezentativnih rezultata istraživanja sedimenta i jačanje istraživačkog kapaciteta i njihovog uticaja na kvalitet sedimenta kao važne ekosistemske cjeline.

Sa tim u vezi, polazne hipoteze disertacije su:

- Sedimenti slatkovodnih ekosistema predstavljaju sekundarne izvore i rezervoare prethodno akumulirane mikroplastike
- Rezultati ovih istraživanja pokazaće razliku u distribuciji i zastupljenosti mikroplastike u odnosu na ispitivano vodno tijelo (rijeka/jezero) i u odnosu na sezonu uzorkovanja (proljeće/jesen).
- Zakonske regulative i odluke na lokalnom i nacionalnom nivou u pogledu zaštite, procjene i upravljanja rizicima, očuvanja i/ili remedijacije istraživanih lokaliteta od mogućeg povišenog prisustva mikroplastike, kao i za potrebe planiranja prostora moraju biti čvrsto povezane usaglašavajući se sa ciljevima i principima održivog razvoja.

Materijali, metode i plan istraživanja

Metodologija doktorske disertacije sastoji se od:

- terenskog rada;
- laboratorijskog rada (priprema, analiza, identifikacija);
- poređenje rezultata sa dostupnim literaturnim podacima;
- statističke analize;
- izvođenja zaključaka.

Terenski rad predstavlja unaprijed isplaniranu tehniku uzorkovanja površinskog sedimenta iz rijeka i jezera na odabranim lokalitetima u Crnoj Gori. Uzorkovanje površinskog sedimenta (gornjih 5 cm) će se, u zavisnosti od specifičnosti lokacije, obavljati zaranjanjem ili primjenom Ponarovog grabila. Uzorkovanje površinskog sedimenta vršiće se u dva periodična ciklusa, proljećnom i jesenjem tokom istraživačke godine.

Laboratorijski rad odnosno analiza mikroplastike u slatkovodnim sedimentima primjenom jedinstvene metodologije određivanja prisustva mikroplastike sastoji se iz više koraka: zamrzavanje i sušenje uzoraka; razdvajanje gustine; razgradnja organske materije; prosijavanje i filtracija; vizuelna i hemijska identifikacija mikroplastike. Postupak pripreme, analize i identifikacije mikroplastike u uzorcima sedimenta obavljaće se u laboratorijama Univerziteta Crne Gore, kao i laboratorijama Morske biološke postaje u Piranu, Slovenija. Vizuelna identifikacija mikroplastike vršiće se primenom optičkog mikroskopa, dok će se hemijska identifikacija mikroplastike vršiti primjenom Fourierove infracrvene (FTIR) spektroskopije. Spektroskopija je odlična tehnika koja se koristi za pozitivnu identifikaciju sintetičkih polimera u uzorcima. Oslabljena ukupna refleksija (ATR) FT-IR je dobro uspostavljena, brza, jednostavna i efikasna tehnika za identifikaciju sastava polimera na osnovu apsorpcionih traka infracrvene spektroskopije prema specifičnoj frekvenciji (Tavşanoğlu et al., 2020). Ova tehnika je jedna od najpouzdanijih i najčešćih tehnike za identifikaciju mikroplastike, koja proizvodi spektre visokog kvaliteta (Tagg et al., 2015). Svi spektri će biti procenjeni analizom apsorpcionih traka i poređenjem sa spektralnom literaturom.

Dobijeni rezultati će se porediti sa dostupnim literaturnim podacima iz regiona i svijeta primjenom Web of Science (WoS) koji predstavlja dominantnu globalnu bazu podataka u cilju dobijanja jasnijih i preciznijih informacija kao i u cilju doprinosa naučnoj zajednici.

Statistička analiza rezultata doprinijeće boljem i jasnijem tumačenju rezultata. Rezultati će primjenom statističkih programa biti predstavljeni u dvodimenzionalnom sistemu, dok će se statističke korelacije rezultata predstaviti u zavisnosti od različitih promjenljivih.

Na osnovu detaljno analiziranih i predstavljenih rezultata izvešće se zaključci koji će predstavljati značajan naučni doprinos.

Očekivani naučni doprinos

Poseban značaj ovog istraživanja biće jedinstvenost rezultata analize mikroplastike u površinskom sedimentu slatkovodnih ekosistema, koja se po prvi put sprovode u Crnoj Gori, uzimajući u obzir aktuelnost ovih istraživanja. Takođe, rezultati do kojih će se doći analizom sastava i sadržaja mikroplastike u površinskim sedimentima ispitivanih rijeka u jezera doprinijeće unaprijeđenju saznanja o prisustvu mikroplastike u slatkovodnim ekosistemima Crne Gore, i uopšte njenom uticaju na kvalitet slatkovodnih ekosistema, prehrambeni lanac i ljudsko zdravlje.

Rezultati istraživanja koji će biti sastavni dio doktorske disertacije, daće procjenu stanja odabranih slatkovodnih ekosistema u pogledu sadržaja mikroplastike u površinskim sedimentima. Inovativni potencijal buduće disertacije ogleda se u metodološkom pristupu polaznih istraživanja koji se može unaprijeđivati, kako u pogledu primjenjenih tehnika, tako i pogledu odabira drugih ispitivanih medijuma (biotičkih ili abiotičkih) ili tehnika za potrebe detaljnije i preciznije analize i procjene ispitivane sredine.

Glavni naučni doprinos ogleda se u:

- Jačanju kapaciteta naše naučne zajednice u smislu kreiranja uslova za razvoj i primjenu novih metodologija za istraživanje prisustva mikroplastike u slatkovodnim ekosistemima Crne Gore;
- Unaprijeđivanju naučne baze novim podacima o slatkovodnim ekosistemima Crne Gore;
- Objavljivanju publikacija u referentnim naučnim časopisima na SCI listi, sa visokim impakt faktorom;
- Razvoju postojeće saradnje sa institucijama u regionu i stvaranje kompetencija za proširenje saradnje sa novim institucijama;
- Jačanju konkurentnosti Univerziteta Crne Gore u oblasti istraživanja na nacionalnom i međunarodnom nivou;
- Saradnji sa zainteresovanim stranama kroz diseminaciju projektnih rezultata i kreiranje uslova za buduće projektne aktivnosti;
- Podizanje svijesti o značaju implementacije principa održivog razvoja;
- Podršci donosiocima odluka na lokalnom i nacionalnom nivou u pogledu zaštite, procjene i upravljanja rizicima, očuvanja i/ili remedijacije istraživanih lokaliteta od mogućeg povišenog prisustva mikroplastike u sedimentima slatkovodnih ekosistema, kao i za potrebe planiranja prostora;
- Jačanju naučnog monitoringa;
- Naučnom i istraživačkom doprinosu u budućim istraživanjima i predstavljaće model za buduća istraživanja i monitoring.

Krajnji korisnici ovog istraživanja biće prije svega šira naučna zajednica, jer će rezultati biti publikovani u referentnim naučnim časopisima i predstavljeni na konferencijama, seminarima i tematskim radionicama. Tako prezentovani, rezultati će koristiti i drugim zainteresovanim stranama, direktno ili indirektno uključenim u očuvanje životne sredine i zdravlja ljudi.

