



Fakulta rybnářství  
a ochrany vod  
Faculty of Fisheries  
and Protection  
of Waters

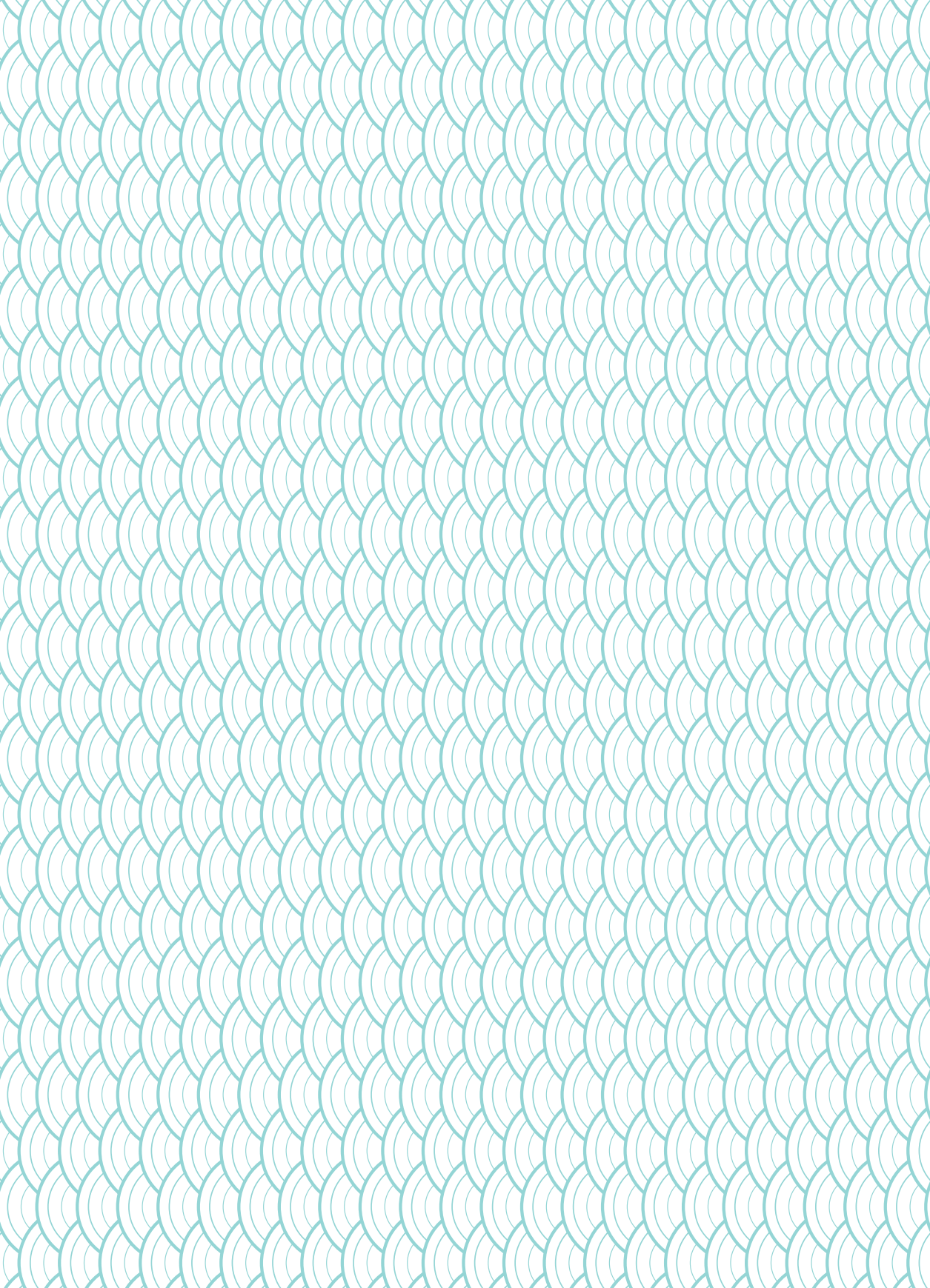
Jihočeská univerzita  
v Českých Budějovicích  
University of South Bohemia  
in České Budějovice



# Biennial report

## 2012–2013

Vodňany, Czech Republic; 2014





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## Biennial report 2012–2013

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## INTRODUCTION BY THE DEAN OF THE FFPW USB

For the fifth time already, I present the traditional Biennial Report that summarizes our activities of the past two years. At the beginning, dear colleagues and students, let me quote the traditional motto we have been following since 2007: **“It is better to shoot for the stars and possibly miss than head for a dunghill and hit it safely”**.

The dream of a flourishing faculty has become reality. In Vodňany, we have been fully enjoying the modern workplaces and in České Budějovice the staff and students are already looking forward to their new faculty's facilities. Our foreign colleagues perceive us as the largest research and educational institution in the Czech Republic and in Europe focusing on fishery, aquaculture and freshwater management. The faculty disposes of corresponding powers, wide scientific expertise, unique infrastructure with modern laboratory facilities, equipment and efficient management that represent the main driving force of the research and education involving a tight relation to the application sphere of an international significance. **We strive to work independently and competently for the benefit of all and to create a high quality environment.** After all, all the changes we experienced at our young faculty reflect self confidence and faith in success supported by patience and persistence. At the beginning of 2009, there were 61 employees and 15 Ph.D. students and, by the end of 2013, there were already 140 employees, 50 Ph.D. students and 230 Master and Bachelor students.

The faculty established a modern base thanks to infrastructure projects under the EU Operational Programmes. The first new building, so-called “domeček (little house)” was opened in Vodňany in February 2012. Three other buildings connected to the South Bohemian Research Center of Aquaculture and Biodiversity of Hydrocenoses (CENAKVA) were inaugurated in September 2013, and the mill, i.e., the International Environmental Educational, Advisory and Information Center of Water Protection Vodňany (IEEAIC), was established at the end of 2013. The buildings intended for Master and Bachelor students

on the campus of the University of South Bohemia in České Budějovice and the building located at Husova street in České Budějovice designated for scientific purposes are to be completed. Both buildings will be in full service to the Institute of Aquaculture of the FFPW USB from the winter semester 2015.

In the past two years, the faculty underwent an immense transformation. The Research Institute of Fish Culture and Hydrobiology in Vodňany, with regard to its parameters, has already now participated in establishing world trends in fishery and other fields of study. It consists of modern facilities, laboratories and technologies for both students and scientists. The Institute of Aquaculture has gradually transformed from a facility ensuring schooling of Master and Bachelor students into a scientific institute which has been proven by the research focused on fish nutrition and meat quality of fish. The CENAKVA Center, which was originally perceived as an infrastructure project, has served for interdisciplinary scientific development of the faculty's institutes. At the beginning of 2012, we incorporated two new parts into the faculty structure. The first involved the Institute of Complex Systems (ICS) situated in Nové Hradky and the second was the IEEAIC in Vodňany. At the beginning of 2014, the ICS after a two-year long journey of “self-searching” narrowed down the number of employees and became a permanent part of the faculty. In addition to the Institute's own research activity, it has cooperated with European fishery organizations and it has sorted, recorded and processed experimental data for them. The IEEAIC, as an organizational unit, was built on a so-called green field and until the end of 2013, the Center was working under provisional conditions. The Center has successfully managed development projects and selection procedures. At present, it consists of a modern administrative center located in Vodňany with accommodation capacities and it focuses on international summer schools, lifelong learning, workshops, promotion and project management. Our participation in scientific outcomes of the USB proves that we are





a scientific faculty of the University. With respect to the development of the research organization (RVO), which is a system of scientific institutional funding in the Czech Republic based on productivity by publications, we produced 25% of the University research outcomes. Despite the fact that our faculty is small in size, it is highly productive. Our employees comprise more than 15% of academic workers and 60% of Ph.D. students from abroad. The faculty's average age is 39 years. With respect to knowledge transfer in practice, we have constituted more than 50% of outcomes, i.e., patents, trademarks and technologies, at the USB.

Now, I would like to proceed to the hardest part which consists in acknowledgment of the faculty team. I would like to express my thanks to all fellow employees, Ph.D. students and students for the effort they devoted to our dream. We were all forced to move out from the main building of the faculty and stay in substitute premises several

years ago. We had to manage a vast amount of professions beyond our own scientific and pedagogic obligations, which involved business, moving services, plumbing, negotiation with companies, economics, legal matters, psychology in relation to inspection authorities and during all that we had to stay sane, be in three places at once, accomplish everything preferably yesterday, look optimistic and not become addicted to alcohol. My dear colleagues, it was an extreme adrenaline rush. Thank you, we have made it!

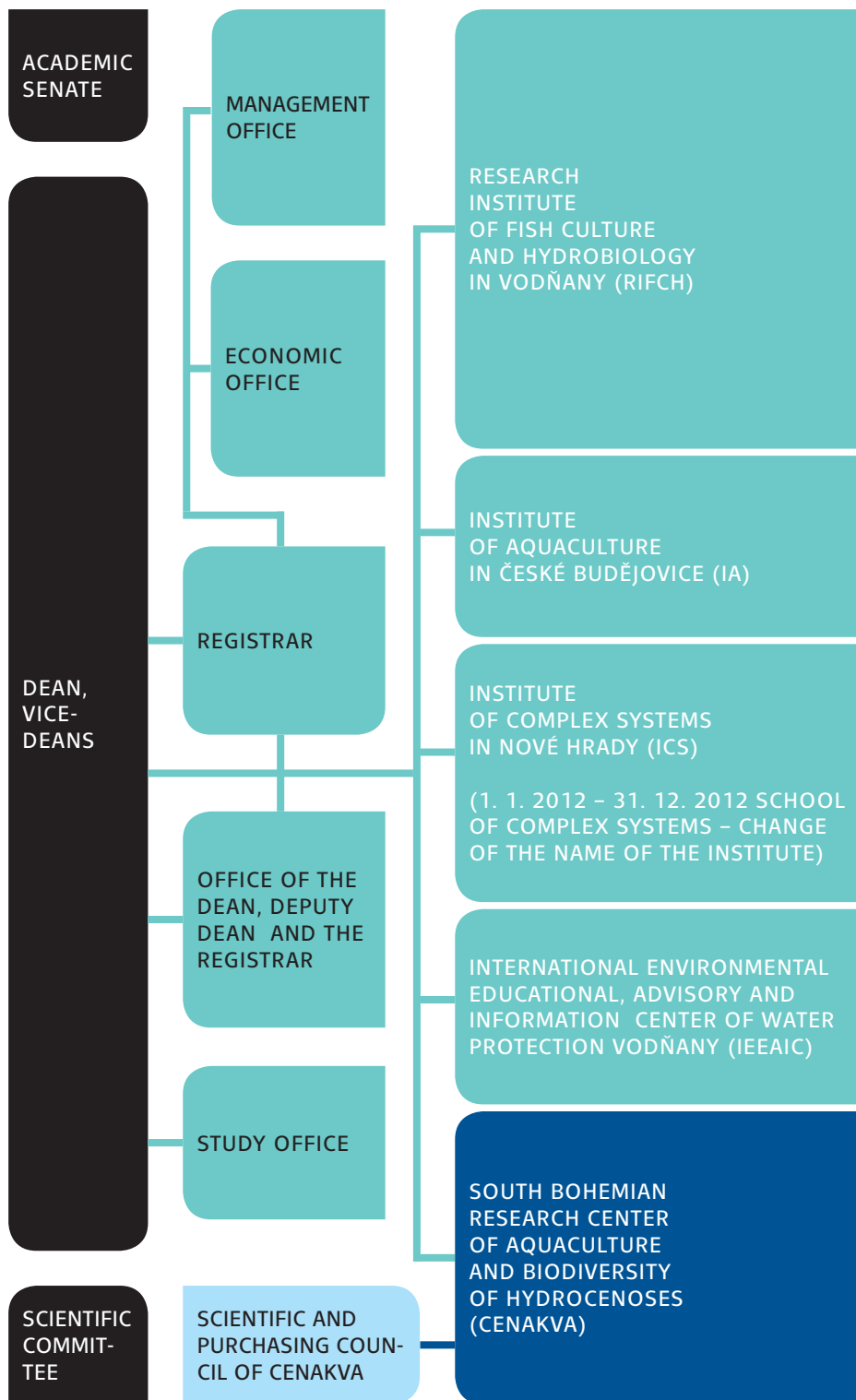
Yet, I must emphasize several names of our colleagues since new things are always invented and implemented by individuals. My thanks to my colleagues in the CENAKVA Center for the organization of scientific programmes, namely to Assoc. Professors Pavel Kozák, Tomáš Policar, Tomáš Randák and Martin Flajšhans, to Professor Dalibor Štys and Dipl.-Ings. Petr Císař and Jan Mráz. I must praise my deputy, Director of the RIFCH Assoc. Prof. Pavel Kozák, who was my right hand. However, my left hand was our former Registrar Dipl.-Ing. Vladimír Nedopil, the construction technician Michal Černický and the head of the Economic Office Dipl.-Ing. Jaromíra Nečasová. Without these persons, the buildings would have never been built in Vodňany. In addition to that, the buildings would have not existed without our managers directed by Dipl.-Ing. Michal Hojdeckr. As I have highlighted my right and left hand, I must also stress that the professional head involved in implementation of visions and ideas was and still is Dipl.-Ing. Michal Hojdeckr together with his team and the Dean's Office. Thank you!

Dear colleagues, we must not forget to express our thanks to our families for their patience they have had with us scientists and dreamers in the past period. Enjoy the simple everydayness and do not forget that you belong to the organization that is called the Faculty of Fisheries and Protection of Waters.

**Prof. Dipl.-Ing. Otomar Linhart, D.Sc.**  
Dean of the FFPW USB

# 01

## STRUCTURE OF THE FFPW USB





EXPERIMENTAL FISH CULTURE AND FACILITY

GENETIC FISHERIES CENTER

LABORATORY OF MOLECULAR, CELLULAR AND QUANTITATIVE GENETICS

LABORATORY OF REPRODUCTIVE PHYSIOLOGY

LABORATORY OF INTENSIVE AQUACULTURE

LABORATORY OF ETHOLOGY OF FISH AND CRAYFISH  
(UNTIL 31. 12. 2012 LABORATORY OF ETHOLOGY AND NUTRITION OF FISH AND CRAYFISH)

LABORATORY OF ENVIRONMENTAL CHEMISTRY AND BIOCHEMISTRY

LABORATORY OF AQUATIC TOXICOLOGY AND ICHTHYOPATHOLOGY

LABORATORY OF CONTROLLED FISH REPRODUCTION

LABORATORY OF POND AQUACULTURE

LABORATORY OF NUTRITION AND FISH QUALITY (SINCE 1. 1. 2013)

TISSUE CULTURES WORKPLACE – CERTIFIED LABORATORY

LABORATORY OF APPLIED SYSTEMS BIOLOGY

LABORATORY OF MACROMOLECULAR STRUCTURE AND DYNAMICS

LABORATORY OF LASER, MICROSCOPY, CONDENSED PHASE  
IN BIOLOGY AND MATERIAL ENGINEERING

UNIT OF LIFELONG LEARNING  
(UNTIL 25. 5. 2013 UNIT OF LIFELONG LEARNING, STI AND BUSINESS)

UNIT OF PROJECT MANAGERS  
(UNTIL 25. 5. 2013 UNIT OF PUBLIC RELATIONS AND PROJECT MANAGERS)

RESERACH PROGRAM NO. 1

RESERACH PROGRAM NO. 2

RESERACH PROGRAM NO. 3

RESERACH PROGRAM NO. 4

RESERACH PROGRAM NO. 5

RESERACH PROGRAM NO. 6

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- Registrar:** Assoc. Prof. Dipl.-Ing. Tomáš Polícar, Ph.D., USB FFPW Vodňany
- Internal members:** Prof. Dipl.-Ing. Jan Kouřil, Ph.D., USB FFPW České Budějovice  
Assoc. Prof. Dipl.-Ing. Pavel Kozák, Ph.D., USB FFPW Vodňany  
Assoc. Prof. Dipl.-Ing. Martin Flajšhans, Dr.rer.agr., USB FFPW Vodňany  
Assoc. Prof. Dipl.-Ing. Tomáš Randák, Ph.D., USB FFPW Vodňany  
Dipl.-Ing. Marek Rodina, Ph.D., USB FFPW Vodňany  
Dipl.-Ing. Martin Kocour, Ph.D., USB FFPW Vodňany  
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Prof. Zdeňka Svobodová, DVM, D.Sc., USB FFPW Vodňany  
Prof. M.Sc. Jan Zrzavý, Ph.D., USB FS České Budějovice  
Prof. M.Sc. Tomáš Polívka, Ph.D., USB FS České Budějovice  
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Assoc. Prof. M.Sc. Milan Gelnar, Ph.D., MU Brno  
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M.Sc. Pavel Punčochář, Ph.D., MA CR Praha  
Assoc. Prof. M.Sc. Adam Petrussek, Ph.D., FS CUNI Praha  
Assoc. Prof. M.Sc. Pavel Stopka, Ph.D., FS CUNI Praha  
Assoc. Prof. M.Sc. Jiří Masojídek, Ph.D., IM ASCR, v.v.i., Třeboň  
prof. Dipl.-Ing. Josef Dvořák, MeU Brno / until 13. 12. 2013

## SCIENTIFIC AND PURCHASING COUNCIL OF THE CENAKVA

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- 1 Internal member:** Prof. Dipl.-Ing. Otomar Linhart, D.Sc.  
**Deputy:** Dipl.-Ing. Marek Rodina, Ph.D.
- 2 Internal member:** Assoc. Prof. Dipl.-Ing. Pavel Kozák, Ph.D.  
**Deputy:** Assoc. Prof. Dipl.-Ing. Tomáš Policar, Ph.D.
- 3 Internal member:** Prof. M.Sc. Dalibor Štys, Ph.D.  
**Deputy:** M.Sc. Roman Grabic, Ph.D.
- 4 Internal member:** Assoc. Prof. Dipl.-Ing. Tomáš Randák, Ph.D.  
**Deputy:** Dipl.-Ing. Martin Kocour, Ph.D.
- 5 Internal member:** Prof. Dipl.-Ing. Martin Flajšhans, Dr.rer.agr.  
**Deputy:** Dipl.-Ing. Vojtěch Kašpar, Ph.D.
- 6 External member:** M.Sc. Jiří Zimola, Governor of the Region of South Bohemia  
**Deputy:** Dipl.-Ing. Jaromír Slíva,  
Member of the Council, Region of South Bohemia
- 7 External member:** Dipl.-Ing. Tomáš Zídek, Deputy Minister, Ministry of Finance, CR  
**Deputy:** Dipl.-Ing. Jiří Nedoma, Povodí Ohře, s.p., General Director
- 8 External member:** Prof. M.Sc. Zdeněk Opatrný, Ph.D.,  
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**Deputy:** Prof. Dipl.-Ing. Petr Ráb, D.Sc., IAPG AS CR v.v.i., Liběchov
- 9 External member:** M.Sc. Petr Kubala, Povodí Vltavy, s.p., General Director  
**Deputy:** Dipl.-Ing. Zdeněk Zídek, PV, s.p., General Manager Horní Vltava
- 10 External member:** Dipl.-Ing. Jan Hůda, Ph.D., CFFA, President  
**Deputy:** Václav Špeta, DVM, Blatenská ryba, Ltd., Executive Director
- 11 External member:** Dipl.-Ing. Viktor Blaščák, Mayor of the town Vodňany  
**Deputy:** M.Sc. Pavel Janšta, Deputy Mayor of the town Vodňany
- 12 External member:** Dipl.-Ing. Karel Tureček, Deputy Minister,  
The Ministry of Finance, CR  
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Deputy Director  
**Deputy:** Miloš Sochor, MBA, South Moravian Innovation Center Brno,  
Main Consultant

## ACADEMIC SENATE OF THE FACULTY

---

since 18. 11. 2013

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- Chairman:** Dipl.-Ing. David Gela, Ph.D., RIFCH
- Members:** Dipl.-Ing. Petr Dvořák, Ph.D., IA  
Prof. Dipl.-Ing. Jan Kouřil, Ph.D., IA  
M.Sc. Bořek Drozd, Ph.D., IA  
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- Vice-Chairman:** Dipl.-Ing. David Hlaváč
- Members:** Dipl.-Ing. Jan Másílko  
B.Sc. Miloslav Vaněček  
Martin Kahanec, DiS.

14. 12. 2011 – 18. 11. 2013

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- Chairman:** Dipl.-Ing. Martin Bláha, Ph.D., RIFCH
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### STUDENTS

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Dipl.-Ing. David Hlaváč  
Dipl.-Ing. Jiří Kříšťan





Insignia of the Faculty of Fisheries and Protection of Waters USB.



The rector of the University of South Bohemia and the faculty management during the Opening ceremony of the South Bohemian Research Center of Aquaculture and Biodiversity of Hydrocenoses. From the left: Prof. L. Grubhoffer, Prof. O. Linhart, Assoc. Prof. P. Kozák, Assoc. Prof. T. Polícar, and M. Kocour, Ph.D.



# RIFCH

## THE RESEARCH INSTITUTE OF FISH CULTURE AND HYDROBIOLOGY

is nowadays the largest and most complex workplace focused on scientific and especially applied research in the field of fisheries and protection of waters in the Czech Republic. In the years 2011–2013, the main building of the institute was completely renovated and expanded under the project CENAKVA. It provides administrative facilities, most of newly equipped research laboratories, as well as facilities for conducting aquacultural and toxicological studies, genomic manipulations or bio-monitoring assessment. The reconstruction was done also at the Experimental Fish Culture and Facility, which is primarily intended for the intensive rearing of fish and crayfish using recirculating aquaculture systems. The newly constructed building of the Genetic Fisheries Center is focused on reproduction, genetics and breeding of fish, espe-

cially sturgeons. RIFCH also has a fish farm, owns or leases ponds, and manages river fishing ground.

The main focus of research of the institute, which currently provides six laboratories, include studies of reproduction, culture, as well as genetic and population diversity of economically important or endangered fish and crayfish species. It is further focused on the monitoring of contaminants in aquatic ecosystems and their effects on exposed organisms, including the development of systems for monitoring of water quality using fish and crayfish as bio-indicators. The prevention and treatment of fish diseases are also investigated.

Academic staff of the institute provides study courses at the faculty covering all (bachelor, master and doctoral) levels.



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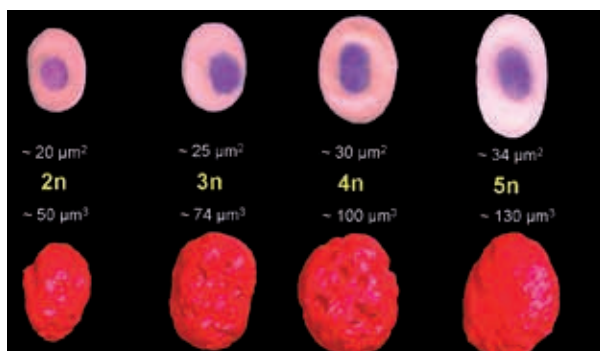
Academic staff and Ph.D. students of the Laboratory of Molecular, Cellular and Quantitative Genetics are focused on molecular biology and proteomics, cytogenetics, flow- and image cytometry and quantitative genetics in freshwater fish species, conservation of fish genetic resources and increasing the genetic potential of economically important species – common carp (*Cyprinus carpio*), tench (*Tinca tinca*), Eu-

ropean catfish (*Silurus glanis*) and already ten species of acipenserid fishes. The laboratory performs both fundamental and applied research in genetic, biological and physiological aspects of polyploid and unisexual fish populations, both the native ones (genera of loach *Cobitis*, weatherfish *Misgurnus*, gibel carp *Carassius*, and *Thymallus*) and those produced in aquaculture (tench, sterlet, Siberian sturgeon



*Acipenser baeri*, and Russian sturgeon *A. gueldenstaedtii*, rainbow trout *Oncorhynchus mykiss* and brook trout *Salvelinus fontinalis* a.o.). The field of molecular biology is focused on the studies in genetic and population diversity of commercially important species of fish and crayfish, as well as to practical applications of molecular markers in aquaculture. The laboratory is interested in the study of protein composition of sperm and seminal fluid in different fish species. Within the last few years, the laboratory was focused on studies of molecular and cytogenetic aspects of polyploidy in acipenserids, closely cooperating with the Laboratory of Fish Genetics, Institute of Animal Physiology and Genetics, Czech Academy of Sciences, v.v.i., in Liběchov. Laboratory members made important progress in studies of spontaneous polyploidy in sturgeons, as well as in production of gynogenetic populations of sterlet for caviar production. Last but not least, they greatly contributed to understanding the relationships between genome size, nuclear size and both its 2-D and 3-D conformation in cells of highly polyploid sturgeons. We are interested in the development and management of breeding

programmes based upon the determination of heritability of performance traits and comparison of performance traits among different breeds, lines or crosses of commercially important species, namely in common carp and tench. Members of the laboratory cooperate with fisheries practice also by means of pilot projects in frame of the Operation Programme Fisheries for testing and transfer of new technologies into aquaculture production. Within this cooperation, a hydrostatic pressure unit was developed and tested during 2012–2013 for induction of triploidy in salmonids, and registered as a utility model. At present, it concerns the only available device of its kind both in the Czech- and Slovak Republic. Scientists of the laboratory are also active members of the Fish Breeding Board of the Fish Farmers' Association of the Czech Republic and in the national Board for Farm Animal Genetic Resources. Academic staff and Ph.D. students are involved in all degrees of education realized at the faculty and they cooperate with universities, scientific institutions and other institutions and subjects in the Czech Republic and abroad.



Comparison of area and volume of erythrocyte nuclei in polyploid sturgeons.



Miloš Havelka preparing sturgeon eggs for experimental interspecific hybridisation.



Artificial propagation of *Acipenser ruthenus*.



Petr Ráb and Martin Flajšhans launching of the book *Fish Genetics and Selective Breeding*.

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Nowadays, the Laboratory Physiology of Reproduction is the largest laboratory of the faculty of Fisheries and Protection of Waters. Beside the Czech Republic, members of laboratory came from Bangladesh, France, Iran, Japan, Turkey and Ukraine.

The laboratory carries out lecturing, basic and applied research with focus on reproduction of our economically significant and endangered fish species primarily. Recently, members of laboratory developed device (utility model) and provide it with a trade mark "ExposureScope". ExposureScope provides stroboscopic light for microscope with adjustable intensity and frequency of flashes for observation of spermatozoa. Another tool for observation of extremely fast swimming fish sperm is a system of high-speed microscopy. These tools give us an opportunity for detail study and modelling of sperm movement. In this field, the laboratory closely collaborates with Biomathematical Institute of Oxford University.

The laboratory also developed a technology for production of sturgeon caviar without need to sacrifice the fish. This product is recorded under a trade mark „Sturgeon friendly caviar“. The production of caviar will be carried out at Research Institute of Fish Culture and Hydrobiology in cooperation with Germany fish farm Fischzucht Rhönforelle GmbH & Co. KG.

Until recently the utilization of testicular sperm was not possible in sturgeons (e.g. *post mortem*). The laboratory developed method of *in vitro* maturation of testicular sperm, which makes the utilization of testicular sperm available.

Interspecific transplantation experiments of fish germ stem cells are other partial successes of laboratory. The laboratory performed successful transplantation of germ stem cells between different sturgeon species as the first. Regarding to this, the laboratory closely collaborates with Japanese Faculty of Fisheries of Hokkaido University.

The laboratory manages a gen bank with cryopreserved sperm of broodstock, possesses a licence for handling of genetically modified organisms and keeps transgenic zebrafish (*Danio rerio*) with labelled germ cells.

The laboratory also offers assistance for sex and maturity stage determination and for artificial reproduction of fish itself.



Sturgeon primordial germ cells (PGCs) after transplantation into a goldfish embryo. Sturgeon PGC is labelled with green (Saito et al., 2014. The origin and migration of primordial germ cells in sturgeions. Plos One 9 (2): e86861).

## LABORATORY OF INTENSIVE AQUACULTURE



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The laboratory is focused on research and development of rearing technology in the field of intensive aquaculture including optimisation of artificial and out-of-season spawning of broodstock with the use of hormonal and environmental induction, rearing of larvae and juveniles with the combination of pond and intensive aquaculture, intensive production of stocking and marketable fish. The research of the laboratory is mainly focused on the following fish species: pikeperch (*Sander lucioperca*), burbot (*Lota lota*), Eurasian perch (*Perca fluviatilis*), Northern pike (*Esox lucius*) and common barbel (*Barbus barbus*).

The laboratory staffs observe and assess the morphology and physiological quality of sperm and the ageing process of oocytes during the artificial reproduction of above mentioned fish species. Other activities are focused on the optimisation of egg fertilisation and removing of the eggs stickiness before the artificial incubation (mainly in pikeperch) ensur-

ing high survival of high-quality embryos and larvae. One of the very meaningful applied results of this laboratory is development and optimization of technology providing pikeperch juvenile production with the combination of pond and RAS aquaculture. This technology describes very effective methods of culture pikeperch larvae and juveniles under pond conditions up to advanced fry which is used for the adaptation in RAS and to dry feed. High-quality of pikeperch juveniles with low production cost are produced by this technology which is suitable and sustainable for pikeperch aquaculture in Central Europe.

This laboratory also studies the biology, reproduction, current occurrence and optimisation of the rearing in two European endemic crayfish species – white-clawed crayfish (*Austropotamobius pallipes*) and thick-clawed crayfish (*Astacus pachypus*).

The laboratory actively cooperates with Czech fishery companies such as: Fishery Nové Hradky, Klatovské

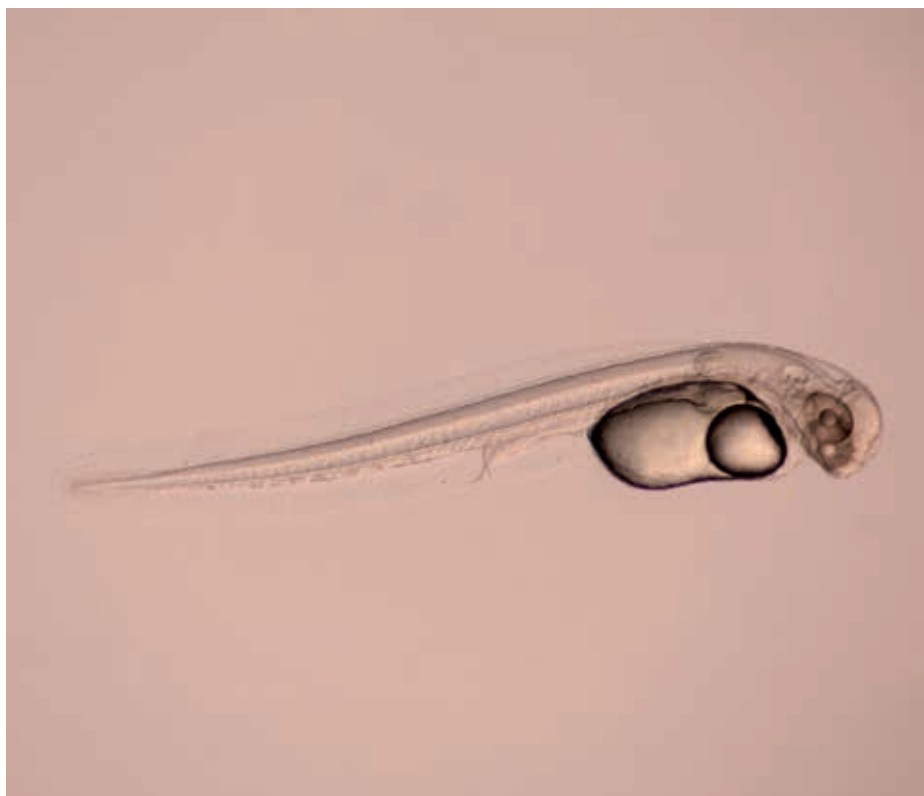
fishery, Švarc – intensive fish culture and FISH Farm Bohemia) and also with foreign fish farmers such as: Excellence Fish – Netherlands, Van Slooten Aquacultuur

– Netherlands, Fish 2 Be – Belgium, LucasPerch – France, Asialor – France, Moneycarragh Fish Farm – Northern Ireland, EKO-HIDRO-90 Bulgaria).

