

BIENNIAL REPORT

INSTITUTE OF VERTEBRATE BIOLOGY
ACADEMY OF SCIENCES OF THE CZECH REPUBLIC

2005–2006



BIENNIAL REPORT

INSTITUTE OF VERTEBRATE BIOLOGY
ACADEMY OF SCIENCES OF THE CZECH REPUBLIC

2005–2006



Biennial Report 2005–2006

Periodical continuation of the former Institute's bulletins *Vertebratologické Zprávy* (1969–1987), *Zprávy ÚSEB* (1988–1991) and the *ILE Biennial Report* (1993–1994).

Edited by Miroslav Čapek, Hana Slabáková and Jan Zima

Published by the Institute of Vertebrate Biology ASCR, v. v. i., Brno

Graphic design by Jan Dungal

Printed by Metoda spol. s. r. o., Brno

© Institute of Vertebrate Biology, Academy of Sciences of the Czech Republic, v. v. i.

ISBN 978-80-903329-8-0

CONTENTS

Contents	3
Preface	5
Structure of the Institute of Vertebrate Biology of the Academy of Sciences of the Czech Republic (until December 31, 2006)	6
Structure of the Institute of Vertebrate Biology of the Academy of Sciences of the Czech Republic, v. v. i. (since January 1, 2007)	7
Addresses	8
Management and Services	9
Scientific Council (until December 31, 2006)	10
Council of the Institute (since January 1, 2007)	10
Research projects	11
Institutional Research Plan	11
Projects supported by the Grant Agency of the Academy of Sciences of the CR	11
Projects supported by the Grant Agency of the CR	12
Projects supported by the Ministry of Agriculture	13
Projects supported by the Ministry of Environment	13
Projects supported by the Ministry of Education, Youth and Sport	13
International projects	13
List of publications	16
Books, textbooks, edited proceedings	16
Chapters in books	16
Papers in journals included in the databases ISI Web of Knowledge	17
Papers in other refereed journals	21
Papers in proceedings	22
Book reviews	25
Popularization books and articles	26
Principal scientific divisions	27
Department of Medical Zoology	27
Department of Population Biology	32
Department of Ichthyology	40
Department of Fish Ecology	50
Department of Avian Ecology	58
Department of Mammalian Ecology	64
Obituary	73
Awards	74
International activities	76
International scientific meetings organized by the Institute	76
Participation in international conferences	77
Membership in international organizations	78
Membership in editorial boards	79
Education and teaching activities	80
Teaching at universities	80
Undergraduate students	81
PhD students	83
Editorial activities	85

PREFACE

I am glad to introduce this traditional report summarizing the main results of scientific activities of the Institute during the last two years. The most important event in this period was the transformation of the Institute into a public research institution. This process was completed at the end of 2006.

The Academy of Sciences of the Czech Republic has undergone profound changes in relation to varied scientific and organisational aspects since its foundation in 1993. This transformation included also human resources and the Academy has become a modern, democratically administrated cluster of autonomous, non-university research institutes. The institutes of the Academy of Sciences were state contributory organisations, which was quite unusual legal form within the European Union. The legal subjectivity of the institutes was restricted, and this fact weakened their independency in respect of both the economic area and the cooperation with other subjects.

The acceptance of Act No. 341/2005 Coll. on Public Research Institutions made it possible to remove these deficiencies. The act introduced a new form of legal entity – a public institution, with principal activities in the research area and with significant provision of an infrastructure for research. Besides the main research performance, the Institute may now realize also secondary and other activities for profit, subject to legal restrictions.

After January 1, 2007, further transformation steps follow. The members of the Council of the Institute have been elected, and public competition for the post of the director has been announced. All these changes will certainly have a profound influence on the life and the research performance of the Institute in the future.

The last two years can be considered fruitful for the Institute and its staff. The fellows were particularly successful in raising funds for grant projects. The institutional budget assigned from the state contribution in the frame of the Institutional Research Plan achieved approximately 22 and 23 million CZK in 2005 and 2006, respectively. Additional 14 million CZK were provided in both the years for investment into laboratory equipment and maintenance of buildings. Research grants and diverse contracting funding contributed to the budget with 16 and 26.5 million CZK in 2005 and 2006, respectively.

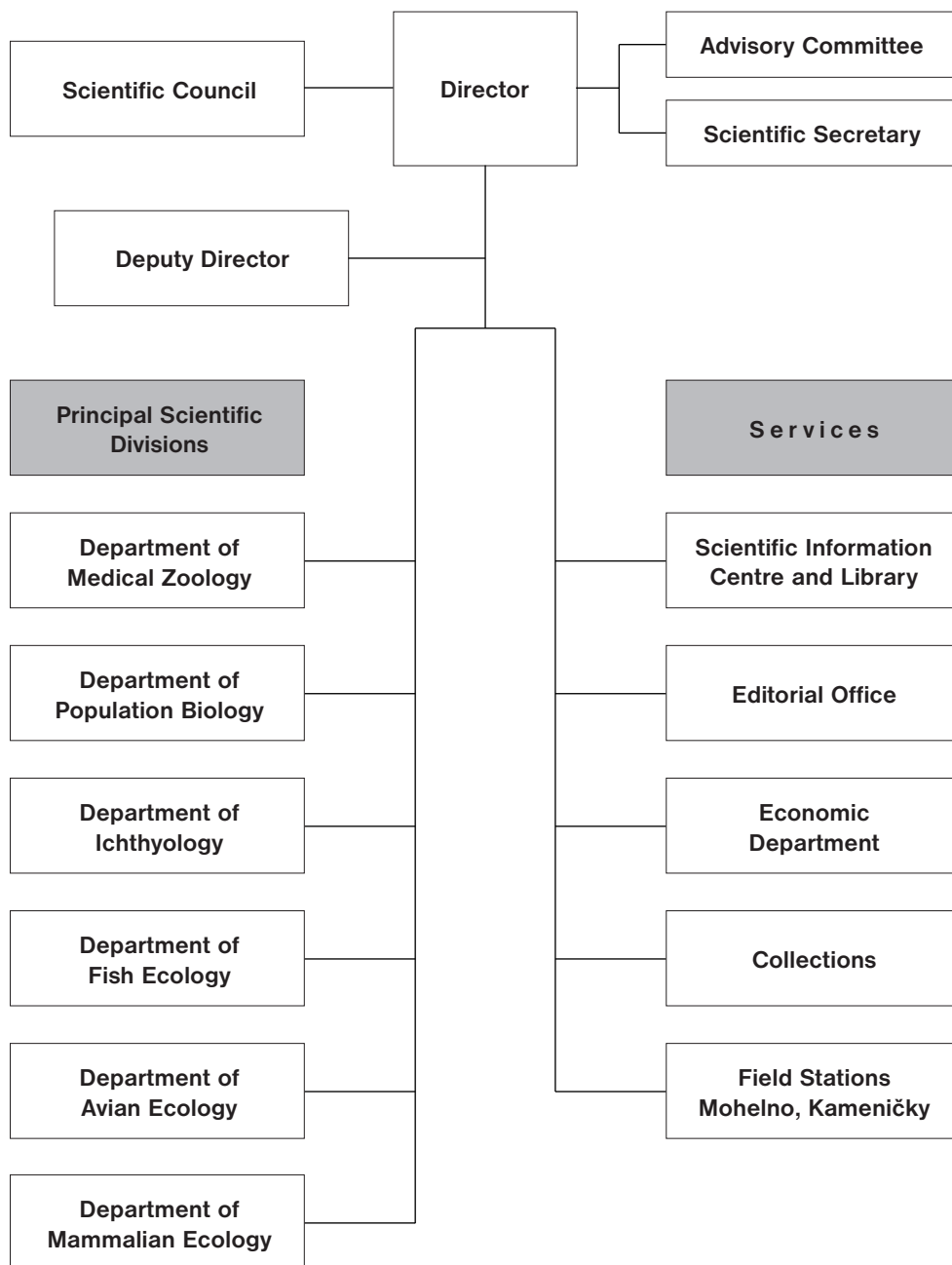
In the previous two years, the Institute employed 61 fellows paid from the institutional sources, and additional 36 fellows were contracted on the basis of research grant funding. In the respective period, 18 foreign workers were employed.

The scientific achievements of the Institute are summarized in the list of publications. Altogether, 267 scientific contributions authored by the fellows of the Institute were published in 2005–2006. Almost 100 papers appeared in international journals included in databases of the Web of Science. The total impact factor of these publications was 69.7 in 2005 and 67.1 in 2006, what indicates a remarkable increase in comparison with 2003 and 2004 (total impact factor of 40.4 and 46.9, respectively). I hope the Institute will continue this successful development towards research excellence also in the next years.

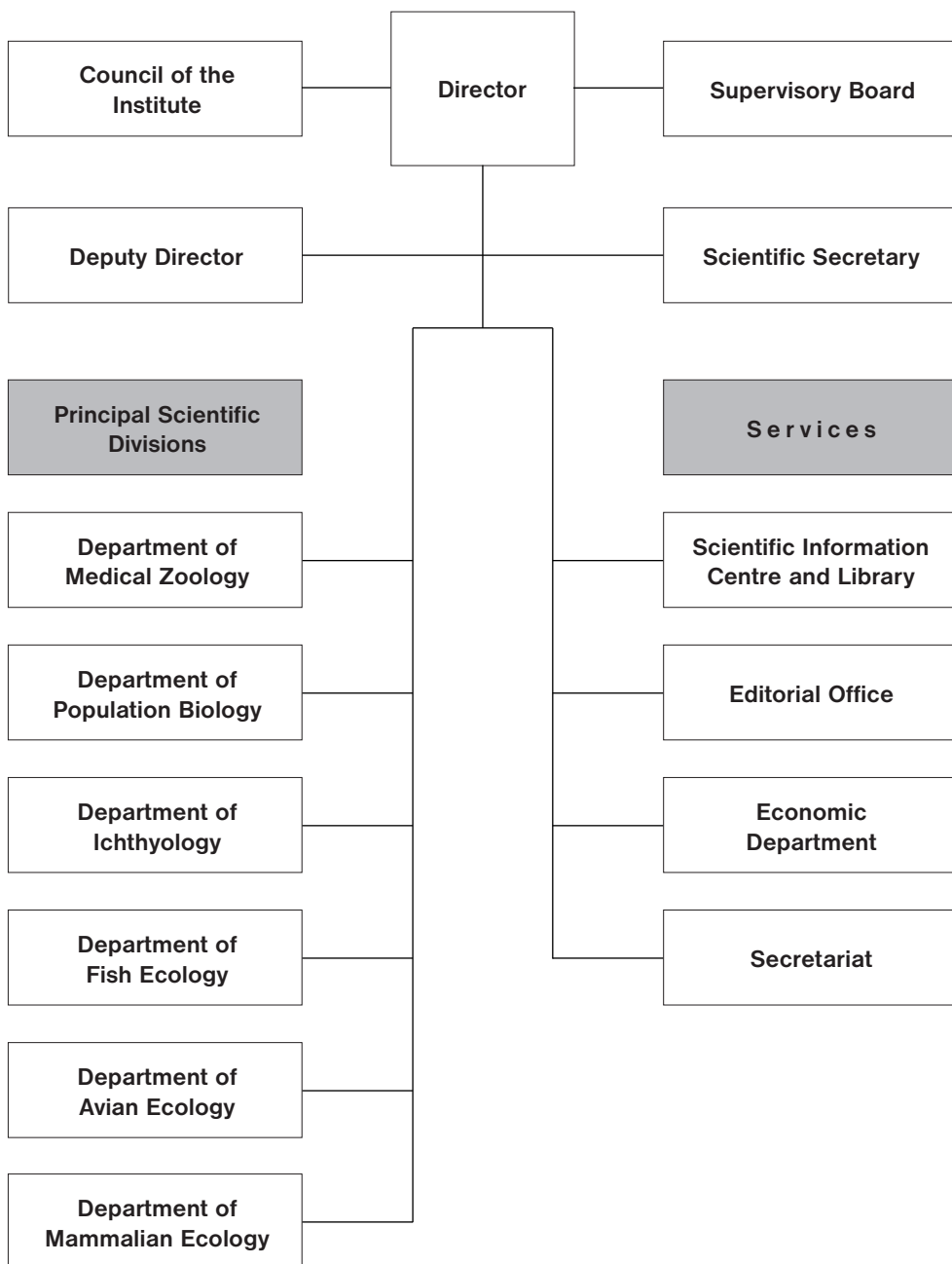
Jan Zima



**STRUCTURE OF THE INSTITUTE OF VERTEBRATE BIOLOGY
OF THE ACADEMY OF SCIENCES OF THE CZECH REPUBLIC**
(until December 31, 2006)



**STRUCTURE OF THE INSTITUTE OF VERTEBRATE BIOLOGY
OF THE ACADEMY OF SCIENCES OF THE CZECH REPUBLIC, v. v. i.
(since January 1, 2007)**



ADDRESSES

Headquarters

Institute of Vertebrate Biology of the ASCR, v. v. i.
Květná 8
603 65 Brno, Czech Republic
Phone: ++420-543422540; ++420-543211538
Fax: ++420-543211346
ubo@brno.cas.cz, ubo@ivb.cz
Website: <http://www.ivb.cz>

External Workplaces & Field Stations

Department of Medical Zoology, Animal House Facility

Klášterní 2
691 42 Valtice
Phone: ++420-519352961
Fax: ++420-519352387
jhalouzka@brno.cas.cz

Department of Population Biology, Animal House Facility

Studenec 122
675 02 Koněšín
Phone: ++420-568627959
Fax: ++420-568627950
jpialek@brno.cas.cz
Website: <http://www.studenec.ivb.cz/>

Mohelno Field Station

675 75 Mohelno 134
Phone: ++420-568642330, ++420-568642314
Custodian: Lubomír K E R N D L

Kamenický Field Station

539 41 Kamenický 98
Phone: ++420-469318118
Custodian: Miloslava C A C H O V Á

MANAGEMENT AND SERVICES

Director: Prof. RNDr. Jan Z I M A , DSc
phone: ++420-543211538, ++420-543422554
fax: ++420-543211346
jzima@brno.cas.cz, jzima@ivb.cz

Deputy Director: Assoc. Prof. RNDr. Zdeněk H U B Á L E K , DSc
phone: ++420-519352961
fax: ++420-519352387
zhubalek@brno.cas.cz

Scientific Secretary: Ing. Miroslav Č A P E K , PhD
phone: ++420-543422538, ++420-543422540
fax: ++420-543211346
capek@brno.cas.cz

Economic Department & Secretariat

Ing. Zdeňka H L A V Á Č K O V Á , Head – since April 1, 2005
hlavackova@ivb.cz

Ing. Alois H O R Á K – since May 9, 2007
horak@ivb.cz

Zdena H Á J K O V Á
zhajkova@ivb.cz

Bohumila K O Ž N Á R K O V Á
koznarkova@ivb.cz

Lenka G L O S O V Á – since March 5, 2005
glosova@ivb.cz

Jitka N O V O T N Á – until April 4, 2005
novotna@ivb.cz

Vlasta V Á L K O V Á – until October 9, 2006
valkova@ivb.cz

Drahomíra K R E J Č O V Á – since October 2, 2006
Jaroslav Z D R A Ž I L
zdrzil@ivb.cz

Scientific Information Centre & Library

Ing. Hana S L A B Á K O V Á , Head
slabakova@brno.cas.cz

Alena F L O R I A N O V Á
florianova@ivb.cz

Editorial Office RNDr. Pavel B L A H Á K , Managing Editor
editorfz@brno.cas.cz

Collections Jiří C H A M R , curator
chamr@brno.cas.cz

Technical Support Vlastimil H A N Á Č E K
Jana H A N Á Č K O V Á
Lubomír K E R N D L – until February 28, 2006
Jana Š R O M O V Á
Milada W E B E R O V Á – until December 31, 2006
Ivana P E T Ý R K O V Á – since March 5, 2007

SCIENTIFIC COUNCIL (until December 31, 2006)

- Chairperson:** RNDr. Miloslav H O M O L K A , PhD
phone: ++420-543422517
fax: ++420-543211346
homolka@ivb.cz
- Members at Large:** Mgr. et. Mgr. Josef B R Y J A , PhD
Ing. Marcel H O N Z A , PhD
Assoc. Prof. RNDr. Zdeněk H U B Á L E K , DSc
RNDr. Martin R E I C H A R D , PhD
Mgr. Jan Z U K A L , PhD
- External Members:** Prof. RNDr. Jiří G A I S L E R , DSc
(Masaryk University, Brno)
Assoc. Prof. RNDr. Milan G E L N A R , PhD
(Masaryk University, Brno)
Ing. Petr R Á B , DSc
(Institute of Animal Physiology and Genetics AS CR, Liběchov)

COUNCIL OF THE INSTITUTE (since January 1, 2007)

- Chairperson:** Prof. RNDr. Jan Z I M A , DSc
phone: ++420-543422554
fax: ++420-543211346
jzima@ivb.cz, jzima@brno.cas.cz
- Members at Large:** Mgr. et. Mgr. Josef B R Y J A , PhD
Ing. Marcel H O N Z A , PhD
RNDr. Miloslav H O M O L K A , PhD
Assoc. Prof. RNDr. Zdeněk H U B Á L E K , DSc
Ing. Pavel J U R A J D A , PhD
- External Members:** Prof. RNDr. Jiří G A I S L E R , DSc
(Masaryk University, Brno)
Assoc. Prof. RNDr. Miloš M A C H O L Á N , PhD
(Institute of Animal Physiology and Genetics AS CR, v. v. i., Brno)
Assoc. Prof. RNDr. Zdeněk Ř E H Á K , PhD
(Masaryk University, Brno)

RESEARCH PROJECTS

Institutional Research Plan

AV0Z60930519 Biodiversity and ecology of vertebrates: implications in conservation and sustainable management of natural populations - J. Zima, 2005–2010

Projects supported by the Grant Agency of the Academy of Sciences of the Czech Republic

IAA6093403 Evolutionary determinants of brood parasitism in ducks - P. Musil (Charles University, Prague), M. Honza (IVB AS CR), 2004–2008

IAA6093404 Species diversity and ecology of selected West African vertebrates - P. Koubek (IVB AS CR), M. Gelnar (Masaryk University, Brno), P. Hejčmanová (Czech University of Agriculture, Prague), 2004–2008

IAA600930506 Behavioral and genetic study of prezygotic isolation barriers in the house mouse hybrid zone - J. Piálek, 2005–2008

IAA600930605 Evolution of antiparasitic strategies of selected hosts towards avian brood parasitism - M. Honza, 2006–2010

IAA600930608 The role of MHC in sexual selection - observational and experimental study in three model vertebrate species - J. Bryja (IVB AS CR), A. Šimková (Masaryk University, Brno), 2006–2008

IAA600930609 Genetic structure of chamois populations in Central Europe - J. Zima, 2006–2009

IAA600930611 (Re)emerging mosquito-borne virus diseases - Z. Hubálek (IVB AS CR), J. Januška (Institute of Public Health, Ostrava), 2006–2008

IBS5045111 Molecular and other genetic markers applied in conservation of populations of endangered, rare and vanishing fish species in the Czech Republic - P. Ráb (Institute of Animal Physiology and Genetics AS CR, Liběchov), V. Lusková (IVB AS CR), 2001–2005

KJB6005301 What happens when *Reynoutria* taxa reproduce by means other than vegetative? - K. Bímová (Institute of Botany AS CR, Průhonice), J. Piálek (IVB AS CR), 2003–2006

KJB600930501 The impact of mating tactics on individual reproductive success and population parameters in the European bitterling: behavioural and genetic approach - M. Reichard, 2005–2007

KJB600930508 European reed warbler populations across a migratory divide: insights into migration by analyses of DNA sequences, stable isotopes and ringing recoveries - P. Procházka, 2005–2007

KJB600930610 Phylogeography and evolutionary history of a semi-fossorial rodent *Microtus subterraneus* - N. Martinková, 2006–2008

KJB600930611 Brood parasitism as an alternative reproductive strategy of ducks: genetically - endocrinological approach - R. Ležalová, 2006–2008

KJB600930613 Diversity of cultivable microorganisms of ixodid ticks, recognized vectors of vertebrate pathogens - I. Rudolf (IVB AS CR), P. Švec (Masaryk University, Brno), 2006–2008

KJB600930615 Feeding behavior, parasite infections and self-medicative abilities of an introduced chimpanzee population, Rubondo Island National Park, Tanzania - K. Petrželková, 2006–2008

IQS500450513 Population and genetic structure of brown trout and grayling as groundwork for efficient management of fisheries in salmonid waters - V. Šlechta (Institute of Animal Physiology and Genetics AS CR, Liběchov), K. Halačka (IVB AS CR), 2005-2009

Projects supported by the Grant Agency of the Czech Republic

GA206/03/0726 Ecology of emerging arthropod-borne microorganisms - Z. Hubálek, 2003-2005

GA206/03/0757 Assessment of population size and population structure of Eurasian otter (*Lutra lutra*) in different habitats by a non-invasive genetic method - J. Zima, 2003-2005

GA206/04/2003 Ecological interactions in populations of small rodents - E. Tkadlec (Palacký University, Olomouc), I. Pavlík (Veterinary Research Institute, Brno), M. Heroldová (IVB AS CR), 2004-2006

GA206/05/2159 Genetic, population and reproductive variability of invasive fish species, *Carassius „gibelio“* with alternating bisexual/asexual reproduction in central Europe - V. Lusková (IVB AS CR), J. Flajšhans (University of South Bohemia, České Budějovice), V. Šlechta (Institute of Animal Physiology and Genetics AS CR, Liběchov), 2005-2007

GA206/06/0851 Extra-pair fertilizations and the strength of sexual selection in socially monogamous passerine - T. Albrecht (IVB AS CR), P. Muclinger (Charles University, Prague), 2006-2008

GA206/06/0953 Phenotypic plasticity of thermal physiology traits in newts - L. Gvoždík, 2006-2008

GA206/06/0954 Intraspecific variability of populations of two cryptic bat species of genus *Pipistrellus* in Central Europe - Z. Řehák (Masaryk university, Brno), J. Bryja (IVB AS CR), 2006-2008

GA206/06/0955 Genetics - J. Piálek, 2006-2008

GA524/03/0061 Comparative studies on dracunculoid nematodes, with special reference to agents of serious diseases of fish - F. Moravec (Institute of Parasitology AS CR, České Budějovice), V. Baruš (IVB AS CR), 2003-2005

GA524/04/1115 Fluctuating asymmetry in fish parasites: a new approach to assess environmental stress of aquatic ecosystem? - B. Koubková (Masaryk University, Brno), M. Machala (Veterinary Research Institute, Brno), P. Jurajda (IVB AS CR), 2004-2006

GA524/04/1128 MHC class IIB genes of European cyprinid fish: their genetic variability and evolution in relation to the host life-history traits and parasitism - A. Šimková (Masaryk university, Brno), P. Jurajda (IVB AS CR), 2004-2006

GA524/06/0264 Ciliates of genus *Troglodytella*: pathogens or endosymbionts? Novel approach towards veterinary care and understanding digestion in apes - D. Modrý (University of Veterinary and Pharmaceutical Sciences, Brno), K. Petrželková (IVB AS CR), S. Kišidayová (Institute of Animal Physiology SAS, Košice, Slovakia), 2006-2008

GA524/06/0687 Importance of red fox in different ecosystems of Central Europe - J. Červený (IVB AS CR), M. Anděra (National Museum, Prague), K. Šťastný (Czech University of Agriculture, Prague), 2006-2008

GD524/05/H536 Evolutionary ecological analysis of biological systems: research center for PhD studies - M. Chytrý (Masaryk university, Brno), P. Jurajda (IVB AS CR), 2005-2008

GP206/03/P134 Feeding strategy of large herbivore mammals between forest and field habitats - J. Kamler, 2003-2005

- GP206/06/P152** Reproductive isolating mechanisms in *Nothobranchius* fishes (Aplocheilidae) – M. Reichard, 2006–2008
- GP206/06/P302** Genetic structure of black grouse populations in the Czech Republic – J. Svobodová, 2006–2008
- GP524/05/P291** Parasitism and invasive species: effect of parasite infection on the biology of *Neogobius kessleri* in its native and introduced range – M. Ondračková, 2005–2006

Projects supported by the Ministry of Agriculture

- GAZV QF3028** Development of new technologies of rearing commercially important riverine species of fish and crayfish endangered by environment degradation – P. Kozák (University of South Bohemia, České Budějovice), J. Barthová (Charles University, Prague), P. Spurný (Mendel Agriculture and Forestry University, Brno), S. Navrátil (University of Veterinary and Pharmaceutical Sciences, Brno), M. Prokeš (IVB AS CR), 2003–2007
- GAZV QF3029** Harmonization with the EU in application of the principles of pharmacovigilancy in aquaculture in the Czech Republic – V. Piačková (University of South Bohemia, České Budějovice), J. Hajšlová (Institute of Chemical Technology, Prague), Z. Svobodová (University of Veterinary and Pharmaceutical Sciences, Brno), M. Prokeš (IVB AS CR), T. Barth (Institute of Organic Chemistry and Biochemistry AV CR, Prague), 2003–2007
- GAZV QF4192** Methodology of evaluation of damages caused by game to field crops – J. Kamler (IVB AS CR), J. Dvořák (Mendel Agriculture and Forestry University, Brno), 2004–2006

Projects supported by the Ministry of Environment

- SM/6/3/05** Genetic diversity of endangered fish species – base of effective protection of biodiversity – S. Lusk, 2005–2007
- Management plan of large carnivores (brown bear, wolf, lynx) in the Czech Republic – P. Koubek, 2003–2005

Projects supported by the Ministry of Education, Youth and Sport

- LC522** Ichthyoparasitology Research Center – M. Gelnar (Masaryk University, Brno), T. Scholz (Institute of Parasitology AS CR, České Budějovice), P. Jurajda (IVB AS CR) Brno), 2005–2009
- LC06073** Biodiversity Research Center – P. Kindlman (Institute of Systems Biology and Ecology AS CR, České Budějovice), and other seven partners, including J. Zima (IVB AS CR), 2005–2011

International projects

European Union – 6th Framework Programme

- Integrated project EDEN** (no. 010284-2) Emerging diseases in a changing European environment (coordinated by CIRAD Montpellier, France) – Z. Hubálek, 2004–2008

- Integrated project MODELKEY** (no. SSPI-CT-2003-511237-2) Models for assessing and forecasting the impact of environmental key pollutants on marine and freshwater ecosystems and biodiversity (coordinated by Umweltforschungszentrum Leipzig - Halle GmbH, Germany) - P. Jurajda, 2005-2010
- Integrated consortium on ticks and tick-borne diseases** (ICTTD - 3) - L. Grubhofer (Biology Center AS CR, České Budějovice), Z. Hubálek (IVB AS CR), 2004-2008
- Marie Curie research training network SEXASEX** (no. MRTN-CT-2004-512492) Sex to asex: a case study on transitions and coexistence between sexual and asexual reproduction (coordinated by the Royal Belgian Institute of Natural Sciences, Belgium) - J. Zima, 2004-2009
- Marie Curie intra-European fellowship PHYLOMICROTUS** (no. 24956) Phylogeography of the Orkney vole *Microtus arvalis orcadensis* (cooperation with University of York, UK) - N. Martínková, 2006-2008
- Project INTAS** (no. 03-51-4030) A multidisciplinary study of hybrid zones in the common shrew (coordinated by the University of York, UK) - J. Zima, 2004-2007

Other EU projects

- European Science Foundation Research Networking Programme** Integrating population genetics and conservation biology: Merging theoretical, experimental and applied approaches - J. Bryja (member of the steering committee), 2004-2009
- European Science Foundation Research Networking Programme** Thermal adaptation in ectotherms: Linking life history, physiology, behaviour and genetics - L. Gvoždík (member of the steering committee), 2006-2011
- Large Scale Facility Project** (no. HPRI-CT-2001-00180) Intraspecific diversity in selected cyprinid fish species in the conditions of Central Europe (coordinated by the Institute of Aquaculture, University of Stirling, Scotland, UK) - J. Mendel, 2005
- Bavarian Interreg-III-A-Project** Wildlife and human in Bavarian-Czech-Austrian border region - example of the otter (cooperation with the Bavarian Forest Institute and Technical University of Munich, Germany) - P. Hájková, 2006-2007
- IUCN and European Commission** Assessment of European mammal species - J. Zima (participant), 2006-2007

Bilateral projects

- PPP Programme DAAD - AS CR** (project no. D2-CZ30/04-05) Mechanisms of speciation in rodents - H. Burda (University Essen-Duisburg, Germany), J. Zima (IVB AS CR), 2004-2005
- Programme KONTAKT** (project no. 26) Zoogeography, taxonomy and phylogeography of mammals in south-eastern Europe, Asia Minor and South Africa - V. Vohralík (Charles University, Prague), J. Zima (IVB AS CR), B. Kryštufek (University of Primorska, Koper, Slovenia), 2005-2006
- Programme KONTAKT** (project no. 144) Variability of social system in *Apodemus* mice (Rodentia) - M. Stanko (Institute of Zoology SAS, Bratislava, Slovakia), J. Bryja (IVB AS CR), 2004-2005
- Austrian Science and Research Liaison Office Brno** Bioarchaeology of the Holocene populations of Central Europe: reconstruction of mobility and manipulative behaviour - V. Sládek (IVB

AS CR), M. Berner (Naturhistorisches Museum, Wien, Austria), P. Galeta (University of West Bohemia, Plzeň), 2006

Integrated Bilateral Project Development of new methods for the laboratory diagnostics of West Nile Virus disease in human and some other animals (cooperation with Istituto Zooprofilattico e Sperimentale, Teramo, Italy) - Z. Hubálek, 2004–2005

Individual projects

Leverhulme Trust (UK), project Adaptation and coevolution in an unusual symbiosis (cooperation with University of Leicester, UK) - M. Reichard, 2003–2005

Natural Environment Research Council (UK), project Stoats and the Irish question (cooperation with University of York, UK) - N. Martínková, 2005

The Leakey Foundation (USA), general grant The possible role of ciliate (*Troglodytella abressarti*) in chimpanzee hind gut fermentation – K. Petrželková, 2006–2007.

British Ecological Society (UK), early career project grant (ref no. 551-617) Phenotypic correlates of lifetime reproductive success in the bitterling fish - M. Reichard , 2006–2007

LIST OF PUBLICATIONS

Books, textbooks, edited proceedings

- BERENCSI G., KHAN A., HALOUZKA J. (eds), 2005. Emerging Biological Threat. NATO Science Series. Life and Behavioural Sciences 370. IOS Press, Amsterdam, 192 pp. ISBN 1-58603-555-X.
- BRYJA J., ZUKAL J. (eds), 2006. Zoologické dny Brno 2006. ÚBO AV ČR, Brno, 269 pp. ISBN 80-903329-4-3.
- BUDIL I., BLAŽEK V., SLÁDEK V. (eds), 2005. Dějiny, rasa a kultura. Vydavatelství a nakladatelství Aleny Králové, Ústí nad Labem, 99 pp. ISBN 80-903412-4-1.
- CÍLEK V. (ed.), LOŽEK V., ŠKODA A., NĚMEC L., FATKA O., LITOCHEB J., ČERNÝ P., SEJKORA J., LITOCHEBOVÁ E., NEKUT B., BRUTHANS J. B., BENEŠOVÁ L., ŠNAJDROVÁ J., KOMÍNKOVÁ D., SOFRON J., HLAVÁČEK R., KARLÍK P., NESVADBOVÁ J., POJER F., ABSOLON K., ANDĚRA M., BOBEK M., BUFKA L., ČERVENÝ J., FISCHEROVÁ J., FISCHER D., FUCHS R., HLAVÁČ J., HOMOLKA P., JÍCHA V., MACEK J., PAVLÍČKO A., PEŠKE L., RIEGERT J., SEDLÁČEK O., ŠIMEK J., ŠVÁTORA M., URBAN S., DEJMAL I., PETŘÍČEK V., ČÁKA J., PALOWSKI E., MIKULÁŠ R., KESLOVÁ J., BAŠE M., KENDER J., SCHMELZOVÁ R., SMEJTEK L., DURDÍK T., VELFL J., VURM K., MAJER J., HOFMANN G., BŘEZOVSKÝ M., DAŇKOVSKÁ D., TRANTINA V., HOYER H., VÁŇOVÁ K., 2005. Střední Brdy. Ministerstvo zemědělství ČR, Příbram, 377 pp. ISBN 80-7084-266-0
- DVOŘÁK J., HOMOLKA M., HEROLDOVÁ M., KAMLER J., CERKAL R., LUJC J., SKLÁDANKA J., DOLEŽAL P., 2006. Atlas poškození polních plodin – savci. Mendelova zemědělská a lesnická univerzita, Brno, 35 pp. ISBN 80-7375-019-8.
- DVOŘÁK J., KAMLER J., VACA D., 2006. Problematika škod působených zvěří na zemědělských plodinách. Mendelova zemědělská a lesnická univerzita, Brno, 42 pp. ISBN 80-7157-939-4.
- HANEL L., LUSK S., 2005. Ryby a mihule České republiky: rozšíření a ochrana. ČSOP, Vlašim, 448 pp. ISBN 80-86327-49-3.
- KIRSCHNER J., RÁB P., ROUDNÁ M., STAŇKOVÁ J., VILÍMOVÁ J., ZIMA J., 2006. Biologická rozmanitost. Identifikace priorit a rozvoje kapacit pro plnění závazků České republiky vyplývajících z Úmluvy o biologické rozmanitosti. Ministerstvo životního prostředí ČR a UNDP/GEF, Praha, 228 pp. ISBN 80-7212-390-4
- LUSK S. (ed.), 2005. Distribution, Taxonomy and Genetic Status of the European Species of the Genus *Gobio*. Folia Zoologica 54, Suppl. 1, 98pp.
- LUSK S., LUSKOVÁ V. (eds), 2006. Biodiverzita ichtyofauny České republiky (VI). ÚBO AV ČR, Brno, 162 pp. ISBN 80-903329-6-X.
- PROCHÁZKA P., SEDLÁČEK O. (eds), 2006. 8th Workshop of the Southeastern European Bird Migration Network (SEEN). ÚBO AV ČR, Brno, 56 pp. ISBN 80-903329-5-1.

Chapters in books

- ALBRECHT T., BRYJA J., HÁJKOVÁ P., MIKULÍČEK P., ZIMA J., 2005. Genetická diverzita a metodické aspekty jejího výzkumu. In: Vačkář D. (ed.), Ukazatele změn biodiverzity. Academia, Praha; 24–42
- BARUŠ V., PROKEŠ M., 2006. *Anguillicola crassus* Kuwahara, Niimi et Itagaki, 1974 – krevnatka úhoří. In: Mlíkovský J., Stýblo P. (eds), Nepůvodní druhy fauny a flóry České republiky. Arbora Publishers, Zvolen; 207–208.
- BARUŠ V., PROKEŠ M., 2006: *Ascaridia dissimilis* Pérez Viguera, 1931 – škrkavička krocání. In: Mlíkovský J., Stýblo P. (eds), Nepůvodní druhy fauny a flóry České republiky. Arbora Publishers, Zvolen; 208–210.
- BARUŠ V., PROKEŠ M., 2006: *Ascaridia platyceri* Hartwich et Tscherner, 1979 – škrkavička papouščí. In: Mlíkovský J., Stýblo P. (eds), Nepůvodní druhy fauny a flóry České republiky. Arbora Publishers, Zvolen; 210–211.
- BRYJA J., ALBRECHT T., BÍMOVÁ B., HÁJKOVÁ P., MARTÍNKOVÁ N., MIKULÍČEK P., VYSKOČILOVÁ M., ZEMANOVÁ B., PIÁLEK J., 2006. Využití molekulárně-genetických metod v zoologii a ekologii: přehled projektů řešených na Ústavu biologie obratlovců AV ČR. In: Paule L., Urban P., Gömöry D. (eds), Genetika poľovnej zveri a voľne žijúcich živočíchov. Arbora Publishers, Zvolen; 75–82.
- CERKAL R., DVOŘÁK J., KAMLER J., VEJRAŽKA K., 2006. Poškození porostů ječmene býložravci. In: Zimolka J. (ed.), Ječmen – formy a užitkové směry v České republice. Profi Press, Praha; 120–125.
- ČERVENÝ J., 2005. Rešerše a hodnotení realizovaných a probíhajících projektů aktivní ochrany rysa ostrovida (*Lynx lynx*) v České republice. In: Kumstátová T., Nová P., Marhoul P. (eds), Hodnocení projektů aktivní podpory ohrožených živočichů v České republice. Olga Čermáková, Hradec Králové, 423–427.
- HÁJKOVÁ P., ZEMANOVÁ B., HÁJEK B., BRYJA J., 2006. Využitie neinvazívnej DNA analýzy pri štúdiu populácií vydry riečnej. In: Paule L., Urban P., Gömöry D. (eds), Genetika poľovnej zveri a voľne žijúcich živočíchov. Arbora Publishers, Zvolen; 83–90.

- HUBÁLEK Z., KRÍŽ B., MENNE B., 2006. West Nile Virus: Ecology, Epidemiology and Prevention. In: Menne B., Ebi K.L. (eds.), Climate Change and Adaptation Strategies for Human Health. Steinkopff, Darmstadt; 217-242.
- LUSK S., HANEL L., 2005. Změny biodiverzity ichtyofauny. In: Vačkář, D. (ed.), Ukazatele změn biodiverzity. Academia, Praha; 197-207.
- PETRŽELKOVÁ K.J., HASEGAWA H., MOSCOVICE L.R., KAUR T., ISSA M.H., HUFFMAN M.A., 2005. New records of parasitic nematodes for chimpanzees found from the introduced population on Rubondo island, Tanzania. In: Frolich K., Steinbach F. (eds), Erkrankungen der Zootiere. Institut für Zoo- und Wildtierforschung, Berlin; 269.
- POLEDNÍK L., POLEDNÍKOVÁ K., HÁJKOVÁ P., CULKOVÁ M., 2005. Rešerše a hodnocení realizovaných a probíhajících projektů aktivní ochrany vydry říční (*Lutra lutra*) v České republice. In: Kumstátová T., Nová P., Marhoul P. (eds), Hodnocení projektů aktivní podpory ohrožených živočichů v České republice. Olga Čermáková, Hradec Králové, 417-422.
- SLÁDEK V., 2005. Rasa: mýtus pro popis lidské variability. In: Budil I.T., Blažek V., Sládek V. (eds), Dějiny, rasa a kultura. Vydavatelství a nakladatelství Aleny Králové, Ústí nad Labem, 37-48.
- TOMÁŠKOVÁ L., BEJČEK V., SEDLÁČEK F., ŠTASTNÝ K., TKADLEC E., ZIMA J., 2005. Population Biology of Shrews (*Sorex araneus* and *Sorex minutus*) from a Polluted Area in Central Europe. In: Meritt J.F., Churchfield S., Hutterer R., Sheftel B.I. (eds), Advances in the Biology of Shrews II. International Society of Shrew Biologists, New York; 189-197.

Papers in journals included in the databases ISI Web of Knowledge

- ALBRECHT T., HOŘÁK D., KREISINGER J., KLVÁŇA P., MICHOT T.C., 2006. Factors determining poached nest predation along a wetland gradient. *Journal of Wildlife Management* 70: 784-791.
- ALBRECHT T., KREISINGER J., PIÁLEK J., 2006. The strength of direct selection against female promiscuity is associated with rates of extrapair fertilizations in socially monogamous songbirds. *American Naturalist* 167: 739-744.
- ANTONOV A., STOKKE B.G., MOKSNES A., KLEVEN O., HONZA M., ROSKAFT E., 2006. Eggshell strength of an obligate brood parasite: a test of the puncture resistance hypothesis. *Behavioral Ecology and Sociobiology* 60: 11-18.
- BAKONYI T., HUBÁLEK Z., RUDOLF I., NOWOTNY N., 2005. Novel flavivirus or new lineage of West Nile virus, Central Europe. *Emerging Infectious Diseases* 11: 225-231.
- BARUŠ V., KAJEROVÁ V., KOUBKOVÁ B., 2005. A new species of *Pterothominx* Freitas, 1959 (Nematoda: Capillariidae) parasitising psittacine birds (Psittaciformes). *Systematic Parasitology* 62: 59-64.
- BERKOVÁ H., ZUKAL J., 2006. Flight activity of bats at the entrance of a natural cave. *Acta Chiropterologica* 8: 187-195.
- BERTEAUX D., HUMPHRIES M.M., KREBS C.J., LIMA M., MCADAM A.G., PETTORELLI N., REALE D., SAITOH T., TKADLEC E., WELADJI R.B., STENSETH N.C., 2006. Constraints to projecting the effects of climate change on mammals. *Climate Research* 32: 151-158.
- BÍMOVÁ B., KARN R.C., PIÁLEK J., 2005. The role of salivary androgen-binding protein in reproductive isolation between two subspecies of house mouse: *Mus musculus musculus* and *Mus musculus domesticus*. *Biological Journal of the Linnean Society* 84: 349-361.
- BOŽÍKOVÁ E., MUNCLINGER P., TEETER K., TUCKER P.K., MACHOLÁN M., PIÁLEK J., 2005. Mitochondrial DNA in the hybrid zone between *Mus musculus musculus* and *Mus musculus domesticus*: a comparison of two transects. *Biological Journal of the Linnean Society* 84: 363-378.
- BRACK W., BAKKER J., DE DECKERE E., DEERENBERG C., VAN GILS J., HEIN M., JURAJDA P., KOOIJMAN B., LAMOREE M., LEK S., DE ALDA M.J.L., MARCOMINI A., MUNOZ I., RATTEI S., SEGNER H., THOMAS K., VON DER OHE P.C., WESTRICH B., DE ZWART D., SCHMITT-JANSEN M., 2005. MODELKEY - Models for assessing and forecasting the impact of environmental key pollutants on freshwater and marine ecosystems and biodiversity. *Environmental Science and Pollution Research* 12: 252-256.
- BRYJA J., GALAN M., CHARBONNEL N., COSSON J.-F., 2005. Analysis of major histocompatibility complex class II gene in water voles using capillary electrophoresis-single stranded conformation polymorphism. *Molecular Ecology Notes* 5: 173-176.
- BRYJA J., GALAN M., CHARBONNEL N., COSSON J.-F., 2006. Duplication, balancing selection and trans-species evolution explain the high levels of polymorphism of the DQA MHC class II gene in voles (Arvicolinae). *Immunogenetics* 58: 191-202.

- BRYJA J., NESVADBOVÁ J., HEROLDOVÁ M., JÁNOVÁ E., LOSÍK J., TREBATICÁ L., TKADLEC E., 2005. Common vole (*Microtus arvalis*) population sex ratio: biases and process variation. *Canadian Journal of Zoology* 83: 1391-1399.
- BRYJA J., STOPKA P., 2005. Facultative promiscuity in a presumably monogamous mouse *Apodemus microps*. *Acta Theriologica* 50: 189-196.
- CERKAL R., DVOŘÁK J., KAMLER J., HŘIVNA L., 2006. Posouzení vlivu simulovaného poškození listové plochy na výnos a kvalitu cukrovky. *Listy cukrovarnické a řepařské* 122: 257-261.
- COPP G.H., BIANCO P.G., BOGUTSKAYA N.G., ERÖS T., FALKA I., FERREIRA M.T., FOX M.G., FREYHOF J., GOZLAN R.E., GRABOWSKA J., KOVÁČ V., MORENO-AMICH R., NASEKA A.M., PEŇÁZ M., POVŽ M., PRZYBYLSKI M., ROBILLARD M., RUSSELL I.C., STAKENAS S., ŠUMER S., VILA-GISPERS A., WIESNER C., 2005. To be, or not to be, a non-native freshwater fish? *Journal of Applied Ichthyology* 21: 242-262.
- DÁVIDOVÁ M., ONDRAČKOVÁ M., BARUŠ V., REICHARD M., KOUBKOVÁ B., 2005. Nematode infections of the European bitterling (*Rhodeus sericeus* Pallas, 1776: Cypriniformes). *Helminthologia* 42: 45-48.
- DRASTICHOVÁ J., ŠVESTKOVÁ E., LUSKOVÁ V., SVOBODOVÁ Z., 2005. Cytochemical study of carp neutrophil granulocytes after acute exposure to cadmium. *Journal of Applied Ichthyology* 21: 215-219.
- DUSBÁBEK F., LITERÁK I., ČAPEK M., HAVLÍČEK M., 2006. Three species of the genus *Pellonyssus* (Acari: Macronyssidae) including a new species from Costa Rican birds. *International Journal of Acarology* 32: 175-178.
- GVOŽDÍK L., 2005. Does reproduction influence temperature preferences in newts? *Canadian Journal of Zoology* 83: 1038-1044.
- GVOŽDÍK L., VAN DAMME R., 2006. *Triturus* newts defy the running-swimming dilemma. *Evolution* 60: 2110-2121.
- HÁJKOVÁ P., ZEMANOVÁ B., BRYJA J., HÁJEK B., ROCHE K., TKADLEC E., ZIMA J., 2006. Factors affecting success of PCR amplification of microsatellite loci from otter faeces. *Molecular Ecology Notes* 6: 559-562.
- HASEGAWA H., IKEDA Y., FUJISAKI A., MOSCOVICE L.R., PETRŽELKOVÁ K., KAUR T., HUFFMAN M.A., 2005. Morphology of chimpanzee pinworms, *Enterobius (Enterobius) anthropopitheci* (Geddes, 1916) (Nematoda: Oxyuridae), collected from chimpanzees, *Pan troglodytes*, on Rubondo island, Tanzania. *Journal of Parasitology* 91: 1314-1317.
- HEROLDOVÁ M., JÁNOVÁ E., BRYJA J., TKADLEC E., 2005. Set-aside plots - source of small mammal pests? *Folia Zoologica* 54: 337-350.
- HOHAUSOVÁ E., JURAJDA P., 2005. Restoration of a river backwater and its influence on fish assemblage. *Czech Journal of Animal Science* 50: 473-482.
- HONZA M., KUIPER S.M., CHERRY M.I., 2005. Behaviour of African turdid hosts towards experimental parasitism with artificial red-chested cuckoo *Cuculus solitarius* eggs. *Journal of Avian Biology* 36: 517-522.
- HONZA M., MOSKÁT C., 2005. Antiparasite behaviour in response to experimental brood parasitism in the great reed warbler: a comparison of single and multiple parasitism. *Annales Zoologici Fennici* 42: 627-633.
- HONZA M., ŠICHA V., PROCHÁZKA P., LEŽALOVÁ R., 2006. Host nest defense against a color-dimorphic brood parasite: great reed warblers (*Acrocephalus arundinaceus*) versus common cuckoos (*Cuculus canorus*). *Journal of Ornithology* 147: 629-637.
- HORÁK D., ALBRECHT T., KLVAŇA P., MUSIL P., 2006. The relationship between size of egg and young in the common pochard. *Journal of Ornithology* 147 (5 Suppl. 1): 183. [meeting abstract]
- HUBÁLEK Z., 2005. Co-fluctuation among bird species in their migration timing. *Folia Zoologica* 54: 159-164.
- HUBÁLEK Z., 2005. North Atlantic weather oscillation and human infectious diseases in the Czech Republic, 1951-2003. *European Journal of Epidemiology* 20: 263-270.
- HUBÁLEK Z., BURDA H., SCHARFF A., HETH G., NEVO E., ŠUMBERA R., PEŠKO J., ZIMA J., 2005. Emmonsiosis of subterranean rodents (Bathyergidae, Spalacidae) in Africa and Israel. *Medical Mycology* 43: 691-697.
- HUBÁLEK Z., HALOUZKA J., JUŘICOVÁ Z., ŠIKUTOVÁ S., RUDOLF I., 2006. Effect of forest clearing on the abundance of *Ixodes ricinus* ticks and the prevalence of *Borrelia burgdorferi* s.l. *Medical and Veterinary Entomology* 20: 166-172.
- HUBÁLEK Z., LUKÁČOVÁ L., HALOUZKA J., ŠIRŮČEK P., JANUŠKA J., PŘECECHTĚLOVÁ J., PROCHÁZKA P., 2006. Import of West Nile virus infection in the Czech Republic. *European Journal of Epidemiology* 21: 323-324.
- HUBÁLEK Z., ŠKORPÍKOVÁ V., HORAL D., 2005. Avian botulism at a sugar beet processing plant in South Moravia (Czech Republic). *Veterinární medicína* 50: 443-445.
- HUBÁLEK Z., ZEMAN P., HALOUZKA J., JUŘICOVÁ Z., ŠTOVÍČKOVÁ E., BÁLKOVÁ H., ŠIKUTOVÁ S., RUDOLF I., 2005. Mosquitoborne viruses, Czech Republic, 2002. *Emerging Infectious Diseases* 11: 116-118.
- HUMPL M., LUSK S., 2006. Effect of multiple electro-fishing on determining the structure of fish communities in small streams. *Folia Zoologica* 55: 315-322.

