Training Course 'Impact of invasive alien species on biodiversity and ecosystem services in extreme environments'

03 – 04 April 2017, Sofia, Bulgaria

ORGANISED BY:

Institute of Biodiversity and Ecosystem Research,
Bulgarian Academy of Sciences (IBER-BAS), Bulgaria
Reykjavik University, Iceland
East and South European Network for Invasive Alien Species (ESENIAS)
Danube Region Invasive Alien Species Network (DIAS)

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d:ias Danube Region Invasive Alien Species Network

Training Course ‘Impact of invasive alien species on biodiversity and ecosystem services in extreme environments’

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ORGANISING AND PROGRAMME COMMITTEE:

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Training Course Outline

Invasive alien species (IAS) are among the most significant and growing environmental concerns worldwide. They are considered as a driver of biodiversity loss and recognised as being a major cause of species extinctions. Biological invasions may alter fundamental ecological properties and processes of the native ecosystems, and may have economic and social impact. It is expected that biological invasions in Europe will increase.

Owing to the projected increase in frequency and magnitude of extreme climatic events and predicted increases in average temperatures, ecosystems could be further affected by global changes. On the other hand, the invasive alien species can increase the vulnerability of ecosystems to other climate-related stressors and also reduce their potential to sequester greenhouse gasses.

The networking, awareness raising and capacity building are underlined in several European and global documents as one of the key factors for successful IAS management. One of the main objectives of the ESENIAS-TOOLS project is to raise the public awareness and gain wide support for combating IAS in Bulgaria. These objectives are implemented within the project working groups WG8 ‘Capacity building’ and WG9 ‘Awareness raising’. The present training course has been designed to address IAS impact on biodiversity and ecosystem services in extreme environments at regional level through promotion of knowledge sharing. Thus, the training course will allow improving skills and competencies of, as well as networking among scientists from the participating ESENIAS countries.

The training course aims at:

- Capacity building and increasing awareness on IAS impact on biodiversity and ecosystem services in extreme environments among young scientists and PhD students from Bulgaria and the ESENIAS countries;
- Imparting basic skills and competencies on IAS, its related terminology, the relevant international regulatory framework, networks, projects and information systems;
- Networking and cooperation among scientists in the ESENIAS region.

The language of the course will be English.

The training course is open to young scientists, PhD and MSc students from Bulgaria and the ESENIAS region.

No registration fee is required.

To apply, please submit a filled application form with a short motivation to the Organising and Programme committee at the following e-mail address esenias2017training@gmail.com or visit the ESENIAS webpage www.esenias.org for more information.

The deadline for applications is **10 March 2017.**

Preliminary Programme

Day 1 – 03 April 2017

09:15 – 9:45 **Registration and coffee**

9:45 – 10:00 **Welcome and introduction of participants**

10:00 – 10:45 Lecture 1. Invasive Alien Species (IAS); Environmental, economic and social impact. Introduction to Risk analysis
10:45 – 11:30 Lecture 2. Pathways of biological invasions, Human factor. Climate change as a driver of biological invasions
11:30 – 12:00 Discussion

12:00 – 13:00 **Lunch break**

13:00 – 13:45 Lecture 3. IAS management (prevention, early detection and control). International regulatory framework related to IAS. IAS related networks, projects and information systems
13:45 – 14:30 Lecture 4. Ecosystem services and biological invasions

14:30 – 14:45 Discussion

14:45 – 15:15 **Coffee**

15:15 – 16:00 Specialised lecture 1

16:00 – 16:15 Discussion

16:15 – 17:00 Specialised lecture 2

17:00 – 17:15 Discussion

Day 2 – 4 April 2017

09:00 – 9:45 Specialised lecture 3

9:45 – 10:00 Discussion

10:00 – 10:30 **Coffee**

10:30 – 11:15 Specialised lecture 4

11:15 – 11:30 Discussion

11:30 – 12:15 Specialised lecture 5

12:15 – 12:30 Discussion

12:30 – 13:30 **Lunch break**

13:30 – 14:15 Specialised lecture 6

14:15 – 14:30 Discussion

14:30 – 15:15 Specialised lecture 7

15:15 – 15:30 Discussion

15:30 – 16:00 **Coffee**

16:00 – 16:45 Specialised lecture 8

16:45 – 17:00 Discussion

17:00 – 17:30 Course evaluation, distribution of certificates and course closure

Invited Course Instructors
(in alphabetical order)