This laboratory also collaborates with following Czech and foreign research institutions: the Academy of Sciences of the Czech Republic, Mendel University in Brno, Czech University of Life Sciences in Prague, Faculty of Agriculture of University of South Bohemia in České Budějovice, T. G. Masaryk Water Research Institute in Prague, Nancy University – France, University of Warmia and Mazury – Poland, State Research Institute of Agriculture and Fisheries – Germany, University of Belgrade – Serbia, Kherson State Agricultural University – Ukraine, Russian Federal Research Institute of Fisheries and Oceanography (VNIRO) –

Russia, Aquaculture Initiative – Northern Ireland, BIM institute – Ireland and Research Institute for Fisheries, Aquaculture and Irrigation – Hungary.

Academic staff of the laboratory participates in the teaching process of bachelor, magister and doctorate students at faculty..



Freshly hatched larvae of pikeperch (*Sander lucioperca* L.).

## LABORATORY OF ETHOLOGY OF FISH AND CRAYFISH

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The activities of the laboratory are focused on several main research fields, which are various aspects of crayfish biology including their involvement in the continuous water monitoring systems, reproduction of riverine fish species, applied hydrobiology, as well as assessing and improving the quality of fish meat especially in terms of omega-3 unsaturated fatty acids including fish nutrition itself. The last-mentioned issues were recently solved in the newly established Laboratory of Nutrition and Fish Quality.

Crayfish-related aims deal with selected biological features of both native and non-native species e.g. growth alternations and patterns in body appendage injuries, studies in genetic diversity in noble crayfish (*Astacus astacus*) and narrow-clawed crayfish (*Astacus leptodactylus*) as well as research on crayfish reproduction in general (sperm ultrastructure in several species, proteomic changes during sperm capacitation). We are developing methods for artificial egg incubation with related progress in the search for highly effective and safe antifungal treatments. In this term, applications of peracetic acid for both the preventive and therapeutic treatments are expected in future astaciculture. Attention is also paid to the conservation management of indigenous crayfish species, their monitoring and safety transfers. Together with the former Laboratory of Applied System Biology (recently Laboratory of Signal and Image Processing) in Nové Hradky, we develop systems for the continuous monitoring of water quality based on the non-invasive monitoring of crayfish heart rate activity and tracking 3D trajectories of fish in small tanks.

The main results recently achieved in the field of crayfish are the publication of comprehensive monograph “Biology and Culture of Crayfish“, published at the beginning of 2013, the description of narrow-clawed population coexisting with the crayfish plague pathogen in the Lake Eğirdir in Turkey and study describing the socio-economic drivers related to the spread of non-native crayfish species in Europe. We also contributed in defining current conservation strategies for native crayfish in the European context.

The research of riverine fish species reproduction is made in cooperation with other laboratories, particularly with the Laboratory of Intensive Aquaculture. Our laboratory is focused especially on alternative (nature-friendly) methods of spawning and nutrition of riverine fish species, recently mainly barbel (*Barbus barbus*) and vimba (*Vimba vimba*).

We work at monitoring of invertebrates communities in lotic and lentic waters, evaluating the effect of different intensity of fisheries management in these communities. Specific research in progress concerns fishpond littoral belts in relation to colonization of macrophytes by phytophilous zoobenthos. Further, we have described in detail the succession of fishpond ecosystems in years following the removing of sediment.

Laboratory employees are also involved in teaching at all degrees of studied programs, and have broad cooperation with relevant research institutions as well as state and private bodies home and abroad across studied topics.



Antonín Kouba helping with setting traps for narrow-clawed crayfish (*Astacus leptodactylus*) in Turkey.



Stocking of noble crayfish (*Astacus astacus*) in the village of Semice, the Czech Republic.

## LABORATORY OF ENVIRONMENTAL CHEMISTRY AND BIOCHEMISTRY



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The laboratory activity is focused on the occurrence of xenobiotic substances in aquatic ecosystems and the investigation of their impact on exposed organisms. The lab is currently turning its attention towards the monitoring of contamination using passive sampling methods. Laboratory scale toxicological studies play an important part of experimental activities as well as field sampling of water and fish. Experi-

ments are mainly focused on the impact assessment of selected chemical compounds (now especially pharmaceuticals and pesticides) on model organisms. The effect of xenobiotic substances present in the aquatic environment on fish is studied especially by means of determination of selected biochemical parameters (biomarkers) in fish tissues. The laboratory is equipped with state of art instruments for trace



analyses e.g. two-dimensional liquid chromatography with tandem mass spectrometry (LC/LC-MS/MS) used for highly sensitive and selective analysis of polar compounds in water samples, passive samplers and fish tissues, GC-MS/MS for non-polar compounds analyses and LC/LC-HRMS for the most sensitive analyses and for non-target screening. Some of the chemical analyses are performed in cooperation with specialized analytical laboratories from other institutes (Umea University, SLU Uppsala, National Veterinary Institute in Prague, etc.). The scope of analyses includes not only pollutants limited by the legislation but also new compounds belonging to family of emerging pollutants. These compounds represent a potential risk for exposed organisms according to the latest scientific information. Recently, the laboratory is focused on development of new progressive detection methods and consequent analyses of wide spectra of relevant pharmaceuticals, illicit drugs, UV filters and pesticides in the environmental samples. Semi-field experiments are carried out for the passive samplers POCIS (Polar Organic Compounds Integrative Sampler) calibration. The sampling and analytical methods and equipment are used for evaluation of traditional and newly introduced sewage treatment

technologies. We investigate possibilities for the removal of wide spectra biologically active substances during treatment processes. Biomonitoring systems using fish as bio-indicators for continuous quality control of drinking water are developed. ČEVAK, Inc., PVK, Inc., and W.P.E., Inc., companies are involved in the mentioned research. The laboratory participates in the national program of water quality monitoring coordinated by Czech Hydrometeorological Institute (CHMI). We also cooperate with institutions and organizations engaged in environmental protection, ecological risk and contamination assessment.

The laboratory participated in activities of the accredited Testing laboratory of trace analyses and toxicology (ZL SAT).

Laboratory employees also are interested in fishery management and ichthyological monitoring of open waters.

Laboratory employees also participate in education of students at FFPW USB which are studying in bachelor, master and also postgraduate study programs.



Ganna Fedorova prepares samples in the analytic laboratory.

## LABORATORY OF AQUATIC TOXICOLOGY AND ICHTHYOPATHOLOGY



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The activities of the laboratory are focused on the determination of effects of xenobiotics on aquatic organisms, prevention and therapy of fish diseases, examination of fish health and monitoring of the effect of fish culture intensity on water quality in the ponds. The part of this laboratory is the workplace of toxicology, which performs tests of acute toxicity on fish, aquatic arthropod, green chlorococcal algae and plant *Sinapis alba*. On the basis of these acute toxicity tests ecotoxicological properties of substances, preparations and wastes are evaluated. For this activity, this workplace was given the Certificate of accreditation by the Czech institute for accreditation. Moreover, sub-chronic and chronic toxicity tests on fish, crayfish and their early-life stages are performed for scientific purposes. The main studies are aimed at evaluating the effects and mode of action of drugs, pesticides and products, which are usually characterized by low biodegradability and persistence in the water environment and therefore might be dangerous for the aquatic organisms and human as well. An important part of the laboratory is workplace hydrochemistry, which performs analysis of basic parameters of water quality and carries out analysis of total mercury in biological materials and sediments. Every year the laboratory successfully participates in inter-laboratory comparison tests organized by the Center for Assessment of Laboratories ASLAB at T. G. Masaryk Water Research Institute, public research institution (TGM WRI), in Prague and obtains a certificate of participation. Recently the laboratory is focused on monitoring the occurrence of endocrine disrupting chemicals, especially synthetic progestins in the aquatic environment, and assessing their effects on fish. Furthermore, attention is also paid to the issue

in nitrite influence on fish health, results of this research provide important information applicable in fish breeding technology. In 2013, the workplace was equipped with complete facilities for the preparation of histological sections (tissue processor Histomaster (Model 2052/1.5), modular tissue embedding center (Leica EG1150), semi-automatic rotary Microtome, automatic slide staining system (TISSUE-TEK® DRS™ 2000, SEKURA) and microscopy combined with camera system MOTIC). These devices enable us to observe changes in the tissues of fish exposed to tested substances on the level of gene expression and thus help us to assess possible negative effects of these substances on the exposed organisms with high sensitivity.

The employees of the laboratory are also focused on the testing of drugs which are widely used in the fishery practice. They also do verifications and development of strategies in the treatment of the common diseases in aquaculture. For the fish farmer they suggest the therapeutical and rearing procedures, which minimize the losses caused by various pathogens.

The employees of the laboratory also cooperate with colleagues from the Veterinary Research Institute in Brno and with the University of Veterinary and Pharmaceutical Sciences Brno. Some of the laboratory staff are also members of the research teams of international projects TRAFON and FishBOOST.

The laboratory cooperates also with the Police of the Czech Republic, fishery associations and municipal authorities on the investigation of the causes of acute fish kills. Moreover, the laboratory monitors effects of pesticides on non-target aquatic organisms and records the acute fish kills in the Czech Republic in the cooperation with the Ministry of Agriculture.



Ph.D. student Christoph Steinbach during sample preparation for gene expression.

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–

The purpose of the Genetic Fisheries Center (GFC) is to preserve genetic resources of existing broodstock and populations of carp, tench, wels and sturgeons. Nowadays we are keeping 15 breeds and lines of common carp (*C. carpio*), 11 breeds plus three colour varieties of tench and two breeds of wels. This center has been entrusted with leading the breeding and testing program of common carp and tench performance in the Czech Republic since 1982. We take pride in the successful breeding of several species of the Chondrostei order – Russian sturgeon (*A. gueldenstaedtii*), Siberian sturgeon (*Acipenser baerii*), Sterlet (*Acipenser ruthenus*), Sevriuga (*Acipenser stellatus*), Beluga (*Huso huso*), Atlantic sturgeon (*Acipenser oxyrinchus*), white sturgeon (*Acipenser transmontanus*), Adriatic sturgeon (*Acipenser naccarii*) and albinotic sterlet. We arranged two CITES permits for the import of fertilized eggs of the Mississippi paddlefish (*Polyodon spathula*) from a private aquaculture farm in Kentucky, USA and the Shortnose sturgeon (*Acipenser brevirostrum*) from Canada.

This Center has also been serving since 1996 for the education of fish breeding for faculty Bachelor, Master and Ph.D. students in the form of field train-

ing. The GFC is involved in international scientific collaboration AQUAEXCEL (Aquaculture Infrastructures for Excellence in European Fish Research) and in national projects supported by Czech administration.

Since 2013 we have started a new facility with a year-round operation. There are laboratories, sanitary and technological backgrounds. The lecture room for 32 students or visitors is fully equipped.

The experimental part is equipped with a special research laboratory for the incubation of fertilized fish eggs in small quantities under fully controlled conditions.

The hatchery with ten Weis incubation jars and eight hatching troughs is ready for experiments with higher quantity of fish eggs. Twelve circular tanks (6m<sup>3</sup> in total) and four rectangular basins (12 m<sup>3</sup> in total) operated by two separated recirculation aquaculture systems (RAS) are used for rearing the yearlings.

Two RAS (2 x 8 m<sup>3</sup>) are ready for experimental preparation of broodstock for controlled reproduction.

The GFC has outdoor breeding tanks with either through-flow or recirculation systems. The systems of earthen ponds with total acreage of 43 ha serve for rearing of young, marketable and brood fish.

The GFC also provides a functional basis for laboratories of the faculty dealing with e.g. the study of colour heritability of tench, genome manipulations of

selected fish species (common carp, tench, gibel carp, sturgeons – see Laboratory of Molecular, Cellular and Quantitative Genetics), fish gametes (see Laboratory of Reproductive Physiology) and for the subsequent application of obtained results in aquaculture. We also successfully collaborate with other laboratories of our faculty.



Martin Kahanec (2<sup>nd</sup> from the right) with the faculty students during a field training.



The yearling of Russian sturgeon (*A. gueldenstaedtii*) from own breeding of the Genetic Fisheries Center.



## EXPERIMENTAL FISH CULTURE AND FACILITY



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**Zdeněk Sakastr**

technician  
–



**Eva Šimoniková**

cleaner  
–

The Experimental Fish Culture and Facility consists of 50 complex experimental ponds with a total area of nearly 7 ha and a fish breeding facility using both flow and recirculation systems for rearing mainly early stages of various species of fish and crayfish. In early 2013, this was extended to the new rearing facility, laboratory and teaching space. A new outdoor nursery was commissioned where 100 different types of tanks intended for rearing fish and crayfish are available.

The unit is used by students of individual laboratories to implement experiments aimed mainly at research in aquaculture breeding technologies, and

considerable attention is paid to the following areas: intensive aquaculture methods including recirculation systems; fish reproduction, including hormonal and environmental stimulation; rearing early stages of economic and endangered species of fish, including the optimization of environmental conditions and nutrition; applied fishing hydrobiology etc. Over the last few years much attention has been paid to dedicated breeders that are focused on breeding technology of prey (perch, *Perca fluviatilis*, pike perch, *Sander lucioperca*) and river (barbel, *Barbus barbus*, vimba bream, *Vimba vimba*, nase, *Chondrostoma nasus*) fish species in recirculating systems. Also in the field



of rescue breeds, especially (*Astacus astacus*), was implemented in the workplace. Many experiments

that contributed to the acquisition of new knowledge are gradually introduced into practice.



Artificial reproduction of *Vimba vimba*.



The signal crayfish (*Pacifastacus leniusculus*) held individually in an experimental box.



# INSTITUTE OF AQUACULTURE IN ČESKÉ BUDĚJOVICE

provides students with a wide variety of opportunities within the narrow specialization of traditional fish farming, processing of fish, HACCP ("Hazard Analysis and Critical Control Points" – health dangers monitoring) implementation, intensive aquaculture, controlled reproduction of fish, water management, fish utilization and protection of open waters. The laboratories of the institute provide research, educational and consulting services focusing on pond aquaculture, nutrition and feeding of fish in ponds, intensive culture of coldwater and warmwater fish including the use of recirculation systems with biological water treatment, fish feed testing, artificial and semi-artificial reproduction of fish under the hormonal and environmental stimulation of ovulation, early ontogenesis of fish, evaluation of the ecological stability of streams and reservoirs, monitoring of biodiversity

in streams, fish migration, the protection of fish in open waters and sport fishing. Other important tasks and activities of the Institute regard fish processing and safe storage of fish, the evaluation of food safety, good manufacturing practice (GMP) in the processing of fish products, practical application of the HACCP principles and the assessment of sensory and textural properties of fish muscles.

Since 19. 7. 2012 a fish shop has been officially operated in Husova třída in České Budějovice at the Aquaculture University Institute. The shop serves mainly to promote the quality and application of quality fish kept in faculty ponds and for students to gain practical experience at the faculty. The fish shop staff prepare the formulation of new fish products and verify their application on the market. The shop also caters for functions and banquets.



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## LABORATORY OF POND AQUACULTURE AND PROTECTION OF WATERS



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The laboratory of Pond Aquaculture and Protection of Waters deals with three broad research lines connected together in cooperation with the rest of laboratories at the Faculty of Fisheries.

The research aim of the laboratory is to deal with pond-fish farming, fish farming management and applied hydrobiology. The laboratory significantly participates in the research of new methods of supplementary feeding of economically significant fish species. It deals with the issue of stabilization of costs for feed within a semi-intensive method of fish pond management, improvement of feed digestibility and a decreasing of feeding coefficient by adjusting the served feed. It also assesses the nutrient balance in the waters especially in ponds and monitors the water and its changes as a result of fish farm. The laboratory also deals with the characterization and assessment of fish

as a raw input material for further market utilization. It assesses changes in mass after killing and factors influencing the quality and nutritional values of fish meat. It also deals with nutritional and qualitative values of fish meat in relation to various food sources of fish, quality control of products, microbiological and chemical quality assessment.

The laboratory deals with monitoring of ichthyofauna and the assessment of ecological stability of fish communities in flows and reservoirs in protected nature reserves in cooperation with administrations of protected nature reserves. It evaluates existing methods of fishery management, proposes and elaborates new methods of fishery management supporting biodiversity and ecological stability of water environment.



The laboratory is engaged in the project of assessment of migration permeability of water flows in the Czech Republic, where it deals with the issue of migration permeability of newly built fish passes.

The laboratory provides and coordinates education of the bachelor and follow-up master study of the fisheries subject at the University of South Bohemia in České Budějovice, Faculty of Fisheries and Protection

of Waters. It cooperates with significant fishing business both in the Czech Republic and abroad, where students pass through professional and operation trainee-ships. The laboratory cooperates on a long term basis with organizations of nature and landscape protection and participates in solving selected projects dealing with water ecosystems.



The faculty students evaluating fish passes in terrain.



Shaped carp hulls.



The faculty students harvesting with a bottom net.

## LABORATORY OF CONTROLLED FISH REPRODUCTION AND INTENSIVE FISH CULTURE



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Laboratory members are focused on controlled fish reproduction including the optimization of methods for obtaining viable fish gametes by adjustment of water conditions with or without hormonal preparations usage in commercially important fishes (common carp, *Cyprinus carpio*, tench, *Tinca tinca*, grass carp, *Ctenopharyngodon idella*, pike, *Esox lucius*, pike-perch, *Sander lucioperca*, sturgeons, Acipenseridae, coregonids, *Coregoninae*, salmonids, *Salmonidae*), fishes new to aquaculture (perch, *Perca fluviatilis*, North African catfish, *Clarias gariepinus*) and wild caught fishes from open waters (grayling, *Thymallus thymallus*, and barbell, *Barbus barbus*). Research is supported by the evaluation of the release of dynamic sex hormones during pre-spawning and the spawning period. The laboratory is also studying controlled reproduction and quality of gametes after artificial reproduction in tropical ornamental fish species, es-

pecially in *Chromobotia macracantha*, *Agamyxis pectiniifrons*, *Platydoras costatus*, *Synodontis angelicus*, *Synodontis ocellifer* and *Pimelodus pictus*. The experiments are also focused on the influence of environmental factors, especially temperature, on the early development of fish (wheatherfish, *Misgurnus fossilis*, African catfish, crucian carp, *Carassius carassius*, etc.). Attention is paid to the feeding biology of selected fishes during the first year of life by using achieved knowledge on habituating of fish to artificial feed.

Laboratory members are interested in technology of intensive aquaculture with special regard to the use of recirculating aquaculture systems (RAS) for culture of Eurasian perch, pike-perch, African catfish, coregonids, sturgeons and salmonids. Areas of interest include the study of the metabolism (oxygen consumption and ammonia excretion in fish), evalu-



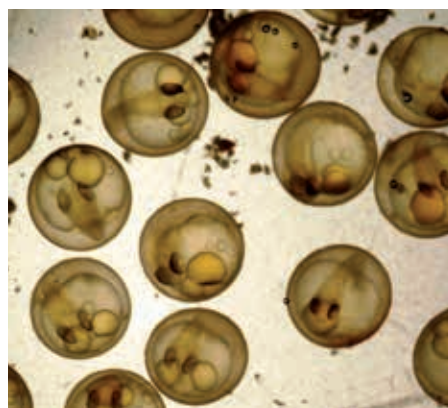
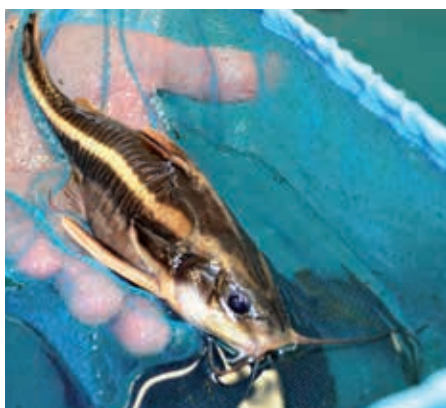
ation of growth rate, weight heterogeneity, survival, morphometric parameters and feed conversion ratio for the mentioned species. Experiments are carried out primarily in the context of abiotic factors such as water temperature, oxygen levels, feeding frequency, stocking density and photoperiod. The optimization of weaning (habituation of fish from of live food to starter feed), including the ability of usage of enriched live food is the main topic in research on fish larvae. Feeding experiments are carried out on marketable fish, including the evaluating of quality of the final product (i.e. a fillet yield, chemical composition, technological and sensory characteristics of flesh). The different recirculation systems and their technological elements are monitored in terms of energy consumption, water consumption, pollution, suitability to different climatic conditions and culture of various fish species.

Besides the experiments taking place at our experimental facilities, other parts of the experiments (focused on fish reproduction) and long-term monitoring (focused on RAS technology) are taking place at: the Experimental Fish Culture and Facility of RIFCH Vodňany, the hatchery in Mydlovary, the salmonid farms in Litomyšl (flow-through system and hatchery), in Mlýny (RAS system) as well as abroad (PAN Golysz in Poland and Gosrybcentr Tyumeri in Russia).

Laboratory members are involved in teaching of several aquacultural subjects at the faculty (including

the supervision of bachelor's, masters and doctoral theses). Another important aim of our laboratory is to support the commercial aquaculture sector by consultancy and publishing of materials for fish farmers.

The experimental facilities of the Laboratory of Controlled Fish Reproduction and Intensive Fish Culture are located in the building of South Bohemian Agency for the Support to Innovative Business in České Budějovice, Na Zlaté stoce 1619, where the laboratory has moved from the temporary location at the Faculty of Agriculture. A large aquarium room is equipped with three to four separate adjustable (variable number of tanks and total volume of water) recirculating systems for fish. A smaller aquarium room is equipped with tanks with internal filtration for broodstock conditioning, mainly tropical ornamental fish. In the autumn of 2014, the laboratory is moving to the renovated building of the Institute of Aquaculture in Husova street.



Mature female of *Platydoras costatus* and egg incubation of (*Coregonus peled*).

## LABORATORY OF NUTRITION AND FISH QUALITY



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The laboratory focuses on various factors that affect the quality of fish flesh and the effects of fish consumption on human nutrition. Among others our department has developed a patented technology to produce carp with increased content of omega-3 fatty acids. The laboratory is also engaged in teaching in of both the present and distant form in the subject fisheries (Fish nutrition, Aquaculture commodities, Specialized Seminars).

During the last year the equipment of the laboratory has been supplemented with an HPLC and HPTLC equipment, a -80 freezer and as well as several smaller instruments as vertical and horizontal gel electrophoresis, an oven for drying, centrifuge, evaporator for small volumes, analytical scales, mixers and stirrers. Beside the instruments for daily use the laboratory was also furnished with a fume hood and security cupboards for the safe storage of our volatile and flammable solvents as well as for toxic chemicals. We also have the possibility to use a transportable spectrophotometer from the laboratory of controlled fish reproduction and intensive fish culture. There is still some equipment missing but now we are able to perform most of the necessary analyses in our own labo-

ratory. The methods we have established during the last year are: Fatty acid composition (GC); Tocopherol separation and content ( $\alpha$ ,  $\gamma$ ,  $\delta$ ) (HPLC); Lipid class and phospholipid separation (HPTLC), TBARS (lipid oxidation) and Protein oxidation (spectrophotometric), Iodine value, and Dry matter.

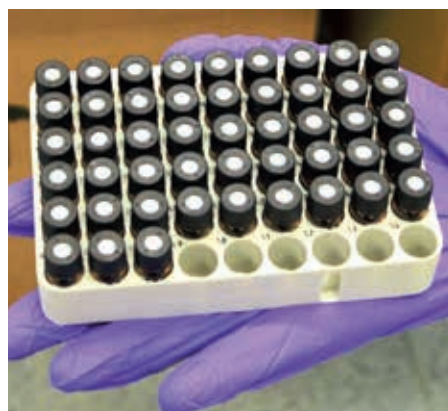
We have also been engaged in developing a method to evaluate the unsaturation factor of fish by Raman Spectroscopy in order to establish a fast method for verification of the omega-3 content in the omega-3 carp for example.

Besides this, objects of our research have been the development of novel products from fish mince, a by-product from the filleting process and the prolongation of shelf life of fish and fish products by addition of novel additives. We also evaluate the effects of different technologies as finishing feeding and purging on various economic and fish quality aspects. In this project we collaborated with the companies Klatovské Rybářství, Inc., and Rybářství Chlumeck nad Cidlinou and Blatenská ryby, Ltd.

In addition the aspects of the preparation process at home, especially frying of fish was also investigated. We showed that the frying fat has a great impact

on the final fatty acid composition of the fillet. In the human nutrition area we work currently on the possible positive effects of omega-3 fatty acids against the toxic effects of the heavy metals mercury and cadmium. The aim of this study is especially to investigate the impact of consumption of contaminated fish. In this project where we work with cell culture we collaborate with Prof. Tanja Schwerdtle of University Potsdam (previously University Münster) in the cell culture part.

We also have established a new collaboration with the University of Hohenheim (Stuttgart) and the Fish-farm Anapartners, Ltd., in Prague.



Extraction of lipids from pond plankton samples (left) and fatty acid methyl esters (FAME) in vials ready to gas chromatography (GC) analysis.



Raman spectrometer for non-destructive analysis of fish flesh quality.



# ICS

## INSTITUTE OF COMPLEX SYSTEMS IN NOVÉ HRADY

was established after the Physical Biology Institute was divided and it became a part of the Faculty of Fisheries and Protection of Waters. The institute focuses on applied and basic research in the field of complex systems, especially tissue cultures, macromolecular complexes or higher organisms. The key scientific tasks include behavior analysis and modeling biological processes using experimental measuring, mathematical methods or software tools. The institute consists of several interconnected laboratories

that enable research from primary cell cultures cultivation to automatic processing using software tools developed exclusively for the school. Thanks to this connection, the students can not only gain detailed specialized knowledge, but also acquire a general overview of the issues concerned (multidisciplinary knowledge). The institute cooperates with Czech and foreign research centers and it also develops cooperation with business spheres.



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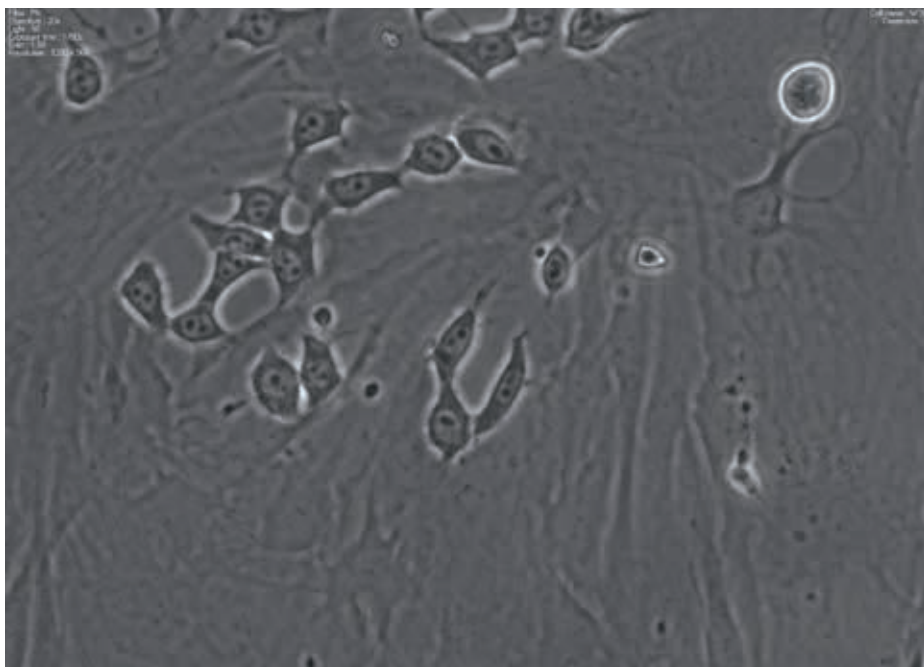
**THE LABORATORY OF TISSUE CULTURE**
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The Laboratory of Tissue Culture is accredited as testing laboratory L1614 by Czech Accreditation Institute by standard ČSN EN ISO/IEC 17025:2005 since 2011. The aim of the laboratory is to become the leading supplier of products for testing the biocompatibility of materials with activities mainly in the field of biomedicine and ecology. Biocompatibility is related to the behavior of biomaterials in various contexts. Biocompatible material is assessed by the interaction of the cell material with the environment, in particular according to the cytotoxic effects, the toxicology and allergic reactions, according to carcinogenic, teratogenic or mutagenic reactions and the influence of the infectious process and according to the extent and quality of biodegradation. Currently the laboratory accredited tests of cytotoxicity of infusion, direct contact, dilatation of the cells and test of clastogenicity on the mammalian cells. The test of cytotoxicity *in vitro* is carried out on lines L929, HeLa and MG63. Reaction cytotoxicity of each sample material to interact with the cell line is scanned sequentially at specified time intervals by collecting cinematography (time lapse microscopy). The laboratory has special microscopes for the progressive scanning reactions of the cytotoxicity, with culture chambers allowing a temperature of 37 °C and a mixture of 5% CO<sub>2</sub> and air (culture conditions cell lines).

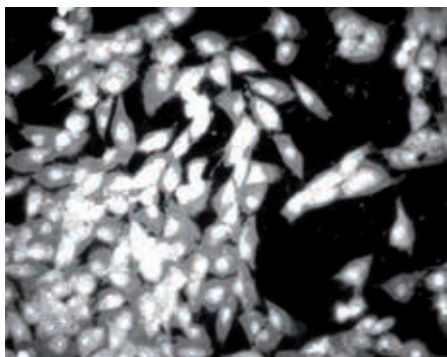
Test of cytotoxicity by direct contact – the cell line MG63.

In 2012–2013 the laboratory was testing cytotoxicity with clients from ELMARCO Ltd., Liberec and Zkušebna kamene a kameniva Ltd., based in Hořice v Podkrkonoší. Furthermore, the laboratory performed the inter-laboratory tests on the “test cytotoxicity infusion” with the laboratory of culture of the Medical Faculty MU Brno, testing laboratory 1540 and “test cytotoxicity direct contact” with the laboratory of tissue culture, Faculty of Medicine, Palacký University in Olomouc, testing laboratory 1308 at the same time with the laboratory of tissue culture the Medical Faculty MU Brno, testing laboratory 1540. The laboratory performs tests and other methods for the customer that are unaccredited. The laboratory continues to deal with the method of colonization surface of a solid material of a cell for companies Timplant Ltd., Ostrava, The Dental Clinic of the University Hospital in Plzeň, University of Technology in Brno and the Regional Centre of Advanced Technologies and Materials in Olomouc, which was made in 2012–2013.

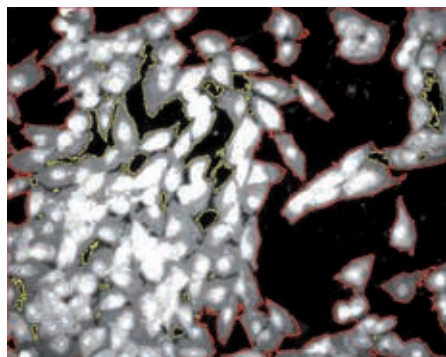




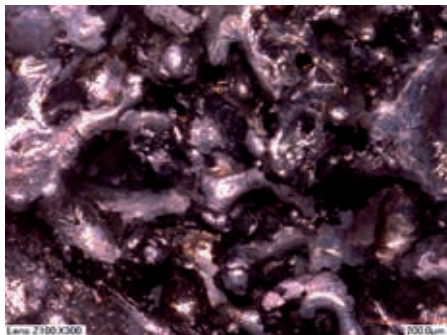
WI 38 – Human Caucasian foetal lung (fibroblast).



