



KNJIGA SAŽETAKA
BOOK OF ABSTRACTS

24.-25. travnja 2021. g.
April 24-25, 2021

5. Simpozij
Studentata
PhD doktorskih
Student Studija
Symposium

PMF

2021

Prirodoslovno-matematički fakultet | Zagreb
Faculty of Science | Zagreb
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**Simpozij studenata doktorskih studija PMF-a
PhD Student Symposium 2021**

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Faculty of Science, University of Zagreb

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Organizator/Organiser

Prirodoslovno-matematički fakultet, Sveučilište u Zagrebu
Faculty of Science, University of Zagreb, Zagreb, Croatia

Izdavač/Publisher

Prirodoslovno-matematički fakultet, Sveučilište u Zagrebu
Faculty of Science, University of Zagreb, Croatia

Web stranica Simpozija/Symposium website

https://www.pmf.unizg.hr/studiji/doktorski_studiji/simpozij_studenata_doktorskih_studija_pmf-a
https://www.pmf.unizg.hr/en/study_programmes/doctoral_study/phd_student_symposium

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Text prepared by authors, who are fully responsible for the abstracts.

ISBN: 978-953-6076-90-1

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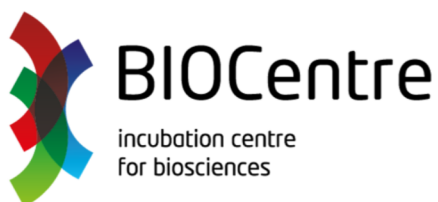
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Drage studentice i dragi studenti doktorskih studija,

veliko mi je zadovoljstvo pozdraviti vas na petom jubilarnom Simpoziju doktoranda PMF-a. Izrazito me veseli da smo, unatoč svim izazovima koje je zadnja godina pred nas stavila, uspjeli se okupiti i organizirati još jedan u nizu simpozija doktorskih studenata.

Kako to priliči obljetnicama, i ovo smo peto izdanje Simpozij nadogradili te po prvi puta Simpozij održavamo tijekom dva dana. Osim toga, ove smo godine pozvali i doktorske studente ne samo izvan PMF-a već i izvan naše države da vam se pridruže i podijele s vama zadovoljstvo izlaganja svojih znanstvenih rezultata te čari istraživanja i bavljenja znanošću. Kako bismo omogućili što većem broju studenata doktorskih studija da se pridruže Simpoziju, ali i svima vama još malo podigli letvicu u vašoj doktorskoj izobrazbi te vas tako što bolje pripremili za sve izazove koji vas čekaju na vašem istraživačkom i znanstvenom putu, omogućili smo prezentaciju vaših rezultata i na engleskom jeziku, koju izrazito preporučujemo.

No, svakako, ovoga Simpozija sa svim njegovim proširenjima i nadgradnjama ne bi bilo da nema vas i vaše želje za istraživanjem, vašeg entuzijazma i znanstvene radoznalosti koja je iznjedrila brojne kvalitetne rezultate, a radi kojih ste ovaj vikend ovdje i koje ćete, vjerujem, s ponosom predstaviti svojim kolegama, mentorima i nastavnicima iz svojih ali i srodnih znanstvenih područja. Koliko vama studentima doktorskih studija ovaj Simpozij znači govore i brojke vas koji ste se prijavili kako biste svoje uspjehe u znanstvenom istraživanju podijelili s drugima, ali i vas koji ste se prijavili kako biste poslušali rezultate drugih i time pružili podršku jedni drugima na zajedničkom znanstvenom putu. A kakav taj put obično biva, da je pun uspona i padova, velikog broja uličica i slijepih ulica, s tek možda po kojom brzom cestom ili prečicom, u potpunosti razumijemo i mi seniorniji koji smo tim istim putem prošli prije vas. I zato vam možemo poručiti, hodajte tim putem široko otvornih očiju i nemojte nikada izgubiti mladenačku zaigranost i znatiželju, ne odustajete prerano, vjerujte svojim idejama i idealima, ali i poslušajte savjete onih koji su putem kročili prije vas. Iskoristite svaku mogućnost da prikupite znanje i iskustvo i ponesete ga sa sobom, jer put je dug i izazovan, a znanje i iskustvo bit će vaši najvjerniji suputnici na tom putu. No, isto tako, ne zaboravite, ovaj put donosi brojne nagrade i ispunjenja, a svaki sljedeći uspjeh vas osnažuje, izgrađuje i budi želju za osvajanjem novih vrhunaca!