Spisak objavljenih radova kandidata

1. **Bošković, N.**, Joksimović, D., Bajt, O. (2022b) Microplastics in fish and sediments from the Montenegrin coast (Adriatic Sea): similarities in accumulation. *Science of the Total Environment*, 850: 158074
2. **Bošković, N.** (2022) Particle size determination of microplastic in the sediments along the Montenegrin coast, Adriatic Sea. Second International Conference: "Adriatic Biodiversity Protection – AdriBioPro2022" in Kotor, Montenegro
3. **Bošković, N.**, Joksimović, D., Perošević-Bajčeta, A., Peković M., Bajt, O. (2022a) Distribution and characterization of microplastics in marine sediments from the Montenegrin coast. *J Soils Sediments*. <https://doi.org/10.1007/s11368-022-03166-3>
4. **Bošković, N.**, Joksimović, D., Bajt, O. (2021) Zastupljenost mikroplastike u sedimentu Bokokotorskog zaliva. Pedeseta međunarodna konferencija o korišćenju i zaštiti voda "VODA 2021" u organizaciji Srpskog društva za zaštitu voda, Zlatibor, Republika Srbija, Zbornik radova 257-262
5. **Bošković, N.**, Joksimović, D., Peković, M., Perošević-Bajčeta, A., Bajt, O. (2021) Microplastics in Surface Sediments along the Montenegrin Coast, Adriatic Sea: Types, Occurrence, and Distribution. *J. Mar. Sci. Eng.* 9: 841. <https://doi.org/10.3390/jmse9080841>
6. **Bošković, N.**, Joksimović, D., Bajt, O., Perošević-Bajčeta, A., Peković, M. (2021) Distribution and characterization of microplastics in the marine sediments from the Montenegrin coast. 12th International SedNet Conference, Lille, France
7. Joksimović, D., Perošević-Bajčeta, A., Martinović, R., **Bošković, N.**, Peković, M. (2021) Distribution of Heavy Metals in Core Sediment at the Montenegrin coast. 12th International SedNet Conference, Lille, France
8. Joksimović, D., Perošević-Bajčeta, A., Pestorić, B., Martinović, R., **Bošković, N.** (2021) Heavy Metals Toxicity in Sediment and the Marine Environment. In: *The Handbook of Environmental Chemistry*. Springer, Berlin, Heidelberg. https://doi.org/10.1007/698_2020_690
9. **Bošković, N.**, Joksimović, D., Pešić, A., Perošević, A., Peković, M. (2020) Akumulacija teških metala u mišićnom tkivu barbuna (*Mullus barbatus*) na Crnogorskom primorju. Četrdeset deveta konferencija o korišćenju i zaštiti voda "VODA 2020" u organizaciji Srpskog društva za zaštitu voda, Trebinje, Bosna i Hercegovina, Zbornik radova 377-382
10. Joksimović, D., Perošević-Bajčeta, A., Martinović, R., **Bošković, N.**, Peković, M. (2020). Procjena rizika i akumulacija metala u sedimentu u Bokokotorskom zalivu. Četrdeset deveta konferencija o korišćenju i zaštiti voda "VODA 2020" u organizaciji Srpskog društva za zaštitu voda, Trebinje, Bosna i Hercegovina, Zbornik radova 311-317
11. **Bošković, N.**, Joksimović, D., Peković, M., Bajt, O. (2020) Microplastics in sediments from the coastal area of the Boka Kotorska Bay on the Montenegrin coast. *Studia Marina* 33 (1): 18-25
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6. Bošković, N., Joksimović, D., Peković, M., Perošević-Bajčeta, A., Bajt, O. (2021) Microplastics in Surface Sediments along the Montenegrin Coast, Adriatic Sea: Types, Occurrence, and Distribution. *J. Mar. Sci. Eng.* 9:841.
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**SAGLASNOST PREDLOŽENOG/IH MENTORA I DOKTORANDA SA
 PRIJAVOM**

Odgovorno potvrđujem da sam saglasan sa temom koja se prijavljuje.

Prvi mentor	Dr Željko Jaćimović	<i>Ž. Jaćimović</i>
Drugi mentor		
Doktorand	Dr Neda Bošković	<i>Neda Bošković</i>

IZJAVA

Odgovorno izjavljujem da doktorsku disertaciju sa istom temom nisam prijavio/la ni na jednom drugom fakultetu.

Datum i mjesto: 28.09.2022.god. u Podgorici

Potpis doktoranda
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Број: 08-419
Датум, 25.03.2010. г.

Primijeno: 6.04.2010			
Opis pred. / Ref.	Broj	Prilog	Vrijednost
09	244		

Na osnovu člana 75 stav 2 Zakona o visokom obrazovanju (Sl.list RCG br. 60/03) i člana 18 Statuta Univerziteta Crne Gore, Senat Univerziteta Crne Gore, na sjednici održanoj 25.03.2010. godine, donio je

ODLUKU O IZBORU U ZVANJE

Dr ŽELJKO JAĆIMOVIĆ bira se u akademsko zvanje **redovni profesor** Univerziteta Crne Gore za predmete: Neorganska hemija, Hemijska veza i struktura molekula (dio: Struktura molekula) na studijskom programu Hemijska tehnologija na osnovnim akademskim studijama, Opšta i neorganska hemija, na Samostalnom studijskom programu Farmacija na osnovnim akademskim studijama i Neorganska hemija II, na studijskom programu Hemijska tehnologija na postdiplomskim specijalističkim studijama na **Metalurško-tehnološkom fakultetu**.

REKTOR

Prof. dr Predrag Miranović
Prof. dr Predrag Miranović

BIOGRAFIJA ŽELJKA JAĆIMOVIĆA

Željko Jaćimović je rođen 1966. godine u Bijelom Polju, gdje je završio osnovnu školu i gimnaziju. Diplomirao je hemiju na Prirodno-matematičkom fakultetu Univerziteta u Sarajevu 1991. godine. Postdiplomske studije upisao je 1992. godine na Hemijskom fakultetu u Beogradu, a magistarski rad pod nazivom „Sinteza i kristalna struktura dihloro-bis (3-amino-5-metilpirazol) cink(II) kompleksa“ odbranio je 1996. godine. Doktorsku disertaciju pod nazivom "Sinteze i strukture kompleksa Zn(II), Cd(II), Hg(II) i Cu(II) sa nekim di- i trisupstituisanim derivatima pirazola“ odbranio je u februaru 1999. godine na Institutu za hemiju Prirodno-matematičkog fakulteta u Novom Sadu.

Za asistenta na Katedri za opštu i neorgansku hemiju Metalurško-tehnološkog fakulteta (MTF) Univerziteta Crne Gore izabran je 1992. godine. Kao asistent izvodio je na MTF-u vježbe iz Opšte i neorganske hemije, Neorganske hemije, Kristalografije sa difraktometrijom i Neorganske hemije II, kao i iz Hemije na Prirodno-matematičkom fakultetu (PMF) i Hemije na Medicinskom fakultetu u Podgorici. Za docenta na Univerzitetu Crne Gore izabran je 1999. godine na predmetu Opšta i neorganska hemija, a za vanrednog profesora 2004. godine na predmetima na MTF-u Neorganska hemija, Hemijska veza i struktura molekula i Hemija čvrstog stanja. Od 2005. godine angažovan je za izvođenje nastave iz predmeta Opšta i neorganske hemija na Odsjeku za biologiju PMF, a od 2007. godine i za nastavu predmeta Opšta i neorganska hemija na studijskom programu Farmacija. U zvanje redovnog profesora na Univerzitetu Crne Gore izabran je u martu 2010. godine, na predmetima Neorganska hemija, Hemijska veza i struktura molekula na akademskim studijama i Neorganska hemija II na postdiplomskim specijalističkim studijama MTF-a, kao i Opšta i neorganska hemija na samostalnom studijskom programu Farmacija.

U periodu 2001-2004. godine, u dva mandata, obavljao je funkciju šefa Katedre za opštu i neorgansku hemiju na MTF-u, a od marta do oktobra 2015. obavljao je i funkciju vršioca dužnosti dekana MTF-a.

Prof. dr Željko Jaćimović dobio je značajna domaća i inostrana priznanja za ostvarene naučne rezultate. U knjizi *“Who is Who in Thermal Analysis and Calorimetry”*, renomiranog izdavača *Springer International Publishing* (hardcover ISBN 978-3-319-09485-4; eBook ISBN 978-3-319-09486-1), publikovanoj 2014. godine, prikazan je kratkom biografijom i bibliografijom kao jedan od 350 vodećih naučnika iz oblasti termičke analize i kalorimetrije. Ministarstvo nauke Crne Gore dodijelilo mu je 2018. godine Nagradu za najboljeg naučnika starijeg od 30 godina, a Univerzitet Crne Gore, 2020. godine, godišnju Nagradu za poseban doprinos u razvoju naučno-istraživačkog, stručnog i umjetničkog rada i međunarodnog pozicioniranja Univerziteta.

Željko Jaćimović ima 61 naučni rad publikovan u referentnim međunarodnim časopisima sa SCI liste, koji pripadaju oblasti sinteze i karakterizacije novih kompleksnih jedinjenja. Pored tih radova ima i tri rada publikovana u drugim međunarodnim časopisima i tri rada u domaćim časopisima. Ima i 15 radova štampanih u cjelosti u zbornicima radova međunarodnih naučnih konferencija. Dio rezultata svojih istraživanja prezentovao je i u vidu

71 saopštenja na inostranim i 19 na domaćim konferencijama, od kojih značajan broj na evropskim i svjetskim kristalografskim kongresima.