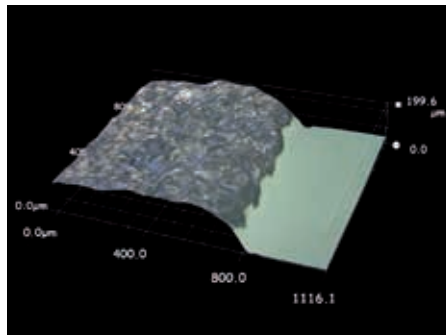
MG63 (human osteosarcoma) on the sample's surface  
TNT 11\_1.



MG63 (human osteosarcoma) on the sample's surface  
TNT 11\_1 – evaluation.



The cell line MG63 (human osteosarcoma) on a sample  
of Ti-grain surface electric discharge.



The cell line MG63 (human osteosarcoma) in 3D on the edge  
of the sample Ti VII.

## LABORATORY OF APPLIED SYSTEMS BIOLOGY

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The laboratory deals with the basic and applied research of complex systems especially in the natural systems area. The main direction of the research is the analysis of natural systems based on automatic data processing from the controlled experiments. The laboratory is connected to other laboratories of the Institute of Complex Systems and provides the analysis of the experimental data and software tool for annotation and evaluation. Key activities are: controlled

experiment, basic research of light microscopy, experimental data filtration, machine image processing, multidimensional data analysis, mathematical modeling of processes.

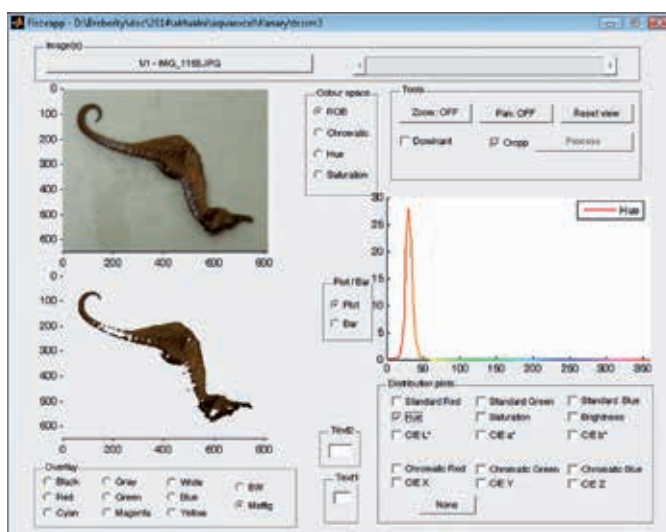
The laboratory cooperates on several projects: Automatic recognition of cell culture behaviour. The analysis of the state and behaviour of cell culture is one of the commonly used approaches in the field of bio-compatibility of materials or personalized medi-

cine. The analysis is done manually by the specialist. The problem is that the amount of the data for the manual analysis is huge and therefore only the basic analysis of the microscopic experiments is realized. The amount of the information about the cell culture behaviour contained in the experiment is much higher than can be analyzed by a human operator. The main aim of the project is to develop the automatic method for objects detection in the time-lapse microscopy images and classification of the behaviour of the objects. The output of the project will be the automatic method for analysis of cell culture state under user

defined conditions. Research of microscopy imaging is focused on the basic research of light microscopy imaging techniques especially on the Point Spread Function (PSF). The objects displayed by a light microscope are disrupted by the PSF which complicates the usage of the image processing method for image analysis. The research deals with the defining of the concept of distinctiveness, distinctness, focus and the possibility of usage of PSF for next analysis of microscopy data.



Segmentation results for the analysis of fish coloration for different diets.



Applications for evaluating of fish coloration.

## LABORATORY OF MACROMOLECULAR STRUCTURE AND DYNAMICS

THE LABORATORY ENDED 31. 12. 2013



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The aims of the laboratory are structural studies of membrane and soluble biological macromolecular complexes using methods of X-ray diffraction. X-ray crystallography is the major technique to get the structure of biological macromolecules at atomic resolution. These protein structures are central to understanding the detailed mechanisms of biological processes and to discover novel therapeutics using a structure-based approach. Several non-membrane membrane protein complexes, which are important for living on the earth, have been crystallized in our lab. The laboratory consists of two sub-laboratories named MolBiol and Xtall. MolBiol is the laboratory of molecular biology designed for isolation and purification of proteins. These pro-

teins are later used in the Xtall laboratory for crystallization experiments aimed at production of diffractable crystals. Obtained crystals are measured at the synchrotron radiation sources and diffraction data are used for solving of protein structure. Purified proteins are crystallized either using standard or alternative or advanced crystallization techniques; the last two have been developed and tested in our lab as well. Key activities are basic research in the field of and purification of proteins and their crystallization, teaching of Bio-crystallization methods, close cooperation with affiliate laboratories from the Czech republic and also abroad, organization of international course under auspices of the Federation of European Biochemical Societies.

Processed by: Assoc. Prof. M.Sc. Ivana Kutá Smatanová, Ph.D.

## LABORATORY OF LASER, MICROSCOPY, CONDENSED PHASE IN BIOLOGY AND MATERIAL ENGINEERING

THE LABORATORY ENDED 31. 12. 2013



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The laboratory realizes theoretical and experimental research in laser microscopy & spectroscopy. Charges of these activities are: design and construction laser systems and study the electrical and optical properties of these systems in order to use them as tools for laser applications, e.g. for human treatment, Lidar to detect the vegetation area, forest, mountains, roads, etc. and pollution in air and water.

Designing and constructions Multi-functional two/multi-Photon Laser Scanning Microscopy (MF-TPLSM) by combing three platforms of laser scanning microscopy; the fluorescence microscopy, harmonic generation microscopy and polarizing microscopy for detecting the Second Harmonic Generation (SHG) signals in the forward and backward directions as well as the two photon excitation fluoresce (TPEF), etc.

The further research area of lab is Condensed Matter Physics (Theoretical and Experimental). It contents study of electronic structure, linear, nonlinear optical properties and the other properties, investigating the promising materials for Li-ion rechargeable batteries, hybridized materials, solar cells, alloys, biological crystals, renewable energy materials, Ionic liquid, SHG materials, mono-crystals.

Members of laboratory deal with design and fabrication of new multi-functional materials which should

be less expensive, more flexible, require less energy and more apt specific applications for emerging application of quantum electronics, optoelectronic materials and the devices based on them. Novel multi-functional materials which can produce visible, ultraviolet and infra-red laser radiation at wavelengths that are presently inaccessible via conventional sources for many industrial, medical, biological and entertainment applications.

Another purpose of the laboratory is calculating the properties of low dimensional nanoscale materials such as nanotubes, nanowires, and thin-films, etc. For the calculations we use the density functional theory (DFT); Full-Potential Linear Augmented Plane Wave (FP-LAPW) method as embodied in the WIEN2K code, also the Linear Muffin-tin orbital (LMTO) method, VASP code, and some other codes.

The laboratory has worldwide collaboration with other universities and institutes from USA, Greece, India, Poland, Australia, France, Algeria, Morocco, Germany, Japan, China, Pakistan, Malaysia, United Arab Emirates, Saudi Arabia Kingdom, UK, and Italy.





# IEEAIC

## INTERNATIONAL ENVIRONMENTAL EDUCATIONAL, ADVISORY AND INFORMATION CENTER OF WATER PROTECTION VODŇANY

Except for the ordinary scientific and research activities, the Faculty of Fisheries and Protection of Waters, the University of South Bohemia in České Budějovice has been expanding its activities into the field of education. But this education is not only about realisation of postgraduate study programmes, but also about realisation of different courses, programmes, international conferences and informational events in the field of lifelong learning focused on different target groups, which are connected by a professional or a non-professional (it means hobby) interest in water management and water protection. Under these activities, some significant projects were realised. It led not only to the broadening of the network of collaborating subjects, but also to the common formulation and sharing of the idea of building up the educational, public educational, information

and advisory center, focused on the water issues and providing its services to the broad spectrum of different target groups. These ideas and intentions of the FFPW USB gave birth to the International Environmental Educational, Advisory and Information Center of Water Protection Vodňany (since 1. 1. 2012). The center initially comprised of mainly project managers, but as time passed, it began to profile itself as a real advisory institution not only in the field of project management, but also in the field of lifelong learning and public education. Basic activities of the center can be divided into three categories: project management, publishing activities, and lifelong learning. The center has been situated in a reconstructed building, in the former Brok's family mill in Vodňany since 1. 1. 2014.



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The complete project activity is provided by the Unit of project managers led by Dipl.-Ing. Michal Hojdekr, MBA, since 1. 6. 2013 by Dipl.-Ing. Martin Vlček. The project managers are searching, processing and fully administrating the projects from EU structural funds as well as the other national and international

grants. A preparation of project documentation is also offered as a service to the public since 2013 as an advisory activity of the center. The unit also provides the most of administrative agenda of the faculty development.

## FACULTY DEVELOPMENT

In recent time the Faculty of Fisheries and Protection of Waters, the University of South Bohemia has achieved modern facilities thanks to the realisation of the European infrastructure projects. You can find a detailed description of the individual projects further

on in this report. For the information about the **South Bohemian Research Center of Aquaculture and Biodiversity Hydrocenoses (CENAKVA)**, go to the pages 60–72.

## Research and teaching capacity development of the FFPW USB and FA USB

In the spring of 2012, construction works of the new building began as part of the Operational program Science and Research for innovation. “Development of the Faculty of Agriculture USB and the Faculty of Fisheries and Protection of Waters USB”. The construction is happening at the site of the former Pavilion of agricultural equipment in the street Na Sádkách in České Budějovice. The project target is to

build adequate training capacities for the Institute of Aquaculture of the Faculty of Fisheries and Protection of Waters. The project implementation will ensure spaces for teaching, related science research and experimental activities. The main objective is to ensure conditions for the development of bachelor, master and doctoral studies linked to Science & Research activities. In the new building will be modern lecture

halls, auditoriums, teaching laboratories and offices for teachers and doctoral students. The project will have the space for appropriate physical facilities,

including laboratory and teaching equipment. The building is also prepared for the Faculty of Agriculture USB.

### FFPW USB modernization

The project target is complex modernization/re-construction of the building in Husova street in České Budějovice. At the same time there will be added instrumentation to achieve the target state of the top material and technical conditions for field-oriented courses of masters and Ph.D. degrees primarily linked to research and development activities of a dynamically evolving of the Faculty of Fisheries and Protection of Waters USB. Construction works were initiated in mid-2013 and recently we have started with the internal infrastructure. All newly proposed changes are intended to adapt the internal layout and operational links learning and research needs. Also technical con-

ditions for the accessibility of individual spaces for disabled students will be improved and of course the ICT (Information Communication Technology) will also undergo improvement. With a complete modernization of the building in Husova street the teaching and research facilities will conform to the standards of the 21<sup>st</sup> century. The project essentially improves conditions for the Laboratory of Controlled Reproduction and Intensive Fish Breeding, the Laboratory of Pond Aquaculture and Protection of Waters, the Laboratory of Nutrition and Fish Quality and the Laboratory Applied Hydrobiology.

### Accommodation and facilities for Ph.D. students

By the construction of this building "domeček" has been created operating premises, garages and accommodation for Ph.D. students. The construction was fully financed by the faculty financial resources, the total budget was 9.1 mil. CZK. An acceptance took

place in February 2012. Currently, the accommodation facilities are fully occupied by Ph.D. students. The faculty Management Office and the Investment and Business Office are further resided in the operational area.



The building called "domeček" located in Zátíší in Vodňany servicing as accommodation for Ph.D. students, also as an office for units of the faculty.



The visualisation of the reconstructed building in Husova street in České Budějovice.



The construction of the new building of the FFPW USB and the FA USB in Na Sádkách in České Budějovice. The facilities will be servicing for education and research and development.

### Reconstruction of the family house at the Experimental Fish Culture and Facility

The reconstruction of the family house at the Experimental Fish Culture and Facility in Vodňany was completed the 31<sup>st</sup> December 2012. The construction works are done by the companies DK IBEX, Ltd., and Smola Milan Elektromontáže. The Faculty of Fisheries

and Protection of Waters USB paid the investment in the amount of 1,635,677 CZK without VAT from its own resources. The building has been used by the facility manager.



The reconstructed family house at the Experimental Fish Culture and Facility of the FFPW USB in Vodňany.

## The reconstruction of the International Environmental Educational, Advisory and Information Center of Water Protection Vodňany (IEEAIC)

The reconstruction of the former “Brok’s (Wöflf’s) mill” building started in April 2012 with the support of the project of the Ministry of Environment (OP Environment) No. CZ.1.02/7.1.00/09.06274 International Environmental Educational, Advisory and Information Center of Water Protection Vodňany (responsible leader for the FFPW USB is Dipl.-Ing. Michal Hojdek, MBA). Prof. Dipl.-Ing. Otomar Linhart, D.Sc., the dean of the Faculty of Fisheries and Protection of Waters, the University of South Bohemia in České Budějovice, tapped the cornerstone of the new Center in June 2012. The ceremony related to the cornerstone of the IEEAIC’s building was attended by many VIPs from ministries, regional offices and regional companies. The building of the center of Water Protection IEEAIC

Vodňany was approved by the Building department of the Municipality in Vodňany at the end of 2013 and in 2014, all employees of the Unit of project managers and of the Unit of lifelong learning will move to its new premises. The center will finally dispose of adequate facility for fulfillment of its own activities.

The reconstructed object includes a large lecture hall for at least 100 people, two classrooms with a capacity of at least 25 and 45 students; office for ensuring permanent counseling services; technical background (copy room, dining room, etc.); accommodation with a capacity of 38 people in 20 rooms. Conferences and accommodation rooms have been available for renting since the beginning 2014.

Project budget:	Total expenses: 43,365,798 CZK
	Acknowledged expenses (OP ŽP): 29,346,069 CZK
	Not acknowledged expenses (funded by FFPW USB): 14,019,729 CZK



The object of the International Environmental Educational, Advisory and Information Center of Water Protection Vodňany before and during reconstruction.



Prof. Otomar Linhart, the dean of the FFPW USB, during the ceremony related to the cornerstone of the Center.



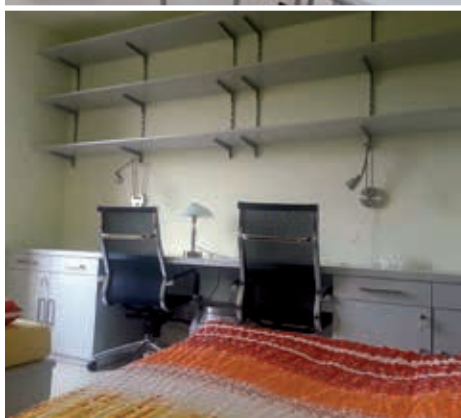
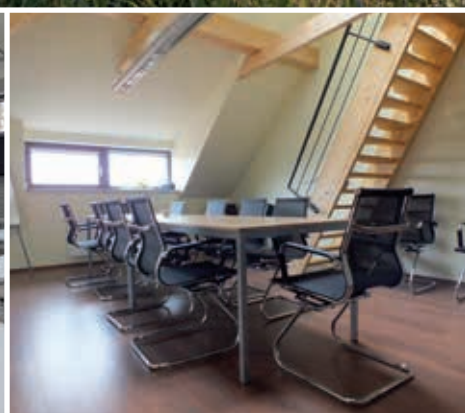


OPERAČNÍ PROGRAM  
ŽIVOTNÍ PROSTŘEDÍ



EVROPSKÁ UNIE  
Fond soudržnosti  
Evropský fond pro regionální rozvoj

Pro vodu,  
vzduch a přírodu



Exterior and interiors of the IEEAIC Vodňany.

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The unit primarily focuses on lifelong learning and publishing activities of the faculty. The organization of conferences, seminars, courses and workshops isn't provided only for the faculty staff, but also for the general public, companies and public services. In 2013, the unit cooperated in the organization of the international conference DIFA II (see page 122), the

Microscopy workshop (see page 122), the International summer schools and has prepared a number of other events (see pages 57–59). The language courses for the public are offered since the beginning of 2014. A part of the unit also provides publishing activities. List of publications on pages 78–91.

**LIFELONG LEARNING**

Educational seminars, courses and studies co-funded by the European Union and the State budget of the Czech Republic.

## International Summer Fishery Schools in Vodňany, and International Summer Biophysical Schools in Nové Hradý

### 2012

The 5<sup>th</sup> year of the International Summer schools took place at the Faculty of Fisheries and Protection of Waters, the University of South Bohemia in České Budějovice, Czech Republic, from 1<sup>st</sup> to 28<sup>th</sup> July 2012. The faculty hosted 5 foreign and 5 Czech university students in Vodňany and 20 high school students, 10 foreign and 5 Czech university students in Nové Hradý, who were working on interesting projects under the leadership of Ph.D. students of the faculty, as in previous years. The students were working under supervision in laboratories in the mornings and the

afternoons and evenings were devoted to the lectures and to the theoretical education in the field of fishery, water protection, and biophysics. There were also excursions and trips in the South Bohemian region included in the programme in 2012, it's worth mentioning e.g. the visit of the Fishery in Mydlovary, or the visit of the Institute of Science and Technology in Austria. The International summer schools 2012 were crowned by the Celebratory symposium, where the students presented their project outputs they were working on for four weeks.

### 2013

During the 6<sup>th</sup> year of the International Summer schools in 2013 (30. 6. – 26. 7. 2013) participated 14 foreign and 17 Czech students in Vodňany, 39 high school students, 7 foreign and 15 Czech university students in Nové Hradý. The lab work accompanied by lectures was revived by excursions, which took place every Thursday (Třeboň, Hluboká nad Vltavou, Nové Hradý, Austria). The Summer school 2013 was

also enriched by the sports day, accompanied by an informal seating around the campfire. The Celebratory symposium has only underlined a truly successful year of the Summer Schools 2013.

Both of these International summer schools were organized within the project of OP EK "Strengthening of excellence scientific teams in USB FFPW" (CZ.1.07/2.3.00/20.0024).

## Organization and managing of Professional fishery seminars in the years 2012–2013 (OP Fisheries, CZ.1.25/3.1.00/10.00302)

The professional fishery seminar devoted to the problems of fish-eating predators was prepared by the FFPW USB within the Fishing days in Vodňany 2012. The seminar was intended for representatives of federal fisheries, fisheries production and also for the fishing public. It was attended by 40 participants, professionals and laymen, from 17<sup>th</sup> to 18<sup>th</sup> May 2012. The seminar with a topic of Management and market-

ing in fishery was organized within the Fishing days in Vodňany 2013. It was held from 16<sup>th</sup> to 17<sup>th</sup> May 2013 and was attended by 15 people. Another in the series of seminars was held in early December (3.–4. 12. 2013), with the topic of Fisheries production. The seminar attracted more than 50 people, who were listening to the interesting lectures on various aspects of fish farming.

## Seminars, roadshows, lectures held by the project "scienceZoom"

During years 2012 and 2013, the Faculty of Fisheries and Protection of Waters USB presented a number of educational events, which showed to pupils of primary and secondary schools and to the general public, what the faculty is about. The most successful was the program called Roadshow, which introduced to

pupils science perceived with all senses. The lecturers Lukáš Pál and Roman Lunda uncovered to children the fish and crayfish empire. The lecturers from the Institute of complex systems FFPW USB, Prof. M.Sc. Petr Chvosta, Ph.D., and M.Sc. Naďa Štysová, presented to participants regular physical phenomena using simple





International Summer Fishery Schools in Vodňany in 2013 (top picture), the pupils from the primary schools in Sušice during roadshow (bottom pictures).

and fun experiments. The program had been attended by hundreds of school pupils in České Budějovice, Písek, Vlachovo Březí, Husinec, and Trhové Sviny.

In addition, a number of seminars were organized, in which our scientists presented various research – from crayfish seminars to seminars focused on hydro-biological topics or interests in the life of fish species. There were also a number of excursions in the Genet-

ic Fisheries Center or the Experimental Fish Culture and Facility in Vodňany.

The lectures were held in the restaurant Modrý dveře in České Budějovice, where the FFPW USB experts were discussing several topics (e.g.: Omega-3carp, new dangerous substances in water ambient) which was intended for the general public.

### Educative trail “Water is science”

This unusual educative trail was built during 2013 in Vodňany. Can we imagine when scientific problems are materialized in artist’s visions? Anyone can see the result at 5 locations in Vodňany from September 2013. The team of young sculptors under the leadership of Matěj Hájek from the Prague Trafačka made, in collaboration with FFPW USB scientists, sculptures, which illustrate various areas related to the water empire. The aim of the trail is to popularize research

problems, which are dealt with by our scientists. For example, a 3,5 m high pink crayfish and a swing in the style of Omega3carp were built in front of the faculty facilities. The trail is 4 kilometres long and take visitors through the picturesque spots of Vodňany. The trail was funded by the project “scienceZoom”.





Sculptures of the educative trail “Water is science” in Vodňany.

Processed by: M.Sc. Ivana Němcová and Klára Kovaříková, (IEEAIC and Lifelong learning), M.Sc. Lucie Hasilová, Dipl.-Ing. Vladimír Nedopil and Michal Černický (Faculty development)

South Bohemian  
Research  
Center

**CEDAKVA**

of Aquaculture  
and Biodiversity  
of Hydrocenoses



# CENAKVA

## SOUTH BOHEMIAN RESEARCH CENTER OF AQUACULTURE AND BIODIVERSITY OF HYDROCENOSSES

A top regional R & D Center in the South Bohemian region with an international reach has been built through the resources under the Operational Programme Research and Development for Innovation of the Ministry of Education. This Center specializes in applied and targeted research in the areas of fishery and water protection and creates conditions conducive to research and economic activity at the faculty. Reconstruction of three buildings of the FFPW in Vodňany was carried out. The buildings were equipped with unique technology to implement cutting-edge research and, last but not least, the project has enabled significant human resource development. The activities of The South Bohemian Research Center of Aquaculture and Biodiversity of Hydrocenoses were initiated in 2010. The implementation phase of the project was completed on 31<sup>st</sup> Decem-

ber 2013 during which 125 employees of the Faculty of Fisheries and Protection of Waters contributed to its implementation. A period of sustainability of the Center is followed by the end of 2018. It is already largely covered by the project "National program of sustainability I" designed just for successful centers of the OP R & D. The research Center CENAKVA and a sophisticated system of education serve as the foundation for quality national and international research and educational activities at the faculty. CENAKVA develops interdisciplinary oriented research programs which are combined into logical scientific units with a focus on 1) Nutrition and quality of fish, 2) Biology, protection and aquaculture of sturgeon, 3) Long-term sustainable aquaculture, 4) Biology and protection of crayfish, 5) Water quality, and 6) Extraction and management of experimental data.



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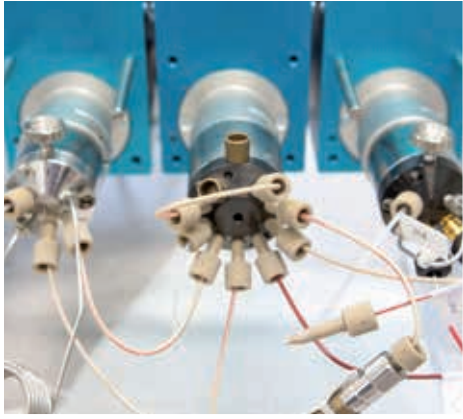
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## CONSTRUCTION PART

With respect to the implementation of the construction-technical part of the CENAKVA project, the infrastructure of three FFPW USB premises was adapted. Three buildings of the Center were built or reconstructed (including a trough rearing station) and the costs reached approximately CZK 102.5 million.

### a) The main building of the FFPW USB

It involves reconstruction, construction of the extension and superstructure to the main building of the FFPW USB at the address of Zátěší 728/II, 389 25 Vodňany, No. 344/3. In the main building, there are the dean's offices and the laboratories of the Research Institute of Fish Culture and Hydrobiology (see the organizing structure pages 6–7).





### **b) Genetic Fisheries Center**

It is a new building No. 389/3 in Vodňany. A non-productive facility containing capacities of a specialized experimental workplace designated for spawning, hatching and rearing of fish, mainly sturgeons. The object is used by the faculty staff, mainly by the Laboratory of Molecular and Quantitative Genetics and the Laboratory of Reproductive Physiology. The Genetic Fisheries Center is also used for teaching faculty students.



### **c) Experimental Fish Culture and Facility**

Construction works were implemented at the experimental premises of the FFPW USB that consist of the existing complex of experimental ponds and the Experimental Fish Culture facility. A trough rearing station was also built during the construction activities.



By implementing this investment venture a unique base for our own R&D activities in corresponding laboratories, experimental premises with relevant equipment, techniques and technologies and a corresponding administrative background was established. There are experiments carried out and the research is focused mainly on breeding technologies in aquaculture.

## DEVICES AND EQUIPMENT

Unique devices and equipment were bought from the project at a total value of approximately CZK 63 million. Key devices comprise, for example, a two-dimensional liquid chromatograph with a high-resolution mass spectrometer, an automatic sequenator, a flow cytometer, a microscope with a culture chamber

and an automated sample exchange system, UPLC with UV, etc. In addition to the key equipment, around 70 pieces of particular devices and equipment, such as microscopes, analytical balances, multimeters, freezing boxes, thermocyclers, centrifugal machines, and many other were also purchased.



The laboratory of Environmental Chemistry and Biochemistry with a two-dimensional liquid chromatograph.

## GRAND OPENING

The entire complex of buildings and laboratories of the research centre situated in Vodňany was inaugurated on 26<sup>th</sup> September 2013 at a ceremony participated by respected guests from a social sphere together with participants of the international scientific conference DIFA II. The guests were, for example, president of the Senate of the Czech Republic, Mr. Milan Štěch, rector of the University of South Bohemia, Prof. M.Sc. Libor Grubhoffer, Ph.D., or president of Fish Farmers Association of the Czech Republic Dipl.-

Ing. Jan Hůda, Ph.D. The guests symbolically let out siberian sturgeon on the new research premises and they wished the Center several significant research projects and international prestige. During the entire event, it was, among others, possible to visit all the Center's infrastructures and the tours were guided both by research and service workers of the Center who provided professional comments on individual buildings and laboratories. More than 400 guests took part in the event.



From the left: Prof. O. Linhart, the dean of the FFPW USB, Assoc. Prof. D. Škodová Parmová, the vice-rector for international relations USB, Prof. L. Grubhoffer, the rector of USB, Dipl.-Ing. F. Štágl, the councilor of the South Bohemian Region, Martin Kahanec, a worker of the FFPW USB, Dipl.-Ing. M. Karásek, the representative of the contractor IMOS, Inc., Dipl.-Ing. V. Blažčák, the mayor of the town Vodňany, M. Štěch, the president of the Senate of the Czech Republic.

## OUTCOMES

The project was fulfilled through 6 research programs.

### RP No. 1: Fish meat quality

In the course of 2010–2013, a technology for farming common carp with an increased content of omega-3 fatty acids was developed and successfully tested in practice within the RP No. 1. The technology was patent protected and the “Omega3carp” product has a registered trademark. In cooperation with the Department of Preventive Cardiology of the Institute of Clinical and Experimental Medicine, clinical tests were carried out with the aim to verify positive qualities of carp meat used for treatment of cardiovascular diseases. It was proven that “Omega3carp” meat

had a positive impact on lipids in plasma (HDL and LDL cholesterol, triglycerides) and marker of inflammation (CRP) and it thus had very valuable results in prevention and treatment of cardiovascular diseases. Next, a finishing feeding technology and a prediction of changes in composition of fatty acids by means of a diluting model in common carp and brook trout were tested. It was also succeeded to develop new fish products with a high content of omega-3 fatty acids (wine sausage, foie gras, frankfurters, etc.).

**The head of the research program Prof. Jana Pickova, Ph.D.;**  
**the deputy head Dipl.-Ing. Jan Mráz, Ph.D.**



J. Mráz, the deputy head of the research program, with the result of his research – a carp with an increased content of omega-3 fatty acids.

## RP No. 2: Caviar production technology

A rearing technology of early-life stages of sturgeon and a complete series of scientific studies concerning sperm physiology of sturgeons, an acrosome reaction, controlled reproduction, sperm cryoconservation and cryoresistance, protein fractions in seminal plasma and the impact of anti-androgenic substances on steroidogenesis in fish were published within the RP No. 2 of the CENAKVA Project. Laboratory members made significant progress in studying spontaneous polyploidy in sturgeon fish species and they considerably contributed to understanding the relationships between genome sizes and a content of DNA in cell nuclei in highly polyploid sturgeons. In the sphere of production of gynogenetic populations of starlet (*Acipenser ruthenus*) for caviar production, radiation protocols of sterlet sperm causing inactivation of DNA were developed, optimized and tested in operation. Subsequently, an FCA analysis of the genetic distance of analysed genotypes of parents and offspring showed that samples of emerged gynogenetic populations of sterlet clustered with maternal

genotypes and all tested individuals were bearing only maternal alleles on the SPL 101 informative locus. Female representation in these populations was expected to achieve up to 80%. Research of cryoconservation and transfer of primordial gonocytes, sterlet spermatogonia and oogonia started to develop with the aim to accelerate sterlet sexual maturation and thus to accelerate a rearing cycle under production conditions. Two utility models were registered. One of them comprised of a device designated for synchronization of flashes of a light source with video camera signal in order to monitor and record microscopic images of sperm and the second model involved a pressure unit used for induction of polyploidy in fish. The "Sturgeon Friendly Caviar" trademark was registered in the sphere of our own sturgeon caviar production in the Czech Republic, after that, it was registered in the EU and potential new acceding countries. By the end of 2013, the faculty's caviar was successfully introduced to the public and media and, at the same time, the first caviar was supplied to customers.

**The head of the research program Assoc. Prof. Dipl.-Ing. Martin Flajšhans, Dr.rer.agr.;**  
**the deputy head Prof. Dipl.-Ing. Otomar Linhart, D.Sc.**

STURGEON  FRIENDLY  
 CAVIAR



Trademark "Sturgeon Friendly Caviar"  
 from the faculty sturgeon caviar production  
 of *Acipenser baeri*.



### RP No. 3: Innovation of intensive production methods of commercially and recreationally important fish species

The most important applied outcome that originated within the RP No. 3 was to create and optimize production technologies employing a combination of pond and intensive fish farming for the production of quality juvenile pikeperch (*Sander lucioperca*). This activity resulted in a description of a very effective technological method of rearing of pikeperch larvae and juvenile fish to a stage of advanced fry in ponds with a subsequent transfer of fish into intensive rearing conditions using artificial pellet feeding. With respect to the above-mentioned technology, it was discovered that it was possible to gain high quality pikeperch stocks with a high survival rate and low production costs due to this production process. Within the basic research of the RP No. 3, dopamine

inhibition of LH secretion in experimental female brood tench (*Tinca tinca*) was identified for the first time. Based on this research, artificial hormonal induction of oocyte ovulation in tench in a dose of 10–20  $\mu\text{g}\cdot\text{kg}^{-1}$  mGnRH $\alpha$  was optimized. Despite a proven dopamine inhibition in this species, a requirement for a present application of GnRH $\alpha$  with a dopamine inhibitor under suboptimal temperature conditions was not recorded. Achieved results represented a significant shift in view of neuroendocrine regulation of LH secretion in tench and they also brought practically usable information on optimal use of hypothalamic hormones during controlled reproduction of tench females.

**The head of the research program Prof. Dipl.-Ing. Jan Kouřil, Ph.D.;**  
**the deputy head Assoc. Prof. Dipl.-Ing. Tomáš Polícar, Ph.D.**



Advanced fry of *Sander lucioperca*.



## RP No. 4: Development and innovation of systems for continuous water quality monitoring using fish and crayfish as bio-indicators with innovative approaches within management of water supply reservoirs

The main objective of the RP No. 4 was to create a system of continuous water quality monitoring using bio-indicators.