AGATA WOJTAL is a Professor at the Department of Karol Starmach Department of Freshwater Biology, Institute of Nature Conservation, Polish Academy of Sciences (PAS), Krakow, Poland. Before coming to the Institute in 2014, she worked at the Institute of Botany, PAS in Krakow, Poland. Her research is focused on the taxonomy, ecology and biogeography of diatoms. She focuses on understanding how environmental parameters affect the structure and functioning of diatom assemblages. Dr. Wojtal is interested in oligotrophic habitats and taxa that are highly sensitive to environmental variability and provide information about changes at the regional and global scale. Spring water diatoms were in her interest until recently. Her results from diatom analysis in natural and human-altered springs from geologically diverse area of southern Poland were published in 2013 in Bibliotheca Diatomologica.

The unique high-mountain water bodies have attracted her attention. Several diatoms are closely related with these conditions and possess high indicative potential. Unfortunately, the autecology of many diatoms is still understudied. She did some work on the influence of high-mountain oligotrophic habitats on diatoms in Poland and Bulgaria, based on fossil and recent materials. As a result some data about their autecology and biodiversity in the past and present are provided. In addition, the current quantitative changes among the taxa that are scattered and those whose occurrence is limited to the oligotrophic alpine habitats are discussed.

AHMET ULUDAG is a Professor on weed science at the Faculty of Agriculture of Canakkale Onsekiz Mart University and Faculty of Agriculture and Nature Sciences of Duzce University in Turkey. He reads lectures and conducts research on different aspects of weed science and plant protection. He has been involved in the IAS science for over a decade. His work on IAS is not only limited to research and field studies but also to policy related issues. He has worked as project manager on IAS at the European Environment Agency and contributed to the IAS activities in the context of preparation of IAS legislation at EU level. Currently he is giving lectures also on IAS policy and networking. He is among the leading people who has established and maintained the functioning of the ESENIAS network so far. He is a leader of ESENIAS-TOOLS WG10 on networking and dissemination of project results. He is also a member of several other IAS related international and national organisations.

Prof. Uludag will share his experience on IAS strategy (prevention, early detection and control), international and regional policies, projects and information systems. Furthermore, he will focus on EU Regulation on IAS and works of international organisations.

ALAIN ROQUES (D.SC., PH.D.) is Research Director at the French National Institute for Agricultural Research (INRA), and he is leading the Forest Zoology Research Unit of Orléans since 2004. He has 31 years of experience in the biology, ecology and behavior of forest insects. During the last ten years, his research activity focused on biological invasions and the effect of global warming on the populations of terrestrial invertebrates. He has participated in most of the recent EU-funded projects dealing with biological invasions. He coordinated the inventory of alien terrestrial invertebrates in Europe realised in the DAISIE project. Dr. Roques was the main editor of the book '*Alien terrestrial arthropods of Europe*', published in 2010, which provided the first comprehensive review of the fauna of alien terrestrial arthropods that colonised the European continent and its associated islands. The book summarises the present knowledge of the arthropod invasion process from temporal trends

and biogeographic patterns to pathways and vectors, invaded habitats, and ecological and economic impacts. He was also the editor of another recent book devoted to the relationships between climate change and insects: "*Processionary moths and Climate Change: an update*". He published 167 peer-reviewed papers, 25 books and book chapters, and presented 93 communications at international conferences.