A samo jedan od takvih vrhunaca osvojile su danas i vaše kolegice iz Organizacijskog odbora. Nakon više mjeseci neumornog rada i svih izazova koje su na tom putu morale svladati, dovele su ovaj Simpozij do njegove realizacije, na čemu im od srca čestitam i zahvaljujem! A svima vama koji ste se okupili, u ime Znanstvenog i Organizacijskog odbora Simpozija želim uspješan i ugodan znanstveni vikend na PMF-u.



Izv. prof. dr. sc. Marijana Đaković
prodekanica za znanost i doktorske studije

Dear PhD Students,

It is my great pleasure to welcome you to the fifth Faculty of Science PhD Student Symposium. I am extremely happy that, despite all the challenges that the last year has put before us, we managed to gather and organize another edition of Symposium and celebrate its fifth anniversary.

As it usually goes with anniversaries, we have here as well introduced some novelties and upgraded Symposium to a two-day meeting. Besides, we are inviting PhD students from and outside Croatia to join you in sharing the excitement of doing science and presenting research findings. To be in a position to invite a larger number of PhD students to the Symposium, but also to raise the standards of your PhD training and prepare you for all the challenges that await you on your scientific path, we have made this Symposium bilingual, and warmly welcome your presentations in English.

But despite all the novelties and upgrades, it is certainly you who make this Symposium possible! You and your desire, enthusiasm and scientific curiosity that has yielded loads of high-quality results, which you are here this weekend for, and which, I believe, you will be proudly presenting to your colleagues, mentors, and teachers from your own and related scientific fields. And what this Symposium means to you is clearly visible in the overall attendees' numbers, the number of those of you who will present, but also those of you who applied just to attend Symposium and supporting your colleagues on the scientific path you all just stepped on. But how this path looks like? It is certainly not the straight one, but rather full of ups and downs, full of smaller and larger dead-end streets, with maybe only a few fast roads or shortcuts. Although it mostly seems to you that we (seniors) are not aware of a large number of downs and dead-end streets, we ensure you, we walked the same path before you. Any suggestions? Certainly, yes! Walk this path with eyes wide open, and never, never lose your youthful playfulness and curiosity, do not give up too early, believe in your ideas and ideals, but also listen to advice of those who walked the path before you, and you will soon find out how enjoyable this path is. Moreover, take every opportunity to gain knowledge and experience, as the journey is challenging, and the knowledge and experience proved to be the most helpful and faithful companions on this trip. Once in such good company, surrounded with helpful and faithful friends, this journey brings plenty rewards and fulfillments, with each success empowering you, and awakening your desire to climb higher and conquer new heights!

And only one of those heights was conquered today by your colleagues from the Organizing Committee. After several months of tireless and dedicated work, and all the challenges that had to be overcome along the way, they brought this Symposium to its realization, for all of you to gather and have wonderful and enjoyable time together. I sincerely congratulate them! And to all of you who have gathered to make this Symposium happen, on behalf of the Scientific and Organizing Committee of the Symposium, I wish you a successful and pleasant scientific weekend at the Faculty of Science.

Assoc. Prof. Marijana Đaković
Vice-Dean for Science and Doctoral Studies



LATE MIOCENE FLOURISHING OF FRESHWATER COCKLES (BIVALVIA: CARDIIDAE) IN THE PANNONIAN LAKE

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The Pannonian Lake existed for about 7 million years, from the end of the Middle Miocene to the beginning of the Early Pliocene, and during that geological time it changed significantly geographically and biologically [1]. It was formed by the closure of the Paratethys Sea and its gradual change in salinity, as a result of which many stenohaline organisms became extinct, and euryhaline organisms, including cockles, began to develop rapidly and their number and species diversity increased [2]. Most lake mollusks experience their maximum during the Late Miocene. Croatian Natural History Museum stores a rich collection of Miocene and Pliocene freshwater mollusks, including over 2000 specimens of freshwater cockles, mostly members of the Lymnocardiinae subfamily. About 100 species have been determined, and the first results indicate that the largest number originates from the youngest Miocene Rhomboidea deposits [3,4]. Species that stand out with the number of specimens are *Lymnocardium mayeri* (245), *L. riegeli* (202), *L. rogenhoferi* (110), *L. diprosopum* (94) and *Pseudocatillus simplex* (136). Due to the fragmentation and shell deficiencies, 97 specimens were determined at the genus level. The main findings of these fossil shells are located around the hills in Northern Croatia, which during the Late Miocene represented the islands in the lake. They inhabited a part of the neritic zone, which indicates the coastline relief that can be traced along the sites and which has changed over time. A big difference in the number of freshwater cockles through different stages of the existence of the Pannonian Lake in the wider area can be correlated with the salinity changes and their ability to adapt to new environments [5].

ACKNOWLEDGMENTS

We thank the Croatian Natural History Museum, which made it possible to work on the mollusks collections.

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