AquaVIP Klaipėda

Innovative Aquaculture Summer School

28 June – 2 July, 2021

OVERVIEW: LECTURERS & PRESENTATION TOPICS

Andrius Sutnikas
Project Manager at Klaipėda Science and Technology Park/ Lithuania (AquaVIP project leader)

KSTP provides services and is involved in many activities related to the scope of blue and green technologies. For more than 10 years Andrius gained and shared his experience in various international projects, bringing together critical mass of businesses, experts and academic institutions, boosting cooperation in development of innovative technology solutions, establishing clusters and competence centers.

Topic of presentation: AquaVIP project tasks and activities: career in aquaculture sector

There is a growing demand for a skilled personnel and high-quality competences in blue bioeconomy sector and not only across the Baltic Sea region, but Europe and worldwide. Aquaculture is one of the fastest developing sector of bioeconomy. In order to develop innovative aquaculture sector and move the focus into the South Baltic region, competencies and knowledge are crucial. This is where AquaVIP has a field for action. AquaVIP project objective is to boost aquaculture labour market within the South Baltic area by fostering human resources capacity: students and companies along the aquaculture value chain through cross-border training and networking, which will result in an increased number of skilled professionals and future employees in the blue economy sector.

Agnė Vaitkevičienė
Vice-president and Executive Director at Lithuanian Biotechnology Association, Chief Operating Officer at Cureline Baltic/ Lithuania

Agne Vaitkeviciene holds a BS in molecular biology (Vilnius University, Lithuania) and MS in organ, tissue and cell donation (University of Barcelona, Spain). Since 2006 she has been working in the field of cell therapy. In 2013 Agne Vaitkeviciene co-founded a life science startup company and managed its activities in the field of advanced therapy medicinal product research and manufacturing as CEO until 2019. Since 2019 she is actively involved as an expert in EU programs, such as IMI2, EIT Health Innostars and consults biotechnology companies in life science product development management. Agne is a board member at Vilnius University Life Science Center and Center of Innovative Medicine.

Topic of presentation: Perspectives and challenges of bioeconomy sector development

Aquaculture, fishery, use of wastes and biomass, blue biotechnology, all are very specific but fast growing sectors of blue bioeconomy. European Union pays particular attention to bioeconomy as part of a sustainable development strategy, implementation of innovations and formation of smart specialization of regions. Bioeconomy offers a unique opportunity to address complex inter-connected challenges while achieving economic growth. What challenges do we face to create and implement new technological solutions? We will focus on the role of biotechnology in the scope of bioeconomy and the impact it could bring to the green journey of Europe.

Dr. Konrad Ocelewicz
Proffesor at Division of Marine Biology and Ecology, University of Gdansk/ Poland

Dr. Konrad Ocalewicz received his M.Sc. in the field of biotechnology in animal breeding from University of Agriculture and Technology in Olsztyn in 1998 and his PhD in agriculture and fisheries from University of Warmia and Mazury in 2002. Results of his research on the spontaneous and induced chromosome mutations in the rainbow trout were part of his D.Sc. dissertation defended at the Department of Biology and Biotechnology, University of Warmia and Mazury in Olsztyn in 2011. Since 2013, Konrad Ocalewicz has been an assistant professor at the Department of Marine Biology and Ecology, Institute of Oceanography, University of Gdańsk. His scientific interests cover a range of issues such as aquaculture, sex determination and differentiation in fish, development of the isogenic and clonal fish lines, production of sterile triploid and all-female stocks of salmonids, dynamics of teloemric DNA and telomerase in fish cells, among others. Konrad Ocelewicz will give for summer school participants two interesting presentations.

Topic of presentation: Aquaculture state of play in the Baltic Sea Region

Looking at the demand for seafood consumption in Europe, together with considering economy risks showed by the pandemic situation, aquaculture pollution, exploitation of the living resources, climate-change, quality of food from, wild stocks vs. farmed stocks, fish welfare, the sector needs sustainable solutions that which are already present or can be applied within the Baltic Sea Region. Innovative aquaculture encompasses many different production methods and target organisms. The presentation will illustrate the state of play and trends of new solutions present in the region of the Baltic Sea: open cages, IMTA, RAS systems, aquaponics, and algae cultivation farms, and to familiarize stakeholders with the current situation and future potential.