Oblast njegovih istraživanja je neorganska hemija, a naročito kompleksna (koordinaciona) jedinjenja. Iz te grupe jedinjenja posebno su interesantna ona na bazi pirazola i njegovih derivata sa prelaznim metalima, zato što ulaze u sastav mnogih lijekova (posebno antipiretika i antireumatika), herbicida i fungicida, a koriste se i kao ekstrageni različitih metalnih jona. Kompleksna jedinjenja platine, paladijuma i rutenijuma sa tiosemikarbazonima i tiosemikarbazidima kao ligandima pokazuju antitumornu aktivnost, pa je sinteza, karakterizacija i biološka aktivnost ovih kompleksih jedinjenja takođe jedan od značajnih pravaca njegovih istraživanja. Sinteza novih kompleksnih jedinjenja i njihova fizičko-hemijska karakterizacija (elementarna analiza, IR spektroskopija, NMR, Raman spektroskopija, termičke analize, ¹H spektri, konduktometrijska i magnetna mjerenja, biološka aktivnost, X-ray rendgeno-strukturna analiza) čine osnovu Jaćimovićevih publikovanih i saopštenih naučnih radova.

Željko Jaćimović je član Evropske kristalografske asocijacije i Hemijskog društva Crne Gore. U periodu 2000-2006. obavljao je funkciju sekretara Hemijskog društva Crne Gore, a od 2006. je predsjednik tog društva, koje je te 2006. godine postalo punopravni član Federacije evropskih hemijskih društava. Najzaslužniji je što je Hemijsko društvo Crne Gore dobilo i organizovalo Prvi (2007. u Miločeru) i Drugi (2009. u Baru) simpozijum hemije i životne sredine zemalja Jugoistočne Evrope, na kojem su pored učesnika iz regiona učestvovali i hemičari iz Turske, Italije, Rusije i SAD, među kojima i predsjednik Američkog hemijskog društva – odjela za zaštitu životne sredine.

Bio je predsjedavajući naučne konferencije *14th European meeting on Environmental Chemistry* 2013. godine, čiji je domaćin bilo Hemijsko društvo Crne Gore. Bio je član naučnog odbora hemijskih konferencija 8 zemalja (Grčka, Rumunija, Bugarska, Makedonija, Albanija, Srbija, Crna Gora, Kipar) – konferencija koje organizuju hemijska društva Jugoistočne Evrope, kao i konferencija *1st, 2st, 3st and 4st Central and Eastern European Conference on Thermal Analysis and Calorimetry, CEEC-TAC1*, 2011, 2013, 2015 I 2017 godine. Bio je član naučnog odbora *1st i 6th Thermoanalytical Conference*, koje organizuje Springerov *Journal of Thermal Analysis and Calorimetry*, časopis sa SCI liste.

Od 2013. godine je član Uređivačkog odbora časopisa "Glasnik hemičara i tehnologa Bosne i Hercegovine".

Željko Jaćimović je, kao rukovodilac ili član tima, učestvovao u realizaciji više značajnih istraživačkih i razvojnih projekata.

Bio je istraživač na dva projekta finansirana od strane Ministarstva nauke bivše SRJ: "Preparation Materials with Antibacterial Catalytic Effect on Metal Basis" i "Electrochemical Disinfections of Drink Water".

Bio je rukovodilac tri istraživačka projekta finansirana od Ministarstva prosvjete i nauke Crne Gore: "Kompleksi serije pirazola i njegovih derivata", "Kompleksi serije prelaznih metala sa pirazolom i njegovim derivatima" i "Sinteza, fizičko-hemijska karakterizacija i biološka aktivnost kompleksa serije prelaznih metala sa pirazolom i njegovim derivatima".

Bio je rukovodilac i pet bilateralnih naučno-istraživačkih projekata Crne Gore:

1. Sa Grčkom, pod nazivom "Sinteza, struktura i biološka aktivnost novih metalnih pirazolonskih kompleksa - anti-oksidantne i biomimetičke aktivnosti kod metalnih kompleksa", (2006-2008);
2. Sa Hrvatskom - "*Structural characterization of novel complex material for broad applications*", (2012-2013);
3. Sa Slovenijom - "*The use of natural and synthetic zeolites for the removal of heavy-metals (or inorganic ions) from waste-waters*", (2012-2013);
4. Sa Austrijom – „*Synthesis, physico-chemical characterization and biological activity of new transition metal complexes with pyrazole based ligands and their potential application*“, (2013- 2016);
5. Sa Mađarskom, pod nazivom „*Synthesis, physico-chemical and biological characterization of new transition metal complexes with pyrazole derivates and their potential application*“, (2016-2018).

Bio je i član istraživačkog tima bilateralnog projekta Crne Gore sa Kinom, pod nazivom „*Climate change: global challenge and national response (Chinese and Montenegro perspective) - Building business environment for European “new/green” investments and industries*“, (2014-2016).

Prof. Jaćimović je bio i jedan od rukovodilaca CEEPUS projekta CIII-SI-0905-1415, pod nazivom „*Training and Research in Environmental Chemistry and Toxicology*“, (2013-2015).

Bio je ključni istraživač na dva inovativna projekta:

- „Ispitivanje biološke efikasnosti novosintetisanih jedinjenja i biljnog ekstrakta prema najznačajnijim oboljenjima vinove loze u Crnoj Gori“, finansiranom od Ministarstva nauke 2018-2020,

- "*Testing of bio-efficacy of newly synthesized compounds and herbal extract according to the most important grapevine diseases in Montenegro (BIOEXTRA)*", 2018-2020. godine.

Rukovodilac je tima Crne Gore na Eureka projektu (2020-2023) „*Development of test strips based on electrochemical (bio)sensors for determining the concentration of disease biomarkers for the purpose of early diagnostics and prevention*“, i član crnogorskog tima na Erasmus+ projektu (2019-2022) „*Harmonization and Innovation of the PhD Study Program for Plant Protection in Sustainable Agriculture (HarISA)*“.

Prof. Željko Jaćimović ima veoma dobru i redovnu naučnu saradnju sa više institucija međunarodnog renomea: Univerzitetom u Beču (sa Fakultetom za prirodne nauke - Odsjek za neorgansku hemiju i sa Institutom za kristalografiju i mineralogiju), Univerzitetom u Durhamu - Velika Britanija, Hemijskim fakultetom iz Beograda, Institutom za nuklearne nauke - Vinča, Prirodno-matematičkim fakultetom iz Novog Sada, Nacionalnim Institutom za hemiju iz Ljubljane, Institutom Ruđer Bošković iz Zagreba, Univerzitetom za tehnologiju i ekonomiju iz Budimpešte (departmanom za analitičku i neorgansku hemiju). O uspješnosti te saradnje svjedoči značajan broj zajedničkih radova publikovanih u referentnim naučnim časopisima.

Kako u Crnoj Gori nema hemijskog fakulteta, prof. Željko Jaćimović se više puta usavršavao u gore navedenim institucijama i radio na zajedničkim projektima sa kolegama iz tih institucija. U tom pogledu posebno treba istaći Univerzitet u Beču (mart-jul 2001, septembar–oktobar 2001, jun 2005, 2010-2015).

Dobitnik je granta Američkog hemijskog društva i član internacionalne delegacije - rad po pozivu koji je saopštio u Čikagu 2007. godine u okviru *Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy*.

Preko Univerziteta Crne Gore bio je aktivni učesnik TEMPUS projekta "*Improvement of Teaching Quality in South East Europe*", u okviru kojeg je imao izlaganje na zajedničkom skupu u Sarajevu 2003. godine, i projekta "*Creation of Montenegro Team of Bologna Promoters*", u okviru kojeg je imao dvije posjete Univerzitetu *La Sapienza* u Rimu.

Posjeduje aktivno znanje engleskog jezika (usavršavanje u Kembridžu mart 2000. godine i Notingemu januar-februar 2001) i pasivno znanje italijanskog jezika.