- JANÁČ M., JURAJDA P., 2005. Inter-calibration of three electric fishing techniques to estimate 0+ juvenile fish densities on sandy river beaches. *Fisheries Management and Ecology* 12: 161-167.
- JURAJDA P., ČERNÝ J., POLAČIK M., VALOVÁ Z., JANÁČ M., BLAŽEK R., ONDRAČKOVÁ M., 2005. The recent distribution and abundance of non-native *Neogobius* fishes in the Slovak section of the River Danube. *Journal of Applied Ichthyology* 21: 319-323.
- JURAJDA P., REICHARD M., SMITH C., 2006. Immediate impact of an extensive summer flood on the adult fish assemblage of a channelized lowland river. *Journal of Freshwater Ecology* 21: 493-502.
- KAJEROVÁ V., BARUŠ V., 2005. Corrections to description of *Cardiofilaria dubia* (Nematoda) parasitizing Australian parrot. *Helminthologia* 42: 167-169.
- KAJEROVÁ V., BARUŠ V., 2005. Psittacine birds (Aves: Psittaciformes) as new hosts of *Baruscapillaria obsignata* (Nematoda: Capillariidae). *Acta Veterinaria Brno* 74: 571-574.
- KAMLER J., HOMOLKA M., 2005. Faecal nitrogen: a potential indicator of red and roe deer diet quality in forest habitats. *Folia Zoologica* 54: 89-98.
- KLOUBEC B., ČAPEK M., 2005. Seasonal and diel budgets of song: a study of Savi's warbler (*Locustella luscinioides*). *Journal of Ornithology* 146: 206-214.
- KOŠČO J., LUSK S., HALAČKA K., LUSKOVÁ V., KOŠUTH P., 2005. Distribution of species of the genus *Gobio* in the Tisza River drainage area, Slovakia. *Folia Zoologica* 54: 65-72.
- KOTLÍK P., DEFFONTAINE V., MASCHERETTI S., ZIMA J., MICHAUX J.R., SEARLE, J.B., 2006. A northern glacial refugium for bank voles (*Clethrionomys glareolus*). *Proceedings of the National Academy of Sciences of the United States of America* 103: 14860-14864.
- KOUBKOVÁ B., BARUŠ V., MATĚJUSOVÁ I., HODOVÁ I., KOUBEK P., 2006. *Thelastoma gueyei* sp. n. (Nematoda: Thelastomatidae) from the Senegal diplopod *Archispirostreptus tumuliporus* (Diplopoda: Spirostreptidae). *Nematology* 8: 739-747.
- KREISINGER J., ALBRECHT T., 2006. Nest predation in mallards: the role of crypsis and parental behaviour. *Journal of Ornithology* 147 (5 Suppl. 1): 197. [meeting abstract]
- LEŽALOVÁ R., TKADLEC E., OBORNÍK M., ŠIMEK J., HONZA M., 2005. Should males come first? The relationship between offspring hatching order and sex in the black-headed gull *Larus ridibundus*. *Journal of Avian Biology* 36: 478-483.
- LIU H.-Z., ZHU Y.-R., SMITH C., REICHARD M., 2006. Evidence of host specificity and congruence between phylogenies of bitterling and freshwater mussels. *Zoological Studies* 45: 428-434.
- LOJKÁSEK B., LUSK S., HALAČKA K., LUSKOVÁ V., DROZD P., 2005. The impact of the extreme floods in July 1997 on the ichthyocenosis of the Oder catchment area (Czech Republic). *Hydrobiologia* 548: 11-22.
- LUSK S., HALAČKA K., LUSKOVÁ V., HORÁK V., 2005. Distribution of *Gobio* species in the Czech Republic. *Folia Zoologica* 54: 56-64.
- LUSK S., LUSKOVÁ V., HALAČKA K., ŠLECHTOVÁ V., ŠLECHTA V., 2005. Characteristics of the remnant *Vimba vimba* population in the upper part of the Dyje River. *Folia Zoologica* 54: 389-404.
- LUSK S., ŠLECHTA V., 2005. Changes in the taxonomy of gudgeons from European waters. *Folia Zoologica* 54: 2-4.
- MARTÍNKOVÁ N., SEARLE J.B., 2006. Amplification success rate of DNA from museum skin collections: a case study of stoats from 18 museums. *Molecular Ecology Notes* 6: 1014-1017.
- MENDEL J., LUSKOVÁ V., HALAČKA K., LUSK S., VETEŠNÍK L., 2005. Genetic diversity of *Gobio gobio* populations in the Czech Republic and Slovakia, based on RAPD markers. *Folia Zoologica* 54: 13-24.
- MORAVEC F., ŠIMKOVÁ A., PEČÍNKOVÁ M., ONDRAČKOVÁ M., 2006. Morphology of *Philometroides barbi* (Nematoda: Philometridae), a rare tissue parasite of the Mediterranean barbel *Barbus meridionalis* (Osteichthyes). *Diseases of Aquatic Organisms* 69: 265-268.
- MOSKÁT C., BARTA Z., HAUBER M.E., HONZA M., 2006. High synchrony of egg laying in common cuckoos (*Cuculus canorus*) and their great reed warbler (*Acrocephalus arundinaceus*) hosts. *Ethology, Ecology and Evolution* 18: 159-167.
- MUNCLINGER P., ALBRECHT T., JAVŮRKOVÁ V., HONZA M., KREISINGER J., 2006. Non-invasive molecular analysis of reproductive strategies in mallards. *Journal of Ornithology* 147 (5 Suppl. 1): 216. [meeting abstract]
- ONDRAČKOVÁ M., DÁVIDOVÁ M., GELNAR M., JURAJDA P., 2006. Susceptibility of Prussian carp infected by metacercariae of *Posthodiplostomum cuticola* (v. Nordmann, 1832) to fish predation. *Ecological Research* 21: 526-529.
- ONDRAČKOVÁ M., DÁVIDOVÁ M., PEČÍNKOVÁ M., BLAŽEK R., GELNAR M., VALOVÁ Z., ČERNÝ J., JURAJDA P., 2005. Metazoan parasites of *Neogobius* fishes in the Slovak section of the River Danube. *Journal of Applied Ichthyology* 21: 345-349.
- OTTOVÁ E., ŠIMKOVÁ A., JURAJDA P., DÁVIDOVÁ M., ONDRAČKOVÁ M., PEČÍNKOVÁ M., GELNAR M., 2005. Sexual ornamentation and parasite infection in males of common bream (*Abramis brama*): a reflection of immunocompetence status or simple cost of reproduction? *Evolutionary Ecology Research* 7: 581-593.

- PEŇÁZ M., SVOBODOVÁ Z., BARUŠ V., PROKEŠ M., DRASTICHOVÁ J., 2005. Endocrine disruption in a barbel, *Barbus barbus* population from the River Jihlava, Czech Republic. *Journal of Applied Ichthyology* 21: 420–428.
- PETRŽELKOVÁ K.J., DOWNS N.C., ZUKAL J., RACEY P.A., 2006. A comparison between emergence and return activity in pipistrelle bats *Pipistrellus pipistrellus* and *P. pygmaeus*. *Acta Chiropterologica* 8: 381–390.
- PETRŽELKOVÁ K.J., HASEGAWA H., MOSCOVICE L.R., KAUR T., ISSA M.H., HUFFMAN M.A., 2006. Parasitic nematodes in the chimpanzee population on Rubondo Island, Tanzania. *International Journal of Primatology* 27: 767–777.
- PIÁLEK J., ALBRECHT T., 2005. Choosing mates: complementary versus compatible genes. *Trends in Ecology and Evolution* 20: 63.
- PIÁLEK J., HAUFFE H.C., SEARLE J., 2005. Chromosomal variation in the house mouse. *Biological Journal of the Linnean Society* 84: 535–563.
- POLAČIK M., KOVÁČ V., 2006. Fecundity and annual course of maturation in spirin, *Alburnoides bipunctatus*. *Folia Zoologica* 55: 399–410.
- PRÁŠEK V., JURAIDA P., 2005. Expansion of *Proterorhinus marmoratus* in the Morava River basin (Czech Republic, Danube R. watershed). *Folia Zoologica* 54: 189–192.
- PRCHALOVÁ M., VETEŠNÍK L., SLAVÍK O., 2006. Migrations of juvenile and subadult fish through a fishpass during late summer and fall. *Folia Zoologica* 55: 162–166.
- PROKEŠ M., ŠOVČÍK P., PEŇÁZ M., BARUŠ V., SPURNÝ P., VILIZZI L., 2006. Growth of barbel, *Barbus barbus*, in the River Jihlava following major. *Folia Zoologica* 55: 86–96.
- PROKEŠOVÁ J., BARANČEKOVÁ M., HOMOLKA M., 2006. Density of red deer and roe deer and their distribution in relation to different habitat characteristics in a floodplain forest. *Folia Zoologica* 55: 1–14.
- RAPPOLE J. H., HUBÁLEK Z., 2006. Birds and influenza H5N1 virus movement to and within North America. *Emerging Infectious Diseases* 12: 1486–1492.
- REICHARD M., BRYJA J., ONDRAČKOVÁ M., DÁVIDOVÁ M., KANIEWSKA P., SMITH C., 2005. Sexual selection for male dominance reduces opportunities for female mate choice in the European bitterling (*Rhodeus sericeus*). *Molecular Ecology* 14: 1533–1542.
- REICHARD M., ONDRAČKOVÁ M., PRZYBYLSKI M., LIU H., SMITH C., 2006. The costs and benefits in an unusual symbiosis: experimental evidence that bitterling fish (*Rhodeus sericeus*) are parasites of unionid mussels in Europe. *Journal of Evolutionary Biology* 19: 788–796.
- RUDOLF I., GOLOVCHENKO M., ŠKUTOVÁ S., RUDENKO N., GRUBHOFFER L., HUBÁLEK Z., 2005. *Babesia microti* (Piroplasmida: Babesiidae) in nymphal *Ixodes ricinus* (Acari: Ixodidae) in the Czech Republic. *Folia Parasitologica* 52: 274–276.
- RUFF C.B., HOLT B. M., SLÁDEK V., BERNER M., MURPHY W.A., ZUR NEDDEN D., SEIDLER H., RECHEIS W., 2006. Body size, body proportions, and mobility in the Tyrolean „Ice man“. *Journal of Human Evolution* 51: 91–101.
- ŘEHULKOVÁ E., BARUŠ V., GELNAR M., 2005. Two remarkable nematodes from the African reedfish *Erpetoichthys calabaricus* (Polypteriformes: Polypteridae). *Helminthologia* 42: 149–153.
- SCHNITZER J., LUNDÁK M., EXNEROVÁ A., MUNCLINGER P., ALBRECHT T., 2006. Secondary male ornamentation as a signal of a good parent in the Scarlet Rosefinch. *Journal of Ornithology* 147 (5 Suppl. 1): 248. [meeting abstract]
- SLÁDEK V., BERNER M., SAILER R., 2006. Mobility in Central European Late Eneolithic and Early Bronze Age: tibial cross-sectional geometry. *Journal of Archaeological Science* 33: 470–482.
- SMITH C., REICHARD M., 2005. Females solicit sneakers to improve fertilization success in the bitterling fish (*Rhodeus sericeus*). *Proceedings of the Royal Society of London. B - Biological Sciences* 272: 1683–1688.
- SMITH C., REICHARD M., DOUGLAS A., JURAIDA P., 2006. Population consequences of behaviour in the European bitterling (*Rhodeus sericeus* Cyprinidae). *Ecology of Freshwater Fish* 15: 139–145.
- SPENCE R., FATEMA M.K., REICHARD M., HUQ K.A., WAHAB M.A., AHMED Z.F., SMITH C., 2006. The distribution and habitat preferences of the zebrafish in Bangladesh. *Journal of Fish Biology* 69: 1435–1448.
- STÜNZNER D., HUBÁLEK Z., HALOUZKA J., WENDELIN I., SIXL W., MARTH E., 2006. Prevalence of *Borrelia burgdorferi* sensu lato in the tick *Ixodes ricinus* in the Styrian mountains of Austria. *Wiener klinische Wochenschrift: the Middle European Journal of Medicine* 118: 682–685.
- SUCHOMEL, J., HEROLDOVÁ M., 2006. Population of *Apodemus flavicollis* in three large isolated forests under various environmental conditions in Southern Moravia (the Czech Republic). *Ekológia* 25: 377–387.
- SVOBODOVÁ Z., MÁCHOVÁ J., DRASTICHOVÁ J., GROCH L., LUSKOVÁ V., POLESZCZUK G., VELÍŠEK J., KROUPOVÁ H., 2005. Haematological and biochemical profiles of carp blood following nitrite exposure at different concentrations of chloride. *Aquaculture Research* 36: 1177–1184.
- SYCHRA O., LITERÁK I., ČAPEK M., HAVLÍČEK M., 2006. Chewing lice (Phthiraptera) from typical antbirds and ground antbirds (Passeriformes: Thamnophilidae, Formicariidae) from Costa Rica, with descriptions of three new species of the genera *Formicaphagus* and *Myrsidea*. *Zootaxa* 1206: 47–61.

- ŠANDA R., LUSKOVÁ V., VUKIČ J., 2005. Notes on the distribution and taxonomic status of *Gobio gobio* from the Morača River basin (Montenegro). *Folia Zoologica* 54: 73–80.
- ŠIMKOVÁ A., JARKOVSKÝ J., KOUBKOVÁ B., BARUŠ V., PROKEŠ M., 2005. Associations between fish reproductive cycle and the dynamics of metazoan parasite infection. *Parasitology Research* 95: 65–72.
- ŠIROKÝ P., PETRŽELKOVÁ K.J., KAMLER M., MIHALCA A.D., MODRÝ D., 2006. *Hyalomma aegyptium* as dominant tick in tortoises of the genus *Testudo* in Balkan countries, with notes on its host preferences. *Experimental and Applied Acarology* 40: 279–290.
- ŠLECHTOVÁ V., LUSKOVÁ V., ŠLECHTA V., HALAČKA K., LUSK S., KOŠČO J., 2005. Intraspecific allozyme diversity of *Gobio gobio* in Czech and Slovak rivers. *Folia Zoologica* 54: 25–32.
- TKADLEC E., ZBOŘIL J., LOSÍK J., GREGOR P., LISICKÁ L., 2006. Winter climate and plant productivity predict abundances of small herbivores in central Europe. *Climate Research* 32: 99–108.
- VALOVÁ Z., JURAJDA P., JANÁČ M., 2006. Spatial distribution of 0+ juvenile fish in differently modified lowland rivers. *Folia Zoologica* 55: 293–308.
- VELÍŠEK J., DOBŠÍKOVÁ R., SVOBODOVÁ Z., MODRÁ H., LUSKOVÁ V., 2006. Effect of deltamethrin on the biochemical profile of common carp (*Cyprinus carpio* L.). *Bulletin of Environmental Contamination and Toxicology* 76: 992–998.
- VETEŠNÍK L., HALAČKA K., LUSKOVÁ V., LUSK S., 2006. Erythrocyte profile of diploid and triploid silver crucian carp (*Carassius auratus*). *Acta Veterinaria Brno* 75: 203–207.
- VILIZZI L., COPP G.H., CARTER M.G., PEŇÁZ M., 2006. Movement and abundance of barbel, *Barbus barbus*, in a mesotrophic chalk stream in England. *Folia Zoologica* 55: 183–197.
- VYSKOČILOVÁ M., TRACHTULEC Z., FOREJT J., PIÁLEK J., 2005. Does geography matter in hybrid sterility in house mice? *Biological Journal of the Linnean Society* 84: 663–674.
- ZUKAL J., ŘEHÁK Z., 2006. Flight activity and habitat preference of bats in a karstic area, as revealed by bat detectors. *Folia Zoologica* 55: 273–281.
- ZUKAL J., BERKOVÁ H., ŘEHÁK Z., 2005. Activity and shelter selection by *Myotis myotis* and *Rhinolophus hipposideros* hibernating in the Kateřinská cave (Czech Republic). *Mammalian Biology* 70: 271–281.
- ŽÁKOVSKÁ A., ČAPKOVÁ L., ŠERÝ O., HALOUZKA J., DENDIS M., 2006. Isolation of *Borrelia afzelii* from overwintering *Culex pipiens* biotype molestus mosquitoes. *Annals of Agricultural and Environmental Medicine* 13: 345–348.

Papers in other refereed journals

- BARÁNEK V., MAREŠ J., PROKEŠ M., JIRÁSEK J., SPURNÝ P., 2005. Možnosti odchovu plůdku candáta obecného (*Sander lucioperca*) v kontrolovaných podmínkách – krátký přehled. *Bulletin VÚRH Vodňany* 41: 128–134.
- BEDNÁŘOVÁ J., ZUKAL J., ŘEHÁK Z., 2006. Rozšíření netopyra velkouchého (*Myotis bechsteini*) v České republice. *Vespertilio* 9–10: 9–26.
- BRYJA J., KMENT P., 2006. Plošnice (Heteroptera) Chráněné krajinné oblasti Kokořínsko. *Bohemia Centralis* 27: 267–294.
- BUFKA L., HEURICH M., ENGLENDER T., WÖFL M., ČERVENÝ J., SCHERZINGER W., 2005. Wolf occurrence in the Czech – Bavarian – Austrian border region: review of a history and current status. *Silva Gabreta* 11: 27–42.
- ČERVENÝ J., ANDĚRA M., KOUBEK P., BUFKA L., 2006. Změny v rozšíření našich savců na začátku 21. století. *Ochrana přírody* 61: 44–51.
- GAISLER J., ŘEHÁK Z., ZUKAL J., 2006. Výzkum netopyrů v Moravském krasu: historie a současný stav. *Vespertilio* 9–10: 75–85.
- HENEBERG P., ŠÍREK J., ŠKORPÍKOVÁ V., ŠIMEČEK K., ŠAFRÁNEK J., MAZÁNEK D., HUBÁLEK Z., JERÁBKOVÁ E., 2006. Overview of sand martin (*Riparia riparia*) localities in the Czech Republic. *Linzer biologische Beiträge* 38: 1413–1447.
- HEROLDOVÁ M., OBDRŽÁLKOVÁ D., ZAPLETAL M., ZEJDA J., 2006. Hraboš polní v roce 2005 a jak dál. *Rostlinolékař* (1): 19–20.
- HEROLDOVÁ M., OBDRŽÁLKOVÁ D., ZAPLETAL M., ZEJDA J., 2006. Hraboš polní: jeden z nejvážnějších škůdců. *Agromanuál* (9–10): 42–43.
- HOMOLKA M., HEROLDOVÁ M., 2006. Kvalitní potravní nabídka: prevence mladých porostů před okusem velkých herbivorů v oblasti NPP Kněžyně. *Beskydy* 19: 185–188.
- HUBÁLEK Z., 2006. Ptačí chřipka a tažní ptáci. *Crex* 26: 131–137.
- HUBÁLEK Z., HUDEC K., VAČKAŘ J., 2005. Přilet tažných ptáků na jižní Moravu v letech 1997–1999. *Sylvia* 41: 59–71.

- JURAJDA P., VASSILEV M., POLAČIK M., TRICHKOVA T., 2006. A first record of *Percottus glenii* (Perciformes: Odontobutidae) in the Danube River in Bulgaria. *Acta Zoologica Bulgarica* 58: 279–282.
- KAMLER J., DVOŘÁK J., 2006. Ochrana porostů polních plodin před zvěří – součást agrotechniky. *Úroda* (2): 59–61.
- KAMLER J., HEROLDOVÁ M., HOMOLKA M., DVOŘÁK J., 2006. Volně žijící býložravci a polní plodiny. *Svět myslivosti* 7(7): 8–9.
- KAMLER J., HOMOLKA M., 2005. Vliv býložravé zvěře na obnovu buku lesního v horském prostředí. *Folia Venatoria* 35: 79–84.
- KAMLER J., HOMOLKA M., HEROLDOVÁ M., DVOŘÁK J., 2005. Volně žijící býložravci a polní plodiny. *Folia Venatoria* 35: 205–210.
- KMENT P., BRYJA J., 2006. Revised occurrence of *Heterotoma* species (Heteroptera: Miridae) in the Czech Republic and Slovakia with remarks on nomenclature, diagnostic characters and ecology. *Acta Musei Moraviae, Scientiae Biologicae* 91: 7–52.
- KMENT P., BRYJA J., HRADIL K., JINDRA Z., 2005. New and interesting records of true bugs (Heteroptera) from the Czech Republic and Slovakia 3. *Klapalekiana* 41: 157–213.
- KMENT P., BRYJA J., JINDRA Z., 2005. New records of true bugs (Heteroptera) of the Balkan peninsula. *Acta Entomologica Slovenica* 13: 9–20.
- OBDRŽÁLKOVÁ D., ZAPLETAL M., ZEJDA J., HEROLDOVÁ M., 2006. Co lze očekávat od vývoje populace hraboše v roce 2006. *Úroda* (2): 59–61.
- ONDRAČKOVÁ M., TRICHKOVA T., JURAJDA P., 2006. Present and historical occurrence of metazoan parasites in *Neogobius kessleri* (Pisces: Gobiidae) in the Bulgarian section of the Danube River. *Acta Zoologica Bulgarica* 58: 401–408.
- POŽGAYOVÁ M., PROCHÁZKA P., HONZA M., 2005. Predace snůšky pěníce černohlavé (*Sylvia atricapilla*) strakapoudem velkým (*Dendrocopos major*). *Sluka* 2: 97–101.
- PROCHÁZKA P., 2006. Analýza stabilních izotopů – alternativní metoda studia migrace ptáků. *Sylvia* 42: 3–21.
- SUCHOMEL J., HEROLDOVÁ M., 2006. Diversity of small mammals communities in two semiartificial wooded habitats. *Hystrix* 17: 179–182.
- TÓTHOVÁ A., BRYJA J., BEJDÁK P., VAŇHARA J., 2006. Molecular markers used in phylogenetic studies of Diptera with a methodological overview. *Acta Universitatis Carolinae, Biologica* 50: 125–133.
- ZAPLETAL M., OBDRŽÁLKOVÁ D., ZEJDA J., HEROLDOVÁ M., 2006. Prognóza vývoje početnosti hraboše polního v ČR v roce 2006. *Agro* (3): 28–29.
- ZAPLETAL M., OBDRŽÁLKOVÁ D., ZEJDA J., HEROLDOVÁ M., 2006. Škody hrabošem polním a zajícem polním v sadech v zimě 2005/06. *Rostlinolékař* (5): 11.

Papers in proceedings

- ADÁMEK Z., JURAJDA P., MUSIL J., JANÁČ M., KABILKA P., POLAČIK M., ŤUK J., VALOVÁ Z., ZEMAN J., 2006. Perch (*Perca fluviatilis* L.) diet during the flooding period of the Chabařovice coal mining pit (North-West Bohemia, Czech Republic). In: 5th International Conference on Reservoir Limnology and Water Quality: „Reservoirs – Establishing the Balance between Human Use and Biotic Integrity“. Biologické centrum AV ČR, Brno: 67–68.
- BARANČEKOVÁ M., PROKEŠOVÁ J., HOMOLKA M., KAMLER J., 2005. The preference by browsing in floodplain forest – the role of abundance and nutrient content. In: Pohlmeier K. (ed.), 27th Congress of the International Union of Game Biologists. DSV-Verlag, Hamburg: 278–279.
- BARÁNEK V., MAREŠ J., PROKEŠ M., JIRÁSEK J., SPURNÝ P., 2005. Odchov larev candáta obecného (*Sander lucioperca*) v kontrolovaných podmínkách – krátké sdělení. In: Spurný E. (ed.), 8. Česká ichtyologická konference: sborník referátů z konference s mezinárodní účastí konané v Brně 14. a 15. září 2005. Mendelova zemědělská a lesnická univerzita, Brno: 226–227.
- BARÁNEK V., MAREŠ J., PROKEŠ M., JIRÁSEK J., SPURNÝ P., 2005. Převod rychleného plůdku candáta obecného (*Sander lucioperca*) na umělou dietu (předběžné výsledky). In: Spurný E. (ed.), 8. Česká ichtyologická konference: sborník referátů z konference s mezinárodní účastí konané v Brně 14. a 15. září 2005. Mendelova zemědělská a lesnická univerzita, Brno: 221–225.
- BARÁNEK V., PROKEŠ M., BARUŠ V., PEŇÁZ M., CILEČEK M., MAREŠ J., JIRÁSEK J., SPURNÝ P., 2006. Srovnání růstu juvenilního (1+) jesetera malého (*Acipenser ruthenus*) při použití experimentální a komerční diety. In: Vykusová B. (ed.), 9. Česká ichtyologická konference. Jihočeská univerzita, České Budějovice: 8–11.
- BARUŠ V., PEŇÁZ M., PROKEŠ M., 2005. Rod kapr *Cyprinus* Linnaeus, 1758 – aktuální přehled o druhové diverzitě. In: Spurný E. (ed.), 8. Česká ichtyologická konference: sborník referátů z konference s mezinárodní účastí konané v Brně 14. a 15. září 2005. Mendelova zemědělská a lesnická univerzita, Brno: 9–15

- BLAHÁK P., PROKEŠ M., 2005. Délko-hmotnostní parametry velkých jedinců jelce proudníka (*Leuciscus leuciscus*), jelce tlouště (*L. cephalus*) a jelce jesena (*L. idus*) ulovených v České republice a ve Slovenské republice. In: Spurný E. (ed.), 8. Česká ichtyologická konference: sborník referátů z konference s mezinárodní účastí konané v Brně 14. a 15. září 2005. Mendelova zemědělská a lesnická univerzita, Brno; 154–159.
- BRYJA J., HÁJKOVÁ P., 2006. Ochranařská genetika a její využití při studiu a ochraně savců. In: Adamec M., Urban P. (eds.), Výskum a ochrana cicavcov na Slovensku 7. Štátna ochrana prírody, Banská Bystrica; 109–113.
- CERKAL R., DVOŘÁK J., KAMLER J., VEJRAŽKA K., 2006. Hodnocení škod působených zvěří na polních plodinách. In: Neudert L., Smutný V. (eds), MZLU pěstitelům: sborník odborných příspěvků. Žabčice, 14. června 2006. Mendelova zemědělská a lesnická univerzita, Brno; 36–42.
- CERKAL R., DVOŘÁK J., KAMLER J., VEJRAŽKA K., ŠEJNOHOVÁ H., 2006. Zhodnocení ztrát na výnosu a kvalitě vybraných polních plodin po simulovaném poškození listové plochy rostlin. In: Dvořák J., Kamler J., Vaca D. (eds), Problematika škod působených zvěří na zemědělských plodinách. Mendelova zemědělská a lesnická univerzita, Brno; 15–28.
- ČERVENÝ J., KOUBEK P., MARHOUL P., NOVÁ P., VOLF O., BARTOŠOVÁ D., BUFKA L., BLÁHA J., 2006. Large carnivores: wolf, brown bear, and lynx in the Czech Republic. In: Bath A. (ed.), Transboundary Management of Large Carnivore Populations. Council of Europe, Strasbourg; 45–48.
- HABÁN V., PROKEŠ M., BARUŠ V., MAREŠ J., 2006. Individuální růst a hmotnostní kondice kapra obecného (*Cyprinus carpio m. domestica*) v Novomlýnské nádrži (předběžné výsledky). In: Vykusová B. (ed.), 9. Česká ichtyologická konference. Jihočeská univerzita, České Budějovice; 16–21.
- HÁJKOVÁ P., 2006. Vydra říční - populačná a genetická štruktúra. In: Adamec M., Urban P. (eds.), Výskum a ochrana cicavcov na Slovensku 7. Štátna ochrana prírody, Banská Bystrica; 123–128.
- HALAČKA K., VETEŠNÍK L., 2005. Vliv teplotního a kyslíkového stresu na karasa stříbřitého. In: Spurný E. (ed.), 8. Česká ichtyologická konference: sborník referátů z konference s mezinárodní účastí konané v Brně 14. a 15. září 2005. Mendelova zemědělská a lesnická univerzita, Brno; 270–274.
- HANEL L., LUSK S., 2006. Dlouhodobé sledování mihule ukrajinské (*Eudontomyzon mariae*) v Račím potoce (1998–2006). In: Lusk S., Lusková V. (eds), Biodiverzita ichtyofauny České republiky (VI). ÚBO AV ČR, Brno; 45–49.
- HARTVICH P., LUSK S., 2006. První nález sumečka černého (*Ameiurus melas*) na Třeboňsku v České republice. In: Lusk S., Lusková V. (eds), Biodiverzita ichtyofauny České republiky (VI). ÚBO AV ČR, Brno; 55–58.
- HEROLDOVÁ M., SUCHOMEL J., ZEJDA J., OBDRŽÁLKOVÁ D., ZAPLETAL M., 2006. Hlodavci jako škůdci lesa. In: Kapitola P., Baňaf P. (eds), Škodliví činitelé v lesích Česka 2005/2006. Lesní ochranná služba VÚLHM, Jiloviště-Strnady; 40–43.
- HUMPL M., LUSK S., 2006. Změny početnosti vranky obecné (*Cottus gobio* L.) v řece Louče u Skryjí v letech 1968–2004. In: Lusk S., Lusková V. (eds), Biodiverzita ichtyofauny České republiky (VI). ÚBO AV ČR, Brno; 65–69.
- JANÁČ M., JURAJDA P., 2006. Porovnání účinnosti dvou typů plůdkové záťahové sítě. In: Vykusová B. (ed.), 9. Česká ichtyologická konference. Jihočeská univerzita, České Budějovice; 29–32.
- KAMLER J., DVOŘÁK J., HEROLDOVÁ M., HOMOLKA M., 2006. Volně žijící býložravci a polní plodiny. In: Dvořák J., Kamler J., Vaca D. (eds), Problematika škod působených zvěří na zemědělských plodinách. Mendelova zemědělská a lesnická univerzita, Brno; 8–14.
- KAMLER J., HOMOLKA M., 2005. Brown hare (*Lepus europaeus*) - the main factor limiting growth of European beech in forest environment. In: Pohlmeier, K. (ed.), 27th Congress of the International Union of Game Biologists. DSV-Verlag, Hamburg; 118–119.
- KAMLER J., HOMOLKA M., 2005. Estimating of the red (*Cervus elaphus*) and roe deer (*Capreolus capreolus*) diet quality by near-infrared reflectance spectroscopy. In: Pohlmeier, K. (ed.), 27th Congress of the International Union of Game Biologists. DSV-Verlag, Hamburg; 366–367.
- KAMLER J., HOMOLKA M., 2005. Přirozené sezónní změny ve výběru potravy a trávicím traktu přezývkavé zvěře. In: Přezimovací obůrky a oblasti chovu. Česká lesnická společnost, Špindlerův Mlýn; 32–34.
- KAMLER J., HOMOLKA M., HEROLDOVÁ M., 2006. Potravní ekologie spárkaté zvěře a škody okusem. In: Předcházení škod spárkatou zvěří. Česká lesnická společnost, Hranice; 38–41.
- KONEČNÁ G., JANÁČ M., JURAJDA P., 2006. Sezónní variabilita vzorků rybiho společenstva. In: Vykusová B. (ed.), 9. Česká ichtyologická konference. Jihočeská univerzita, České Budějovice; 43–45.
- KORUNOVÁ V., LUSKOVÁ V., LUSK S., 2006. Zatížení ryb rtutí v horních úsecích Divoké Orlice a Tiché Orlice. In: Sborník konference Orlicko - Kladsko 2006. Sdružení obcí Orlicko, Jablonné nad Orlicí; 179–184.
- KOŠČO J., KOŠUTH P., LUSKOVÁ V., LUSK S., KOŠUTHOVÁ L., HALAČKA K., 2006. Súčasný stav rozšírenia zástupcov čeľade Cobitidae v Slovenskom povodí Tisy. In: Lusk S., Lusková V. (eds), Biodiverzita ichtyofauny České republiky (VI). ÚBO AV ČR, Brno; 17–23.
- KOŠČO J., LUSK S., LUSKOVÁ V., HALAČKA K., KOŠUTH P., 2005. Amur sleeper, a new invasive species in the Danube river network. In: II International Symposium Alien Species in Holarctic (Borok - 2). Rossijskaja Akademija nauk, Rybinsk; 200–201.

- KOŠČO J., LUSK S., KOŠUTHOVÁ L., KOŠUTH P., 2005. Chránené druhy rýb Slovenska - súčasť NATURY 2000. In: Spurný E. (ed.), 8. Česká ichtyologická konference: sborník referátů z konference s mezinárodní účastí konané v Brně 14. a 15. září 2005. Mendelova zemědělská a lesnická univerzita, Brno; 97-102.
- KOŠČO J., LUSK S., KOŠUTHOVÁ L., LUSKOVÁ V., KOŠUTH P., HALAČKA K., 2005. Invázne druhy rýb Slovenska - ich rozšírenie a vplyv. In: Spurný E. (ed.), 8. Česká ichtyologická konference: sborník referátů z konference s mezinárodní účastí konané v Brně 14. a 15. září 2005. Mendelova zemědělská a lesnická univerzita, Brno; 109-115.
- KOUBEK P., ČERVENÝ J., 2005. Ochrana a obhospodařování populace rýsa ostrovida v České republice. In: Ochrana a obhospodařování šeliem na Slovensku. Výskumný ústav živočišnej výroby, Nitra; 49-53.
- LOJKÁSEK B., LUSK S., PAPOUŠEK I., 2006. Nepůvodní druhy ryb povodí Odry na Moravě a ve Slezsku. In: Lusk S., Lusková V. (eds), Biodiverzita ichtyofauny České republiky (VI). ÚBO AV ČR, Brno; 79-85.
- LUIJ J., CERKAL R., DVOŘÁK J., VEJRAŽKA K., KAMLER J., 2006. The yield loss of maize (*Zea mays* L.) grown for grain when the plants are mechanically damaged. In: MendelNet'06 Agro. Mendelova zemědělská a lesnická univerzita, Brno; 32. [CD-ROM]
- LUSK S., HANEL L., LUSKOVÁ V., LOJKÁSEK B., HARTVICH P., 2006. Červený seznam mihulí a ryb České republiky - verze 2005. In: Lusk S., Lusková V. (eds), Biodiverzita ichtyofauny České republiky (VI). ÚBO AV ČR, Brno; 7-15.
- LUSK S., LUSKOVÁ V., 2005. Invazivní druhy ryb v podmínkách České republiky. In: Spurný E. (ed.), 8. Česká ichtyologická konference: sborník referátů z konference s mezinárodní účastí konané v Brně 14. a 15. září 2005. Mendelova zemědělská a lesnická univerzita, Brno; 116-121.
- LUSK S., LUSKOVÁ V., 2005. Vnitrodruhová diverzita ichtyofauny České republiky - znalost a ochrana. In: Spurný E. (ed.), 8. Česká ichtyologická konference: sborník referátů z konference s mezinárodní účastí konané v Brně 14. a 15. září 2005. Mendelova zemědělská a lesnická univerzita, Brno; 103-108.
- LUSK S., LUSKOVÁ V., HANEL L., HALAČKA K., 2005. Alien species in the ichthyofauna of the Czech Republic: their impact and meaning. In: II International Symposium Alien Species in Holarctic (Borok - 2). Rossijskaja Akademija nauk, Rybinsk; 203-204.
- LUSK S., LUSKOVÁ V., LOJKÁSEK B., HALAČKA K., 2005. Problémy ochrany evropsky významných lokalit mihulí a ryb v povodích Dyje, Moravy a Odry. In: Měkotová J., Štěrba O. (eds), Říční krajina 3. Univerzita Palackého, Olomouc; 208-213.
- LUSK S., LUSKOVÁ V., LOJKÁSEK B., HALAČKA K., VETEŠNÍK L., MERTA L., 2006. K výskytu vzácných a chráněných druhů mihulí a ryb v povodí řeky Moravy. In: Lusk S., Lusková V. (eds), Biodiverzita ichtyofauny České republiky (VI). ÚBO AV ČR, Brno; 87-94.
- LUSKOVÁ V., LUSK S., HALAČKA K., VETEŠNÍK L., 2005. *Carassius auratus*, the most successful invasive species in the waters of the Czech Republic. In: II International Symposium Alien Species in Holarctic (Borok - 2). Rossijskaja Akademija nauk, Rybinsk; 204-205.
- MÁCHOVÁ J., PROKEŠ M., FAINA R., KROUPOVÁ H., SVOBODOVÁ Z., PEŇÁZ M., BARUŠ V., 2006. Použití přípravku Diazinon 60 EC v rybářské praxi a jeho toxicita pro ryby a další vodní organismy. In: Vykusová B. (ed.), 9. Česká ichtyologická konference. Jihočeská univerzita, České Budějovice; 79-84.
- MENDEL J., LUSK S., LUSKOVÁ V., KOŠČO J., PAPOUŠEK I., HALAČKA K., VETEŠNÍK L., 2006. Molekulárně-biologické analýzy hrouzka Kesslerova ve vodách České republiky a Slovenska. In: Lusk S., Lusková V. (eds), Biodiverzita ichtyofauny České republiky (VI). ÚBO AV ČR, Brno; 95-101.
- MENDEL J., LUSKOVÁ V., LUSK S., HALAČKA K., 2006. Rybí osídlení a genetická diverzita populace hrouzka obecného z Divoké Orlice u Kostelce nad Orlicí. In: Sborník konference Orlicko - Kladsko 2006. Sdružení obcí Orlicko, Jablonné nad Orlicí; 175-178.
- NOVÁKOVÁ M., 2005. Is stone marten (*Martes foina*) food competitor of western polecat (*Mustela putorius*) in the Czech Republic? In: Pohlmeier, K. (ed.), 27th Congress of the International Union of Game Biologists. DSV-Verlag, Hamburg; 427-428.
- PALÍKOVÁ M., BARUŠ V., VÁVROVÁ M., NAVRÁTIL S., 2006. Distribuce rizikových prvků ve tkáních parmy obecné. In: Hygiena alimentorum XXVII: bezpečnost a kvalita produktů hydiny, ryb a zveriny - záruke spokojnosti konzumenta. Univerzita veterinárskeho lekárstva, Košice; 360-363.
- PALÍKOVÁ M., BARUŠ V., VÁVROVÁ M., NAVRÁTIL S., 2006. Obsah rizikových prvků ve svalovině a játrech úhoře říčního (*Anguilla anguilla*) a hlístici (*Anguillicola crassus*). In: Hygiena alimentorum XXVII: bezpečnost a kvalita produktů hydiny, ryb a zveriny - záruke spokojnosti konzumenta. Univerzita veterinárskeho lekárstva, Košice; 364-367.
- PIVNÍČKA K., HUMPL M., 2006. Vliv kvality vody na rybářsky využívané ichthyocenózy v Berounce, 1975-2003. In: Lusk S., Lusková V. (eds), Biodiverzita ichtyofauny České republiky (VI). ÚBO AV ČR, Brno; 109-115.
- POLAČIK M., JANÁČ M., JURAJDA P. 2006. Súčasný rozšírenie býčkov rodu *Neogobius* (Gobiidae) v pozdlžnom profile Dunaja. In: Vykusová B. (ed.), 9. Česká ichtyologická konference. Jihočeská univerzita, České Budějovice; 110-113.

- PROKEŠ M., BARUŠ V., PEŇÁZ M., 2005. Výskyt a charakteristika úlovků jelce jesena (*Leuciscus idus* Linnaeus, 1758) v povodí řeky Moravy. In: Spurný E. (ed.), 8. Česká ichtyologická konference: sborník referátů z konference s mezinárodní účastí konané v Brně 14. a 15. září 2005. Mendelova zemědělská a lesnická univerzita, Brno; 147–153.
- PROKEŠ M., BARUŠ V., PEŇÁZ M., 2006. Charakteristika exploatace parmy obecné, ostroretky stěhovavé, jelce tlouště a jelce jesena v říčním a jezerním ekosystému. In: Vykusová B. (ed.), 9. Česká ichtyologická konference. Jihočeská univerzita, České Budějovice; 119–123.
- PROKEŠOVÁ J., BARANČEKOVÁ M., HOMOLKA M., 2005. Roe (*Capreolus capreolus*) and red (*Cervus elaphus*) deer foraging habits under snow conditions. In: Pohlmeier, K. (ed.), 27th Congress of the International Union of Game Biologists. DSV-Verlag, Hamburg; 447–449.
- SPURNÝ P., PROKEŠ M., 2005. Profesor Vlastimil Baruš jubilantem. In: Spurný E. (ed.), 8. Česká ichtyologická konference: sborník referátů z konference s mezinárodní účastí konané v Brně 14. a 15. září 2005. Mendelova zemědělská a lesnická univerzita, Brno; 6–8.
- SYCHRA J., ADÁMEK Z., 2006. New approach to phytophilous macroinvertebrates sampling in emergent littoral vegetation. In: 5th International conference on Reservoir Limnology and Water Quality: „Reservoirs – Establishing the Balance between Human Use and Biotic Integrity“. Biologické centrum AV ČR, Brno; 230–233.
- ŠOVČÍK P., SPURNÝ P., PEŇÁZ M., 2006. Štruktúra populácie rýb v rieke Jihlave v úseku ovplyvnenom prevádzkou energetického komplexu Dukovany – Dalešice. In: Vykusová B. (ed.), 9. Česká ichtyologická konference. Jihočeská univerzita, České Budějovice; 166–171.
- ŠVANYGA J., VALOVÁ Z., JANÁČ M., BIALEK M., MACHALA M., JURAJDA P., 2006. Rybí společenstvo znečištěného úseku Labe na Pardubicku. In: Vykusová B. (ed.), 9. Česká ichtyologická konference. Jihočeská univerzita, České Budějovice; 172–175.
- VALLO P., 2006. Vnútro- a medzidruhová variabilita podkovárovcovitých (Chiroptera: Hipposideridae) juhovýchodného Senegalu na základe mitochondriálneho génu pre cytochróm b. In: Halgoš J. (ed.), Študentská vedecká konferencia, 26. apríl 2006. Zborník recenzovaných príspevkov. Kartprint, Bratislava; 173–175.

Book reviews

- ČAPEK Jr. M., 2005. Bird D.M., The Bird Almanac: a Guide to Essential Facts and Figures of the World's Birds. Completely revised and updated. Firefly Books, New York, 2005, 460 pp. Sluka 2: 148–149.
- HUBÁLEK Z., 2006. Místo systů vevery. Kimmig P., Hassler D., Braun R., Zecken. Kleiner Stich mit bösen Folgen. Překlad Barfussová R., Klišata – Nepatrné kousnutí s neblahými následky. Pragma, Praha, 2003, 114 pp. Literární noviny 19: 7.
- JANÁČ M., 2006. Campbell A., Dawes J. (eds): Encyclopedia of Underwater Life. Oxford University Press, Oxford, 2005, 306 pp. Folia Zoologica 55: 150.
- MARTÍNKOVÁ N., 2005. Albert V.A. (ed.), Parsimony, Phylogeny and Genomics. Oxford University Press, Oxford, 2005, 238 pp. Folia Zoologica 54: 448.
- PETRŽELKOVÁ K. J., 2006. Reynolds V., The Chimpanzees of the Budongo Forest: Ecology, Behaviour, and Conservation. Oxford University Press, Oxford, 2005, 297 pp. Folia Zoologica 55: 198.
- PIÁLEK J., ZIMA J., 2006. Conner J.K., Hartl D.L.: A Primer of Ecological Genetics. Sinauer Associates, Sunderland, 2004, 304 pp. Folia Geobotanica 41: 237.
- PROCHÁZKA P., 2005. Greenberg R., Marra P.P. (eds), Birds of Two Worlds: the Ecology and Evolution of Migration. John Hopkins University Press, Baltimore, 2005, 466 pp. Sylvia 41: 143–145.
- PROCHÁZKA P., 2006. Videler J.J., Avian Flight. Oxford University Press, New York, 2005, 258 pp. Folia Zoologica 55: 52.
- TKADLEC E., 2006. Barbosa P., Castellanos I. (eds), Ecology of Predator-Prey Interactions. Oxford University Press, Oxford, 2005, 394 pp. Folia Zoologica 55: 223–224.
- ZIMA J., 2006. Cracraft J., Donoghue M.J. (eds), Assembling the Tree of Life. Oxford University Press, Oxford, 2004, 576 pp. Folia Zoologica 55: 74.
- ZIMA J., 2006. Ferrière R., Dieckmann U., Couvet D. (eds): Evolutionary Conservation Biology. Cambridge University Press, Cambridge, 2004, 428 pp. Folia Geobotanica 41: 237–238.
- ZIMA J., 2006. Gordon M.S., Bartol S.M. (eds): Experimental Approaches to Conservation Biology. University of California Press, Berkeley, 2004, 358 pp. Folia Geobotanica 41: 238–239.
- ZIMA J., 2006. Jablonka E., Lamb M.J.: Evolution in Four Dimensions: Genetic, Epigenetic, Behavioral and Symbolic Variation in the History of Life. MIT Press, Cambridge, 2005, 472 pp. Folia Geobotanica 41: 348–349.
- ZIMA J., 2006. Kemp, T. S., The Origin and Evolution of Mammals. Oxford University Press, Oxford, 2005, 331 pp. Folia Zoologica 55: 28.

- ZIMA J., 2006. Reşit Akçakaya H. (ed.) Species Conservation and Management: Case Studies. Oxford University Press, Oxford, 2004, 533 pp. *Folia Zoologica* 55: 112.
- ZIMA J., 2006. Singh R.S., Uyenoyama M.K. (eds.): The Evolution of Population Biology. Cambridge University Press, Cambridge, 2004, 460 pp. *Folia Geobotanica* 41: 349.

Popularization books and articles

- ČAPEK M., SLABÁKOVÁ H., ZIMA J. (eds), 2005. Biennial Report 2003–2004. ÚBO AV ČR, Brno, 76 pp.
- ČERVENÝ J., 2005. Seminář Rady Evropy o managementu velkých šelem. Svět myslivosti 6(6): 7–8.
- ČERVENÝ J., 2006. Myslivec a rys, dva lovci a jedna kořist – srnčí zvěř. Svět myslivosti 7(3): 8–11.
- ČERVENÝ J., ANDĚRA M., KOUBEK P., 2005. Co nového v naší fauně? Vyhodnocení dotazníků z let 2001–2003. *Myslivost* 53(12): 62–66.
- ČERVENÝ J., BUFKA L., KOUBEK P., 2005. Velké šelmy v České republice. I. Mýty a skutečnost. *Vesmír* 84: 656–663.
- ČERVENÝ J., KOUBEK P., 2006. Medvěd je opět stálým druhem naší zvěře. Svět myslivosti 7(11): 6–8.
- ČERVENÝ J., KOUBEK P., BUFKA L., 2005. Velké šelmy v České republice. II. Vlk obecný. *Vesmír* 84: 726–730.
- ČERVENÝ J., KOUBEK P., BUFKA L., 2006. Velké šelmy v České republice. III. Medvěd hnědý. *Vesmír* 85: 20–25.
- ČERVENÝ J., KOUBEK P., BUFKA L., 2006. Velké šelmy v České republice. IV. Rys ostrovid. *Vesmír* 85: 86–94.
- DVOŘÁK J., KAMLER J., 2006. Jak dál se sikou v plzeňském regionu? Svět myslivosti 7(12): 6–7.
- DVOŘÁK J., KAMLER J., 2006. Škody působené zvěří – zkouška schopnosti komunikace. Svět myslivosti 7(2): 12–13.
- HOMOLKA M., 2005. Lesy v kulturní krajině a nekulturní los. *Veronica* 19(2): 8–10.
- HOŘÁK D., PROCHÁZKA P., 2006. Setkání ornitologů v Praze. *Akademický bulletin AV ČR* 2006(6): 8.
- HUBÁLEK Z., 2005. Czechia, nebo Czechland(s)? *Akademický bulletin AV ČR* 2005(7–8): 34.
- HUBÁLEK Z., 2005. Spamie. *Literární noviny* 16(7): 1, 3.
- HUBÁLEK Z., 2006. Spamie. *Ikaros*: 1. <http://www.ikaros.cz/clanek.asp?ID=20051201>
- HUBÁLEK Z., 2005. Špička ledovce. *Literární noviny* 16(28): 28.
- JURAJDA P., 2005. Ryby v našich tocích. *Bílé Karpaty* 10: 20–21.
- KAMLER J., 2005. Jak (ne)bezpečně je být myslivcem? Svět myslivosti 6(12): 14–15.
- KAMLER J., 2005. Úvodník. Svět myslivosti 6(11): 2.
- KAMLER J., 2006. Je hon vědců na myslivce oprávněný? *Myslivost* 54(9): 6–7.
- KAMLER J., 2006. Ještě ke stanovisku. *Myslivost* 54(11): 34.
- KAMLER J., 2006. Na zvěř jen jistou ránu! Svět myslivosti 7(10): 11–12.
- KAMLER J., 2006. Seminář „Předcházení škodám působeným spárkatou zvěří“. Svět myslivosti 7(12): 4–5.
- KAMLER J., 2006. Úvodník. Svět myslivosti 7(12): 1.
- KAMLER J., 2006. Zachrání nás puškohledy pro noční vidění před invazí černé zvěře?. *Myslivost* 54(10): 28–29.
- KAMLER J., DVOŘÁK J., 2005. Jsou společenské lovy budoucností české myslivosti? *Myslivost* 53(10): 10–11.
- KAMLER J., DVOŘÁK J., 2005. Nestresujeme zvěř zbytečně? Svět myslivosti 6(8): 10–11.
- KAMLER J., DVOŘÁK J., 2006. Seminář o škodách zvěří na zemědělských plodinách. *Myslivost* 54(6): 81.
- KAMLER J., HOMOLKA M., HEROLDOVÁ M., 2005. Jak se podívat jelenovi do žaludku. *Myslivost* 53(11): 16–17.
- KAMLER J., PAVLATA L., 2006. Začíná příkrmování – pozor na acidózy u spárkaté zvěře. Svět myslivosti 7(11): 14–15.
- KAMLER J., PROKEŠOVÁ J., 2005. 27. kongres Unie biologů zvěře. Svět myslivosti 6(10): 10–11.
- KOUBEK P., 2005. „Levicke pořovnícké dni“ podesáté!. Svět myslivosti. 6(6): 4–6.
- KOUBEK P., 2005. Myslivecká statistika. Svět myslivosti. 6(11): 12.
- KOUBEK P., 2005. Úvodník. Svět myslivosti 6(7): 2.
- KOUBEK P., ČERVENÝ J., 2006. Rys ostrovid v Evropě. Svět myslivosti 7(3): 4–5.
- LOYKA P., JURAJDA P., ADÁMEK Z., 2005. Migrace ryb na řece Moravě. *Rybářství* 2005(3): 78.
- MUNCLINGER P., ZIMA J., 2006. Molekulární ekologie není ekologie molekul. *Živa* 54: L–LI.
- PENÁZ M., 2006. Invazní druhy ryb České republiky. *Veronica* 20(2): 8–11.
- REICHARD M., 2005. Rozmnožování hořavky duhové II. Samčí strategie. *Živa* 53: 29–30.
- RUDOLF I., ŠIKUTOVÁ S., HUBÁLEK Z., 2005. Mohou komáři přenášet lymfskou borreliózu? Krátké zamyšlení nad vektorovou kompetencí. *Vesmír* 41: 134–136.
- VALOVÁ Z., 2005. Reprodukce ryb dolní Moravy a Dyje. *Živa* 53: 179–181
- ZIMA J., 2006: Jak mě poznamenala Biologická olympiáda. In: Farkač J., Božková, H. (eds), *Biologická olympiáda*. Jan Farkač, Praha: 105.