In 2011, a system for mediated monitoring of water quality based on non-invasive monitoring of crayfish heartbeat by means of infrared light was designed and established. Heartbeat data were processed by a specialized software programme using a signal frequency analysis that revealed the changes. In 2013, the system was improved with monitoring of crayfish movement by means of a video camera. A software programme for image processing distinguishing rest and active phases of crayfish was developed in order to detect movement. With reference to a complex conception of the research and related protection of native crayfish species which are also endangered by invasion of non-native crayfish species to a large extent, we focused on many biological aspects of both these groups. It mainly concerned growth and growth alternation issues, reproduction, crayfish plaque, artificial incubation, intensification of young crayfish culture, possibility of preventive and therapeutic interventions and toxicological studies. In terms of the research activities related to monitoring systems

using fish as bio-indicators, a methodology, that can be used for the monitoring systems we had already designed and installed at three key water works in the Czech Republic (Želivka, Káraný and Podolí) in the past, was processed. The objective of this methodology was to provide potential users of bio-monitoring devices using rainbow trout (*Oncorhynchus mykiss*) as a bio-indicator with information about technical solutions and installation of bio-monitoring units, a rearing technology of rainbow trout in the system, bio-indicative applications and possibilities of control of these systems.

A pilot system for the determination of 3D trajectories in small reservoirs was established for the use of fish as bio-indicators. The system employs depth map sensors for a robust determination of spatial coordinates of objects.

**The head of the research program**  
**Assoc. Prof. Dipl.-Ing.**  
**Pavel Kozák, Ph.D.;**  
**the deputy head**  
**Assoc. Prof. Dipl.-Ing.**  
**Tomáš Randák, Ph.D.**



P. Kozák, the head of a research program, with *Pacifastacus leniusculus*.

## **RP No. 5: Innovations related to monitoring of occurrence of extraneous substances in the environment, an assessment of the impact on exposed organisms and possibilities to eliminate pollution in waste water treatment processes**

In the course of the project, the research team of the RP No. 5 engaged in issues of monitoring, detection and fate of a large spectrum of extraneous compounds (mainly pharmaceutical preparations and pesticides) in the aquatic environment and they studied the impact of chemical pollution of waters on fish. Thanks to the financial support of the project, 3 modern analytical instruments were bought and put into operation – a liquid chromatograph with a tandem mass detection, a gas chromatograph with a tandem mass spectrometer and a two-dimensional liquid spectrometer with a high-resolution mass spectrometer. These instruments enabled to detect a wide spectrum of polar and non-polar contaminants

at environmentally relevant concentration levels and also to implement metabolomic studies. The research team of the RP No. 5 in the course of the project published or participated in publication of results in more than 50 scientific articles in impacted journals, 5 methodologies, 1 technology and 1 monograph. At the same time, more than 20 commercial contracts for the application sphere that focused mainly on bio-monitoring, development of new analytical methods and detection of extraneous compounds in the components of the aquatic environment at the total amount of approximately 5 million CZK were also implemented.

**The head of the research program Assoc. Prof. Dipl.-Ing. Tomáš Randák, Ph.D.;  
the deputy head M.Sc. Roman Grabic, Ph.D.**



Two-dimensional liquid chromatograph in the Laboratory of Environmental Chemistry and Biochemistry.


## RP No. 6: Establishment and use of a systematic knowledge base for the development of experimental technologies

The content of the research program involved establishment of innovative methods in the sphere of gaining and further processing of experimental data. In the course of the project, several main outcomes were achieved that formed a functional complex which fulfilled the objectives of the programme. Accreditation of the Laboratory of Tissue Culture in compliance with the standard CSN EN ISO/IEC 17025:2005 established space for obtaining experimental data in the microscopy and material bio-compatibility spheres. Development of an analysis method for microscopic images based on information theory enabled automatic and objective processing of these data. The development of a method of an automatic LC-MS data analysis (metabolomics and proteomics), that was based on an idea of searching of

anomalies in noise in high resolution spectra and on automatic detection of isotopes and fragments, enabled detection of significant substances that remained otherwise hidden in noise. The system analysing the crayfish heartbeat developed in cooperation with RP No. 4 provided a simple and a fast tool for the determination of water pollution or assessment of behaviour at different stimuli. An innovative system for the experimental data management providing support from the first experiment draft up to the data sharing enabled to comply with a high standard of experimental data treatment produced and processed within the research activity. The results achieved in the programme formed not only a compact package of solutions but they also demonstrated cooperation among the research programmes.

**The head of the research program Dipl.-Ing. Petr Císař, Ph.D.;**  
**the deputy head Dipl.-Ing. Štěpán Papáček, Ph.D.**

## FINANCING OF THE CENTER

	<b>Contribution of the European Union:</b>	<b>214,527,018 CZK</b>
	<b>Contribution from the state budget:</b>	<b>37,857,709 CZK</b>
	<b>Total contribution:</b>	<b>252,384,727 CZK</b>

## FUTURE OF THE CENTER

The CENAKVA Project sustainability is ensured by the following project funded from the National Sustainability Programme I. until 2018. The project is titled Sustainability and Excellence of Center of Aquaculture and Biodiversity of Hydrocenoses (CENAKVA II). The Faculty of Fisheries and Protection of Waters has received a grant in an amount of CZK 123,780,000 for the implementation of this project from the Ministry of Education, Youth and Sports. Total costs of this project are almost double. We expect that thanks to the Center in the next ten years the faculty will become a European, scientific,

research, innovation, educational and information leader in freshwater fisheries, aquaculture and protection of waters. We are going to use our independent science, research, development, innovation, information systems and competent professionals who we employ or we have trained, or who will be employed in the future. We believe that Europe will need our opinion or a close cooperation for the development of fisheries, aquaculture and water management for their decision-making mechanisms and our graduates will be required at the European labour market.

## HUMAN RESOURCES

The Center and the faculty have a high quality academic staff, including the number of significant R & D teaching authorities recognized in their field both at home and abroad. We have favourable average age for the further development and increasing number of workers from different countries. We manage very well the system of tenders and recruitment of new employees. We follow a strict rule and recruit the highest quality of new employees with professional and language skills (knowledge of English). We have a clearly defined career system with predetermined

milestones and benefits for each type positions. We carry out ongoing, regular evaluation and assessment of the faculty staff incl. determination of long-term and short-term tasks. The team of the faculty is dynamic and ambitious with a high degree of enthusiasm. Most employees of the FFPW USB are loyal and dedicated to the faculty. There is a permanent interest of doctoral students to return to the environment of the faculty after completing their post-doctoral internship and further develop activities of the FFPW USB.



Collective of the Faculty and the Center in June 2012.



Collective of the Faculty and the Center in June 2014.

# 02

## OUR ACTIVITIES:

SCIENTIFIC ACTIVITIES  
EDUCATION AND  
TEACHING ACTIVITIES  
INTERNATIONAL ACTIVITIES  
PROMOTION



## RESEARCH PROJECTS 2012–2013

### PROJECTS SUPPORTED BY THE MINISTRY OF EDUCATION, YOUTH AND SPORT OF THE CZECH REPUBLIC

- CZ.1.05/2.1.00/01.0024 South Bohemian Research Center of Aquaculture and Biodiversity of Hydrocenoses (2010–2013, responsible leader Prof. Dipl.-Ing. Otomar Linhart, D.Sc.)
- CZ.1.07/2.3.00/20.0024 Strengthening of excellence scientific teams in USB FFPW (2011–2014, responsible leader Prof. Dipl.-Ing. Otomar Linhart, D.Sc.)
- CZ.1.07/2.3.00/09.0203 Education for South Bohemia research capacity (2009–2012, responsible leader M.Sc. Tomáš Rolinek)
- CZ.1.07/2.3.00/30.0006 The creation of postdoc positions at the University of South Bohemia and the support of intersectional mobility by expert stays at the foreign leading R&D institutions (2012–2015, responsible leader Prof. Dipl.-Ing. Otomar Linhart, D.Sc.)
- CZ.1.05/4.1.00/04.0190 Development of the Agricultural faculty and of the Faculty of fisheries and Protection of Waters – development of USB AF and USB FFPW (2011–2014, responsible leader Dipl.-Ing. Václav Lukeš)
- CZ.1.07/2.3.00/30.0049 The Development of postdoc positions at the USB (2012–2015, responsible leader for the FFPW USB M.A. Jiří Koleček)
- CZ.1.07/2.3.00/35.0001 ScienceZOOM – popularization R & D at the USB (2012–2014, responsible leader for the FFPW USB M.Sc. Miroslav Boček)
- CZ.1.07/1.1.14/01.0037 Youth Club II – Support of the technical and natural sciences education at secondary school (2012–2014, responsible leader Prof. M.Sc. Štys Dalibor, Ph.D.)
- CZ.1.05/3.1.00/10.0214 South Bohemian University and Academic CTT (2012–2015, responsible leader for the FFPW USB Dipl.-Ing. Václav Nebeský)
- CZ.1.05/4.1.00/11.0257 Modernization of FFPW USB (2013–2015, responsible leader Dipl.-Ing. Václav Lukeš)
- CZ.1.07/2.2.00/15.0076 Innovation of full-time bachelor's study program Fisheries (2010–2013, responsible leader Dipl.-Ing. Pavel Vejsada, Ph.D.)
- CZ.1.07/1.1.10/02.0072 Development and innovation of environmental programme in primary and high schools (2010–2012, responsible leader Dipl.-Ing. Blanka Vykusová, Ph.D.)
- CZ.1.07/1.1.14/02.0052 Natural and technical science without barriers (09/2013–12/2014, responsible leader Dipl.-Ing. Petr Císař, Ph.D.)

### Bilateral projects – Programme KONTAKT

- ME10126 Environmental and hormonal induction of spawning, anesthesia, ontogenetic development and rearing of chosen fish species (2010–2012, responsible leader Prof. Dipl.-Ing. Jan Kouřil, Ph.D.)
- ME10125 Modern methods of intensive culture of European native crayfish with the aim to increase their occurrence in running waters (2010–2012, responsible leader Assoc. Prof. Dipl.-Ing. Tomáš Polícar, Ph.D.)
- ME10015 The using of sex reverse and proteomic analysis in frozen sperm of paddlefish for production of caviar (2010–2012, responsible leader Prof. Dipl.-Ing. Otomar Linhart, D.Sc.)
- ME09016 The role of WrbA protein in life (2009–2012, responsible leader Assoc. Prof. M.Sc. Ivana Kutá Smatanová, Ph.D.)
- LH12179 Identification of emerging pollutants of aquatic ecosystems in the Yangtze River using passive sampler/massspectrometry approach (2012–2014, responsible leader Assoc. Prof. Dipl.-Ing. Vladimír Žlábek, Ph.D.)
- LH13246 Biotechnological approaches in reproduction of freshwater fish (03/2013–12/2014, responsible leader prof. Dipl.-Ing. Otomar Linhart, D.Sc.)

### Projects of international cooperation – Programme COST

- FA-0801 LARVANET Critical success factors for fish larval production in European aquaculture: a multidisciplinary network (2009–2013, responsible leader for the FFPW USB Assoc. Prof. M.Sc. Zdeněk Adámek, Ph.D.)
- LD-11011 Adventure and benefit from crystallization of higher plants membrane protein complex following its structural studies (2011–2013, responsible leader Assoc. Prof. M.Sc. Ivana Kutá Smatanová, Ph.D.)
- FA 1205 Assessing and improving the quality of aquatic animal gametes to enhance aquatic resources – The need to harmonize and standardize evolving methodologies, and improve transfer from academia to industry (11/2012–11/2016, responsible leader for the FFPW USB Dipl.-Ing. Martin Pšenička, Ph.D.)

### University development fund

- Implementation of teaching of the subject Zoogeography at the Faculty of Fisheries and Protection of Waters University of South Bohemia in České Budějovice (2012, responsible leader M.Sc. Bořek Drozd, Ph.D.)

### Aktion

- 65p3 Genetic structure and communities of epibionts in native crayfish species populations with the respect to conservation strategies (09/2012–09/2013, responsible leader Dipl.-Ing. Martin Bláha, Ph.D.)
- 63p15 Microscopy of living cells (2012, responsible leader Prof. M.Sc. Dalibor Štys, Ph.D.)
- 63p7 Microscopy of living cells (07/2013–06/2014, responsible leader Prof. M.Sc. Dalibor Štys, Ph.D.)

### Development programmes

- Project management of the R & D projects at the FFPW USB (2012, responsible leader Assoc. Prof. Dipl.-Ing. Tomáš Polícar, Ph.D.)
- Strengthening of linguistic and professional skills of the students and staff of the FFPW USB (2012, responsible leader Dipl.-Ing. Martin Kocour, Ph.D.)

- Continued internationalization of the FFPW USB through strengthening international mobility (2012, responsible leader Assoc. Prof. Dip.-Ing. Martin Flajšhans, Dr.rer.agr.)
- Promotional and marketing activities of the FFPW USB (2012, responsible leader Dipl.-Ing. Václav Nebeský)
- Development of the IT at the FFPW USB (2012, responsible leader Dipl.-Ing. Marek Rodina, Ph.D.)
- Support of the FFPW USB internationalization (2013, responsible leader Dipl.-Ing. Vojtěch Kašpar, Ph.D.)
- Support of the FFPW USB with application sphere and public (2013, responsible leader Dipl.-Ing. Václav Nebeský)
- Communication, market research, promotion and marketing at the FFPW USB (2013, responsible leader Dipl.-Ing. Václav Nebeský)
- Development of staffs' skills and life-long learning at the FFPW USB (2013, responsible leader Dipl.-Ing. Martin Kocour, Ph.D.)

## PROJECTS SUPPORTED BY THE MINISTRY OF AGRICULTURE

### Projects of National Agency for Agricultural Research

- QH82117 Environment friendly and effective pond management with maximal utilisation of current trophic potential and sustainable good water quality and fish production (2008–2012, responsible leader Dipl.-Ing. Jana Máčková, Ph.D.)
- QH82118 Maintenance of biodiversity in cultured breeds of common carp (2008–2012, responsible leader Dipl.-Ing. Martin Kocour, Ph.D.)
- QH82119 Research of sperm and embryos cryopreservation (2008–2012, responsible leader Prof. Dipl.-Ing. Otomar Linhart, D.Sc.)
- QJ101C033 Development and optimization of intensive culture in pikeperch (*Sander lucioperca*) and perch (*Perca fluviatilis*) in the Czech Republic (2010–2014, responsible leader Assoc. Prof. Dipl.-Ing. Tomáš Polícar, Ph.D.)
- QJ1210237 Prophylaxis of serious infectious diseases of carp fish (2012–2016, responsible leader Veronika Piačková, DVM, Ph.D.)
- QJ1210013 Technology of the freshwater fish breeding with using of re-circulatory systems of Danish type focused on the methods of effective treatment of environment and veterinary care (2012–2016, responsible leader for the FFPW USB Prof. Dipl.-Ing. Jan Kouřil, Ph.D.)

### Other grants

- National programme for conservation and utilization of genetic resources of farm animals – Maintenance of genetic resources in fish (responsible leader Assoc. Prof. Dipl.-Ing. Martin Flajšhans, Dr.rer.agr.)
- Subsidiary programme 2.A.e.1a) Maintenance and improving of genetic quality of farm animals and plants, Controls of performance – fish (responsible leader Assoc. Prof. Dipl.-Ing. Martin Flajšhans, Dr.rer.agr.)

### OP Fisheries

- CZ.1.25/3.1.00/11.00301 Preparation and publication of methodological publications in 2011 (2011–2013, responsible leader Dipl.-Ing. Blanka Vykusová, Ph.D.)
- CZ.1.25/3.1.00/11.00302 Preparation and publishing of 47th volume of the special quarterly Bulletin VÚRH Vodňany (2011–2013, responsible leader Dipl.-Ing. Blanka Vykusová, Ph.D.)
- CZ.1.25/3.1.00/11.00303 Preparation and publishing of professional publications 2011 (2011–2013 responsible leader Dipl.-Ing. Blanka Vykusová, Ph.D.)
- CZ.1.25/3.1.00/11.00379 Preparation and publication of the 48th volume of professional Bulletin VÚRH Vodňany (2012–2014, responsible leader Dipl.-Ing. Blanka Vykusová, Ph.D.)
- CZ.1.25/3.1.00/11.00381 Preparation and publication of methodological publications 2012 (2012–2014, responsible leader Dipl.-Ing. Blanka Vykusová, Ph.D.)
- CZ.1.25/3.1.00/10.00302 Specialized seminars on fishery (2012–2014, responsible leader Dipl.-Ing. Blanka Vykusová, Ph.D.)
- CZ.1.25/3.1.00/11.00380 Preparation and publication of technical book focused on the issue of fish migrations (2012–2014, responsible leader Dipl.-Ing. Blanka Vykusová, Ph.D.)
- CZ.1.25/3.1.00/11.00376 Preparation and publication of technical book focused on gastronomy of aquaculture products and quality of fishery products (2012–2014, responsible leader Dipl.-Ing. Blanka Vykusová, Ph.D.)
- CZ.1.25/3.4.00/11.00388 Feeding of carp with various grain feeds: the economy of breeding and effects on water quality in ponds (2012, Třeboň Fishery, responsible leader for the USB FFPW Dipl.-Ing. Jan Másilko)
- CZ.1.25/3.4.00/11.00375 Development of culture technology for adaptation and intensive rearing of larvae and juveniles in pike (*Esox lucius* L.). (2012, Fishery Nové Hradky, responsible leader for the USB FFPW Assoc. Prof. Dipl.-Ing. Tomáš Polícar, Ph.D.)
- CZ.1.25/3.4.00/11.00395 Practical verification of finishing feeding technology in brook trout culture under conditions of the Czech Republic (2012, Fishery Klatovy, responsible leader for the USB FFPW Dipl.-Ing. Jan Mráz, Ph.D.)
- CZ.1.25/3.4.00/11.00400 The use of recirculating hatchery for egg incubation and rearing of *Salvelinus fontinalis* and *Salvelinus alpinus* crossbreed (2012, Trout farm MLÝNY, responsible leader for the USB FFPW Prof. Dipl.-Ing. Jan Kouřil, Ph.D.)
- CZ.1.25/3.4.00/11.00397 Verification of culture technology producing high quality pike (*Esox lucius* L.) juveniles (2012, Nové Hradky Fishery, responsible leader for the USB FFPW Assoc. Prof. Dipl.-Ing. Tomáš Polícar, Ph.D.)
- CZ.1.25/3.1.00/11.00258 The development of siberian sturgeon intensive breeding in RAS as complementary fish species (2012, Trout Fishery MLÝNY, responsible leader for the FFPW USB Dipl.-Ing. David Gela, Ph.D.)
- CZ.1.25/3.1.00/11.00271 Development of technology for larval feeding adaptation of pike on pelleted feed and intensive farming in RAS (2012, Nové Hradky Fishery, responsible leader for the USB FFPW Assoc. Prof. Dipl.-Ing. Tomáš Polícar, Ph.D.)
- CZ.1.25/3.1.00/11.00257 Development of technology for disposal of sludge from recirculating aquaculture system for fish culture using vermicomposting (2012, Trout farm MLÝNY, responsible leader for the USB FFPW Dipl.-Ing. Antonín Kouba, Ph.D.)
- CZ.1.25/3.4.00/11.00389 The use of paracetic acid in the technology of breeding of common carp (*Cyprinus carpio* L.) (2012–2013, Fishery Třeboň, responsible leader for the FFPW USB Eliška Zusková, DVM, Ph.D.)
- CZ.1.25/3.4.00/11.00373 Controlled reproduction and rearing fry of vimba (*Vimba vimba*) under controlled conditions (2012–2013, Mariánské Lázně Fishery, responsible leader for the USB FFPW Assoc. Prof. Dipl.-Ing. Pavel Kozák, Ph.D.)

- CZ.1.25/3.4.00/11.00374 Verification of technology of mass induction of triploidy in brook trout under operational conditions (2012–2013, Trout farm Kaplice, responsible leader for the USB FFPW Assoc. Prof. Dipl.-Ing. Martin Flajšhans, Dr.rer.agr.)

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- CZ.1.25/3.1.00/11.00270 Development of novel fish products utilizing by-products from freshwater fish processing (2012–2013, Fish Processing Plant Klatovy, responsible leader for the FFPW USB Dipl.-Ing. Jan Mráz, Ph.D.)

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- CZ.1.25/3.1.00/11.00293 Product development based mechanically shredded fish meat (2012–2013, FISH MARKET, responsible leader for the USB FFPW Assoc. Prof. Dipl.-Ing. František Vácha, Ph.D.)

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- CZ.1.25/3.4.00/10.00316 Practical evaluation of effects of nutrition and purging on omega-3 fatty acids content in carp flesh (2011–2012, Fishery Blatenská Ryba, responsible leader for the FFPW USB Dipl.-Ing. Jan Mráz, Ph.D.)

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- CZ.1.25/3.4.00/10.00314 Verification of current rearing technology Salmonids fish for production a market brook trout, Arctic charr and its hybrids (2011–2012, Fishery Litomyšl, responsible leader for the FFPW USB Prof. Dipl.-Ing. Jan Kouřil, Ph.D.)

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- CZ.1.25/3.1.00/12.00124 Extending shelf life of chilled fish products (04/2013–09/2014, Fishery Chlumec nad Cidlinou, responsible leader for the FFPW USB Dipl.-Ing. Jan Mráz, Ph.D.)

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- CZ.1.25/3.4.00/12.0075 Verification of the technology of hatching substrates in brown trout (*Salmo trutta m. fario*) (09/2013–11/2014, Fishery Litomyšl, responsible leader for the FFPW USB Dipl.-Ing. Viktor Švinger, Ph.D.)

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- CZ.1.25/3.4.00/13.00467 The use of recirculation systems (RAS) in nase (*Chondrostoma nasus*) fry culture (09/2013–06/2014, FISH Farm Bohemia, responsible leader for the FFPW USB Assoc. Prof. Dipl.-Ing. Pavel Kozák, Ph.D.)

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- CZ.1.25/3.4.00/12.00448 Products from separated smoked fish flesh (11/2013–11/2014, FISH MARKET, responsible leader for the FFPW USB Assoc. Prof. Dipl.-Ing. František Vácha, Ph.D.)

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- CZ.1.25/3.4.00/12.00118 Verification of technology for successful propagation and production of advanced fry of burbot (12/2013–11/2014, Fishery Nové Hradý, responsible leader for the FFPW USB Assoc. Prof. Dipl.-Ing. Tomáš Polícar, Ph.D.)

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- CZ.1.25/3.4.00/12.00444 Verification of current salmonid culture technology for rearing of *Salvelinus umbla* and its hybrids (12/2013–11/2014, Fishery Litomyšl, responsible leader for the FFPW USB Prof. Dipl.-Ing. Jan Kouřil, Ph.D.)

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- CZ.1.25/3.4.00/12.00107 *In situ* analyses of fat content and composition in freshwater fish flesh – implementation to aquaculture practise (2013, Fishery Klatovy, responsible leader for the FFPW USB Dipl.-Ing. Jan Mráz, Ph.D.)

## PROJECTS SUPPORTED BY THE GRANT AGENCY OF THE CZECH REPUBLIC

- P503/11/1130 Effect of environmental levels of selected pharmaceuticals on rainbow trout (*Oncorhynchus mykiss*) and fish cell culture models (2011–2015, responsible leader Assoc. Prof. Dipl.-Ing. Tomáš Randák, Ph.D.)

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- 207/11/0717 Molecular mechanism of autocatalytic trans-splicing of the RTX protein FrpC of *Neisseria meningitidis* (2011–2015, responsible leader for the FFPW USB Assoc. Prof. M.Sc. Ivana Kutá, Ph.D.)

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- 207/12/0775 Structure-functional relationships of haloalkane dehalogenases (2012–2016, responsible leader Assoc. Prof. M.Sc. Ivana Kutá Smatanová, Ph.D.)

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- P502/12/P177 Basic biology of crayfish sperm with emphasis on the molecular and morphological modifications during capacitation and acrosome reaction (2012–2014, responsible leader Dipl.-Ing. Antonín Kouba, Ph.D.)

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- P503/12/P165 Newly emerging endocrine disruptors in aquatic environment and their effect on fish (2012–2014, responsible leader Dipl.-Ing. Hana Kocour Kroupová, Ph.D.)

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- P502/12/1973 Characterization of swimming fish sperm flagella: biophysical quantification (2012–2015, responsible leader Jacky Cosson, Ph.D., Dr.h.c.)

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- P503/12/1834 Identification of epigenetic biomarkers of male germ cell disorders linked to adverse environmental factors (2012–2015, responsible leader for the FFPW USB M.Sc. Sayeed Mohammad Hadi Alavi, Ph.D.)

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- P505/12/0545 Diversity of native and invasive crayfish in Central Europe: from population genetic structure and reproductive modes to conservation and systematics (2012–2015, responsible leader for the FFPW USB Assoc. Prof. Dipl.-Ing. Pavel Kozák, Ph.D.)

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- GA523/08/0824 Relationships of ploidy level, genome and cell size in model polyploid fish with cytological and physiological impacts on conservation and culture (2008–2012, responsible leader Assoc. Prof. Dipl.-Ing. Martin Flajšhans, Dr.rer.agr.)

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- GA523/09/1793 The effect of endocrine disruptors on the reproduction parameters and gene expression in chosen gene of mouse and fish gonads (2009–2012, responsible leader for the FFPW USB M.Sc. Sayeed Mohammad Hadi Alavi, Ph.D.)

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- GPP502/10/P426 Fertilisation process in sturgeon, function of acrosom and prevention polysperm (2010–2012, responsible leader Dipl.-Ing. Martin Pšenička, Ph.D.)

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- GPP503/10/P492 Study of pathomorphological and pathophysiological changes in fish after their exposure to nitrites (2010–2012, responsible leader Eliška Sudová, DVM, Ph.D.)

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- 502/11/0090 Maturation and ageing of fish spermatozoa: A comparative study between teleostean and chondrosteian fish species as taxonomically distant models (2011–2015, responsible leader Dipl.-Ing. Marek Rodina, Ph.D.)

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- P503/13/34049P The toxicoproteomic: the potential for identification of new biomarkers in male fertility (02/2013–12/2015, responsible leader M.Sc. Azadeh Hatfeh, Ph.D.)

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- P502/13/39438P Neuroendocrine regulation of ovulation and spermiation in Cypriniformes (02/2013–12/2015, responsible leader M.Sc. Peter Podhorec, Ph.D.)

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- P502/13/26952S Induction of chimerism by transplantation of germ stem cells in critically endangered sturgeons as a tool of their conservation (02/2013–12/2017, responsible leader Dipl.-Ing. Martin Pšenička, Ph.D.)

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- P503/13/01543S Influence of cadmium and mercury compounds and fish lipids on cell lipid metabolism, oxidative stress and cell viability (02/2013–12/2015, responsible leader M.Sc. Sabine Sampels, Ph.D.)

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- P503/13/12477S Transport of pharmaceuticals in soils (02/2013–12/2017, responsible leader for the FFPW USB M.Sc. Roman Grabic, Ph.D.)

## PROJECTS SUPPORTED BY THE GRANT AGENCY OF THE CZECH ACADEMY OF SCIENCE

- IAA608030801 Diversity of bioenergetics pathways, membrane functions, signaling mechanisms and proteomics of cryopreserved sperm of evolutionary different fish species (2008–2012, responsible leader Prof. Dipl.-Ing. Otomar Linhart, D.Sc.)

## PROJECTS SUPPORTED BY THE GRANT AGENCY OF THE UNIVERSITY OF SOUTH BOHEMIA

- 046/2010/Z Reproduction and genetics of selected model species of teleostean and chondrosteian fish (2010–2012, responsible leader Prof. Dipl.-Ing. Otomar Linhart, D.Sc.)
- 047/2010/Z Breeding and environmental aspects of aquaculture and hydrocoenoses (2010–2012, responsible leader Assoc. Prof. Dipl.-Ing. Martin Flajšhans, Dr.rer.agr.)
- 152/2010/Z Model-based analysis of experiment and observation in applied biology microclimatology (2010–2012, responsible leader Prof. M.Sc. Dalibor Štys, Ph.D.)
- 003/2012/Z Genetic diversity of *Thymallus thymallus* in Central European rivers (2012, responsible leader Dipl.-Ing. Miloš Havelka, Ph.D.)
- 022/2012/Z Effect of environmental concentration of prometryne and its metabolites on non-target organisms of the aquatic ekosysteme (2012, responsible leader Dipl.-Ing. Alžběta Stará)
- 023/2012/Z Evaluation of spermiation indices and protein composition of seminal plasma in sterlet (*A. ruthenus*) during short-term storage (2012, responsible leader M.Sc. Anna Shaliutina, Ph.D.)
- 024/2012/Z Fish sperm motility: new quality parameters obtained by flagellar analysis (2012, responsible leader M.Sc. Volodymyr Bondarenko)
- 025/2012/Z Sperm morphology, ATP contents and motility traits during short-term storage in pikeperch (*Sander lucioperca*) – an application to develop artificial reproduction (2012, responsible leader Dipl.-Ing. Jiří Křížan, Ph.D.)
- 061/2012/Z High doses of GnRH $\alpha$  emulsified using Freund incomplete adjuvants in combination with an inhibitor of dopamine in the induction of ovulation in pike (*Esox lucius*) (2012, responsible leader Dipl.-Ing. Viktor Švinger, Ph.D.)
- 080/2013/Z Induction of germ-line chimerism by transplantation of tench (*Tinca tinca*) primordial germ cells into white cloud mountain minnow (*Tanichthys albonubes*) (2013–2014, responsible leader M.Sc. Zuzana Linhartová)
- 114/2013/Z New methods and biotechnological approaches in fish reproduction and genetics (2013–2015, responsible leader Prof. Dipl.-Ing. Otomar Linhart, D.Sc.)
- 074/2013/Z Optimization of breeding aspects of the pond and intensive aquaculture (2013–2015, responsible leader Assoc. Prof. Dipl.-Ing. Tomáš Polícar, Ph.D.)
- 087/2013/Z Bioindication, new approaches to the evaluation of the contamination of hydrocoenoses and health aspects in fish farming (2013–2015, responsible leader Assoc. Prof. Dipl.-Ing. Tomáš Randák, Ph.D.)
- 134/2013/Z Selected complexity phenomena in condensed phase: experiment development and theory (2013–2015, responsible Prof. M.Sc. Dalibor Štys, Ph.D.)
- 125/2013/Z Toxic influence and bioconcentration of the human drug athenol on rainbow trout (*Oncorhynchus mykiss*) (2013, responsible leader Dipl. Biol. Christoph Antonius Steinbach)
- 067/2013/Z Modulations in neuroendocrine regulation of steroidogenesis in male goldfish exposed to anti-androgen vinclozolin (2013, responsible leader M.Sc. Mahdi Golshan)
- 086/2013/Z Optimization of gynogenesis in sturgeons (2013, responsible leader M.Sc. Ievgen Lebeda)

## INTERNATIONAL RESEARCH PROJECTS

### Seventh Framework Programme

- AQUAEXCEL – Aquaculture infrastructures for excellence for European fish research (2011–2015, responsible leader for the FFPW USB Prof. Dipl.-Ing. Otomar Linhart, D.Sc.)
- 613912, TRAF00N – Traditional Food Network to improve the transfer of knowledge for innovation (11/2013–10/2016, responsible leader for the FFPW USB Assoc. Prof. Dipl.-Ing. Tomáš Polícar, Ph.D.)

## PROJECTS SUPPORTED BY THE TECHNOLOGY AGENCY OF THE CZECH REPUBLIC

- TA01010214 Distributed, knowledge-based repository for large datasets for biology, food safety and other biology applications (2011–2015, responsible leader Dipl.-Ing. Petr Čisář, Ph.D.)