Profesor Jaćimović održao je plenarno predavanje (predavanje po pozivu) na 14-tom Kongresu hemicara i tehnologa Bosne i Hercegovine (prvom nakon 1988. godine) pod nazivom "*Complexes of transition metals with pyrazole derived ligands: synthesis, physico-chemical characterization and potential application*", koji je održan u oktobru 2014. godine.

Željko Jaćimović je dao izuzetan doprinos reformi douniverzitetskog obrazovanja u Crnoj Gori. Bio je predsjednik Komisije za promjenu nastavnih planova i programa u osnovnoj školi (2003-2005), član Nacionalnog kurikularnog savjeta i koordinator za oblast prirodnih nauka u tom savjetu (2002-2005), član Nadzornog odbora za reformu obrazovanja pri Ministarstvu prosvjete i nauke (2006-2009) i član državnog tima za izradu Nacionalnog okvira kvalifikacija. Od 2007. do 2010. bio je predsjednik Komisije Zavoda za školstvo za akreditaciju programa stručnog usavršavanja nastavnika douniverzitetskog nivoa. Autor je strategije za uspostavljanje i razvoj nove institucije u našem obrazovnom sistemu – Ispitnog centra Crne Gore, institucije zadužene za eksternu provjeru znanja, vještina i kompetencija učenika i za sva međunarodna testiranja douniverzitetskog nivoa. Prvi je direktor tog centra i na toj funkciji je od 2006. do 2015. Bio je član (2007-2015) Glavnog odbora za međunarodno testiranje učenika PISA i Naučnog odbora *Agency for Cooperation in Secondary Education PACE*. Učestvovao je kao predavač na brojnim seminarima vezanim za metodologiju i izradu novih programa zasnovanih na nastavno-ciljnom kurikulumu. Bio je predavač na konferenciji *ERI SEE (Education Reform Initiative of South Eastern Europe)* iz oblasti ocjenjivanja, Bar 2007. Ekspert je *European Training Fondation* (sa sjedištem u Torinu) za oblast ključnih kompetencija i ocjenjivanja. Jedan je od autora publikacije te fondacije "*Key Competences for Lifelong Learning-development in the Montenegrin Education System, Project number WP 06-53-01*", (2007). Recenzent je 10 i urednik 4 udžbenika za osnovnu školu i gimnaziju. Koautor je zbirke zadataka iz hemije za drugi i treći razred gimnazije. Bio je član žirija za ocjenu projekata na prvom (2006) i drugom (2008) regionalnom takmičenju mladih talenata iz oblasti prirodnih nauka u Bugarskoj, finansiranog od strane UNESKO.

Prof. Jaćimović je bio tim lider na 48, 49. i 50. Međunarodnoj hemijskoj olimpijadi (Azerbejdžan, Tajland, Češka i Slovačka), na kojoj učestvuju pobjednici državnih takmičenja iz hemije (u prosjeku 200 najboljih učenika iz 50 država svijeta).

Za izvanredan doprinos razvoju obrazovanja dodijeljena mu je 2009. godine državna nagrada "Oktoih", najveća nagrada Crne Gore za oblast obrazovanja.

Prof. Jaćimović je učestvovao i u reformi Univerziteta Crne Gore, u periodu 2014-2017, kao jedan od četiri koordinatora tima za reformu. Dio dobijenih podataka i analiza sumiran je u publikaciji Univerziteta Crne Gore i *European University Association* „Analiza stanja i strateška opredjeljenja za reorganizaciju i integraciju Univerziteta Crne Gore“, iz aprila 2015.

U periodu 2015-2017. bio je član Naučnog odbora Univerziteta Crne Gore, a od avgusta 2016. do jula 2017. i član Upravnog odbora Univerziteta, kao predstavnik Vlade Crne Gore.

Bio je i član pregovaračkog tima za pridruživanje Crne Gore Evropskoj Uniji, za poglavlje 26, koje se odnosi na obrazovanje i kulturu.

Inostrani je ekspert za reakreditaciju doktorskih studija Hemije na MTF Univerziteta u Beogradu (2020. godina) i doktorskih studija Hemije na PMF Univerziteta u Nišu (2021).

Prof. dr Željko Jaćimović bio je član Odbora za obrazovanje CANU, a član je Odbora za hemijske i biološke nauke pri Odjeljenju prirodnih nauka. Bio je član užeg tima potprojekta Obrazovanje, u okviru projekta CANU “Crna Gora u XXI stoljeću”, i autor je dva rada u Zborniku radova tog potprojekta.

Prof. dr Željko Jaćimović nedavno se okušao i u oblasti patenata. Ima prihvaćen nacionalni patent Crne Gore P-2019-204 “*Pyrazole derivative and it's Co complex as a fungicide for the control of Phomopsis viticola sacc (BioextraPz)*”, a Svjetskoj patentnoj organizaciji prijavio je 2021. godine patent “*Method for preparation of extract from fraxinus ornus and its use*”, i ima dobre indicije da će patent biti uskoro prihvaćen.

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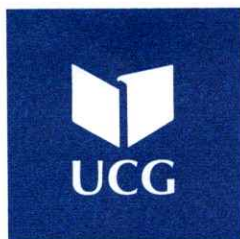
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**O D L U K U
O IZBORU U ZVANJE**

Dr MILJAN BIGOVIĆ bira se u akademsko zvanje **vanredni profesor Univerziteta Crne Gore** iz oblasti **Organska hemija i biohemija na Prirodno-matematičkom fakultetu Univerziteta Crne Gore**, na period od pet godina.



**SENAT UNIVERZITETA CRNE GORE
PREDSJEDNIK**

Prof. dr Vladimir Božović, rektor

Europass Radna biografija



Lični podaci

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Glavni poslovi i odgovornosti	2012-2016. – saradnik u nastavi / Prirodno-matematički fakultet Univerziteta Crne Gore;
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Obrazovanje i osposobljavanje

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Glavni predmeti / stečene profesionalne vještine	2009-2015 - Hemijski fakultet Univerziteta u Beogradu – smjer: organska hemija – doktorske studije.
Ime i vrsta organizacije obrazovne institucije	
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Lične vještine i kompetencije

Maternji jezik(ci)	Srpski
Drugi jezik(ci)	Engleski jezik (1) Ruski jezik (2)

Samoprocjena Evropski nivo (*)	Razumijevanje				Govor				Pisanje	
	Slušanje		Čitanje		Govorna interakcija		Govorna produkcija			
Jezik1	C2	Iskusni korisnik	C2	Iskusni korisnik	C2	Iskusni korisnik	C2	Iskusni korisnik	C2	Iskusni korisnik
Jezik2	B1	Samostalni korisnik	B1	Samostalni korisnik	A2	Temeljni korisnik	A1	Temeljni korisnik	A2	Temeljni korisnik

(*) [Zajednički evropski referentni okvir za jezike](#)