PRINCIPAL SCIENTIFIC DIVISIONS

Department of Medical Zoology

Head

RNDr. Jiří H A L O U Z K A , PhD <jhalouzka@brno.cas.cz>
ecology of pathogens and arthropod vectors

Research Scientists

Assoc. Prof. RNDr. Zdeněk H U B Á L E K , DSc <zhubalek@brno.cas.cz>
ecology of pathogens and vertebrate hosts

RNDr. Zinočka J U Ř I C O V Á , PhD <juricova@brno.cas.cz>
ecology of pathogens, serosurveys

Mgr. Ivo R U D O L F , PhD <rudolf@brno.cas.cz>
molecular-biology methods and detection

Mgr. Silvie Š I K U T O V Á , PhD <sikutova@brno.cas.cz>
serology, vector biologist

Undergraduates

Hana D A N Ā K O V Á

Václav H O E N I G

Jana M A S A Ř Í K O V Á

Petra S V O B O D O V Á

Technicians

Juraj P E Š K O

Ladislava Š E V Č Í K O V Á

Research priorities

Research is focused on the ecology of selected microbial pathogens (including new emerging diseases), the causative agents of human and animal infections. The phenomenon of natural focality is studied in respect of the role of wild endotherm vertebrates (hosts or reservoirs) and hematophagous arthropods (vectors) and under effects of the recently globally changing natural conditions.

Main research topics:

- arboviruses (i.e. viruses transmitted by ticks, mosquitoes and other hematophagous arthropods, such as the West Nile, Sindbis, Třahyňa, and tick-borne encephalitis viruses)
- spirochetes (*Borrelia burgdorferi*, the agent of Lyme borreliosis) and some other bacterial agents
- circulation of these pathogens in terrestrial and aquatic ecosystems under changing natural conditions including human impact
- development and optimisation of a new molecular-biological methods for the detection and characterization of the pathogens studied
- prophylactic strategy establishment and prevention of free-living vertebrates and humans in relation to preventive medicine (human and veterinary), environmental protection, and nature conservation



Staff of the Department of Medical Zoology – right to left: J. Halouzka, Z. Juřicová, Z. Hubálek, L. Ševčíková, I. Rudolf, S. Šikutová, J. Peško. (Photo by R. Krbeček).

Selected research results

Migratory birds and avian influenza A virus H5N1 – its spread in Eurasia, possible introduction to America and continental dispersal

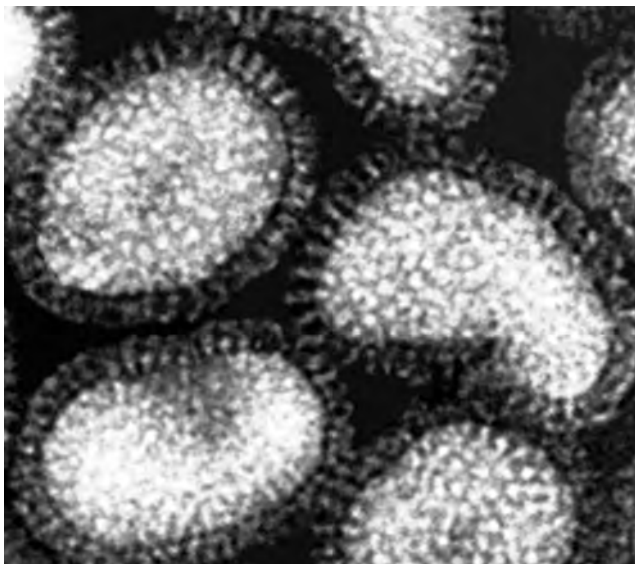
Waterfowl are the reservoir of a majority of influenza A viruses, including highly pathogenic avian influenza (HPAI). Marked lethality of its H5N1 subtype seemed to limit the role of migratory birds in the dispersal. However, the situation changed as HPAI H5N1 virus has expanded rapidly across Asia and into Europe and Africa, and migratory birds contributed to this dispersal. Birds could theoretically introduce H5N1 virus to the Western Hemisphere through migration, vagrancy and translocation by people (bird trade). Vagrants and migratory birds are not likely inter-hemispheric introductory hosts; import of infected domestic or pet birds is more probable. In the case of successful introduction, the virus might spread over the continent easily, with migratory waterfowl (swans, geese, and ducks) playing a similar role as in Eurasia.

HUBÁLEK Z., 2004: An annotated checklist of pathogenic microorganisms associated with migratory birds. *Journal of Wildlife Diseases* 40: 639-659.

HUBÁLEK Z., 2006: Migratory birds and influenza virus. 8th Workshop of the Southeastern European Bird Migration Network (SEEN), Prague, abstract.

HUBÁLEK Z., 2006: Ptačí chřipka a tažní ptáci [Bird influenza and migrating birds]. *Crex* 26: 131-137.

RAPPOLE J.H., HUBÁLEK, Z., 2006: Birds and influenza H5N1 virus movement to and within North America. *Emerging Infectious Diseases* 12: 1486-1492.



Virions of the influenza A virus (WHO 2006).

Import of West Nile virus infection in the Czech Republic

We report West Nile virus infection of the central nervous system in a 69-year-old man, residing in North Moravia (Czech Republic), who visited the USA from 6 July to 31 August 2002. He developed fever with fatigue at the end of his USA stay. He was hospitalized after his return with fever up to 39.5 °C, fatigue, anorexia, dizziness, insomnia, blurred speech, and a marked bradypsychism. A significant increase of antibodies neutralizing West Nile virus was detected between the first (1:16) and second (1:256) blood serum sample. The patient recovered gradually. This is the first recorded human case of West Nile fever imported to the Czech Republic.

HUBÁLEK Z., HALOUZKA J., JUŘICOVÁ Z., 1999: West Nile fever in Czechland. *Emerging Infectious Diseases* 5: 594-595.

HUBÁLEK Z., LUKÁČOVÁ L., HALOUZKA J., ŠIRŮČEK P., JANUŠKA J., PŘECECHTĚLOVÁ J., PROCHÁZKA P., 2006: Import of West Nile virus infection in the Czech Republic. *European Journal of Epidemiology* 21: 323-324.

Applications of research results

Effects of forest clearing on the abundance of *Ixodes ricinus* ticks and the prevalence of *Borrelia burgdorferi* s.l.

Questing *Ixodes ricinus* ticks were collected on a forest trail that had been completely cleared of shrubs and ground vegetation in winter 2002 and on a nearby control uncleared forest transect in South Moravia (Czech Republic). Samples were collected each May in 2003, 2004 and 2005. Nymphal ticks were 3.4, 1.9 and 1.2 times less frequent on cleared forest than on uncleared trails in the three perspective years, whereas adult tick abundance was 27.2, 4.0 and

2.2 times lower, respectively. The ticks were examined for borreliae by dark-field microscopy: prevalence of nymphal ticks infected with *Borrelia burgdorferi sensu lato* (12.6% to 20.0%) did not differ significantly between the cleared and uncleared trail during the three years. In conclusion, the habitat modification appeared to result in a decreased abundance of *I. ricinus* as well as a reduced frequency of infected ticks (and thus indirectly a lower potential risk of Lyme borreliosis), which lasted, however, for only two years. Eight cultures of borreliae isolated from the ticks were all identified as the „ornithophilic“ genomic species *Borrelia garinii*, possibly indicating a greater role of forest birds than that of forest rodents as the hosts of immature *I. ricinus* in the tick (and borrelial) colonization of the cleared part of the forest.

HUBÁLEK Z., HALOUZKA J., JUŘICOVÁ Z., 2003: Longitudinal surveillance of the tick *Ixodes ricinus* for borreliae. *Medical and Veterinary Entomology* 17: 46–51.

HUBÁLEK Z., HALOUZKA J., JUŘICOVÁ Z., ŠIKUTOVÁ S., RUDOLF I., 2006: Effect of forest clearing on the abundance of *Ixodes ricinus* ticks and the prevalence of *Borrelia burgdorferi* s.l. *Medical and Veterinary Entomology* 20: 166–172.



L. Ševčíková handling biological material in a hazard box. (Photo by I. Rudolf)

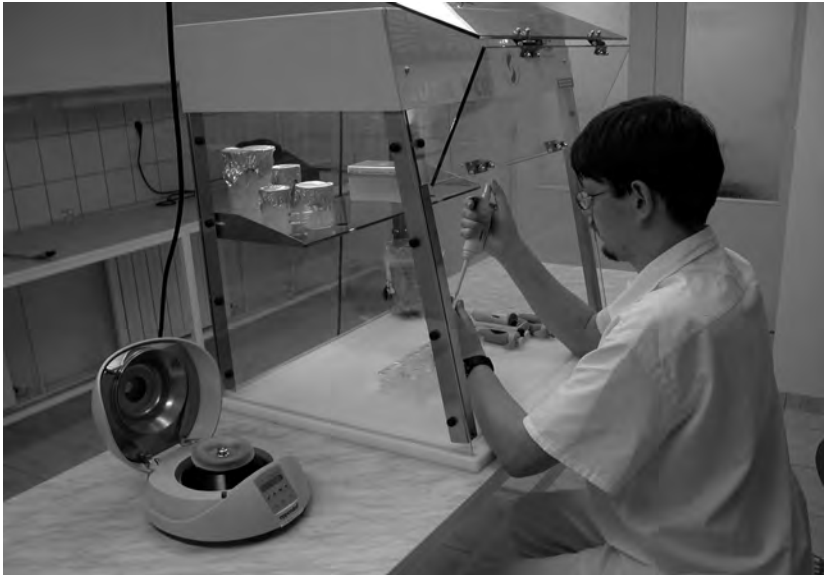
International cooperation

Prevalence of *Borrelia burgdorferi* sensu lato in the tick *Ixodes ricinus* in the Styrian Mountains of Austria

A total of 691 *Ixodes ricinus* ticks (22 males, 39 females, 501 nymphs and 129 larvae) were collected by flagging method from vegetation in 11 areas at altitudes between 789 and 1350 m above sea level in mixed woodland with pastureland and cattle in the province of Styria (Austria). They were examined for presence of *Borrelia burgdorferi* s.l. by dark field microscopy and PCR. Attempts to cultivate borreliae were made in BSK-H medium. The overall positivity rate of all collected ticks (excepting larvae) was 10.9%: 9.1% in males, 17.9% in females and 10.4% in nymphs. The larvae examined showed no presence of *B. burgdorferi* s.l. The mean infection rate of the vector of Lyme disease in the collection area of the highest altitude in this study – and the highest reported in Europe (Gaberl, 1350 m a.s.l.) was 6.4%: 1/9 males, 2/18 females, and 6/114 (5.3%) nymphs were positive. Culture attempts were positive in 12 cases and species identification showed eight isolates of *Borrelia afzelii* and four of *Borrelia garinii*. Three additional positive results found by PCR method (negative by dark field microscopy) were identified twice as *B. afzelii* and once as *B. garinii*. This study showed that the risk of acquiring of Lyme disease in habitats at higher altitudes is limited due to a lower density of *I. ricinus* and lesser infection rate of ticks than at lower altitudes in Central Europe, nevertheless it does exist.

STÜNZNER D., HUBÁLEK Z., HALOUZKA J., POSTIC D, PIERER K., MARTH E., 1998: Prevalence of *Borrelia burgdorferi* s.l. in *Ixodes ricinus* ticks from Styria (Austria) and species identification by PCR-RFLP analysis. Zentralblatt für Bakteriologie 288: 471-478.

STÜNZNER D., HUBÁLEK Z., HALOUZKA J., WENDELIN I., SIXL W., MARTH E., 2006. Prevalence of *Borrelia burgdorferi* sensu lato in the tick *Ixodes ricinus* in the Styrian mountains of Austria. Wiener klinische Wochenschrift: the Middle European Journal of Medicine 118: 682-685.



I. Rudolf preparing samples for PCR procedure. (Photo by J. Halouzka)

Department of Population Biology

Head

Prom. biol. Jaroslav P I Á L E K , PhD <pialek@brno.cas.cz>
population biology and genetics

Research Scientists

Mgr. et Mgr. Josef B R Y J A , PhD <bryja@brno.cas.cz>
molecular ecology

Joëlle G O Û Y D E B E L L O C Q , PhD <joellegouy@googlemail.com>
immunogenetics, parasitology

Mgr. Lumír G V O Ž D Í K , PhD <gvozdik@brno.cas.cz>
physiological ecology

Heidi C. H A U F F E , PhD <hauffe@cealp.it>
chromosomal evolution, speciation

Mgr. Peter K A Ň U C H , PhD <kanuch@netopiere.sk>
ecology, breeding phenology and behaviour of bats

Mgr. Natália M A R T Í N K O V Á , PhD <martinkova@brno.cas.cz>
phylogeography

Mgr. Jana S V O B O D O V Á , PhD <svobodovajana@fle.czu.cz>
molecular genetics of birds

Prof. Emil T K A D L E C , PhD <tkadlec@prfnw.upol.cz>
population dynamics

Prof. RNDr. Jan Z I M A , DSc <jzima@brno.cas.cz>
cytogenetics and biodiversity

PhD Students

RNDr. Barbora B Í M O V Á

Mgr. Dagmar Č Í Ž K O V Á

Mgr. Ludovít Ď U R E J E

Mgr. Jan D V O Ř Á K

Mgr. Petra D U F K O V Á

Mgr. Petra H Á J K O V Á

Mgr. Adam K O N E Č N Ý

Mgr. Radka P O L Á K O V Á

Mgr. Marie V E R K A E R E N

Mgr. Martina V Y S K O Č I L O V Á

Mgr. Barbora Z E M A N O V Á

Undergraduates

Drahomíra F A I N O V Á

Alena F O R N Ů S K O V Á

Pavla K Ř Í Ž O V Á

Hana P A T Z E N H A U E R O V Á

Marta P R O M E R O V Á

Dana R Y M E Š O V Á

Michal V I N K L E R

Technicians

Mgr. Anna B R Y J O V Á

Dušan H A V E L K A

Dana H A V E L K O V Á
Helena H E J L O V Á
Kristýna H E J L O V Á
Mgr. Jana P I Á L K O V Á
Ludmila R O U S K O V Á
Mgr. Monika Š U G E R K O V Á
Lucie V L Č K O V Á

Research priorities

The studies are performed on both laboratory and natural populations. Empirical data from observations and experiments supplemented by simulation modelling are used to investigate important questions of evolutionary biology, such as (model organisms given in parentheses):

- hybrid zones as barriers against gene flow and their role in speciation (*Mus*, *Sorex*, *Triturus*)
- study of factors affecting population structure (fish, bats and mammals)
- links between life history traits, adaptive genetic variation and population dynamics in small mammals (voles)
- phylogeography and reconstruction of historical colonization (*Mustela*, *Clethrionomys*, *Microtus*)
- analysis of reproductive success by using DNA markers (paternity analyses in fish, birds and mammals)
- conservation genetics of endangered vertebrate species (*Lutra*, *Rupicapra*); development of non-invasive techniques of DNA sampling
- mechanisms and evolution of thermal physiology traits in ectotherms (*Triturus*)
- functional approaches in studying morphological adaptations (*Zootoca*, *Triturus*)

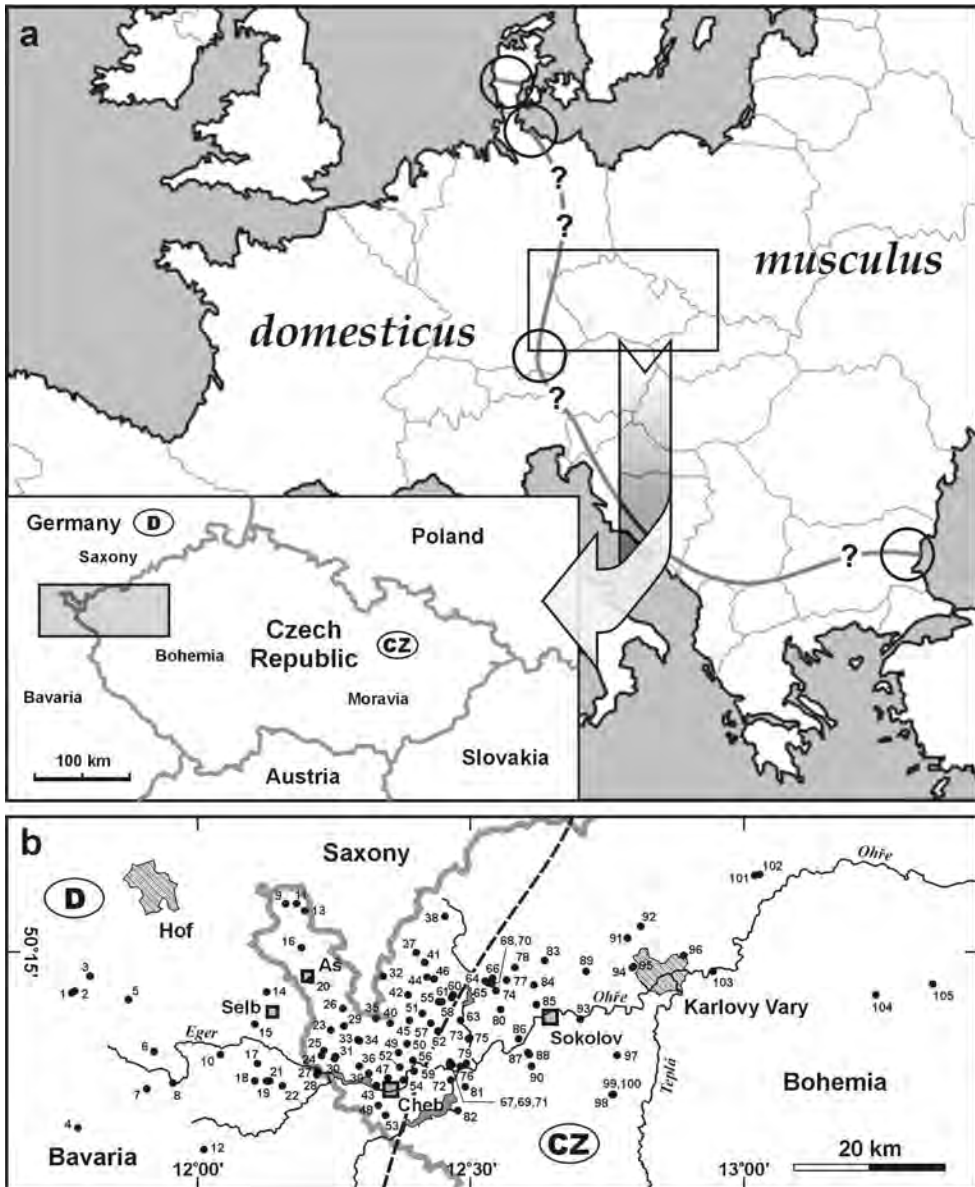
The results of these investigations are used in preparing recommendations for nature conservation, rodent pest control, lecturing at universities in Brno, České Budějovice, Prague, and Olomouc.

Selected research results

Behavioural and genetic study of speciation in a hybrid zone in the house mouse, *Mus musculus*

Two house mouse subspecies, *Mus m. musculus* and *M. m. domesticus*, form a long and narrow hybrid zone (HZ) running in Europe from Denmark to the Black Sea. Despite long-term interest in the study of this contact zone we have still a limited information about proximate mechanisms maintaining the HZ and thereby keeping the parental taxa in parapatry. To solve this question, we conducted a study of another part of the mouse HZ within the last 10 years. Based on maximum-likelihood analysis of more than 1500 mice from 105 localities we characterized the Czech-Bavarian transect across the HZ [1]. While most of molecular markers show similar transition in terms of frequencies from one taxon to another we found that one marker located on mitochondrial DNA is shifted from the centre and this shift is random when two transects are compared [2]. To determine factors keeping the two mouse

taxa apart and preventing intermixing of their genomes, we transported some mice to the laboratory and studied fitness components of parental and hybrid individuals. Behavioural studies focusing on assortative mating indicate that salivary signals (androgen-binding protein) most probably participate on subspecies specific recognition but in themselves are not efficient



(A) The course of the *musculus/domesticus* hybrid zone in Europe. Circles indicate previously studied transects in Denmark, Germany and Bulgaria. In the insert, the position of the Czech study area is indicated. (B) Location of 105 sampling sites. The thick dashed line is an approximate zone center defined as a 0.5-isocline derived from the bicubic spline smoothing of allele frequencies at each site.

enough to noticeably impede gene flow [3]. Hybrid male sterility is among presumed factors which can prevent gene flow between diverging subpopulations and in a pivot study we showed that genes causing spermatogenetic breakdown are polymorphic and widespread in wild *M. m. musculus* [4].

1. MACHOLÁN M., MUNCLINGER P., ŠUGERKOVÁ M., DUFKOVÁ P., BÍMOVÁ B., BOŽÍKOVÁ E., ZIMA J., PIÁLEK J., in press: Genetic analysis of autosomal and X-linked markers across a mouse hybrid zone. *Evolution*. doi: 10.1111/j.1558-5646.2007.00065.x
2. BOŽÍKOVÁ E., MUNCLINGER P., TEETER C., TUCKER P.C., MACHOLÁN M., PIÁLEK J., 2005. Mitochondrial DNA in the hybrid zone between *Mus musculus musculus* and *Mus musculus domesticus*: a comparison of two transects. *Biological Journal of the Linnnean Society* 84: 363–378.
3. BÍMOVÁ B., KARN R.C., PIÁLEK J., 2005. The role of salivary androgen-binding protein in reproductive isolation between two subspecies of house mouse: *Mus musculus musculus* and *Mus musculus domesticus*. *Biological Journal of the Linnnean Society* 84: 349–361.
4. VYSKOČILOVÁ M., TRACHTULEC Z., FOREJT J., PIÁLEK J., 2005: Does geography matter in the hybrid sterility in house mice? *Biological Journal of the Linnnean Society* 84: 663–674.

Non-invasive genetic sampling

Genetic studies of elusive or endangered species are often constrained by difficulties in obtaining sufficient number of samples. We optimised the method and increased the success rate of otter (*Lutra lutra*) faeces genotyping using microsatellite and SRY markers. The optimised method was used to estimate population size and structure of free-ranging otters in two different habitats without any contact or disturbance of animals. Complete reliable genotypes were obtained from 60% of samples. Together with tissues from otter carcasses (mostly road-kills), faecal samples were used to study genetic variability, structure and demographic history of otter populations in the Czech and Slovak Republics. Throughout analyses, strict recommendations to avoid contamination and genotyping errors were followed.

In another study, we successfully applied non-invasive approach on PCR-based test for species identification of two cryptic bats *Pipistrellus pipistrellus* and *P. pygmaeus*. DNA analysis of droppings obtained during trapping or other handling of individuals can substitute the punching of wing-membranes. The results can be potentially obtained even without contact with animals, e.g., using fresh droppings from day roosts.

Another valuable source of samples for molecular genetic studies is museum collections. We have been able to perform a comprehensive phylogeographic research of a stoat (*Mustela erminea*) using mitochondrial DNA sequences from DNA isolated from museum skin collections. We took particular care to ensure authenticity of sequences from the museum samples using methods derived from laboratory protocols for handling ancient DNA.

- HÁJKOVÁ P., PERTOLDI C., ZEMANOVÁ B., ROCHE K., HÁJEK B., BRYJA J., ZIMA J., 2007: Genetic structure and evidence for recent population decline in Eurasian otter (*Lutra lutra*) populations in the Czech and Slovak Republics: implications for conservation. *Journal of Zoology* 272: 1–9.
- HÁJKOVÁ P., ZEMANOVÁ B., BRYJA J., HÁJEK B., ROCHE K., TKADLEC E., ZIMA J., 2006: Factors affecting success of PCR amplification of microsatellite loci from otter faeces. *Molecular Ecology Notes* 6: 559–562.
- KAŇUCH P., HÁJKOVÁ P., ŘEHÁK Z., BRYJA J., in press: A rapid PCR-based test for species identification of two cryptic bats *Pipistrellus pipistrellus* and *P. pygmaeus* and its application on museum and dropping samples. *Acta Chiropterologica*.
- MARTÍNKOVÁ N., SEARLE J.B., 2006: Amplification success rate of DNA from museum skin collections: a case study of stoats from 18 museums. *Molecular Ecology Notes* 6: 1014–1017.

Applications of research results

Implementation of the Convention on Biological Diversity in the Czech Republic

In May of 1999 the UN Development Programme and the Global Environmental Facility announced a capacity development initiative that was intended to support effective implementation of international agreements adopted under the auspices of the United Nations, concerned with improving the state of the environment on the Earth. On the basis of this Initiative, a National Capacity Self-Assessment project was commenced to perform thorough analysis of conditions in implementing the three international agreements, adopted at the UN Global Conference on the Environment and Development, held in 1992 in Rio de Janeiro. The analysis is intended to lead to identification of capacity constraints for meeting the obligations of states following from these agreements and to the preparation of an action plan to improve the situation. Thus, this assessment is intended to evaluate the state of preparation of the Czech Republic for implementation of the objectives of the Convention on Biological Diversity. An evaluation is made of the level of strategic planning and proposal of individual steps and prospects, and problems are sought that can be identified as being critical from the standpoint of achieving the intermediate and final targets. In order to provide for the intentions formulated in the Convention, it is above all necessary to create and develop suitable capacities at the individual, institutional and systemic levels. This approach is fundamentally promoted in the assessment.

KIRSCHNER J., RÁB P., ROUDNÁ M., STAŇKOVÁ J., VILÍMOVÁ J., ZIMA J. (ed.), 2006: Biological diversity. Identification of priorities and capacity development for performance of obligations of the Czech Republic following from the Convention on Biological Diversity. Ministry of Environment of the Czech Republic / UNDP-GEF, Praha, 228 pp.



Threatened mammal species, Eurasian otter *Lutra lutra*, can be studied using non-invasive genetic methods (Photo by J. Roleček).

The first gorilla born in the Czech Republic is a girl

The first offspring of the western lowland gorilla in the Czech Republic was born at the Prague ZOO in December 2004. This birth received great publicity and has been popularized in various TV and radio-broadcasting programmes. However, the gender of the young remained enigmatic. Two independent laboratories performed genetic studies aimed to sex identification of the individual but their results appeared contradictory.

The Institute was then asked by the authorities of the Prague ZOO to make additional investigations. The suitability of the genetic sex identification was tested by using blood samples of adult gorillas of known sex. Duplex PCR was conducted to amplify parts of the *Sry* gene (occurring only in males), whereas the *Zfy-Zfx* gene (amplified in both sexes) was used as a positive control of a PCR reaction. Then we used fresh samples of faeces for DNA extraction and amplification in the young and its father. The results showed unequivocally that the young named Moja is a female.



Moja, young female western lowland gorilla at the Prague ZOO. (Photo by T. Mrhálková)

International cooperation

Historical and contemporary selection on major histocompatibility complex genes in cyclic rodents

Host-pathogen interactions are of particular interest in the understanding of the interplay between population dynamics and natural selection. The genes of major histocompatibility complex (MHC) of demographically fluctuating species are very suitable markers for this purpose because they are involved in the initiation of the immune response against pathogens

and they exhibit high levels of genetic variation that are proposed to be adaptive in natural vertebrate populations. We optimised single strand conformation polymorphism analysis method using capillary electrophoresis to study polymorphism of DNA sequences in large scale population studies [1] and applied this method to analyse the variation of two MHC Class II genes (DQA1, DRB) during the demographic cycle of the water vole *Arvicola terrestris*. Positive historical selection was found to act very intensively on antigen-binding sites of MHC molecules in arvicolid rodents as documented by extensive trans-species polymorphism within the subfamily. For the first time within rodents, we documented the duplication of the DQA gene in three vole species with both copies being transcriptionally active [2]. We compared neutral genetic structure of seven populations (estimated from 14 microsatellites) with that estimated from MHC genes and we evidenced more intense selection on the gene DQA1 than on DRB or neutral markers and this pattern emphasized with increasing population abundance. In the year of low abundance, when populations were geographically isolated, overall differentiation patterns of both MHC genes were more pronounced than at neutral markers suggesting the action of local selection in fragmented populations. With increasing effective migration between sites the differences between MHC and neutral markers progressively vanished and in the high-abundance year, overall differentiation for DQA1 gene became even significantly lower than those of neutral markers, suggesting more homogenisation for that gene than what could be observed by chance for a neutral gene evolving under drift and migration only. Spatial and temporal fluctuations in parasite pressure are proposed as the most plausible mechanism inducing observed changes in contemporary selection pattern during demographic cycle [3].

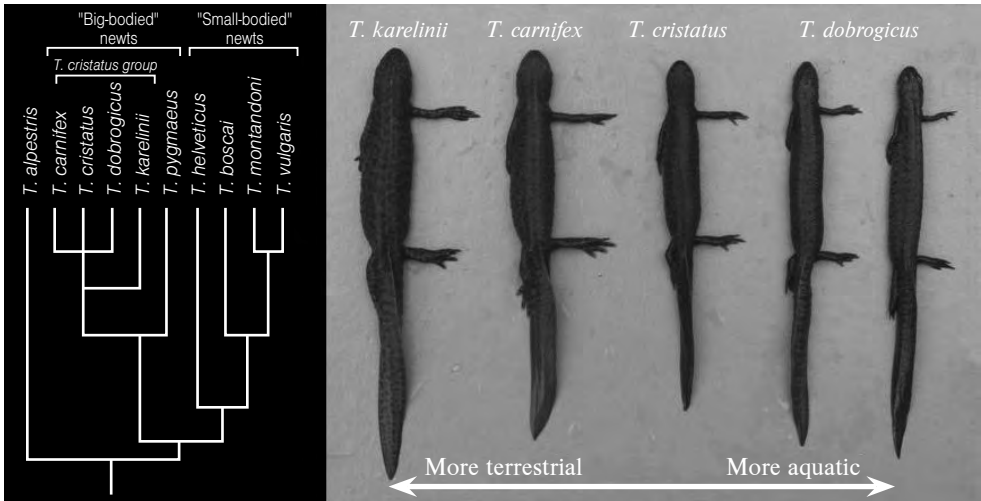
1. BRYJA J., GALAN M., CHARBONNEL N., COSSON J.-F., 2005: Analysis of major histocompatibility complex class II gene in water voles using capillary electrophoresis-single stranded conformation polymorphism. *Molecular Ecology Notes* 5: 173-176.
2. BRYJA J., GALAN M., CHARBONNEL N., COSSON J.-F., 2006: Duplication, balancing selection and trans-species evolution explain the high levels of polymorphism of the DQA MHC class II gene in voles (*Arvicolinae*). *Immunogenetics* 58: 191-202.
3. BRYJA J., CHARBONNEL N., BERTHIER K., GALAN M., COSSON J.-F., submitted: Density-related changes in selection pattern on major histocompatibility complex genes in fluctuating populations of voles. *Molecular Ecology*.

Evolution of form and function in newts

Conflicts between structural requirements for carrying out different ecologically relevant functions may result in a compromise phenotype that maximizes neither function. Identifying and evaluating functional trade-offs may therefore aid in understanding the evolution of organismal performance. We examined the possibility of an evolutionary trade-off between aquatic and terrestrial locomotion in females of European species of the newt genus *Triturus*. Biomechanical models suggest a conflict between the requirements for aquatic and terrestrial locomotion. For instance, having an elongate, slender body, a large tail and reduced limbs should benefit undulatory swimming, but at the cost of reduced running capacity. To test the prediction of an evolutionary trade-off between swimming and running capacity, we investigated relationships between size-corrected morphology and maximum locomotor performance in females of ten species of newts. Phylogenetic comparative analyses revealed that an evolutionary trend of body elongation (increasing axilla-groin distance) is associated with a reduction in head width and forelimb length. Body elongation resulted in reduced maximum running speed, but, surprisingly, also led to a reduction in swimming speed. The

evolution of longer tails was associated with an increase in maximal swimming speed. We found no evidence for an evolutionary trade-off between aquatic and terrestrial locomotor performance, probably because of the unexpected negative effect of body elongation on swimming speed. We conclude that the idea of a design conflict between aquatic and terrestrial locomotion, mediated through antagonistic effects of body elongation, does not apply to our model system.

GVOŽDÍK L., VAN DAMME R., 2006: *Triturus* newts defy the running-swimming dilemma. *Evolution* 60: 2110–2121.



Species of the *Triturus cristatus* group showing the most prominent trend in body elongation and limb reduction within the (*Triturus*) clade.

Department of Ichthyology

Head

Ing. Karel H A L A Ā K K A , PhD <halacka@ivb.cz>
karyology, histology and reproduction

Research Scientists

Prof. Ing. Vlastimil B A R U Š , DSc <barus@ivb.cz>
ichthyoparasitology, ecology and taxonomy

Ing. Martin H U M P L , PhD <humpl@email.cz>
multivariate statistical methods and ecology

RNDr. Věra L U S K O V Á , PhD <luskova@ivb.cz>
hematology and biochemistry

Assoc. Prof. Ing. Stanislav L U S K , PhD <lusk@ivb.cz>
ecology, revitalization of aquatic habitats

Ing. Milan P E Ň Á Z , DSc <penaz@ivb.cz>
embryology and ecology

Ing. Miroslav P R O K E Š , PhD <prokes@ivb.cz>
ontogeny and ecology

Ing. Lukáš V E T E Š N Í K , PhD <vetesnik@ivb.cz>
ecology and reproduction

PhD Students

Mgr. Jan M E N D E L

Mgr. Ivo P A P O U Š E K

Undergraduates

Eva B A R T O Ň O V Á

Technicians

Jan K O C I Á N

Milena K O N Í Ā K O V Á

Radka P I L Á T O V Á

Research Priorities

The research of fishes is performed at various levels of spatial and biological organization (individual, population, and community), in relation to distribution, biology, ecology, and diversity. The study reflects the heterogeneity of aquatic environment, both in term of habitats and microhabitats, and the biodiversity between and within species. Fishes are considered to be complex bioindicators of degradation as well as regeneration of aquatic habitats. Accordingly, a number of activities are aimed at restoring and revitalisation of aquatic ecosystems.

Main research topics:

- diversity of fish communities and population parameters of key species in various types of aquatic habitats
- genetic diversity of fish populations
- rehabilitation of aquatic habitats and ecosystems for the restoration and conservation of fish biodiversity
- biology and conservation management of threatened species
- alien invasive species and their impact on native fish biodiversity

Selected research results

Growth characteristics of the barbel, *Barbus barbus*, in the middle course of the Jihlava River

Growth in length and weight, based on a combination of scale annulus interpretation and back-calculation using the Fraser-Lee model, was studied in male and female barbel, *Barbus barbus*, from a section of the Jihlava River sampled in 1999–2001. Results were compared with growth data obtained with similar methods in 1976, prior to construction and functioning of a hydropower scheme complex (Dukovany-Dalešice), and during the period of the scheme's partial operation (1980–1984). Recent growth rate, under seemingly fully-established environmental conditions and complete adaptation of the barbel population, showed the highest values, especially in males. A distinct sexual dimorphism in growth rate was also confirmed, with females growing faster than males, though to a lower extent than recorded both during previous periods and from several other localities. Further, upon comparison of back-calculated lengths for previous years of recently tagged-and-recaptured fish (1999–2001), with observed lengths directly measured at corresponding ages, no significant differences were overall found between the results obtained by either method in most age groups. Finally, the linear Fraser-Lee model proved a sufficiently accurate and practical method for back-calculating lengths for previous years of life also in barbel.

PROKEŠ M., ŠOVČÍK P., PEŇÁZ M., BARUŠ V., SPURNÝ P., VILIZZI L., 2006: Growth of barbel, *Barbus barbus*, in the River Jihlava following major habitat alteration and estimated by two methods. *Folia Zoologica* 55: 86–96.

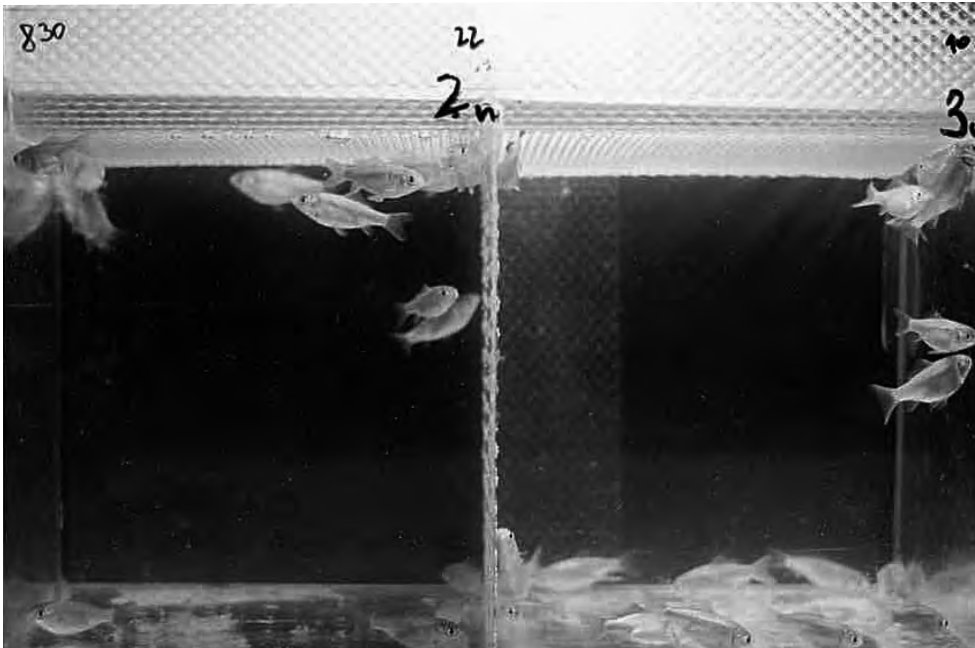


Ichthyological investigation on the Jihlava River. Left to right: J. I. Namin, V. Baruš, L. Vetešník, M. Prokeš. (Photo by M. Peňáz)

Physiological and behavioural differences between *Carassius auratus* lineages differing in ploidy levels and parental origin

In recent years, original uniform (unisexual-triploid) populations of silver crucian carp in central Europe transform dramatically. Previous state of sporadic diploid individuals' occurrence (both males and females) has been gradually substituted by current state, where on some localities these diploids begin to dominate. Main goal of our experiments is to understand factors which affect this dynamics of diploid-polyploid complexes.

The reactions of the individuals *Carassius auratus* on temperature and low-oxygen stress were observed. The results show differences in dependence not only on the ploidy levels but also on their ancestry. It may be an important selective factor in specific natural conditions which affected occurrence this groups in specific biotope. Haematological analysis was performed on 27 adult specimens of *Carassius auratus* irrespective of sex in 2003 and on 32 juveniles of distinguished sex in 2004. In this study we found that the ploidy level affected significantly ($p < 0.01$) the values of the erythrocyte count, mean corpuscular volume and mean corpuscular haemoglobin. Although we did not prove any significant effect of sex in juvenile diploids of *C. auratus* on the values of erythrocyte profile, the erythrocyte count, haematocrit value and haemoglobin content value were higher for males than for females. The erythrocyte count decreased significantly ($p < 0.01$) with increasing ploidy level. The index of haemoglobin content followed the same trend of a decreasing mean value with increasing ploidy level. Mean corpuscular volume and mean corpuscular haemoglobin increased with the increasing ploidy level ($p < 0.01$). Haematocrit value and mean corpuscular haemoglobin concentration did not significantly differ from the point of view of the ploidy level.



Different depth preferences for swimming of diploid (left) and triploid (right) *Carassius auratus* in an aquarium. (Photo by K. Halačka)



Blood taking from *Carassius auratus* K. Halačka (left), L.Vetešník (right). Photo by S. Lusk.

HALAČKA K., VETEŠNÍK L., 2005: Vliv teplotního a kyslíkového stresu na karasa stříbřitého [Influence of temperature and oxygen stress on silver crucian carp (*Carassius auratus* L.)]. In: Spurný E. (ed.), 8. Česká ichtyologická konference. Mendelova zemědělská a lesnická univerzita, Brno; 270-274.

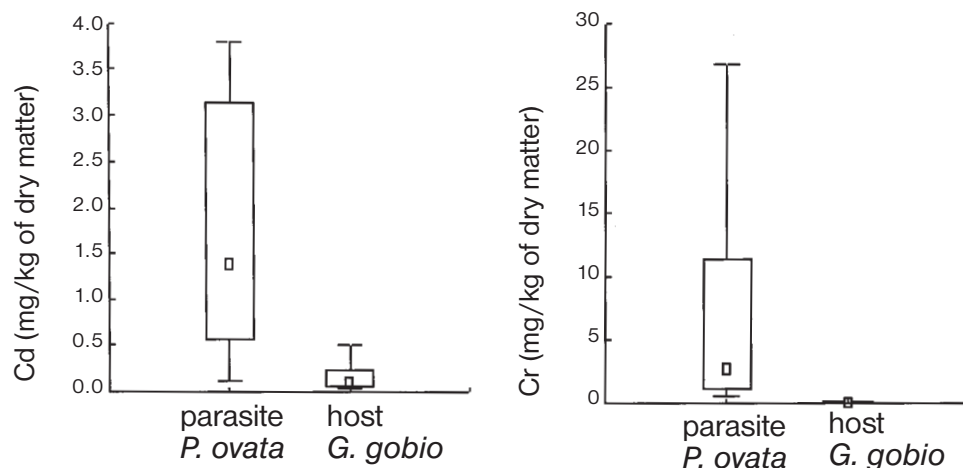
VETEŠNÍK L., HALAČKA K., LUSKOVÁ V., LUSK S., 2006: Erythrocyte profile of diploid and triploid silver crucian carp (*Carassius auratus*). *Acta Veterinaria Brno* 75: 203-207.

The nematode parasites of vertebrates: a potential sentinel species of heavy metal accumulation

To assess the bioindicator value of parasites, the concentrations of six heavy metals (Cr, Cu, Pb, Cd, Ni and Zn) were analyzed by atomic absorption spectrometry in pregnant females of the nematode *Philometra ovata*, body cavity parasites of gudgeon (*Gobio gobio*) and muscle samples of infected and uninfected hosts. The concentration of heavy metals was significantly higher in specimen of *P. ovata* compared to the host muscle tissue.

The parasite-to-muscle ratio of heavy metals varied from 3.2 to 121.7, in increasing concentrations for Cr, Cd, Cu, Pb, Ni and Zn. The presence of parasites did not influence the heavy metal content of the hosts, and no significant differences were found between muscle tissues of parasitized and non-parasitized fishes. The bioconcentration factor ($BFs = C_{\text{parasite}} / C_{\text{sediment}}$) varied between 0.4 and 25.8 and $BFw (C_{\text{parasite}} / C_{\text{water}})$ between 2133 and 25354. In conclusion the *P. ovata* - gudgeon parasite host system is an effective and practical bioindicator, even a sentinel system, of heavy metals load in aquatic ecosystems. Our results demonstrate that this parasite accumulates heavy metals at higher rates than the other nematode species (*Anguillicola crassus*, *Contracaecum rudolphii*, *Protospirura muricola*).

- BARUŠ V., JARKOVSKÝ J., PROKEŠ M., 2007: *Philometra ovata* (Nematoda: Philometroidea): a potential sentinel species of heavy metal accumulation. *Parasitology Research* 100: 929-933.
- BARUŠ V., TENORA F., ŠUMBERA R., 2003: Relative concentrations of four heavy metals in the parasites *Protospirura muricola* (Nematoda) and *Inermicapsifer arvicanthidis* (Cestoda) in their definitive host silvery mole-rat (*Heliophobius argenteocinereus*: Rodentia). *Helminthologia* 40: 227-232.
- PALÍKOVÁ M., BARUŠ V., 2003: Mercury content in *Anguillicola crassus* (Nematoda) and its host *Anguilla anguilla*. *Acta Veterinaria Brno* 72: 289-294.



The concentration of heavy metals in a specimen of *P. ovata* and the host *Gobio gobio* muscle tissue.

***Vimba vimba*: a locally vanished and endangered species**

In the past, *Vimba vimba* was among the key components of the fish assemblages inhabiting the middle and lower reaches of streams in the Czech Republic. Dam building, water pollution, fragmentation of the longitudinal continuum of most rivers in the course of the 20th century has resulted in the fact that at present the species is classified as Vulnerable. The degree of its threatening differs in various drainage areas. The species is comparatively abundant in some parts of the Labe and Vltava drainage area (the Berounka River, the lower reaches of the Labe River, the confluence of the Malše and Vltava rivers). Recently, *V. vimba* has vanished from the drainage area of the Odra River. In the Morava drainage area, it is rather numerous in the middle and lower reaches of the Bečva River. Residual populations exist in the Dyje River upstream of the Vranov Reservoir and in the lower reaches of the Jihlava River.

Investigations on the remnant *Vimba* population in the Dyje River upstream of the Vranov Reservoir, carried out in 1934, have shown that it can survive for 70 years at a low level of its genetic diversity. The numbers of the adult component of this population does not exceed one thousand individuals. In view of the low mean age of the population, with just two age groups being responsible for reproduction, it has been recommended to foster the population with material obtained by hand-stripping and rearing individuals from that population.

Besides, another important measure to improve the status of *Vimba vimba* populations could inhere in successively renewing the migration permeability of streams in their longitudinal profile. Like *Chondrostoma nasus*, *Vimba vimba* is among the fish species that perform long-range spawning migrations.

- LUSK S., HANEL L., LUSKOVÁ V., LOJKÁSEK B., HARTVICH P., 2006: Červený seznam mihulí a ryb České republiky – Verze 2005 [The Red List of lampreys and fishes in the Czech Republic – Version 2005]. Biodiverzita ichtyofauny ČR (VI): 7–16.
- LUSK S., LUSKOVÁ V., HALAČKA K., ŠLECHTOVÁ V., ŠLECHTA V., 2005: Characteristics of the remnant *Vimba vimba* population in the upper part of the Dyje River. Folia Zoologica 54: 389–404.



The Dyje River upstream of the Vranov Reservoir. (Photo by K.Halačka)

Characteristics of populations of the *Zingel zingel* and *Zingel streber* in the Czech Republic

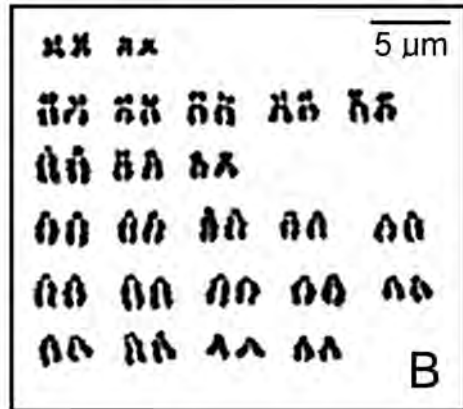
Zingel zingel and *Zingel streber* are typical Danubian species occurring rarely in the Morava River drainage area within the Czech Republic. Due to weir constructions and especially due to increase of water pollution during the first half of the last century, they disappeared from our waters, and both species were assessed as critically endangered and protected by the national and European legislations. Only after improvements of the water quality in the Morava and Dyje Rivers, the new occurrence of *Z. zingel* was ascertained as early as in 1992, and that of *Z. streber* in 2003 in the area of the confluence of both rivers. A very numerous occurrence of young-of-the-year *Z. streber* specimens evidenced a successful reproduction.

The restoration of both species was enabled by constant improvements of the water quality and by possibilities of free migrations from the Danube through the Slovakian-Austrian part of the Morava River. The stable occurrence of both species is constrained at present to short sections (Morava r.km 70–74.1 and Dyje 0.0–26.7).

The karyotype of *Z. zingel* was analyzed. The diploid chromosome number was $2n=48$ for the female, and only $2n=47$ for the male, but there was also present a single large unpaired metacentric chromosome. This indicated the presence of the $X1X1X2X2/X1X2Y$ multiple sex chromosome system produced by the fusion of two sub- or acrocentrics chromosomes, one of them being the sex chromosome Y.



