



43rd IAD Conference

Rivers and Floodplains in the Anthropocene:
Upcoming Challenges in the Danube River Basin

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– Proceedings –

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Preface

Dear Participants of the 43rd IAD Conference,

Living in pandemic times, it is not easy to organize an international conference. However, such conferences are very important for the scientific community, especially if this community is so diverse regarding countries and topics as IAD is.

This year, IAD celebrates a special event. Since 65 years since it is continuously present in limnological research in the Danube River Basin. For many decades, IAD was among the very few scientific fora ensuring connectivity between the Western and Eastern research teams, facilitating knowledge exchange, as well as joint projects and publications in the region.

The IAD Conference always was a 'jour fixe' to meet colleagues of the IAD family from the entire Danube Basin. However, this year we have to celebrate this IAD anniversary in a virtual way, as unfortunately, it is still not possible to meet personally due to the particular situation of our countries, with lockdowns and travel restrictions still in place.

Our hope is that the upcoming event – carried out as an online conference – can at least partly substitute the usual way of meeting and foster active exchanges between the participants.

The number of registered participants, around 80 persons, makes us hopeful! Furthermore, there are 41 presentations (39 oral and 3 posters) which show the wide thematic range on the one hand, and the interest of the scientists working within IAD to present their work on the other hand. Additionally it proves the interest of all of us to listen to the latest scientific developments in aquatic ecology research in the Danube Region.

We hope that this 'special' conference will be successful and interesting for IAD and will represent the transition to normal times in the future!



Cristina Sandu (President of IAD)



Bernd Cyffka (Head of Conference)

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Occurrence and spread of human-induced antimicrobial resistance in a large river water system: developing a holistic picture based on the Joint Danube Survey 4 activities

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The problem of human-induced antimicrobial resistance (acquired due to human activities) is an emerging concern in aquatic environments. The isolation of (facultative) pathogenic organisms with acquired antibiotic resistance, even concerning last-line antibiotics, from rivers and lakes, is well documented throughout the world. In the last few years, there has been a rapid increase in the number of studies addressing these topics and their possible implications for human health. However, most studies concentrate on a relatively limited methodology, e.g. applying non-quantitative and either cultivation-based or direct-detection based molecular biological methods. In addition, often only small geographic areas and short periods of time are covered. This is one of the reasons why many relevant questions concerning the occurrence and spread of antimicrobial resistance in aquatic ecosystems still remain unanswered.

The largest European river water survey (Joint Danube Survey 4) offered a unique opportunity to study the occurrence and spread of human-induced antimicrobial resistance along the whole Danube River. Within the research project, isolates from samples from the entire course of the Danube and their main tributaries, including high frequency sampling at selected locations, have been collected and analysed. Samples from the water compartment but also from submerged biofilms have been considered. State-of-the-art quantitative molecular biological techniques and culture-based analyses targeting different bacterial organisms have been combined with a large set of physical, chemical and biological parameters to obtain a robust and comprehensive picture of the occurrence and spread of human-induced antimicrobial resistance in the Danube River.

Based on the findings of this quantitative, integrative study approach, it seems likely to significantly improve the current understanding on the importance on the spread and stabilization of human-induced antibiotic resistance in large rivers. The results of this study will also be useful to guide future monitoring and management strategies.