Društvene vještine i kompetencije	Vještine koje posjedujete Komunikativan, timski orijentisan, društven
Organizacione vještine i kompetencije	Vještine koje posjedujete Sposobnost rada kako pojedninačnog tako i timskog, posjedovanje organizacionih sposobnosti u smislu organizacije rada, raspodjele zadataka i tumačenja rezultata rada.
Računarske vještine i kompetencije	Programi i programski jezici kojima vladate MS Office Hemijski programski paketi: Chem Draw and Chem Scratch
Vozačka dozvola	Kategorija koju posjedujete C-kategorija
Dodaci	Dokumenti koje dostavljate Publikacije: <p>M. Bigovic, V. Maslak, Z. Tokic-Vujosevic, V. Divjakovic and R. N. Saicic (2011), A useful synthetic equivalent of a hydroxacetone enolate, <i>Organic Letters</i>, 13 (17), 4720-4723. ISSN: 1523-7060 (Print), ISSN: 1523-7052 (Online)</p> <p>M. Bigovic, S. Skaro, V. Maslak, R. N. Saicic, (2013), Expanding the scope of the indium-promoted allylation reaction: 4-(bromomethyl)-1,3-dioxol-2-one as a synthetic equivalent of a 3-arylhydroxyacetone enolate, <i>Tetrahedron Letters</i>, 54, 6624-6626. ISSN: 0040-4039</p> <p>T. Narancic, J. Radivojevic, P. Jovanovic, Dj. Francuski, M. Bigovic, V. Maslak, V. Savic, B. Vasiljevic, K. O'Connor, J. Nikodinovic-Runic, (2013), Highly efficient Michael-tupe addition of acetaldehyde to β-nitrostyrenes by whole resting cells of <i>Escherichia coli</i> expressing 4-oxalocrotonate tautomerase, <i>Bioresource Tehnology</i>, Vol. 142, 462-468, 2013. ISSN: 0960-8524</p> <p>V.Kastratović, Ž. Jaćimović, M. Bigović, M.Kosović, D.Đurović., „Speciation of copper in lake sediments and bioaccumulation of macrophytes Scadar Lake, Montenegro“ , International conference protection and restoration of the environment XII, Jun 2014, Skiathos Island, Greece, Book of abstracts, page 172</p> <p>Kastratović, V., Krivokapić, S., Bigović, M., Đurović, D., Blagojević, N. (2014) Bioaccumulation and translocation of heavy metals by <i>Ceratophyllum demersum</i> from Skadar Lake, Montenegro, <i>Journal of the Serbian Chemical Society</i>, 79(11): 1445–1460. ISSN 0352-5139 (Print) ISSN 1820-7421 (Online)</p> <p>V. Kastratović, Ž. Jaćimović, D. Đurović, M. Bigović, S. Krivokapić, (2015), <i>Lemna minor L.</i> As bioindicator of heavy metal pollution in Skadar Lake, Montenegro, <i>Kragujevac Journal of Science</i> 37, 123-134. ISSN 1450-9636</p> <p>Kastratović V., Jaćimović Ž., Bigović M., Đurović D. and Krivokapić S. (2016) Environmental Status and Geochemical Assessment Sediments of Lake Skadar, Montenegro. <i>Environmental Monitoring and Assessment</i>, DOI: 10.1007/s10661-016-5459-0</p> <p>V. Kastratović, M.R. Bigović, Ž. Jaćimović, M.Kosović, D.Đurović, S. Krivokapić, „Bioaccumulation of cobalt and nickel in macrophytes from Skadar Lake“ 13th International Conference on Protection and Restoration of the Environment, 3rd to 8th July, 2016, Mykonos island, Greece, Book of abstract, page 150, ISBN: 978-6865-94-7</p>

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Ostale aktivnosti i interesovanja:

- Član Srpskog hemijskog društva i Društva hemičara Crne Gore;
- Učešće u realizaciji 1., 2. i 3. Festivala nauke Republike Srbije (2008-2011);
- Član Organizacionog odbora 14th European Conference of Chemistry of the Environment (European Meeting on Environmental Chemistry, EMEC), 4-7. Decembar 2013., Budva;
- Autor i ocjenjivač takmičarskih testova iz hemije u organizaciji Ispitnog centra Crne Gore;
- Autor i ocjenjivač takmičarskih zadataka i koordinator hemijskog kolegijuma Olimpijade znanja u organizaciji Prirodno-matematičkog fakulteta Crne Gore;
- Član fondacije za promovisanje nauke „Prona“ od 2014. godine – angažovan kao mentor radova iz oblasti hemije na Zimsoj školi nauke, kao predavač i organizator praktikuma iz hemije na Ljetnjoj školi nauke;
- Koordinator za hemiju za takmičenje „Olimpijada znanja“ u organizaciji Prirodno-matematičkog fakulteta Univerziteta Crne Gore;
- Mentor sam i vođa crnogorskog tima na 51., 52. i 53. Međunarodnim hemijskim olimpijadama (održanim 2019, 2020 i aktuelnoj 2021. godini). Od 2014. do danas sam dio tima koji obavlja pripreme učenika za međunarodne hemijske olimpijade;
- Učesnik na većem broju bilateralnih projekata između Crne Gore sa jedne i Srbije, Hrvatske, Slovenije i Mađarske sa druge strane.
- Istraživanje zagađenja crnogorskog primorja i Skadarskog jezera sa organokalajnim jedinjenjima i toksičnim metalima (Crna Gora-Hrvatska, 2014-2016);
- Uticaj teških metala na promjenu metabolizma ljekovitog bilja (Crna Gora-Srbija, 2016-2018);
- Sinteza, karakterizacija i biološki aspekti novih ditiokarbamatnih kompleksa nekih prelaznih metala (Crna Gora-Srbija, 2016-2018);
- Sinteza, fizičko-hemijska i strukturna istraživanja novih, potencijalno biološki aktivnih Šifovih baza-derivata ditiokarbamata (Crna Gora-Hrvatska, 2016-2018);
- Sinteza, fizičko-hemijska karakterizacija i potencijalna biološka karakterizacija-aktivnost novih kompleksnih jedinjenja prelaznih metala sa pirazolom i njegovim derivatima (Crna Gora-Mađarska, 2016-2018);
- Modeliranje grafovima u matematičkoj hemiji (Crna Gora-Slovenija, 2018-2020).

Rukovodilac je bilateralnog projekta sa Srbijom pod nazivom „ Sinteza Sifovih baza i ispitivanje njihove antimikrobne i antioksidativne sposobnosti, za period 2019-2021.

Član je projekta „Balneološki efekti peloida, mineralne vode, ljekovitog i aromatičnog bilja na inflamatorni odgovor kod reumatoidnih i kardiovaskularnih bolesti (period 2018-2020).

Član je Centra Izvrnosti Centre of Excellence for Biomedical Researches CEBIMER, kao rukovodilac istraživanja u oblasti hemije, i član naučnog odbora Centra.

Tokom 2017. i 2018. godine, u okviru ERASMUS-projekta, boravio sam na Departmanu za Bioorgansku hemiju Farmaceutskog instituta Univerziteta Saarland u Saarbruckenu, Njemačka;

Tokom 2015., 2016. i 2017. boravio sam na Institutu „Ruđer Bošković“ u cilju naučne saradnje u sklopu bilateralnih projekata;

Recenzent „Priručnika za laboratorijsku dijagnostiku“, autora Snežane Pantović i Ivana Dožića, u izdanju Medicinskog fakulteta Univerziteta Crne Gore, Podgorica, 2017.

Autor poglavlja u udžbeniku „Osnovi biohemije“ za studente visoke medicinske škole, urednika Snežane Pantović, Medicinskog fakulteta Univerziteta Crne Gore, Podgorica, 2018.

Koautor udžbenika „Hemija za četvrti razred gimnazije“ u izdanju Zavoda za udžbenike i nastavna sredstva, Podgorica, 2020. godine.

Recenzent udžbenika „Hemija 3“ za treći razred gimnazije“ autora Svetlane Varagić i Mirjane Segedinac, Zavod za udžbenike i nastavna sredstva, Podgorica, 2020.

Recenzent „Zbirke zadataka za četvrti razred gimnazije“ autora Stanojke Vučurović, Željka Jaćimovića i Vlatka Kastratovića, u izdanju Zavoda za udžbenike i nastavna sredstva, Podgorica, 2020. godine.

Recenzent „Zbirke zadataka za treci razred gimnazije“ autora Stanojke Vučurović, Željka Jaćimovića i Vlatka Kastratovića, u izdanju Zavoda za udžbenike i nastavna sredstva, Podgorica, 2020. godine.

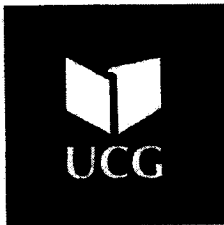
Recenzent sam u većem broju časopisa nacionalnog i međunarodnog značaja koji se bave tematikom iz oblasti organske hemije i hemije životne sredine.

Na 56. Savetovanju Srpskog hemijskog društva, bio sam član žirija za dodjelu IUPAC-ove nagrade za najbolje postersko saopštenje;

Dobitnik granta za učešće u „Školi proteomike“, koja se održana u februaru 2020. godine na Hemijskom fakultetu Univerziteta u Beogradu, a koja je organizovana u okviru projekta FoodEnTwin.

Mentor sam i komentor studentima osnovnih, specijalističkih i magistarskih studija, a član sam većeg broja komisija za odbrane završnih, specijalističkih i master radova na Prirodno-matematičkom fakultetu i drugim organizacionim jedinicama UCG.