Zingel streber from the Morava River. (Photo by K. Halačka)



The karyotype of *Zingel zingel*, A - male, B - female

HALAČKA K., VETEŠNÍK L., LUSK S., MENDEL J., PAPOUŠEK I., in press: The X1X1X2X2/X1X2Y multiple sex chromosome system in the *Zingel zingel* (Pisces: Perciformes) from the Morava River (Czech Republic). *Caryologia*.

LUSK S., HALAČKA K., LUSKOVÁ V., VETEŠNÍK L., 2004: Re-occurrence of *Zingel streber* (Teleostei: Pisces) in the Czech Republic. *Folia Zoologica* 53: 417-422.

VETEŠNÍK L., HALAČKA K., LUSKOVÁ V., LUSK S., 2004: Growth of *Zingel streber* and *Zingel zingel* and their distribution in the Czech Republic. VII. Česká ichtyologická konference, Vodňany: 74-77.

Applications of Research Results

Removing of migratory barriers fragmenting large rivers

A weir in Břeclav, river km 27, constitutes the first migratory barrier for water fauna on the lower Dyje River, which has free migratory route to the Danube River through 70 km long

Slovakian-Austrian stretch of the Morava River. At the end of 2005, a new fishpass was put into service within the frame of „Action plan of floodpass building on selected rivers of the Czech Republic“. During 2006, we conducted a monitoring of its function performance. It was stated that both the entrance and interior bouldered migratory parts are fully functional for whole species and age spectrum of fish community. From the aspect of fish migration it is necessary to optimize the upper part including the exit part of the fishpass. Feasible modifications (such as enlargement of entry slots and adding of 2–3 rows of boulders in upper parts) should allow full migratory passability for the whole species range of the lower Dyje River ichthyofauna.

Floodgate Střekov constitutes the first migratory barrier on the Elbe River (river km 321) on the territory of the Czech Republic. In 2001, the new lowland pool fishpass was built there in connection with the project „Salmon 2000“, allowing periodical monitoring of migrating fishes.

Significant numbers of juvenile (age 0+) and subadult (age 1+ and 2+) fish were observed migrating through a lowland pool fishpass from August to October in 2003 and 2004. Records of weekly catches totalled 2 148 (2003) and 6 469 (2004), mainly bleak, barbel, roach and dace. Fish migrated in the upstream direction probably to search the feeding grounds and refuges and their numbers corresponded to spring spawning migrations in the same fishpass and the year.

LUSK S., 2006: Zpráva o sledování a vyhodnocení funkčnosti rybiho přechodu na jezu Břeclav v ř.km 26,7 řeky Dyje v průběhu roku 2006 [Report on monitoring and functionality of the fish pass on the weir Břeclav (river km 26.7 of the Dyje River) during 2006]. MS, Povodí Moravy SP, Brno, 22 pp.

PRCHALOVÁ M., VETEŠNÍK L., SLAVÍK O., 2006: Migrations of juvenile and subadult fish through a fishway during the late summer and fall. *Folia Zoologica* 55: 162–166.



Building of fish pass on the Dyje River in Břeclav. (Photo by K. Halačka)



The new lowland pool fishpass at Střekov. (Photo by K. Halačka)

Artificial wetlands – significant support for stable fish biodiversity in a river alluvium

The natural dynamics of water discharges and the ensuing fluvial stream activity resulted in a considerable diversification of aquatic environments in fluvial ecosystems. Besides the active streams in flooding area, there originated and developed a diversified system of aquatic habitats. This hydrological system offered conditions for fish assemblages showing a high species richness. However, the modifications of most streams as well as other human activities resulted in a limitation or complete elimination of any fluvial activity of the streams. Therefore, new habitats are no longer created by the natural activity of water discharges and fluvial activity. On the contrary, the habitats created by the streams in the past are now gradually vanishing. Now there are two alternatives as regards the future of these habitats: either the existing natural habitats can be maintained and renewed by human efforts, or new habitats can be provided in the form of artificial wetlands (earth pits, channels, artificial pools and lakes). Alluvial habitats are irreplaceable environments for several indigenous fish species protected by native as well as European legislation: *Rhodeus amarus*, *Misgurnus fossilis*, *Cobitis elongatoides* incl. hybrid populations, *Umbra krameri* and, of other species, *Carassius carassius*, *Tinca tinca* and *Leucaspis delineatus*. Also, artificial wetlands can provide more stable environments for the survival of fishes during critical periods. Artificial habitats, connected with the main stream or flooded during floods are populated by species inhabiting the major stream. The artificial aquatic habitats lying outside the active alluvium can be provided with fish assemblages aimed at conservation goals. The highly positive contribution of artificial habitats in stabilizing populations of the species mentioned above has been demonstrated in concrete objects in the floodplains of the rivers Morava, Dyje, Lužnice and, in eastern Slovakia, the drainage areas of the Bodrog, Latorica, Tisza and Ondava rivers.

- HALAČKA K., LUSK S., LUSKOVÁ V., 1998: Fish communities in artificial pools in the floodplain along the lower reaches of the River Dyje. *Folia Zoologica* 47: 125-134.
- HORÁK V., 2003: Rehabilitation of the lower Dyje River floodplain for fish. *Ecology & Hydrobiology* 3: 121-126.
- HORÁK V., LUSK S., HALAČKA K., LUSKOVÁ V., 2004: Artificial wetlands – yes or no? *Ecology & Hydrobiology* 4: 119-127.
- LUSK S., HALAČKA K., LUSKOVÁ V., 2003: Rehabilitating the floodplain of the lower River Dyje for fish. *River Research and Applications* 19: 281-288.
- LUSK S., KOŠČO J., LUSKOVÁ V., HORÁK V., KOŠUTH P., HALAČKA K., HARTVICH P., 2006: Význam umělých mokřadů v říčním aluviu pro podporu a uchování původní biodiverzity [Importance of artificial wetlands in floodpains for support and preservation of the native biodiversity]. *Sborník Říční krajina* 4, Olomouc: 165-171.



Two time stages of the artificial wetland in the Chomoutov Nature Reserve. (Photo by S. Lusk)

Department of Fish Ecology

Head

Ing. Pavel J U R A J D A , PhD <jurajda@brno.cas.cz>
fish ecology

Research Scientists

Assoc. Prof. RNDr. Zdeněk A D Á M E K , PhD <adamek@ivb.cz>
hydrobiology and feeding ecology of fish

Mgr. Markéta O N D R A Č K O V Á , PhD <audrey@sci.muni.cz>
fish parasitology

RNDr. Martin R E I C H A R D , PhD <reichard@ivb.cz>
behavioural and evolutionary ecology of fish

PhD Students

Mgr. Veronika F O L T Á N K O V Á

Mgr. Petra H Á J K O V Á

Mgr. Michal J A N Á Č

Mgr. Markéta K O N E Č N Á

Mgr. Matej P O L A Č I K

Mgr. Zdenka V A L O V Á

Undergraduates

Gabriela K O N E Č N Á

Jan Š V A N Y G A

Technicians

Bc. Václava H A R P E R - D O L E J Š K O V Á - until August 31, 2006

Mgr. Markéta D U Š K O V Á

Ing. Jiří H U M L



Field laboratory in the town of Vidin, Bulgaria. Left to right: M. Vassilev, T. Trichkova, M. Ondračková, M. Poláčik, K. Francová, M. Dušková. (Photo by J. Huml)

Research Priorities

We use fish to investigate questions in ecology and evolution as well as applied issues in fisheries management, conservation of aquatic habitats and floodplain restoration. Our field and experimental studies are conducted in Europe, Asia and Africa.

The current topics investigated in our department are:

- behavioural and evolutionary ecology of bitterling fish
- adaptation and coevolution of bitterling and their mussel hosts
- ecology, distribution and parasites of invasive *Neogobius* fishes
- 0+ juvenile fish community structure in lowland rivers and their flood plains
- optimisation of methods for 0+ juvenile fish sampling
- impacts of metazoan parasites on 0+ juvenile fish development
- community ecology of fishes in the Gambia River floodplain, Senegal, West Africa
- reproductive isolating mechanisms in the East African annual fishes *Nothobranchius* spp.

Selected Research Results

The coevolutionary relationship between bitterling fishes and freshwater mussels

Bitterlings (subfamily Acheilognathinae) are freshwater cyprinid fishes that have evolved an unusual spawning symbiosis with freshwater mussels from the family Unionidae. Female bitterling develop long ovipositors that they use to place their eggs deep inside the gill cavity of a mussel and males fertilise the eggs by releasing sperm into the inhalant siphon of the mussel. Bitterling embryos develop inside the mussel gill cavity for weeks and constrain mussel physiology. In turn, unionid mussels have parasitic larvae called glochidia. They are released into the water column, attach to fish gills or fins and obtain nourishment from the fish host. We found that relationship between bitterling and mussel, popularly considered mutualistic on the premise that bitterling use mussels as spawning sites while the mussel benefits by using bitterling to disperse their glochidia, is more complex.

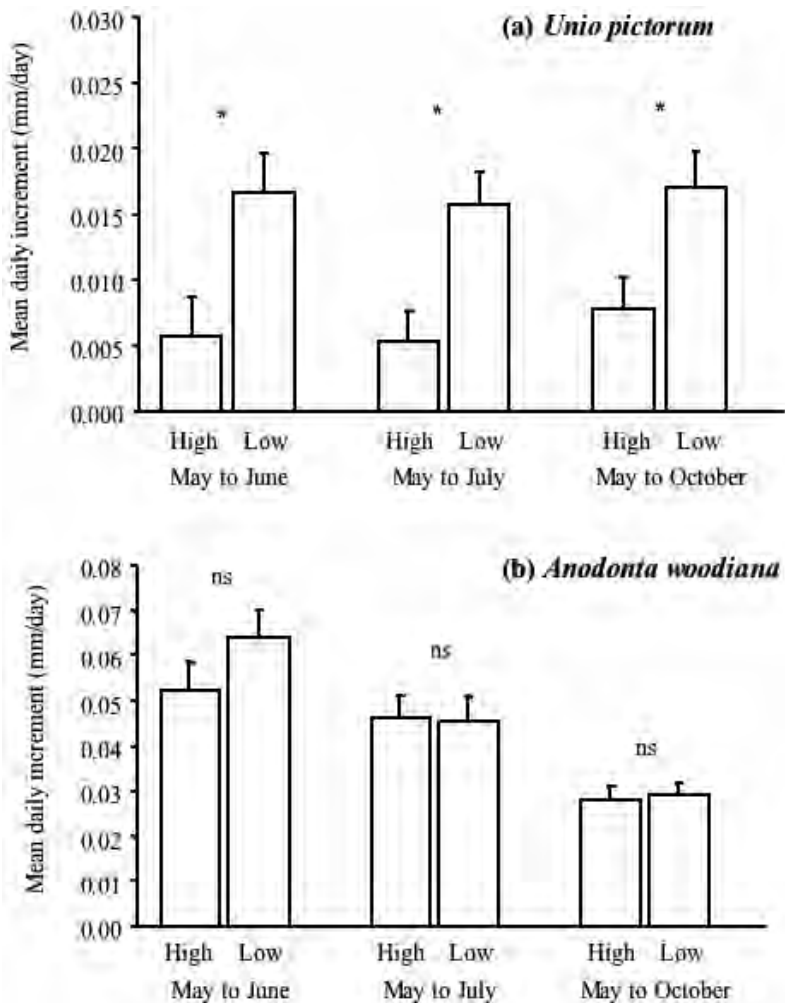
We investigated the costs and benefits from the symbiosis to both fish and mussels and found that in Europe, bitterling are parasites of mussels. European bitterling do not host glochidia, but adult European mussels suffer from a reduction in growth and fecundity if they carry bitterling embryos. In a further study, we found that this may be due to a lag in the coevolutionary relationship – bitterling presence in Europe is recent and mussels may have not had enough time to evolve sufficient adaptations. Indeed, in Asia, where bitterling origin is ancient, mussels are able to eject bitterling eggs and embryos prematurely, similarly to the eviction of cuckoo eggs by their bird foster parents. In a large scale comparative study in China, we discovered that the bitterling species vary in the level of their specificity to particular hosts and revealed a complex network of relationships between bitterling and mussel traits.

LIU H., ZHU Y., SMITH C., REICHARD M., 2006: Evidence of host specificity and congruence between phylogenies of bitterlings and freshwater mussels. *Zoological Studies* 45: 428-434.

REICHARD M., LIU H., SMITH C., 2007: The coevolutionary relationship between bitterling fishes and freshwater mussels: insights from interspecific comparisons. *Evolutionary Ecology Research* 9: 239-259.

REICHARD M., ONDRAČKOVÁ M., PRZYBYLSKI M., LIU H., SMITH C., 2006: The costs and benefits in an unusual symbiosis: experimental evidence that bitterling fish (*Rhodeus sericeus*) are parasites of unionid mussels in Europe. *Journal of Evolutionary Biology* 19: 788-796.

REICHARD M., PRZYBYLSKI M., KANIEWSKA P., LIU H., SMITH C., 2007: A possible evolutionary lag in the relationship between freshwater mussels and European bitterling. *Journal of Fish Biology* 70: 709-725.



Mean (+1 SE) daily shell growth of (a) *Unio pictorum* and (b) *Anodonta woodiana* mussels at high and low embryo density treatments calculated for the periods May to June (28 days), May to July (70 days), and May to October (131 days) 2004.

Sexual selection in the bitterling fish: the role of female choice and male mating tactics

Natural selection theory is based on the principle of unequal individual reproductive success within a species. This is caused by differential survival among individuals (ecological adaptations) and different number of offspring produced by individuals (sexual selection). Sexual selection explains the evolution of adaptations to maximise the individual reproductive potential, particularly adaptations to male-male interference competition for females and female choice. Using a series of experiments with a small cyprinid fish, the European bitterling, *Rhodeus sericeus*, we separated the two components of sexual selection and investigated their relative importance by estimating male reproductive success through paternity assignments. For individual males, the success in male-male competition for territories was significantly



A pair of European bitterlings before spawning. (Photo by C. Smith)

more important than female preference of a given male. Dominant males monopolised access to territories and sired considerably more offspring than males preferred by females. Therefore, the hierarchical rank of males reduced opportunities for female choice and females, despite being choosy, had limited control over the paternity of their offspring. In another set of experiments, we found that female bitterling may use sophisticated behaviour to prolong the spawning act and solicit sneaking fertilisations from subordinate males. This behaviour enables preferred, but subordinate, males to sire some offspring. Our data suggest new prospect in explaining the evolution of alternative male reproductive tactics, so far considered as a “parasitic” strategy undermining female choice.

Our results show that alternative male tactics may, contrary to the current view, augment rather than decrease the role of female choice. Given the important consequences of this finding on effective population size, our results have also general implications in the management of natural populations.

REICHARD M., BRYJA J., ONDRAČKOVÁ M., DÁVIDOVÁ M., KANIEWSKA P., SMITH C., 2005: Sexual selection for male dominance reduces opportunities for female mate choice in the European bitterling (*Rhodeus sericeus*). *Molecular Ecology* 14: 1533–1542.

SMITH C., REICHARD M., 2005: Females solicit sneakers to improve fertilisation success in the bitterling fish (*Rhodeus sericeus*). *Proceedings of the Royal Society London, Series B* 272: 1683–1688.

SMITH C., REICHARD M., DOUGLAS A., JURAJDA P., 2006: Population consequences of behaviour in the European bitterling (*Rhodeus sericeus*, Cyprinidae). *Ecology of Freshwater Fishes* 15: 137–145

Sampling methodology and monitoring of 0+ juvenile fish in channelized lowland rivers

Fish reproduction and use of nursery habitats by 0+ fish have been long-term monitored (1991-2006) in lowland channelized and regulated river Morava (r km 69.4-92.8). At twenty localities within the river stretch, 0+ juvenile fish assemblages are sampled in late summer by point abundance sampling (PAS) electrofishing.

PAS is widely used sampling strategy based on collecting numerous small (point) samples of the same size. This principle is considered to be more statistically robust than sampling low number of large samples. To evaluate its suitability for monitoring 0+ juvenile fish assemblages, we compared PAS with a strategy that surveys the given area in its whole length: a continuous sampling. Both strategies provided similar estimates of 0+ juvenile fish assemblages, in terms of species richness, species composition, relative proportion of the most abundant species and size structure. PAS proved to be the less time-demanding strategy (consuming approximately 60% of time compared to CS) allowing either surveying the fixed area quicker than CS or surveying longer area within fixed time interval. We therefore evaluated PAS as an appropriate strategy for sampling 0+ juvenile fish in lowland channelized rivers.

Though the lower part of the Morava River was modified for navigation, it is currently not used for this purpose. Therefore a variable water discharge is allowed to occur, which creates more habitat variability. The riprap bank is a uniform bank type occurring along the shoreline. Gently sloped sand-gravel beaches are formed along the inner bands of the river during low summer discharges. During periods of elevated discharge, the water level reaches the bank-side vegetation above the boulder bank. All these habitat types are, according to our results, suitable for, and to a large extent utilized by, the 0+ juvenile fish assemblage.

Mainly bitterling, chub, bleak, and gudgeon have adapted to the conditions following river modification and form abundant and stable populations. These species reproduce successfully and form a major part of the 0+ fish community. Specialist species (phytophils and most of lithophils) are disadvantaged, in term of their reproductive success.

JANÁČ M., JURAJDA P., in press: A comparison of point abundance and continuous sampling by electrofishing for age 0 fish in a channelized lowland river. *North American Journal of Fisheries Management*.

VALOVÁ Z., JURAJDA P., JANÁČ M., 2006: Spatial distribution of 0+ juvenile fish in differently modified lowland rivers. *Folia Zoologica* 55: 293-308.

Applications of Research Results

Water Framework Directive implementation

Since 1999, we have provided monitoring of young-of-the-year fishes in selected profiles of the river network that were included in the water quality assessment program in the Czech Republic (coordinated by Water Research Institute TGM Praha). In 2005, National Methodology for fish monitoring program within WFD implementation, based on international sources (FAME, CEN), has been completed and tested. During 2006, this methodology has been used in monitoring of 174 sites. The monitoring of young-of-the-year fish has been proven as a suitable methodology for WFD evaluation in the intensively stocked rivers in the Czech Republic.

JURAJDA P., SLAVÍK O., ADÁMEK Z., 2006: Sampling of young-of-the-year fishes in rivers. National Methodology of the Ministry of Environment CR. (in Czech) http://www.ochranavod.cz/dokumenty/RYB_tekouci%20vody.pdf

International Cooperation

Distribution, ecology and parasite fauna of zebrafish (*Danio rerio*) in Bangladesh

Zebrafish, *Danio rerio*, is a well established laboratory species in biomedical research. It has proven to be hugely influential in studies on gene expression of physiological, morphological and behavioural traits. There are surprisingly few data available on zebrafish natural behaviour and ecology. We have participated in an expedition that collected data on geographical distribution, habitat preferences, population structure and parasite load of wild zebrafish in Bangladesh. We found that zebrafish inhabits standing water bodies within the floodplain rather than river environment and that it is the most abundant in shallow lakes, ponds and ditches with rich vegetation at the margins. It is commonly abundant in water bodies with a connection to rice cultivation. We have identified parasite fauna of zebrafish based on a dissection of 120 individual zebrafish and eight additional fish species co-occurring with zebrafish. Our results suggest that there are large differences in parasite abundance and species richness among zebrafish populations from across Bangladesh which may be used in subsequent studies linking genetic background and susceptibility to parasitic diseases.

This project is based on the international cooperation with University of Leicester (United Kingdom), University of Khulna and University of Mymensingh (Bangladesh).

ONDRAČKOVÁ M., SPENCE R., SMITH C., 2006. Occurrence of metazoan parasites of zebrafish *Danio rerio* (Cyprinidae) in Bangladesh. In: Bryja J., Zúkal J. (eds), Zoologické dny Brno 2006. Ústav biologie obratlovců AV ČR, Brno; 135.

SPENCE R., RUNA K.F., REICHARD M., HUQ K.A., WAHAB M.A., AHMED Z.F., SMITH C., 2006: The distribution and habitat preferences of the zebrafish in Bangladesh. *Journal of Fish Biology*. 69: 1435–1448.



Field research in Bangladesh. (Photos by M. Reichard and C. Pateman Jones, respectively)

Distribution, ecology and parasites of *Neogobius* fishes in their native and non-native area of distribution

Four Ponto–Caspian gobies of the genus *Neogobius* are regarded as invasive species because of their ability to rapidly establish abundant populations in the non–native areas, as was



Sampling in Bulgarian section of the Danube. (Photo by J. Huml)

documented in Europe and North America. In the non-native range, *Neogobius* spp. may affect local ecosystem directly e.g. by changing food web interactions, or indirectly by acting as a vector for non-native parasites. To explain the successful introductions of *Neogobius* spp. in the Danube River basin, we investigated their distribution, ecology and parasites in both native and non-native range (lower and middle Danube, respectively). We found that *N. melanostomus* and *N. kessleri* dominated in the non-native range whereas *N. fluviatilis* dominated in the native range. Our results of fish distribution support the hypothesis of disjunctive spreading since very low population densities of *N. gymnotrachelus* and especially *N. melanostomus* were registered in the Croatian section of Danube, i.e. in the middle between native and non-native abundant populations. *N. gymnotrachelus* was relatively rare in both examined Danube stretches. *N. kessleri* and *N. melanostomus* reached a bigger size in the non-native area and some differences between populations were found also in the diet.

Parasite fauna of native and non-native populations of *N. kessleri* and *N. melanostomus* showed slight differences in both parasite abundance and parasite species richness. Parasite community in riverine fish did not differ among populations especially in *N. kessleri*; on the other hand, in fish from side-arm system, a habitat untypical for this fish species, the parasite species richness was two times higher than in the river. Parasite fauna of *Neogobius* spp. comprises mainly common and abundant parasites in the particular site showing very low host - specificity. Ponto-Caspian gobies seem to be fish hosts very susceptible to various parasite species and their parasite community reflects the fish feeding strategy and habitat preference.

This project is based on the international cooperation with Bulgarian Academy of Sciences (Bulgaria), University of Osijek (Croatia) and University of Vienna (Austria).

- JURAJDA P., ČERNÝ J., POLAČIK M., VALOVÁ Z., JANÁČ M., BLAŽEK R., ONDRAČKOVÁ M., 2005: The recent distribution and abundance of non-native *Neogobius* fishes in the Slovak section of the River Danube. *Journal of Applied Ichthyology* 21: 319–323.
- JURAJDA P., VASSILEV M., POLAČIK M., TRICHKOVA T., 2006: A first record of *Percottus glenii* (Perciformes: Odontobutidae) in the Danube River in Bulgaria. *Acta Zoologica Bulgarica* 58: 279–282.
- ONDRAČKOVÁ M., DÁVIDOVÁ M., PEČÍNKOVÁ M., BLAŽEK R., GELNAR M., VALOVÁ Z., ČERNÝ J., JURAJDA P., 2005: Metazoan parasites of *Neogobius* fishes in the Slovak section of the River Danube: a preliminary study. *Journal of Applied Ichthyology* 21: 345–349.
- ONDRAČKOVÁ M., TRICHKOVA T., JURAJDA P., 2006: Present and historical occurrence of metazoan parasites in *Neogobius kessleri* (Pisces: Gobiidae) in the Bulgarian Section of the Danube River. *Acta Zoologica Bulgarica* 58: 401–408.



Racer goby *Neogobius gymnotrachelus*. (Photo by P. Jurajda)

Department of Avian Ecology

Head

Ing. Marcel H O N Z A , PhD <honza@brno.cas.cz>
behavioural ecology of birds

Research scientists

Mgr. Tomáš A L B R E C H T , PhD <albrecht@ivb.cz>
ecology of birds

Ing. Miroslav Č A P E K , PhD <capek@brno.cas.cz>
ecology and behaviour of birds, bird parasites

MVDr. Vojtěch M R L Í K , PhD <mrlík@brno.cas.cz; mrlík@vfu.cz> -
until December 31, 2005
behaviour of birds and mammals

RNDr. Petr P R O C H Á Z K A , PhD <prochazka@ivb.cz>
ecology of birds

PhD students

Mgr. Radka L E Ž A L O V Á

Mgr. Lenka P O L A Č I K O V Á

Mgr. Milica P O Ž G A Y O V Á

Mgr. Václav Š I C H A

Undergraduates

Bc. Drahomíra F A I N O V Á

Research priorities

Our research focuses on understanding the ecological and evolutionary basis of reproductive strategies. Important goals of this research are to identify the ecological factors that promote parasitic reproductive behaviour, predator avoidance and nest predation. We conduct studies adopting the adaptationist and optimality approach of behavioural ecology to examine fitness costs and benefits of various characters in bird populations. Further we aim at understanding the evolution and signalling function of secondary male ornaments in birds. Using genetic markers we study population differentiation and phylogeography of selected European passerines across migratory divides which are inferred from measurements of stable isotope ratios and ringing recoveries. Our current research also concentrates on patterns of singing activity in passerines and includes studies of parasites associated with birds of the Afrotropical and Neotropical Regions as well.

Selected research results

Extra-pair fertilizations and mechanisms of mate choice

Extra-pair fertilizations (EPF) are frequently documented in songbirds. A costs–benefits approach has frequently been used to understand the evolutionary origin and maintenance of promiscuity in this group. Recent meta-analyses suggest that direct costs to unfaithful females outweigh indirect benefits from infidelity in socially monogamous songbirds, what

indicates that in these taxa, EPF evolved primarily as a self-interest male tactic. We performed a comparative analysis to show that standardized selection gradients acting against female infidelity (direct costs of promiscuity) explain variation in EPF rates at an interspecific level in passerines. This result confirms that costs to females resulting from reduced parental care by cheated males constrain promiscuity in this group. Our data indicate that females exert resistance over EPF when the costs of infidelity are high and, conversely, that the rate of EPF increases when selection on females to defend themselves against EPF attempts by males is weak and costs of infidelity are low. Indirect (genetic) benefits to females should play a central role in choice of extra-pair mate, since female birds do apparently obtain only sperm from these mates. There are two basic models of mate choice in animals, with indicator model proposing an absolute criterion of mate choice such as sexual ornaments, and the other one proposing (dis)similarity between the female and male as the main mechanism. The latter is often called choice of 'genetic compatibility' in recent literature. However, the term 'genetic compatibility' has an existing meaning in speciation and we therefore propose use of the term 'genetic complementarity' over 'genetic compatibility'. This is in agreement with Trivers (1972) who was to our knowledge the first to clearly articulate the phenomenon of mating based on genetic dissimilarity.

ALBRECHT T., KREISINGER J., PIÁLEK J., 2006. The strength of direct selection against female promiscuity is associated with rates of extrapair fertilizations in socially monogamous passerines. *American Naturalist* 167: 739-744.

PIÁLEK J., ALBRECHT T., 2005. Choosing mates: compatible versus complementary genes. *Trends in Ecology & Evolution* 20: 63.

Coevolution between European hosts and their brood parasites

Successive adaptations and counteradaptations by avian brood parasites and their hosts provide some of the best examples of direct coevolution in nature. Successfully parasitized hosts often raise only the cuckoo young and have zero reproductive success. This creates conditions for coevolutionary arms race between hosts and parasites. We studied both adaptations of the hosts and counteradaptations of the parasites, respectively.

We tested experimentally responses of the hosts towards multiple cuckoo parasitism and suggest that when the parasitism rate reaches high levels, e.g. at the beginning of the coevolutionary arms race, defense against multiple parasitism may be an important component of host's adaptation to brood parasitism in general. Other major adaptations are those related to the parasitic egg. We evaluated the puncture resistance hypothesis for the occurrence of thick-shelled eggs in common cuckoo by investigating costs of cuckoo egg ejection in four *Acrocephalus* warblers. Last but not least, we tested great reed warbler discrimination against two cuckoo morphs in two areas with different parasitism rates and proportions of the two morphs. Our results suggest that both local parasitism pressure and relative abundance of the two colour morphs of a brood parasite may significantly influence host defences. Finally, we studied laying strategy of cuckoo that is well-synchronized with that of the host. This matching of laying patterns with those of the hosts suggests an adaptive response to ensure optimal hatchability of the cuckoo eggs and to avoid multiple parasitism of the same nest even under heavy pressures of brood parasitism.

ANTONOV, A., STOKKE, B. G., MOKSNES, A., HONZA, M., 2006: Eggshell strength of an obligate brood parasite: a test of the puncture resistance hypothesis. *Behavioral Ecology and Sociobiology* 60: 11-18

- HONZA M., MOSKÁT C., 2005: Antiparasite behaviour in response to experimental brood parasitism in the great reed warbler: a comparison of single and multiple parasitism. *Annales Zoologici Fennici* 42: 627–633.
- HONZA M., ŠICHA V., PROCHÁZKA P., LEŽALOVÁ R., 2006: Host nest defense against a color-dimorphic brood parasite: great reed warblers (*Acrocephalus arundinaceus*) versus common cuckoos (*Cuculus canorus*). *Journal of Ornithology* 147: 629–637.
- MOSKÁT C., BARTA Z., HAUBER M.E., HONZA M., 2006: High synchrony of egg laying in common cuckoos *Cuculus canorus* and their great reed warbler *Acrocephalus arundinaceus* hosts. *Ethology, Ecology and Evolution* 18: 159–167.

Savi's warbler: A model species for studying the patterns of singing activity

Males of many bird species spend enormous amounts of time singing, which may amount to several hundred thousand songs per season. They sing in order to acquire a mate and to defend a territory and its resources or to minimize the risk of cuckoldry by neighbouring males and to maximize the probability of their own successful extrapair copulations. Diel patterns of singing vary among bird species in aspects such as the timing of peaks through the day or night and throughout the season.

We studied seasonal and diel patterns of singing activity of Savi's warblers *Locustella luscinioides* in two areas of Central Europe 300 km apart, over a period of 18 years. We assess about 4,600 records of individuals singing. Males were found to exhibit similar singing activity in both study sites. They started to sing after arrival at the beginning of April and peaked from the end of April to the beginning of May. Thereafter, their singing activity was lower but more



A male Savi's warbler singing. (Photo by L. Hlášek)

stable for a relatively long period from mid-May to mid-July. At the end of July, males sang only sporadically and singing activity ceased at the beginning of August. At the beginning and towards the end of the song-period males sang sporadically whereas in the period of the highest singing activity they sang over the entire 24-h period. During the whole song-period, there was a significant difference in singing activity between daylight and the dark (67.2 and 32.8%, respectively). However, the period of daylight was longer. Average singing activity showed similar levels in daylight and the dark with mean numbers of 5.9 and 6.6 males per hour, respectively. Major changes in singing activity were related to the twilight periods. There were distinctive dawn and dusk choruses. In the morning, Savi's warblers exhibited similar levels of singing activity over 3 h of the dark before twilight, singing reached its highest level at twilight and 1 h after twilight. During the evening, singing activity reached its highest-level 1 h before twilight, while during twilight it was decreasing, with a considerable decline 1 h after nightfall.

KLOUBEC B., ČAPEK, M., 2005: Seasonal and diel budgets of song: a study of Savi's warbler (*Locustella luscinioides*). *Journal of Ornithology* 146: 206-214.

International cooperation

Coevolution between an African brood parasite and its hosts

The red-chested cuckoo parasitizes many passerines in Africa, but some common species sympatric with the brood parasite are rarely used as hosts. Since very little is known about



M. Honza and M. I. Cherry at the field station in the Ndumo Game Reserve, South Africa. (Archives of the Ndumo Game Reserve)

brood parasitism on this continent, we experimentally tested responses of three turdid hosts to parasitism with artificial cuckoo egg. Our results support the hypothesis that rejection behaviour in two species (olive thrush, Kurrichane thrush) evolved as defence against interspecific parasitism, with thrushes appearing to be ahead in the host–parasite arms-race. The Cape robin, by contrast, appears not to reject cuckoo eggs, either because it is unable to recognize them, or because the cost associated with removal may be too high.

This study was made in collaboration with the University of Stellenbosch (Matieland, South Africa) and it was supported by a John Ellerman Fellowship.

HONZA M., KUIPER S.M., CHERRY M.I., 2005. Behaviour of African turdid hosts towards experimental parasitism with artificial red-chested cuckoo *Cuculus solitarius*. *Journal of Avian Biology* 36: 517–522.

Parasites associated with birds native to rainforests on the Caribbean slope of Costa Rica

We undertook our research of ectoparasites on birds of the Cordillera de Talamanca mountain range in Limón province, southeastern Costa Rica. In the rainy season of 2004 (August through September), we sequentially studied birds at two locations (Hitoy Cerere Biological Reserve and Barbilla National Park) on the Caribbean slope differing in elevation and habitat character. A total of 530 individuals of 79 bird species were examined. In this contribution we focus on chewing lice (Phthiraptera) and mites (Acari: Macronyssidae) associated with hummingbirds (Trochilidae), typical antbirds (Thamnophilidae), ground antbirds (Formicariidae), manakins (Pipridae) and grosbeaks (Cardinalidae) inhabiting lowland tropical rainforests.



M. Čapek examining a long-tailed hermit *Phaethornis superciliosus* in the laboratory of Hitoy Cerere Biological Reserve, Costa Rica, August 19, 2004. (Photo by M. Havlíček)

We found five chewing lice species belonging to the genera *Formicaphagus*, *Machaerilaemus* and *Myrsidea* of which three are the species new to science. They and their type hosts are as follows: *Formicaphagus tyrannina* ex *Cercomacra tyrannina* (Thamnophilidae), *Myrsidea mcleannani* ex *Phaenostictus mcleannani* (Thamnophilidae) and *Myrsidea klimesi* ex *Formicarius analis* (Formicariidae). These are the first records of *Myrsidea* from members of the passerine families Thamnophilidae and Formicariidae. Mites were represented by three species of the genus *Pellonyssus* of which *P. cyanoides* from *Cyanocopsa cyanoides* is the species new to science.

Scientists from the University of Veterinary and Pharmaceutical Sciences in Brno, the Institute of Vertebrate Biology AS CR in Brno, the Institute of Parasitology AS CR in České Budějovice (Czech Republic) and the University of Queensland in Brisbane (Australia) collaborated on the work. We are grateful to the Ministerio del Ambiente y Energía de Costa Rica for permission to conduct our study.

DUSBÁBEK F., LITERÁK I., ČAPEK M., HAVLÍČEK M., 2006: Three species of the genus *Pellonyssus* (Acari: Macronyssidae) including a new species from Costa Rican birds. *International Journal of Acarology* 32: 175-178.

SYCHRA O., LITERÁK I., ČAPEK M., HAVLÍČEK M., 2006: Chewing lice (Phthiraptera) from typical antbirds and ground antbirds (Passeriformes: Thamnophilidae, Formicariidae) from Costa Rica, with descriptions of three new species of the genera *Formicaphagus* and *Myrsidea*. *Zootaxa* 1206: 47-61.

Department of Mammalian Ecology

Head

Assoc. Prof. RNDr. Petr K O U B E K , PhD <koubek@brno.cas.cz>
wildlife ecology and ethology

Research scientists

Mgr. Miroslava B A R A N Ā E K O V Ā , PhD <barancekova@ivb.cz>
wildlife ecology

Assoc. Prof. Ing. Jaroslav Ā E R V E N Ý , PhD <jardaryscervený@brno.cas.cz>
wildlife ecology

RNDr. Marta H E R O L D O V Ā , PhD <heroldova@ivb.cz>
feeding ecology of small mammals

RNDr. Miloslav H O M O L K A , PhD <homolka@ivb.cz>
feeding ecology of herbivorous mammals

Mgr. Eva J Ā N O V Ā , PhD <janova.eva@seznam.cz>
ecology of small mammals

Ing. Jiří K A M L E R , PhD <kamler@ivb.cz>
wildlife ecology

Mgr. Klára P E T R Ž E L K O V Ā , PhD <petrzekova@ivb.cz>
primatology

Mgr. Jarmila P R O K E Š O V Ā , PhD <jprokesova@ivb.cz>
wildlife ecology

Assoc. Prof. Mgr. Vladimír S L Ā D E K , PhD <sladekv@yahoo.fr>
anthropology

Mgr. Jan Z U K A L , PhD <zukal@ivb.cz>
ecology and ethology of bats

PhD students

Mgr. Jana B E D N Ā Ř O V Ā

Mgr. Hana B E R K O V Ā

Ing. Jiří H O N Z Í R E K

Mgr. Michaela N O V Ā K O V Ā

Mgr. Peter V A L L O

Mgr. Martin P O K O R N Ý

Undergraduates

Radim P L H A L

Technicians

Marta H A M A N O V Ā

Jiří C H A M R

Research priorities

Research is focused on the ecology of selected mammalian groups. The results of investigations are aimed to improve management of forest stands, game management, rodent pest control, and protection of biodiversity.

Main research topics:

- feeding ecology of large herbivores and their impact on vegetation
- foraging ecology and anti-predator strategies of bats

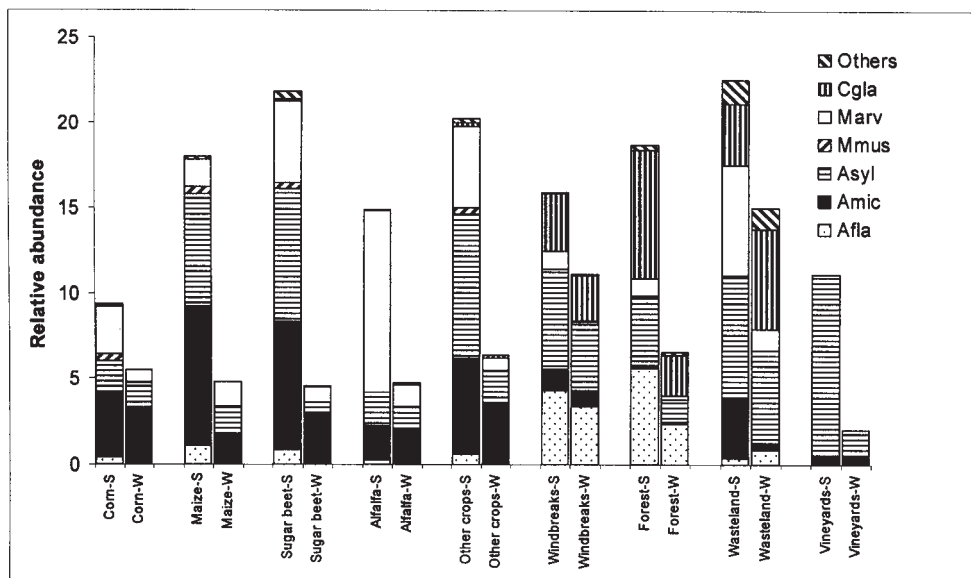
- ecology and behaviour of large carnivores, and foraging ecology and distribution of mustelids
- synecology of small terrestrial mammals
- diversity and ecology of small mammals and ungulates of West Africa

Selected research results

Structure and diversity of small mammal communities in agriculture landscape

Result of six year trappings (51,480 trap/nights, total catch 5,536 small terrestrial mammals) in various field crops and other habitats in a poorly wooded agricultural landscape of southern Moravia (Czech Republic) were presented. Fourteen small mammal species were captured; the relative population density and dominance of each species in each crop and other habitats were evaluated. According to Renkonen's index of similarity small mammal communities could be divided into two main groups: the first comprised windbreaks, small woods and fallow land with high dominance of species with affinity to forest environment; the other group is formed by open habitat communities. These were again divided into two groups: perennial crop group (as alfalfa) and one-year crop group (as corn, sugar beet, maize, and other crops). In the first group with forest affinity a higher diversity of small mammal community compared to second, open habitat one has been found. Changes of diversity index values according to the agrotechnical changes were also evaluated.

HEROLDOVÁ M., BRYJA J., ZEJDA J., TKADLEC E., 2007: Structure and diversity of small mammal communities in agriculture landscape. *Agriculture, Ecosystems & Environment* 120: 206-210.

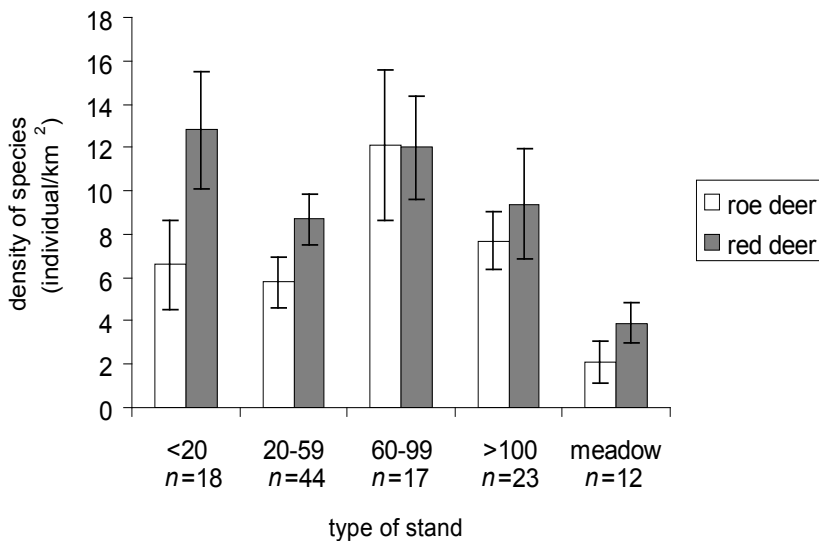


Relative abundance and community structure in spring+summer (S) and autumn+winter (W) samples in habitats studied. Cgla - *Clethrionomys glareolus*, Marv - *Microtus arvalis*, Mmus - *Mus musculus*, Asyl - *Apodemus sylvaticus*, Amic - *A. microps*, Afla - *A. flavicollis*.

Density and distribution of deer in a floodplain forest

Data on the density and distribution of deer help to protect artificial plantations and naturally regenerating stands against browsing damage, to select suitable additional feeding places and to assist in rational game management. Habitat selection by deer is best viewed as a trade-off between selection of cover and selection of food. High primary production, high biodiversity of the floodplain forest ecosystem and agricultural fields situated along the forest offer very specific conditions, which can significantly influence habitat selection of deer species living there. We analysed density and distribution of red deer and roe deer in relation to habitat structure and distribution of food sources during winters 2001–2004 in a floodplain forest along the Morava River. Densities of both species were relatively high (red and roe deer, 9.6 and 7.0 ind./km² respectively). Red deer preferred forest stands with dense cover (60–80 %) and a diversified shrub layer (more than three tree species). Roe deer mainly used old stands of age 50–99 years with a high cover of canopy layer and conversely low cover of herb layer, dominated by bramble. A positive relationship between the distributions of both species was detected. Inter-specific spatial interference was not observed, despite their high densities in the study area.

PROKEŠOVÁ J., BARANČEKOVÁ M., HOMOLKA M., 2006: Density of red deer and roe deer and their distribution in relation to different habitat characteristics in a floodplain forest. *Folia Zoologica* 55: 1–14.



Average values of the roe and red deer density (individual/km²) in forest stands of different age and in meadows.

Flight activity of bats during non-hibernation period

We studied the flight activity of bats under three different conditions: a) emergence and return activity of bats in maternity colonies [1], b) foraging activity of bats [2 and 3], and c) flight activity in the entrance of natural karstic cave [4].

Parameters of return activity generally occurred at lower light intensities than those of emergence at six maternity colonies of pipistrelle bats (*Pipistrellus pipistrellus* and *P. pygmaeus*) in NE Scotland. Therefore, the interval between dawn return and sunrise was generally longer



Křivé Lake (floodplain forest) where the highest bat flight activity was recorded. (Photo by Z. Řehák)

than that between sunset and dusk emergence. Emergence and return were equal in duration. Bats clustered more on emergence in comparison with return during pregnancy and lactation, whereas during postlactation this trend was reversed [1].

The foraging activity of bats was studied in karstic area and various natural forests. Bat detectors were used to record echolocation calls of bats on line transects during the first half of the night. *Myotis daubentonii* was the most numerous species. The number of bat species was the highest in rocky habitats, and the lowest in agrocoenoses. The greatest intensity of flight activity of the bat community was observed over ponds and streams [2]. Generally, the level of flight activity of bats detected in lowland forests was significantly higher compared to the activity in mountain forests. The highest activity was recorded in the floodplain forest. On the contrary, the mountain spruce forest was utilized by bats only scarcely. In lowland forests, the highest activity was registered in the pregnancy period and it gradually decreased towards the end of the season. In mountain forests, the level of activity was rather well-balanced throughout the season. In spite of that the lowest activity was obtained in pregnancy period. In all forest habitats, the flight activity was higher at the beginning of the night than before midnight [3].

Activity patterns of bats were recorded automatically with a double infrared light barrier at the entrance of Kateřinská cave (Czech Republic) too. Five periods were defined on the basis of bat flight activity. All periods showed a non-random temporal distribution and a concentration of flight activity around specific time. There was a positive correlation between the number of bat passes through the entrance and outside ambient temperature and a negative correlation between the number of passes and barometric pressure. Rain had no significant effect on the level of bat activity [4].

1. PETRŽELKOVÁ K.J., DOWNS N.C., ZUKAL J., RACEY P.A., 2006. A comparison between emergence and return activity in pipistrelle bats *Pipistrellus pipistrellus* and *P. pygmaeus*. *Acta Chiropterologica* 8: 381–390.
2. ZUKAL J., ŘEHÁK Z., 2006. Flight activity and habitat preference of bats in a karstic area, as revealed by bat detectors. *Folia Zoologica* 55: 273–281.
3. SIMPROVÁ, P. 2006: Časové změny v letové aktivitě společenstva netopýrů v lesním prostředí [Temporal changes in flight activity of a bat community in forest habitat]. *Bakalářská práce, PŘF MU*: 46 pp.
4. BERKOVÁ H., ZUKAL J., 2006. Flight activity of bats at the entrance of a natural cave. *Acta Chiropterologica* 8: 187–195.

Applications of Research Results

Evaluation of game damage to the field crops

Field crops are extensively damaged by large herbivores in many localities of the Czech Republic. To judge the impact of herbivores on the yield of crop, plants at an early stage of development were experimentally clipped to simulate browsing varying in intensity. In some fields we evaluated the extent and economic effect of wild herbivore damage on main field crops. We also analysed and developed a new method for assessing the damage to crops. The manual elaborated features free living game which cause serious damage to field crops. Pictures of main types of damage to crops are also included.

In general, damage to leaves caused only a small reduction of the yield. Winter wheat or barley crops were not influenced by a considerable reduction of leaves. Only yield of sun flower and winter rape was significantly lower in defoliated plants. Crop damages at the later stages of plant development were more important. In fields connected to the forest edge 5–50% plants were damaged. Our method allows to make accurate estimates of the extent of damages. The study provides practical guidelines for state agencies, wildlife managers and farmers.



Wild boar rooting in a pasture. (Photo by J. Kamler)



Result of roe deer browsing on sunflower. (Photo by J. Kamler)

- CERKAL R., DVORÁK J., KAMLER J., VEJRAŽKA K., 2006. Poškození porostů ječmene býložravci [Game damages to barley]. In: Zimolka J. (ed.), Ječmen – formy a užitkové směry v České republice. Profi Press, Praha; 120–125.
- DVORÁK J., HOMOLKA M., HEROLDOVÁ M., KAMLER J., CERKAL R., LUJC J., SKLÁDANKA J., DOLEŽAL P., 2006. Atlas poškození polních plodin – savci [Atlas of game damages to field crops]. Mendelova zemědělská a lesnická univerzita, Brno, 35 pp.
- KAMLER J., HOMOLKA M., HEROLDOVÁ M., DVORÁK J., 2005. Volně žijící býložravci a polní plodiny [Free living ungulates and field crops]. *Folia Venatoria* 35: 205–210.

International Cooperation

Feeding behaviour, parasite infections and self-medicative abilities of an introduced chimpanzee population

The chimpanzee population on Rubondo Island results from an introduction of 17 individuals in the late 60ties and it is the only example of a viable, long-term self-sustaining released chimpanzee population with a minimum of human intervention at the time of release and afterwards. Our on-going research is aimed to study these chimpanzees as a model population adapted to a new environment from the aspects of feeding behaviour, self-medication, and parasite exchange among released chimpanzees and colobus monkeys (*Colobus guaraza*) and indigenous velvet monkeys (*Cercopithecus aethiops*). Obtained results will contribute to our understanding of chimpanzee behavioural and ecological flexibility and are supposed to help to increase the success of next releases.

We examined the relationship between fruit availability, dietary composition and grouping in the descendents of an introduced chimpanzee population on Rubondo Island. Tree fruit

availability was positively correlated with rainfall, with a period of relative tree fruit scarcity corresponding with the long dry season. Liana fruit availability was not related to rainfall, and lianas exhibited more stable fruiting patterns across seasons. Fruits made up the majority of chimpanzee diet, with lianas accounting for 35% of dietary fruit species. Fruits of the liana *Saba comorensis* were available during all months of phenological monitoring, but they were consumed more when tree fruit was scarce, suggesting that *S. comorensis* fruits may be a fallback food for Rubondo chimpanzees. There were no increases in consumption of lower-quality plant parts between seasons, and there were no changes in nesting group size between seasons. These results contrast with evidence from several endemic chimpanzee study sites, and indicate that Rubondo chimpanzees may experience fewer ecological constraints on dietary quality and grouping patterns.

We identified three nematode species not previously reported in chimpanzees (*Pan troglodytes*) introduced on Rubondo Island, Tanzania: *Protopharynx muricola*, *Subulura* sp., and *Anatrichosoma* sp. The chimpanzee pinworm, *Enterobius anthropopitheci* was redescribed based on light and scanning electron microscopy of both sexes collected from the feces of Rubondo chimpanzees.

