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 time 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: 65 years since its establishment and its continuous presence 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 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, over 100 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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Invasive alien species in the Danube River Basin: Results of the JDS4

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The co-existential pattern of native and alien species was investigated along the Danube River Basin (DRB) during JDS4 (2019). A total of 51 JDS4 sites was sampled in the entire Danube River, and additional sites in the Lower Danube. The standard operational procedures adopted by ICPDR, and – for the first time – eDNA-based tools were used for the sampling. A smartphone application 'Invasive Alien Species in Europe' developed by the European Commission's Joint Research Centre and specifically updated to include invasive alien species concerning the DRB was additionally applied for data collection.

Six alien aquatic plants, 35 benthic macroinvertebrates and 17 fish species were recorded in DRB during the survey. Two groups of invasive species should be mentioned: 1) Ponto-Caspian species that do not have to cross very strong hydro- and geographical barriers during their spreading; and 2) Species that cross large geographical distances to arrive to the DRB (originated from North America and Asia). An overall decrease of the former abundance of *Corbicula fluminea* was recognised in some Danube sections. An extreme large amount of Ponto-Caspian amphipods was detected in the Upper Danube: *Echinogammarus* sp. and Gammaridae gen. sp., representing one third of the overall individual number of the macroinvertebrates detected in the Upper Danube (Austria). New Decapoda species (*Procambarus clarkii, Pacifastacus leniusculus*) appeared at new locations of the Middle Danube, indicating their recent spreading. A new Ponto-Caspian snail species (*Clathrocaspia knipowitschii*) was distributed along extended sections of the Lower and Middle Danube. The magnificent bryozoan *Pectinatella magnifica* was recorded for the first time in the Bulgarian shoreline zone of the Danube River. The (e)DNA-based detection revealed the presence of 5 macroinvertebrate species which were not recorded by other methods. The level of biocontamination of the Danube River was estimated as moderate to high, with higher levels for the Upper (high to severe biocontamination) and Middle

Danube (moderate to high biocontamination), in comparison to the Lower Danube (low biocontamination). The results show that DRB is under considerable influence of biological invasions. The number of identified alien species has increased over three times since 2007. The (e)DNA-based method has proved to be an effective additional tool in aquatic IAS monitoring. The smartphone app may greatly facilitate the access and update of IAS records for management and control purposes and contribute to IAS awareness raising in the Danube countries by involving actively the citizens in future surveys.