- Član Uredničke komisije recenzenata (Editorial key reviewers committee) časopisa Journal of Achievements in Materials and Manufacturing Engineering



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Broj / Ref 03-4940

Datum / Date 16.11.2020

Crna Gora
UNIVERZITET CRNE GORE
METALURŠKO-TEHNOLOŠKI FAKULTET

Priljena: <u>23.11.2020</u>			
Org. jed.	Broj	Prilog	Vrijednost
-	<u>1921</u>		

Na osnovu člana 72 stav 2 Zakona o visokom obrazovanju („Službeni list Crne Gore“ br 44/14, 47/15, 40/16, 42/17, 71/17, 55/18, 3/19, 17/19, 47/19, 72/19 i 74/20) i člana 32 stav 1 tačka 9 Statuta Univerziteta Crne Gore, Senat Univerziteta Crne Gore na sjednici održanoj 16.11.2020. godine, donio je

ODLUKU O IZBORU U ZVANJE

Dr Milica Kosović Perutović bira se u akademsko zvanje docent Univerziteta Crne Gore za oblasti **Opšta i neorganska hemija i Zagađivači u životnoj sredini**, na Metalurško-tehnološkom fakultetu Univerziteta Crne Gore, na period od pet godina.



**SENAT UNIVERZITETA CRNE GORE
PREDSJEDNIK**

Prof. dr Danilo Nikolić, rektor

PERSONAL INFORMATION

Milica Kosović Perutović

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✉ mkosovic@ucg.ac.me

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Gender | Female | Date of birth | 16/07/1983 | Country | Montenegro

WORK EXPERIENCE

16.11.2020-

Docent**Faculty of Metallurgy and Technology, University of Montenegro**

Teaching in the following subjects:

- General and inorganic chemistry (Faculty of Science, study program Biology)
- Ecotoxicology (Faculty of Metallurgy and Technology in Podgorica, study program Environmental Protection)
- Medical biochemistry and chemistry (Faculty of Medicine, Podgorica, part of the course)
- Chemistry (Faculty of Medicine, study program Dentistry)
- Chemistry of natural organic compounds (Faculty of Metallurgy and Technology, study program Chemical Technology, part of the course)
- Coordination compounds-selected chapters (Faculty of Metallurgy and Technology in Podgorica)
- Ecotoxicology (Biotechnical Faculty Podgorica, Food Safety)

01.09.2011 – 16.11.2020

Teaching assistant**Faculty of Metallurgy and Technology, University of Montenegro**

Since the beginning of his engagement at the Faculty of Metallurgy and Technology, she has been performing exercises on the following subjects:

- General Chemistry (study programs Chemical Technology and Metallurgy and Materials),
- Inorganic Chemistry (study programs Chemical Technology and Metallurgy and Materials),
- Chemical bond and structure of molecules (study program Chemical Technology),
- Bioinorganic chemistry (study program Chemical Technology).

In the study program Environmental Protection performs exercises in the subject:

- General chemistry,
- Inorganic chemistry,
- Ecotoxicology,
- Food contaminants.

Engaged from the very beginning of her work at the faculty on performing exercises in the subject:

- General and inorganic chemistry at the Faculty of Science and Mathematics in

Podgorica (study program Biology),

- General and inorganic chemistry at the Faculty of Medicine (study program Pharmacy),
- Chemistry (Biotechnical Faculty, study programs Plant Production and Animal Husbandry, part of exercises)

At the Faculty of Philosophy (study program Teacher Education) she performed exercises on the subject

- Chemistry.

Since September 2014. at the Faculty of Medicine in Podgorica (study program Medicine) performed part of the exercises on the subject

- Medical biochemistry and chemistry.

Since the 2018/19 academic year, she has been engaged to teach the following subjects under mentorship:

- Ecotoxicology (Faculty of Metallurgy and Technology in Podgorica, study program Environmental Protection, part of the course),
- General and inorganic chemistry (Faculty of Science, study program Biology)
- Chemistry (Faculty of Medicine, study program Dentistry),
- Medical biochemistry and chemistry (part: General and inorganic chemistry, Faculty of Medicine, study program Medicine).
- Chemistry of natural organic compounds (Faculty of Metallurgy and Technology, study program Chemical Technology, part of the course)

01. 10. 2010. -01. 06. 2011.

Chemistry teacher

High school “ Stojan Cerović “ , Nikšić

01. 01. 2011. -30. 05. 2011.

Chemistry teacher

Elementary school “ Ratko Žarić “ , Nikšić

EDUCATION AND TRAINING

27.12.2016

PhD, Doctor of science - chemistry

Faculty of Natural and Mathematical sciences, Kragujevac, Serbia

- Department: Chemistry

Name of the thesis: Synthesis, characterization and clarify the mechanism of substitution reactions of transition metal complexes of some ions

2009.

Chemist for research and development

Faculty of Natural and Mathematical sciences, Kragujevac, Serbia

2002.

High school diploma

High school “ Stojan Cerović “ , Nikšić

PERSONAL SKILLS

Native language Montenegrin

Other language

Engleski jezik

Ruski jezik

UNDERSTANDING		SPEAKING		WRITING
Listening	Reading	Spoken interaction	Spoken production	
B2	B2	B2	B2	B2
A2	A2	A2	A2	A1
Stages: A1 / 2: Beginner - B1 / 2: Independent user - C1 / 2 Experienced user A common European reference framework for languages				

Communication skills

- Excellent communication skills gained during many years of work with associates and students (teaching)

W

Organizational / managerial skills

- Since 2012. participates in compiling and reviewing tests of the state competition in Chemistry for primary and secondary school students organized by the Examination Center of Montenegro.
- As a member of the team (first as an observer and then as a mentor) participated in the International Chemistry Olympiad (International Chemistry Olympiad, IChO2012 Washington, D.C, IChO2013 Moscow, Russia, IChO2014 Hanoi, Vietnam, IChO2015 Azerbaijan, Baku.). Since 2015, engaged as part of the team in the preparation of competitors for the International Chemistry Olympiad

IT skills

- Everyday active use of the Microsoft Office [™] program package, Chemdraw and many other programs.

Driving licence

- B

ADDITIONAL INFORMATION

Projects

Associate on national scientific projects:

1."Synthesis, physico-chemical and biological characterization of new complex compounds based on pyrazole and its derivatives, biological activity and potential application in pharmacy, agriculture and medicine", National Scientific Research Project (2012-2015).

2. "Synthesis of new dithiocarbamate compounds and their antimicrobial and toxic properties testing", National Scientific Research Project (2012-2014).

3. Innovation project: „Study on biological efficacy of newly synthesized compounds and plant extract to the most important diseases of grapevine in Montenegro- BIOEXTRA" supported by Ministry of Science of Montenegro (2018-2020)

4. Center of Excellence for Biomedical Research - CEBIMER, Head: Dr. Vjerslava Slavić, Head: Institute of Physical Medicine, Rehabilitation and Rheumatology "Dr. Simo

Milošević" Igalo

Associate in bilateral scientific - technological cooperation:

1. "Synthesis, physico-chemical and biological characterization of new transition metal complexes with pyrazole derivatives and their potential application" Institut für Mineralogie und Kristallographie, Fakultät für Geowissenschaften, Geographie und Astronomie, Univ. Wien, (2012-2014)
2. "Use of natural and synthetic zeolites for the removal of heavy metals from wastewaters and drinking water", Faculty of Metallurgy and Technology, University of Montenegro and Chemistry Institute of Ljubljana, Hajdrihova 19, 1000 Ljubljana (2012-2013)
3. "Fungicidal activity of new complexes of dithiocarbamate ligands with transition metals", Bilateral project funded by MN CG and MZS HR (Z. Leka, A. Višnjevac) (2013-2014)
4. "Synthesis, physico-chemical and structural research of new potentially biologically active Schiff dithiocarbamate bases". Faculty of Metallurgy and Technology, University of Montenegro and Ruđer Bošković Institute, Zagreb, Croatia (2017-2018)
5. "Synthesis, physico-chemical characterization of new complex compounds of transition metals with pyrazole derivatives and their potential application Faculty of Metallurgy and Technology, University of Montenegro and Faculty of Natural and Mathematical sciences, University of Novi Sad (2017-2018)
6. "The synthesis, characterization and biological aspects of new dithiocarbamate complexes of certain transition metals", Faculty of Metallurgy and Technology, University of Montenegro and Faculty of Natural and Mathematical sciences, University of Kragujevac (2017-2018)