Dr. Roques will present recent progresses in the analysis of the invasion patterns of introduced alien species in relation to globalisation. The building of a novel, worldwide database of ca. 46,000 first records of 17,000 established alien species from all animal and plant taxa allowed to study the temporal dynamics of alien species accumulations across regions and taxa, showing that there is no sign of saturation for the establishment of new alien species in most groups. The analysis of long-term changes in rates of species spread, following establishment, also revealed that, in insects at least, the species detected in Europe after 1990 spread roughly 3-4 times faster than the ones that arrived earlier. The relationships between this faster spread and the political changes in Europe following the collapse of the Iron Curtain and the further dismantling of customs checkpoints within an enlarged, free-trading European Union will be discussed. The interactions between climate change and invasions will also be considered using specific case studies such as the pine processionary moth and the colonisation by alien insects of tropical/subtropical trees planted in Europe.

DAVID C. FINGER is an Asst. Professor at Reykjavik University, Reykjavik, Iceland. He reads lectures on Environmental modelling, Environmental Engineering and Environmental Impact Assessments. His main areas of research focus on preserving water resources and freshwater ecosystems and increasing the resilience of mountain ecosystems. He has participated in numerous research projects focusing on mountain areas, including EU FP7 project ACQWA, Swiss research project Brienzersee, NRP MontanAqua project, SNF fellowship at UC Davis and the ongoing ISAVIA project. David is a MC member of the COST Actions ES1306, ES1104, ES1303 and ES1404; he has authored over 70 scientific publications and international conference contributions and is currently guest editor at the Land Development and Degradation journal. More information is available here: https://fingerd.jimdo.com/

Increasing anthropogenic pressure and changing climatic conditions are affecting vital freshwater systems across Europe. Enhanced input of nutrients due to overfertilisation can lead to eutrophication, climate changes can enhance conditions for new species, pollution can endanger aquatic life and imported species can change the complex interaction within the ecosystem. Numerical modelling of aquatic ecosystems can provide valuable insights into the dynamic functioning of complex freshwater ecosystems, revealing the main threads to proper functioning of the systems. In this lecture numerical modelling approaches will be discussed and case studies from Europe and North America will be presented. The lecture will conclude with an outlook on how data from ESENIAS-TOOLS project could be used with modelling studies to assess and predict anthropogenic and climatic impacts on freshwater ecosystems.

DAVID WILLIAMS is a Diatom systematist-taxonomist at the Department of Life Sciences - Division: LS Algae, Fungi and Plants Division, Natural History Museum - London, U.K. His research is divided more or less equally between empirical studies on the systematics and biogeography of diatoms (especially ancient lakes and circum-Pacific distributions) and theoretical studies related to advances in cladistic (systematic) theory. His main interests are diatom phylogeny, systematics and biogeography. During the last decade or so Dr. Williams has concentrated his efforts on the role fossils have in determining the evolutionary relationships in diatoms. Publications: 184 papers, 9 books; Abstracts, Reviews, Obituaries, Letters, Popular articles, etc.: 89 items.

INGI RUNAR JONSSON is a senior fish biologist at the Icelandic Marine and Freshwater Research Institute. He has been working at the institute since 1994. His main research has been on salmonids (Atlantic salmon, Arctic charr and brown trout), including assessment on stock size, exploitation, ecology, migration pattern and life-history. He has been taking part in research projects on invertebrates and diatoms. Participant in the ESENIAS-TOOLS project.

His talk will give an overview mainly on invasive freshwater species in Iceland. He will focus mainly on fish, but also the existence of the diatom *Didymosphenia geminata.* The subject will be discussed in context with the angling fisheries in freshwater in Iceland. Also the importance of risk assessment guidelines or management plans to guide the experts.

JÓN S. ÓLAFSSON is the leader of the limnology group at the Institute of Freshwater Fisheries, Reykjavík, Iceland. His talk will give an overview with theoretical background on the effect of invasive alien species have on native freshwater ecosystems. In most of the talk he will be focusing on Arctic and sub-arctic regions and discuss some foreseeable threats of alien taxa on freshwater ecosystems of these northern regions during climate changes. He will be using case studies from Iceland and elsewhere in the northern hemisphere.

NADJA OGNJANOVA-RUMENOVA is a Professor at the Geological Institute, Bulgarian Academy of Sciences, currently employed also at the Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Sciences. She is a diatom expert, who works on several fields of algology. She is taxonomist, paleolomnologist but she works in the diatom based water monitoring system in Bulgaria.