HASEGAWA H, IKEDA Y, FUJISAKI A, MOSCOVICE L.R, PETRZELKOVA K.J., KAUR T, HUFFMAN M.A., 2005: Morphology of chimpanzee pinworms, *Enterobius (Enterobius) anthropopitheci* (Geddoelst, 1916) (Nematoda: Oxyuridae), collected from chimpanzees, *Pan troglodytes*, on Rubondo Island, Tanzania. *Journal of Parasitology* 91: 1314-1317.

MOSCOVICE L. R., ISSA M.H., PETRZELKOVA K.J., KEULER N.S., SNOWDON C.T., HUFFMAN M.A., 2007: Fruit availability, chimpanzee diet and grouping patterns on Rubondo Island, Tanzania. *American Journal of Primatology* 69: 1-16.

PETRZELKOVA K.J., HASEGAWA H., MOSCOVICE L.R., KAUR T, ISSA M., HUFFMAN M.A., 2006: Parasitic nematodes in the chimpanzee population on Rubondo Island, Tanzania. *International Journal of Primatology* 27:767-777.

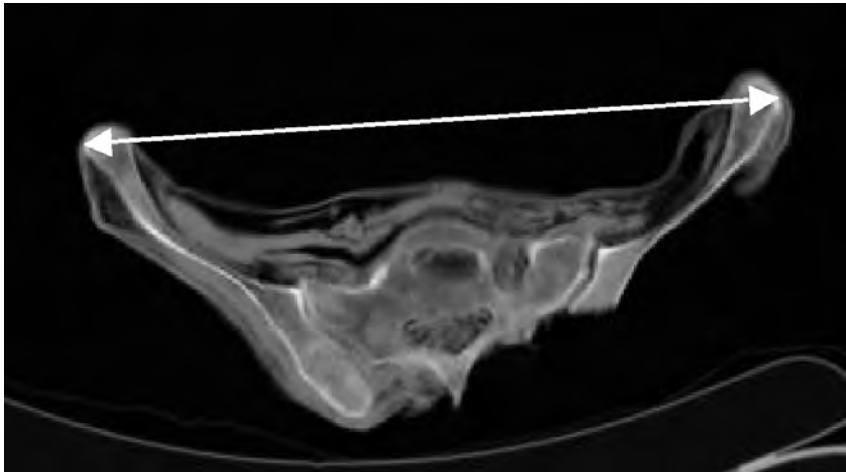


Mother and baby chimpanzee. (Photo by K. J. Petrželková)

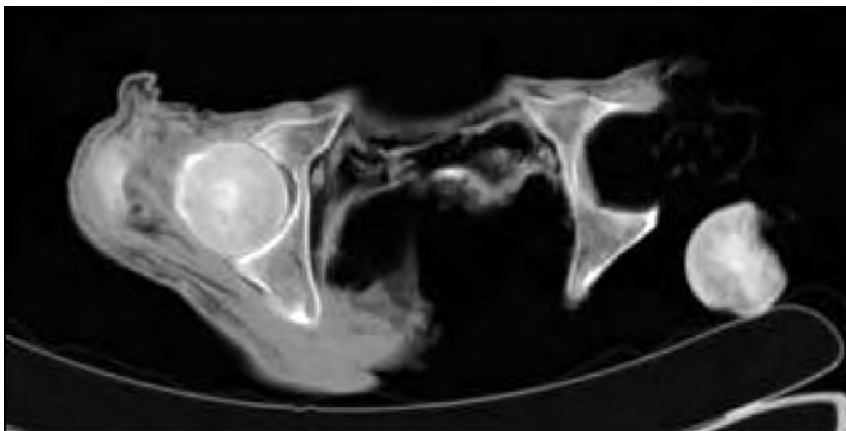
Body proportion and bone biomechanics of the Tyrolean “Iceman” (Ötzi)

Body mass and structural properties of the femoral and tibial midshafts of the “Iceman” (Ötzi), a late Neolithic (5200 BP) mummy found in the Tyrolean Alps, are determined from computed tomographic scans of his body, and compared with those of a sample of 139 males spanning the European Early Upper Paleolithic through Bronze Age. Two methods, based on femoral head breadth and estimated stature and bi-iliac (pelvic) breadth, yield identical body mass estimates of 61 kg for the Iceman. In combination with his estimated stature of 158 cm, this indicates a short but relatively wide, or stocky body compared to our total sample. His femur is about average in strength for Neolithic males, but his tibia is well above average. His femur also shows adaptations for his relatively broad body (mediolateral strengthening), while his tibia shows adaptations for high mobility over rough terrain (anteroposterior strengthening). In many respects his tibia more closely resembles those of European Mesolithic rather than Neolithic males, which may reflect a more mobile lifestyle than was characteristic of most Neolithic males, perhaps related to a pastoral subsistence strategy. There are indications that mobility in

(a)



(b)



Transverse CT scans through pelvic region (a) and CT scans of femoral heads used for body size estimate (b) (Iceman, 5200 B.P.). Left femur is postmortem dislocated from acetabulum.

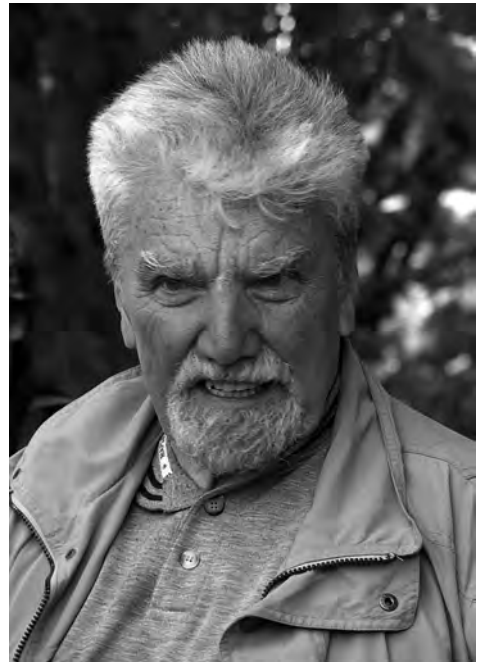
general declined between the European Mesolithic and Neolithic, and that body size and shape may have become more variable throughout the continent following the Upper Paleolithic.

The research was led by Christopher Ruff (Johns Hopkins University School of Medicine) with cooperation from United States (Brigitte Holt, University Massachusetts; William A. Murphy, University of Texas), Czech Republic (Vladimír Sládek, Institute of Vertebrate Biology) and Austria (Margit Berner, Naturhistorisches Museum; Dieter zur Nedden, Wolfgang Recheis, University of Innsbruck; Horst Seidler, University of Vienna).

RUFF C., HOLT B., SLÁDEK V., BERNER M., MURPHY W.A., NEDDEN D., SEIDLER H., RECHEIS W., 2006: Body size, body proportions, and mobility in the Tyrolean "Iceman". *Journal of Human Evolution* 51: 91-101.

OBITUARY

Zdeněk Veselovský (1928–2006)



Zdeněk Veselovský at the Prague Zoo in the summer of 2006 (photo by A. Pospěch).

Professor Zdeněk Veselovský was a distinguished zoologist who was a source of great inspiration to generations of ornithologists, mammalogists, and behavioural biologists in the Czech Republic. He was born in Jaroměř on 26 August 1928 and died on 24 November 2006 in Prague.

Zdeněk Veselovský was a naturalist of very broad competence, and his skills for popularization of the animal world to wide public were particularly recognized and appreciated. He was the author of more than 100 research papers and he published 35 books and textbooks. He had worked for almost 30 years as the director of the Prague ZOO (1959–1988), and he was later appointed as the professor of zoology at universities in České Budějovice and Prague.

He was a research fellow of the Institute during a short period in 1992 and 1993. This employment, provided by the Academy of Sciences, was quite important for Zdeněk Veselovský, because it enabled him to continue his scientific career in uneasy times of his life.

Zdeněk Veselovský was a man with great enthusiasm, curiosity and love of nature. His deep knowledge and warm friendly personality will be greatly missed by many.

AWARDS

In 2004, Zdeněk Hubálek was awarded the Prize of the Academy of Sciences of the Czech Republic for his studies on biology of West Nile virus, the agent of encephalitis in some vertebrates including humans. The results were published in 17 scientific papers and received a wide international response (the principal 1999 paper has been cited 224 times up to February 2007). Zdeněk Hubálek's long-term research concentrates on the ecology of arthropod-borne viruses and bacteria pathogenic for vertebrates, such as arboviruses and Lyme disease borreliae, and his papers have been cited almost 1 400 times. He has been assessing potential role of free-living birds in dispersal of pathogenic bacteria and viruses and is involved in the EDEN project of the 6th Framework Programme (West Nile virus, tick-borne diseases). Z. Hubálek is a member of two expert commissions of WHO.



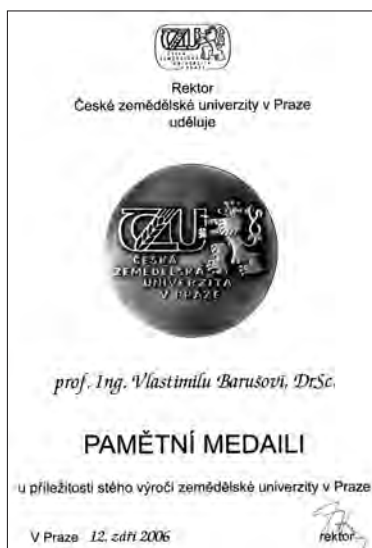
Zdeněk Hubálek (right) receives the 2004 Prize of the Academy of Sciences of the Czech Republic from the former president of the Academy of Sciences of the Czech Republic Helena Illnerová (left). Archives of the Press Department of the AS CR.

In 2005, Martin Reichard was awarded the Otto Wichterle Prize for his studies on general processes in population, behavioural and evolutionary biology. He uses fishes as a model group. His current research has concentrated on the evolution of reproductive strategies and mating systems, co-evolutionary dynamics and the effect of individual behaviour on population processes. He further investigates the ecology of early developmental stages of fish with a special attention to larval dispersal and the effects of biotic and abiotic factors on the success of natural reproduction. He is also involved in several projects on the ecology of tropical fishes in Senegal, Bangladesh, and China.



The Otto Wichterle Prize award ceremony 2005. Martin Reichard (left) receives the Otto Wichterle Prize for young scientists from the president of the Academy of Sciences of the Czech Republic Václav Pačes (right). Photo by M. Hužvárová.

In 2006, the rector of Czech University of Agriculture in Prague awarded Vlastimil Baruš, director of the former Institute of Vertebrate Zoology and the Institute of Systematic and Ecological Biology CS AS, a commemorative medal which was struck in honour of the 100th anniversary of the university.



Commemorative medal of Czech University of Agriculture in Prague.

INTERNATIONAL ACTIVITIES

The Institute's international collaboration is a very important part of its all research activities. Our scientists work in close collaboration and exchange their views with scholars from various institutions in many countries. Each department is involved in various forms of international co-operation and we have recently been participating in 20 international projects including six projects within the EU Sixth Framework Programme. We have been deriving much benefit from established links with foreign laboratories, however, we use any opportunity to find new contacts. The Institute organizes scientific meetings, offers study visits to foreign students and supports participation of our specialists in major scientific events abroad. Great emphasis is placed on young scientist-centred educational stays. Our scientists are members of 38 international organizations and 8 editorial boards, respectively.

International scientific meetings organized by the Institute

- 8th SE European Bird Migration Network Workshop, Prague, Czech Republic, February 2-5, 2006

The 8th Workshop of Southeast European Bird Migration Network (SEEN) was jointly organized by the Institute of Vertebrate Biology and the Faculty of Science of Charles University. SEEN workshops present a fruitful discussion platform for investigators of avian migration along the less studied southeastern European flyway. A total of 46 participants from 15 countries attended the workshop. The majority of the studies reported on results of orientation experiments, however, several participants demonstrated that also other approaches, such as satellite telemetry or stable isotope analysis are being adopted. These modern methods have challenged the traditional view of avian migrations and enable to answer hitherto unthinkable questions. An important lecture was held by Zdeněk Hubálek from the Department of Medical Zoology, Institute of Vertebrate Biology of the ASCR on avian influenza, followed by a discussion how the network could contribute to the understanding of possible spread of the H5N1 virus. The next workshop will be held in Kraków in 2007.

- Conference “Zoologické dny 2006” [Zoological Days 2006], Brno, February 9-10, 2006

Long-term tradition of the “Zoological days” conference goes back to 1969 and it is connected with the Institute of Vertebrate Biology and the former Institute of Vertebrate Zoology. Nevertheless, its scope and contents has changed as all lifestyle in the Czech Republic after the velvet revolution in 1989. Former meeting of Czech and Slovak zoologists serving as forum of the Czech Zoological Society (co-organizer) became a serious yearly scientific conference where mainly students and young researchers present actual results of their research focussed on various aspects of both vertebrate and invertebrate zoology. The student competition is organized thanks to the sponsorship of the OLYMPUS company which became a regular co-operative partner of the conference. In 2006, six students received awards for their outstanding presentations. Since students presented at least half of all posters and lectures (total number of presentations: 143 lectures and 136 posters) this sponsorship was a great help. Since 2003, the conference has been held at the Faculty of Science, Masaryk University Brno (co-organizer) and approximately 350 both professional and amateur zoologists from the Czech and Slovak Republics participated in it every year.



Participants of the conference watching a presentation in a lecture theatre at Masaryk University (photo by M. Stanko).

Participation in international conferences

- ESF BIRD Final Conference, Wilhelmshaven, Germany, February 16–20, 2005
- Man and Biosphere Meeting, Simenti, Senegal, March 1–2, 2005
- Annual International Symposium FSBI: Fish Habitat Ecology and Conservation, Bangor, Wales, United Kingdom, July 18–22, 2005
- 9th International Congress of Mammalogy, Sapporo, Japan, July 31 – August 5, 2005
- 10th Congress of European Society for Evolutionary Biology, Krakow, Poland, August 15–20, 2005
- 29th Ethological Conference, Budapest, Hungary, August 20–27, 2005
- 5th Conference of the European Ornithologists' Union, Strasbourg, France, August 20–23, 2005
- 10th European Bat Research Symposium, Galway, Ireland, August 21–26, 2005
- Applied Ornithology 2005, Zvolen, Slovakia, September 16–17, 2005
- 13th Meeting of the International Hamsterworkgroup, Illmitz, Austria, October 14–17, 2005
- 5th Asia-Pacific Congress of Entomology, Jeju, South Korea, October 18–21, 2005
- European Otter Workshop, Padula, Italy, October 20–23, 2005
- Ecology of Stream Fish: State of the Art and Future Prospects II, León, Spain, June 12–16, 2006
- EIFAC International Symposium, Mondsee, Austria, June 12–17, 2006
- 11th International Behavioral Ecology Congress, Tours, France, July 23–29, 2006
- Genetics of speciation, Vancouver, Canada, July 21–24, 2006
- Behavioral Ecology Congress, Tours, France, July 23–30, 2006
- International Congress of Parasitology, Glasgow, United Kingdom, August 6–11, 2006

- 24th International Ornithological Congress, Hamburg, Germany, August 13–19, 2006
- 36th International Conference, International Association for Danube Research, Vienna, Austria, September 4–8, 2006
- Applied Ornithology 2006, Zvolen, Slovakia, September 8–9, 2006

Membership in international organizations

ALBRECHT T.	International Society for Behavioral Ecology (ISBE)
BARUŠ V.	Sociedad Cubana de Parasitología Animal, honorary chairman
BÍMOVÁ B.	International Mammalian Genome Society
BRYJA J.	Steering Committee of European Science Foundation
ČAPEK M.	IOC Standing Committee on Ornithological Nomenclature
ČERVENÝ J.	Ad Hoc Group for Environmental Problems of COST (Council for Research and Development, EU) Czech National Committee of the MAB Programme Working Group for Large Carnivores Initiative for Europe
GVOŽDÍK L.	American Society of Ichthyologists and Herpetologists American Society of Naturalists British Herpetological Society Society for the Study of Amphibians and Reptiles Society for the Study of Evolution Steering Committee of European Science Foundation
HONZA M.	Steering Committee of European Science Foundation
JURAJDA P.	Fisheries Society of British Isles
MARTÍNKOVÁ N.	Society of Systematic Biologists
MRLÍK V.	Peregrine Fund, World Center for Birds of Prey Working Group for Montagu's Harrier World Working Groups on Birds of Prey and Owls
KOUBEK P.	Working Group for Large Carnivores Initiative for Europe
PIÁLEK J.	European Society for Evolutionary Biology International Mammalian Genome Society Societas Europea Herpetologica Society for the Study of Amphibians and Reptiles Society for the Study of Evolution
PROCHÁZKA P.	Deutsche Ornithologen-Gesellschaft
REICHARD M.	Association for the Study of Animal Behaviour British Ecological Society European Society for Evolutionary Biology Fisheries Society of the British Isles
SLÁDEK V.	Paleoanthropology Society (USA)
ZIMA J.	Czech National Committee of the IUBS International Advisory Board, BIOTER Centre of Excellence (EU) Insectivores Specialists Group SSC IUCN International <i>Sorex araneus</i> Cytogenetics Committee Rodents Specialists Group SSC IUCN Societas Europaea Mammalogica

Membership in editorial boards

BARUŠ V.	Transactions of the Zoological Society of India Helminthologia
BLAHÁK, P.	Folia Zoologica (managing editor)
GVOŽDÍK, L.	Folia Zoologica
HONZA M.	Folia Zoologica
HUBÁLEK Z.	Cryobiology Folia Parasitologica
KOUBEK, P.	Folia Zoologica
LUSK S.:	Folia Zoologica
PEŇÁZ M.	Folia Zoologica (editor-in-chief) Quaderni E.T.P. - Journal of Freshwater Biology Polskie Archiwum Hydrobiologii
SLABÁKOVÁ H.	Folia Zoologica
ZIMA J.	Hystrix - Italian Journal of Mammalogy Folia Zoologica

EDUCATION AND TEACHING ACTIVITIES

The Institute lays great emphasis on education and teaching activities. In 2005–2006, we gave lectures at seven faculties of seven universities and supervised 61 undergraduates and 53 postgraduates from 11 faculties of eight universities. Another important fact is that 19 and 9 students supervised by the staff succeeded in obtaining their MSc and PhD degrees, respectively. We have accreditation from the Ministry of Education, Youth and Sports of the Czech Republic to perform post-gradual studies in zoology at the Faculty of Science, Masaryk University in Brno, and the Faculty of Biological Sciences, South Bohemian University in České Budějovice. We participate in research projects carried out in two joint laboratories, "Evolutionary Genetics of Animals" (established by the Department of Zoology, Faculty of Science, Charles University in Prague, the Institute of Animal Physiology and Genetics AS CR in Liběchov and the Institute of Vertebrate Biology in Brno) and "Ichthyoparasitology - The Centre of Basic Research" (established by the Faculty of Science, Masaryk University in Brno and the Institute of Vertebrate Biology in Brno). These laboratories provide a firm basis for better interaction between the Academy of Sciences CR and universities, which helps to make the institute attractive to students. Moreover, the scientists of the Institute are members of scientific councils and boards at universities.

Teaching at universities

Lecturer	Subject	2005 hours	2006 hours	Faculty/ University
Albrecht T.	Modern statistical methods	20	20	6
Bryja J.	Molecular ecology	24	24	1
	Population ecology	8	8	1
Čapek M.	Ornithology	48	48	1
Červený J.	Vertebrate Zoology	28	28	7
	Field course of zoology	60	60	2
	Zoology for game-keepers	26	26	7
Halouzka J.	Tutorials in immunology	8	8	1
Honza M.	Ecology of birds	26	26	1
Hubálek Z.	Fundamentals of microbiology	30	30	1
	Microbial zoonoses and sapronoses	30	30	1
	Tutorials in microbiology	60	60	1
Jurajda P.	Ecology of fish	26	26	1
Koubek P.	Game biology	22	22	1
Lusk S.	Ichthyology	36	36	1
Prokeš M.	Ichthyology	4	4	3
Sládek V.	Biological anthropology 2	54	54	4
	Biological anthropology for archeologists 1	65	65	4
	Biological anthropology for archeologists 2	65	65	4
	Human variability and adaptability	54	54	4
	Locomotor system 1	65	65	4
	Tutorials in anthropology	13	13	4
Svobodová J.	Animal ecology	14	14	7
	Biodiversity	3	3	7
	Ecological methods	8	8	7
	Field course of nature preservation	42	42	7
	Field course of zoology	17	17	7

	General ecology	28	28	7	
	Zoology	52	52	7	
Tkadlec E.	Life history	30	30	5	
	Population ecology	45	45	5	
	Scientific methodology	30	30	5	
	Time series in ecology	15	15	5	
	Tutorials (MSc students)	30	30	5	
	Tutorials (PhD students)	20	20	5	
Zima J.	Biodiversity	26+26	26+26	1,6	
	Field course of zoology	42	42	6	
	Genetical methods in zoology	12	12	6	
	Systematics and phylogeny of vertebrates	13	13	6	
Zukal J.	Behavioral ecology	45	45	1	
	Ethology	26	26	1	
	Chiropterology	22	22	1	
Total	16	42	1333	1333	7/7

¹ Faculty of Science, Masaryk University, Brno

² Department of General Zoology, University of Essen

³ Faculty of Agronomy, Mendel University of Agriculture and Forestry, Brno

⁴ Faculty of Humanities, University of West Bohemia, Plzeň

⁵ Faculty of Science, Palacký University, Olomouc

⁶ Faculty of Science, Charles University, Prague

⁷ Faculty of Forestry and Environment, Czech University of Agriculture, Prague

Undergraduate students working in the Institute and/or supervised by the Institute's fellows in 2005-2006

Student	Supervisor/ Consultant	2005	2006	Defended the theses	Faculty/ University
Bartoňová E.	Lusková V.	+	+		1
Bednářová J.	Zukal J.	+	+		1
Bejdák P.	Bryja J.		+		1
Bémová P.	Bryja J.	+		2005	9
Bencová V.	Bryja J.	+		2005	1
Bendová P.	Jurajda P.	+	+		7
Daniszová K.	Červený J.	+	+	2006	8
Dařenová E.	Bryja J.	+	+	2006	1
Doležálková I.	Hubálek Z.		+		1
Dufková P.	Piálek J.	+	+	2006	9
Fainová D.	Procházka P.		+		9
Fornůsková A.	Bryja J.		+		1
Franěk J.	Zukal J.	+	+	2006	1
Friedl L.	Sládek V.	+	+	2006	6
Gryc L.	Zukal J.	+	+	2006	1
Hnojská V.	Sládek V.		+		6
Hrabec M.	Kamler J.	+	+		3
Hoening V.	Hubálek Z.	+	+		1
Jamrich A.	Gvoždík L.	+	+	2006	11
Janková J.	Hubálek Z.	+	+		1
Jarošová V.	Hubálek Z.	+	+		1
Javůrková V.	Albrecht T.	+	+		7

Kalinová Z.	Koubek P.		+		10
Konečná G.	Jurajda P.		+		1
Konečný A.	Bryja J.	+		2005	1
Koubínová D.	Zima J.	+	+		8
Koubová M.	Svobodová J.	+	+		9
Křížová P.	Bryja J.		+		1
Loudová J.	Svobodová J.	+	+		10
Mazurová E.	Jurajda P.	+	+		1
Měřáková E.	Gvoždík L.		+		1
Michálek B.	Tkadlec E.	+	+		7
Mikeska M.	Čapek M.	+		2005	2
Mrštný L.	Červený J.	+	+	2006	10
Nentvichová M.	Červený J.	+	+	2006	10
Novák Z.	Červený J.	+		2005	8
Ondrouchová H.	Bryja J.		+		1
Pankowská A.	Sládek V.	+	+		6
Paták Ladislav	Tkadlec E.	+	+		1
Patzenhauerová H.	Bryja J.	+	+		1
Patzenhauerová H.	Bryja J.	+		2005	1
Petrášová I.	Reichard M.		+		1
Polačik M.	Jurajda P.	+	+		1
Promerová M.	Bryja J.	+	+		1
Průchová E.	Sládek V.	+		2005	5
Průchová E.	Sládek V.	+	+	2006	6
Rybaříková J.	Honza M.	+		2005	1
Řežucha R.	Reichard M.		+		1
Simprová P.	Zukal J.		+		1
Slavíková K.	Zukal J.	+	+		1
Staněk D.	Zukal J.	+	+		1
Suvorov P.	Albrecht T.	+	+		8
Svobodová P.	Hubálek Z.		+		1
Šovčík P.	Prokeš M.	+	+		4
Štrom V.	Reichard M.		+		1
Švanyga J.	Jurajda P.	+	+		1
Tkadlčíková R.	Tkadlec E.	+	+		7
Vávra F.	Tkadlec E.	+	+		7
Vinkler M.	Albrecht T.	+	+		8
Vrtílek M.	Reichard M.		+		1
Zemanová B.	Bryja J.	+	+	2006	1
Zifčák P.	Tkadlec E.	+	+		7
Total 61	20	46	54	19	11/8

¹ Faculty of Science, Masaryk University, Brno

² Faculty of Arts, Masaryk University, Brno

³ Faculty of Forestry and Wood Technology, Mendel University of Agriculture and Forestry, Brno

⁴ Faculty of Agronomy, Mendel University of Agriculture and Forestry, Brno

⁵ Faculty of Humanities, University of West Bohemia, Plzeň

⁶ Faculty of Arts, University of West Bohemia, Plzeň

⁷ Faculty of Science, Palacký University, Olomouc

⁸ Faculty of Science, Charles University, Prague

⁹ Faculty of Biological Sciences, University of South Bohemia, České Budějovice

¹⁰ Faculty of Forestry and Environment, Czech University of Agriculture, Prague

¹¹ Faculty of Science, Komenský University, Bratislava, Slovakia

PhD students working in the Institute and/or supervised by the Institute's fellows in 2005-2006

Student	Supervisor/ Consultant	2005	2006	Defended the theses	Faculty/ University
Barančeková M.	Koubek P.	+		2005	1
Bednářová J.	Zukal J.	+	+		1
Berková H.	Zukal J.	+	+		1
Bimová B.	Piálek J.	+	+		5
Čížková D.	Bryja J.		+		1
Daďourek M.	Tkadlec E.	+	+		4
Dufková P.	Piálek J.		+		6
Ďureje E.	Piálek J.	+	+		1
Dvořák J.	Gvoždík L.	+	+		1
Fejková P.	Červený J.	+	+		5
Foltánková V.	Reichard M.	+	+		1
Gregor P.	Tkadlec E.	+	+		4
Hájková P.	Jurajda P.	+	+		1
Hejtmánková M.	Gvoždík L.	+	+		4
Honzírek J.	Koubek P.	+	+		2
Horák A.	Piálek J.	+	+		6
Horák V.	Lusk S.	+		2005	1
Hulová Š.	Bryja J.		+		6
Janáč M.I	Jurajda P.	+	+		1
Jánová E.	Tkadlec E.	+	+		1
Kocurová M.	Červený J.	+	+		5
Konečná M.	Reichard M.		+		1
Konečný A.	Bryja J.	+	+		1
Lazarová J.	Zima J.	+		2005	5
Ležalová R.	Honza M.	+	+		6
Lisická L.	Tkadlec E.	+	+		4
Losík J.	Tkadlec E.	+	+		4
Mendel J.	Lusková V.	+	+		1
Měštková L.	Červený J.	+	+		5
Mikulíček P.	Piálek J.	+		2005	5
Němečková I.	Mrlík V.	+	+	2006	1
Nová P.	Zima J.	+	+	2006	5
Novák V.	Zukal J.	+	+		1
Nováková M.	Koubek P.	+	+		1
Pokorný M.	Zukal J.	+	+		1
Polačík M.	Jurajda P.	+	+		1
Polačiková L.	Honza M.	+	+		1
Poláková R.	Bryja J.		+		1
Požgayová M.	Honza M.	+	+		1
Prokešová J.	Homolka M.	+		2005	1
Sychra J.	Adámek Z.	+	+		1
Šicha V.	Honza M.	+	+		1
Šikutová S.	Halouzka J.	+	+		1
Švanyga J.	Jurajda P.	+	+		1
Thelenová J.	Tkadlec E.	+	+		4
Třebatická L.	Tkadlec E.	+	+		4
Valová Z.	Jurajda P.	+	+		1
Vallo P.	Koubek P.	+	+		1
Varfálvyová D.	Tkadlec E.	+	+		4
Vetešník L.	Lusk S.	+		2005	3

Vyskočilová M.	Piálek J.	+		2005	1
Zachařová J.	Červený J.	+	+		5
Zemanová B.	Bryja J.		+		1
Total	53	16	47	46	9
					6/5

¹ Faculty of Science, Masaryk University, Brno

² Faculty of Forestry and Wood Technology, Mendel University of Agriculture and Forestry, Brno

³ Faculty of Agronomy, Mendel University of Agriculture and Forestry, Brno

⁴ Faculty of Science, Palacký University, Olomouc

⁵ Faculty of Science, Charles University, Prague

⁶ Faculty of Biological Sciences, University of South Bohemia, České Budějovice

EDITORIAL ACTIVITIES

The „Institute“ publishes the international journal „*Folia Zoologica*“. The journal is covered by many reference journals, including the Current Contents. The current value of the impact factor for 2005 amounts 0.585.

Publisher and address of Editorial Office:

Institute of Vetebrate Biology AS CR, v. v. i. Květná 8, 603 65 Brno, Czech Republic.

e-mail: editorfz@brno.cas.cz

Editor-in-Chief: Milan P E Ň Á Z , Brno
Associate Editors: Gordon H. C O P P , Lowestoft
Richard H.K. M A N N , Huntingdon
Christopher F. M A S O N , Colchester

Managing Editor: Pavel B L A H Á K , Brno

Subject Editors:
mammalogy: Jan Z I M A
ornithology: Marcel H O N Z A
herpetology: Lumír G V O Ž D Í K
ichthyology: Stanislav L U S K
monographs: Petr K O U B E K
book reviews: Hana S L A B Á K O V Á

Folia Zoologica appears in three series:

- (1) basic series - published quarterly, 4 issue s, 1 volume per year
- (2) *Folia Zoologica Monographs* - published occasionally
- (3) *Folia Zoologica Supplements* - published occasionally, usually containing contributions from important international meetings

From 2005 through 2006, altogether 102 papers were published (2005: 57, 2006: 45) of which 48 articles concerning ichthyology (2005: 24, 2006: 24), 37 mammalogy (2005: 30, 2006: 17), 15 ornithology (2005: 12, 2006: 3) one batrachology (2006), and one article was interdisciplinary (2005), respectively.

The authors originate from 26 countries, as follows: Czech Republic 75 articles (2005: 52, 2006: 23), Spain 32 (2005: 12, 2006: 20), Poland 24 (2005: 11, 2006: 13), Germany 19 (2005: 13, 2006: 6), United Kingdom 17 (2005: 5, 2006: 12), Portugal 16 (2005: 3, 2006: 13), Slovakia 16 (2005: 10, 2006: 6), China 15 (2005: 13, 2006: 2), Croatia 15 (2005: 10, 2006: 5), Turkey 14 (2005: 9, 2006: 5), Italy 13 (2005: 8, 2006: 5), Belgium 11 (2005), Russia 9 (2005: 8, 2006: 1), Greece 8 (2005: 5, 2006: 3), Argentina 7 (2005: 4, 2006: 3), Hungary 5 (2005: 3, 2006: 2), Austria 4 (2005: 1, 2006: 3), Iran 4 (2006), Slovenia 4 (2005), Belarus 3 (2005), France 3 (2005: 1 2006: 2), Finland 2 (2006), New Zealand 2 (2005: 1, 2006: 1), Lithuania 1 (2006), Uganda 1 (2006), and USA 1 (2006), respectively.

Biennial Report 2005–2006

Periodical continuation of the former Institute's bulletins *Vertebratologické Zprávy* (1969–1987), *Zprávy ÚSEB* (1988–1991) and the *ILE Biennial Report* (1993–1994).

Edited by Miroslav Čapek, Hana Slabáková and Jan Zima

Published by the Institute of Vertebrate Biology ASCR, v. v. i., Brno

Graphic design by Jan Dungal

Printed by Metoda spol. s. r. o., Brno

© Institute of Vertebrate Biology, Academy of Sciences of the Czech Republic, v. v. i.

ISBN 978-80-903329-8-0

CONTENTS

Contents	3
Preface	5
Structure of the Institute of Vertebrate Biology of the Academy of Sciences of the Czech Republic (until December 31, 2006)	6
Structure of the Institute of Vertebrate Biology of the Academy of Sciences of the Czech Republic, v. v. i. (since January 1, 2007)	7
Addresses	8
Management and Services	9
Scientific Council (until December 31, 2006)	10
Council of the Institute (since January 1, 2007)	10
Research projects	11
Institutional Research Plan	11
Projects supported by the Grant Agency of the Academy of Sciences of the CR	11
Projects supported by the Grant Agency of the CR	12
Projects supported by the Ministry of Agriculture	13
Projects supported by the Ministry of Environment	13
Projects supported by the Ministry of Education, Youth and Sport	13
International projects	13
List of publications	16
Books, textbooks, edited proceedings	16
Chapters in books	16
Papers in journals included in the databases ISI Web of Knowledge	17
Papers in other refereed journals	21
Papers in proceedings	22
Book reviews	25
Popularization books and articles	26
Principal scientific divisions	27
Department of Medical Zoology	27
Department of Population Biology	32
Department of Ichthyology	40
Department of Fish Ecology	50
Department of Avian Ecology	58
Department of Mammalian Ecology	64
Obituary	73
Awards	74
International activities	76
International scientific meetings organized by the Institute	76
Participation in international conferences	77
Membership in international organizations	78
Membership in editorial boards	79
Education and teaching activities	80
Teaching at universities	80
Undergraduate students	81
PhD students	83
Editorial activities	85

PREFACE

I am glad to introduce this traditional report summarizing the main results of scientific activities of the Institute during the last two years. The most important event in this period was the transformation of the Institute into a public research institution. This process was completed at the end of 2006.

The Academy of Sciences of the Czech Republic has undergone profound changes in relation to varied scientific and organisational aspects since its foundation in 1993. This transformation included also human resources and the Academy has become a modern, democratically administrated cluster of autonomous, non-university research institutes. The institutes of the Academy of Sciences were state contributory organisations, which was quite unusual legal form within the European Union. The legal subjectivity of the institutes was restricted, and this fact weakened their independency in respect of both the economic area and the cooperation with other subjects.

The acceptance of Act No. 341/2005 Coll. on Public Research Institutions made it possible to remove these deficiencies. The act introduced a new form of legal entity – a public institution, with principal activities in the research area and with significant provision of an infrastructure for research. Besides the main research performance, the Institute may now realize also secondary and other activities for profit, subject to legal restrictions.

After January 1, 2007, further transformation steps follow. The members of the Council of the Institute have been elected, and public competition for the post of the director has been announced. All these changes will certainly have a profound influence on the life and the research performance of the Institute in the future.

The last two years can be considered fruitful for the Institute and its staff. The fellows were particularly successful in raising funds for grant projects. The institutional budget assigned from the state contribution in the frame of the Institutional Research Plan achieved approximately 22 and 23 million CZK in 2005 and 2006, respectively. Additional 14 million CZK were provided in both the years for investment into laboratory equipment and maintenance of buildings. Research grants and diverse contracting funding contributed to the budget with 16 and 26.5 million CZK in 2005 and 2006, respectively.

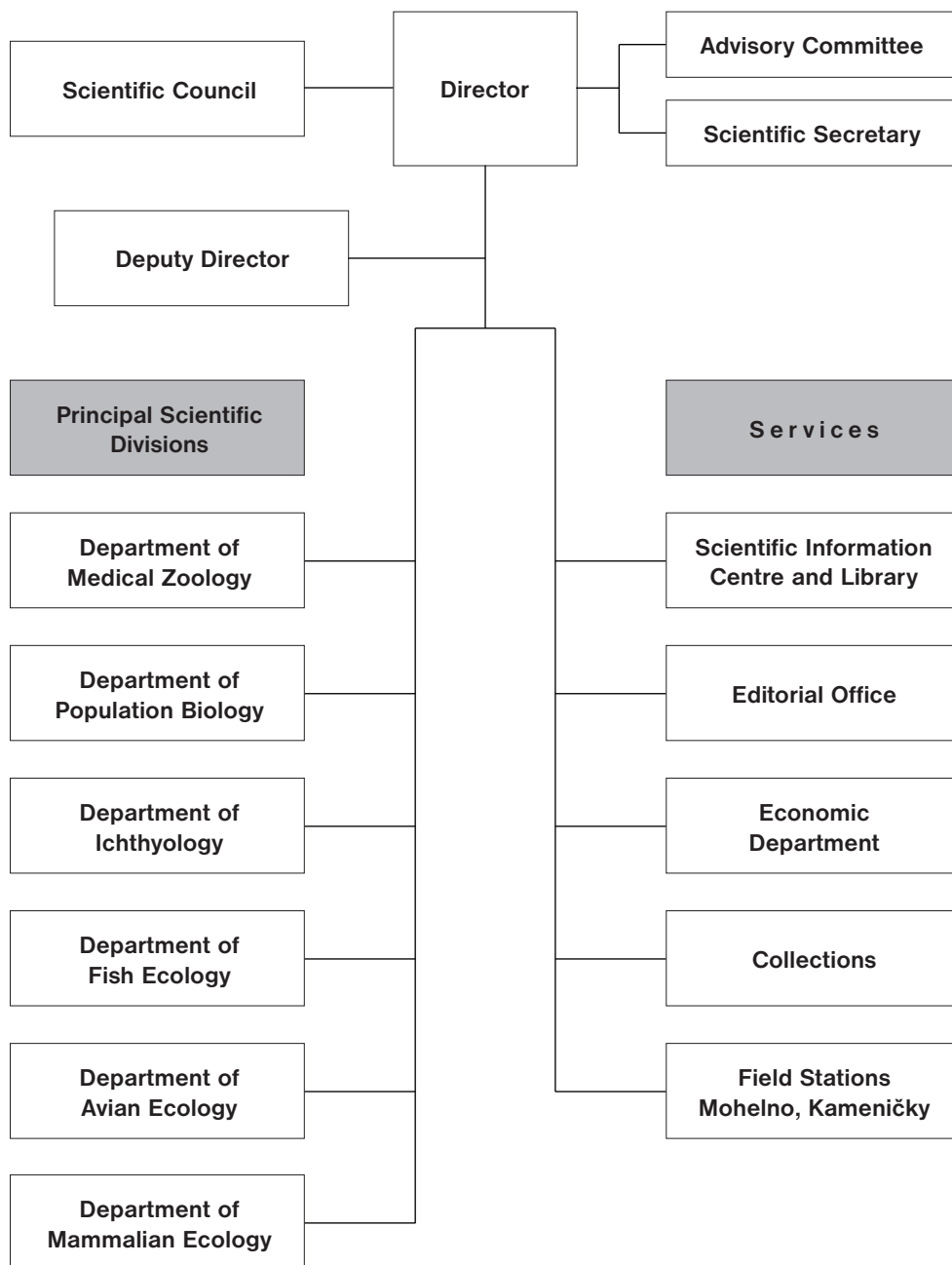
In the previous two years, the Institute employed 61 fellows paid from the institutional sources, and additional 36 fellows were contracted on the basis of research grant funding. In the respective period, 18 foreign workers were employed.

The scientific achievements of the Institute are summarized in the list of publications. Altogether, 267 scientific contributions authored by the fellows of the Institute were published in 2005–2006. Almost 100 papers appeared in international journals included in databases of the Web of Science. The total impact factor of these publications was 69.7 in 2005 and 67.1 in 2006, what indicates a remarkable increase in comparison with 2003 and 2004 (total impact factor of 40.4 and 46.9, respectively). I hope the Institute will continue this successful development towards research excellence also in the next years.

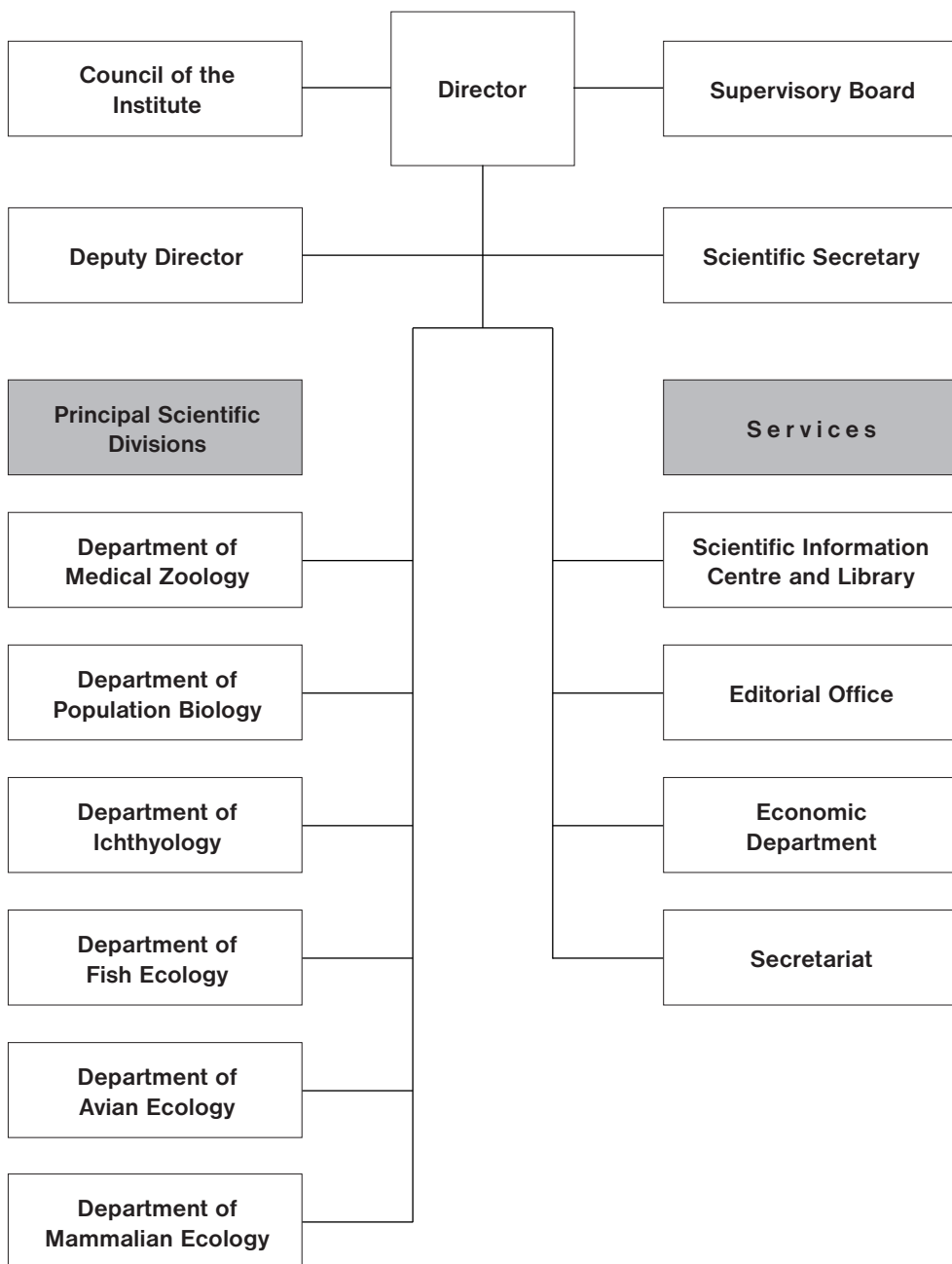
Jan Zima



**STRUCTURE OF THE INSTITUTE OF VERTEBRATE BIOLOGY
OF THE ACADEMY OF SCIENCES OF THE CZECH REPUBLIC**
(until December 31, 2006)



**STRUCTURE OF THE INSTITUTE OF VERTEBRATE BIOLOGY
OF THE ACADEMY OF SCIENCES OF THE CZECH REPUBLIC, v. v. i.
(since January 1, 2007)**



ADDRESSES

Headquarters

Institute of Vertebrate Biology of the ASCR, v. v. i.
Květná 8
603 65 Brno, Czech Republic
Phone: ++420-543422540; ++420-543211538
Fax: ++420-543211346
ubo@brno.cas.cz, ubo@ivb.cz
Website: <http://www.ivb.cz>

External Workplaces & Field Stations

Department of Medical Zoology, Animal House Facility

Klášterní 2
691 42 Valtice
Phone: ++420-519352961
Fax: ++420-519352387
jhalouzka@brno.cas.cz

Department of Population Biology, Animal House Facility

Studenec 122
675 02 Koněšín
Phone: ++420-568627959
Fax: ++420-568627950
jpialek@brno.cas.cz
Website: <http://www.studenec.ivb.cz/>

Mohelno Field Station

675 75 Mohelno 134
Phone: ++420-568642330, ++420-568642314
Custodian: Lubomír K E R N D L

Kamenický Field Station

539 41 Kamenický 98
Phone: ++420-469318118
Custodian: Miloslava C A C H O V Á

MANAGEMENT AND SERVICES

Director: Prof. RNDr. Jan Z I M A , DSc
phone: ++420-543211538, ++420-543422554
fax: ++420-543211346
jzima@brno.cas.cz, jzima@ivb.cz

Deputy Director: Assoc. Prof. RNDr. Zdeněk H U B Á L E K , DSc
phone: ++420-519352961
fax: ++420-519352387
zhubalek@brno.cas.cz

Scientific Secretary: Ing. Miroslav Č A P E K , PhD
phone: ++420-543422538, ++420-543422540
fax: ++420-543211346
capek@brno.cas.cz

Economic Department & Secretariat

Ing. Zdeňka H L A V Á Č K O V Á , Head – since April 1, 2005
hlavackova@ivb.cz

Ing. Alois H O R Á K – since May 9, 2007
horak@ivb.cz

Zdena H Á J K O V Á
zhajkova@ivb.cz

Bohumila K O Ž N Á R K O V Á
koznarkova@ivb.cz

Lenka G L O S O V Á – since March 5, 2005
glosova@ivb.cz

Jitka N O V O T N Á – until April 4, 2005
novotna@ivb.cz

Vlasta V Á L K O V Á – until October 9, 2006
valkova@ivb.cz

Drahomíra K R E J Č O V Á – since October 2, 2006
Jaroslav Z D R A Ž I L
zdrzil@ivb.cz

Scientific Information Centre & Library

Ing. Hana S L A B Á K O V Á , Head
slabakova@brno.cas.cz

Alena F L O R I A N O V Á
florianova@ivb.cz

Editorial Office RNDr. Pavel B L A H Á K , Managing Editor
editorfz@brno.cas.cz

Collections Jiří C H A M R , curator
chamr@brno.cas.cz

Technical Support Vlastimil H A N Á Č E K
Jana H A N Á Č K O V Á
Lubomír K E R N D L – until February 28, 2006
Jana Š R O M O V Á
Milada W E B E R O V Á – until December 31, 2006
Ivana P E T Ý R K O V Á – since March 5, 2007

SCIENTIFIC COUNCIL (until December 31, 2006)

- Chairperson:** RNDr. Miloslav H O M O L K A , PhD
phone: ++420-543422517
fax: ++420-543211346
homolka@ivb.cz
- Members at Large:** Mgr. et. Mgr. Josef B R Y J A , PhD
Ing. Marcel H O N Z A , PhD
Assoc. Prof. RNDr. Zdeněk H U B Á L E K , DSc
RNDr. Martin R E I C H A R D , PhD
Mgr. Jan Z U K A L , PhD
- External Members:** Prof. RNDr. Jiří G A I S L E R , DSc
(Masaryk University, Brno)
Assoc. Prof. RNDr. Milan G E L N A R , PhD
(Masaryk University, Brno)
Ing. Petr R Á B , DSc
(Institute of Animal Physiology and Genetics AS CR, Liběchov)

COUNCIL OF THE INSTITUTE (since January 1, 2007)

- Chairperson:** Prof. RNDr. Jan Z I M A , DSc
phone: ++420-543422554
fax: ++420-543211346
jzima@ivb.cz, jzima@brno.cas.cz
- Members at Large:** Mgr. et. Mgr. Josef B R Y J A , PhD
Ing. Marcel H O N Z A , PhD
RNDr. Miloslav H O M O L K A , PhD
Assoc. Prof. RNDr. Zdeněk H U B Á L E K , DSc
Ing. Pavel J U R A J D A , PhD
- External Members:** Prof. RNDr. Jiří G A I S L E R , DSc
(Masaryk University, Brno)
Assoc. Prof. RNDr. Miloš M A C H O L Á N , PhD
(Institute of Animal Physiology and Genetics AS CR, v. v. i., Brno)
Assoc. Prof. RNDr. Zdeněk Ř E H Á K , PhD
(Masaryk University, Brno)

RESEARCH PROJECTS

Institutional Research Plan

AV0Z60930519 Biodiversity and ecology of vertebrates: implications in conservation and sustainable management of natural populations - J. Zima, 2005–2010

Projects supported by the Grant Agency of the Academy of Sciences of the Czech Republic

IAA6093403 Evolutionary determinants of brood parasitism in ducks - P. Musil (Charles University, Prague), M. Honza (IVB AS CR), 2004–2008

IAA6093404 Species diversity and ecology of selected West African vertebrates - P. Koubek (IVB AS CR), M. Gelnar (Masaryk University, Brno), P. Hejčmanová (Czech University of Agriculture, Prague), 2004–2008

IAA600930506 Behavioral and genetic study of prezygotic isolation barriers in the house mouse hybrid zone - J. Piálek, 2005–2008

