

FITFISH ANNUAL CONFERENCE

22nd April 2016
Hotel Palace
Belgrade, Serbia



UNIVERSITY OF BELGRADE
INSTITUTE FOR
MULTIDISCIPLINARY RESEARCH

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Drage kolege,
ovim putem Vas pozdravljamo i želimo dobrodošlicu na godišnju konferenciju "Plivanje riba i implikacije za migraciju i akvakulturu (FITFISH)" u okviru COST Akcije FA1304. Tri glavne teme koje su povezane sa ciljevima FITFISH Akcije i koje će biti predstavljene na godišnjoj konferenciji su: funkcionalni mehanizmi odgovorni za korisne efekte plivanja, migracije riba i vežbe u akvakulturi. Godišnja konferencija će dati sintezu napretka postignutog u saznanjima iz oblasti efekata vežbi na rast i dobro stanje riba, kao i implementaciju tog znanja u akvakulturi, za praćenje riba, za biološka rešenja u optimizaciji migracije riba i modeliranju efekata na populacije.

Nadamo se da će konferencija obezbediti stimulativnu sredinu za mnoge interesantne diskusije.

Mirjana Lenhardt (Lokalni organizator)
Josep Planas (Potpredsednik FITFISH Akcije)
Arjan Palstra (Predsednik FITFISH Akcije)

Dear Colleagues,

We would like to welcome you to the Annual conference of COST Action FA1304 "Swimming of fish and implications for migration and aquaculture (FITFISH)". Three main topics connected to the goals of the FITFISH Action will be presented at the Annual Conference: *Functional mechanisms behind the beneficial effects of swimming, Fish Migration and Exercise in aquaculture*. The Annual Conference will provide a synthesis of the progress made in gaining knowledge about exercise effects on the growth and welfare of fish, as well as the implementation of this knowledge in aquaculture, and in tracking fish, biological solutions to optimise migration and modelling of effects on populations.

We hope that the conference will provide a stimulating environment for many interesting discussions.

Mirjana Lenhardt (Local organiser)
Josep Planas (FITFISH Action Vice Chair)
Arjan Palstra (FITFISH Action Chair)



Annual conference of FITFISH project will be held at the Palace Hotel

The Palace Hotel Beograd is located in the very heart of Belgrade, in close vicinity to the main pedestrian zone of Knez Mihailova Street and conveniently located in a quiet part of town near the historical and cultural attractions, city and state institutions, museums, theatres, cinemas, numerous shopping centres and Skadarlija – the old Bohemian quarter.

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<http://www.palacehotel.co.rs/en/>

FRIDAY, APRIL 22, 2016

Room: The conference room on the top floor of the *Palace* hotel

ORAL PRESENTATIONS

- 8.30 **Registration of attendance**
- 9.00 **Stress axis regulation and its role in exercise-enhanced growth**
Marcel Schaaf (Institute of Biology, Leiden University, the Netherlands)
- 9.30 **Orientation and navigation of the European eel using the Earth's magnetic field**
Caroline Durif (Institute of Marine Research, Norway)
- 10.00 **Optimal fins and flows underpin reef fish swimming efficiency**
Chris Fulton (The Australian National University, Canberra, Australia)
- 10.30 **Coffee-break**
- 11.00 **Exercising Atlantic salmon in fluctuating water current: Consequences for performance in aquaculture production**
Øyvind Øverli (Faculty of Veterinary Medicine and Biosciences, Oslo, Norway)
- 11.30 **Electronic tracking advances reveal migratory movements of sturgeon in Sacramento/San Joaquin watershed**
Pete Klimley (University of California, USA)
- 12.00 **Lunch break**
- 13.30 **COST Action FA1304 FITFISH, WG1 - Functional mechanisms behind the beneficial effects of swimming**
Paolo Domenici (CNR-IAMC, Italy)
- 13.50 **COST Action FA1304 FITFISH, WG 2 - Fish migration: Status and progress**
Leo Nagelkerke (Wageningen University, The Netherlands)
- 14.10 **COST Action FA1304 FITFISH, WG3 - Exercise in Aquaculture**
Helgi Thorarensen (Holar University College, Iceland)
- 14.30 **COST Action FA1304 FITFISH, WG4 - Transfer of knowledge to end users**
Simon MacKenzie (University of Stirling, United Kingdom)
- 14.50 **COST Action FA1304 FITFISH, WG5 - Training of early stage researchers: Status and progress**
Mirjana Lenhardt (Institute for Multidisciplinary Research, University of Belgrade, Serbia)