Prof. Ognjanova will talk on the stalked diatom *Didymosphenia geminata* (Didymo) - a freshwater diatom which has historically been found in cool, oligotrophic waters of Northern Europe and Northern North America. Since the mid-1980s, this diatom has been observed increasingly in new areas, e.g. New Zealand, Iceland and at high elevation in Alpine areas. Recently, the species has also been recorded in high-mountain areas in Southern Europe. The diatom data for Rila Mountains, Bulgaria, including both fossil and recent records, provide some evidence for the distribution of *D. geminata.* These data provide also a basis to define more accurately the habitat preference of this species. Although Didymo does not present a significant human health risk it can form massive blooms and may have negative impacts on stream habitats, hampering fishery and degrading the recreational value of streams.

RUMEN TOMOV is a Professor at the University of Forestry, Sofia, and the Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Sciences. He reads lectures on Integrated Pest Management, Biocontrol, Phytosanitary Control and Biological Invasions. His main areas of research are Applied Entomology – Bioecology and Control of IAS and Crop Pests. He is a participant in 14 projects on IAS, including EU projects CONTROCAM, DAISIE, ALARM, SEE-ERA.NE, SCOPES program of the Swiss Government and three IAS COST Actions FP1002, TD1209, Action FP1401. He participates in the Invasive Alien Species Working Group 2 – Early Warning and Rapid Response and the Scientific Forum on Invasive Alien Species at the European Commission. Prof. Tomov is a co-founder of ESENIAS and DIAS networks and a national representative of ESENIAS in Bulgaria. He is a sub-coordinator of ESENIAS-TOOLS project and leader of WG5 on Data collection, analysis, standardisation and harmonisation on alien terrestrial invertebrate species. He is an author of 86 scientific publications, including the book '*Non-indigenous insects and their threat to biodiversity and economy in Albania, Bulgaria and Republic of Macedonia*' (2013).

Prof. Tomov will present some fundamental issues and most recent developments in Invasion Biology, focusing on environmental, economic and social impact, risk assessment, pathways of IAS introduction, as well as human factor and climate change as drivers of biological invasions.

SVETLA BRATANOVA-DONCHEVA works at the Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Sciences. Her main areas of research are: ecosystem research, functional ecology, forest ecosystem functioning, resilience and adaptation of ecosystems, and ecosystem services. She is an active participant in numerous research projects, such as ENVEurope, SENSFOR, Eurocoppice, and ESMERALDA, as well as a project manager for IBER-BAS and scientific coordinator of MetEcoSMap Project, funded by FM of EEA, focusing on the methodology of mapping and assessment of ecosystem services. Dr. Bratanova-Doncheva is a member of MAES Working group at the European Commission. She is also the Bulgarian representative in the ILTER network and National Coordinator of LTER-Bg. Author of more than 80 publications in national and international journal and conference contributions.

Dr. Bratanova-Doncheva will present on Ecosystem services assessment and mapping – development and application of the Bulgarian methodology, and relation to IAS.

ZLATKO LEVKOV is a Professor at the Institute of Biology, Faculty of Natural Sciences in Skopje, Republic of Macedonia. His research is focused on diatomology, including taxonomy, phylogeny, biogeography, ecology, palaeoecology and forensic. In the last ten years the main focus is given to diatoms of Lake Ohrid, especially their diversity and taxonomy. The deep drilling project in Lake Ohrid allowed deeper research in palaeoecology, biostratigraphy and evolution of the diatoms. Additionally, the diatom research of Dr. Levkov comprises taxonomic analyses of several pennate diatom genera from all continents, such as *Amphora, Rhoicosphenia* and *Luticola*. However, most of the taxonomic research is orientated on water bodies from Macedonia, with special attention to high-mountain habitats (glacial lakes, bogs, ferns).

His presentation will contain data from 20-year research on diatoms from Lake Ohrid. The lake is known as centre for biodiversity with high degree of endemism, but still there are many open biological questions about the origin and speciation of diatoms. What are the main factors influencing the speciation and what is the resistance and resilience of the lake. One of the points will be the question why some relict diatom species are still living in the lake and what factors allow their long existence in the lake.