Topic of presentation: Biotechnology in finfish aquaculture

Biotechnology using biological systems to provide organisms showing new characteristics. In the aquaculture, biotechnology have been applied to provide fish with modified features that are safe for costumers and the environment. Reproductive biotechnologies including androgenesis, gynogenesis and triploidization have been induced in many farm fishes, and successfully introduced to aquaculture, conservation/restoration of the natural fish stocks and biomedicine research. Application of completely homozygous androgenetic and gynogenetic doubled haploid (DH) fish improves de novo assembly of the genomes sequenced using next-generation sequencing approach. DHs are used in the selective breeding programs and development of all-female or all-male fish stocks.

Dr. Adrian A. Bischoff-Lang
Senior Scientist at the Professorship Aquaculture and Sea-Ranching, University of Rostock/ Germany

Dr. Adrian A. Bischoff-Lang is an experienced scientist and project manager of national and international research projects. The scientific background is in Aquaculture and Fisheries Biology, Zoology and Marine Chemistry (PhD in Fisheries Biology), strongly engaged in the educational sector at the University of Rostock as well as a member of the HELCOM CG Aquaculture. His scientific interests are diverse ranging from the nutrient budgets of aquaculture production, to the integration of nutrient extracting organisms (e.g. worms) into the aquaculture process, the culture of pikeperch larvae with live feed, but also the transfer of these research into the aquaculture production.

Topic of presentation: RAS technology state-of-art and further development

Recirculating aquaculture system (RAS) is one of the fastest developing technologies of aquaculture sector, which is considered as the future of sustainable seafood production. RAS provides opportunities to reduce water usage and to improve waste management and nutrient recycling. RAS makes intensive fish production compatible with environmental sustainability. The presentation by Adrian Bischoff-Lang will overview the basics of the technology including principles and set-up of RAS, mechanical filtration, biological filtration, system control and regulation, disinfection, water conditioning, nutrients within RAS, animal health and other issues. Also, basic development directions and innovations will be presented.

Topic of presentation: IMTA. Aquaponics with African catfish

Aquaponics is on of integrated multi-trophic aquaculture (IMTA) technologies and refers to systems combining conventional aquaculture, breeding, fish, crayfish or shrimps in tanks with hydroponics, growing plants in water. The aquaponic system, feeds water from the aquaculture system to the hydroponic system, where the by-products are broken down by nitrifying bacteria into nitrites and then into nitrates, which are absorbed by plants as nutrients. The water is then recirculated back to the hydroponic system. Aquaponic production at Rostock University, combines African catfish breeding with plants breeding. Since aquaponics is considered as one of the most promising innovative and sustainable food production technology the advanced research at Rostock University has a huge potential for the aquaculture and agriculture sectors.

Laura Ballesteros Redondo
PhD student and Researcher at the Professorship Aquaculture and Sea-Ranching, University of Rostock/ Germany

Laura is a biologist from Spain who has performed her Bachelor in Biology at Oviedo University (Spain) and Master in "Marine and Lacustrine Science and Management" at Ghent University (Belgium). Her professional experience goes from the study of meiobenthos and macrobenthos in the Antarctica and North Sea until the study of Appendicularia from the Bay of Biscay and its culture with microalgae under artificial conditions. Since 2 years, she is working as PhD student at Rostock University doing her thesis in the feeding protocol for pikeperch larvae using phytoplankton and zooplankton in order to increase the efficiency of the process.

