



Podgorica, 26.06.2024. godine

Broj: 01/7-918/18

**UNIVERZITET CRNE GORE
CENTAR ZA DOKTORSKE STUDIJE**

Uvaženi,

Na osnovu člana 46 Pravila doktorskih studija Univerziteta Crne Gore u prilogu vam dostavljamo zapisnik sa odbrane doktorske disertacije dr Nede Bošković na službenom i engleskom jeziku.

S poštovanjem,



DIREKTOR,

Prof. dr Nedeljko Latinović

ZAPISNIK
sa odbrane doktorske disertacije dr Nede Bošković

Sačinjen dana 11.06.2024. godine, započeto u 11,00 časova.

Komisija za odbranu doktorske disertacije pod nazivom „Kontaminacija mikroplastikom slatkovodnih ekosistema Crne Gore: prva zapažanja o pojavi, prostornim obrascima, identifikaciji, brojnosti, distribuciji i ekološkoj procjeni“, naziv doktorske disertacije na engleskom: “Contamination of freshwater ecosystems of Montenegro with microplastics: First observations on occurrence, abundance, spatial patterns, identification and ecological assessment“, kandidatkinje dr Nede Bošković, imenovana Odlukom Senata Univerziteta Crne Gore br. 03-918/11/1 od 24.05.2024. godine, čiji je predsjednik prof. dr Miljan Bigović, pristupila je odbrani doktorske disertacije dana 11.06.2024. godine, sa početkom u 11,00 časova, u „Sali Senata“ u zgradi Rektorata UCG, o čemu je javnost bila ranije upoznata postavljanjem obavještenja na sajtu Centra za interdisciplinarne i multidisciplinarne studije i sajtu Univerziteta Crne Gore i objavljivanjem obavještenja u dnevnim novinama „Pobjeda“ (izdanje od 06.06.2024.).

Nakon što je predsjednik Komisije iznio biografske podatke i informacije o doktorandu i dao kratak prikaz rada, doktorand je u vremenu od pola sata, iznio kraći rezime, rezultate i zaključke do kojih je došao u svom radu, a zatim su članovi Komisije postavljali kandidatu pitanja (koja su u prilogu ovog zapisnika).

Nakon uspješnog odgovora kandidata na postavljena pitanja, Komisija se povukla na vijećanje i jednoglasno donijela i javno objavila sljedeću

ODLUKU

da je dr Neda Bošković uspješno odbranila doktorsku disertaciju pod nazivom „Kontaminacija mikroplastikom slatkovodnih ekosistema Crne Gore: prva zapažanja o pojavi, prostornim obrascima, identifikaciji, brojnosti, distribuciji i ekološkoj procjeni“, naziv doktorske disertacije na engleskom: “Contamination of freshwater ecosystems of Montenegro with microplastics: First observations on occurrence, abundance, spatial patterns, identification and ecological assessment“, čime su se stekli uslovi da joj se dodijeli diploma o stečenom akademskom nazivu doktora nauka - Održivi razvoj.

O toku i rezultatu odbrane doktorske disertacije vodio se ovaj zapisnik, u skladu sa odredbama člana 45 stav 2, 3, 4 i člana 46 Pravila doktorskih studija (Bilten UCG br. 513/20 i 561/22), koji potpisuju članovi Komisije i zapisničar i koji se dostavlja Senatu Univerziteta Crne Gore.

Komisija za odbranu doktorske disertacije,

1. Prof. dr Miljan Bigović, vanredni profesor
Prirodno-matematičkog fakulteta Univerziteta Crne Gore
2. Prof. dr Željko Jaćimović, redovni profesor
Metalurško-tehnološkog fakulteta Univerziteta Crne Gore
3. Prof. dr Oliver Bajt, vanredni profesor
Univerziteta u Ljubljani
4. Prof. dr Nedeljko Latinović, redovni profesor
Biotehničkog fakulteta Univerziteta Crne Gore
5. Doc. dr Milica Kosović Perutović, docent
Metalurško-tehnološkog fakulteta Univerziteta Crne Gore

Zapisničar:

Dragana Radulović, stručni saradnik u CIMS-u

Dragana Radulović

MINUTES
from the defense of doctoral dissertation by Neda Bošković, PhD

Written on June 11, 2024, with the beginning at 11,00 a.m.