## PROJECTS OF INTERREG IVC

- LakeAdmin – Regional administration of lake restoration initiatives (2012–2014, responsible leader M.A. Jiří Koleček and M.Sc. Ivana Němcová)

## PROJECTS OF THE MINISTRY OF THE ENVIRONMENT

- CZ.1.02/7.1.00/09.06274 International Environmental Educational, Advisory and Information Center of Water Protection Vodňany (2012–2013, responsible leader Dipl.-Ing. Michal Hojdecký, MBA)

## EUROPEAN TERRITORIAL CO-OPERATION AUSTRIA – CZECH REPUBLIC 2007–2013

- Crossborder cooperation in the field of fisheries and aquaculture Waldviertel – South Bohemia (07/2013–09/2014, responsible leader for the FFPW USB Assoc. Prof. M.Sc. Zdeněk Adáček, Ph.D.)
- The role of small multipurpose water reservoirs in the sustainability of biodiversity in natural environment of South Bohemia and Lower Austria (1/2014–8/2014, responsible leader for the FFPW USB Assoc. Prof. M.Sc. Zdeněk Adáček, Ph.D.)

## LIST OF PUBLICATIONS AND PUBLISHING 2012–2013

## 2012

## PAPERS IN JOURNALS IN WEB OF SCIENCE (TOTAL 88)

- Alavi, S., Hatef, A., Mylonas, C., Gela, D., Papadaki, M., Rodina, M., Kašpar, V., Pšenička, M., Podhorec, P., Linhart, O., 2012. Sperm characteristics and androgens in *Acipenser ruthenus* after induction of spermiation by carp pituitary extract or GnRH $\alpha$  implants. *Fish Physiology and Biochemistry* 38 (6): 1655–1666.
- Alavi, S., Hatef, A., Pšenička, M., Kašpar, V., Boryshpolets, S., Dzyuba, B., Cosson, J., Bondarenko, V., Rodina, M., Gela, D., Linhart, O., 2012. Sperm biology and control of reproduction in sturgeon: (II) sperm morphology, acrosome reaction, motility and cryopreservation. *Reviews In Fish Biology And Fisheries* 22 (12): 861–886.
- Alavi, S., Rodina, M., Gela, D., Linhart, O., 2012. Sperm biology and control of reproduction in sturgeon: (I) testicular development, sperm maturation and seminal plasma characteristics. *Reviews In Fish Biology And Fisheries* 22 (3): 695–717.
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- Andrejij, J., Dvořák, P., Dvořáková Lišková, Z., Massányi, P., Straňna, I., Nad, P., Skalická, M., 2012. Content of selected metals in muscle of cyprinid fish species from the Nitra River, Slovakia. *Neuroendocrinology Letters* 33 (3–4): 84–89.
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- Černoch, I., Franěk, M., Diblíková, I., Hilscherová, K., Randák, T., Ocelka, T., Blaha, L., 2012. POCIS sampling in combination with ELISA: Screening of sulfonamide residues in surface and waste waters. *Journal of Environmental Monitoring* 14 (1): 250–257.
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Institute	Laboratory	Worker	2012	2013
<b>RIFCH</b>	Laboratory of Ethology of Fish and Crayfish	Assoc. Prof. Dipl.-Ing. Pavel Kozák, Ph.D.	36	47
		Dipl.-Ing. Miloš Buřič, Ph.D.	14	16
		Dipl.-Ing. Martin Bláha, Ph.D.	4	2
		Dipl.-Ing. Antonín Kouba, Ph.D.	11	28
		M.Sc. Hamid Niksirat Hashjin	5	9
		M.Sc. Iryna Kuklina	0	1
		Dipl.-Ing. Václav Nebeský	0	1
	Laboratory of Intensive Aquaculture	Assoc. Prof. Dipl.-Ing. Tomáš Policar, Ph.D.	38	33
		Dipl.-Ing. Jiří Kříšťan, Ph.D.	0	1
		Dipl.-Ing. Viktor Švinger, Ph.D.	0	1
		M.Sc. Volodymyr Bondarenko	1	8
		M.Sc. Azin Mohagheghi Samarín, Ph.D.	0	2
	Laboratory of Reproductive Physiology	Dipl.-Ing. Martin Pšenička, Ph.D.	26	29
		Dipl.-Ing. Marek Rodina, Ph.D.	82	88
		Prof. Dipl.-Ing. Otomar Linhart, D.Sc.	99	95
		Jacky Cosson, Ph.D., dr.h.c.	114	120
		M.Sc. Sergey Boryshpolets, Ph.D.	12	23
		M.Sc. Azadeh Hatéf, Ph.D.	15	20
		M.Sc. Taiju Saito, Ph.D.	18	27
		M.Sc. Boris Dzyuba, Ph.D.	15	22
		M.Sc. Anna Kolečová, Ph.D. (born Shaliutina)	0	2
		M.Sc. S.M.H. Alavi, Ph.D.	43	45
		M.Sc. Mahdi Golshan	0	1
		M.Sc. Olga Bondarenko	0	1
		M.Sc. Zuzana Linhartová	8	3
		M.Sc. Galina Prokopchuk	0	1
		M.Sc. Pavlo Fedorov	0	1
	Laboratory of Molecular, Cellular and Quantitative Genetics	Assoc. Prof. Dipl.-Ing. Martin Flajšhans, Dr.rer.agr.	61	72
		Dipl.-Ing. Martin Kocour, Ph.D.	37	50
		Dipl.-Ing. Martin Hulák, Ph.D. (in memoriam)	34	37
		Dipl.-Ing. Vojtěch Kašpar, Ph.D.	15	19
		M.Sc. Ping Li, Ph.D.	41	52
		Dipl.-Ing. Miloš Havelka, Ph.D.	1	4
		M.Sc. Ievgeniá Gazo	0	1
	Laboratory of Environmental Chemistry and Biochemistry	Assoc. Prof. Dipl.-Ing. Tomáš Randák, Ph.D.	62	84
		Assoc. Prof. Dipl.-Ing. Vladimír Žlábek, Ph.D.	55	71
		M.Sc. Roman Grabic, Ph.D.	109	148
		Jitka Kolářová, DVM	46	51
		Dipl.-Ing. Jan Turek, Ph.D.	11	11
		M.Sc. Zhihua Li, Ph.D.	50	62
		M.Sc. Ganna Fedorova, Ph.D.	3	9
		M.Sc. Viktoriia Burkina	1	1
		M.Sc. Oksana Golovko	1	0

Institute	Laboratory	Worker	2012	2013
RIFCH	Laboratory of Aquatic Toxicology and Ichthyopathology	dr hab. Dipl.-Ing. Josef Velíšek, Ph.D.	77	102
		Dipl.-Ing. Hana Kocour Kroupová, Ph.D.	33	33
		Dipl.-Ing. Jana Máchová, Ph.D.	69	89
		Eliška Zusková, DVM, Ph.D.	31	27
		Dipl.-Ing. Olga Valentová	6	1
		Veronika Piačková, DVM, Ph.D.	44	39
		Prof. Zdeňka Svobodová, DVM, D.Sc.	119	124
		Dr. Vimal Kumar Hatwal	12	20
		Dipl.-Ing. Alžběta Stará	9	14
		Dipl.-Biol. Christoph Steinbach	0	1
	Experimental Fish Culture and Facility	Dipl.-Ing. Pavel Lepič	3	4
Dipl.-Ing. Jitka Hamáčková		29	22	
Genetic Fisheries Center	Dipl.-Ing. David Gela, Ph.D.	53	70	
IA	Laboratory of Pond Aquaculture and Protection of Waters	Dipl.-Ing. Pavel Vejsada, Ph.D.	1	5
		Assoc. Prof. M.Sc. Zdeněk Adámek, Ph.D.	24	23
		Assoc. Prof. Dipl.-Ing. František Vácha, Ph.D.	11	15
		Dipl.-Ing. Petr Dvořák, Ph.D.	2	4
		M.Sc. Maria Anton-Pardo, Ph.D.	9	12
	Laboratory of Controlled Fish Reproduction and Intensive Fish Culture	Prof. Dipl.-Ing. Jan Kouřil, Ph.D.	24	16
		Dipl.-Ing. Vlastimil Stejskal, Ph.D.	13	9
		M.Sc. Bořek Drozd, Ph.D.	2	–
		M.Sc. Peter Podhorec, Ph.D.	4	5
	Laboratory of Nutrition and Fish Quality	Dipl.-Ing. Jan Mráz, Ph.D.	9	8
		M.Sc. Sabine Sampels, Ph.D.	19	17
		Prof. Dr. Jana Pickova, Ph.D.	94	103
		Dipl.-Ing. Tomáš Zajíc, Ph.D.	0	1
ICS	Laboratory of Applied Systems Biology	Prof. M.Sc. Dalibor Štys, Ph.D.	24	49
		Dipl.-Ing. Petr Císař, Ph.D.	4	4
		Dipl.-Ing. Štěpán Papáček, Ph.D.	3	5
		Dipl.-Ing. Jan Urban, Ph.D.	4	4
		Dipl.-Ing. B.Sc. Renata Rychtáriková, Ph.D.	0	2
		M.Sc. Jiří Jablonský, Ph.D.	5	5
		M.Sc. Tomáš Náhlík	1	1
	Laboratory of Macromolecular Structure and Dynamics	Assoc. Prof. Mgr. Ivana Kutá Smatanová, Ph.D.	19	24
		M.Sc. Michal Kutý, Ph.D.	16	8
		M.Sc. Jaroslava Kohoutová, Ph.D.	5	2
		M.Sc. Tatyana Prudnikova, Ph.D.	2	1
	Lab. of Laser, Microscopy, Condensed phase in Biology and Material Engineering	Prof. Dr. Ali H. Reshak	159	248
	IEEAIC	Unit of Lifelong Learning	Dipl.-Ing. Blanka Vykusová, Ph.D.	6





## HABILITATION AND PROFESSORIAL PROCEDURES



**Prof. Dipl.-Ing. Jan Kouřil, Ph.D.**, was appointed the professor of “Fishery” in Prague’s Carolinum on the 1<sup>st</sup> February 2012. He prepared and defended his thesis on the topic “Controlled reproduction of fish and intensive aquaculture (the concept of scientific work and university teaching).”

Prof. J. Kouřil was born in Protivín in 1948. After graduating from the Secondary fishing and technical school in Vodňany, he started to study at the University of Agriculture, the Faculty of Agronomy in 1967. Since 1972 he worked in the Research Institute of Hydrobiology in Vodňany (RIFCH), first as a student, later as a researcher, teacher, head of a research department and a number of other positions. In the period of 1990 to 2005 he served as a director of the RIFCH, contributed to the integration of the Institute under the University of South Bohemia in České Budějovice. He dedicated his professional life to the controlled reproduction of fish and intensive aquaculture. In this area he is one of the most respected experts. He is the author or co-author of more than 60 scientific articles in prestigious scientific journals, nearly 30 methodological publications and a number of other studies.



**Assoc. Prof. Dipl.-Ing. Vladimír Žlábek, Ph.D.**, was appointed the associate professor of “Fishery” with effect from the 1<sup>st</sup> July 2012. He defended his habilitation thesis on the topic “Biomarkers of effects of contaminants on fish”.

Assoc. Prof. V. Žlábek attended the Secondary agricultural school in Písek, and then he studied at the Faculty of Agriculture of the University of South Bohemia in České Budějovice. He graduated from the doctoral study at the same faculty in the field of Animal hygiene and prevention of livestock diseases. He started to work in the RIFCH USB as a researcher in 2002. In the period of 2007–2010, he worked at the Swedish university SLU in Uppsala, where he focused on the effects of bioactive compounds on the metabolism of fish. He primarily deals with the occurrence of contaminants in aquatic ecosystems and studies their effects on exposed organisms. He is the author or co-author of more than 60 peer-reviewed articles published in international journals and many other articles and studies.



**Prof. M.Sc. Dalibor Štys, Ph.D.**, received the letter of appointment from the President of the Czech Republic along with 49 other professors in the Great Hall of the Prague Karolina on the 16<sup>th</sup> November 2012. Prof. Štys was appointed the professor of applied physics on the proposal of the Scientific board of the Mechanical Engineering faculty of the Czech Technical University in Prague.

Prof. D. Štys graduated from the Faculty of Science, at the Charles University in Prague (1987). Then he worked at the Institute of Organic Chemistry and Biochemistry, the Academy of Sciences and the University of Lund in Sweden. After his return he contributed to the creation of the Institute of Physical Biology in Nové Hradce USB which was also led by him. He also has a share in establishing the fisheries center CENAKVA. He worked as the vice-dean for development at the FFPW USB since early 2012. Since November 2012, he became the director of the Department of Research and Innovation of the Ministry of Education, Youth and Sports. Then he held the post of the Minister of Education, Youth and Sports from June 2013 to January 2014. His research work is mainly focused on the biochemistry, physiology of photosynthesis and bioinformatics. He is the author of more than 70 articles in prestigious scientific journals, technologies, software and many others.

## EDUCATION AND TEACHING ACTIVITIES

The Faculty of Fisheries and Protection of Waters, University of South Bohemia in České Budějovice offers all levels of study programs (bachelor, follow-up master, doctoral) in both full-time and combined form. Tuition of bachelor and follow-up master study is concentrated mainly at the Institute of Aquaculture in České Budějovice; tuition of doctoral study is concentrated mainly at the Research Institute of Fish Culture and Hydrobiology in Vodňany.

### BACHELOR'S DEGREE STUDIES

#### ACCREDITED STUDY PROGRAMMES AND DISCIPLINES

Study programme (SP)	Code of SP	Study discipline (SD)	Code of SD (KKOV)	Form of study	Stand. length of study (years)	Language	Accredited to DD.MM.YYYY
Zootecnics	B4103	Fishery	4103R003	Full-time, Combined	3	Czech	31.07.2014
Ecology and Environmental Protection	B1601	Protection of Waters	1601R004	Full-time	3	Czech	31.12.2017

#### PROFILES AND GOALS OF STUDY

In **discipline of Fishery**, the students can obtain professional knowledge in the field of biological-ecological linkages of water organisms, modern technologies and techniques in fish culture, fisheries and water management. Problems concerning legislation in the fisheries, water and nature protection will be studied as well. The study is focused also on the language skills of students who should be able to communicate well in English. The tuition is offered in full-time as well as combined form of study. The aim of study is to educate professionals for lower and middle management who will be able to work in the fields of fish culture, fishery and hunting legislation, institutions of

environment and laboratories evaluating water quality. **The discipline: Protection of Waters** focuses more on chemical processes in aquatic environment, physical characteristics of waters, ecology, EU legislation in water usage, circulation of waters in the environment, waste water treatment, waterworks engineering, water management and water structures. The tuition is offered meanwhile in full-time form of study only. The aim of the study is to educate professionals for lower and middle management who will ensure filling, keeping and improving of legislation concerning protection of waters and environment.

### NUMBER OF STUDENTS ENROLLED TO THE 1<sup>ST</sup> YEAR OF STUDY

Academic year	Study programme (code of programme)	Study discipline	Form of study	Number of applications received	Number of applicants admitted	Number of students enrolled
2012/2013	Ecology and Environmental protection (B1601)	Protection of Waters	Full-time	80	61	38
2013/2014	Ecology and Environmental protection (B1601)	Protection of Waters	Full-time	77	57	33
2012/2013	Zootechnics (B4103)	Fishery	Full-time	89	72	33
2013/2014	Zootechnics (B4103)	Fishery	Full-time	73	59	39
2012/2013	Zootechnics (B4103)	Fishery	Combined	65	42	36
2013/2014	Zootechnics (B4103)	Fishery	Combined	50	47	36

### NUMBER OF BACHELOR STUDENTS IN HIGHER CLASSES

Data validity: October 31<sup>st</sup> of the academic year.

Academic year	Study programme (code of programme)	Study discipline	Form of study	2 <sup>nd</sup> year of study	3 <sup>rd</sup> year of study	Studying more than 3 years	Total number of students
2012/2013	Ecology and Environmental protection (B1601)	Protection of Waters	Full-time	-	-	-	-
2012/2013	Zootechnics (B4103)	Fishery	Full-time	31	28	6	65
2012/2013	Zootechnics (B4103)	Fishery	Combined	14	10	-	24
Total number of students				45	38	6	89
2013/2014	Ecology and Environmental protection (B1601)	Protection of Waters	Full-time	12	-	-	12
2013/2014	Zootechnics (B4103)	Fishery	Full-time	17	15	10	42
2013/2014	Zootechnics (B4103)	Fishery	Combined	6	14	7	27
Total number of students				35	29	17	81



## GRADUATES OF BACHELOR'S STUDIES IN 2012 AND 2013

Year of graduation	Student	Topic of Bachelor thesis	Supervisor	Result
2012	Jaroslava Blažková	The demembration as a tool to study a movement and physiology of activation of fish spermatozoa	Dipl.-Ing. Marek Rodina, Ph.D.	Graduated
2012	Vojtěch Bulíček	Acute toxicity of nitrite for sturgeons (Acipenseridae)	Dipl.-Ing. Jana Máčková, Ph.D.	Graduated
2012	Miroslav Čech	The occurrence and basic aspects of the biology of <i>Pseudorasbora parva</i> (Temminck et Schlegel, 1842) in a model pond system located in the region of Třeboňsko	Assoc. Prof. MSc. Dipl.-Ing. Josef Rajchard, Ph.D. (Faculty of Agriculture USB)	Graduated
2012	Radek Gebauer	Fish Population in Tributaries of Tepla Vltava River	Dipl.-Ing. Petr Dvořák, Ph.D.	Graduated
2012	Lukáš Hock	Changes to the fish populations in the upper stream of Labe, which is caused by sudden fluctuation of the water flow in the river	Dipl.-Ing. Petr Dvořák, Ph.D.	Graduated
2012	Antonín Jankových	Synchronization of ovulation in females of brook charr and rainbow trout	Prof. Dipl.-Ing. Jan Kouřil, Ph.D.	Graduated
2012	Jan Kubec	The electrostimulation the spermiation in the crayfish	Assoc. Prof. Dipl.-Ing. Pavel Kozák, Ph.D.	Graduated
2012	Roman Lunda	The fish populations in the selected Šumava mountains streams with an occurrence of the freshwater pearl mussel	Dipl.-Ing. Petr Dvořák, Ph.D.	Graduated
2012	Adam Seicherstein	Comparison of species composition and dynamics of zooplankton communities in ponds with extensive management	Dipl.-Ing. Martin Bláha, Ph.D.	Graduated
2012	Pavel Šauer	Effect of carp feeding on species composition and dynamics of zooplankton in ponds	Dipl.-Ing. Martin Bláha, Ph.D.	Graduated
2012	Roman Šebesta	The community of zooplankton in the pools in inundation area of the Lužnice river	Dipl.-Ing. Martin Bláha, Ph.D.	Graduated
2012	Josef Vobr	The assessment of the impact of nutrition of common carp ( <i>Cyprinus carpio</i> L.) to change the quality of meat	Dipl.-Ing. Pavel Vejsada, Ph.D.	Graduated
2013	Ondřej Houda	Testing of production efficiency during culturing of market size of North African catfish ( <i>Clarias gariepinus</i> ) using specialized feeds with an substitute of fish meal in semioperational conditions of RAS	M.Sc. Bořek Drozd, Ph.D.	Graduated with honors
2013	Martin Chytrý	Ichthyofauna of selected sections of the Jizera basin	Dipl.-Ing. Petr Dvořák, Ph.D.	Graduated with honors
2013	Adam Bořík	The effect of atenolol on a fish organism	Assoc. Prof. Dipl.-Ing. Vladimír Žlábek, Ph.D.	Graduated
2013	Tomáš Dušek	Influence of light regime on the success of adaptation of pike ( <i>Esox lucius</i> ) larvae on pelleted feed in RAS	Assoc. Prof. Dipl.-Ing. Tomáš Policar, Ph.D.	Graduated
2013	Roman Franěk	Hematological changes in fish exposed to nitrites	Eliška Zusková, DVM, Ph.D.	Graduated
2013	Jan Hampel	Optimization of harvest of juveniles of pikeperch ( <i>Sander lucioperca</i> ) taken out of ponds and following ability of the fish to adapt to system RAS	Assoc. Prof. Dipl.-Ing. Tomáš Policar, Ph.D.	Graduated
2013	Viktor Holaň	Occurrence of perfluorinated compounds in fish from rivers of the Czech Republic	Assoc. Prof. Dipl.-Ing. Tomáš Randák, Ph.D.	Graduated



2013	Oldřich Hudec	Using Persteril® in practice for the prevention of fungal infections of eggs and fry baths sturgeon compared to commonly used products	Dipl.-Ing. David Gela, Ph.D.	Graduated
2013	Michal Chotěborský	Adaptation of Intensively bred juvenile fish of pikeperch ( <i>Sander lucioperca</i> ) to a pond condition	Assoc. Prof. Dipl.-Ing. Tomáš Policar, Ph.D.	Graduated
2013	Jakub Jung	Biodegradation of environmental pollutants – crystallization haloalkane dehalogenase DpcA of psychrobacter cryohalolentis K5	Assoc. Prof. M.Sc. Ivana Kutá Smatanová, Ph.D.	Graduated
2013	Bohuslav Kolek	Mercury content in muscle of chub ( <i>Leuciscus cephalus</i> ) from the downstream tributaries of the Elbe river	Dipl.-Ing. Jan Turek, Ph.D.	Graduated
2013	Jakub Krejsa	Effect of alternative feed on content of omega-3 fatty acids in fish muscles	Dipl.-Ing. Jan Mráz, Ph.D.	Graduated
2013	Jaroslava Lidová	The effects of prometryne on early life stages of common carp	dr hab. Dipl.-Ing. Josef Velíšek, Ph.D.	Graduated
2013	Filip Ložek	Damages caused by predation of invertebrates on the earliest development stages of fish	Dipl.-Ing. Martin Bláha, Ph.D.	Graduated
2013	Pavel Malcher	Biodegradation environmental pollutants – characterization of mutant haloalkane dehalogenase DhaA31 of <i>Rhodococcus rhodochrous</i> NCIMB 13064	Assoc. Prof. M.Sc. Ivana Kutá Smatanová, Ph.D.	Graduated
2013	Jindřiška Matějková	Hormonal induction of ovulation in white-barred catfish ( <i>Agamyxis pectiniifrons</i> )	M.Sc. Peter Podhorec, Ph.D.	Graduated
2013	Lucie Mikešová	Reproduction burbot ( <i>Lota lota</i> ) and incubation of eggs at different temperatures in service	Dipl.-Ing. Jiří Kříšťan, Ph.D.	Graduated
2013	Pavel Němec	Biodegradation of environmental pollutants – Structural characterization of a new type of haloalkane LinB32 from <i>Sphingobium japonicum</i> UT26	M.Sc. Michal Kutý, Ph.D.	Graduated
2013	Roman Okrouhlý	Revitalization of small streams and small water reservoirs	Dipl.-Ing. Petr Dvořák, Ph.D.	Graduated
2013	Martin Papež	Biodegradation of environmental pollutants – Structural characterization of a new type of haloalkane DbeA	Assoc. Prof. M.Sc. Ivana Kutá Smatanová, Ph.D.	Graduated
2013	Petr Pecher	Impact of long-term storage on fish welfare	Dipl.-Ing. Pavel Vejsada, Ph.D.	Graduated
2013	Róbert Pflug	Impact of alternative feed on growth, yield and sensory evaluation of flesh of salmonids	Dipl.-Ing. Jan Mráz, Ph.D.	Graduated
2013	Miloslav Vaněček	Do humic substances reduce nitrite toxicity to fish?	Dipl.-Ing. Hana Kocour Kroupová, Ph.D.	Graduated
2013	Václav Zelenka	Ichthyologic monitoring the flow of Popelka in Nová Ves nad Popelkou	Dipl.-Ing. Petr Dvořák, Ph.D.	Graduated
2013	Hynek Zikmund	Monitoring of fish migration on the Blanice river in the Bavorov fishway	Dipl.-Ing. Petr Dvořák, Ph.D.	Graduated

## AWARDS FOR EXCELLENT STUDY PERFORMANCE

The full-time students with excellent study performance were awarded with merital and premium scholarships. In the academic year 2011/2012, six students were awarded with a total scholarship of 28,350 CZK. In the academic year 2012/2013, seven

students were awarded with a total scholarship of 24,880 CZK. The system of scholarships was directed by the Scholarship regulations USB and by the Dean's decision No. 27/2011.

### Extraordinary scholarships

Two new types of extraordinary scholarships were introduced in the academic year 2012/13. The first type is the Extraordinary scholarship for Talented Students and is aimed to support talented students as specified in the Dean's Decision No. 31/2012. In the academic year 2012/2013, one bachelor study stu-

dent was awarded the scholarship of 40,000 CZK in total. In the academic year 2013/2014, the same student was awarded the scholarship of 40,000 CZK. The second type of the scholarships is the Scholarship for Athletes specified in the Dean's Decision No. 7/2013.

### Merital scholarship

Merital scholarship is automatically awarded to the students of bachelor's and follow-up masters study programs who enrolled in courses in minimal sum of 60 credits in the previous academic year at the FFPW and attained weighted study average of 1.60 or lower.

Limit of 60 credits was not applicable for the students who continue in masters study program after successful termination of study in the bachelor's study program.

#### Students who met the conditions to be awarded with merital scholarship for excellent study performance in 2011/2012:

Student	Scholarship per month (in CZK)	Total scholarship (in CZK)
Tomáš Dušek	700	6,300
Ondřej Houda	700	6,300
Martin Chytrý	700	6,300
Hana Šachlová	1,050	9,450
Celkem	–	28,350

#### Students who met the conditions to be awarded with the merital scholarship for excellent study performance in 2012/2013:

Student	Scholarship per month (in CZK)	Total scholarship (in CZK)
Marek Urbánek	660	5,940
Jakub Balcar	660	5,940
Celkem	–	11,880

# 40,230

## Premium scholarship

Premium scholarship was awarded to students for excellent study performance during whole study and during final state exam.

### Categories of premium scholarship granted in 2011/2012:

Conditions for awarding of premium scholarship	Scholarship (in CZK)	Number of students awarded	Total (in CZK)
a) For outstanding study results in the last year of study:			
The amount of scholarship	Weighted study average		
Twice the calculated base when the weighted study average was between	1.00–1.10		
1,5 multiple of the calculated base when the weighted study average was between	1.11–1.30		
The calculated base when the weighted study average was between	1.31–1.60		
b) For thesis with outstanding research, development, innovation or other creative results contributing to the deepening of knowledge, thus those scored as excellent by the state committee	1,000	2	2,000
c) For results in RIR for purposes of evaluation of research and development			
d) For outstanding results during the whole study – Dean’s award and Rector’s award:			
Dean’s award:	– Weighted study average of 1.40 or lower for the entire study period and – The final state exam with an overall rating “excellent” and – Defense of bachelor’s thesis with a rating of “excellent”		
Rector’s award:	According to the USB scholarship regulations		
e) “Dean’s award for the best scientific publication of employees and students of the FFPW USB younger than 35 years”			
f) Dealing with a project of USB Grant Agency			
Total			2,000

### Recipients of premium scholarship in 2011/2012:

Student	Awarded premium scholarships according to categories – for details see the table above						Total
	a)	b)	c)	d)	e)	f)	
Jaroslava Blažková		1,000					1,000
Jan Kubec		1,000					1,000
Total		2,000					2,000

### Categories of premium scholarship granted in 2012/2013

Conditions for awarding of premium scholarship		Scholarship (in CZK)	Number of students awarded	Total (in CZK)
a) For outstanding study results in the last year of study:				
The amount of scholarship	Weighted study average			
Twice the calculated base when the weighted study average was between	1.00–1.10			
1,5 multiple of the calculated base when the weighted study average was between	1.11–1.30			
The calculated base when the weighted study average was between	1.31–1.60			
b) For thesis with outstanding research, development, innovation or other creative results contributing to the deepening of knowledge, thus those scored as excellent by the state committee		1,000	5	5,000
c) For results in RIR for purposes of evaluation of research and development				
d) For outstanding results during the whole study – Dean's award and Rector's award:				
Dean's award:	– Weighted study average of 1.40 or lower for the entire study period and – The final state exam with an overall rating "excellent" and – Defense of bachelor's thesis with a rating of "excellent"	8,000	1	8,000
Rector's award:	according to the USB scholarship regulations			
e) "Dean's award for the best scientific publication of employees and students of the FFPW USB younger than 35 years"				
f) Dealing with a project of USB Grant Agency				
Total				13,000

### Recipients of premium scholarship in 2012/2013:

Student	Awarded premium scholarships according to categories – for details see the table above						Total
	a)	b)	c)	d)	e)	f)	
Tomáš Dušek		1,000					1,000
Roman Franěk		1,000					1,000
Ondřej Houda		1,000		8,000			9,000
Jindřiška Matějková		1,000					1,000
Róbert Pflug		1,000					1,000
Total		5,000		8,000			13,000

# 13,000



The faculty students Hana Šachlová (left) and Jaroslava Blažková received extraordinary scholarships.



### Extraordinary Scholarship for Talented Students

The Scholarship is intended to support and attract able and diligent students and motivate such students to cooperate closely with the faculty.

*„A talented, able and hard-working student doesn't suffer from an existential distress at our Faculty“*

Entitled to receive the scholarship are students, who where in the previous academic year registered for classes with overall credit volume of at least 60 credit points and whose weighted average did not exceed 1.5. In addition, they actively worked in the

laboratories FFPW USB, participated in the faculty publicly; assisted academic staff through teaching or achieved significant success in sport. The amount of the scholarships received will be divided based on the grades and activities of the students.

#### Extraordinary scholarships for talented students in the academic year 2012/2013:

Student	Scholarship per month (in CZK)	Total scholarship (in CZK)
Hana Šachlová	5,000	40,000
Total	-	40 000

#### Extraordinary scholarships for talented students in the academic year 2013/2014:

Student	Scholarship per month (in CZK)	Total scholarship (in CZK)
Hana Šachlová	12,000	60,000
Total	-	60,000

### Extraordinary Scholarship for Athletes

Scholarships are awarded for outstanding sport achievements and/or for support of sport activities. Excellent placement in national, international or university competitions (championships) is an outstanding sport achievement. The scholarship for support of sport activities will be awarded to students to facilitate the participation in major sport events, support of training or sport performance.

# 100,000

## FOLLOW-UP MASTER STUDIES

### ACCREDITED STUDY PROGRAMMES AND DISCIPLINES

Study programme (SP)	Code of SP	Study discipline (SD)	Code of SD (KKOV)	Form of study	Stand. length of study (years)	Language	Accredited to DD.MM.YYYY
Zootechnics	N4103	Fishery	4103T003	Full-time, Combined	2	Czech	01.03.2016
Zootechnics	N4103	Aquaculture	4103T017	Full-time	2	English	01.11.2015

### PROFILES AND GOALS OF STUDY

Follow-up master study, in the discipline Fishery prepares professionals and specialists focused on the areas of fisheries, aquaculture and protection of aquatic environment. This study increases the level of knowledge from the bachelor study mainly in the field of fresh water fish culture. Further, the students will obtain experience from crayfish culture, subsidy sources in fisheries, culture of aquarian fish, revitalization of water systems and aquatic toxicology. It is continued by increasing of language skills in English. Students can specialise in three different topics 1) Protection of waters, 2) Genetics and reproduction of fish and 3) Aquaculture. The graduates will be able to

apply their knowledge in higher and top management of large working teams of fishery and water management sector and in public service units on both levels – national and European.

The discipline of Aquaculture is taught in English and it was created for the education of foreign students. The profile of study is similar to the Czech discipline of Fishery, but this discipline is focused more on the field of freshwater fish culture. The students can specialise in genetics and breeding of fish or in special aquacultures. The graduates will be able to transfer their knowledge to different fish culture conditions as well as to different fish species.



Pavla Linhartová the student of the FFPW USB promoting the faculty in the media.

### NUMBER OF STUDENTS ENROLLED TO THE 1<sup>ST</sup> YEAR OF STUDY

Academic year	Study programme (code of programme)	Study discipline	Form of study	Number of applications received	Number of applicants admitted	Number of students enrolled
2012/2013	Zootechnics (N4103)	Fishery	Full-time	16	16	12
2013/2014	Zootechnics (N4103)	Fishery	Full-time	28	20	20
2012/2013	Zootechnics (N4103)	Fishery	Combined	5	0	0
2013/2014	Zootechnics (N4103)	Fishery	Combined	10	9	9
2012/2013	Zootechnics (N4103)	Aquaculture	Full-time	0	0	0
2013/2014	Zootechnics (N4103)	Aquaculture	Full-time	6	6	2

### NUMBER OF MASTER STUDENTS IN HIGHER CLASSES

Data validity: October 31<sup>st</sup> of the academic year.