Topic of presentation: Larviculture. Case of pikeperch larvae production

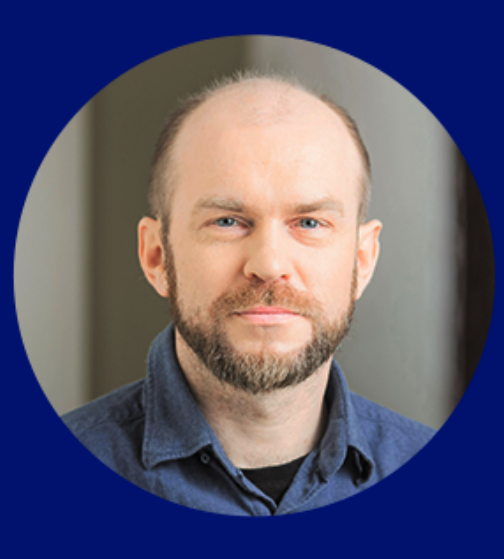
Larviculture presentation will have a general introduction including definition, importance and the main bottlenecks related to fish aquaculture and in particular to the fish larvae such as larval quality, size, deformations, cannibalism and swimmbladder inflation. Live feed will be presented as one of the best solutions for the improvement of larvae culture and the efficiency of fish production. The presentation will deal also with the most used live feed organisms such as Artemia spp., rotifers and a zooplankton group with a highly increasing interest, the copepods. Finally, a description of the feeding protocol for pikeperch larvae and the last improvements will be presented.

Xaver Neitemeier-Duventester
PhD student and Researcher at the Professorship Aquaculture and Sea-Ranching, University of Rostock/ Germany

Xaver Neitemeier-Duventester is a PHD student at the Department Aquaculture and Sea-Ranching at the University of Rostock, working mainly on the taxonomy of fish parasites. His doctoral thesis is on the parasite fauna of Elasmobranchii from Indonesian waters. As a former employee in the EMFF project „Hygiene management and health concept for surface water-dependent partial circulation systems in Mecklenburg-Western Pomerania“ he has been working on fish parasites at aquaculture sites in Mecklenburg-Western Pomerania. His main research interests are Trypanorhyncha and the use of the Confocal Laser Scanning Microscope (CLSM) in taxonomic work with fish parasites. Besides a research trip to the White Sea (Russia) and a research stay in Indonesia, he has also participated in international conferences.

Topic of presentation: Disease and parasites in aquaculture

Diseases and parasites have a major impact on aquaculture production. They can cause a lot of damage to commercial facilities, therefore knowledge about parasites and other pathogens is essential for the operation of aquaculture facilities. Besides viruses, bacteria, protozoa and fungi, fish parasites such as nematodes and crustaceans play an important role. The identification and differentiation of the various pathogens is the first step in combating diseases. If the pathogen is known, management interventions can be taken to ensure the health of the fish and minimize the economic consequences. Through morphological work, the diagnosis of most parasite species is possible.



Dr. Nerijus Nika
Researcher, the Head of Fishery and Aquaculture Laboratory of Marine Research Institute, Klaipėda University/ Lithuania

Dr. Nerijus Nika is an expert in fish biology, fishery management and conservation. His recent involvement is mostly related to aquaculture and blue bioeconomy sector development. Expert has an experience in national and international research projects, related to aquatic ecology, fish biology and aquaculture, stock assessment, fishery management and blue biotechnology application (11 projects). The expertise and the field of interests include marine recirculating aquaculture technology, animal biology and physiology research and application in aquaculture technology optimisation.

Topic of presentation: Probiotics in aquaculture

In large-scale production facilities, where aquatic animals are exposed to stressful conditions, problems related to diseases and deterioration of environmental conditions often occur. One of the potential solutions for the above mentioned problems are probiotics. Application of benefficial microorganisms is one of innovative means to improve and regenerate water quality and stabilize the microflora of the gastrointestinal tract of fish, improving nutrition efficiency and health status. There will be shortly presented the rationale of probiotic application, methodologies and benefits. Results of new probiotic product developed by Baltic Probiotics will be presented as example for practical application issues.

Topic of presentation: RAS technology for whiteleg shrimp

Klaipeda Science and Technology Park together with Klaipeda University launched first in Lithuania RAS for whiteleg shrimp production. The shrimp RAS is a saltwater system of ca. 38 m3 total water volume, with eight growing tanks for 100 to 200 kg of production per cycle. The goal is to acquire shrimp cultivation knowledge and to optimize growth technology for local conditions. It is believed, that successful prototype will open new business opportunities and models for innovative and energy smart aquaculture in the region. Nerijus Nika will present the design and operation of the technology, results of several experimental growing cycles, optimisation and development of the technology.