IAA600930605 Evolution of antiparasitic strategies of selected hosts towards avian brood parasitism - M. Honza, 2006–2010

IAA600930608 The role of MHC in sexual selection - observational and experimental study in three model vertebrate species - J. Bryja (IVB AS CR), A. Šimková (Masaryk University, Brno), 2006–2008

IAA600930609 Genetic structure of chamois populations in Central Europe - J. Zima, 2006–2009

IAA600930611 (Re)emerging mosquito-borne virus diseases - Z. Hubálek (IVB AS CR), J. Januška (Institute of Public Health, Ostrava), 2006–2008

IBS5045111 Molecular and other genetic markers applied in conservation of populations of endangered, rare and vanishing fish species in the Czech Republic - P. Ráb (Institute of Animal Physiology and Genetics AS CR, Liběchov), V. Lusková (IVB AS CR), 2001–2005

KJB6005301 What happens when *Reynoutria* taxa reproduce by means other than vegetative? - K. Bímová (Institute of Botany AS CR, Průhonice), J. Piálek (IVB AS CR), 2003–2006

KJB600930501 The impact of mating tactics on individual reproductive success and population parameters in the European bitterling: behavioural and genetic approach - M. Reichard, 2005–2007

KJB600930508 European reed warbler populations across a migratory divide: insights into migration by analyses of DNA sequences, stable isotopes and ringing recoveries - P. Procházka, 2005–2007

KJB600930610 Phylogeography and evolutionary history of a semi-fossorial rodent *Microtus subterraneus* - N. Martinková, 2006–2008

KJB600930611 Brood parasitism as an alternative reproductive strategy of ducks: genetically - endocrinological approach - R. Ležalová, 2006–2008

KJB600930613 Diversity of cultivable microorganisms of ixodid ticks, recognized vectors of vertebrate pathogens - I. Rudolf (IVB AS CR), P. Švec (Masaryk University, Brno), 2006–2008

KJB600930615 Feeding behavior, parasite infections and self-medicative abilities of an introduced chimpanzee population, Rubondo Island National Park, Tanzania - K. Petrželková, 2006–2008

IQS500450513 Population and genetic structure of brown trout and grayling as groundwork for efficient management of fisheries in salmonid waters - V. Šlechta (Institute of Animal Physiology and Genetics AS CR, Liběchov), K. Halačka (IVB AS CR), 2005-2009

Projects supported by the Grant Agency of the Czech Republic

GA206/03/0726 Ecology of emerging arthropod-borne microorganisms - Z. Hubálek, 2003-2005

GA206/03/0757 Assessment of population size and population structure of Eurasian otter (*Lutra lutra*) in different habitats by a non-invasive genetic method - J. Zima, 2003-2005

GA206/04/2003 Ecological interactions in populations of small rodents - E. Tkadlec (Palacký University, Olomouc), I. Pavlík (Veterinary Research Institute, Brno), M. Heroldová (IVB AS CR), 2004-2006

GA206/05/2159 Genetic, population and reproductive variability of invasive fish species, *Carassius „gibelio“* with alternating bisexual/asexual reproduction in central Europe - V. Lusková (IVB AS CR), J. Flajšhans (University of South Bohemia, České Budějovice), V. Šlechta (Institute of Animal Physiology and Genetics AS CR, Liběchov), 2005-2007

GA206/06/0851 Extra-pair fertilizations and the strength of sexual selection in socially monogamous passerine - T. Albrecht (IVB AS CR), P. Muclinger (Charles University, Prague), 2006-2008

GA206/06/0953 Phenotypic plasticity of thermal physiology traits in newts - L. Gvoždík, 2006-2008

GA206/06/0954 Intraspecific variability of populations of two cryptic bat species of genus *Pipistrellus* in Central Europe - Z. Řehák (Masaryk university, Brno), J. Bryja (IVB AS CR), 2006-2008

GA206/06/0955 Genetics - J. Piálek, 2006-2008

GA524/03/0061 Comparative studies on dracunculoid nematodes, with special reference to agents of serious diseases of fish - F. Moravec (Institute of Parasitology AS CR, České Budějovice), V. Baruš (IVB AS CR), 2003-2005

GA524/04/1115 Fluctuating asymmetry in fish parasites: a new approach to assess environmental stress of aquatic ecosystem? - B. Koubková (Masaryk University, Brno), M. Machala (Veterinary Research Institute, Brno), P. Jurajda (IVB AS CR), 2004-2006

GA524/04/1128 MHC class IIB genes of European cyprinid fish: their genetic variability and evolution in relation to the host life-history traits and parasitism - A. Šimková (Masaryk university, Brno), P. Jurajda (IVB AS CR), 2004-2006

GA524/06/0264 Ciliates of genus *Troglodytella*: pathogens or endosymbionts? Novel approach towards veterinary care and understanding digestion in apes - D. Modrý (University of Veterinary and Pharmaceutical Sciences, Brno), K. Petrželková (IVB AS CR), S. Kišidayová (Institute of Animal Physiology SAS, Košice, Slovakia), 2006-2008

GA524/06/0687 Importance of red fox in different ecosystems of Central Europe - J. Červený (IVB AS CR), M. Anděra (National Museum, Prague), K. Šťastný (Czech University of Agriculture, Prague), 2006-2008

GD524/05/H536 Evolutionary ecological analysis of biological systems: research center for PhD studies - M. Chytrý (Masaryk university, Brno), P. Jurajda (IVB AS CR), 2005-2008

GP206/03/P134 Feeding strategy of large herbivore mammals between forest and field habitats - J. Kamler, 2003-2005

- GP206/06/P152** Reproductive isolating mechanisms in *Nothobranchius* fishes (Aplocheilidae) – M. Reichard, 2006–2008
- GP206/06/P302** Genetic structure of black grouse populations in the Czech Republic – J. Svobodová, 2006–2008
- GP524/05/P291** Parasitism and invasive species: effect of parasite infection on the biology of *Neogobius kessleri* in its native and introduced range – M. Ondračková, 2005–2006

Projects supported by the Ministry of Agriculture

- GAZV QF3028** Development of new technologies of rearing commercially important riverine species of fish and crayfish endangered by environment degradation – P. Kozák (University of South Bohemia, České Budějovice), J. Barthová (Charles University, Prague), P. Spurný (Mendel Agriculture and Forestry University, Brno), S. Navrátil (University of Veterinary and Pharmaceutical Sciences, Brno), M. Prokeš (IVB AS CR), 2003–2007
- GAZV QF3029** Harmonization with the EU in application of the principles of pharmacovigilancy in aquaculture in the Czech Republic – V. Piačková (University of South Bohemia, České Budějovice), J. Hajšlová (Institute of Chemical Technology, Prague), Z. Svobodová (University of Veterinary and Pharmaceutical Sciences, Brno), M. Prokeš (IVB AS CR), T. Barth (Institute of Organic Chemistry and Biochemistry AV CR, Prague), 2003–2007
- GAZV QF4192** Methodology of evaluation of damages caused by game to field crops – J. Kamler (IVB AS CR), J. Dvořák (Mendel Agriculture and Forestry University, Brno), 2004–2006

Projects supported by the Ministry of Environment

- SM/6/3/05** Genetic diversity of endangered fish species – base of effective protection of biodiversity – S. Lusk, 2005–2007
- Management plan of large carnivores (brown bear, wolf, lynx) in the Czech Republic – P. Koubek, 2003–2005

Projects supported by the Ministry of Education, Youth and Sport

- LC522** Ichthyoparasitology Research Center – M. Gelnar (Masaryk University, Brno), T. Scholz (Institute of Parasitology AS CR, České Budějovice), P. Jurajda (IVB AS CR) Brno), 2005–2009
- LC06073** Biodiversity Research Center – P. Kindlman (Institute of Systems Biology and Ecology AS CR, České Budějovice), and other seven partners, including J. Zima (IVB AS CR), 2005–2011

International projects

European Union – 6th Framework Programme

- Integrated project EDEN** (no. 010284-2) Emerging diseases in a changing European environment (coordinated by CIRAD Montpellier, France) – Z. Hubálek, 2004–2008

- Integrated project MODELKEY** (no. SSPI-CT-2003-511237-2) Models for assessing and forecasting the impact of environmental key pollutants on marine and freshwater ecosystems and biodiversity (coordinated by Umweltforschungszentrum Leipzig - Halle GmbH, Germany) - P. Jurajda, 2005-2010
- Integrated consortium on ticks and tick-borne diseases** (ICTTD - 3) - L. Grubhofer (Biology Center AS CR, České Budějovice), Z. Hubálek (IVB AS CR), 2004-2008
- Marie Curie research training network SEXASEX** (no. MRTN-CT-2004-512492) Sex to asex: a case study on transitions and coexistence between sexual and asexual reproduction (coordinated by the Royal Belgian Institute of Natural Sciences, Belgium) - J. Zima, 2004-2009
- Marie Curie intra-European fellowship PHYLOMICROTUS** (no. 24956) Phylogeography of the Orkney vole *Microtus arvalis orcadensis* (cooperation with University of York, UK) - N. Martínková, 2006-2008
- Project INTAS** (no. 03-51-4030) A multidisciplinary study of hybrid zones in the common shrew (coordinated by the University of York, UK) - J. Zima, 2004-2007

Other EU projects

- European Science Foundation Research Networking Programme** Integrating population genetics and conservation biology: Merging theoretical, experimental and applied approaches - J. Bryja (member of the steering committee), 2004-2009
- European Science Foundation Research Networking Programme** Thermal adaptation in ectotherms: Linking life history, physiology, behaviour and genetics - L. Gvoždík (member of the steering committee), 2006-2011
- Large Scale Facility Project** (no. HPRI-CT-2001-00180) Intraspecific diversity in selected cyprinid fish species in the conditions of Central Europe (coordinated by the Institute of Aquaculture, University of Stirling, Scotland, UK) - J. Mendel, 2005
- Bavarian Interreg-III-A-Project** Wildlife and human in Bavarian-Czech-Austrian border region - example of the otter (cooperation with the Bavarian Forest Institute and Technical University of Munich, Germany) - P. Hájková, 2006-2007
- IUCN and European Commission** Assessment of European mammal species - J. Zima (participant), 2006-2007

Bilateral projects

- PPP Programme DAAD - AS CR** (project no. D2-CZ30/04-05) Mechanisms of speciation in rodents - H. Burda (University Essen-Duisburg, Germany), J. Zima (IVB AS CR), 2004-2005
- Programme KONTAKT** (project no. 26) Zoogeography, taxonomy and phylogeography of mammals in south-eastern Europe, Asia Minor and South Africa - V. Vohralík (Charles University, Prague), J. Zima (IVB AS CR), B. Kryštufek (University of Primorska, Koper, Slovenia), 2005-2006
- Programme KONTAKT** (project no. 144) Variability of social system in *Apodemus* mice (Rodentia) - M. Stanko (Institute of Zoology SAS, Bratislava, Slovakia), J. Bryja (IVB AS CR), 2004-2005
- Austrian Science and Research Liaison Office Brno** Bioarchaeology of the Holocene populations of Central Europe: reconstruction of mobility and manipulative behaviour - V. Sládek (IVB

AS CR), M. Berner (Naturhistorisches Museum, Wien, Austria), P. Galeta (University of West Bohemia, Plzeň), 2006

Integrated Bilateral Project Development of new methods for the laboratory diagnostics of West Nile Virus disease in human and some other animals (cooperation with Istituto Zooprofilattico e Sperimentale, Teramo, Italy) - Z. Hubálek, 2004–2005

Individual projects

Leverhulme Trust (UK), project Adaptation and coevolution in an unusual symbiosis (cooperation with University of Leicester, UK) - M. Reichard, 2003–2005

Natural Environment Research Council (UK), project Stoats and the Irish question (cooperation with University of York, UK) - N. Martínková, 2005

The Leakey Foundation (USA), general grant The possible role of ciliate (*Troglodytella abressarti*) in chimpanzee hind gut fermentation – K. Petrželková, 2006–2007.

British Ecological Society (UK), early career project grant (ref no. 551-617) Phenotypic correlates of lifetime reproductive success in the bitterling fish - M. Reichard , 2006–2007

LIST OF PUBLICATIONS

Books, textbooks, edited proceedings

- BERENCSI G., KHAN A., HALOUZKA J. (eds), 2005. Emerging Biological Threat. NATO Science Series. Life and Behavioural Sciences 370. IOS Press, Amsterdam, 192 pp. ISBN 1-58603-555-X.
- BRYJA J., ZUKAL J. (eds), 2006. Zoologické dny Brno 2006. ÚBO AV ČR, Brno, 269 pp. ISBN 80-903329-4-3.
- BUDIL I., BLAŽEK V., SLÁDEK V. (eds), 2005. Dějiny, rasa a kultura. Vydavatelství a nakladatelství Aleny Králové, Ústí nad Labem, 99 pp. ISBN 80-903412-4-1.
- CÍLEK V. (ed.), LOŽEK V., ŠKODA A., NĚMEC L., FATKA O., LITOCHEB J., ČERNÝ P., SEJKORA J., LITOCHEBOVÁ E., NEKUT B., BRUTHANS J. B., BENEŠOVÁ L., ŠNAJDROVÁ J., KOMÍNKOVÁ D., SOFRON J., HLAVÁČEK R., KARLÍK P., NESVADBOVÁ J., POJER F., ABSOLON K., ANDĚRA M., BOBEK M., BUFKA L., ČERVENÝ J., FISCHEROVÁ J., FISCHER D., FUCHS R., HLAVÁČ J., HOMOLKA P., JÍCHA V., MACEK J., PAVLÍČKO A., PEŠKE L., RIEGERT J., SEDLÁČEK O., ŠIMEK J., ŠVÁTORA M., URBAN S., DEJMAL I., PETŘÍČEK V., ČÁKA J., PALOWSKI E., MIKULÁŠ R., KESLOVÁ J., BAŠE M., KENDER J., SCHMELZOVÁ R., SMEJTEK L., DURDÍK T., VELFL J., VURM K., MAJER J., HOFMANN G., BŘEZOVSKÝ M., DAŇKOVSKÁ D., TRANTINA V., HOYER H., VÁŇOVÁ K., 2005. Střední Brdy. Ministerstvo zemědělství ČR, Příbram, 377 pp. ISBN 80-7084-266-0
- DVOŘÁK J., HOMOLKA M., HEROLDOVÁ M., KAMLER J., CERKAL R., LUJC J., SKLÁDANKA J., DOLEŽAL P., 2006. Atlas poškození polních plodin – savci. Mendelova zemědělská a lesnická univerzita, Brno, 35 pp. ISBN 80-7375-019-8.
- DVOŘÁK J., KAMLER J., VACA D., 2006. Problematika škod působených zvěří na zemědělských plodinách. Mendelova zemědělská a lesnická univerzita, Brno, 42 pp. ISBN 80-7157-939-4.
- HANEL L., LUSK S., 2005. Ryby a mihule České republiky: rozšíření a ochrana. ČSOP, Vlašim, 448 pp. ISBN 80-86327-49-3.
- KIRSCHNER J., RÁB P., ROUDNÁ M., STAŇKOVÁ J., VILÍMOVÁ J., ZIMA J., 2006. Biologická rozmanitost. Identifikace priorit a rozvoje kapacit pro plnění závazků České republiky vyplývajících z Úmluvy o biologické rozmanitosti. Ministerstvo životního prostředí ČR a UNDP/GEF, Praha, 228 pp. ISBN 80-7212-390-4
- LUSK S. (ed.), 2005. Distribution, Taxonomy and Genetic Status of the European Species of the Genus *Gobio*. *Folia Zoologica* 54, Suppl. 1, 98pp.
- LUSK S., LUSKOVÁ V. (eds), 2006. Biodiverzita ichtyofauny České republiky (VI). ÚBO AV ČR, Brno, 162 pp. ISBN 80-903329-6-X.
- PROCHÁZKA P., SEDLÁČEK O. (eds), 2006. 8th Workshop of the Southeastern European Bird Migration Network (SEEN). ÚBO AV ČR, Brno, 56 pp. ISBN 80-903329-5-1.

Chapters in books

- ALBRECHT T., BRYJA J., HÁJKOVÁ P., MIKULÍČEK P., ZIMA J., 2005. Genetická diverzita a metodické aspekty jejího výzkumu. In: Vačkář D. (ed.), Ukazatele změn biodiverzity. Academia, Praha; 24–42
- BARUŠ V., PROKEŠ M., 2006. *Anguillicola crassus* Kuwahara, Niimi et Itagaki, 1974 – krevnatka úhoří. In: Mlíkovský J., Stýblo P. (eds), Nepůvodní druhy fauny a flóry České republiky. Arbora Publishers, Zvolen; 207–208.
- BARUŠ V., PROKEŠ M., 2006: *Ascaridia dissimilis* Pérez Viguera, 1931 – škrkavička krocání. In: Mlíkovský J., Stýblo P. (eds), Nepůvodní druhy fauny a flóry České republiky. Arbora Publishers, Zvolen; 208–210.
- BARUŠ V., PROKEŠ M., 2006: *Ascaridia platyceri* Hartwich et Tscherner, 1979 – škrkavička papouščí. In: Mlíkovský J., Stýblo P. (eds), Nepůvodní druhy fauny a flóry České republiky. Arbora Publishers, Zvolen; 210–211.
- BRYJA J., ALBRECHT T., BÍMOVÁ B., HÁJKOVÁ P., MARTÍNKOVÁ N., MIKULÍČEK P., VYSKOČILOVÁ M., ZEMANOVÁ B., PIÁLEK J., 2006. Využití molekulárně-genetických metod v zoologii a ekologii: přehled projektů řešených na Ústavu biologie obratlovců AV ČR. In: Paule L., Urban P., Gömöry D. (eds), Genetika poľovnej zveri a voľne žijúcich živočíchov. Arbora Publishers, Zvolen; 75–82.
- CERKAL R., DVOŘÁK J., KAMLER J., VEJRAŽKA K., 2006. Poškození porostů ječmene býložravci. In: Zimolka J. (ed.), Ječmen – formy a užitkové směry v České republice. Profi Press, Praha; 120–125.
- ČERVENÝ J., 2005. Rešerše a hodnocení realizovaných a probíhajících projektů aktivní ochrany rysa ostrovida (*Lynx lynx*) v České republice. In: Kumstátová T., Nová P., Marhoul P. (eds), Hodnocení projektů aktivní podpory ohrožených živočichů v České republice. Olga Čermáková, Hradec Králové, 423–427.
- HÁJKOVÁ P., ZEMANOVÁ B., HÁJEK B., BRYJA J., 2006. Využitie neinvazívnej DNA analýzy pri štúdiu populácií vydrý riečnej. In: Paule L., Urban P., Gömöry D. (eds), Genetika poľovnej zveri a voľne žijúcich živočíchov. Arbora Publishers, Zvolen; 83–90.

- HUBÁLEK Z., KRÍŽ B., MENNE B., 2006. West Nile Virus: Ecology, Epidemiology and Prevention. In: Menne B., Ebi K.L. (eds.), Climate Change and Adaptation Strategies for Human Health. Steinkopff, Darmstadt; 217-242.
- LUSK S., HANEL L., 2005. Změny biodiverzity ichtyofauny. In: Vačkář, D. (ed.), Ukazatele změn biodiverzity. Academia, Praha; 197-207.
- PETRŽELKOVÁ K.J., HASEGAWA H., MOSCOVICE L.R., KAUR T., ISSA M.H., HUFFMAN M.A., 2005. New records of parasitic nematodes for chimpanzees found from the introduced population on Rubondo island, Tanzania. In: Frolich K., Steinbach F. (eds), Erkrankungen der Zootiere. Institut für Zoo- und Wildtierforschung, Berlin; 269.
- POLEDNÍK L., POLEDNÍKOVÁ K., HÁJKOVÁ P., CULKOVÁ M., 2005. Rešerše a hodnocení realizovaných a probíhajících projektů aktivní ochrany vydry říční (*Lutra lutra*) v České republice. In: Kumstátová T., Nová P., Marhoul P. (eds), Hodnocení projektů aktivní podpory ohrožených živočichů v České republice. Olga Čermáková, Hradec Králové, 417-422.
- SLÁDEK V., 2005. Rasa: mýtus pro popis lidské variability. In: Budil I.T., Blažek V., Sládek V. (eds), Dějiny, rasa a kultura. Vydavatelství a nakladatelství Aleny Králové, Ústí nad Labem, 37-48.
- TOMÁŠKOVÁ L., BEJČEK V., SEDLÁČEK F., ŠTASTNÝ K., TKADLEC E., ZIMA J., 2005. Population Biology of Shrews (*Sorex araneus* and *Sorex minutus*) from a Polluted Area in Central Europe. In: Meritt J.F., Churchfield S., Hutterer R., Sheftel B.I. (eds), Advances in the Biology of Shrews II. International Society of Shrew Biologists, New York; 189-197.

Papers in journals included in the databases ISI Web of Knowledge

- ALBRECHT T., HOŘÁK D., KREISINGER J., KLVÁŇA P., MICHOT T.C., 2006. Factors determining poached nest predation along a wetland gradient. *Journal of Wildlife Management* 70: 784-791.
- ALBRECHT T., KREISINGER J., PIÁLEK J., 2006. The strength of direct selection against female promiscuity is associated with rates of extrapair fertilizations in socially monogamous songbirds. *American Naturalist* 167: 739-744.
- ANTONOV A., STOKKE B.G., MOKSNES A., KLEVEN O., HONZA M., ROSKAFT E., 2006. Eggshell strength of an obligate brood parasite: a test of the puncture resistance hypothesis. *Behavioral Ecology and Sociobiology* 60: 11-18.
- BAKONYI T., HUBÁLEK Z., RUDOLF I., NOWOTNY N., 2005. Novel flavivirus or new lineage of West Nile virus, Central Europe. *Emerging Infectious Diseases* 11: 225-231.
- BARUŠ V., KAJEROVÁ V., KOUBKOVÁ B., 2005. A new species of *Pterothominx* Freitas, 1959 (Nematoda: Capillariidae) parasitising psittacine birds (Psittaciformes). *Systematic Parasitology* 62: 59-64.
- BERKOVÁ H., ZUKAL J., 2006. Flight activity of bats at the entrance of a natural cave. *Acta Chiropterologica* 8: 187-195.
- BERTEAUX D., HUMPHRIES M.M., KREBS C.J., LIMA M., MCADAM A.G., PETTORELLI N., REALE D., SAITOH T., TKADLEC E., WELADJI R.B., STENSETH N.C., 2006. Constraints to projecting the effects of climate change on mammals. *Climate Research* 32: 151-158.
- BÍMOVÁ B., KARN R.C., PIÁLEK J., 2005. The role of salivary androgen-binding protein in reproductive isolation between two subspecies of house mouse: *Mus musculus musculus* and *Mus musculus domesticus*. *Biological Journal of the Linnean Society* 84: 349-361.
- BOŽÍKOVÁ E., MUNCLINGER P., TEETER K., TUCKER P.K., MACHOLÁN M., PIÁLEK J., 2005. Mitochondrial DNA in the hybrid zone between *Mus musculus musculus* and *Mus musculus domesticus*: a comparison of two transects. *Biological Journal of the Linnean Society* 84: 363-378.
- BRACK W., BAKKER J., DE DECKERE E., DEERENBERG C., VAN GILS J., HEIN M., JURAJDA P., KOIJMAN B., LAMOREE M., LEK S., DE ALDA M.J.L., MARCOMINI A., MUNOZ I., RATTEI S., SEGNER H., THOMAS K., VON DER OHE P.C., WESTRICH B., DE ZWART D., SCHMITT-JANSEN M., 2005. MODELKEY - Models for assessing and forecasting the impact of environmental key pollutants on freshwater and marine ecosystems and biodiversity. *Environmental Science and Pollution Research* 12: 252-256.
- BRYJA J., GALAN M., CHARBONNEL N., COSSON J.-F., 2005. Analysis of major histocompatibility complex class II gene in water voles using capillary electrophoresis-single stranded conformation polymorphism. *Molecular Ecology Notes* 5: 173-176.
- BRYJA J., GALAN M., CHARBONNEL N., COSSON J.-F., 2006. Duplication, balancing selection and trans-species evolution explain the high levels of polymorphism of the DQA MHC class II gene in voles (Arvicolinae). *Immunogenetics* 58: 191-202.

- BRYJA J., NESVADBOVÁ J., HEROLDOVÁ M., JÁNOVÁ E., LOSÍK J., TREBATICÁ L., TKADLEC E., 2005. Common vole (*Microtus arvalis*) population sex ratio: biases and process variation. *Canadian Journal of Zoology* 83: 1391-1399.
- BRYJA J., STOPKA P., 2005. Facultative promiscuity in a presumably monogamous mouse *Apodemus microps*. *Acta Theriologica* 50: 189-196.
- CERKAL R., DVOŘÁK J., KAMLER J., HŘIVNA L., 2006. Posouzení vlivu simulovaného poškození listové plochy na výnos a kvalitu cukrovky. *Listy cukrovarnické a řepašské* 122: 257-261.
- COPP G.H., BIANCO P.G., BOGUTSKAYA N.G., ERÖS T., FALKA I., FERREIRA M.T., FOX M.G., FREYHOF J., GOZLAN R.E., GRABOWSKA J., KOVÁČ V., MORENO-AMICH R., NASEKA A.M., PEŇÁZ M., POVŽ M., PRZYBYLSKI M., ROBILLARD M., RUSSELL I.C., STAKENAS S., ŠUMER S., VILA-GISPERS A., WIESNER C., 2005. To be, or not to be, a non-native freshwater fish? *Journal of Applied Ichthyology* 21: 242-262.
- DÁVIDOVÁ M., ONDRAČKOVÁ M., BARUŠ V., REICHARD M., KOUBKOVÁ B., 2005. Nematode infections of the European bitterling (*Rhodeus sericeus* Pallas, 1776: Cypriniformes). *Helminthologia* 42: 45-48.
- DRASTICHOVÁ J., ŠVESTKOVÁ E., LUSKOVÁ V., SVOBODOVÁ Z., 2005. Cytochemical study of carp neutrophil granulocytes after acute exposure to cadmium. *Journal of Applied Ichthyology* 21: 215-219.
- DUSBÁBEK F., LITERÁK I., ČAPEK M., HAVLÍČEK M., 2006. Three species of the genus *Pellonyssus* (Acari: Macronyssidae) including a new species from Costa Rican birds. *International Journal of Acarology* 32: 175-178.
- GVOŽDÍK L., 2005. Does reproduction influence temperature preferences in newts? *Canadian Journal of Zoology* 83: 1038-1044.
- GVOŽDÍK L., VAN DAMME R., 2006. *Triturus* newts defy the running-swimming dilemma. *Evolution* 60: 2110-2121.
- HÁJKOVÁ P., ZEMANOVÁ B., BRYJA J., HÁJEK B., ROCHE K., TKADLEC E., ZIMA J., 2006. Factors affecting success of PCR amplification of microsatellite loci from otter faeces. *Molecular Ecology Notes* 6: 559-562.
- HASEGAWA H., IKEDA Y., FUJISAKI A., MOSCOVICE L.R., PETRŽELKOVÁ K., KAUR T., HUFFMAN M.A., 2005. Morphology of chimpanzee pinworms, *Enterobius (Enterobius) anthropopitheci* (Gedoelst, 1916) (Nematoda: Oxyuridae), collected from chimpanzees, *Pan troglodytes*, on Rubondo island, Tanzania. *Journal of Parasitology* 91: 1314-1317.
- HEROLDOVÁ M., JÁNOVÁ E., BRYJA J., TKADLEC E., 2005. Set-aside plots - source of small mammal pests? *Folia Zoologica* 54: 337-350.
- HOHAUSOVÁ E., JURAJDA P., 2005. Restoration of a river backwater and its influence on fish assemblage. *Czech Journal of Animal Science* 50: 473-482.
- HONZA M., KUIPER S.M., CHERRY M.I., 2005. Behaviour of African turdid hosts towards experimental parasitism with artificial red-chested cuckoo *Cuculus solitarius* eggs. *Journal of Avian Biology* 36: 517-522.
- HONZA M., MOSKÁT C., 2005. Antiparasite behaviour in response to experimental brood parasitism in the great reed warbler: a comparison of single and multiple parasitism. *Annales Zoologici Fennici* 42: 627-633.
- HONZA M., ŠICHA V., PROCHÁZKA P., LEŽALOVÁ R., 2006. Host nest defense against a color-dimorphic brood parasite: great reed warblers (*Acrocephalus arundinaceus*) versus common cuckoos (*Cuculus canorus*). *Journal of Ornithology* 147: 629-637.
- HORÁK D., ALBRECHT T., KLVAŇA P., MUSIL P., 2006. The relationship between size of egg and young in the common pochard. *Journal of Ornithology* 147 (5 Suppl. 1): 183. [meeting abstract]
- HUBÁLEK Z., 2005. Co-fluctuation among bird species in their migration timing. *Folia Zoologica* 54: 159-164.
- HUBÁLEK Z., 2005. North Atlantic weather oscillation and human infectious diseases in the Czech Republic, 1951-2003. *European Journal of Epidemiology* 20: 263-270.
- HUBÁLEK Z., BURDA H., SCHARFF A., HETH G., NEVO E., ŠUMBERA R., PEŠKO J., ZIMA J., 2005. Emmonsiosis of subterranean rodents (Bathyergidae, Spalacidae) in Africa and Israel. *Medical Mycology* 43: 691-697.
- HUBÁLEK Z., HALOUZKA J., JUŘICOVÁ Z., ŠIKUTOVÁ S., RUDOLF I., 2006. Effect of forest clearing on the abundance of *Ixodes ricinus* ticks and the prevalence of *Borrelia burgdorferi* s.l. *Medical and Veterinary Entomology* 20: 166-172.
- HUBÁLEK Z., LUKÁČOVÁ L., HALOUZKA J., ŠIRŮČEK P., JANUŠKA J., PŘECECHTĚLOVÁ J., PROCHÁZKA P., 2006. Import of West Nile virus infection in the Czech Republic. *European Journal of Epidemiology* 21: 323-324.
- HUBÁLEK Z., SKORPÍKOVÁ V., HORAL D., 2005. Avian botulism at a sugar beet processing plant in South Moravia (Czech Republic). *Veterinární medicína* 50: 443-445.
- HUBÁLEK Z., ZEMAN P., HALOUZKA J., JUŘICOVÁ Z., ŠTOVÍČKOVÁ E., BÁLKOVÁ H., ŠIKUTOVÁ S., RUDOLF I., 2005. Mosquitoborne viruses, Czech Republic, 2002. *Emerging Infectious Diseases* 11: 116-118.
- HUMPL M., LUSK S., 2006. Effect of multiple electro-fishing on determining the structure of fish communities in small streams. *Folia Zoologica* 55: 315-322.

- JANÁČ M., JURAJDA P., 2005. Inter-calibration of three electric fishing techniques to estimate 0+ juvenile fish densities on sandy river beaches. *Fisheries Management and Ecology* 12: 161-167.
- JURAJDA P., ČERNÝ J., POLAČIK M., VALOVÁ Z., JANÁČ M., BLAŽEK R., ONDRAČKOVÁ M., 2005. The recent distribution and abundance of non-native *Neogobius* fishes in the Slovak section of the River Danube. *Journal of Applied Ichthyology* 21: 319-323.
- JURAJDA P., REICHARD M., SMITH C., 2006. Immediate impact of an extensive summer flood on the adult fish assemblage of a channelized lowland river. *Journal of Freshwater Ecology* 21: 493-502.
- KAJEROVÁ V., BARUŠ V., 2005. Corrections to description of *Cardiofilaria dubia* (Nematoda) parasitizing Australian parrot. *Helminthologia* 42: 167-169.
- KAJEROVÁ V., BARUŠ V., 2005. Psittacine birds (Aves: Psittaciformes) as new hosts of *Baruscapillaria obsignata* (Nematoda: Capillariidae). *Acta Veterinaria Brno* 74: 571-574.
- KAMLER J., HOMOLKA M., 2005. Faecal nitrogen: a potential indicator of red and roe deer diet quality in forest habitats. *Folia Zoologica* 54: 89-98.
- KLOUBEC B., ČAPEK M., 2005. Seasonal and diel budgets of song: a study of Savi's warbler (*Locustella luscinoides*). *Journal of Ornithology* 146: 206-214.
- KOŠČO J., LUSK S., HALAČKA K., LUSKOVÁ V., KOŠUTH P., 2005. Distribution of species of the genus *Gobio* in the Tisza River drainage area, Slovakia. *Folia Zoologica* 54: 65-72.
- KOTLÍK P., DEFFONTAINE V., MASCHERETTI S., ZIMA J., MICHAUX J.R., SEARLE, J.B., 2006. A northern glacial refugium for bank voles (*Clethrionomys glareolus*). *Proceedings of the National Academy of Sciences of the United States of America* 103: 14860-14864.
- KOUBKOVÁ B., BARUŠ V., MATĚJUSOVÁ I., HODOVÁ I., KOUBEK P., 2006. *Thelastoma gueyei* sp. n. (Nematoda: Thelastomatidae) from the Senegal diplopod *Archispirostreptus tumuliporus* (Diplopoda: Spirostreptidae). *Nematology* 8: 739-747.
- KREISINGER J., ALBRECHT T., 2006. Nest predation in mallards: the role of crypsis and parental behaviour. *Journal of Ornithology* 147 (5 Suppl. 1): 197. [meeting abstract]
- LEŽALOVÁ R., TKADLEC E., OBORNÍK M., ŠIMEK J., HONZA M., 2005. Should males come first? The relationship between offspring hatching order and sex in the black-headed gull *Larus ridibundus*. *Journal of Avian Biology* 36: 478-483.
- LIU H.-Z., ZHU Y.-R., SMITH C., REICHARD M., 2006. Evidence of host specificity and congruence between phylogenies of bitterling and freshwater mussels. *Zoological Studies* 45: 428-434.
- LOJKÁSEK B., LUSK S., HALAČKA K., LUSKOVÁ V., DROZD P., 2005. The impact of the extreme floods in July 1997 on the ichthyocenosis of the Oder catchment area (Czech Republic). *Hydrobiologia* 548: 11-22.
- LUSK S., HALAČKA K., LUSKOVÁ V., HORÁK V., 2005. Distribution of *Gobio* species in the Czech Republic. *Folia Zoologica* 54: 56-64.
- LUSK S., LUSKOVÁ V., HALAČKA K., ŠLECHTOVÁ V., ŠLECHTA V., 2005. Characteristics of the remnant *Vimba vimba* population in the upper part of the Dyje River. *Folia Zoologica* 54: 389-404.
- LUSK S., ŠLECHTA V., 2005. Changes in the taxonomy of gudgeons from European waters. *Folia Zoologica* 54: 2-4.
- MARTÍNKOVÁ N., SEARLE J.B., 2006. Amplification success rate of DNA from museum skin collections: a case study of stoats from 18 museums. *Molecular Ecology Notes* 6: 1014-1017.
- MENDEL J., LUSKOVÁ V., HALAČKA K., LUSK S., VETEŠNÍK L., 2005. Genetic diversity of *Gobio gobio* populations in the Czech Republic and Slovakia, based on RAPD markers. *Folia Zoologica* 54: 13-24.
- MORAVEC F., ŠIMKOVÁ A., PEČÍNKOVÁ M., ONDRAČKOVÁ M., 2006. Morphology of *Philometroides barbi* (Nematoda: Philometridae), a rare tissue parasite of the Mediterranean barbel *Barbus meridionalis* (Osteichthyes). *Diseases of Aquatic Organisms* 69: 265-268.
- MOSKÁT C., BARTA Z., HAUBER M.E., HONZA M., 2006. High synchrony of egg laying in common cuckoos (*Cuculus canorus*) and their great reed warbler (*Acrocephalus arundinaceus*) hosts. *Ethology, Ecology and Evolution* 18: 159-167.
- MUNCLINGER P., ALBRECHT T., JAVŮRKOVÁ V., HONZA M., KREISINGER J., 2006. Non-invasive molecular analysis of reproductive strategies in mallards. *Journal of Ornithology* 147 (5 Suppl. 1): 216. [meeting abstract]
- ONDRAČKOVÁ M., DÁVIDOVÁ M., GELNAR M., JURAJDA P., 2006. Susceptibility of Prussian carp infected by metacercariae of *Posthodiplostomum cuticola* (v. Nordmann, 1832) to fish predation. *Ecological Research* 21: 526-529.
- ONDRAČKOVÁ M., DÁVIDOVÁ M., PEČÍNKOVÁ M., BLAŽEK R., GELNAR M., VALOVÁ Z., ČERNÝ J., JURAJDA P., 2005. Metazoan parasites of *Neogobius* fishes in the Slovak section of the River Danube. *Journal of Applied Ichthyology* 21: 345-349.
- OTTOVÁ E., ŠIMKOVÁ A., JURAJDA P., DÁVIDOVÁ M., ONDRAČKOVÁ M., PEČÍNKOVÁ M., GELNAR M., 2005. Sexual ornamentation and parasite infection in males of common bream (*Abramis brama*): a reflection of immunocompetence status or simple cost of reproduction? *Evolutionary Ecology Research* 7: 581-593.

- PEŇÁZ M., SVOBODOVÁ Z., BARUŠ V., PROKEŠ M., DRASTICHOVÁ J., 2005. Endocrine disruption in a barbel, *Barbus barbus* population from the River Jihlava, Czech Republic. *Journal of Applied Ichthyology* 21: 420–428.
- PETRŽELKOVÁ K.J., DOWNS N.C., ZUKAL J., RACEY P.A., 2006. A comparison between emergence and return activity in pipistrelle bats *Pipistrellus pipistrellus* and *P. pygmaeus*. *Acta Chiropterologica* 8: 381–390.
- PETRŽELKOVÁ K.J., HASEGAWA H., MOSCOVICE L.R., KAUR T., ISSA M.H., HUFFMAN M.A., 2006. Parasitic nematodes in the chimpanzee population on Rubondo Island, Tanzania. *International Journal of Primatology* 27: 767–777.
- PIÁLEK J., ALBRECHT T., 2005. Choosing mates: complementary versus compatible genes. *Trends in Ecology and Evolution* 20: 63.
- PIÁLEK J., HAUFFE H.C., SEARLE J., 2005. Chromosomal variation in the house mouse. *Biological Journal of the Linnean Society* 84: 535–563.
- POLAČIK M., KOVÁČ V., 2006. Fecundity and annual course of maturation in spirin, *Alburnoides bipunctatus*. *Folia Zoologica* 55: 399–410.
- PRÁŠEK V., JURAJDA P., 2005. Expansion of *Proterorhinus marmoratus* in the Morava River basin (Czech Republic, Danube R. watershed). *Folia Zoologica* 54: 189–192.
- PRCHALOVÁ M., VETEŠNÍK L., SLAVÍK O., 2006. Migrations of juvenile and subadult fish through a fishpass during late summer and fall. *Folia Zoologica* 55: 162–166.
- PROKEŠ M., ŠOVČÍK P., PEŇÁZ M., BARUŠ V., SPURNÝ P., VILIZZI L., 2006. Growth of barbel, *Barbus barbus*, in the River Jihlava following major. *Folia Zoologica* 55: 86–96.
- PROKEŠOVÁ J., BARANČEKOVÁ M., HOMOLKA M., 2006. Density of red deer and roe deer and their distribution in relation to different habitat characteristics in a floodplain forest. *Folia Zoologica* 55: 1–14.
- RAPPOLE J. H., HUBÁLEK Z., 2006. Birds and influenza H5N1 virus movement to and within North America. *Emerging Infectious Diseases* 12: 1486–1492.
- REICHARD M., BRYJA J., ONDRAČKOVÁ M., DÁVIDOVÁ M., KANIEWSKA P., SMITH C., 2005. Sexual selection for male dominance reduces opportunities for female mate choice in the European bitterling (*Rhodeus sericeus*). *Molecular Ecology* 14: 1533–1542.
- REICHARD M., ONDRAČKOVÁ M., PRZYBYLSKI M., LIU H., SMITH C., 2006. The costs and benefits in an unusual symbiosis: experimental evidence that bitterling fish (*Rhodeus sericeus*) are parasites of unionid mussels in Europe. *Journal of Evolutionary Biology* 19: 788–796.
- RUDOLF I., GOLOVCHENKO M., ŠIKUTOVÁ S., RUDENKO N., GRUBHOFFER L., HUBÁLEK Z., 2005. *Babesia microti* (Piroplasmida: Babesiidae) in nymphal *Ixodes ricinus* (Acari: Ixodidae) in the Czech Republic. *Folia Parasitologica* 52: 274–276.
- RUFF C.B., HOLT B. M., SLÁDEK V., BERNER M., MURPHY W.A., ZUR NEDDEN D., SEIDLER H., RECHEIS W., 2006. Body size, body proportions, and mobility in the Tyrolean „Ice man“. *Journal of Human Evolution* 51: 91–101.
- ŘEHULKOVÁ E., BARUŠ V., GELNAR M., 2005. Two remarkable nematodes from the African reedfish *Erpetoichthys calabaricus* (Polypteriformes: Polypteridae). *Helminthologia* 42: 149–153.
- SCHNITZER J., LUNDÁK M., EXNEROVÁ A., MUNCLINGER P., ALBRECHT T., 2006. Secondary male ornamentation as a signal of a good parent in the Scarlet Rosefinch. *Journal of Ornithology* 147 (5 Suppl. 1): 248. [meeting abstract]
- SLÁDEK V., BERNER M., SAILER R., 2006. Mobility in Central European Late Eneolithic and Early Bronze Age: tibial cross-sectional geometry. *Journal of Archaeological Science* 33: 470–482.
- SMITH C., REICHARD M., 2005. Females solicit sneakers to improve fertilization success in the bitterling fish (*Rhodeus sericeus*). *Proceedings of the Royal Society of London. B - Biological Sciences* 272: 1683–1688.
- SMITH C., REICHARD M., DOUGLAS A., JURAJDA P., 2006. Population consequences of behaviour in the European bitterling (*Rhodeus sericeus* Cyprinidae). *Ecology of Freshwater Fish* 15: 139–145.
- SPENCE R., FATEMA M.K., REICHARD M., HUQ K.A., WAHAB M.A., AHMED Z.F., SMITH C., 2006. The distribution and habitat preferences of the zebrafish in Bangladesh. *Journal of Fish Biology* 69: 1435–1448.
- STÜNZNER D., HUBÁLEK Z., HALOUZKA J., WENDELIN I., SIXL W., MARTH E., 2006. Prevalence of *Borrelia burgdorferi* sensu lato in the tick *Ixodes ricinus* in the Styrian mountains of Austria. *Wiener klinische Wochenschrift: the Middle European Journal of Medicine* 118: 682–685.
- SUCHOMEL, J., HEROLDOVÁ M., 2006. Population of *Apodemus flavicollis* in three large isolated forests under various environmental conditions in Southern Moravia (the Czech Republic). *Ekológia* 25: 377–387.
- SVOBODOVÁ Z., MÁCHOVÁ J., DRASTICHOVÁ J., GROCH L., LUSKOVÁ V., POLESZCZUK G., VELÍŠEK J., KROUPOVÁ H., 2005. Haematological and biochemical profiles of carp blood following nitrite exposure at different concentrations of chloride. *Aquaculture Research* 36: 1177–1184.
- SYCHRA O., LITERÁK I., ČAPEK M., HAVLÍČEK M., 2006. Chewing lice (Phthiraptera) from typical antbirds and ground antbirds (Passeriformes: Thamnophilidae, Formicariidae) from Costa Rica, with descriptions of three new species of the genera *Formicaphagus* and *Myrsidea*. *Zootaxa* 1206: 47–61.

- ŠANDA R., LUSKOVÁ V., VUKIČ J., 2005. Notes on the distribution and taxonomic status of *Gobio gobio* from the Morača River basin (Montenegro). *Folia Zoologica* 54: 73–80.
- ŠIMKOVÁ A., JARKOVSKÝ J., KOUBKOVÁ B., BARUŠ V., PROKEŠ M., 2005. Associations between fish reproductive cycle and the dynamics of metazoan parasite infection. *Parasitology Research* 95: 65–72.
- ŠIROKÝ P., PETRŽELKOVÁ K.J., KAMLER M., MIHALCA A.D., MODRÝ D., 2006. *Hyalomma aegyptium* as dominant tick in tortoises of the genus *Testudo* in Balkan countries, with notes on its host preferences. *Experimental and Applied Acarology* 40: 279–290.
- ŠLECHTOVÁ V., LUSKOVÁ V., ŠLECHTA V., HALAČKA K., LUSK S., KOŠČO J., 2005. Intraspecific allozyme diversity of *Gobio gobio* in Czech and Slovak rivers. *Folia Zoologica* 54: 25–32.
- TKADLEC E., ZBOŘIL J., LOSÍK J., GREGOR P., LISICKÁ L., 2006. Winter climate and plant productivity predict abundances of small herbivores in central Europe. *Climate Research* 32: 99–108.
- VALOVÁ Z., JURAJDA P., JANÁČ M., 2006. Spatial distribution of 0+ juvenile fish in differently modified lowland rivers. *Folia Zoologica* 55: 293–308.
- VELÍŠEK J., DOBŠÍKOVÁ R., SVOBODOVÁ Z., MODRÁ H., LUSKOVÁ V., 2006. Effect of deltamethrin on the biochemical profile of common carp (*Cyprinus carpio* L.). *Bulletin of Environmental Contamination and Toxicology* 76: 992–998.
- VETEŠNÍK L., HALAČKA K., LUSKOVÁ V., LUSK S., 2006. Erythrocyte profile of diploid and triploid silver crucian carp (*Carassius auratus*). *Acta Veterinaria Brno* 75: 203–207.
- VILIZZI L., COPP G.H., CARTER M.G., PEŇÁZ M., 2006. Movement and abundance of barbel, *Barbus barbus*, in a mesotrophic chalk stream in England. *Folia Zoologica* 55: 183–197.
- VYSKOČILOVÁ M., TRACHTULEC Z., FOREJT J., PIÁLEK J., 2005. Does geography matter in hybrid sterility in house mice? *Biological Journal of the Linnean Society* 84: 663–674.
- ZUKAL J., ŘEHÁK Z., 2006. Flight activity and habitat preference of bats in a karstic area, as revealed by bat detectors. *Folia Zoologica* 55: 273–281.
- ZUKAL J., BERKOVÁ H., ŘEHÁK Z., 2005. Activity and shelter selection by *Myotis myotis* and *Rhinolophus hipposideros* hibernating in the Kateřinská cave (Czech Republic). *Mammalian Biology* 70: 271–281.
- ŽÁKOVSKÁ A., ČAPKOVÁ L., ŠERÝ O., HALOUZKA J., DENDIS M., 2006. Isolation of *Borrelia afzelii* from overwintering *Culex pipiens* biotype molestus mosquitoes. *Annals of Agricultural and Environmental Medicine* 13: 345–348.

Papers in other refereed journals

- BARÁNEK V., MAREŠ J., PROKEŠ M., JIRÁSEK J., SPURNÝ P., 2005. Možnosti odchovu plůdku candáta obecného (*Sander lucioperca*) v kontrolovaných podmínkách – krátký přehled. *Bulletin VÚRH Vodňany* 41: 128–134.
- BEDNÁŘOVÁ J., ZUKAL J., ŘEHÁK Z., 2006. Rozšíření netopyra velkouchého (*Myotis bechsteini*) v České republice. *Vespertilio* 9–10: 9–26.
- BRYJA J., KMENT P., 2006. Ploštice (Heteroptera) Chráněné krajinné oblasti Kokořínsko. *Bohemia Centralis* 27: 267–294.
- BUFKA L., HEURICH M., ENGLENDER T., WÖFL M., ČERVENÝ J., SCHERZINGER W., 2005. Wolf occurrence in the Czech – Bavarian – Austrian border region: review of a history and current status. *Silva Gabreta* 11: 27–42.
- ČERVENÝ J., ANDĚRA M., KOUBEK P., BUFKA L., 2006. Změny v rozšíření našich savců na začátku 21. století. *Ochrana přírody* 61: 44–51.
- GAISLER J., ŘEHÁK Z., ZUKAL J., 2006. Výzkum netopyrů v Moravském krasu: historie a současný stav. *Vespertilio* 9–10: 75–85.
- HENEBERG P., ŠÍREK J., ŠKORPÍKOVÁ V., ŠIMEČEK K., ŠAFRÁNEK J., MAZÁNEK D., HUBÁLEK Z., JERÁBKOVÁ E., 2006. Overview of sand martin (*Riparia riparia*) localities in the Czech Republic. *Linzer biologische Beiträge* 38: 1413–1447.
- HEROLDOVÁ M., OBDRŽÁLKOVÁ D., ZAPLETAL M., ZEJDA J., 2006. Hraboš polní v roce 2005 a jak dál. *Rostlinolékař* (1): 19–20.
- HEROLDOVÁ M., OBDRŽÁLKOVÁ D., ZAPLETAL M., ZEJDA J., 2006. Hraboš polní: jeden z nejdůležitějších škůdců. *Agromanuál* (9–10): 42–43.
- HOMOLKA M., HEROLDOVÁ M., 2006. Kvalitní potravní nabídka: prevence mladých porostů před okusem velkých herbivorů v oblasti NPP Kněžyně. *Beskydy* 19: 185–188.
- HUBÁLEK Z., 2006. Ptačí chřipka a tažní ptáci. *Crex* 26: 131–137.
- HUBÁLEK Z., HUDEC K., VAČKAŘ J., 2005. Přilet tažných ptáků na jižní Moravu v letech 1997–1999. *Sylvia* 41: 59–71.