Academic year	Study programme (code of programme)	Study discipline	Form of study	2 <sup>nd</sup> year of study	Studying more than 2 years	Total number of students
2012/2013	Zootechnics (N4103)	Fishery	Full-time	13	5	18
2012/2013	Zootechnics (N4103)	Fishery	Combined	–	–	–
2012/2013	Zootechnics (N4103)	Aquaculture	Full-time	–	–	–
<b>Total</b>				<b>13</b>	<b>5</b>	<b>18</b>
2013/2014	Zootechnics (N4103)	Fishery	Full-time	11	6	17
2013/2014	Zootechnics (N4103)	Fishery	Combined	–	–	–
2013/2014	Zootechnics (N4103)	Aquaculture	Full-time	–	–	–
<b>Total</b>				<b>11</b>	<b>6</b>	<b>17</b>



Fisheries Insignia (so called "Fisheries Law") of the FFPW USB in České Budějovice.

## GRADUATES OF FOLLOW-UP MASTER STUDIES IN 2012 AND 2013

Year of graduation	Student	Topic of Diploma thesis	Supervisor	Result
2012	B.Sc. Antonín Kölbl	Processing technology and quality of meat smoked mackerel	Assoc. Prof. Dipl.-Ing. František Vácha, Ph.D.	Graduated with honors
2012	B.Sc. Markéta Prokešová	Effect of water temperature on early life history in African catfish ( <i>Clarias gariepinus</i> )	M.Sc. Bořek Drozd, Ph.D.	Graduated with honors
2012	B.Sc. Miroslav Blecha	Optimization of artificial spawning of pikeperch ( <i>Sander lucioperca</i> ) using HCG and new ways of removing artificial stickiness of eggs before incubation.	Assoc. Prof. Dipl.-Ing. Tomáš Polícar, Ph.D.	Graduated
2012	B.Sc. Daniel Červený	Assessment of fish contamination in important fishing grounds	Assoc. Prof. Dipl.-Ing. Tomáš Randák, Ph.D.	Graduated
2012	B.Sc. Petr Čtrnáct	Testing the production efficiency of special types of feed for catfish in the rearing of African catfish ( <i>Clarias gariepinus</i> ) in a recirculating system	Prof. Dipl.-Ing. Jan Kouřil, Ph.D.	Graduated
2012	B.Sc. Adéla Denková	Effect of temperature, fish size and feeding on oxygen consumption and ammonia excretion in the Nile tilapia ( <i>Oreochromis niloticus</i> )	Dipl.-Ing. Vlastimil Stejskal, Ph.D.	Graduated
2012	B.Sc. Jiří Hajiček	Adaptation of northern pike ( <i>Esox lucius</i> L.) on artificial pelleted feed under controlled conditions	Assoc. Prof. Dipl.-Ing. Tomáš Polícar, Ph.D.	Graduated
2012	B.Sc. Petr Hulan	The influence of repeated defrosting on nutritional efficiency of <i>Artemia salina</i> nauplii for early developmental stages of fish	Assoc. Prof. M.Sc. Zdeněk Adámek, Ph.D.	Graduated
2012	B.Sc. Dagmara Jablonická	Evaluation of the intensive culture of pikeperch ( <i>Sander lucioperca</i> ) under commercial-scale conditions including the quality of the final product	Dipl.-Ing. Vlastimil Stejskal, Ph.D.	Graduated
2012	B.Sc. Petr Janoušek	The influence of carp nutrition ( <i>Cyprinus carpio</i> ) on changes of meat quality	Assoc. Prof. Dipl.-Ing. František Vácha, Ph.D.	Graduated
2012	B.Sc. Jan Mandelíček	Comparing various methods for hatching brown trout ( <i>Salmo trutta m. fario</i> ) in a controlled condition	Assoc. Prof. Dipl.-Ing. Tomáš Randák, Ph.D.	Graduated
2012	B.Sc. Miloš Marek	Possibilities of intensive breeding of pikeperch ( <i>Sander lucioperca</i> ) and european perch ( <i>Perca fluviatilis</i> ) in common duo-culture	Dip.-Ing. Vlastimil Stejskal, Ph.D.	Graduated
2012	B.Sc. Jan Matoušek	The effect of different oxygen saturation on feed intake and growth of pikeperch ( <i>Sander lucioperca</i> ) in intensive culture	Dipl.-Ing. Vlastimil Stejskal, Ph.D.	Graduated
2012	B.Sc. Jan Opatřil	Seasonal changes in macrozoobenthos of the Brno reservoir during water level manipulation	Assoc. Prof. M.Sc. Zdeněk Adámek, Ph.D.	Graduated
2012	B.Sc. Michal Pavlíček	Environmental conditions during the carp pond harvesting	Assoc. Prof. M.Sc. Zdeněk Adámek, Ph.D.	Graduated
2012	B.Sc. Miloš Petr	The efficiency testing of production commercial feeds for african catfish ( <i>Clarias gariepinus</i> )	prof. Dipl.-Ing. Jan Kouřil, Ph.D.	Graduated

2012	B.Sc. Jiří Srp	The genome size determination in sturgeons using 2-D a 3-D image cytometry	Assoc. Prof. Dipl.-Ing. Martin Flajšhans, Dr.rer.agr.	Graduated
2012	B.Sc. Pavel Šmíd	Analysis of fishing pressure at sport fisheries managed by Czech Angling Union under the united fishing system	Assoc. Prof. Dipl.-Ing. Petr Hartvich, Ph.D.	Graduated
2012	B.Sc. Jiří Šrámek	Ichthyofauna of selected streams of Bohemian Forest	Ing. Petr Dvořák, Ph.D.	Graduated
2012	B.Sc. Lukáš Vejřík	Redundant fingerling of perch ( <i>Perca fluviatilis</i> L.) in Vír Reservoir and its impact on other trophic levels	M.Sc. Martin Čech, Ph.D. (Faculty of Science USB)	Graduated
2012	B.Sc. Jan Watzek	Production of yearlings in common barbel ( <i>Barbus barbus</i> L.) under intensive controlled conditions during winter season	Assoc. Prof. Dipl.-Ing. Pavel Kozák, Ph.D.	Graduated
2012	B.Sc. Jakub Zrostlík	Practical verification of rearing of common carp with high levels of omega-3 fatty acids	Assoc. Prof. Dipl.-Ing. Pavel Kozák, Ph.D.	Graduated
2013	B.Sc. Jiří Bartoň	Efficiency of the technology of WWTP České Budějovice for the elimination of pharmaceuticals	M.Sc. Roman Grabic, Ph.D.	Graduated
2013	B.Sc. Pavel Brož	Tolerance of Nile tilapia to nitrites	Dipl.-Ing. Jana Máčková, Ph.D.	Graduated
2013	B.Sc. Michal Gučík	Monitoring of the bullhead ( <i>Cottus gobio</i> ) in the upper reaches of the river Elbe	Dipl.-Ing. Petr Dvořák, Ph.D.	Graduated
2013	B.Sc. Dalibor Koutník	Verification of success of previous noble crayfish introduction and revision of occurrence of spiny cheek crayfish in the CHKO Třeboňsko	Assoc. Prof. Dipl.-Ing. Pavel Kozák, Ph.D.	Graduated
2013	B.Sc. Pavla Linhartová	The effect of xenobiotics on DNA integrity and physiology of fish spermatozoa	Dipl.-Ing. Vojtěch Kašpar, Ph.D.	Graduated
2013	B.Sc. Jozef Mecko	Influence of antiparasitic baths of fish on haematological and biochemical indicators	Eliška Zusková, DVM, Ph.D.	Graduated
2013	B.Sc. Martin Prchal	Comparison of biometrical and slaughtering indicators of crossbreeds of common carp with using two different breeds of Amur mirror carp	Dipl.-Ing. Martin Kocour, Ph.D.	Graduated
2013	B.Sc. Petr Svačina	Effect of ponds and pond systems on the composition of the benthos in horní Lužnice	Dipl.-Ing. Petr Dvořák, Ph.D.	Graduated
2013	B.Sc. Petr Svatek	Comparison of rate of pike and pike perch cannibalism in first year of life	Dipl.-Ing. Martin Bláha, Ph.D.	Graduated
2013	B.Sc. Lukáš Veselý	Interannual variability of littoral age 0+ fish in the canyon-shaped reservoir	M.Sc. Michal Kratochvíl (Biology Centre ASCR)	Graduated

## AWARDS FOR EXCELLENT STUDY PERFORMANCE

The full-time students with excellent study performance were awarded with merital and premium scholarships. In the academic year 2011/2012, seventeen students were awarded with a total scholarship of 101,700 CZK. In the academic year, 2012/2013, ten

students were rewarded with a total scholarship of 63,550 CZK. The system of scholarships was directed by the Scholarship regulations USB and by the Dean's decision No. 27/2011.



## Extraordinary scholarships

Two new types of extraordinary scholarship were introduced in the academic year 2012/13. The first type is the Extraordinary scholarship for Talented Students and is aimed to support talented students as specified in the Dean's Decision No. 31/2012. In the academic year 2012/2013, one master study student was awarded the scholarship of 40,000 CZK in total.

In the academic year 2013/2014, two students were awarded the scholarship of 128,000 CZK. The second type of the scholarships is the Scholarship for Athletes specified in the Dean's Decision No. 7/2013. One student was awarded this scholarship in 2012/2013, in the total amount of 6,500 CZK.

## Merital scholarship

Merital scholarship is automatically awarded to the students of bachelor's and follow-up master's study programs who enrolled in courses in minimal sum of 60 credits in the previous academic year at the FFPW and attained weighted study average of 1.60 or lower. The limit of 60 credits was not applied for the students who continue in master's study program after successful termination of study in the bachelor's study program.

### Students who met the conditions were awarded with the merital scholarship for excellent study performance in 2011/2012

Student	Scholarship per month (in CZK)	Total scholarship (in CZK)
B.Sc. Jaroslava Blažková	700	6,300
B.Sc. Matěj Dvořák	700	6,300
B.Sc. Pavla Linhartová	700	6,300
B.Sc. Martin Prchal	700	6,300
Total	–	25,200

### Students who met the conditions were awarded with the merital scholarship for excellent study performance in 2012/2013:

Student	Scholarship per month (in CZK)	Total scholarship (in CZK)
B.Sc. Martin Chytrý	990	8,910
B.Sc. Ondřej Houda	990	8,910
B.Sc. Radek Gebauer	990	8,910
B.Sc. Jaroslava Blažková	660	5,940
B.Sc. Roman Franěk	660	5,940
B.Sc. Róbert Pflug	660	5,940
Total	–	44,550

## Premium scholarship

Premium scholarship was awarded to students for excellent study performance during whole study and during final state exam.

**Categories of premium scholarship granted in 2011/2012:**

Conditions for granting of premium scholarship (for academic performance in 2010/2011)	Amount of Scholarship (in CZK)	Number of students rewarded	Total (in CZK)	
a) For outstanding study results in the last year of study:				
The amount of scholarship	Weighted study average			
Twice the calculated base when the weighted study average was between	1.00–1.10			
1,5 multiple of the calculated base when the weighted study average was between	1.11–1.30	7,500	1	
The calculated base when the weighted study average was between	1.31–1.60	5,000	5	
			25,000	
b) For thesis with outstanding research, development, innovation or other creative results contributing to the deepening of knowledge, thus those scored as excellent by the state committee		3,000	12	36,000
c) For results in RIR for purposes of evaluation of research and development				
d) For outstanding results during the whole study – Dean's award and Rector's award:				
Dean's award:	– Weighted study average of 1.40 or lower for the entire study period and – The final state exam with an overall rating "excellent" and – Defense of bachelor's thesis with a rating of "excellent"			
Rector's award:	According to the USB scholarship regulations	8,000	1	
			8,000	
e) "Dean's award for the best scientific publication of employees and students of the FFPW USB younger than 35 years"				
f) Dealing with a project of USB Grant Agency				
<b>Total</b>			<b>76,500</b>	

# 76,500

**Premium scholarship recipients in 2011/2012:**

Student	Awarded premium scholarships according to categories – for details see the table left						Total (in CZK)
	a)	b)	c)	d)	e)	f)	
B.Sc. Miroslav Blecha	5,000	3,000					8,000
B.Sc. Petr Čtrnáct		3,000					3,000
B.Sc. Petr Hulan		3,000					3,000
B.Sc. Antonín Kőlbl	5,000						5,000
B.Sc. Jan Mandelíček		3,000					3,000
B.Sc. Miloš Marek		3,000					3,000
B.Sc. Jan Matoušek		3,000					3,000
B.Sc. Miloš Petr		3,000					3,000
B.Sc. Markéta Prokešová	7,500	3,000		8,000			18,500
B.Sc. Jiří Srp	5,000	3,000					8,000
B.Sc. Jiří Šrámek	5,000	3,000					8,000
B.Sc. Lukáš Vejřík		3,000					3,000
B.Sc. Jan Watzek	5,000	3,000					8,000
<b>Total</b>	<b>32,500</b>	<b>36,000</b>		<b>8,000</b>			<b>76,500</b>



The faculty student Pavla Linhartová won a silver medal in the European championship in karate – category: kumite woman.

### Categories of premium scholarship granted in 2012/2013:

Conditions for granting of premium scholarship (for academic performance in 2010/2011)	Amount of Scholarship (in CZK)	Number of students rewarded	Total (in CZK)
a) For outstanding study results in the last year of study:			
<b>The amount of scholarship</b>	<b>Weighted study average</b>		
Twice the calculated base when the weighted study average was between	1.00–1.10		
1.5 multiple of the calculated base when the weighted study average was between	1.11–1.30		
The calculated base when the weighted study average was between	1.31–1.60	5,000	2
			10,000
b) For thesis with outstanding research, development, innovation or other creative results contributing to the deepening of knowledge, thus those scored as excellent by the state committee	3,000	3	9,000
c) For results in RIR for purposes of evaluation of research and development			
d) For outstanding results during the whole study – Dean’s award and Rector’s award:			
<b>Dean’s award:</b>	– Weighted study average of 1.40 or lower for the entire study period and – The final state exam with an overall rating “excellent” and – Defense of bachelor’s thesis with a rating of “excellent”		
<b>Rector’s award:</b>	According to the USB scholarship regulations		
e) “Dean’s award for the best scientific publication of employees and students of the FFPW USB younger than 35 years”			
f) Dealing with a project of USB Grant Agency			
<b>Total</b>			<b>19,000</b>

### Premium scholarship recipients in 2012/2013:

Student	Awarded premium scholarships according to categories – for details see the table above						Total (in CZK)
	a)	b)	c)	d)	e)	f)	
B.Sc. Jiří Bartoň	5,000						5,000
B.Sc. Pavla Linhartová	5,000	3,000					8,000
B.Sc. Petr Svačina		3,000					3,000
B.Sc. Martin Prchal		3,000					3,000
<b>Total</b>	<b>10,000</b>	<b>9,000</b>					<b>19,000</b>

# 19,000

## Extraordinary Scholarship for Talented Students

The Scholarship is intended to support and attract able and diligent students and motivate such students to cooperate closely with faculty.

*„A talented, able and hard-working student doesn't suffer from an existential distress at our Faculty“*

Entitled to receive the scholarship are students, who where in the previous academic year registered for classes with overall credit volume of at least 60 credit points and whose weighted average did not exceed 1.5 and in addition they actively worked in laboratories FFPW USB, participated in faculty publicity, assisted academic staff ensure teaching or achieved

significant success in a sport. The limit of 60 credit points does not apply to students, who have successfully completed Bachelor study program and continue in subsequent Master study program. The amount of the scholarships received will be differentiated based on the grades and activities of the students.

### Extraordinary scholarships for talented students in the academic year 2011/2012:

Student	Scholarship per month (in CZK)	Total scholarship (in CZK)
B.Sc. Pavla Linhartová	5,000	40,000
Total	–	40,000

### Extraordinary scholarships for talented students in the academic year 2012/2013:

Student	Scholarship per month (in CZK)	Total scholarship (in CZK)
B.Sc. Jaroslava Blažková	8,000	64,000
B.Sc. Radek Gebauer	8,000	64,000
Total	–	128,000

## Extraordinary Scholarship for Athletes

Scholarship is awarded for outstanding sport achievements and/or for support of sport activities. Excellent placement in national, international or university competitions (championships) is an outstanding sport achievement. The scholarship for support of sport activities will be awarded to students to facilitate the participation in major sport events, support of training or sport performance.

### Students who met the conditions to be awarded with extraordinary scholarship for athletes in 2012/2013:

Student	Scholarship (in CZK)
B.Sc. Pavla Linhartová	6,500
Total	6,500

# 174,500



## DOCTORAL (PH.D.) STUDY

### ACCREDITED STUDY PROGRAMMES AND DISCIPLINES

Study programme (SP)	Code of SP	Study discipline (SD)	Code of SD	Form of study	Stand. Length of study	Language teaching	Accredited to DD.MM. YYYY
Zootechnics	P4103	Fishery	4103V003	Full-time, combined	4 years	Czech	31.05. 2020
Zootechnics	P4103	Fishery	4103V003	Full-time, combined	4 years	English	31.05. 2020

### PROFILES AND GOALS OF STUDY

The Doctoral study of discipline Fishery represents an interesting opportunity to continue with acquiring new scientific knowledge according to an individual study plan. The study deepens knowledge and abilities acquired in the master study in relation to detailed professional specialization usually in context with

current scientific and research issues. The aim of the study is to prepare students for future academic, research or teaching career in higher education or research institutions. Both full-time and combined forms of study can be taken in Czech or English language.

### NUMBER OF STUDENTS ENROLLED IN THE 1<sup>ST</sup> YEAR OF STUDY

Academic year	Study programme (code of programme)	Study discipline	Form of study	Number of applications received	Number of applicants admitted	Number of students enrolled
2012/13	Zootechnics (B4103)	Fishery	Full-time	19	13	13
2012/13	Zootechnics (B4103)	Fishery	Combined	3	3	3
2013/14	Zootechnics (B4103)	Fishery	Full-time	22	14	13

### NUMBER OF PH.D. STUDENTS IN HIGHER CLASSES

Data validity: October 31<sup>st</sup> of the academic year.

Academic year	Study programme (code of programme)	Study discipline	Form of study	2 <sup>nd</sup> year	3 <sup>rd</sup> year	4 <sup>th</sup> year	5 <sup>th</sup> year	Total number of students
2012/13	Zootechnics (B4103)	Fishery	Full-time	8	10	8	0	26
2012/13	Zootechnics (B4103)	Fishery	Combined	0	2	0	0	2
Total number of students				8	12	8	0	28
2013/14	Zootechnics (B4103)	Fishery	Full-time	11	8	10	2	31
2013/14	Zootechnics (B4103)	Fishery	Combined	2	0	1	0	3
Total number of students				13	8	11	2	34

## GRADUATES OF DOCTORAL STUDIES IN 2012 AND 2013

Year of grad.	Student	Topic of Dissertation	Supervisor
2012	M.Sc. Azadeh Hatef	Sperm functions impairments and steroidogenesis transcriptomic alternations in fish exposed to endocrine disrupting chemicals	Prof. Dipl.-Ing. Otomar Linhart, D.Sc.
2013	M.Sc. Ganna Fedorova	Fate of polar organic pollutants in aquatic environment	M.Sc. Roman Grabic, Ph.D.
2013	Dipl.-Ing. Miloš Havelka	Molecular aspects of interspecific hybridization of sturgeons related to polyploidy and <i>in situ</i> conservation	Assoc. Prof. Dipl.-Ing. Martin Flajšhans, Dr.rer.agr.
2013	Dipl.-Ing. Jan Kohout	Population genetic structure of brown trout as groundwork for efficient management of fisheries in central European salmonid waters	Prof. Dipl.-Ing. Petr Ráb, D.Sc., (IAPG AS CR)
2013	Dipl.-Ing. Jiří Kříšťan	Optimization of reproduction and gamete quality in percid fish	Assoc. Prof. Dipl.-Ing. Tomáš Policar, Ph.D.
2013	M.Sc. Anna Kolečová	Fish sperm motility parameters and total proteins in seminal plasma during <i>in vivo</i> and <i>in vitro</i> storage	Prof. Dipl.-Ing. Otomar Linhart, D.Sc.
2013	Dipl.-Ing. Viktor W. Švinger	Optimization of hormone-induced ovulation in economically important fish species	Prof. Dipl.-Ing. Jan Kouřil, Ph.D.
2013	Dipl.-Ing. Tomáš Zajíc	Impact of production systems on lipid quality of common carp ( <i>Cyprinus carpio</i> )	Prof. Dr. Jana Pickova, Ph.D.



Graduates of doctoral studies with the dean of the faculty during a graduation ceremony in 2013, from the left: M. Havelka, A. Kolečová, V. Švinger, Prof. O. Linhart, T. Zajíc a J. Kříšťan.

## TOPICS OF ONGOING DISSERTATIONS OF FISHERY DISCIPLINE IN THE ACADEMIC YEAR 2012/13

Supervisor	Ph.D. student	Name of doctoral thesis
Assoc. Prof. M.Sc. Zdeněk Adámek, Ph.D.	Dipl.-Ing. David Hlaváč	The effect of supplementary feeding with treated feed mixtures in carp ponds upon discharged water quality
M.Sc. Hadi Alavi, Ph.D.	M.Sc. Mahdi Golshan	Transcriptomics modes of action of endocrine disrupting chemicals on fish reproduction
Jacky Cosson, Ph.D., dr.h.c.	M.Sc. Viktoriya Dzyuba, Ph.D.	Role of regulatory proteins in fish sperm motility
	M.Sc. Galina Prokopchuk	Flagellar movement of fish spermatozoa: interrelationship between physical and biochemical control
	M.Sc. Ievgenia Gazo	The role of protein phosphorylation and reactive oxygen species in sperm cells
M.Sc. Bořek Drozd, Ph.D.	Dipl.-Ing. Markéta Prokešová	Effect of various abiotic environmental factors on early life history of selected Perch-like fishes
M.Sc. Borys Dzyuba, Ph.D.	M.Sc. Olga Bondarenko	Sperm osmotic stress in different fish species
	M.Sc. Pavlo Fedorov	Fish spermatozoa metabolites content in various physiological conditions
Assoc. Prof. Dipl.-Ing. Martin Flajšhans, Dr.rer.agr.	M.Sc. Dmytro Bytuytskyy	Interrelationships between ploidy level, genome size and cell size in a series of ploidy level models from 2n to 12n fish
	M.Sc. Ievgen Lebeda	Optimization of chromosomal manipulations in acipenserids
	Eva Šálková, M.D.	Comparative haematology of polyploid sturgeons
M.Sc. Roman Grabic, Ph.D.	M.Sc. Oksana Golovko	Pharmaceuticals and other human used chemicals in water environment – stability, fate and accumulation in water organisms
	M.Sc. Olga Koba	Applications of advanced instrumentation (HPLC/HRMS and GC/MS/MS) for analysis of environmental pollutants
Assoc. Prof. Dipl.-Ing. Petr Hartvich, Ph.D.	Dipl.-Ing. Jan Másílko	Produce efficiency of mechanical modified cereals in market carp farming
Dipl.-Ing. Vojtěch Kašpar, Ph.D.	M.Sc. Kseniia Pocherniaieva	Applications of qRT-PCR for characterization of developing primordial germ cells
Dipl.-Ing. Antonín Kouba, Ph.D.	Dipl.-Ing. Lukáš Veselý	Ecological aspects of non-native crayfish spreading in Europe
Martin Kocour, Ph.D.	Dipl.-Ing. Martin Prchal	Selective breeding in common carp ( <i>Cyprinus carpio</i> )
Prof. Dipl.-Ing. Jan Kouřil, Ph.D.	M.Sc. Alexey Pimakhin	Growth rate in different perch populations originated from Europe and Asia under controlled conditions of recirculation aquaculture system (RAS)
Assoc. Prof. Dipl.-Ing. Pavel Kozák, Ph.D.	M.Sc. Hamid Niksirat Hashjin	Biology of a gamete, gamete activation and fertilization in crasyfish
	M.Sc. Iryna Kuklina	Utilization of systems for continuously monitoring water quality using fish and crayfish as bioindicator
	M.Sc. Buket Yazicioglu	The reproduction biology of invasive crayfish <i>Orconectes limosus</i>
	Ing. Pavel Lepič	The use of recirculation systems for breeding of river fish
	Ing. Martin Fořt	Development and utilization of systems for biomonitoring in fish and crayfish
Dipl.-Ing. Hana Kocour Kroupová, Ph.D.	Dipl. Biol. Christoph Steinbach	Study of the impact of pharmaceuticals found in aquatic environment on fish using gene expression analysis as a tool
	M.Sc. Jitka Tumová	Newly emerging endocrine disruptors in aquatic environment and their effect on fish
Prof. M.Sc. Jan Kubečka, Ph.D. (BC ASCR)	M.Sc. Ievgen Koliada	Fish detection near the water surface by scientific echo sounders
Prof. Dipl.-Ing. Otomar Linhart, D.Sc.	M.Sc. Mohammad Abdul Momin Siddique	Use of enzymes for elimination of eggs stickiness
Dipl.-Ing. Jan Mráz, Ph.D.	M.Sc. Sarvenaz Khalili	Fish and human health
Veronika Piačková, Ph.D.	M.Sc. Aleš Pospíchal	Prevention of serious viral diseases of cyprinid fish

Assoc. Prof. Dipl.-Ing. Tomáš Policar, Ph.D.	M.Sc. Volodymyr Bondarenko	Reproduction and intensive juvenile culture in pike ( <i>Esox lucidus</i> L.)
	Dipl.-Ing. Miroslav Blecha	Improvement of pikeperch ( <i>Sander lucioperca</i> ) production under semi-intensive and intensive aquaculture
Dipl.-Ing. Martin Pšenička, Ph.D.	M.Sc. Zuzana Linhartová	Micromanipulation and cryopreservation of primordial germ cells of fish
	M.Sc. Amin Golpour Dehsari	Induction of chimerism by transplantation of germ stem cells in critically endangered sturgeons as a tool of their conservation
Assoc. Prof. Dipl.-Ing. Josef Rajchard, DVM, Ph.D. (FA USB)	Dipl.-Ing. Jan Šinko	The effect of massive occurrence of invasive bryozoan <i>Pectinella magnifica</i> on water quality in water reservoirs
M.Sc. Taiju Saito, Ph.D.	M.Sc. Hilal Güralp	Developmental changes of germ cells in fish
	M.Sc. Viktoriia Iegorova	The cloning and characterization of genes that are expressed in germline stem cells of <i>Acipenser ruthenus</i>
M.Sc. Sabine Sampels, Ph.D.	Dipl.-Ing. Pavla Linhartová	Effects of common pollutants and fish nutrients on human cell viability and lipid metabolism <i>in vivo</i>
Dipl.-Ing. Vlastimil Stejskal, Ph.D.	Dipl.-Ing. Jan Matoušek	Technological aspects of intensive culture of whitefish ( <i>Coregonus peled</i> )
Prof. M.Sc. Petr Špatenka, Ph.D. (FE USB)	M.Sc. Syam Krishna Balakrishnan	Investigation of advance oxidation processes (mainly based on plasma discharge and photo catalytic effect) for decomposition of water pollutants
Dipl.-Ing. Tomáš Randák, Ph.D.	Dipl.-Ing. B.Sc. Kateřina Grabicová	Effects of chemicals present in sewage treatment plants' effluents on fish
	Dipl.-Ing. Daniel Červený	New strategy of fishery management supporting wild population of brown trout ( <i>Salmo trutta</i> ) and European grayling ( <i>Thymallus thymallus</i> )
Prof. Zdeňka Svobodová, DVM, D.Sc.	Zuzana Richterová, DVM	Effects of pyrethroids on fish
dr hab. Dipl.-Ing. Josef Velišek, Ph.D.	Dipl.-Ing. Alžběta Stará	The effect of triazine based pesticides on fish
	Dipl.-Ing. Dalibor Koutník	The effect of triazine metabolites on no-target aquatic organisms
Eliška Zusková, DVM, Ph.D.	M.Sc. Latifeh Chupani	The histopathological changes of target organs after expositions of fish various chemicals
Assoc. Prof. Dipl.-Ing. Vladimír Žlábek, Ph.D.	M.Sc. Viktoriia Burkina	Biomarkers in aquatic toxicology – effects of emerging pharmaceuticals on fish
	M.Sc. Sidika Sakalli	Bioactive chemicals in the aquatic environment and their effects on fish

### Extraordinary Scholarship for Athletes

The new type of extraordinary scholarship was introduced in the academic year 2012/13. Scholarship for Athletes, specified in the Dean's Decision No. 7/2013, is awarded for outstanding sport achievements and/or for support of sport activities. Excellent placement in national, international or university competitions (championships) is an outstanding sport achievement. The scholarship for support of sport activities will be awarded to students to facilitate the participation in major sport events, support of training or sport performance. Two students were awarded this scholarship in 2012/2013, in the total amount of 4,500 CZK.

#### Students who met the conditions to be awarded with extraordinary scholarship for athletes in 2012/2013:

Student	Scholarship (in CZK)
M.Sc. Zuzana Linhartová	2,500
Dipl.-Ing. Miroslav Blecha	2,000
<b>Total</b>	<b>4,500</b>

## INTERNATIONAL ACTIVITIES

### COOPERATION

International cooperation runs on several levels:

**1** Cooperation in mutual exchange of publications, experience, results and short-term stays aiming at resolving related research subjects. This cooperation is based on signed contracts between USB FFPW and specific foreign institutions. In the period 2012–2013 we had valid agreements with following institutions:

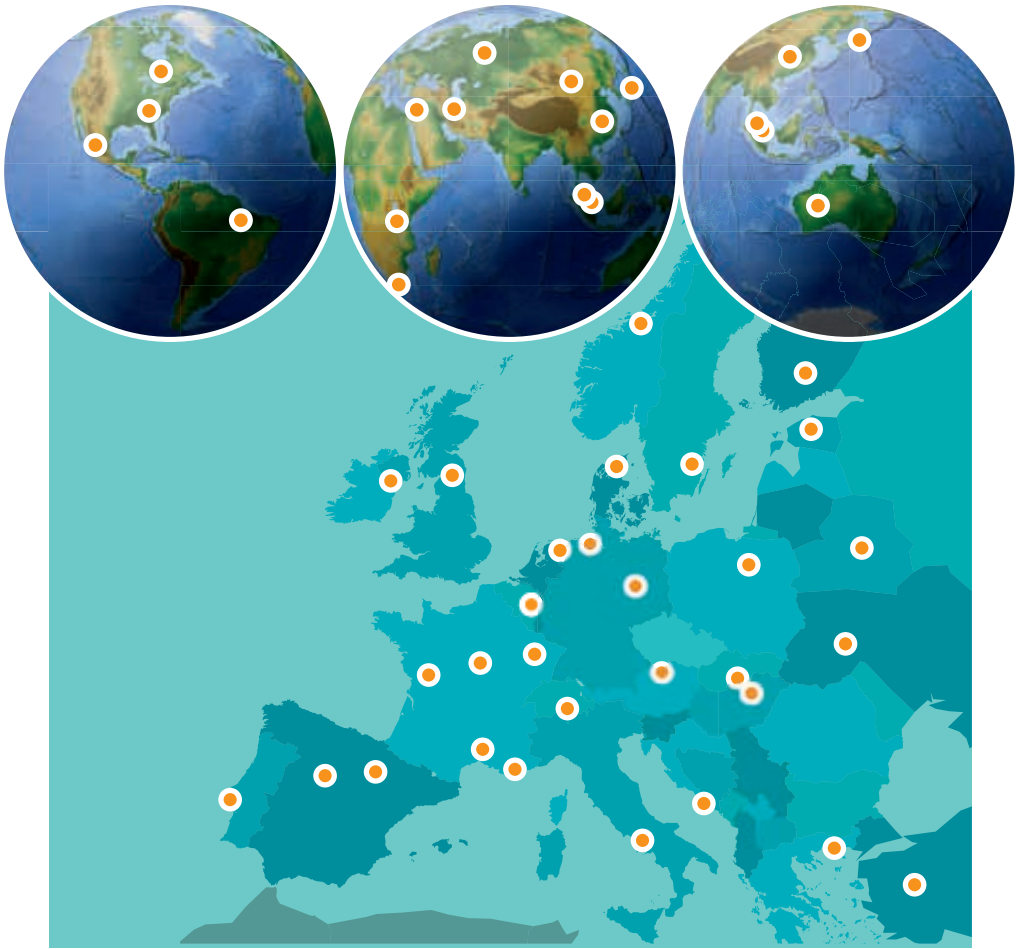
- University of Natural Resources and Life Sciences, Viena, Austria
- Russian Academy of Science, Scientific Research Center for Ecological Safety, Saint Petersburg, Russia
- University of Kragujevac, Serbia
- Department de la Moselle, Metz, France
- University of Newfoundland, Canada
- University of Novi Sad, Serbia
- University of Belgrade, Serbia
- Russian Federal Research Institute of Fisheries and Oceanography VNIRO, Moscow, Russia
- University of Warmia and Mazury, Olsztyn, Poland
- Catholic University of Temuco, Republic of Chile

**2** Bilateral cooperation in scope of countries, which signed contracts on governmental level regarding mutual cooperation in research and development. These programmes are available through the Ministry of Education, Youth and Sports of the Czech Republic (see the chapter *Research projects, p. 74*).