Christophe Legrand
CEO of Local Ocean (UAB Investara)/ Lithuania

Christophe is the CEO of Local Ocean, an indoor shrimp farming technology company . He is an international business man with 20 years experience working in London and Paris. He has worked in the digital and software industries prior to converting into Agtech a couple years ago.

Topic of presentation: Bio-floc technology for shrimp cultivation

Local Ocean has been running since 2017 and has now 12 employees working towards building a scalable, automated and predictive method to grow shrimps indoor by using biofloc technology. Local Ocean already sells its shrimps to the Lithuanian market and is getting ready to expand with the construction of a new 3500m2 pilot farm. Christophe will talk about the states of shrimp farming today, the ecological challenges and its technological advancements to create a sustainable shrimp farming industry in Europe.

Dr. Victor Chepurnov
Managing Director, Technology and Product developer at Tomalgae CVBA/ Belgium

Victor Chepurnov is PhD in algae biology. He has long (over 25 years) scientific work in publicly funded scientific research on microalgae, specialising in diatoms, their systematics, biology, reproduction. Since 2007 - constantly involved in various privately funded projects associated with microalgae, mainly R&D and large-scale production, performance of commercial trials at hatcheries and experimental facilities of large companies in Thailand, India, China, Indonesia and South Korea. Currently Victor is co-founder, Managing Director, Technology and Product developer at Belgian company Tomalgae CVBA; with principal focus to aquaculture. Invented and developed a series of commercialized microalgae-based products for aquaculture.

Topic of presentation: Phototrophic microalgal technologies: myths and realities

The presentation on "Phototrophic microalgal technologies: myths and realities“ sends to participants a warning message – "don't count your algae until you actually have them" (Dr. John Benemann, 2010)". Victor Chepurnov will present his long scientific and practical experience-based overview of microalgae cultivation technologies, its advantages and disatvantages, what needs for susccesful microalgae cultivation technology?

Prof. Jeronimo Chirivella Martorell
Proffesor at Valencia Catholic University Saint Vincent Martyr/ Spain

Prof. Chirivella, PhD in Biology, boasts over 10-year experience in fish farming. Currently he is an Associate Professor at Catholic University of Valencia (UCV), teaching courses like "Aquaculture" and "Aquatic Animal Health" at BSc in Marine Sciences and BSc in Veterinary Medicine, and also "Biotechnology of Microalgae and other Aquatic Microorganisms" at MSc in Applied Blue Biotechnology, where he is the MSc Coordinator. His interest in researching is focus to Microalgae Biomass production and applications.

Topic of presentation: Blue Biotechnology pipeline – from discovery to application

Development of natural products (NPs) into lead compounds requires sustainable supply. Marine biotechnology can significantly contribute to the production of new NPs at various levels of the process chain including discovery, production, downstream processing, and lead development. Microalgae biomass production and the use of marine fishing waste are just two examples to illustrate how to generate value-adding natural products that have various applications ranging from food over chemical to pharmaceutical applications.

Gintautas Narvilas
Researcher at Fishery and Aquaculture Laboratory of Marine Research Institute, Klaipėda University/Lithuania

Gintautas is an aquaculture specialist. He has been working with different species (European eel, pikeperch, perch, rainbow trout, arctic charr, carp, Nile tilapia and whiteleg shrimp) in RAS more than 9 years at private companies, State Fisheries Service and now at Klaipeda University. His professional interests are aquaculture technologies, fish and shrimp farming, fish reproduction, biosecurity, small scale experimental and commercial RAS systems. Beside scientific experiments and technology developement, he is consulting aquaculture companies, conducts practical training for employees.

Topic of presentation: Practical training on standard RAS and aquaponics technology for fish and shrimp farming at KU facilities

Participants will be introduced to KU aquaculture experimental facilities – shrimp RAS at KU Business Incubator; RAS and aquaponics technology (with rainbow trout and Nile tilapia) at Fishery and Aquaculture Laboratory in Kopgalis. Practical demonstration and training exercises will be given by Gintautas Narvilas including daily system maintenance, water quality monitoring, biosecurity, fish evaluation, handling, feeding, and other topics relevant to the participants.

More information & registration: **www.aquavip.edu.pl**

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