Commission for the defense of doctoral dissertation under the title: „Kontaminacija mikroplastikom slatkovodnih ekosistema Crne Gore: prva zapažanja o pojavi, prostornim obrascima, identifikaciji, brojnosti, distribuciji i ekološkoj procjeni“, the title of doctoral dissertation in the English language: “Contamination of freshwater ecosystems of Montenegro with microplastics: First observations on occurrence, abundance, spatial patterns, identification and ecological assessment“, by the candidate Neda Bošković PhD, appointed by the Decision of the Senate University of Montenegro no. 03-918/11/1 from 24.05.2024., which president is prof. Miljan Bigović PhD, approached to the defense of doctoral dissertation on June 11, 2024. with the beginning at 11,00 a.m., in „Senate room“ Rectorate building University of Montenegro, which the public was previously informed about by placing the notice on the website of the Center for interdisciplinary and multidisciplinary studies and on the website of the University of Montenegro and by publishing the notice in the daily newspaper „Pobjeda“ (edition from 06.06.2024.).

After the Commission President read the biography and information about the candidate and gave a short review of the paper, the doctoral student, in the period of half an hour, presented a short summary, results and conclusions reached in her paper, and then the Commission members asked the candidate the questions (which are in the attachment to these minutes).

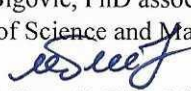
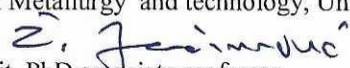
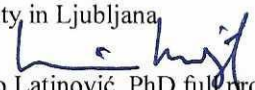
After the candidate's successful answers to the questions, the Commission withdrew for deliberation and unanimously made and publicly announced the following

DECISION

Neda Bošković, PhD successfully defended the doctoral dissertation entitled: „Kontaminacija mikroplastikom slatkovodnih ekosistema Crne Gore: prva zapažanja o pojavi, prostornim obrascima, identifikaciji, brojnosti, distribuciji i ekološkoj procjeni“ the title of the doctoral dissertation in the English language: “Contamination of freshwater ecosystems of Montenegro with microplastics: First observations on occurrence, abundance, spatial patterns, identification and ecological assessment“, by which the conditions were met to award her a diploma on the acquired academic title of Doctor of Science – Sustainable Development.

These minutes were written about the procedure and result of the defense of the doctoral dissertation, in accordance with the provisions of the Article 45 paragraph 2, 3, 4 and Article 46 of the Rules of Doctoral Studies (Bulletin University of Montenegro no. 513/20 and 561/22), and they are signed by the Commission members and the minutes taker and submitted to the Senate of the University of Montenegro.

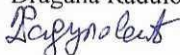
Commission for defense of doctoral dissertation,

1. Miljan Bigović, PhD associate professor
Faculty of Science and Mathematics, University of Montenegro

2. Željko Jaćimović, PhD full professor
Faculty of Metallurgy and technology, University of Montenegro

3. Oliver Bajt, PhD associate professor
University in Ljubljana

4. Nedeljko Latinović, PhD full professor
Biotechnical faculty, University of Montenegro

5. Milica Kosović Perutović, PhD assistant professor
Faculty of Metallurgy and technology, University of Montenegro


Minutes taker:

Dragana Radulović, expert associate in CIMS



UNIVERZITET CRNE GORE
CENTAR ZA INTERDISCIPLINARNE I
MULTIDISCIPLINARNE STUDIJE
PODGORICA

Obrana doktorske disertacije pod naslovom:

„Kontaminacija mikroplastikom slatkovodnih ekosistema Crne Gore: prva zapažanja o pojavi, prostornim obrascima, identifikaciji, brojnosti, distribuciji i ekološkoj procjeni“

Datum odbrane: 11.06.2024. godine u 11,00 časova

Mjesto odbrane: „Sala Senata“ Rektorata Univerziteta Crne Gore, Podgorica

Komisija za odbranu doktorske disertacije imenovana je Odlukom Senata Univerziteta Crne Gore br. 03-918/11/1 od 24.05.2024. godine.

Pitanje/a predsjednika Komisije prof. dr Miljana Bigovića:

1. ЗБОГ ЧЕГА СЕ ЗА РАДОБАЈАЊЕ ПО ГРАДИЕНТУ ГУСТИНЕ НАСЛУЖИЛО ЧЕЊЕЊА КОПУЊО ЗАКУГЕН БОЈЕНА РАСТВОР НАТРОЈУМ-ХЛОРИДА?
- 2) КАКО СТЕ ВПЛУУАМ ИДЕНТИФИКАЦИЈУ ЧЕЊЕЊА МИКРОПЛАСТИКЕ НА FTIR-У?

Prof. dr Miljan Bigović:

UNIVERSITY OF MONTENEGRO
CENTER FOR INTERDISCIPLINARY AND
MULTIDISCIPLINARY STUDIES
PODGORICA

Doctoral dissertation defense under the title:

“Contamination of freshwater ecosystems of Montenegro with microplastics: First observations on occurrence, abundance, spatial patterns, identification and ecological assessment“

Defense date: 11.06.2024. at 11 a.m.