Associate in international scientific projects:

1. "Development of test strips based on electrochemical (bio)sensors for determining the concentration of disease biomarker for the purpose of early diagnostics and prevention", Eureka project (2020-2023)

Innovative activity

National patent

1. (11)03496,(51)A01N 3/00, (21)P-2019-204, (54)Pyrazole derivative and its cobalt complexes for the control of fungi *Phomopsis viticola*, SACC, Bioextra, Pz, Crnogorski glasnik intelektualne svojine, datum objavljivanja 20.01.2020, ISSN 1800-8003

Conferences and invited lectures

Oral presentations at international scientific conferences:

1. **M. Kosović**, A. Višnjevac, D. Vojta, M. Đaković, Z. Leka; "Cobalt complexes with biologically active dithiocarbamate derivative", 22nd Croatian Slovenian Crystallographic Meeting, Biograd, Croatia, 2013, Book of abstracts, page 13

Poster presentations at international scientific conferences:

Papers published in full

1. S.R. Trifunović, D. Bulatović, M. Kosović, Z. Leka: Complex of iron(II) with potassium 3-dithiocarboxy-3-aza-5-aminopentanoate dihydrate, PHYSICAL CHEMISTRY 2012, 11th International Conference on Fundamental and Applied Aspects of Physical Chemistry, 24-28 Sept. 2012, Belgrade, Serbia Proceedings, Volumell, pp 689-691, ISBN 978-86-82475-28-6

2. Ž.Jačimović, V. Leovac, N. Latinović, M. Kosović, I. Đerđ, A. Radović: The influence of newly synthesised Cu(II) complexes based on pyrazole derivatives on the inhibition of *Phomopsis viticola* Sacc. (Sacc.) under laboratory conditions, Second International Symposium on Corrosion and protection of Materials and Environment, Bar, Montenegro, 17-20 Oct, 2012, Book of proceedings Bar, 2012, page 319-326.
3. I. Bošković, M.Kosovic, Ž. Jačimović, N.Latinović: The influence of newly synthesised Zn (II) complexes based on pyrazole derivatives on the inhibition of *Phomopsis viticola* Sacc. (Sacc.) under laboratory conditions, Second International Symposium on Corrosion and protection of Materials and Environment, Bar, Montenegro, 17-20 Oct, 2012, Book of proceedings Bar, 2012, page 327-333.
4. I. Bošković, Ž. Jačimović, M. Kosović. N. Latinović, " The influence of newly synthesised Ni(II) complexes based on pyrazole derivatives on the inhibition B. *Dothidea* of under laboratory conditions", XV Yucor, September 17-20, 2013, Tara, Serbia, Book of abstracts, page 188-193, ISBN 978-86-82343-19-6
5. Z. Leka, M. Kosović, J. Latinović, N. Latinović, " Inhibicioni efekat sintetisanog ditiokarbamato liganda $(NH_4)_3(idadtc)$, na fitopatogenu gljivu *Botryosphaeria dothidea*", XV Yucor, September 17-20, 2013, Tara, Serbia, Book of abstracts, page 260-263, ISBN 978-86-82343-19-6
6. Ž.Jačimović, A.Radović, M.Kosović, N.Latinović: " Influence of newly synthesized Cu(II) complexes on the pyrazole based derivatives on inhibition of B. *Dothidea*", 12th International conference protection and restoration of the environment, Jun 2014, Skiathos Island, Proceedings, page 719-714, ISBN 978-960-88490-6-8
7. V.Kastratović, Ž. Jačimović, M. Bigović, M.Kosović, D.Đurović, S. Krivokapić, " Speciation of copper in lake sediments and bioaccumulation of macrophytes Scadar Lake, Montenegro" , 12th International conference protection and restoration of the environment, Jun 2014, Skiathos Island, Greece, Proceedings, page 725-730, ISBN 978-960-88490-6-8
8. Ž. Jačimović, I.Bošković, A. Radović, M. Kosović, N. Latinovic, „Influence of newly synthesized Cu(II) complexes on the pyrazole based derivatives on inhibition of *Phomopsis viticola* (Sacc.) Sacc., 13th International Conference on Protection and Restoration of the Environment, 3rd to 8th July, 2016, Mykonos island, Greece, Book of abstract, page 154, Proceedings, page 471-476, ISBN 978-960-6865-94-7
9. V. Kastratović, M.R. Bigović, Ž. Jačimović, M.Kosović, D.Đurović, S. Krivokapić, „Bioaccumulation of cobalt and nickel in macrophytes from Skadar Lake“ 13th International Conference on Protection and Restoration of the Environment, 3rd to 8th July, 2016, Mykonos island, Greece, Book of abstract, page 150, Proceedings page 443-448, ISBN 978-960-6865-94-7

Published abstracts

1. Ž. Jačimović, M. Kosović, N. Latinović, V. Leovac, Z. Tomić, "The influence of some pyrazole derivatives and its newly synthesised transitional metal complexes on the inhibition of *Phomopsis viticola* Sacc. (sacc.) under laboratory conditions", 13th European Meeting on Environmental Chemistry, EMEC 13, December 05-08, 2012, Moscow, Russia, p 113, ISBN 978-5-89513-295-1
2. Ž.Jačimović, M. Kosović, A. Radović, " Structural characterization of tautomers of 3-

Amino-5-hydroxypyrazole", 8th International Conference of the Chemical Societies of the South-East European Countries, Belgrade, Serbia, Jun, 2013, Book of abstracts, page 60, ISBN 978-86-7132-053-5

3. D.Vojta, M. Kosović, M. Đaković, A. Višnjevac, Z. Leka, "Preparation and spectral characterization of Pt(II) and Pt(IV) dithiocarbamate complexes", " , 8th International Conference of the Chemical Societies of the South-East European Countries, Belgrade, Serbia, Jun, 2013, Book of abstracts, page 31, ISBN 978-86-7132-053-5

4. A. Višnjevac, D. Vojta, M. Kosović, M.Đaković and Z. Leka:" In situ Co(II) oxidation upon coordination to the dithiocarbamate derivative" 8th European Crystallographic Meeting, ECM 28, UK, 2013 Acta Cryst (2013). A69, page s633

5. M.Kosović, B.Petrović, Ž.Jačimović, Ž.D.Bugarčić, " Sinteza i karakterizacija novih kompleksa Pt(II) sa derivatima pirazola" , 51st Meeting of the Serbian Chemical Society and 2nd Conference of the Young Chemists of Serbia, Serbia, Jun 2014, Book of abstracts, page 7, ISBN 978-86-7132-054-2

6. Ž.Jačimović, A.Radović, M.Kosović, N.Latinović: " Influence of newly synthesized Cu(II) complexes on the pyrazole based derivatives on inhibition of B. Dothidea", 14th European Meeting on Environmental Chemistry, Dec 2013, Budva , Montenegro, Book of abstracts, page 142, ISBN 978-9940-9059-1-0

7. M.Kosović, Ž.Jačimović, M.Pekić, D.Šuković : „The influence of the environment on the quality of olive oil from different locations on Bar, Montenegro “ , 14th European Meeting on Environmental Chemistry, Dec 2013, Budva , Montenegro, Book of abstracts, page 143, ISBN 978-9940-9059-1-0

8. Z.Leka, M.Kosović, A.Višnjevac, D.Vojta, N.Latinović: " Inhibition effect of the platinum and palladium dithiocarbamate complexes on phytopathogenic fungus B. Dothidea", International conference protection and restoration of the environment XII, Jun 2014, Skiathos Island, Greece, Book of abstracts, page 173, ISBN 978-960-88490-51

9. Z.B. Leka, M.M. Kosović, N.I. Latinović, M.D. Vrbica, Fungicidne aktivnosti Ni(II) i Cu(II)-dth kompleksa na fitopatogenu gljivu Phomopsis viticola, 53rd Meeting of the Serbian Chemical Society, Book of Abstract,p:63, Kragujevac,Serbia, 10-11 jun 2016. ISBN 978-86-7132-061-0

10. D. Jacimovic, M. Kosovic, D. Sukovic, M. Pekić, Z. Jacimovic, „ Ecological entrepreneurship-olive production potentials in Montenegro“ International conference GREDIT 2016, April 2016, Skopje, Macedonia, Book of abstracts, page 209, ISBN 978-608-4624-22-6

11. Ž. Jačimović, M. Kosović, G. Giester, Z.Tomić, V.Kastratović, „Influence of different axial ligand and solvent on the aggregation of [Cu(H₂dcp)₂(L)₂] molecules (L=H₂O, CH₃OH)", 6th European Chemistry Congress, EuCheMS, Seville, Spain, September 2016 book of abstract 1280.