- 15.10 **Coffee-break**
- 15.45 **Effect of short-term regulated temperature variations on the swimming economy of Atlantic salmon**
Carlos Manuel Alexandre (Universidade de Évora, Portugal)
- 16.00 **Assessing the influence of individual variation in coping styles on swimming performance in zebrafish (*Danio rerio*)**
Sonia Rey Planellas (University of Stirling, United Kingdom)
- 16.15 **DIDSON training course**
Beata Schmidt (National Marine Fisheries Research Institute, Gdynia, Poland)
- 16.30 **Application of high tech sonar techniques for the monitoring of fish migrations in the Danube River (Serbia)**
Marija Smederevac-Lalić (Institute for Multidisciplinary Research, University of Belgrade, Serbia)
- 16.45 **Swimming exercise to control early maturation in male sea bass (*Dicentrarchus labrax*)**
Marco Graziano (University of Barcelona, Spain)
- 17.00 **Posters and drinks**

FRIDAY, APRIL 22, 2016

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POSTERS

- P1** **Movements and home ranges of *Capoeta angorae* in River Ceyhan, Turkey**
Ahmet Alp (Department of Fisheries, Faculty of Agriculture, University of Kahramanmaraş, Turkey)
- P2** **Simulated migration of feminised eels to stimulate and predict the sexual maturation response**
Thijs Bohm (Animal Breeding and Genomics Centre, Wageningen, the Netherlands)
- P3** **Restoration of fish migration on the Danube focusing on the main migration barrier - the Iron Gates hydropower dams between Romania and Serbia**
Mirjana Lenhardt (Institute for Multidisciplinary Research, University of Belgrade, Serbia)
- P4** **Danube sterlet morphometrics and genetic - guidelines for restocking programs**
Gorčin Cvijanović (Institute for Multidisciplinary Research, University of Belgrade, Serbia)
- P5** **Swimming at low ammonia levels: improved growth and performance?**
Gudrun De Boeck (Department of Biology, University of Antwerp, Belgium)
- P6** **Application of an underwater positioning system for long-term observation of fish behaviour and habitat use**
Riha Milan (Biology Centre, Institute of Hydrobiology, Ceske Budejovice, Czech Republic)
- P7** **The marine migration and swimming depth of sea trout (*Salmo trutta* L.) in South-Icelandic coastal waters**
Johannes Sturlaugsson (Laxfiskar, Fornubudir, Hafnarfjordur, Iceland)
- P8** **The story of Eurasian shads (*Alosa* sp.): genomics, morphometrics, life history and adaptation**
Katarina Tošić (Faculty of Biology, University of Belgrade, Serbia)

**DANUBE STERLET MORPHOMETRICS AND GENETIC – GUIDELINES
FOR RESTOCKING PROGRAMS**

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Despite sterlet (*Acipenser ruthenus* L.) being a less important resource regarding caviar production, their populations have experienced a decline during the 20th century throughout its range, mainly due to poorly regulated fishery, pollution, habitat fragmentation and habitat loss. Stocking programs are implemented throughout Danube River basin, with Upper Danube populations being dependent on continuous stocking efforts, while commercial exploitation of wild stocks in the Middle and Lower Danube has to be compensated with stocking of larvae, fingerlings and juveniles. Selection of proper specimens for stocking programs should be carefully conducted, since it can lead to deleterious impact, such as reduction of effective population size, inbreeding and outbreeding depression, and loss of locally adapted alleles. Therefore, natural populations should be examined genetically both before and after release of hatchery-reared juveniles. Our research on Middle and Lower Danube sterlet, suggests that genetic variability should be attributed almost entirely to individual variability, with a weak population structure and no clear evidence of a bottleneck and inbreeding within populations. Also, specimens used for the supportive stocking in the Tisza River in Hungary originated from the Danube River, so the information about gene flow between these rivers should be carefully considered. Additionally, most of breeding programs are focused on genetic diversity and do not acknowledge complexities of wild populations fitness architecture. Although Middle and Lower Danube dams are recent, in regard to sterlet population time, they create more lentic conditions that do not suit sterlet rheophilous nature. Both our previous and current morphometric research suggests that hatchery-reared sterlet specimens are not necessarily suited for stocking of certain Danube River sections. Lower Danube section have a different water flow regime and suspended sediment discharge than those in Middle Danube and in Lower Tisza River, so the sterlet specimens are differently adapted to their environment, which is in concordance with our findings. We suggest that both shape analysis and genetic analysis should be applied in restocking programs.