Place of defense: „Senate room“ Rectorate building University of Montenegro, Podgorica

Commission for defense of doctoral dissertation was appointed by the Decision of the Senate University of Montenegro, no. 03-918/11/1 od 24.05.2024.

Question/s by the Commission president prof. dr Miljan Bigović:

1. ~~WHY~~ WHY DID YOU USE A SATURATED SOLUTION OF SODIUM CHLORIDE AS AN AGENT FOR SEPARATION OF PLASTIC COMPONENTS BASED ON THE DIFFERENCE IN DENSITY?
- 2) HOW DID YOU IDENTIFY MICROPLASTIC PARTICLES ON FTIR?



UNIVERZITET CRNE GORE
CENTAR ZA INTERDISCIPLINARNE I
MULTIDISCIPLINARNE STUDIJE
PODGORICA

Obrana doktorske disertacije pod naslovom:

„Kontaminacija mikroplastikom slatkovodnih ekosistema Crne Gore: prva zapažanja o pojavi, prostornim obrascima, identifikaciji, brojnosti, distribuciji i ekološkoj procjeni“

Datum odbrane: 11.06.2024. godine u 11,00 časova

Mjesto odbrane: „Sala Senata“ Rektorata Univerziteta Crne Gore, Podgorica

Komisija za odbranu doktorske disertacije imenovana je Odlukom Senata Univerziteta Crne Gore br. 03-918/11/1 od 24.05.2024. godine.

Pitanje/a člana Komisije prof. dr Željka Jaćimovića (prvi mentor):

1. KAKO OBJASNITE NISKE VRIJEDNOSTI REZULTATA INDEKSA ZAGAĐENJA, A VIŠOKE VRIJEDNOSTI REZULTATA INDEKSA OPASNOSTI OD POLIMERA?

2. KAKVI SU VAŠI PLANOVİ ZA BUDUĆNOST? DA LI NAMJERAVATE DA NASTAVITE SA SličNIM ISTRAŽIVANJIMA U BUDUĆNOSTI?

Prof. dr Željko Jaćimović:

UNIVERSITY OF MONTENEGRO
CENTER FOR INTERDISCIPLINARY AND
MULTIDISCIPLINARY STUDIES
PODGORICA

Doctoral dissertation defense under the title:

“Contamination of freshwater ecosystems of Montenegro with microplastics: First observations on occurrence, abundance, spatial patterns, identification and ecological assessment“

Defense date: 11.06.2024. at 11 a.m.

Place of defense: „Senate room“ Rectorate building University of Montenegro, Podgorica

Commission for defense of doctoral dissertation was appointed by the Decision of the Senate University of Montenegro, no. 03-918/11/1 od 24.05.2024.

Question/s by the Commission member prof. dr Željko Jaćimović (first mentor):

1. How do you explain the low values of the Pollution Load Index and the high values of the Polymer Hazard Index?

2. What are your plans for the future? Do you intend to continue with similar research in future?



**UNIVERZITET CRNE GORE
CENTAR ZA INTERDISCIPLINARNE I
MULTIDISCIPLINARNE STUDIJE
PODGORICA**

Odbrana doktorske disertacije pod naslovom:

„Kontaminacija mikroplastikom slatkovodnih ekosistema Crne Gore: prva zapažanja o pojavi, prostornim obrascima, identifikaciji, brojnosti, distribuciji i ekološkoj procjeni“

Datum odbrane: 11.06.2024. godine u 11,00 časova

Mjesto odbrane: „Sala Senata“ Rektorata Univerziteta Crne Gore, Podgorica

Komisija za odbranu doktorske disertacije imenovana je Odlukom Senata Univerziteta Crne Gore br. 03-918/11/1 od 24.05.2024. godine.

Pitanje/a člana Komisije prof. dr Olivera Bajta (drugi mentor) :

1.

**UNIVERSITY OF MONTENEGRO
CENTER FOR INTERDISCIPLINARY AND
MULTIDISCIPLINARY STUDIES
PODGORICA**

Doctoral dissertation defense under the title:

“Contamination of freshwater ecosystems of Montenegro with microplastics: First observations on occurrence, abundance, spatial patterns, identification and ecological assessment“

Defense date: 11.06.2024. at 11 a.m.

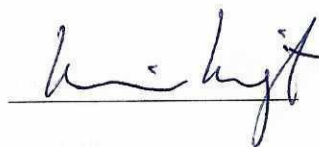
Place of defense: „Senate room“ Rectorate building University of Montenegro, Podgorica

Commission for defense of doctoral dissertation was appointed by the Decision of the Senate University of Montenegro, no. 03-918/11/1 od 24.05.2024.