- Technical university of Munich, Germany
- Polish Academy of Sciences, Institute of Ichthyobiology, Golysz, Poland
- Polish Academy of Science, International Centre of Ecology, Dziekanów Leżeny, Poland
- Research Institution of Fisheries, Aquaculture and Irrigation, Szarvas, Hungary
- Institute of Animal Reproduction and Food Research of the Polish Academy of Sciences, Olsztyn, Poland
- University of Exteremadura, Department of Vegetal Biology, Ecology and Earth Sciences, Badajoz, Spain
- National Centre of Scientific Research, Station of Zoology and Cellular Marine Biology, Villefranche-sur-Mer, France

**3** Direct cooperation with several partners from European countries concentrating on research and development in scope of the programmes of the European Union (see the chapter *Research projects, pp. 74–77*).

- INRA-IFREMER, Fish Genetics Section, Palavas les Flots, France
- National Academy of Sciences of Ukraine, Institute for Problems of Cryobiology and Cryomedicine, Kharkiv, Ukraine
- University of Michoacana de San Nicolás de Hidalgo, Michoacana, Mexico
- Fisheries and Oceans Canada, Biological Station, New Brunswick, Canada
- York University, Toronto, Canada
- University of Johannesburg, South Africa
- Aquaculture Initiative EEIG, Dundalk, Ireland
- Hellenic Centre for Marine Research, Crete Institute of Aquaculture, Heraklion, Greece



- *Institute for Land and Water Management Research, Centre for Sustainable Protection of Ground and Surface Waters, Schrems, Austria*
- *University Nancy, Department of Domestication of Freshwater Fish, Nancy, France*
- *Estonian University of Life Sciences, Institute of Veterinary Medicine and Animal Science, Tartu, Estonia*
- *Universidad Politécnica de Valencia, Department of Animal Science, Valencia, Spain*
- *University Udine, Department of Life Sciences, Pagnacco, Italy*
- *University Umea, Umea, Sweden*
- *Chinese Academy of Fishery Science, Jingzhou City, China*
- *University of Calgary, Canada*
- *V.N. Karazin Kharkiv National University, Department of Biological and Medical Physics, Kharkiv, Ukraine*
- *Faculty of Fisheries Sciences, Hokkaido University, Hokkaido, Japan*
- *University of Malaysia, Institute of Nanoelectronic Engineering, Perlis, Malaysia*
- *University of California, Riverside, USA*
- *Huazhong Agricultural University, Wuhan, China*
- *University Politecnica delle Marche, Ancona, Italy*
- *Southwest University School of Life Science, Chongqing, China*
- *Swedish University of Agricultural Sciences, Uppsala, Sweden*
- *Faculty of Life Science, University of Lisboa, Portugal*
- *University of Oklahoma, USA*
- *Bavarian State Research Center for Agriculture, Freising, Germany*
- *Federal state Unitary Enterprise State Research-and-Production Center of Fishery "Gosrybcenter", Tyumen', Russia*
- *Kentucky State University, Frankfurt, USA*
- *Hanoi University of Agriculture, Faculty of Animal Sciences and Aquaculture, Vietnam*
- *Nha Trang University, Faculty of Aquaculture, Nha Trang, Vietnam*
- *Nong Lam University, Faculty of Fisheries, Ho Chi Minh City, Vietnam*
- *University KAHO Sint-Lieven, Sint-Niklaas, Belgium*



## INTERNATIONAL SCIENTIFIC MEETINGS ORGANIZED BY FFPW USB

### AQUA 2012

The International Conference and Exposition AQUA 2012 took place in the Prague Congress Center from 1<sup>st</sup> to 5<sup>th</sup> September 2012. This event is regularly organized by the European Aquaculture Society and the World Aquaculture Society each six years. FFPW USB had significantly contributed to the organization of the event. As well as the South Bohemian Research Center of Aquaculture and Biodiversity of Hydrocosenes. This joint meeting, consisting of international scientific conference, international exposition, workshops for aquaculture producers, forums organized by the students and the General Headquarters for Research of the European Commission and many other workshops and meetings, in the year 2012 proved again the global importance of aquaculture and specifically of these events. A very rich program of the Conference took place in many halls of the Prague Congress Center. There were presented more than 1,300 specialized articles in 65 different scientific sections. The Conference AQUA 2012 was accompanied by the worldwide aquaculture exposition. The world's leading organizations and companies engaged in breeding and cultivation of aquatic organisms, in feed and drugs production, in the development of breeding technologies and last but not least, in education and science in the field of fisheries, presented their services and products in 115 presentation stands. Thanks

to our presentation stand, the FFPW USB gained a lot of valuable and interesting contacts and could host many special guests. The Round-table discussion on the Quality of Fish Flesh represented an another significant event of the Conference. The technical discussion was lead by two researchers of our faculty, Prof. Jana Pickova, Ph.D. (FFPW USB and Swedish University of Agricultural Sciences) and Assoc. Prof. Dipl.-Ing. Tomáš Randák, Ph.D. (FFPW USB). The Round-table discussion was attended by 40 specialists from all over the world. The specialists agreed on the facts that it is necessary to promote the quality of freshwater fish and the impact of fish flesh on human health, to market high quality fish all year-long and for a reasonable price, to offer a wide fish product range, to put money into the modern recirculation breeding systems, etc. Margaret Eleftheriou, Lindsay Laird and the Steering Committee of EAS awarded the most innovative student poster of the Conference AQUA 2012. 150 of the student posters were displayed and evaluated. The first prize was won by a student of the FFPW USB, Dipl.-Ing. Jiří Kříšťan. He had attracted the Expert Committee by the topic: "The alcalase enzyme treatment for the elimination of egg stickiness in pikeperch *Sander lucioperca* L.". The event AQUA 2012 was attended by 1203 participants from 74 countries all over the world.



The dean of the FFPW USB Prof. O. Linhart with the vice-rectors USB, Assoc. Prof. D. Škodovou Parmovou, and Prof. T. Polívka discussing with the Malay ambassador Zainal Abidin Bakem during AQUA 2012.

## VI<sup>th</sup> International Workshop on Biology and Culture of the Tench (*Tinca tinca* L.)

On 17<sup>th</sup> September 2012 The VI<sup>th</sup> International Workshop on Biology and Culture of the Tench was started. The workshop traditionally addressed all aspects of tench biology and farming (genetics; physiology; embryology; artificial reproduction and nursing; broodstock management; feeding and nutrition; farming technologies; tench diseases, parasitology and immunology; production, processing and prod-

uct quality; logistics, marketing and economics; tench as a model for various studies, etc.). The workshop consisted of oral presentations in sessions and of an excursion to the South Bohemian region to visit a fish hatchery, a traditional pond aquaculture facility, as well as some neighbouring historical castle or monument.

## The conference entitled “Toxicity and Biodegradability of Matters Important in Aquatic Environments”

The conference entitled “Toxicity and Biodegradability of Matters Important in Aquatic Environments” took place at the FFPW USB in Vodňany from 26<sup>th</sup> to 28<sup>th</sup> August 2013. At the conference, 25 scientific contributions were presented that focused on the toxicological, fisheries and water management topics. Students and young scientific workers had an opportunity to participate in the traditional competition entitled “The prize of Prof. Vladimír Sládeček, D.Sc., for the best presentation”. The first prize was awarded to Oksana Golovko (“Removal efficiency of pharmaceuticals from sewage in WWP of České Budějovice”) followed by Alžběta Stará (“Effect of prometryne

on non-target aquatic organisms using oxidative stress biomarkers and antioxidant enzymes”), Marie Ševčíková (“Effect of *in vitro* exposure to metals on adrenocortical cells of rainbow trout – two methods of isolating cells”) and Jan Sadílek (“Cyanobacterial toxins in drinking water – occurrence, removal and risk assessment”). The participants of the conference had possibility to visit the Museum of Forestry, Game-keeping and Fisheries (Chateau Ohrada). Moreover, Dipl.-Ing. E. Levý enriched the conference party with a lecture on healthy diet with a show of non-traditionally prepared products from freshwater fish.



The participants of the workshop “Fish Histopathology, especially in toxicological studies focused on trout and carp”.

### The practical workshop “Fish Histopathology, especially in toxicological studies focused on trout and carp”

The practical workshop “Fish Histopathology, especially in toxicological studies focused on trout and carp” was held in FFPW USB in Vodňany from 17<sup>th</sup> to 18<sup>th</sup> September 2013. The event was organized by the Laboratory of Environmental Chemistry and Biochemistry and the IEEAIC center. The internationally recognized fish pathologist Dr. Heike Schmidt-Posthaus from the Centre for Fish and Wildlife Health, Vetsuisse – Faculty, University of Bern, had presented an excellent educational program. The program included the introduction into fish anatomy and histology, which moved continuously into a pathological area of this

field to culminate in the overview of the most important fish diseases and their diagnoses, primarily histological diagnoses. The lectures were supplemented by photo documentation and the explained topics were practiced by the individual microscopic examination of model histological slides afterwards. The discussion was carried on during whole workshop, and also at the final consultation of histological slides, which were brought by workshop participants. All 30 participants expressed satisfaction with the course and the content of the workshop.

### Scientific conference DIFA II. – “Diversification in Inland Finfish Aquaculture”

The second year of the workshop DIFA (Diversification in Inland Finfish Aquaculture), organised by the FFPW USB was launched in Vodňany, Czech Republic, on 24<sup>th</sup> September 2013. This event followed the previous successful DIFA workshop, which was organized by the faculty in 2011. Organizers welcomed 118 participants from 16 countries from all over the world. The workshop started with the opening words of the dean of the FFPW USB, Prof. Dipl.-Ing. Otomar Linhart, D.Sc., and of the workshop convenor, Dipl.-Ing. Martin Pšenička, Ph.D. During the first day, the participants were listening to the oral and watched poster presentations from the sessions: Quality of fish flesh and nutrition, and Reproduction and biotechnology. The following day, was started with the lectures from the

field of pollutants in the aquatic environment, and freshwater aquaculture of commercially interesting fish. The third day was successfully concluded with the block of lectures from the field of freshwater aquaculture of commercially interesting fish. The best student’s presentations were awarded during the final ceremony. It was also associated with the significant event, the inauguration of the South Bohemian Research Center of Aquaculture and Biodiversity Hydrocenoses. Both winners came from the rang of young scientists of the faculty. The award for the best oral presentation went to M.Sc. Hilal Güralp (Laboratory of Reproductive Physiology) for her presentation “Embryonic stages and primordial germ cells development in pikeperch *Sander lucioperca* (Teleostei: Percidae)”. The award for the best poster went to Dipl.-Ing. Markéta Prokešová (Laboratory of Controlled Reproduction and Intensive Fish Culture), her poster was titled “Effect of water temperature on early life history of African catfish, *Clarias gariepinus* (Burchell, 1822)”.



The guests of the conference DIFA II and the inauguration of the South Bohemian Research Center of Aquaculture Hydrocenoses.

## THE PARTICIPATION IN THE INTERNATIONAL CONFERENCES AND SYMPOSIUMS BY THE FFPW USB EMPLOYEES AND STUDENTS

### Year 2012

- *International Conference for Fish Farming and Aquaculture, Starnberg, Germany, 17.–18. 1. 2012*
- *International Conference and Workshop on Nanostructured Ceramics and other Nanomaterials 2012, New Delhi, India, 13.–16. 3. 2012*
- *Sixth International workshop on Self-Organizing Systems, Dift, Netherlands, 15.–16. 3. 2013*
- *International Conference "Structure" 2012, Klatovy, Czech Republic, 11.–14. 6. 2012*
- *2<sup>nd</sup> International Conference "Visegrad Symposium on Structural Systems Biology", Gyöngyöstarján, Hungary, 13.–18. 6. 2012*
- *International Plant Biology Congress, Freiburg, Germany, 29. 7. – 3. 8. 2012*
- *International Conference "Systems Biology", Toronto, Canada, 19.–23. 8. 2012*
- *19<sup>th</sup> International Astacological Conference, Innsbruck, Austria, 24.–31. 8. 2012*
- *International Conference "EAS and WAS AQUA 2012", Prague, Czech Republic, 1.–5. 9. 2012*
- *International European Conference on Complex Systems, Brusel, Belgium, 3.–7. 9. 2012*
- *International Conference Modelling for Engineering & Human Behaviour 2012, Valencia, Spain, 4.–7. 9. 2012*
- *22 IUBMB – 37<sup>th</sup> FEBS Conference, Sevilla, Spain, 4.–9. 9. 2012*
- *II. International Symposium HUCHO, Łopuszna, Poland, 19.–22. 9. 2012*
- *International Conference ICCBM14, Alabama, USA, 20.–30. 9. 2012*
- *International Conference "People and fish", Weitra, Austria, 28. 9. 2012*
- *Czech Ichthyological Conference, Červená nad Vltavou, Czech Republic, 24.–26. 10. 2012*
- *International Conference CECE 2012 – 9<sup>th</sup> International Interdisciplinary Meeting on Bioanalysis, Brno, Czech Republic, 30. 10. – 2. 11. 2012*
- *International Symposium "Fish and Amphibian embryos as Alternative Models in Toxicology and Teratology", Paris, France, 11.–12. 10. 2012*
- *International Conference Domestication in Finfish Aquaculture, Olsztyn, Poland, 23.–25. 10. 2012*
- *International Conference Acvapedia – 2012, Szarvasz, Hungary, 27.–29. 11. 2012*
- *International Conference on New Sources of omega-3 fatty acids for animal feed and nutrition, Copenhagen, Denmark, 13.–15. 11. 2012*
- *International Conference "HZB-user meeting", Berlin, Germany, 11.–14. 12. 2012*
- *International Conference MutaMorphosis Tribute to Uncertainty, Prague, Czech Republic, 6.–8. 12. 2012*
- *International workshop focuses on a study comparing drug use, Lisbon, Portugal, 9.–12. 12. 2012*

## THE PARTICIPATION IN THE INTERNATIONAL CONFERENCES AND SYMPOSIUMS BY THE FFPW USB EMPLOYEES AND STUDENTS

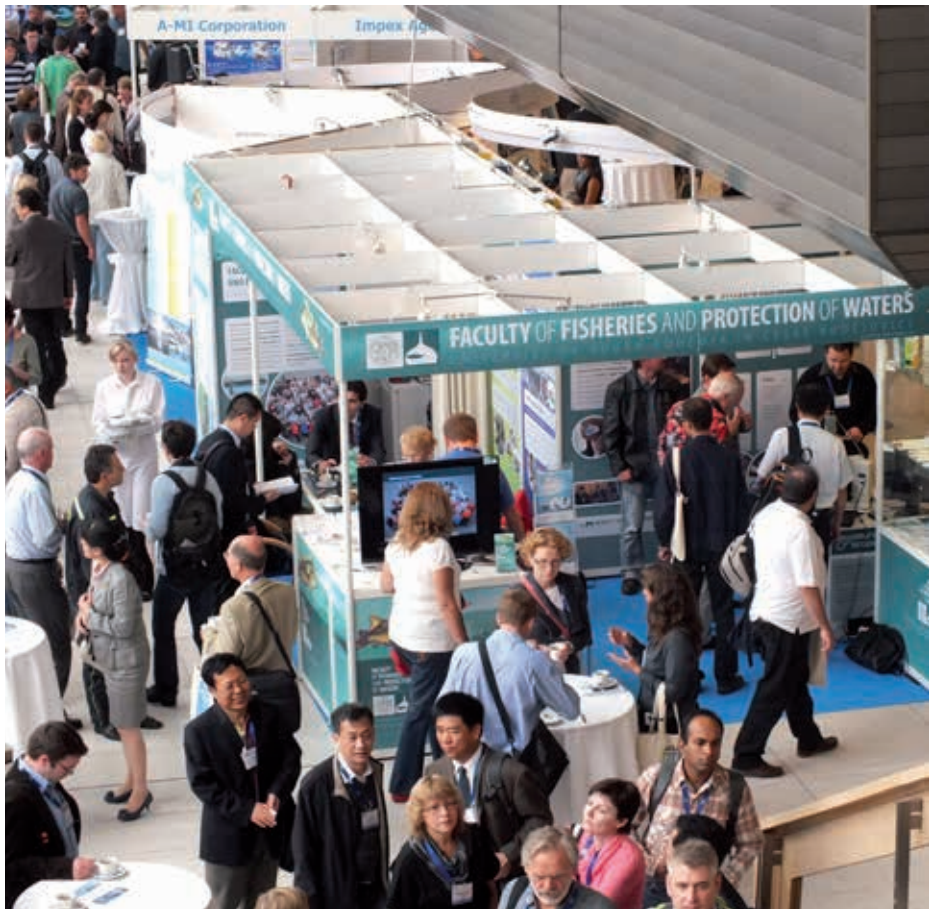
### Year 2013

- 3<sup>rd</sup> Annual Southern California Systems Biology Conference, California, USA, 5.–28. 1. 2013
- International Conference “Reproduction of Natural Population of Fish”, Saint Petersburg, Russia, 15.–18. 4. 2013
- Symposium “Understanding Shape. In silico and in vivo”, Klosterneuburg, Austria, 26. 4. 2013
- International conference focused on monitoring drugs in wastewater, Lisbon, Portugal, 5.–9. 5. 2013
- Intentional Fisheries Conference, Vukovar, Croatia, 8.–10. 5. 2013
- International Conference SETAC, Glasgow, United Kingdom, 11.–17. 5. 2013
- International Conference ISBC 2013, Granada, Spain, 25.–31. 5. 2013
- Workshop Good Practice demonstrativ LakeAdmin, INTERREG IVC, Helsinki, Finland, 29. 5. – 1. 6. 2013
- International Conference “Water and fish”, Belgrade, Serbia, 11.–15. 6. 2013
- 3<sup>rd</sup> International workshop “On material modeling and stimulation”, Malakand, Pakistan, 25. 6. – 5. 7. 2013
- International Conference “Summer meeting of Crustacean Society”, San José, Costa Rica, 3.–15. 7. 2013
- International FEBS Conference, Saint Petersburg, Russia, 6.–14. 7. 2013
- 4<sup>th</sup> International workshop “On Bismuth-Containing Semiconductors”, Arkansas, USA, 12.–19. 7. 2013
- International Conference Micropol and Ecohazard 2013, Zurich, Switzerland, 15.–22. 7. 2013
- 7<sup>th</sup> International symposium „On Sturgeon”, Nanaimo, Canada, 20.–27. 7. 2013
- International Conference Aquaculture Europe 2013, Trondheim, Norway, 12.–5. 8. 2013
- 28<sup>th</sup> International Conference “European Crystallographic Meeting” Warwick, United Kingdom, 24.–31. 8. 2013
- 28<sup>th</sup> European Crystallography, Coventry, United Kingdom, 24. 8. – 2. 9. 2013
- International Conference on Systems Biology, Copenhagen, Denmark, 28. 8. – 3. 9. 2013
- International Conference Eurotox 2013, Interlaken, Switzerland, 1.–4. 9. 2013
- International Conference on the Behavior of Oesticides in Soil, Water and Air, York, United Kingdom, 2.–4. 9. 2013
- 16<sup>th</sup> International Conference “Diseases of Fish and Shellfish”, Tampere, Finland, 2.–6. 9. 2013
- Aquaculture Workshop, Istanbul, Turkey, 3.–5. 9. 2013
- International Conference Structura, Českovice, Czech Republic, 9.–12. 9. 2013
- Interdisciplinary Symposium on Complex Systems 2013, Prague, Czech Republic, 10.–13. 9. 2013
- International Conference “4th International Workshop on the Biology of Fish Gametes”, Algarve, Portugal, 17.–20. 9. 2013
- International Conference HEC16 (Heart of European Bio – Crystallography) Hipping, Austria, 26.–28. 9. 2013
- International Conference “Regional European Crayfish meeting”, Rovinj, Croatia, 26.–28. 9. 2013
- International Conference The Euro Fed Lipid, Antalya, Turkey, 27.–30. 10. 2013
- International “Conference Young Scientists – Safety of the food chain”, Bratislava, Slovakia, 7.–8. 11. 2013
- International conference “Technical Computing Prague”, Prague, Czech Republic, 13. 11. 2013
- International conference “Biology, biotechnology and breeding of coregonid condition of fish stocks”, Tyumen, Russia, 27.–29. 11. 2013
- International Conference HZB-user meeting, Berlin, Germany, 3.–6. 12. 2013



## MEMBERSHIPS OF FFPW IN INTERNATIONAL NETWORKS AND ORGANISATIONS

- *NACEE (Network of Aquaculture Centres in Central Eastern Europe)*
- *AQUA-TNET (European Thematic Network in the Field of Aquaculture, Fisheries and Aquatic Resources management)*
- *EAS (European Aquaculture Society)*
- *W.S.C.S. (World Sturgeon Conservation Society)*
- *Society for Cryobiology*



The faculty presentation stand in Prague during the EAS and WAS symposium AQUA 2012.



## MEMBERSHIPS OF FFPW EMPLOYEES AND STUDENTS IN INTERNATIONAL ORGANISATIONS

- |  |   |
|--|---|
| M.Sc. Bořek Drozd, Ph.D.                             | • EIS (European Ichthyological Society)                         |
| Assoc. Prof. Dipl.-Ing. Martin Flajšhans, Dr.re.agr. | • Network of Tropical Aquaculture Scientists                    |
| Assoc. Prof. Dipl.-Ing. Pavel Kozák, Ph.D.           | • International Association of Astacology                       |
| Jitka Kolářová, DMV                                  | • Crustacean society  |
| Prof. Dipl.-Ing. Otomar Linhart, D.Sc.               | • EAFP (European Association of Fish Pathologists)              |
| Veronika Piačková, DMV, Ph.D.                        | • International Society of Cryobiology                          |
| Prof. Zdeňka Svobodová, DVM, D.Sc.                   | • IGB Berlin  |
| Assoc. Prof. Dipl.-Ing. Vladimír Žlábek, Ph.D.       | • EAFP (European Association of Fish Pathologists)              |
|  | • OECD-Ecotoxicology  |
|  | • EAFP (European Association of Fish Pathologists)              |
|  | • OECD-Ecotoxicology  |
|  | • The Center for Reproductive Biology in Uppsala (CRU)          |
|  | • The Society of Environmental Toxicology and Chemistry (SETAC) |



Meeting during the Inauguration of the South Bohemian Research Center of Aquaculture and Biodiversity Hydrocenoses in Vodňany on 26<sup>th</sup> September 2013.

## MEMBERSHIPS OF THE FFPW USB EMPLOYEES ON INTERNATIONAL EDITORIAL BOARDS

Assoc. Prof. MSc. Zdeněk Adámek, Ph.D.

- Aquaculture International
- Croatian Journal of Fisheries
- Journal of Applied Ichthyology
- Czech Journal of Animal Science
- Acta Veterinaria
- World Journal of Anesthesiology
- World Journal of Immunology
- Acta Advances in Agricultural Sciences
- International Journal  
of Nanoelectronics and Materials
- Physics Research International
- Journal of Atomic, Molecular,  
and Optical Physics
- International Publishers of Science,  
Technology and Medicine  
(Advances in Applied Physics)
- Journal of Science and Technology

Prof. Dipl.-Ing.Otomar Linhart, D.Sc.

Prof. Zdeňka Svobodová, DVM, D.Sc.

dr hab. Dipl.-Ing. Josef Velíšek, Ph.D.

Prof. Dr. Ali Hussain Reshak

## FACULTY ECONOMICS

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As in the previous period, even in the years 2012/2013 the faculty was actively involved in raising funds both from sources in the Czech Republic, EU, and from the application area. An important event in early 2012 was also the merger of the former faculty of the Institute of Physical Biology in Nové Hradky, which entailed not only the expansion of scientific cooperation, but also increased the overall budget of the faculty.

### Year 2012

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In 2012, the faculty continued its successful activities both in the field of scientific research, educational as well as economic. The main funding sources for scientific research activities included grants of the Ministry of Education, Youth and Sports Operational programme Science and Research for Innovation supporting the South Bohemian Research Center of Aquaculture and Biodiversity of Hydrocenoses (CENAKVA, CZ.1.05/2.1.00/01.0024), institutional support RVO, GACR grants, TAČR, GAJU and of EU, especially the 7<sup>th</sup> Framework Programme.

The primary source of financing for educational activities came from the Ministry of Education, which in 2012 amounted to 13.119 milion CZK. The sum of 2.491 milion CZK was assigned to the faculty for Ph.D. scholarships students in 2012. In applied research, the faculty was involved as a partner in projects approved under the Operational Programme for Fish-

eries. Due to profitable commercial activities we achieved a financial gain. Despite the fact that the cost of additional activities exceeded revenues of principal activity the profit was 1.336 milion CZK. The additional profit from activities before tax amounted was 6.355 milion CZK. The faculty profit in 2012 was 4.561 milion CZK after-tax. The profit after approval was transferred to the Fund's capital assets. Compared to 2011, there was a substantial increase in tangible fixed assets (movable and immovable property). The increase was due to the merger with parts of the former Institute of Physical Biology in Nové Hradky and new technologies within the project CENAKVA. The increase in real estate is a technical evaluation of former and new properties (the main administrative building in Zátěšín, the Experimental fish culture and Facility and the newly constructed building of the Genetic Fisheries Center).

### Year 2013

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As in 2012, financial sources came from the project CENAKVA, the Ministry of Education, Youth and Sports, institutional support RVO, grants GACR, NAZV, TAČR, GAJU, the 7<sup>th</sup> EU subsidies Framework Programme. 2013 was the year when the project funding CENAKVA of Operational programme Science and Research for Innovation was terminated.

In order to continue to build an excellent center, the project proposal was submitted to the National Programme for Sustainability I at the beginning of 2013, announced by the Ministry of Education, Youth and Sports. This project has been obtained and the total support provided for the years 2014–2018 is 123.780 milion CZK. The contribution amount for

education from the Ministry of Education, Youth and Sports was in 2013, after taking into account internal adjustments in the amount of 18.701 milion CZK, scholarships in the amount of 3.478 milion CZK.

As it has been for several years, due to profitable commercial activities the faculty achieved a financial gain. We expect the profit will be transferred to the Fund's capital assets.

The most significant investment was the completion of the reconstruction of the MEVPIS building, which was supported by the State Environmental Fund under the Operational Programme Environment. The total value of the property is currently 37.199 milion CZK.

## OTHER EVENTS IN THE LIFE OF THE FACULTY

### Dipl.-Ing. Martin Hulák, Ph.D. *in memoriam*

Our colleague and friend, Dipl.-Ing. Martin Hulák, Ph.D., (\*1979, Šoporňa, Slovakia) suddenly died at the University of Windsor in Canada on the 29<sup>th</sup> August 2012. He graduated from the Slovak University of Agriculture in Nitra, specializing in molecular biology and ecology. He started his doctoral studies in the Research Institute of Fish Culture and Hydrobiology USB in Vodňany in 2004. It was him who put together the molecular laboratory in the former RIFCH USB. After graduation in 2007, he focused on research and teaching career in the Department of Genetics and Fish Breeding. After the establishment of the faculty he became an academic worker of the Laboratory of Molecular, Cellular and Quantitative Genetics of the RIFCH FFPW USB with the guidance of Ph.D. students and his research programs. In March of 2012, he left for postdoctoral stay at the University of Windsor in Ontario, Canada. The supervisor of his work



was Prof. Hugh MacIsaac. Funeral farewell was held at home in Šoporňa in Slovakia on the 13<sup>th</sup> October 2012. Honor his memory.

### Prof. M.Sc. Dalibor Štys, Ph.D., became the Minister of Education

Prof. M.Sc. Dalibor Štys, Ph.D., held the post of the Minister of Education, Youth and Sports from the 10<sup>th</sup>

July 2013 to the 29<sup>th</sup> January 2014 (from the 13<sup>th</sup> August 2013 he was the minister in resignation) ↓.



Prof. Štys works at the Faculty of Fisheries and Protection of Waters USB (FFPW USB) as the head of the Laboratory of Applied Systems Biology. He graduated from the Faculty of Science, the Charles University in Prague (1987). Then he worked at the Institute of Organic Chemistry and Biochemistry, the Academy of Sciences and the University of Lund in Sweden. After his return he contributed to the creation of the Institute of Physical Biology in Nové Hradky USB which was also led by him. He also has a share in establishing the

fisheries center CENAKVA, in which he participated with his research program. Part of the Institute in Nové Hradky, engaged in CENAKVA, has been affiliated to the FFPW USB since 2012. Prof. Štys served here as the vice-dean for development from the beginning. Since November 2012, he became the director of the Department of Research and Innovation of the Ministry of Education, Youth and Sports. His research work is mainly focused on the biochemistry, physiology of photosynthesis and bioinformatics.

### Fishing library, Balon's library

The fishing library became a branch of the Academic Library of the University of South Bohemia in České Budějovice from the 1<sup>st</sup> January 2012. During the summer months of 2013, the book collection was moved back from the temporary premises of the Institute of Aquaculture in České Budějovice to Vodňany, into renovated premises of the main building of the FFPW USB. Currently, in the library there are registered over 20,000 documents out of which the library collection has over 17,000 registered library units. The library is unique with interesting book collections. Since September 2013, readers have an access to the “**Balon's library**“. It contains 295 items of monographs thematically focused mainly on ichthyology and evolutionary biology and magazines Environmental biology of fishes; Fish Physiology and

Biochemistry; Copeia and Journal of Bioeconomics. **Prof. Dr. Eugene Kornel Balon** (1<sup>st</sup> August 1930 in Orlová, Czech Republic 4<sup>th</sup> September 2013 in Guelph, Canada) was a Canadian ichthyologist of Czechoslovak origin. He worked in the RIFCH as a researcher, until his departure into exile at the end of the 60s of the 20<sup>th</sup> century. Then he settled in Canada, Guelph in Axelrod Institute of Ichthyology. In 2010, he donated his valuable private library to the Faculty of Fisheries and Protection of Waters USB. For the last time he visited Vodňany and the faculty in May 2012 with a memorable lecture on West Indian Ocean coelacanth (*Latimeria chalumnae*), whose research he dealt with, among other things. At the same time he donated a valuable piece of baby coelacanth and rare imprint (gyotaku) of an adult fish to the faculty ↓.