12. Ž Jačimović, M. Kosović, V.Kastratović, Berta Barta Holló, V. Leovac, K. Mészáros Szécsényi, " Synthesis and Characterization of Copper, Nickel, Cobalt, Zinc complexes with 4-nitro-3-pyrazolecarboxylic acid ligand" , 1st Journal of Thermal Analysis and Calorimetry Conference and 6th V4 (Joint Czech-Hungarian-Polish-Slovakian) Thermoanalytical Conference (JTACC+V4), Budapest, Hungary, June 2017 book of abstract 131, ISBN 978-963-454-098-4

13. N. Latinović, Ž. Jačimović, J. Latinović, M.Kosović, M. Vlahović, V. Kastratović, " The influence of newly synthesized transition metal complexes based on pyrazole derivatives on the inhibition B. Dothidea under laboratory conditions" , International conference WATER 2018, Constanta, Romania, 2018 book of abstract 61, ISBN 978-606-598-663-3

14. Ž. Jaćimović, N. Latinović, J. Latinović, M. Kosović, M. Vlahović, V. Kastratović, "The examination of potential fungicidal activity of Ethyl-3-(trifluoromethyl)-1H-pyrazole-4-carboxylate and Ethyl-1-(4-nitrophenyl)-5-(trifluoromethyl)-1H-pyrazole-4-carboxylate on fungus *Phomopsis viticola* Sacc under laboratory conditions", International conference WATER 2018, Constanta, Romania, 2018, Book of abstract, page 62, ISBN 978-606-598-663-3
15. M. Bigović, M. Roganović, I. Milašević, D. Đurpvić, V. Kastratović, V. Slavić, M. Kosović, M. Vlahović, S. Perović, A. Perović, Z. Potpara, M. Martinović, S. Pantović, „Physico-Chemical Characterization of Igalo Bay Peloid (Republic of Montenegro) and assessment of the Pollution in the Sampling Area“, 3rd International Congress of Chemists and Chemical Engineers of Bosnia and Herzegovina, Sarajevo, October 2018, Book of abstract, page 91, Print ISSN: 0367-4444, Online ISSN: 2232-7266
16. N. Latinović, Ž. Jaćimović, M. Kosović, M. Vlahović, V. Kastratović, I. Bošković, „Investigation of newly synthesised transition metal complexes based on pyrazole derivatives on the inhibition *Phomopsis viticola* Sacc. under laboratory conditions“, 3rd International Congress of Chemists and Chemical Engineers of Bosnia and Herzegovina, Sarajevo, October 2018, Book of abstract, page 36, Print ISSN: 0367-4444, Online ISSN: 2232-7266
17. Ž. Jaćimović, N. Latinović, J. Latinović, M. Kosović, V. Kastratović, M. Vlahović, V. Grudić, "The influence of some pyrazole derivatives and newly synthesised Cu(II), Ni(II) and Zn(II) complexes to the inhibition of *Phomopsis viticola* mycelium in vitro", 25th Congress of Chemists and Technologists of Macedonia, 19-22 Sep 2018, Ohrid, Macedonia, Book of abstracts, page 118, ISBN 978-9989-760-16-7
18. N. Latinović, Ž. Jaćimović, J. Latinović, M. Kosović, V. Kastratović, M. Bigović, "The examination of potential fungicidal activity ethyl-3-(trifluoromethyl)-5-(trifluoromethyl)-1H-pyrazole-4-carboxylate on fungus *Botryosphaeria dothidea* under laboratory conditions", 25th Congress of Chemists and Technologists of Macedonia, 19-22 Sep 2018, Ohrid, Macedonia, Book of abstracts, page 152, ISBN 978-9989-760-16-7
19. M. Bigović, V. Kastratović, S. Pantović, M. Roganović, I. Milašević, Lj. Ivanović, D. Đurović, V. Slavić, M. Kosović, M. Vlahović, „Determination of fatty and amino acid in Igalo bay peloid (Montenegro)“, 9th International Conference of the Chemical Societies of the South-East European Countries, Targoviste, Romania, May 2019, Book of abstract, ISBN 978-606-603-209-4
20. M. Vlahović, M. Kosović, Ž. Jaćimović, „The examination of composition and physico-chemical properties of the peloid sediments from Sutomore (Montenegro)“, 9th International Conference of the Chemical Societies of the South-East European Countries, Targoviste, Romania, May 2019, Book of abstract, ISBN 978-606-603-209-4
21. K. Vazdar, M. Vazdar, M. Bigović, A. Višnjevac, M. Kosović, Z. Leka, „Optimization of the method of synthesis of ethylene-diamine monoacetic acid, H-EDMA, 56th Meeting on the Serbian Chemical Society, Niš, Serbia, June 7-8, 2019, Book of abstract, page 98, ISBN 978-86-7132-073-3
22. M. Rakočević, D. Đurović, M. Kosović, Ž. Jaćimović, „Determination of Ochratoxin A and Heavy Metals in Selected Wine Sample of Small Commercial Producers From Montenegro“, Lodz, Poland, 2-5 Dec, 2019, Book of abstract, page 117
23. Ž. Jaćimović, N. Latinović, M. Kosović Perutović, J. Latinović, „Fungicidal Activity of Cu(II) Complex with 4-bromo-2-(1H-pyrazol-3-yl)phenol as Ligand on Phytopathogenic Fungus *Phomopsis viticola*“, Lodz, Poland, 2-5 Dec, 2019, Book of abstract, page 118

24. M. Kosović Perutović, P. Zekić, Ž. Četković, D. Jaćimović, , Ž. Jaćimović M. Bigović“ Milk from Montenegro farms: Monitoring and quality of raw milk and dairy products“ Proceedings of the Eighth International Conference on Environmental Management, Engineering, Planning & Economics Thessaloniki, Greece, July 20-24, 2021, 495-503 ISBN: 978-618-5494-53-7

25. M. Bigović, M. Kosović Perutović, L.Mehović,D.Šuković, and Ž. Jaćimović“ Determination of metal content, PAHs and organotin compounds in Sutomore peloid and assesment of the state of the environment“ Proceedings of the Eighth International Conference on Environmental Management, Engineering, Planning & Economics Thessaloniki, Greece, July 20-24, 2021, 373 ISBN: 978-618-5494-53-7

26. Ž. Jaćimović, M. Kosović Perutović, M. Rakočević, V. Kovačević, D. Đurović, “ The determination of heavy metals and ochratoxin A in wine products in Montenegro “, 21st European Meeting on Environmental Chemistry, EMEC 21, Novi Sad, 2021, Book of abstract, page 172, ISBN: 978-89-7132-078-8

27. Ž. Jaćimović, N. Latinović, J. Latinović, M. Kosović Perutović, “ Pyrazole derivative L and its cobalt complex for the control of fungi *Phomopsis viticola* sacc. patent number 03496 “, The determination of heavy metals and ochratoxin A in wine products in Montenegro “, 21st European Meeting on Environmental Chemistry, EMEC 21, Novi Sad, 2021, Book of abstract, page 173, ISBN: 978-89-7132-078-8

28. M. Bigović, S. Pantović, M. Roganović, M. Kosović Perutović, Ž. Jaćimović, “Comparison of heavy metal content in peloids from Igalo and Sutomore (montenegro) and assesment of the environment state “ 21st European Meeting on Environmental Chemistry, EMEC 21, Novi Sad, 2021, Book of abstract, page 127, ISBN: 978-89-7132-078-8

29. M. Kosović Perutović, L Turusković, N. Latinović, M. Šahman Zaimović, Ž. Jaćimović, “ Influence of some pyrazole derivatives on inhibition of *Botryosphaeria dothidea* under laboratory conditions “, 4th International Congress of Chemists and Chemical Engineers of Bosnia and Herzegovina, Sarajevo, June 2022, Book of abstract, page 139, Print ISSN: 0367-4444, Online ISSN: 2232-7266

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