Question/s by the Commission member prof. dr Oliver Bajt (second mentor):

1. WHAT IS YOUR OPINION -
IS IT POSSIBLE, IF, TO COPE
WITH THIS PROBLEM OF
MICROPLASTIC POLLUTION?
WHAT IT IS POSSIBLE TO DO?

Prof. dr Oliver Bajt:



**UNIVERZITET CRNE GORE
CENTAR ZA INTERDISCIPLINARNE I
MULTIDISCIPLINARNE STUDIJE
PODGORICA**

Obrana doktorske disertacije pod naslovom:

„Kontaminacija mikroplastikom slatkovodnih ekosistema Crne Gore: prva zapažanja o pojavi, prostornim obrascima, identifikaciji, brojnosti, distribuciji i ekološkoj procjeni“

Datum odbrane: 11.06.2024. godine u 11,00 časova

Mjesto odbrane: „Sala Senata“ Rektorata Univerziteta Crne Gore, Podgorica

Komisija za odbranu doktorske disertacije imenovana je Odlukom Senata Univerziteta Crne Gore br. 03-918/11/1 od 24.05.2024. godine.

Pitanje/a člana Komisije prof. dr Nedeljko Latinović:

1. Kako ste vršili uzorkovanje i zašto ste odabrali baš taj način?
2. Koliko čestica ste hemijski identifikovali putem FTIR-a?

Prof. dr Nedeljko Latinović:

**UNIVERSITY OF MONTENEGRO
CENTER FOR INTERDISCIPLINARY AND
MULTIDISCIPLINARY STUDIES
PODGORICA**

Doctoral dissertation defense under the title:

“Contamination of freshwater ecosystems of Montenegro with microplastics: First observations on occurrence, abundance, spatial patterns, identification and ecological assessment“

Defense date: 11.06.2024. at 11 a.m.

Place of defense: „Senate room“ Rectorate building University of Montenegro, Podgorica

Commission for defense of doctoral dissertation was appointed by the Decision of the Senate University of Montenegro, no. 03-918/11/1 od 24.05.2024.

Question/s by the Commission member prof. dr Nedeljko Latinović:

1. How did you do the sampling and why did you choose exactly that way?
2. How many particles did you chemically identify by FTIR?



UNIVERZITET CRNE GORE
CENTAR ZA INTERDISCIPLINARNE I
MULTIDISCIPLINARNE STUDIJE
PODGORICA

Obrana doktorske disertacije pod naslovom:

„Kontaminacija mikroplastikom slatkovodnih ekosistema Crne Gore: prva zapažanja o pojavi, prostornim obrascima, identifikaciji, brojnosti, distribuciji i ekološkoj procjeni“

Datum odbrane: 11.06.2024. godine u 11,00 časova

Mjesto odbrane: „Sala Senata“ Rektorata Univerziteta Crne Gore, Podgorica

Komisija za odbranu doktorske disertacije imenovana je Odlukom Senata Univerziteta Crne Gore br. 03-918/11/1 od 24.05.2024. godine.

Pitanje/a člana Komisije doc. dr Milice Kosović Perutović:

1. Kako se vaši rezultati upoređuju sa sličnim studijama iz drugih regiona?
2. Da li se možete osvrnuti na sudbinu popuštanja MP nakon unošenja u akvatični organizam? Koji su načini apsorpcije, distribucije, ali i mjesto dejstva? Kako veličina čestice utiče na njihovu apsorpciju i distribuciju unutar organizma?

Doc. dr Milica Kosović Perutović:

UNIVERSITY OF MONTENEGRO
CENTER FOR INTERDISCIPLINARY AND
MULTIDISCIPLINARY STUDIES
PODGORICA

Doctoral dissertation defense under the title:

“Contamination of freshwater ecosystems of Montenegro with microplastics: First observations on occurrence, abundance, spatial patterns, identification and ecological assessment“

Defense date: 11.06.2024. at 11 a.m.

Place of defense: „Senate room“ Rectorate building University of Montenegro, Podgorica

Commission for defense of doctoral dissertation was appointed by the Decision of the Senate University of Montenegro, no. 03-918/11/1 od 24.05.2024.

Question/s by the Commission member doc. dr Milica Kosović Perutović:

1. How do your results compare with similar studies from other regions?
2. Could you comment on the fate (way) of MP behavior after importation into a aquatic organism? What are the ways of absorption, distribution, target sites of action? How does the size of particles affect their absorption and distrib. within the body?

Milica Perutovic