- JURAJDA P., VASSILEV M., POLAČIK M., TRICHKOVA T., 2006. A first record of *Percottus glenii* (Perciformes: Odontobutidae) in the Danube River in Bulgaria. *Acta Zoologica Bulgarica* 58: 279–282.
- KAMLER J., DVOŘÁK J., 2006. Ochrana porostů polních plodin před zvěří – součást agrotechniky. *Úroda* (2): 59–61.
- KAMLER J., HEROLDOVÁ M., HOMOLKA M., DVOŘÁK J., 2006. Volně žijící býložravci a polní plodiny. *Svět myslivosti* 7(7): 8–9.
- KAMLER J., HOMOLKA M., 2005. Vliv býložravé zvěře na obnovu buku lesního v horském prostředí. *Folia Venatoria* 35: 79–84.
- KAMLER J., HOMOLKA M., HEROLDOVÁ M., DVOŘÁK J., 2005. Volně žijící býložravci a polní plodiny. *Folia Venatoria* 35: 205–210.
- KMENT P., BRYJA J., 2006. Revised occurrence of *Heterotoma* species (Heteroptera: Miridae) in the Czech Republic and Slovakia with remarks on nomenclature, diagnostic characters and ecology. *Acta Musei Moraviae, Scientiae Biologicae* 91: 7–52.
- KMENT P., BRYJA J., HRADIL K., JINDRA Z., 2005. New and interesting records of true bugs (Heteroptera) from the Czech Republic and Slovakia 3. *Klapalekiana* 41: 157–213.
- KMENT P., BRYJA J., JINDRA Z., 2005. New records of true bugs (Heteroptera) of the Balkan peninsula. *Acta Entomologica Slovenica* 13: 9–20.
- OBDRŽÁLKOVÁ D., ZAPLETAL M., ZEJDA J., HEROLDOVÁ M., 2006. Co lze očekávat od vývoje populace hraboše v roce 2006. *Úroda* (2): 59–61.
- ONDRAČKOVÁ M., TRICHKOVA T., JURAJDA P., 2006. Present and historical occurrence of metazoan parasites in *Neogobius kessleri* (Pisces: Gobiidae) in the Bulgarian section of the Danube River. *Acta Zoologica Bulgarica* 58: 401–408.
- POŽGAYOVÁ M., PROCHÁZKA P., HONZA M., 2005. Predace snůšky pěníce černohlavé (*Sylvia atricapilla*) strakapoudem velkým (*Dendrocopos major*). *Sluka* 2: 97–101.
- PROCHÁZKA P., 2006. Analýza stabilních izotopů – alternativní metoda studia migrace ptáků. *Sylvia* 42: 3–21.
- SUCHOMEL J., HEROLDOVÁ M., 2006. Diversity of small mammals communities in two semiartificial wooded habitats. *Hystrix* 17: 179–182.
- TÓTHOVÁ A., BRYJA J., BEJDÁK P., VAŇHARA J., 2006. Molecular markers used in phylogenetic studies of Diptera with a methodological overview. *Acta Universitatis Carolinae, Biologica* 50: 125–133.
- ZAPLETAL M., OBDRŽÁLKOVÁ D., ZEJDA J., HEROLDOVÁ M., 2006. Prognóza vývoje početnosti hraboše polního v ČR v roce 2006. *Agro* (3): 28–29.
- ZAPLETAL M., OBDRŽÁLKOVÁ D., ZEJDA J., HEROLDOVÁ M., 2006. Škody hrabošem polním a zajícem polním v sadech v zimě 2005/06. *Rostlinolékař* (5): 11.

Papers in proceedings

- ADÁMEK Z., JURAJDA P., MUSIL J., JANÁČ M., KABILKA P., POLAČIK M., ŤUK J., VALOVÁ Z., ZEMAN J., 2006. Perch (*Perca fluviatilis* L.) diet during the flooding period of the Chabařovice coal mining pit (North-West Bohemia, Czech Republic). In: 5th International Conference on Reservoir Limnology and Water Quality: „Reservoirs – Establishing the Balance between Human Use and Biotic Integrity“. Biologické centrum AV ČR, Brno: 67–68.
- BARANČEKOVÁ M., PROKEŠOVÁ J., HOMOLKA M., KAMLER J., 2005. The preference by browsing in floodplain forest – the role of abundance and nutrient content. In: Pohlmeier K. (ed.), 27th Congress of the International Union of Game Biologists. DSV-Verlag, Hamburg: 278–279.
- BARÁNEK V., MAREŠ J., PROKEŠ M., JIRÁSEK J., SPURNÝ P., 2005. Odchov larev candáta obecného (*Sander lucioperca*) v kontrolovaných podmínkách – krátké sdělení. In: Spurný E. (ed.), 8. Česká ichtyologická konference: sborník referátů z konference s mezinárodní účastí konané v Brně 14. a 15. září 2005. Mendelova zemědělská a lesnická univerzita, Brno: 226–227.
- BARÁNEK V., MAREŠ J., PROKEŠ M., JIRÁSEK J., SPURNÝ P., 2005. Převod rychleného plůdku candáta obecného (*Sander lucioperca*) na umělou dietu (předběžné výsledky). In: Spurný E. (ed.), 8. Česká ichtyologická konference: sborník referátů z konference s mezinárodní účastí konané v Brně 14. a 15. září 2005. Mendelova zemědělská a lesnická univerzita, Brno: 221–225.
- BARÁNEK V., PROKEŠ M., BARUŠ V., PEŇÁZ M., CILEČEK M., MAREŠ J., JIRÁSEK J., SPURNÝ P., 2006. Srovnání růstu juvenilního (1+) jesetera malého (*Acipenser ruthenus*) při použití experimentální a komerční diety. In: Vykusová B. (ed.), 9. Česká ichtyologická konference. Jihočeská univerzita, České Budějovice: 8–11.
- BARUŠ V., PEŇÁZ M., PROKEŠ M., 2005. Rod kapr *Cyprinus* Linnaeus, 1758 – aktuální přehled o druhové diverzitě. In: Spurný E. (ed.), 8. Česká ichtyologická konference: sborník referátů z konference s mezinárodní účastí konané v Brně 14. a 15. září 2005. Mendelova zemědělská a lesnická univerzita, Brno: 9–15

- BLAHÁK P., PROKEŠ M., 2005. Délko-hmotnostní parametry velkých jedinců jelce proudníka (*Leuciscus leuciscus*), jelce tlouště (*L. cephalus*) a jelce jesena (*L. idus*) ulovených v České republice a ve Slovenské republice. In: Spurný E. (ed.), 8. Česká ichtyologická konference: sborník referátů z konference s mezinárodní účastí konané v Brně 14. a 15. září 2005. Mendelova zemědělská a lesnická univerzita, Brno; 154–159.
- BRYJA J., HÁJKOVÁ P., 2006. Ochranařská genetika a její využití při studiu a ochraně savců. In: Adamec M., Urban P. (eds.), Výskum a ochrana cicavcov na Slovensku 7. Štátna ochrana prírody, Banská Bystrica; 109–113.
- CERKAL R., DVOŘÁK J., KAMLER J., VEJRAŽKA K., 2006. Hodnocení škod působených zvěří na polních plodinách. In: Neudert L., Smutný V. (eds), MZLU pěstitelům: sborník odborných příspěvků. Žabčice, 14. června 2006. Mendelova zemědělská a lesnická univerzita, Brno; 36–42.
- CERKAL R., DVOŘÁK J., KAMLER J., VEJRAŽKA K., ŠEJNOHOVÁ H., 2006. Zhodnocení ztrát na výnosu a kvalitě vybraných polních plodin po simulovaném poškození listové plochy rostlin. In: Dvořák J., Kamler J., Vaca D. (eds), Problematika škod působených zvěří na zemědělských plodinách. Mendelova zemědělská a lesnická univerzita, Brno; 15–28.
- ČERVENÝ J., KOUBEK P., MARHOUL P., NOVÁ P., VOLF O., BARTOŠOVÁ D., BUFKA L., BLÁHA J., 2006. Large carnivores: wolf, brown bear, and lynx in the Czech Republic. In: Bath A. (ed.), Transboundary Management of Large Carnivore Populations. Council of Europe, Strasbourg; 45–48.
- HABÁN V., PROKEŠ M., BARUŠ V., MAREŠ J., 2006. Individuální růst a hmotnostní kondice kapra obecného (*Cyprinus carpio m. domestica*) v Novomlýnské nádrži (předběžné výsledky). In: Vykusová B. (ed.), 9. Česká ichtyologická konference. Jihočeská univerzita, České Budějovice; 16–21.
- HÁJKOVÁ P., 2006. Vydra říční - populačná a genetická štruktúra. In: Adamec M., Urban P. (eds.), Výskum a ochrana cicavcov na Slovensku 7. Štátna ochrana prírody, Banská Bystrica; 123–128.
- HALAČKA K., VETEŠNÍK L., 2005. Vliv teplotního a kyslíkového stresu na karasa stříbřitého. In: Spurný E. (ed.), 8. Česká ichtyologická konference: sborník referátů z konference s mezinárodní účastí konané v Brně 14. a 15. září 2005. Mendelova zemědělská a lesnická univerzita, Brno; 270–274.
- HANEL L., LUSK S., 2006. Dlouhodobé sledování mihule ukrajinské (*Eudontomyzon mariae*) v Račím potoce (1998–2006). In: Lusk S., Lusková V. (eds), Biodiverzita ichtyofauny České republiky (VI). ÚBO AV ČR, Brno; 45–49.
- HARTVICH P., LUSK S., 2006. První nález sumečka černého (*Ameiurus melas*) na Třeboňsku v České republice. In: Lusk S., Lusková V. (eds), Biodiverzita ichtyofauny České republiky (VI). ÚBO AV ČR, Brno; 55–58.
- HEROLDOVÁ M., SUCHOMEL J., ZEJDA J., OBDRŽÁLKOVÁ D., ZAPLETAL M., 2006. Hlodavci jako škůdci lesa. In: Kapitola P., Baňaf P. (eds), Škodliví činitelé v lesích Česka 2005/2006. Lesní ochranná služba VÚLHM, Jiloviště-Strnady; 40–43.
- HUMPL M., LUSK S., 2006. Změny početnosti vranky obecné (*Cottus gobio* L.) v řece Louče u Skryjí v letech 1968–2004. In: Lusk S., Lusková V. (eds), Biodiverzita ichtyofauny České republiky (VI). ÚBO AV ČR, Brno; 65–69.
- JANÁČ M., JURAJDA P., 2006. Porovnání účinnosti dvou typů plůdkové záťahové sítě. In: Vykusová B. (ed.), 9. Česká ichtyologická konference. Jihočeská univerzita, České Budějovice; 29–32.
- KAMLER J., DVOŘÁK J., HEROLDOVÁ M., HOMOLKA M., 2006. Volně žijící býložravci a polní plodiny. In: Dvořák J., Kamler J., Vaca D. (eds), Problematika škod působených zvěří na zemědělských plodinách. Mendelova zemědělská a lesnická univerzita, Brno; 8–14.
- KAMLER J., HOMOLKA M., 2005. Brown hare (*Lepus europaeus*) - the main factor limiting growth of European beech in forest environment. In: Pohlmeier, K. (ed.), 27th Congress of the International Union of Game Biologists. DSV-Verlag, Hamburg; 118–119.
- KAMLER J., HOMOLKA M., 2005. Estimating of the red (*Cervus elaphus*) and roe deer (*Capreolus capreolus*) diet quality by near-infrared reflectance spectroscopy. In: Pohlmeier, K. (ed.), 27th Congress of the International Union of Game Biologists. DSV-Verlag, Hamburg; 366–367.
- KAMLER J., HOMOLKA M., 2005. Přirozené sezónní změny ve výběru potravy a trávicím traktu přezývkavé zvěře. In: Přezimovací obůrky a oblasti chovu. Česká lesnická společnost, Špindlerův Mlýn; 32–34.
- KAMLER J., HOMOLKA M., HEROLDOVÁ M., 2006. Potravní ekologie spárkaté zvěře a škody okusem. In: Předcházení škod spárkatou zvěří. Česká lesnická společnost, Hranice; 38–41.
- KONEČNÁ G., JANÁČ M., JURAJDA P., 2006. Sezónní variabilita vzorků rybiho společenstva. In: Vykusová B. (ed.), 9. Česká ichtyologická konference. Jihočeská univerzita, České Budějovice; 43–45.
- KORUNOVÁ V., LUSKOVÁ V., LUSK S., 2006. Zatížení ryb rtutí v horních úsecích Divoké Orlice a Tiché Orlice. In: Sborník konference Orlicko - Kladsko 2006. Sdružení obcí Orlicko, Jablonné nad Orlicí; 179–184.
- KOŠČO J., KOŠUTH P., LUSKOVÁ V., LUSK S., KOŠUTHOVÁ L., HALAČKA K., 2006. Súčasný stav rozšírenia zástupcov čeľade Cobitidae v Slovenskom povodí Tisy. In: Lusk S., Lusková V. (eds), Biodiverzita ichtyofauny České republiky (VI). ÚBO AV ČR, Brno; 17–23.
- KOŠČO J., LUSK S., LUSKOVÁ V., HALAČKA K., KOŠUTH P., 2005. Amur sleeper, a new invasive species in the Danube river network. In: II International Symposium Alien Species in Holarctic (Borok - 2). Rossijskaja Akademija nauk, Rybinsk; 200–201.

- KOŠČO J., LUSK S., KOŠUTHOVÁ L., KOŠUTH P., 2005. Chránené druhy rýb Slovenska - súčasť NATURY 2000. In: Spurný E. (ed.), 8. Česká ichtyologická konference: sborník referátů z konference s mezinárodní účastí konané v Brně 14. a 15. září 2005. Mendelova zemědělská a lesnická univerzita, Brno; 97-102.
- KOŠČO J., LUSK S., KOŠUTHOVÁ L., LUSKOVÁ V., KOŠUTH P., HALAČKA K., 2005. Invázne druhy rýb Slovenska - ich rozšírenie a vplyv. In: Spurný E. (ed.), 8. Česká ichtyologická konference: sborník referátů z konference s mezinárodní účastí konané v Brně 14. a 15. září 2005. Mendelova zemědělská a lesnická univerzita, Brno; 109-115.
- KOUBEK P., ČERVENÝ J., 2005. Ochrana a obhospodařování populace rýsa ostrovida v České republice. In: Ochrana a obhospodařování šeliem na Slovensku. Výskumný ústav živočišnej výroby, Nitra; 49-53.
- LOJKÁSEK B., LUSK S., PAPOUŠEK I., 2006. Nepůvodní druhy ryb povodí Odry na Moravě a ve Slezsku. In: Lusk S., Lusková V. (eds), Biodiverzita ichtyofauny České republiky (VI). ÚBO AV ČR, Brno; 79-85.
- LUIJ J., CERKAL R., DVOŘÁK J., VEJRAŽKA K., KAMLER J., 2006. The yield loss of maize (*Zea mays* L.) grown for grain when the plants are mechanically damaged. In: MendelNet'06 Agro. Mendelova zemědělská a lesnická univerzita, Brno; 32. [CD-ROM]
- LUSK S., HANEL L., LUSKOVÁ V., LOJKÁSEK B., HARTVICH P., 2006. Červený seznam mihulí a ryb České republiky - verze 2005. In: Lusk S., Lusková V. (eds), Biodiverzita ichtyofauny České republiky (VI). ÚBO AV ČR, Brno; 7-15.
- LUSK S., LUSKOVÁ V., 2005. Invazivní druhy ryb v podmínkách České republiky. In: Spurný E. (ed.), 8. Česká ichtyologická konference: sborník referátů z konference s mezinárodní účastí konané v Brně 14. a 15. září 2005. Mendelova zemědělská a lesnická univerzita, Brno; 116-121.
- LUSK S., LUSKOVÁ V., 2005. Vnitrodruhová diverzita ichtyofauny České republiky - znalost a ochrana. In: Spurný E. (ed.), 8. Česká ichtyologická konference: sborník referátů z konference s mezinárodní účastí konané v Brně 14. a 15. září 2005. Mendelova zemědělská a lesnická univerzita, Brno; 103-108.
- LUSK S., LUSKOVÁ V., HANEL L., HALAČKA K., 2005. Alien species in the ichthyofauna of the Czech Republic: their impact and meaning. In: II International Symposium Alien Species in Holarctic (Borok - 2). Rossijskaja Akademija nauk, Rybinsk; 203-204.
- LUSK S., LUSKOVÁ V., LOJKÁSEK B., HALAČKA K., 2005. Problémy ochrany evropsky významných lokalit mihulí a ryb v povodích Dyje, Moravy a Odry. In: Měkotová J., Štěrba O. (eds), Říční krajina 3. Univerzita Palackého, Olomouc; 208-213.
- LUSK S., LUSKOVÁ V., LOJKÁSEK B., HALAČKA K., VETEŠNÍK L., MERTA L., 2006. K výskytu vzácných a chráněných druhů mihulí a ryb v povodí řeky Moravy. In: Lusk S., Lusková V. (eds), Biodiverzita ichtyofauny České republiky (VI). ÚBO AV ČR, Brno; 87-94.
- LUSKOVÁ V., LUSK S., HALAČKA K., VETEŠNÍK L., 2005. *Carassius auratus*, the most successful invasive species in the waters of the Czech Republic. In: II International Symposium Alien Species in Holarctic (Borok - 2). Rossijskaja Akademija nauk, Rybinsk; 204-205.
- MÁCHOVÁ J., PROKEŠ M., FAINA R., KROUPOVÁ H., SVOBODOVÁ Z., PEŇÁZ M., BARUŠ V., 2006. Použití přípravku Diazinon 60 EC v rybářské praxi a jeho toxicita pro ryby a další vodní organismy. In: Vykusová B. (ed.), 9. Česká ichtyologická konference. Jihočeská univerzita, České Budějovice; 79-84.
- MENDEL J., LUSK S., LUSKOVÁ V., KOŠČO J., PAPOUŠEK I., HALAČKA K., VETEŠNÍK L., 2006. Molekulárně-biologické analýzy hrouzka Kesslerova ve vodách České republiky a Slovenska. In: Lusk S., Lusková V. (eds), Biodiverzita ichtyofauny České republiky (VI). ÚBO AV ČR, Brno; 95-101.
- MENDEL J., LUSKOVÁ V., LUSK S., HALAČKA K., 2006. Rybí osídlení a genetická diverzita populace hrouzka obecného z Divoké Orlice u Kostelce nad Orlicí. In: Sborník konference Orlicko - Kladsko 2006. Sdružení obcí Orlicko, Jablonné nad Orlicí; 175-178.
- NOVÁKOVÁ M., 2005. Is stone marten (*Martes foina*) food competitor of western polecat (*Mustela putorius*) in the Czech Republic? In: Pohlmeier, K. (ed.), 27th Congress of the International Union of Game Biologists. DSV-Verlag, Hamburg; 427-428.
- PALÍKOVÁ M., BARUŠ V., VÁVROVÁ M., NAVRÁTIL S., 2006. Distribuce rizikových prvků ve tkáních parmy obecné. In: Hygiena alimentorum XXVII: bezpečnost a kvalita produktů hydiny, ryb a zveriny - záruke spokojnosti konzumenta. Univerzita veterinárskeho lekárstva, Košice; 360-363.
- PALÍKOVÁ M., BARUŠ V., VÁVROVÁ M., NAVRÁTIL S., 2006. Obsah rizikových prvků ve svalovině a játrech úhoře říčního (*Anguilla anguilla*) a hlístici (*Anguillicola crassus*). In: Hygiena alimentorum XXVII: bezpečnost a kvalita produktů hydiny, ryb a zveriny - záruke spokojnosti konzumenta. Univerzita veterinárskeho lekárstva, Košice; 364-367.
- PIVNÍČKA K., HUMPL M., 2006. Vliv kvality vody na rybářsky využívané ichthyocenózy v Berounce, 1975-2003. In: Lusk S., Lusková V. (eds), Biodiverzita ichtyofauny České republiky (VI). ÚBO AV ČR, Brno; 109-115.
- POLAČIK M., JANÁČ M., JURAJDA P., 2006. Súčasný rozšírenie býčkov rodu *Neogobius* (Gobiidae) v pozdlžnom profile Dunaja. In: Vykusová B. (ed.), 9. Česká ichtyologická konference. Jihočeská univerzita, České Budějovice; 110-113.

- PROKEŠ M., BARUŠ V., PEŇÁZ M., 2005. Výskyt a charakteristika úlovků jelce jesena (*Leuciscus idus* Linnaeus, 1758) v povodí řeky Moravy. In: Spurný E. (ed.), 8. Česká ichtyologická konference: sborník referátů z konference s mezinárodní účastí konané v Brně 14. a 15. září 2005. Mendelova zemědělská a lesnická univerzita, Brno; 147-153.
- PROKEŠ M., BARUŠ V., PEŇÁZ M., 2006. Charakteristika exploatace parmy obecné, ostroretky stěhovavé, jelce tlouště a jelce jesena v říčním a jezerním ekosystému. In: Vykusová B. (ed.), 9. Česká ichtyologická konference. Jihočeská univerzita, České Budějovice; 119-123.
- PROKEŠOVÁ J., BARANČEKOVÁ M., HOMOLKA M., 2005. Roe (*Capreolus capreolus*) and red (*Cervus elaphus*) deer foraging habits under snow conditions. In: Pohlmeier, K. (ed.), 27th Congress of the International Union of Game Biologists. DSV-Verlag, Hamburg; 447-449.
- SPURNÝ P., PROKEŠ M., 2005. Profesor Vlastimil Baruš jubilantem. In: Spurný E. (ed.), 8. Česká ichtyologická konference: sborník referátů z konference s mezinárodní účastí konané v Brně 14. a 15. září 2005. Mendelova zemědělská a lesnická univerzita, Brno; 6-8.
- SYCHRA J., ADÁMEK Z., 2006. New approach to phytophilous macroinvertebrates sampling in emergent littoral vegetation. In: 5th International conference on Reservoir Limnology and Water Quality: „Reservoirs – Establishing the Balance between Human Use and Biotic Integrity“. Biologické centrum AV ČR, Brno; 230-233.
- ŠOVČÍK P., SPURNÝ P., PEŇÁZ M., 2006. Štruktúra populácie rýb v rieke Jihlave v úseku ovplyvnenom prevádzkou energetického komplexu Dukovany – Dalešice. In: Vykusová B. (ed.), 9. Česká ichtyologická konference. Jihočeská univerzita, České Budějovice; 166-171.
- ŠVANYGA J., VALOVÁ Z., JANÁČ M., BIALEK M., MACHALA M., JURAJDA P., 2006. Rybí společenstvo znečištěného úseku Labe na Pardubicku. In: Vykusová B. (ed.), 9. Česká ichtyologická konference. Jihočeská univerzita, České Budějovice; 172-175.
- VALLO P., 2006. Vnútro- a medzidruhová variabilita podkovárovcovitých (Chiroptera: Hipposideridae) juhovýchodného Senegalu na základe mitochondriálneho génu pre cytochróm b. In: Halgoš J. (ed.), Študentská vedecká konferencia, 26. apríl 2006. Zborník recenzovaných príspevkov. Kartprint, Bratislava; 173-175.

Book reviews

- ČAPEK Jr. M., 2005. Bird D.M., The Bird Almanac: a Guide to Essential Facts and Figures of the World's Birds. Completely revised and updated. Firefly Books, New York, 2005, 460 pp. Sluka 2: 148-149.
- HUBÁLEK Z., 2006. Místo systlů vevery. Kimmig P., Hassler D., Braun R., Zecken. Kleiner Stich mit bösen Folgen. Překlad Barfussová R., Klišata – Nepatrné kousnutí s neblahými následky. Pragma, Praha, 2003, 114 pp. Literární noviny 19: 7.
- JANÁČ M., 2006. Campbell A., Dawes J. (eds): Encyclopedia of Underwater Life. Oxford University Press, Oxford, 2005, 306 pp. Folia Zoologica 55: 150.
- MARTÍNKOVÁ N., 2005. Albert V.A. (ed.), Parsimony, Phylogeny and Genomics. Oxford University Press, Oxford, 2005, 238 pp. Folia Zoologica 54: 448.
- PETRŽELKOVÁ K. J., 2006. Reynolds V., The Chimpanzees of the Budongo Forest: Ecology, Behaviour, and Conservation. Oxford University Press, Oxford, 2005, 297 pp. Folia Zoologica 55: 198.
- PIÁLEK J., ZIMA J., 2006: Conner J.K., Hartl D.L.: A Primer of Ecological Genetics. Sinauer Associates, Sunderland, 2004, 304 pp. Folia Geobotanica 41: 237.
- PROCHÁZKA P., 2005. Greenberg R., Marra P.P. (eds), Birds of Two Worlds: the Ecology and Evolution of Migration. John Hopkins University Press, Baltimore, 2005, 466 pp. Sylvia 41: 143-145.
- PROCHÁZKA P., 2006. Videler J.J., Avian Flight. Oxford University Press, New York, 2005, 258 pp. Folia Zoologica 55: 52.
- TKADLEC E., 2006. Barbosa P., Castellanos I. (eds), Ecology of Predator-Prey Interactions. Oxford University Press, Oxford, 2005, 394 pp. Folia Zoologica 55: 223-224.
- ZIMA J., 2006. Cracraft J., Donoghue M.J. (eds), Assembling the Tree of Life. Oxford University Press, Oxford, 2004, 576 pp. Folia Zoologica 55: 74.
- ZIMA J., 2006. Ferrière R., Dieckmann U., Couvet D. (eds): Evolutionary Conservation Biology. Cambridge University Press, Cambridge, 2004, 428 pp. Folia Geobotanica 41: 237-238.
- ZIMA J., 2006. Gordon M.S., Bartol S.M. (eds): Experimental Approaches to Conservation Biology. University of California Press, Berkeley, 2004, 358 pp. Folia Geobotanica 41: 238-239.
- ZIMA J., 2006. Jablonka E., Lamb M.J.: Evolution in Four Dimensions: Genetic, Epigenetic, Behavioral and Symbolic Variation in the History of Life. MIT Press, Cambridge, 2005, 472 pp. Folia Geobotanica 41: 348-349.
- ZIMA J., 2006. Kemp, T. S., The Origin and Evolution of Mammals. Oxford University Press, Oxford, 2005, 331 pp. Folia Zoologica 55: 28.

- ZIMA J., 2006. Reşit Akçakaya H. (ed.) Species Conservation and Management: Case Studies. Oxford University Press, Oxford, 2004, 533 pp. *Folia Zoologica* 55: 112.
- ZIMA J., 2006. Singh R.S., Uyenoyama M.K. (eds.): The Evolution of Population Biology. Cambridge University Press, Cambridge, 2004, 460 pp. *Folia Geobotanica* 41: 349.

Popularization books and articles

- ČAPEK M., SLABÁKOVÁ H., ZIMA J. (eds), 2005. Biennial Report 2003–2004. ÚBO AV ČR, Brno, 76 pp.
- ČERVENÝ J., 2005. Seminář Rady Evropy o managementu velkých šelem. Svět myslivosti 6(6): 7–8.
- ČERVENÝ J., 2006. Myslivec a rys, dva lovci a jedna kořist – srnčí zvěř. Svět myslivosti 7(3): 8–11.
- ČERVENÝ J., ANDĚRA M., KOUBEK P., 2005. Co nového v naší fauně? Vyhodnocení dotazníků z let 2001–2003. *Myslivost* 53(12): 62–66.
- ČERVENÝ J., BUFKA L., KOUBEK P., 2005. Velké šelmy v České republice. I. Mýty a skutečnost. *Vesmír* 84: 656–663.
- ČERVENÝ J., KOUBEK P., 2006. Medvěd je opět stálým druhem naší zvěře. Svět myslivosti 7(11): 6–8.
- ČERVENÝ J., KOUBEK P., BUFKA L., 2005. Velké šelmy v České republice. II. Vlk obecný. *Vesmír* 84: 726–730.
- ČERVENÝ J., KOUBEK P., BUFKA L., 2006. Velké šelmy v České republice. III. Medvěd hnědý. *Vesmír* 85: 20–25.
- ČERVENÝ J., KOUBEK P., BUFKA L., 2006. Velké šelmy v České republice. IV. Rys ostrovid. *Vesmír* 85: 86–94.
- DVOŘÁK J., KAMLER J., 2006. Jak dál se sikou v plzeňském regionu? Svět myslivosti 7(12): 6–7.
- DVOŘÁK J., KAMLER J., 2006. Škody působené zvěří – zkouška schopností komunikace. Svět myslivosti 7(2): 12–13.
- HOMOLKA M., 2005. Lesy v kulturní krajině a nekulturní los. *Veronica* 19(2): 8–10.
- HOŘÁK D., PROCHÁZKA P., 2006. Setkání ornitologů v Praze. *Akademický bulletin AV ČR* 2006(6): 8.
- HUBÁLEK Z., 2005. Czechia, nebo Czechland(s)? *Akademický bulletin AV ČR* 2005(7–8): 34.
- HUBÁLEK Z., 2005. Spamie. *Literární noviny* 16(7): 1, 3.
- HUBÁLEK Z., 2006. Spamie. *Ikaros*: 1. <http://www.ikaros.cz/clanek.asp?ID=20051201>
- HUBÁLEK Z., 2005. Špička ledovce. *Literární noviny* 16(28): 28.
- JURAJDA P., 2005. Ryby v našich tocích. *Bílé Karpaty* 10: 20–21.
- KAMLER J., 2005. Jak (ne)bezpečně je být myslivcem? Svět myslivosti 6(12): 14–15.
- KAMLER J., 2005. Úvodník. Svět myslivosti 6(11): 2.
- KAMLER J., 2006. Je hon vědců na myslivce oprávněný? *Myslivost* 54(9): 6–7.
- KAMLER J., 2006. Ještě ke stanovisku. *Myslivost* 54(11): 34.
- KAMLER J., 2006. Na zvěř jen jistou ránu! Svět myslivosti 7(10): 11–12.
- KAMLER J., 2006. Seminář „Předcházení škodám působeným spárkatou zvěří“. Svět myslivosti 7(12): 4–5.
- KAMLER J., 2006. Úvodník. Svět myslivosti 7(12): 1.
- KAMLER J., 2006. Zachrání nás puškohledy pro noční vidění před invazí černé zvěře?. *Myslivost* 54(10): 28–29.
- KAMLER J., DVOŘÁK J., 2005. Jsou společenské lovy budoucností české myslivosti? *Myslivost* 53(10): 10–11.
- KAMLER J., DVOŘÁK J., 2005. Nestresujeme zvěř zbytečně? Svět myslivosti 6(8): 10–11.
- KAMLER J., DVOŘÁK J., 2006. Seminář o škodách zvěří na zemědělských plodinách. *Myslivost* 54(6): 81.
- KAMLER J., HOMOLKA M., HEROLDOVÁ M., 2005. Jak se podívat jelenovi do žaludku. *Myslivost* 53(11): 16–17.
- KAMLER J., PAVLATA L., 2006. Začíná příkrmování – pozor na acidózy u spárkaté zvěře. Svět myslivosti 7(11): 14–15.
- KAMLER J., PROKEŠOVÁ J., 2005. 27. kongres Unie biologů zvěře. Svět myslivosti 6(10): 10–11.
- KOUBEK P., 2005. „Levicke pořovnícké dñi“ podesáté!. Svět myslivosti. 6(6): 4–6.
- KOUBEK P., 2005. Myslivecká statistika. Svět myslivosti. 6(11): 12.
- KOUBEK P., 2005. Úvodník. Svět myslivosti 6(7): 2.
- KOUBEK P., ČERVENÝ J., 2006. Rys ostrovid v Evropě. Svět myslivosti 7(3): 4–5.
- LOYKA P., JURAJDA P., ADÁMEK Z., 2005. Migrace ryb na řece Moravě. *Rybářství* 2005(3): 78.
- MUNCLINGER P., ZIMA J., 2006. Molekulární ekologie není ekologie molekul. *Živa* 54: L–LI.
- PENÁZ M., 2006. Invazní druhy ryb České republiky. *Veronica* 20(2): 8–11.
- REICHARD M., 2005. Rozmnožování hořavky duhové II. Samčí strategie. *Živa* 53: 29–30.
- RUDOLF I., ŠIKUTOVÁ S., HUBÁLEK Z., 2005. Mohou komáři přenášet lymfskou borreliózu? Krátké zamyšlení nad vektorovou kompetencí. *Vesmír* 41: 134–136.
- VALOVÁ Z., 2005. Reprodukce ryb dolní Moravy a Dyje. *Živa* 53: 179–181
- ZIMA J., 2006: Jak mě poznamenala Biologická olympiáda. In: Farkač J., Božková, H. (eds), Biologická olympiáda. Jan Farkač, Praha: 105.

PRINCIPAL SCIENTIFIC DIVISIONS

Department of Medical Zoology

Head

RNDr. Jiří H A L O U Z K A , PhD <jhalouzka@brno.cas.cz>
ecology of pathogens and arthropod vectors

Research Scientists

Assoc. Prof. RNDr. Zdeněk H U B Á L E K , DSc <zhubalek@brno.cas.cz>
ecology of pathogens and vertebrate hosts

RNDr. Zinočka J U Ř I C O V Á , PhD <juricova@brno.cas.cz>
ecology of pathogens, serosurveys

Mgr. Ivo R U D O L F , PhD <rudolf@brno.cas.cz>
molecular-biology methods and detection

Mgr. Silvie Š I K U T O V Á , PhD <sikutova@brno.cas.cz>
serology, vector biologi

Undergraduates

Hana D A N Ā K O V Á

Václav H O E N I G

Jana M A S A Ř Í K O V Á

Petra S V O B O D O V Á

Technicians

Juraj P E Š K O

Ladislava Š E V Č Í K O V Á

Research priorities

Research is focused on the ecology of selected microbial pathogens (including new emerging diseases), the causative agents of human and animal infections. The phenomenon of natural focality is studied in respect of the role of wild endotherm vertebrates (hosts or reservoirs) and hematophagous arthropods (vectors) and under effects of the recently globally changing natural conditions.

Main research topics:

- arboviruses (i.e. viruses transmitted by ticks, mosquitoes and other hematophagous arthropods, such as the West Nile, Sindbis, Ťahyňa, and tick-borne encephalitis viruses)
- spirochetes (*Borrelia burgdorferi*, the agent of Lyme borreliosis) and some other bacterial agents
- circulation of these pathogens in terrestrial and aquatic ecosystems under changing natural conditions including human impact
- development and optimisation of a new molecular-biological methods for the detection and characterization of the pathogens studied
- prophylactic strategy establishment and prevention of free-living vertebrates and humans in relation to preventive medicine (human and veterinary), environmental protection, and nature conservation



Staff of the Department of Medical Zoology – right to left: J. Halouzka, Z. Juřicová, Z. Hubálek, L. Ševčíková, I. Rudolf, S. Šikutová, J. Peško. (Photo by R. Krbeček).

Selected research results

Migratory birds and avian influenza A virus H5N1 – its spread in Eurasia, possible introduction to America and continental dispersal

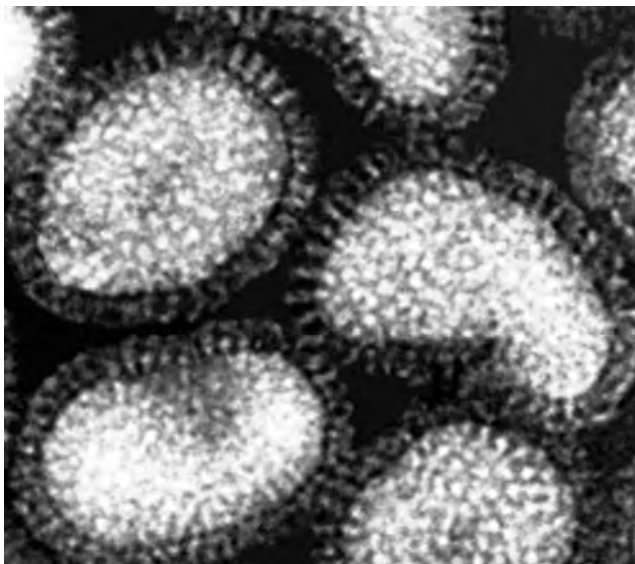
Water anseriform birds are the reservoir of a majority of influenza A viruses, including highly pathogenic avian influenza (HPAI). Marked lethality of its H5N1 subtype seemed to limit the role of migratory birds in the dispersal. However, the situation changed as HPAI H5N1 virus has expanded rapidly across Asia and into Europe and Africa, and migratory birds contributed to this dispersal. Birds could theoretically introduce H5N1 virus to the Western Hemisphere through migration, vagrancy and translocation by people (bird trade). Vagrants and migratory birds are not likely inter-hemispheric introductory hosts; import of infected domestic or pet birds is more probable. In the case of successful introduction, the virus might spread over the continent easily, with migratory anseriform birds (swans, geese, and ducks) playing a similar role as in Eurasia.

HUBÁLEK Z., 2004: An annotated checklist of pathogenic microorganisms associated with migratory birds. *Journal of Wildlife Diseases* 40: 639-659.

HUBÁLEK Z., 2006: Migratory birds and influenza virus. 8th Workshop of the Southeastern European Bird Migration Network (SEEN), Prague, abstract.

HUBÁLEK Z., 2006: Ptačí chřipka a tažní ptáci [Bird influenza and migrating birds]. *Crex* 26: 131-137.

RAPPOLE J.H., HUBÁLEK, Z., 2006: Birds and influenza H5N1 virus movement to and within North America. *Emerging Infectious Diseases* 12: 1486-1492.



Virions of the influenza A virus (WHO 2006).

Import of West Nile virus infection in the Czech Republic

We report West Nile virus infection of the central nervous system in a 69-year-old man, residing in North Moravia (Czech Republic), who visited the USA from 6 July to 31 August 2002. He developed fever with fatigue at the end of his USA stay. He was hospitalized after his return with fever up to 39.5 °C, fatigue, anorexia, dizziness, insomnia, blurred speech, and a marked bradypsychism. A significant increase of antibodies neutralizing West Nile virus was detected between the first (1:16) and second (1:256) blood serum sample. The patient recovered gradually. This is the first recorded human case of West Nile fever imported to the Czech Republic.

HUBÁLEK Z., HALOUZKA J., JUŘICOVÁ Z., 1999: West Nile fever in Czechland. *Emerging Infectious Diseases* 5: 594-595.

HUBÁLEK Z., LUKÁČOVÁ L., HALOUZKA J., ŠIRŮČEK P., JANUŠKA J., PŘECECHTĚLOVÁ J., PROCHÁZKA P., 2006: Import of West Nile virus infection in the Czech Republic. *European Journal of Epidemiology* 21: 323-324.

Applications of research results

Effects of forest clearing on the abundance of *Ixodes ricinus* ticks and the prevalence of *Borrelia burgdorferi* s.l.

Questing *Ixodes ricinus* ticks were collected on a forest trail that had been completely cleared of shrubs and ground vegetation in winter 2002 and on a nearby control uncleared forest transect in South Moravia (Czech Republic). Samples were collected each May in 2003, 2004 and 2005. Nymphal ticks were 3.4, 1.9 and 1.2 times less frequent on cleared forest than on uncleared trails in the three perspective years, whereas adult tick abundance was 27.2, 4.0 and

2.2 times lower, respectively. The ticks were examined for borreliae by dark-field microscopy: prevalence of nymphal ticks infected with *Borrelia burgdorferi sensu lato* (12.6% to 20.0%) did not differ significantly between the cleared and uncleared trail during the three years. In conclusion, the habitat modification appeared to result in a decreased abundance of *I. ricinus* as well as a reduced frequency of infected ticks (and thus indirectly a lower potential risk of Lyme borreliosis), which lasted, however, for only two years. Eight cultures of borreliae isolated from the ticks were all identified as the „ornithophilic“ genomic species *Borrelia garinii*, possibly indicating a greater role of forest birds than that of forest rodents as the hosts of immature *I. ricinus* in the tick (and borrelial) colonization of the cleared part of the forest.

HUBÁLEK Z., HALOUZKA J., JUŘICOVÁ Z., 2003: Longitudinal surveillance of the tick *Ixodes ricinus* for borreliae. *Medical and Veterinary Entomology* 17: 46–51.

HUBÁLEK Z., HALOUZKA J., JUŘICOVÁ Z., ŠIKUTOVÁ S., RUDOLF I., 2006: Effect of forest clearing on the abundance of *Ixodes ricinus* ticks and the prevalence of *Borrelia burgdorferi* s.l. *Medical and Veterinary Entomology* 20: 166–172.



L. Ševčíková handling biological material in a hazard box. (Photo by I. Rudolf)

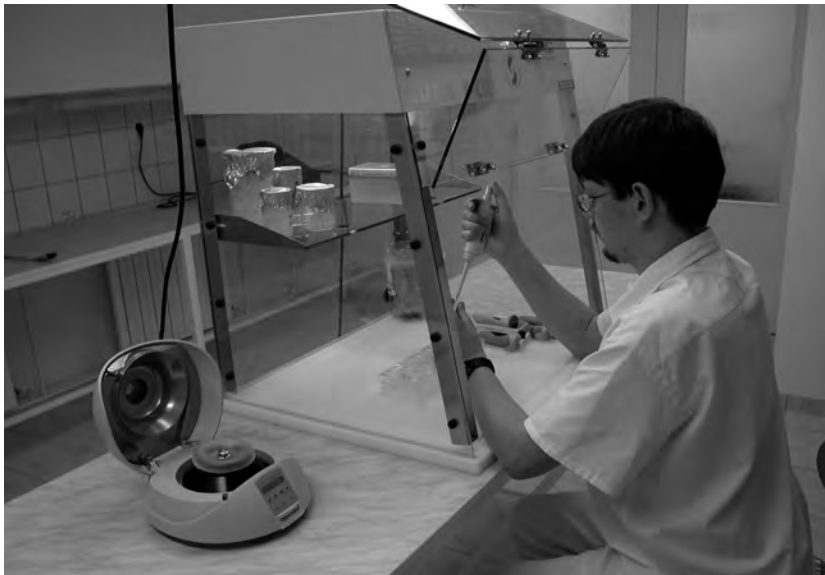
International cooperation

Prevalence of *Borrelia burgdorferi* sensu lato in the tick *Ixodes ricinus* in the Styrian Mountains of Austria

A total of 691 *Ixodes ricinus* ticks (22 males, 39 females, 501 nymphs and 129 larvae) were collected by flagging method from vegetation in 11 areas at altitudes between 789 and 1350 m above sea level in mixed woodland with pastureland and cattle in the province of Styria (Austria). They were examined for presence of *Borrelia burgdorferi* s.l. by dark field microscopy and PCR. Attempts to cultivate borreliae were made in BSK-H medium. The overall positivity rate of all collected ticks (excepting larvae) was 10.9%: 9.1% in males, 17.9% in females and 10.4% in nymphs. The larvae examined showed no presence of *B. burgdorferi* s.l. The mean infection rate of the vector of Lyme disease in the collection area of the highest altitude in this study – and the highest reported in Europe (Gaberl, 1350 m a.s.l.) was 6.4%: 1/9 males, 2/18 females, and 6/114 (5.3%) nymphs were positive. Culture attempts were positive in 12 cases and species identification showed eight isolates of *Borrelia afzelii* and four of *Borrelia garinii*. Three additional positive results found by PCR method (negative by dark field microscopy) were identified twice as *B. afzelii* and once as *B. garinii*. This study showed that the risk of acquiring of Lyme disease in habitats at higher altitudes is limited due to a lower density of *I. ricinus* and lesser infection rate of ticks than at lower altitudes in Central Europe, nevertheless it does exist.

STÜNZNER D., HUBÁLEK Z., HALOUZKA J., POSTIC D, PIERER K., MARTH E., 1998: Prevalence of *Borrelia burgdorferi* s.l. in *Ixodes ricinus* ticks from Styria (Austria) and species identification by PCR-RFLP analysis. Zentralblatt für Bakteriologie 288: 471-478.

STÜNZNER D., HUBÁLEK Z., HALOUZKA J., WENDELIN I., SIXL W., MARTH E., 2006. Prevalence of *Borrelia burgdorferi* sensu lato in the tick *Ixodes ricinus* in the Styrian mountains of Austria. Wiener klinische Wochenschrift: the Middle European Journal of Medicine 118: 682-685.



I. Rudolf preparing samples for PCR procedure. (Photo by J. Halouzka)

Department of Population Biology

Head

Prom. biol. Jaroslav P I Á L E K , PhD <pialek@brno.cas.cz>
population biology and genetics

Research Scientists

Mgr. et Mgr. Josef B R Y J A , PhD <bryja@brno.cas.cz>
molecular ecology

Joëlle G O Û Y D E B E L L O C Q , PhD <joellegouy@googlemail.com>
immunogenetics, parasitology

Mgr. Lumír G V O Ž D Í K , PhD <gvozdik@brno.cas.cz>
physiological ecology

Heidi C. H A U F F E , PhD <hauffe@cealp.it>
chromosomal evolution, speciation

Mgr. Peter K A Ň U C H , PhD <kanuch@netopiere.sk>
ecology, breeding phenology and behaviour of bats

Mgr. Natália M A R T Í N K O V Á , PhD <martinkova@brno.cas.cz>
phylogeography

Mgr. Jana S V O B O D O V Á , PhD <svobodovajana@fle.czu.cz>
molecular genetics of birds

Prof. Emil T K A D L E C , PhD <tkadlec@prfnw.upol.cz>
population dynamics

Prof. RNDr. Jan Z I M A , DSc <jzima@brno.cas.cz>
cytogenetics and biodiversity

PhD Students

RNDr. Barbora B Í M O V Á

Mgr. Dagmar Č Í Ž K O V Á

Mgr. Ludovít Ď U R E J E

Mgr. Jan D V O Ř Á K

Mgr. Petra D U F K O V Á

Mgr. Petra H Á J K O V Á

Mgr. Adam K O N E Č N Ý

Mgr. Radka P O L Á K O V Á

Mgr. Marie V E R K A E R E N

Mgr. Martina V Y S K O Č I L O V Á

Mgr. Barbora Z E M A N O V Á

Undergraduates

Drahomíra F A I N O V Á

Alena F O R N Ů S K O V Á

Pavla K Ř Í Ž O V Á

Hana P A T Z E N H A U E R O V Á

Marta P R O M E R O V Á

Dana R Y M E Š O V Á

Michal V I N K L E R

Technicians

Mgr. Anna B R Y J O V Á

Dušan H A V E L K A

Dana H A V E L K O V Á
Helena H E J L O V Á
Kristýna H E J L O V Á
Mgr. Jana P I Á L K O V Á
Ludmila R O U S K O V Á
Mgr. Monika Š U G E R K O V Á
Lucie V L Č K O V Á

Research priorities

The studies are performed on both laboratory and natural populations. Empirical data from observations and experiments supplemented by simulation modelling are used to investigate important questions of evolutionary biology, such as (model organisms given in parentheses):

- hybrid zones as barriers against gene flow and their role in speciation (*Mus*, *Sorex*, *Triturus*)
- study of factors affecting population structure (fish, bats and mammals)
- links between life history traits, adaptive genetic variation and population dynamics in small mammals (voles)
- phylogeography and reconstruction of historical colonization (*Mustela*, *Clethrionomys*, *Microtus*)
- analysis of reproductive success by using DNA markers (paternity analyses in fish, birds and mammals)
- conservation genetics of endangered vertebrate species (*Lutra*, *Rupicapra*); development of non-invasive techniques of DNA sampling
- mechanisms and evolution of thermal physiology traits in ectotherms (*Triturus*)
- functional approaches in studying morphological adaptations (*Zootoca*, *Triturus*)

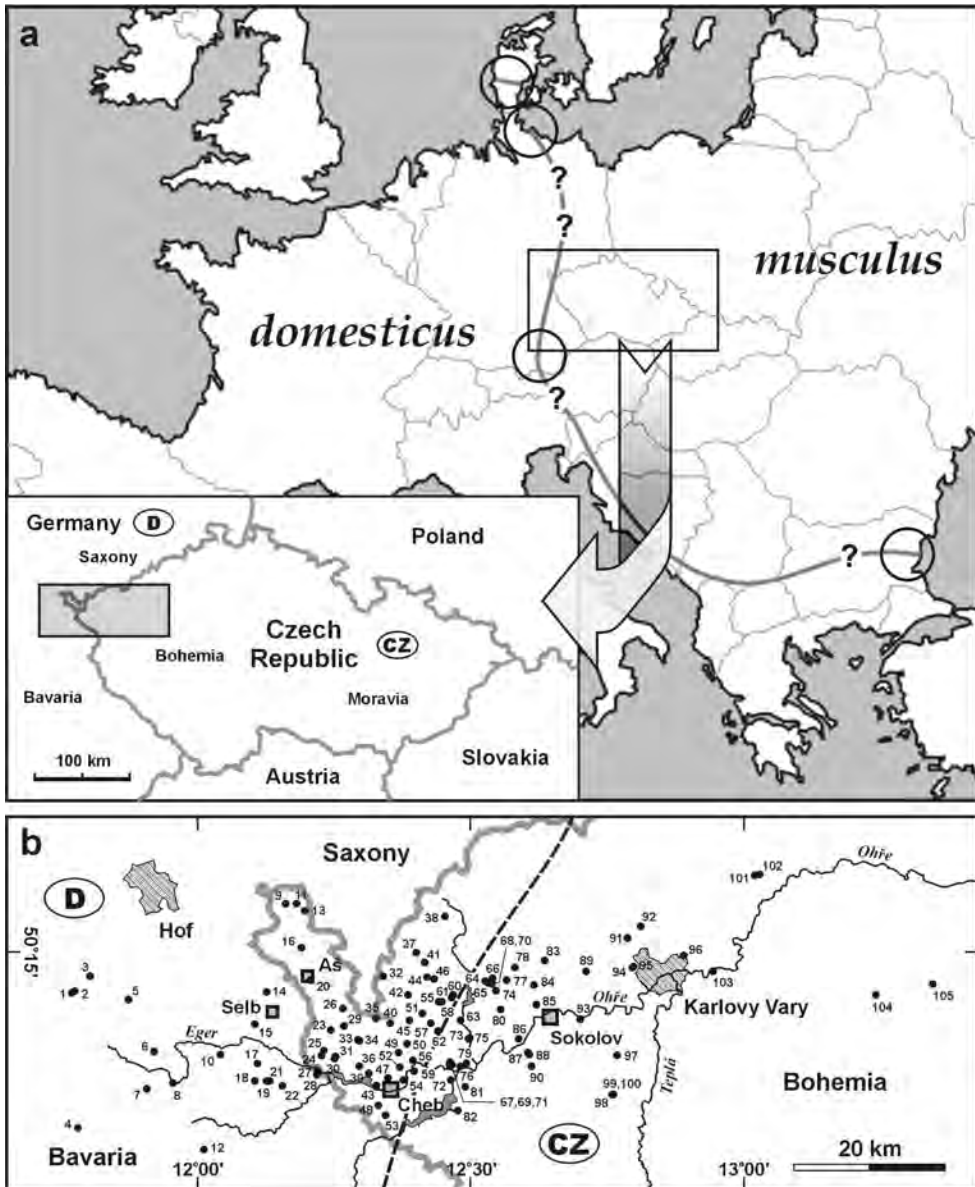
The results of these investigations are used in preparing recommendations for nature conservation, rodent pest control, lecturing at universities in Brno, České Budějovice, Prague, and Olomouc.