## Faculty of Fisheries and Protection of Waters USB or its employees received various awards

- The chairman of the AS CR Prof. Dipl.-Ing. Jiří Drahoš, D.Sc., dr.h.c. handed over the “**Award of the Academy of Sciences CR**” to an international team of 16 workers and co-workers of the Laboratory of Fish Genetics of the Institute of Animal Physiology and Genetics, v.v.i., in Liběchov on the 10<sup>th</sup> October 2012. The member of the award-winning team was also Assoc. Prof. Dipl.-Ing. Martin Flajšhans, Dr.rer.agr. (Laboratory of Molecular, Cellular and Quantitative Genetics). The award belonged to the first category for outstanding results of great scientific importance in the field of biological sciences entitled “Clonal vertebrates: discovery, mechanisms, biodiversity and reconstruction upon a model of cobitid fishes”. The results were published in a total of 62 publications in impacted journals and 3 chapters in professional books.

- **Award of the rector of the University of South Bohemia in České Budějovice** for prestigious scientific publication in 2011 was received by M.Sc. Zhihua Li, Ph.D., (Laboratory of Environmental Chemistry and Biochemistry) for the study: “Evaluating environmental impact of STPs situated on streams in the Czech Republic. An integrated approach to biomonitoring the aquatic environment”, Z.-H. Li et al., *Water Research* 45, pp. 1403–1413 (IF 2011: 4.865). A year later, the same award was received by Dipl.-Ing. Jan Urban, Ph.D., (Laboratory of Applied Systems Biology) for the publication „Time-alignment in high performance liquid chromatography – mass spectrometry based on blank measurement“, Urban et al., Lap LAMBERT Academic Publishing, Germany, 100 pp.

- Dipl.-Ing. Eduard Levý (a manager of the Store for fish health) received a prestigious award at the congress of the Association of chefs and confectioners of the Czech Republic, which took place in Prague’s hotel Intercontinental. He took over the **gold medal of Magdalena Dobromila Rettigová** from the president of the World association of culinary organizations for Europe and the Association of chefs and confectioners of the Czech Republic, Miroslav Kubec, on 1<sup>st</sup> March 2013. This award testifies about the excellent culinary skills ↓.



- FFPW USB won the 2<sup>nd</sup> place in the survey “**Faculty of year 2012/2013**” in the category Veterinary medicine and agriculture. The survey was organized by the Czech student union and its aim is to introduce to potential applicants for study the quality of teaching based on references of current students.



● The governor of the South Bohemian Region, Jiří Zimola, awarded Prof. Linhart, the dean of the FFPW USB, **the Gold Scale Award** in Ales South Bohemian gallery in Hluboká nad Vltavou on 29<sup>th</sup> October 2013. It happened on the occasion of the 95<sup>th</sup> anniversary of the establishment of the independent Czechoslovak state. The prize of the governor is awarded to distinguished personalities who have made an outstanding contribution to the development and reputation of the South Bohemian region ↓.



### Significant visits

During the period of 2012 and 2013, the FFPW USB was also visited by many famous personalities. The Minister of Agriculture, Dipl.-Ing. Petr Bendl, visited the FFPW USB in August 2012. More than once the faculty was visited by the President of the Senate of the Czech Republic, Mr. Milan Štěch. He attended a tour of the renovated faculty buildings on 6<sup>th</sup> August 2012. About a year later, on 26<sup>th</sup> September 2013, he spoke about the research in fisheries in Vodňany during the celebratory ceremony “Opening of the South Bohemian Research Center of Aquaculture and Bio-

diversity of Hydrocenoses”. This event was attended by many other personalities such as the chairman of the European Aquaculture Society (EAS), Prof. Sachi Kaushik, the director of the Central European Institute of Technology CEITEC, Markus Dettenhofer, Ph.D., the chairman of the Grant Agency of the Czech Republic (GACR), Prof. Dr. Petr Matějů, Ph.D., the scientific director of the Centre of region Haná for Biotechnological and Agricultural Research, Prof. M.Sc. Ivo Frébort, Ph.D.

### Election of the dean

The election of the dean of the FFPW USB took place on 2<sup>nd</sup> October 2013. Faculty Academic Senate elected Prof. Dipl.-Ing. Otomar Linhart, D.Sc., for

a second four-year term. The rector of the USB Prof. M.Sc. Libor Grubhoffer, PhD., appointed the dean on 11<sup>th</sup> December 2013.

## PROMOTION AND OUTPUTS IN THE MEDIA

### PROMOTIONAL ACTIVITIES OF THE FFPW USB

Since its establishment the Faculty of Fisheries and Protection of Waters USB has put emphasis on promotional activities. The promotional activities are in the first place about increased awareness of potential faculty students, about study options and subsequent job possibilities of graduates. Another purpose is a familiarization of the general public and the application area about possibilities of commercial and project cooperation with the FFPW USB. Finally, there is an effort to approximate activities of the faculty and the scientific facilities to the general public using popularization instruments. Employees also promote the objectives and outputs of the faculty projects, which

are closely related to further development and direction of the faculty. The faculty continued to set uniform visual style in 2012. During 2013 was created and introduced the new logo for the University of South Bohemia in České Budějovice and for all faculties. The faculty logo consists of the symbol itself – the five-petalled rose styled into fish – and of the full name of the faculty and the university in Czech and English language. This composition is unique not only in the Czech education but also abroad. Since 2013 the piecemeal transformation and implementation of the new visual style has been ongoing.

#### The faculty consistently uses all tools of marketing communication

- **Advertising:** advertising in professional and popular journals (Rybářství), news medium (MF DNES, Lidové noviny, 5+2), on website, etc.
- **Public Relations:** press releases, press conferences, regular communication with the media and the public.
- **Promotional materials and articles:** tiny prints, audio-visual materials, leaflets, vehicle stickers, roll-ups, posters, stickers, T-shirts, wall and pocket calendars, mugs, plastic bags, blocks, etc.
- **Faculty store "Fish for health":** This unique shop significantly contributes to promoting of the faculty. It regularly offers the product Omega3carp to customers. Another key activity is a preparation of the fish receptions (buffets) for various social events. Dipl.-Ing. Eduard Levý, who is the holder of many gastronomical awards, is the head of the store.
- **Internet store RYBÁŘSKÉKNIHY.CZ** offers publications and learning materials produced by the FFPW USB. This website brings to the professional and general public the latest findings from the science activities of the faculty.
- **Open days,** which are very popular from the potential students and from the general public.

#### Press conferences

Press conferences are the most essential activity for the visibility and popularization of the faculty. These press conferences take place in the press center in České Budějovice and the aim of these conferences is to present actual outputs of science and research,

or interesting facts about the faculty. For example, the Omega3carp was presented before Christmas 2012, the new product Sturgeon friendly caviar was presented in 2013. All themes met with great interest of the media, including broadcast in Česká televize.

#### Participation in exhibitions and trade fairs

The faculty has special equipment with a large wall, information roll-ups, posters and LCS TV for presentations in exhibitions, trade fairs, seminars or culture events. The faculty participated in many important events in the years 2012–2013 with this equipment (For Fishing Prague, Země žitelka České Budějovice, Rybaření Brno, Hobby České Budějovice, Gaudeamus Brno, Vodňanské rybářské dny, etc.). The biggest and

most important exposition in the faculty history was so far the participation on the international conference AQUA2 012 in the Prague Congress center in September 2012. There were many significant meetings at the faculty stand, for example with the ambassador of the Malaysian Republic or with representatives of the multinational concern Altech.



Fakulta rybnářství a ochrany vod  
Faculty of Fisheries and Protection of Waters

Jihočeská univerzita v Českých Budějovicích  
University of South Bohemia in České Budějovice  
Czech Republic

Information about the faculty



We are a young active Central European scientific faculty that creates a self-sustaining economic, social, dynamic and nature-friendly Europe.

Prof. Dipl.-Ing. Olovna Loharčík, D.Sc., Dean of the Faculty



1 Youth and productivity

140 employees  
50 doctoral students  
230

2 European investments

European investments allow us to create cutting-edge basic and applied science

3 International scientific reputation



More than half of Ph.D. students

4 International environment

Internationally recognized institute helping to create global trends in fisheries with regard to conservation of biodiversity of hydrocosystems in Europe. It has modern facilities, laboratories and technologies for students, scientists and entrepreneurs.



South Bohemian Research Center of Aquaculture and Fisheries of the University of South Bohemia

We offer applicants to study Aquaculture and Protection of Waters in English in the form of Master's and Doctoral study



Center CENAKVA is used to scientific development of faculty's institutes

We publish about 70-80 results in prestigious scientific journals each year

Cooperation with European and worldwide partners on 7 international projects

Patents, licenses, technologies, trademarks, business activity



International Environmental, Advisory and Information Centre of Water Protection (IEAIC) in Vodňany

Research Institute of Fish Culture and Hydrobiology (RIFCH) in Vodňany

Institute oriented to applied research offers students and scientists specialization in the areas of fish farming, fisheries, fish meat quality, hydrobiology and water protection. Faculty sells quality fish products here.

Institute of Complex Systems (ICS) in Nové Hradky



Institute of Aquaculture (IA) in České Budějovice



Administrative center of the faculty with accommodation and management facilities focused on international students, summer school, lifelong learning, workshops, promotion and management of projects.

Internationally recognized institute helping to create global trends in fisheries with regard to conservation of biodiversity of hydrocosystems in Europe. It has modern facilities, laboratories and technologies for students, scientists and entrepreneurs.



Students and scientists explore complex systems and general signal processing of the modern workplace. They cooperate with European fisheries institutions where there is a need to sort, store and process experimental data.



Faculty of Fisheries and Protection of Waters, University of South Bohemia in České Budějovice

Map showing the location of the faculty in the Czech Republic.



2014

Faculty of Fisheries and Protection of Waters, Zlatá pátá, 376 24 Vodňany, Czech Republic | [info@frov.jcu.cz](mailto:info@frov.jcu.cz)

www.frov.jcu.cz

jakýsi druhý 190 50-22090000  
What kinds of fish we are engaged in:



Proč právě jasanův? Co je to „jasanův“? Nole voda

Text describing the quality and characteristics of the fish products.



Nál kaviár

Text describing the quality and characteristics of the fish products.



Sturgeon friendly caviar

STURGEON FRIENDLY CAVIAR








First name, Last name	Beginning/End of Employ- ment	Position	First name, Last name	Beginning/End of Employ- ment	Position
Assoc. Prof. M.Sc. Zdeněk Adámek, Ph.D.		academic worker	M.Sc. Viktoriya Dzyuba, Ph.D.	since 15. 5. 2012	researcher
M.Sc. S.M.Hadi Alavi, Ph.D.		academic worker	Zdeněk Elsnic		technician
M.Sc. Maria Anton-Pardo, Ph.D.	since 1. 4. 2013	academic worker	M.Sc. Pavlo Fedorov	since 8. 10. 2012	Ph.D. student
M.Sc. Azam Sikander	since 1. 2. 2012 until 31. 12. 2013	Ph.D. student	M.Sc. Gana Fedorova, Ph.D.		researcher
Šárka Beranová		technician	Věra Finková	since 2. 7. 2012 until 28. 2. 2013	technician
Dipl.-Ing. Martin Bláha, Ph.D.		academic worker	Assoc. Prof. Dipl.-Ing. Martin Flajšhans, Dr.rer.agr.		academic worker
Dipl.-Ing. Miroslav Blecha	since 1. 10. 2012	Ph.D. student	M.Sc. Markéta Flajšhansová	since 1. 7. 2012	lector
M.Sc. Miroslav Boček	since 1. 4. 2012	creative manager	M.Sc. Martin Fořt	since 1. 10. 2013	Ph.D. student
M.Sc. Olga Bondarenko		Ph.D. student	Pavel Fořt		technician
M.Sc. Volodymyr Bondarenko		Ph.D. student	Dipl.-Ing. Kateřina Fulínová	od. 1. 2. 2013	technician
Luboš Borovka		technician	M.Sc. Ievgeniia Gazo		Ph.D. student
M.Sc Sergey Boryshpolets, Ph.D.		academic worker	Dipl.-Ing. David Gela, Ph.D.		academic worker
M.Sc. Viktoriia Burkina		Ph.D. student	Marek Gela	since 3. 4. 2012 until 31. 8. 2012	technician
Dipl.-Ing. Miloš Buřič, Ph.D.		researcher	M.Sc. Oksana Golovko		Ph.D. student
M.Sc. Dmytro Bytyutsyy		researcher	M.Sc. Golpour Dehsari Amin	since 21. 10. 2013	Ph.D. student
Dipl.-Ing. Petr Císař, Ph.D.		researcher, director of ICS	M.Sc. Mahdi Golshan	since 1. 2. 2012	Ph.D. student
Jacky Cosson, Ph.D., dr.h.c.		academic worker	M.Sc. Roman Grabic, Ph.D.		academic worker
Olga Černá	since 11. 9. 2012	project manager	Dipl.-Ing. B.Sc. Kateřina Grabicová		Ph.D. student
Michal Černický		construction technician	Dipl.-Ing. Gučík Michal	since 1. 8. 2013	technician
Dipl.-Ing. Lukáš Černý	since 1. 1. 2012 until 31. 12. 2013	Ph.D. student	M.Sc. Hilal Güralp	since 8. 10. 2012	Ph.D. student
Dipl.-Ing. Daniel Červený	since 1. 10. 2012	Ph.D. student	Dipl.-Ing. Jiří Hajíček	since 2. 12. 2013	technician
Dipl.-Ing. Petr Čtrnáct	since 1. 8. 2012 until 30. 9. 2012	technician	Dipl.-Ing. Jitka Hamáčková		researcher
Karel Čupita	until 31. 1. 2013	technician	Dipl.-Ing. Pavel Hartman, Ph.D.		academic worker
M.Sc. Oksana Degtjarik	until 31. 12. 2013	Ph.D. student	M.Sc. Lucie Hasilová	since 10. 9. 2012	head of Manage- ment office
M.Sc. Bořek Drozd, Ph.D.		academic worker	M.Sc. Azadeh Hatef, Ph.D.		researcher
Dipl.-Ing. Petr Dvořák, Ph.D.		academic worker	Dipl.-Ing. Miloš Havelka, Ph.D.		academic worker
Zuzana Dvořáková		editor	M.Sc. Dipl.-Ing. Jana Havlanová	since 1. 10. 2013	assistant of economy, per- sonnel officer
M.Sc. Borys Dzyuba, Ph.D.		academic worker	M.Sc. Jiří Heller	since 1. 3. 2013 until 31. 12. 2013	Ph.D. student

First name, Last name	Beginning/End of Employ- ment	Position	First name, Last name	Beginning/End of Employ- ment	Position
Dipl.-Ing. Markéta Heroutová	since 16. 7. 2012	assistant of director	M.A. Jiří Koleček		project manager
Dipl.-Ing. David Hlaváč		Ph.D. student	M.Sc. Anna Kolečová (born Shaliutina), Ph.D.		researcher
Dipl.-Ing. Michal Hojdeckr, MBA		registrar, director of IEAIC	Vladimír Kotal		technician
M.Sc. Tatsiana Holubeva	since 1. 1. 2012 until 31. 12. 2013	Ph.D. student	Vít Kotlín, DiS.	since 2. 1. 2012	officer for SW & FP
Dipl.-Ing. Monika Homolková		technician	Dipl.-Ing. Antonín Kouba, Ph.D.		academic worker
Helena Hrzůzová	until 25. 4. 2013	work, wages, and personnel officer	Prof. Dipl.-Ing. Jan Kouřil, Ph.D.		academic worker
M.Sc. Chupani Latifeh	since 21. 10. 2013	Ph.D. student	Dipl.-Ing. Dalibor Koutník	since 1. 10. 2013	Ph.D. student
M.Sc. Viktoriiia Iegorova	since 3. 10. 2013	Ph.D. student	Klára Kovaříková		coordinator of activities of lifelong learning
M.Sc. Iuliia Iermak	since 17. 4. 2013 until 31. 12. 2013	Ph.D. student	Assoc. Prof. Dipl.-Ing. Pavel Kozák, Ph.D.		academic worker director of RIFCH
M.Sc. Jiří Jablonský, Ph.D.	since 1. 3. 2013	academic worker	Miroslava Krtková		technician
Vladimír Jachno		technician	Dipl.-Ing. Jiří Kříšťan, Ph.D.		researcher
M.Sc. Michal Jarolímek		project manager	Dipl.-Ing. Michal Kříž		assistant of director
Lucie Kačerová		study officer	Ludmila Křížová		work, wages, and personnel officer
Martin Kahanec, DiS.		technician	M.A. Petr Kubát	since 1. 1. 2012 until 31. 3. 2012	redaktor
Dipl.-Ing. Vojtěch Kašpar, Ph.D.		academic worker	M.Sc. Iryna Kuklina		Ph.D. student
M.Sc. Khalili Tilami Sarvenaz	since 1. 10. 2013	Ph.D. student	M.Sc. Daryna Kulik	since 1. 1. 2012 until 31. 1. 2013	Ph.D. student
M.Sc. Saleem Ayaz Khan	since 1. 1. 2012 until 31. 12. 2013	Ph.D. student	Kumar Girish, Ph.D.	since 1. 8. 2013	academic worker
M.Sc. Wilayat Khan	since 17. 4. 2013 until 31. 12. 2013	Ph.D. student	Kumar Vimal, Dr.	since 28. 1. 2013	academic worker
M.Sc. Olga Koba	since 3. 10. 2013	Ph.D. student	Assoc. Prof. M.Sc. Ivana Kutá Smatanová, Ph.D.	until 31. 12. 2013	academic worker
Dipl.-Ing. Ivana Kobernová		assistant of economy	M.Sc. Michal Kutý, Ph.D.	until 31. 12. 2013	researcher
Šárka Kocmichová, DiS.	since 1. 4. 2012	assistant of economic office	M.Sc. Maryna Lahoda	until 30. 9. 2013	Ph.D. student
Dipl.-Ing. Martin Kocour, Ph.D.		academic worker, vice-dean	M.Sc. Ievgen Lebeda		Ph.D. student
Dipl.-Ing. Hana Kocour Kroupová, Ph.D.		academic worker	Dipl.-Ing. Pavel Lepič		academic worker
Petr Kohout	until 31. 12. 2012	technician	Dipl.-Ing. Andrea Lepičová		researcher
M.Sc. Jaroslava Kohoutová	until 31. 12. 2013	researcher	Dipl.-Ing. Eduard Levý	since 1. 7. 2012	head of fish store
Jan Kojan		technician	M.Sc. Ping. Li, Ph.D.		academic worker
Jitka Kolářová, DVM		researcher	M.Sc. Zhihua Li, Ph.D.		academic worker
Lenka Kolářová		officer of economy	Prof. Dipl.-Ing. Otomar Linhart, D.Sc.		academic worker dean, director of CENAKVA



First name, Last name	Beginning/End of Employment	Position	First name, Last name	Beginning/End of Employment	Position
Dipl.-Ing. Pavla Linhartová	since 1. 10. 2013	Ph.D. student	Prof. Dr. Jana Picková, Ph.D.		academic worker
M.Sc. Zuzana Linhartová		Ph.D. student	Dipl.-Ing. Petra Plachtová		project manager
B.Sc. Dana Luhanová	since 1. 4. 2012	technician	Dipl.-Ing. Jitka Plecerová		study officer
Michal Macho, DiS.		IT worker	Rajeev Raghav Pichirikkat	since 1. 1. 2013 until 31. 3. 2013	researcher
Dipl.-Ing. Jana Máchová, Ph.D.		researcher	Dipl.-Ing. Alexey Pimakhin	until 30. 9. 2013	Ph.D. student
M.Sc. Daria Malakhova	since 1. 3. 2013	Ph.D. student	M.Sc. Maryia Plevaka	since 1. 1. 2012 until 31. 1. 2013	Ph.D. student
B.Sc. Monika Malkusová, DiS.		project manager	Dipl.-Ing. Jiří Plch	until 31. 1. 2013	technician
Dipl.-Ing. Jan Mandelíček	since 1. 10. 2012 until 30. 9. 2013	Ph.D. student	Dipl.-Ing. Vítězslav Plička		technician
Petra Martínková		technician	M.Sc. Peter Podhorec, Ph.D.		academic worker
Dipl.-Ing. Jan Másílko		Ph.D. student	M.Sc. Kseniia Pocherniaieva	since 8. 10. 2012	Ph.D. student
M.Sc. Ivana Mašková	since 1. 7. 2013 until 31. 8. 2013	project manager	M.Sc. Kseniia Pocherniaieva	since 8. 10. 2012	Ph.D. student
Dipl.-Ing. Jan Matoušek	since 1. 10. 2012	Ph.D. student	Assoc. Prof. Dipl.-Ing. Tomáš Polícar, Ph.D.		academic worker vice-dean
M.Sc. Azin Mohagheghi Samarin, Ph.D.	since 23. 11. 2012	academic worker	M.Sc. Aleš Pospíchal	since 1. 10. 2012	Ph.D. student
Dipl.-Ing. Jan Mráz, Ph.D.		academic worker	M.Sc. Eva Prášková, Ph.D.	since 2. 9. 2013	technician
M.Sc. Tomáš Náhlík		Ph.D. student	Dipl.-Ing. Martin Prchal	since 1. 10. 2013	Ph.D. student
Dipl.-Ing. Václav Nebeský, DiS.		officer for external affairs	Žaneta Princová	since 1. 1. 2013 until 31. 12. 2013	technician
Dipl.-Ing. Jaromíra Nečasová		head of economic unit	Dipl.-Ing. Markéta Prokešová	since 1. 10. 2012	Ph.D. student
Dipl.-Ing. Vladimír Nedopil		registrar	M.Sc. Galina Prokopchuk		Ph.D. student
M.Sc. Ivana Němcová	since 1. 4. 2012	project manager	Ilona Prokopová		technician
M.Sc. Niksirad Hashjin Hamid		Ph.D. student	M.Sc. Tatyana Prudnikova, Ph.D.	until 31. 12. 2013	researcher
B.Sc. Jan Novák		technician	Dipl.-Ing. Josef Příborský	since 1. 4. 2012	technician
Pavlna Nováková		assistant of director	Dipl.-Ing. Martin Pšenička, Ph.D.		academic worker
Dipl.-Ing. Štěpán Papáček, Ph.D.		researcher	M.Sc. Massimiliano Rampin, Ph.D.	since 17. 10. 2012 until 31. 12. 2013	researcher
M.Sc. Aliaksandr Pautsina		researcher	Assoc. Prof. Dipl.-Ing. Tomáš Randák, Ph.D.		academic worker
Marie Pečená		technician	Dipl.-Ing. Ján Regenda, Ph.D.	since 1. 10. 2012	academic worker
Dionysios Pentaris, Ph.D.	since 10. 12. 2012 until 14. 1. 2013	researcher	Prof. Dr. Al Jaary Ali Hussain Reshak	until 31. 12. 2013	academic worker
Tomáš Pešta	since 1. 4. 2012	technician	Dipl.-Ing. Marek Rodina, Ph.D.		academic worker
Veronika Piačková, DVM, Ph.D.		researcher			academic worker

First name, Last name	Beginning/End of Employment	Position	First name, Last name	Beginning/End of Employment	Position
M.Sc. Karina Romanova	since 1. 1. 2012	Ph.D. student	Petra Tesařová		assistant of director
Irena Roulová	until 31. 12. 2013	technician	Pavlna Tláskalová		technician
Dipl.-Ing. Renata Rychtářiková, Ph.D.	since 17. 12. 2012	academic worker	M.Sc. Šárka Tomanová	since 1. 8. 2012 until 30. 9. 2012	editor
M.D. Taiju Saito, Ph.D.	since 4. 5. 2012	researcher	M.Sc. Katsiaryna Tratsiak	until 31. 12. 2013	Ph.D. student
M.Sc. Sidika Sakalli	since 1. 10. 2013	Ph.D. student	M.Sc. Jitka Tumová	since 1. 10. 2012	Ph.D. student
Zdeněk Sakastr		technician	Dipl.-Ing. Jan Turek, Ph.D.		academic worker
M.Sc. Gian Anthonyo Salazar Torres	since 23. 10. 2012 until 31. 1. 2013	Ph.D. student	M.Sc. Ekaterina Tutubalina	since 1. 6. 2013 until 31. 12. 2013	Ph.D. student
Ivana Samková		technician	Dipl.-Ing. Jan Urban, Ph.D.		academic worker
M.Sc. Sabina Sampels, Ph.D.		researcher	Assoc. Prof. Dipl.-Ing. František Vácha, Ph.D.		academic worker
B.Sc. Eliška Selnerová		assistant of director	Dipl.-Ing. Olga Valentová		academic worker
M.Sc. Syed Fahad Ali Shah	since 1. 10. 2012 until 30. 6. 2013	Ph.D. student	Jaroslav Vaníš	since 1. 4. 2012	technician
M.Sc. Siddique Mohammad Abdul Momin	since 2. 10. 2013	Ph.D. student	M.Sc. Jana Vašátková	since 17. 9. 2012	lector
Pavla Simandlová		technician	B.Sc. Zuzana Vavrušková		officer of economy – cashier
Ilona Slepíčková		technician	Milada Vazačová		dean's assistant
Dipl.-Ing. Drahoslav Smékal	since 1. 11. 2012 until 23. 8. 2013	technician	Dipl.-Ing. Pavel Vejsada, Ph.D.		academic worker, director of IA
M.Sc. Jindřich Soukup		researcher	dr hab. Dipl.-Ing. Josef Velíšek, Ph.D.		academic worker
Dipl.-Ing. Alžběta Stará		Ph.D. student	Jana Veselá		cleaner
Dipl. Biol. Christoph Antonius Steinbach		Ph.D. student	Dipl.-Ing. Lukáš Veselý	since 1. 10. 2013	Ph.D. student
Dipl.-Ing. Vlastimil Stejskal, Ph.D.		academic worker	M.Sc. Miroslava Vlačihová	until 2. 9. 2012	technician
Jan Suhrada		technician	Dipl.-Ing. Martin Viček	since 14. 2. 2012	project manager
M.Sc. Ekaterina Sviridova	until 31. 1. 2013	Ph.D. student	Dipl.-Ing. Blanka Vykusová, Ph.D.		project manager, editor
Pavel Svoboda		technician	M.Sc. Yazicioglu Buket	since 5. 11. 2012	Ph.D. student
Prof. Zdeňka Svobodová, DVM, D.Sc.		researcher	Dipl.-Ing. Tomáš Zajíc, Ph.D.		researcher
Dipl.-Ing. Pavel Šablatura		technician	M.Sc. Anna Zhyrova	since 1. 1. 2012	Ph.D. student
B.Sc. Martin Šafránek	until 31. 12. 2013	technician	Eliška Zusková, DVM, Ph.D.		academic worker
M.Sc. Radka Šermina		study officer	Assoc. Prof. Dipl.-Ing. Vladimír Žlábek, Ph.D.		academic worker
Eva Šimoníková		cleaner			
Prof. M.Sc. Dalibor Štys, Ph.D.		academic worker			
M.Sc. Naděžda Štysová		project manager			
Dipl.-Ing. Viktor W. Švinger, Ph.D.	until 15. 11. 2013	researcher			

Note: Empty fields mean the lasting working relationship.

# *Delicacy, which protects sturgeons*

*Our caviar is produced from roe from sturgeon reared in aquaculture. The roes are extracted from female fish in a friendly way, similar to artificial spawning. Then by using salt and special technology based on a physical process it is converted into a top culinary product. As there is no need to kill the female during the process, we have chosen the following trade mark for our caviar: Sturgeon friendly caviar.*

STURGEON  FRIENDLY  
CAVIAR  

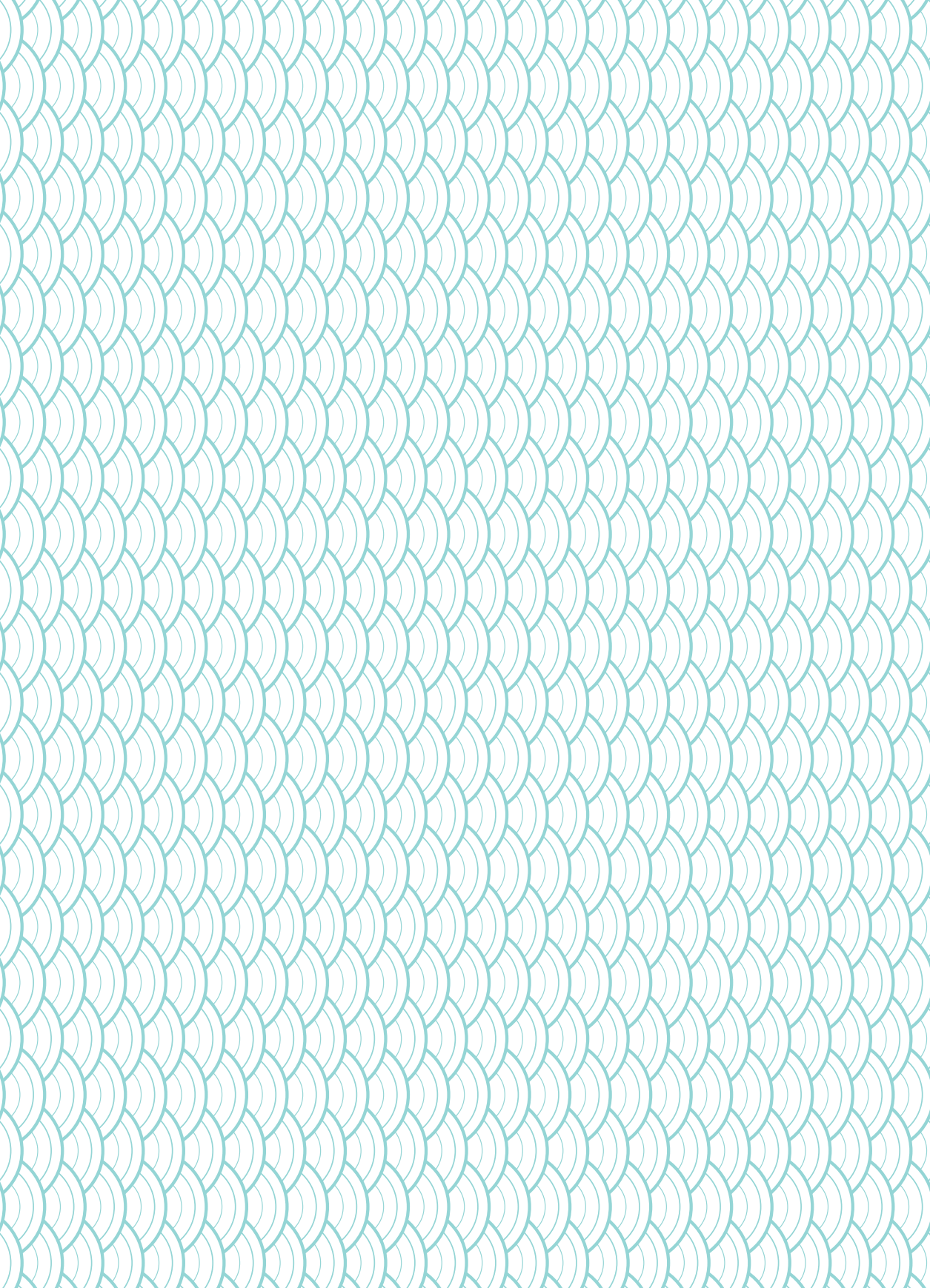



*Mmm...*

[www.sfcaviar.eu](http://www.sfcaviar.eu)

*Have more!*

Producer: University of South Bohemia in České Budějovice  
Faculty of Fisheries and Protection of Waters  
Zátiší 728/II, 389 25 Vodňany, Czech Republic





Fakulta rybnářství  
a ochrany vod  
Faculty of Fisheries  
and Protection  
of Waters

Jihočeská univerzita  
v Českých Budějovicích  
University of South Bohemia  
in České Budějovice



Vodňany, Czech Republic; 2014