Selected research results

Behavioural and genetic study of speciation in a hybrid zone in the house mouse, *Mus musculus*

Two house mouse subspecies, *Mus m. musculus* and *M. m. domesticus*, form a long and narrow hybrid zone (HZ) running in Europe from Denmark to the Black Sea. Despite long-term interest in the study of this contact zone we have still a limited information about proximate mechanisms maintaining the HZ and thereby keeping the parental taxa in parapatry. To solve this question, we conducted a study of another part of the mouse HZ within the last 10 years. Based on maximum-likelihood analysis of more than 1500 mice from 105 localities we characterized the Czech-Bavarian transect across the HZ [1]. While most of molecular markers show similar transition in terms of frequencies from one taxon to another we found that one marker located on mitochondrial DNA is shifted from the centre and this shift is random when two transects are compared [2]. To determine factors keeping the two mouse

taxa apart and preventing intermixing of their genomes, we transported some mice to the laboratory and studied fitness components of parental and hybrid individuals. Behavioural studies focusing on assortative mating indicate that salivary signals (androgen-binding protein) most probably participate on subspecies specific recognition but in themselves are not efficient



(A) The course of the *musculus/domesticus* hybrid zone in Europe. Circles indicate previously studied transects in Denmark, Germany and Bulgaria. In the insert, the position of the Czech study area is indicated. (B) Location of 105 sampling sites. The thick dashed line is an approximate zone center defined as a 0.5-isocline derived from the bicubic spline smoothing of allele frequencies at each site.

enough to noticeably impede gene flow [3]. Hybrid male sterility is among presumed factors which can prevent gene flow between diverging subpopulations and in a pivot study we showed that genes causing spermatogenetic breakdown are polymorphic and widespread in wild *M. m. musculus* [4].

1. MACHOLÁN M., MUNCLINGER P., ŠUGERKOVÁ M., DUFKOVÁ P., BÍMOVÁ B., BOŽÍKOVÁ E., ZIMA J., PIÁLEK J., in press: Genetic analysis of autosomal and X-linked markers across a mouse hybrid zone. *Evolution*. doi: 10.1111/j.1558-5646.2007.00065.x
2. BOŽÍKOVÁ E., MUNCLINGER P., TEETER C., TUCKER P.C., MACHOLÁN M., PIÁLEK J., 2005. Mitochondrial DNA in the hybrid zone between *Mus musculus musculus* and *Mus musculus domesticus*: a comparison of two transects. *Biological Journal of the Linnnean Society* 84: 363–378.
3. BÍMOVÁ B., KARN R.C., PIÁLEK J., 2005. The role of salivary androgen-binding protein in reproductive isolation between two subspecies of house mouse: *Mus musculus musculus* and *Mus musculus domesticus*. *Biological Journal of the Linnnean Society* 84: 349–361.
4. VYSKOČILOVÁ M., TRACHTULEC Z., FOREJT J., PIÁLEK J., 2005: Does geography matter in the hybrid sterility in house mice? *Biological Journal of the Linnnean Society* 84: 663–674.

Non-invasive genetic sampling

Genetic studies of elusive or endangered species are often constrained by difficulties in obtaining sufficient number of samples. We optimised the method and increased the success rate of otter (*Lutra lutra*) faeces genotyping using microsatellite and SRY markers. The optimised method was used to estimate population size and structure of free-ranging otters in two different habitats without any contact or disturbance of animals. Complete reliable genotypes were obtained from 60% of samples. Together with tissues from otter carcasses (mostly road-kills), faecal samples were used to study genetic variability, structure and demographic history of otter populations in the Czech and Slovak Republics. Throughout analyses, strict recommendations to avoid contamination and genotyping errors were followed.

In another study, we successfully applied non-invasive approach on PCR-based test for species identification of two cryptic bats *Pipistrellus pipistrellus* and *P. pygmaeus*. DNA analysis of droppings obtained during trapping or other handling of individuals can substitute the punching of wing-membranes. The results can be potentially obtained even without contact with animals, e.g., using fresh droppings from day roosts.

Another valuable source of samples for molecular genetic studies is museum collections. We have been able to perform a comprehensive phylogeographic research of a stoat (*Mustela erminea*) using mitochondrial DNA sequences from DNA isolated from museum skin collections. We took particular care to ensure authenticity of sequences from the museum samples using methods derived from laboratory protocols for handling ancient DNA.

- HÁJKOVÁ P., PERTOLDI C., ZEMANOVÁ B., ROCHE K., HÁJEK B., BRYJA J., ZIMA J., 2007: Genetic structure and evidence for recent population decline in Eurasian otter (*Lutra lutra*) populations in the Czech and Slovak Republics: implications for conservation. *Journal of Zoology* 272: 1–9.
- HÁJKOVÁ P., ZEMANOVÁ B., BRYJA J., HÁJEK B., ROCHE K., TKADLEC E., ZIMA J., 2006: Factors affecting success of PCR amplification of microsatellite loci from otter faeces. *Molecular Ecology Notes* 6: 559–562.
- KAŇUCH P., HÁJKOVÁ P., ŘEHÁK Z., BRYJA J., in press: A rapid PCR-based test for species identification of two cryptic bats *Pipistrellus pipistrellus* and *P. pygmaeus* and its application on museum and dropping samples. *Acta Chiropterologica*.
- MARTÍNKOVÁ N., SEARLE J.B., 2006: Amplification success rate of DNA from museum skin collections: a case study of stoats from 18 museums. *Molecular Ecology Notes* 6: 1014–1017.

Applications of research results

Implementation of the Convention on Biological Diversity in the Czech Republic

In May of 1999 the UN Development Programme and the Global Environmental Facility announced a capacity development initiative that was intended to support effective implementation of international agreements adopted under the auspices of the United Nations, concerned with improving the state of the environment on the Earth. On the basis of this Initiative, a National Capacity Self-Assessment project was commenced to perform thorough analysis of conditions in implementing the three international agreements, adopted at the UN Global Conference on the Environment and Development, held in 1992 in Rio de Janeiro. The analysis is intended to lead to identification of capacity constraints for meeting the obligations of states following from these agreements and to the preparation of an action plan to improve the situation. Thus, this assessment is intended to evaluate the state of preparation of the Czech Republic for implementation of the objectives of the Convention on Biological Diversity. An evaluation is made of the level of strategic planning and proposal of individual steps and prospects, and problems are sought that can be identified as being critical from the standpoint of achieving the intermediate and final targets. In order to provide for the intentions formulated in the Convention, it is above all necessary to create and develop suitable capacities at the individual, institutional and systemic levels. This approach is fundamentally promoted in the assessment.

KIRSCHNER J., RÁB P., ROUDNÁ M., STAŇKOVÁ J., VILÍMOVÁ J., ZIMA J. (ed.), 2006: Biological diversity. Identification of priorities and capacity development for performance of obligations of the Czech Republic following from the Convention on Biological Diversity. Ministry of Environment of the Czech Republic / UNDP-GEF, Praha, 228 pp.



Threatened mammal species, Eurasian otter *Lutra lutra*, can be studied using non-invasive genetic methods (Photo by J. Roleček).

The first gorilla born in the Czech Republic is a girl

The first offspring of the western lowland gorilla in the Czech Republic was born at the Prague ZOO in December 2004. This birth received great publicity and has been popularized in various TV and radio-broadcasting programmes. However, the gender of the young remained enigmatic. Two independent laboratories performed genetic studies aimed to sex identification of the individual but their results appeared contradictory.

The Institute was then asked by the authorities of the Prague ZOO to make additional investigations. The suitability of the genetic sex identification was tested by using blood samples of adult gorillas of known sex. Duplex PCR was conducted to amplify parts of the *Sry* gene (occurring only in males), whereas the *Zfy-Zfx* gene (amplified in both sexes) was used as a positive control of a PCR reaction. Then we used fresh samples of faeces for DNA extraction and amplification in the young and its father. The results showed unequivocally that the young named Moja is a female.



Moja, young female western lowland gorilla at the Prague ZOO. (Photo by T. Mrhálková)

International cooperation

Historical and contemporary selection on major histocompatibility complex genes in cyclic rodents

Host-pathogen interactions are of particular interest in the understanding of the interplay between population dynamics and natural selection. The genes of major histocompatibility complex (MHC) of demographically fluctuating species are very suitable markers for this purpose because they are involved in the initiation of the immune response against pathogens

and they exhibit high levels of genetic variation that are proposed to be adaptive in natural vertebrate populations. We optimised single strand conformation polymorphism analysis method using capillary electrophoresis to study polymorphism of DNA sequences in large scale population studies [1] and applied this method to analyse the variation of two MHC Class II genes (DQA1, DRB) during the demographic cycle of the water vole *Arvicola terrestris*. Positive historical selection was found to act very intensively on antigen-binding sites of MHC molecules in arvicolid rodents as documented by extensive trans-species polymorphism within the subfamily. For the first time within rodents, we documented the duplication of the DQA gene in three vole species with both copies being transcriptionally active [2]. We compared neutral genetic structure of seven populations (estimated from 14 microsatellites) with that estimated from MHC genes and we evidenced more intense selection on the gene DQA1 than on DRB or neutral markers and this pattern emphasized with increasing population abundance. In the year of low abundance, when populations were geographically isolated, overall differentiation patterns of both MHC genes were more pronounced than at neutral markers suggesting the action of local selection in fragmented populations. With increasing effective migration between sites the differences between MHC and neutral markers progressively vanished and in the high-abundance year, overall differentiation for DQA1 gene became even significantly lower than those of neutral markers, suggesting more homogenisation for that gene than what could be observed by chance for a neutral gene evolving under drift and migration only. Spatial and temporal fluctuations in parasite pressure are proposed as the most plausible mechanism inducing observed changes in contemporary selection pattern during demographic cycle [3].

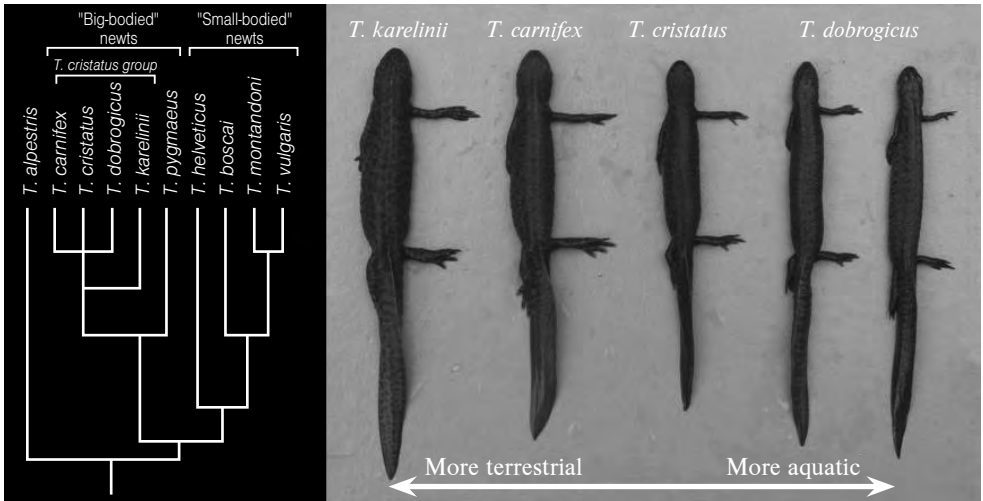
1. BRYJA J., GALAN M., CHARBONNEL N., COSSON J.-F., 2005: Analysis of major histocompatibility complex class II gene in water voles using capillary electrophoresis-single stranded conformation polymorphism. *Molecular Ecology Notes* 5: 173-176.
2. BRYJA J., GALAN M., CHARBONNEL N., COSSON J.-F., 2006: Duplication, balancing selection and trans-species evolution explain the high levels of polymorphism of the DQA MHC class II gene in voles (*Arvicolinae*). *Immunogenetics* 58: 191-202.
3. BRYJA J., CHARBONNEL N., BERTHIER K., GALAN M., COSSON J.-F., submitted: Density-related changes in selection pattern on major histocompatibility complex genes in fluctuating populations of voles. *Molecular Ecology*.

Evolution of form and function in newts

Conflicts between structural requirements for carrying out different ecologically relevant functions may result in a compromise phenotype that maximizes neither function. Identifying and evaluating functional trade-offs may therefore aid in understanding the evolution of organismal performance. We examined the possibility of an evolutionary trade-off between aquatic and terrestrial locomotion in females of European species of the newt genus *Triturus*. Biomechanical models suggest a conflict between the requirements for aquatic and terrestrial locomotion. For instance, having an elongate, slender body, a large tail and reduced limbs should benefit undulatory swimming, but at the cost of reduced running capacity. To test the prediction of an evolutionary trade-off between swimming and running capacity, we investigated relationships between size-corrected morphology and maximum locomotor performance in females of ten species of newts. Phylogenetic comparative analyses revealed that an evolutionary trend of body elongation (increasing axilla-groin distance) is associated with a reduction in head width and forelimb length. Body elongation resulted in reduced maximum running speed, but, surprisingly, also led to a reduction in swimming speed. The

evolution of longer tails was associated with an increase in maximal swimming speed. We found no evidence for an evolutionary trade-off between aquatic and terrestrial locomotor performance, probably because of the unexpected negative effect of body elongation on swimming speed. We conclude that the idea of a design conflict between aquatic and terrestrial locomotion, mediated through antagonistic effects of body elongation, does not apply to our model system.

GVOŽDÍK L., VAN DAMME R., 2006: *Triturus* newts defy the running-swimming dilemma. *Evolution* 60: 2110–2121.



Species of the *Triturus cristatus* group showing the most prominent trend in body elongation and limb reduction within the (*Triturus*) clade.

Department of Ichthyology

Head

Ing. Karel H A L A Ā K K A , PhD <halacka@ivb.cz>
karyology, histology and reproduction

Research Scientists

Prof. Ing. Vlastimil B A R U Š , DSc <barus@ivb.cz>
ichthyoparasitology, ecology and taxonomy

Ing. Martin H U M P L , PhD <humpl@email.cz>
multivariate statistical methods and ecology

RNDr. Věra L U S K O V Á , PhD <luskova@ivb.cz>
hematology and biochemistry

Assoc. Prof. Ing. Stanislav L U S K , PhD <lusk@ivb.cz>
ecology, revitalization of aquatic habitats

Ing. Milan P E Ň Á Z , DSc <penaz@ivb.cz>
embryology and ecology

Ing. Miroslav P R O K E Š , PhD <prokes@ivb.cz>
ontogeny and ecology

Ing. Lukáš V E T E Š N Í K , PhD <vetesnik@ivb.cz>
ecology and reproduction

PhD Students

Mgr. Jan M E N D E L

Mgr. Ivo P A P O U Š E K

Undergraduates

Eva B A R T O Ň O V Á

Technicians

Jan K O C I Á N

Milena K O N Í Ā K O V Á

Radka P I L Á T O V Á

Research Priorities

The research of fishes is performed at various levels of spatial and biological organization (individual, population, and community), in relation to distribution, biology, ecology, and diversity. The study reflects the heterogeneity of aquatic environment, both in term of habitats and microhabitats, and the biodiversity between and within species. Fishes are considered to be complex bioindicators of degradation as well as regeneration of aquatic habitats. Accordingly, a number of activities are aimed at restoring and revitalisation of aquatic ecosystems.

Main research topics:

- diversity of fish communities and population parameters of key species in various types of aquatic habitats
- genetic diversity of fish populations
- rehabilitation of aquatic habitats and ecosystems for the restoration and conservation of fish biodiversity
- biology and conservation management of threatened species
- alien invasive species and their impact on native fish biodiversity

Selected research results

Growth characteristics of the barbel, *Barbus barbus*, in the middle course of the Jihlava River

Growth in length and weight, based on a combination of scale annulus interpretation and back-calculation using the Fraser-Lee model, was studied in male and female barbel, *Barbus barbus*, from a section of the Jihlava River sampled in 1999–2001. Results were compared with growth data obtained with similar methods in 1976, prior to construction and functioning of a hydropower scheme complex (Dukovany-Dalešice), and during the period of the scheme's partial operation (1980–1984). Recent growth rate, under seemingly fully-established environmental conditions and complete adaptation of the barbel population, showed the highest values, especially in males. A distinct sexual dimorphism in growth rate was also confirmed, with females growing faster than males, though to a lower extent than recorded both during previous periods and from several other localities. Further, upon comparison of back-calculated lengths for previous years of recently tagged-and-recaptured fish (1999–2001), with observed lengths directly measured at corresponding ages, no significant differences were overall found between the results obtained by either method in most age groups. Finally, the linear Fraser-Lee model proved a sufficiently accurate and practical method for back-calculating lengths for previous years of life also in barbel.

PROKEŠ M., ŠOVČÍK P., PEŇÁZ M., BARUŠ V., SPURNÝ P., VILIZZI L., 2006: Growth of barbel, *Barbus barbus*, in the River Jihlava following major habitat alteration and estimated by two methods. *Folia Zoologica* 55: 86–96.

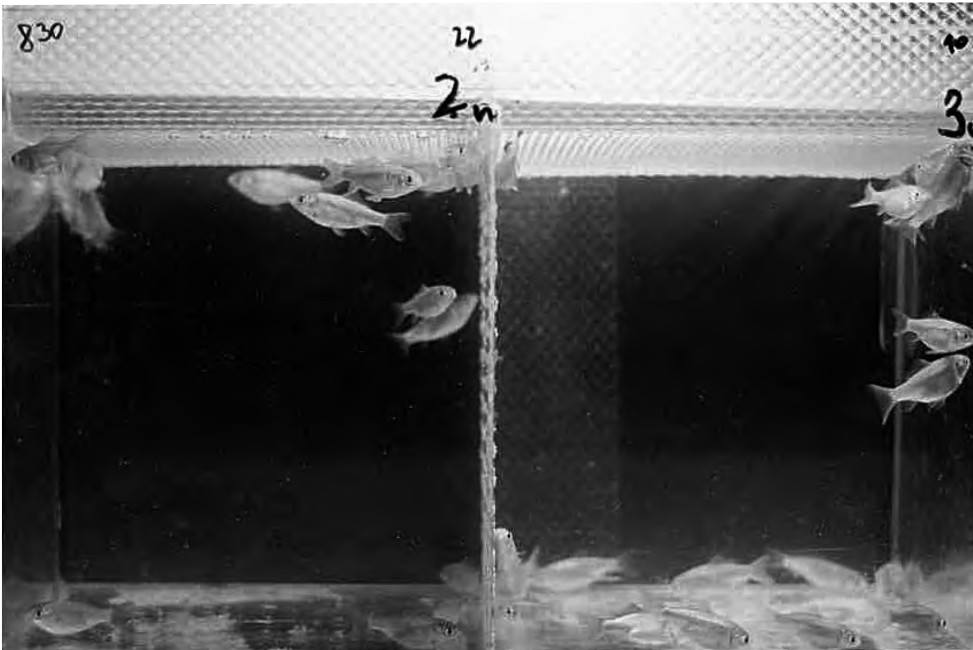


Ichthyological investigation on the Jihlava River. Left to right: J. I. Namin, V. Baruš, L. Vetešník, M. Prokeš. (Photo by M. Peňáz)

Physiological and behavioural differences between *Carassius auratus* lineages differing in ploidy levels and parental origin

In recent years, original uniform (unisexual-triploid) populations of silver crucian carp in central Europe transform dramatically. Previous state of sporadic diploid individuals' occurrence (both males and females) has been gradually substituted by current state, where on some localities these diploids begin to dominate. Main goal of our experiments is to understand factors which affect this dynamics of diploid-polyploid complexes.

The reactions of the individuals *Carassius auratus* on temperature and low-oxygen stress were observed. The results show differences in dependence not only on the ploidy levels but also on their ancestry. It may be an important selective factor in specific natural conditions which affected occurrence this groups in specific biotope. Haematological analysis was performed on 27 adult specimens of *Carassius auratus* irrespective of sex in 2003 and on 32 juveniles of distinguished sex in 2004. In this study we found that the ploidy level affected significantly ($p < 0.01$) the values of the erythrocyte count, mean corpuscular volume and mean corpuscular haemoglobin. Although we did not prove any significant effect of sex in juvenile diploids of *C. auratus* on the values of erythrocyte profile, the erythrocyte count, haematocrit value and haemoglobin content value were higher for males than for females. The erythrocyte count decreased significantly ($p < 0.01$) with increasing ploidy level. The index of haemoglobin content followed the same trend of a decreasing mean value with increasing ploidy level. Mean corpuscular volume and mean corpuscular haemoglobin increased with the increasing ploidy level ($p < 0.01$). Haematocrit value and mean corpuscular haemoglobin concentration did not significantly differ from the point of view of the ploidy level.



Different depth preferences for swimming of diploid (left) and triploid (right) *Carassius auratus* in an aquarium. (Photo by K. Halačka)



Blood taking from *Carassius auratus* K. Halačka (left), L.Vetešník (right). Photo by S. Lusk.

HALAČKA K., VETEŠNÍK L., 2005: Vliv teplotního a kyslíkového stresu na karasa stříbřitého [Influence of temperature and oxygen stress on silver crucian carp (*Carassius auratus* L.)]. In: Spurný E. (ed.), 8. Česká ichtyologická konference. Mendelova zemědělská a lesnická univerzita, Brno; 270-274.

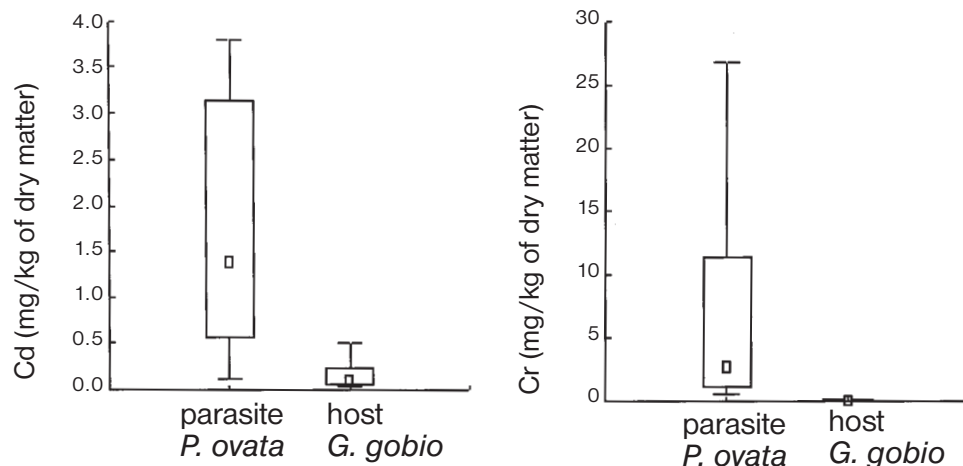
VETEŠNÍK L., HALAČKA K., LUSKOVÁ V., LUSK S., 2006: Erythrocyte profile of diploid and triploid silver crucian carp (*Carassius auratus*). Acta Veterinaria Brno 75: 203-207.

The nematode parasites of vertebrates: a potential sentinel species of heavy metal accumulation

To assess the bioindicator value of parasites, the concentrations of six heavy metals (Cr, Cu, Pb, Cd, Ni and Zn) were analyzed by atomic absorption spectrometry in pregnant females of the nematode *Philometra ovata*, body cavity parasites of gudgeon (*Gobio gobio*) and muscle samples of infected and uninfected hosts. The concentration of heavy metals was significantly higher in specimen of *P. ovata* compared to the host muscle tissue.

The parasite-to-muscle ratio of heavy metals varied from 3.2 to 121.7, in increasing concentrations for Cr, Cd, Cu, Pb, Ni and Zn. The presence of parasites did not influence the heavy metal content of the hosts, and no significant differences were found between muscle tissues of parasitized and non-parasitized fishes. The bioconcentration factor ($BFs = C_{\text{parasite}} / C_{\text{sediment}}$) varied between 0.4 and 25.8 and $BFw (C_{\text{parasite}} / C_{\text{water}})$ between 2133 and 25354. In conclusion the *P. ovata* - gudgeon parasite host system is an effective and practical bioindicator, even a sentinel system, of heavy metals load in aquatic ecosystems. Our results demonstrate that this parasite accumulates heavy metals at higher rates than the other nematode species (*Anguillicola crassus*, *Contracaecum rudolphii*, *Protospirura muricola*).

- BARUŠ V., JARKOVSKÝ J., PROKEŠ M., 2007: *Philometra ovata* (Nematoda: Philometroidea): a potential sentinel species of heavy metal accumulation. *Parasitology Research* 100: 929-933.
- BARUŠ V., TENORA F., ŠUMBERA R., 2003: Relative concentrations of four heavy metals in the parasites *Protospirura muricola* (Nematoda) and *Inermicapsifer arvicanthidis* (Cestoda) in their definitive host silvery mole-rat (*Heliophobius argenteocinereus*: Rodentia). *Helminthologia* 40: 227-232.
- PALÍKOVÁ M., BARUŠ V., 2003: Mercury content in *Anguillicola crassus* (Nematoda) and its host *Anguilla anguilla*. *Acta Veterinaria Brno* 72: 289-294.



The concentration of heavy metals in a specimen of *P. ovata* and the host *Gobio gobio* muscle tissue.

***Vimba vimba*: a locally vanished and endangered species**

In the past, *Vimba vimba* was among the key components of the fish assemblages inhabiting the middle and lower reaches of streams in the Czech Republic. Dam building, water pollution, fragmentation of the longitudinal continuum of most rivers in the course of the 20th century has resulted in the fact that at present the species is classified as Vulnerable. The degree of its threatening differs in various drainage areas. The species is comparatively abundant in some parts of the Labe and Vltava drainage area (the Berounka River, the lower reaches of the Labe River, the confluence of the Malše and Vltava rivers). Recently, *V. vimba* has vanished from the drainage area of the Odra River. In the Morava drainage area, it is rather numerous in the middle and lower reaches of the Bečva River. Residual populations exist in the Dyje River upstream of the Vranov Reservoir and in the lower reaches of the Jihlava River.

Investigations on the remnant *Vimba* population in the Dyje River upstream of the Vranov Reservoir, carried out in 1934, have shown that it can survive for 70 years at a low level of its genetic diversity. The numbers of the adult component of this population does not exceed one thousand individuals. In view of the low mean age of the population, with just two age groups being responsible for reproduction, it has been recommended to foster the population with material obtained by hand-stripping and rearing individuals from that population.

Besides, another important measure to improve the status of *Vimba vimba* populations could inhere in successively renewing the migration permeability of streams in their longitudinal profile. Like *Chondrostoma nasus*, *Vimba vimba* is among the fish species that perform long-range spawning migrations.

- LUSK S., HANEL L., LUSKOVÁ V., LOJKÁSEK B., HARTVICH P., 2006: Červený seznam mihulí a ryb České republiky – Verze 2005 [The Red List of lampreys and fishes in the Czech Republic – Version 2005]. Biodiverzita ichtyofauny ČR (VI): 7–16.
- LUSK S., LUSKOVÁ V., HALAČKA K., ŠLECHTOVÁ V., ŠLECHTA V., 2005: Characteristics of the remnant *Vimba vimba* population in the upper part of the Dyje River. Folia Zoologica 54: 389–404.



The Dyje River upstream of the Vranov Reservoir. (Photo by K.Halačka)

Characteristics of populations of the *Zingel zingel* and *Zingel streber* in the Czech Republic

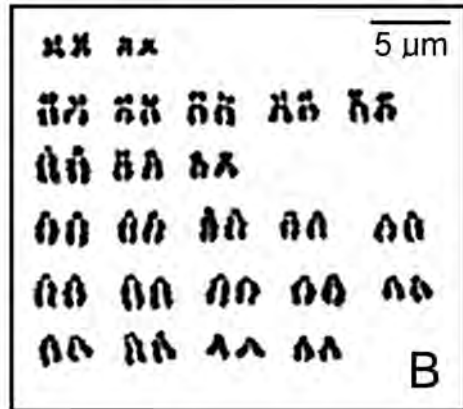
Zingel zingel and *Zingel streber* are typical Danubian species occurring rarely in the Morava River drainage area within the Czech Republic. Due to weir constructions and especially due to increase of water pollution during the first half of the last century, they disappeared from our waters, and both species were assessed as critically endangered and protected by the national and European legislations. Only after improvements of the water quality in the Morava and Dyje Rivers, the new occurrence of *Z. zingel* was ascertained as early as in 1992, and that of *Z. streber* in 2003 in the area of the confluence of both rivers. A very numerous occurrence of young-of-the-year *Z. streber* specimens evidenced a successful reproduction.

The restoration of both species was enabled by constant improvements of the water quality and by possibilities of free migrations from the Danube through the Slovakian-Austrian part of the Morava River. The stable occurrence of both species is constrained at present to short sections (Morava r.km 70–74.1 and Dyje 0.0–26.7).

The karyotype of *Z. zingel* was analyzed. The diploid chromosome number was $2n=48$ for the female, and only $2n=47$ for the male, but there was also present a single large unpaired metacentric chromosome. This indicated the presence of the $X1X1X2X2/X1X2Y$ multiple sex chromosome system produced by the fusion of two sub- or acrocentrics chromosomes, one of them being the sex chromosome Y.



Zingel streber from the Morava River. (Photo by K. Halačka)



The karyotype of *Zingel zingel*, A - male, B - female

HALAČKA K., VETEŠNÍK L., LUSK S., MENDEL J., PAPOUŠEK I., in press: The X1X1X2X2/X1X2Y multiple sex chromosome system in the *Zingel zingel* (Pisces: Perciformes) from the Morava River (Czech Republic). *Caryologia*.

LUSK S., HALAČKA K., LUSKOVÁ V., VETEŠNÍK L., 2004: Re-occurrence of *Zingel streber* (Teleostei: Pisces) in the Czech Republic. *Folia Zoologica* 53: 417-422.

VETEŠNÍK L., HALAČKA K., LUSKOVÁ V., LUSK S., 2004: Growth of *Zingel streber* and *Zingel zingel* and their distribution in the Czech Republic. VII. Česká ichtyologická konference, Vodňany: 74-77.

Applications of Research Results

Removing of migratory barriers fragmenting large rivers

A weir in Břeclav, river km 27, constitutes the first migratory barrier for water fauna on the lower Dyje River, which has free migratory route to the Danube River through 70 km long

Slovakian-Austrian stretch of the Morava River. At the end of 2005, a new fishpass was put into service within the frame of „Action plan of floodpass building on selected rivers of the Czech Republic“. During 2006, we conducted a monitoring of its function performance. It was stated that both the entrance and interior bouldered migratory parts are fully functional for whole species and age spectrum of fish community. From the aspect of fish migration it is necessary to optimize the upper part including the exit part of the fishpass. Feasible modifications (such as enlargement of entry slots and adding of 2–3 rows of boulders in upper parts) should allow full migratory passability for the whole species range of the lower Dyje River ichthyofauna.

Floodgate Střekov constitutes the first migratory barrier on the Elbe River (river km 321) on the territory of the Czech Republic. In 2001, the new lowland pool fishpass was built there in connection with the project „Salmon 2000“, allowing periodical monitoring of migrating fishes.

Significant numbers of juvenile (age 0+) and subadult (age 1+ and 2+) fish were observed migrating through a lowland pool fishpass from August to October in 2003 and 2004. Records of weekly catches totalled 2 148 (2003) and 6 469 (2004), mainly bleak, barbel, roach and dace. Fish migrated in the upstream direction probably to search the feeding grounds and refuges and their numbers corresponded to spring spawning migrations in the same fishpass and the year.

LUSK S., 2006: Zpráva o sledování a vyhodnocení funkčnosti rybiho přechodu na jezu Břeclav v ř.km 26,7 řeky Dyje v průběhu roku 2006 [Report on monitoring and functionality of the fish pass on the weir Břeclav (river km 26.7 of the Dyje River) during 2006]. MS, Povodí Moravy SP, Brno, 22 pp.

PRCHALOVÁ M., VETEŠNÍK L., SLAVÍK O., 2006: Migrations of juvenile and subadult fish through a fishway during the late summer and fall. *Folia Zoologica* 55: 162–166.



Building of fish pass on the Dyje River in Břeclav. (Photo by K. Halačka)



The new lowland pool fishpass at Střekov. (Photo by K. Halačka)

Artificial wetlands – significant support for stable fish biodiversity in a river alluvium

The natural dynamics of water discharges and the ensuing fluvial stream activity resulted in a considerable diversification of aquatic environments in fluvial ecosystems. Besides the active streams in flooding area, there originated and developed a diversified system of aquatic habitats. This hydrological system offered conditions for fish assemblages showing a high species richness. However, the modifications of most streams as well as other human activities resulted in a limitation or complete elimination of any fluvial activity of the streams. Therefore, new habitats are no longer created by the natural activity of water discharges and fluvial activity. On the contrary, the habitats created by the streams in the past are now gradually vanishing. Now there are two alternatives as regards the future of these habitats: either the existing natural habitats can be maintained and renewed by human efforts, or new habitats can be provided in the form of artificial wetlands (earth pits, channels, artificial pools and lakes). Alluvial habitats are irreplaceable environments for several indigenous fish species protected by native as well as European legislation: *Rhodeus amarus*, *Misgurnus fossilis*, *Cobitis elongatoides* incl. hybrid populations, *Umbra krameri* and, of other species, *Carassius carassius*, *Tinca tinca* and *Leucaspis delineatus*. Also, artificial wetlands can provide more stable environments for the survival of fishes during critical periods. Artificial habitats, connected with the main stream or flooded during floods are populated by species inhabiting the major stream. The artificial aquatic habitats lying outside the active alluvium can be provided with fish assemblages aimed at conservation goals. The highly positive contribution of artificial habitats in stabilizing populations of the species mentioned above has been demonstrated in concrete objects in the floodplains of the rivers Morava, Dyje, Lužnice and, in eastern Slovakia, the drainage areas of the Bodrog, Latorica, Tisza and Ondava rivers.

- HALAČKA K., LUSK S., LUSKOVÁ V., 1998: Fish communities in artificial pools in the floodplain along the lower reaches of the River Dyje. *Folia Zoologica* 47: 125-134.
- HORÁK V., 2003: Rehabilitation of the lower Dyje River floodplain for fish. *Ecology & Hydrobiology* 3: 121-126.
- HORÁK V., LUSK S., HALAČKA K., LUSKOVÁ V., 2004: Artificial wetlands – yes or no? *Ecology & Hydrobiology* 4: 119-127.
- LUSK S., HALAČKA K., LUSKOVÁ V., 2003: Rehabilitating the floodplain of the lower River Dyje for fish. *River Research and Applications* 19: 281-288.
- LUSK S., KOŠČO J., LUSKOVÁ V., HORÁK V., KOŠUTH P., HALAČKA K., HARTVICH P., 2006: Význam umělých mokřadů v říčním aluviu pro podporu a uchování původní biodiverzity [Importance of artificial wetlands in floodpains for support and preservation of the native biodiversity]. *Sborník Říční krajina* 4, Olomouc: 165-171.



Two time stages of the artificial wetland in the Chomoutov Nature Reserve. (Photo by S. Lusk)

Department of Fish Ecology

Head

Ing. Pavel J U R A J D A , PhD <jurajda@brno.cas.cz>
fish ecology

Research Scientists

Assoc. Prof. RNDr. Zdeněk A D Á M E K , PhD <adamek@ivb.cz>
hydrobiology and feeding ecology of fish

Mgr. Markéta O N D R A Č K O V Á , PhD <audrey@sci.muni.cz>
fish parasitology

RNDr. Martin R E I C H A R D , PhD <reichard@ivb.cz>
behavioural and evolutionary ecology of fish

PhD Students

Mgr. Veronika F O L T Á N K O V Á

Mgr. Petra H Á J K O V Á

Mgr. Michal J A N Á Č

Mgr. Markéta K O N E Č N Á

Mgr. Matej P O L A Č I K

Mgr. Zdenka V A L O V Á

Undergraduates

Gabriela K O N E Č N Á

Jan Š V A N Y G A

Technicians

Bc. Václava H A R P E R - D O L E J Š K O V Á - until August 31, 2006

Mgr. Markéta D U Š K O V Á

Ing. Jiří H U M L



Field laboratory in the town of Vidin, Bulgaria. Left to right: M. Vassilev, T. Trichkova, M. Ondračková, M. Poláčik, K. Francová, M. Dušková. (Photo by J. Huml)

Research Priorities

We use fish to investigate questions in ecology and evolution as well as applied issues in fisheries management, conservation of aquatic habitats and floodplain restoration. Our field and experimental studies are conducted in Europe, Asia and Africa.

The current topics investigated in our department are:

- behavioural and evolutionary ecology of bitterling fish
- adaptation and coevolution of bitterling and their mussel hosts
- ecology, distribution and parasites of invasive *Neogobius* fishes
- 0+ juvenile fish community structure in lowland rivers and their flood plains
- optimisation of methods for 0+ juvenile fish sampling
- impacts of metazoan parasites on 0+ juvenile fish development
- community ecology of fishes in the Gambia River floodplain, Senegal, West Africa
- reproductive isolating mechanisms in the East African annual fishes *Nothobranchius* spp.

Selected Research Results

The coevolutionary relationship between bitterling fishes and freshwater mussels

Bitterlings (subfamily Acheilognathinae) are freshwater cyprinid fishes that have evolved an unusual spawning symbiosis with freshwater mussels from the family Unionidae. Female bitterling develop long ovipositors that they use to place their eggs deep inside the gill cavity of a mussel and males fertilise the eggs by releasing sperm into the inhalant siphon of the mussel. Bitterling embryos develop inside the mussel gill cavity for weeks and constrain mussel physiology. In turn, unionid mussels have parasitic larvae called glochidia. They are released into the water column, attach to fish gills or fins and obtain nourishment from the fish host. We found that relationship between bitterling and mussel, popularly considered mutualistic on the premise that bitterling use mussels as spawning sites while the mussel benefits by using bitterling to disperse their glochidia, is more complex.

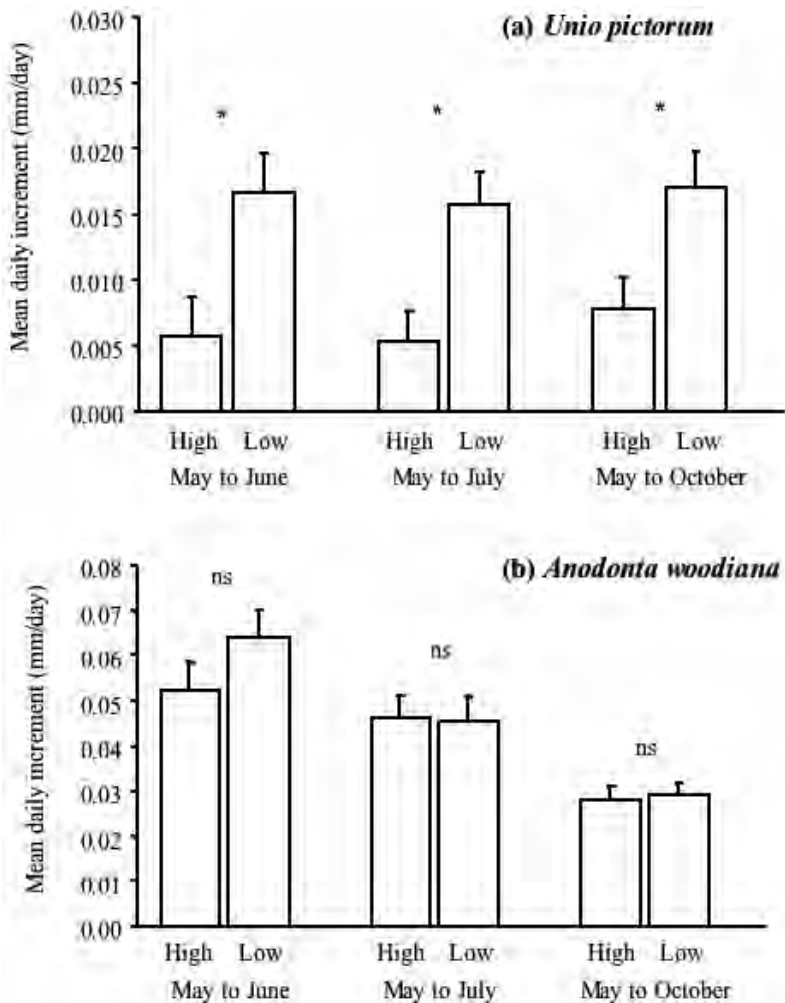
We investigated the costs and benefits from the symbiosis to both fish and mussels and found that in Europe, bitterling are parasites of mussels. European bitterling do not host glochidia, but adult European mussels suffer from a reduction in growth and fecundity if they carry bitterling embryos. In a further study, we found that this may be due to a lag in the coevolutionary relationship – bitterling presence in Europe is recent and mussels may have not had enough time to evolve sufficient adaptations. Indeed, in Asia, where bitterling origin is ancient, mussels are able to eject bitterling eggs and embryos prematurely, similarly to the eviction of cuckoo eggs by their bird foster parents. In a large scale comparative study in China, we discovered that the bitterling species vary in the level of their specificity to particular hosts and revealed a complex network of relationships between bitterling and mussel traits.

LIU H., ZHU Y., SMITH C., REICHARD M., 2006: Evidence of host specificity and congruence between phylogenies of bitterlings and freshwater mussels. *Zoological Studies* 45: 428-434.

REICHARD M., LIU H., SMITH C., 2007: The coevolutionary relationship between bitterling fishes and freshwater mussels: insights from interspecific comparisons. *Evolutionary Ecology Research* 9: 239-259.

REICHARD M., ONDRAČKOVÁ M., PRZYBYLSKI M., LIU H., SMITH C., 2006: The costs and benefits in an unusual symbiosis: experimental evidence that bitterling fish (*Rhodeus sericeus*) are parasites of unionid mussels in Europe. *Journal of Evolutionary Biology* 19: 788-796.

REICHARD M., PRZYBYLSKI M., KANIEWSKA P., LIU H., SMITH C., 2007: A possible evolutionary lag in the relationship between freshwater mussels and European bitterling. *Journal of Fish Biology* 70: 709-725.



Mean (+1 SE) daily shell growth of (a) *Unio pictorum* and (b) *Anodonta woodiana* mussels at high and low embryo density treatments calculated for the periods May to June (28 days), May to July (70 days), and May to October (131 days) 2004.

Sexual selection in the bitterling fish: the role of female choice and male mating tactics

Natural selection theory is based on the principle of unequal individual reproductive success within a species. This is caused by differential survival among individuals (ecological adaptations) and different number of offspring produced by individuals (sexual selection). Sexual selection explains the evolution of adaptations to maximise the individual reproductive potential, particularly adaptations to male-male interference competition for females and female choice. Using a series of experiments with a small cyprinid fish, the European bitterling, *Rhodeus sericeus*, we separated the two components of sexual selection and investigated their relative importance by estimating male reproductive success through paternity assignments. For individual males, the success in male-male competition for territories was significantly



A pair of European bitterlings before spawning. (Photo by C. Smith)

more important than female preference of a given male. Dominant males monopolised access to territories and sired considerably more offspring than males preferred by females. Therefore, the hierarchical rank of males reduced opportunities for female choice and females, despite being choosy, had limited control over the paternity of their offspring. In another set of experiments, we found that female bitterling may use sophisticated behaviour to prolong the spawning act and solicit sneaking fertilisations from subordinate males. This behaviour enables preferred, but subordinate, males to sire some offspring. Our data suggest new prospect in explaining the evolution of alternative male reproductive tactics, so far considered as a “parasitic” strategy undermining female choice.

Our results show that alternative male tactics may, contrary to the current view, augment rather than decrease the role of female choice. Given the important consequences of this finding on effective population size, our results have also general implications in the management of natural populations.

REICHARD M., BRYJA J., ONDRAČKOVÁ M., DÁVIDOVÁ M., KANIEWSKA P., SMITH C., 2005: Sexual selection for male dominance reduces opportunities for female mate choice in the European bitterling (*Rhodeus sericeus*). *Molecular Ecology* 14: 1533–1542.

SMITH C., REICHARD M., 2005: Females solicit sneakers to improve fertilisation success in the bitterling fish (*Rhodeus sericeus*). *Proceedings of the Royal Society London, Series B* 272: 1683–1688.

SMITH C., REICHARD M., DOUGLAS A., JURAJDA P., 2006: Population consequences of behaviour in the European bitterling (*Rhodeus sericeus*, Cyprinidae). *Ecology of Freshwater Fishes* 15: 137–145

Sampling methodology and monitoring of 0+ juvenile fish in channelized lowland rivers

Fish reproduction and use of nursery habitats by 0+ fish have been long-term monitored (1991-2006) in lowland channelized and regulated river Morava (r km 69.4-92.8). At twenty localities within the river stretch, 0+ juvenile fish assemblages are sampled in late summer by point abundance sampling (PAS) electrofishing.

PAS is widely used sampling strategy based on collecting numerous small (point) samples of the same size. This principle is considered to be more statistically robust than sampling low number of large samples. To evaluate its suitability for monitoring 0+ juvenile fish assemblages, we compared PAS with a strategy that surveys the given area in its whole length: a continuous sampling. Both strategies provided similar estimates of 0+ juvenile fish assemblages, in terms of species richness, species composition, relative proportion of the most abundant species and size structure. PAS proved to be the less time-demanding strategy (consuming approximately 60% of time compared to CS) allowing either surveying the fixed area quicker than CS or surveying longer area within fixed time interval. We therefore evaluated PAS as an appropriate strategy for sampling 0+ juvenile fish in lowland channelized rivers.

Though the lower part of the Morava River was modified for navigation, it is currently not used for this purpose. Therefore a variable water discharge is allowed to occur, which creates more habitat variability. The riprap bank is a uniform bank type occurring along the shoreline. Gently sloped sand-gravel beaches are formed along the inner bands of the river during low summer discharges. During periods of elevated discharge, the water level reaches the bank-side vegetation above the boulder bank. All these habitat types are, according to our results, suitable for, and to a large extent utilized by, the 0+ juvenile fish assemblage.

Mainly bitterling, chub, bleak, and gudgeon have adapted to the conditions following river modification and form abundant and stable populations. These species reproduce successfully and form a major part of the 0+ fish community. Specialist species (phytophils and most of lithophils) are disadvantaged, in term of their reproductive success.

JANÁČ M., JURAJDA P., in press: A comparison of point abundance and continuous sampling by electrofishing for age 0 fish in a channelized lowland river. *North American Journal of Fisheries Management*.

VALOVÁ Z., JURAJDA P., JANÁČ M., 2006: Spatial distribution of 0+ juvenile fish in differently modified lowland rivers. *Folia Zoologica* 55: 293-308.

Applications of Research Results

Water Framework Directive implementation

Since 1999, we have provided monitoring of young-of-the-year fishes in selected profiles of the river network that were included in the water quality assessment program in the Czech Republic (coordinated by Water Research Institute TGM Praha). In 2005, National Methodology for fish monitoring program within WFD implementation, based on international sources (FAME, CEN), has been completed and tested. During 2006, this methodology has been used in monitoring of 174 sites. The monitoring of young-of-the-year fish has been proven as a suitable methodology for WFD evaluation in the intensively stocked rivers in the Czech Republic.

JURAJDA P., SLAVÍK O., ADÁMEK Z., 2006: Sampling of young-of-the-year fishes in rivers. National Methodology of the Ministry of Environment CR. (in Czech) http://www.ochranavod.cz/dokumenty/RYB_tekouci%20vody.pdf

International Cooperation

Distribution, ecology and parasite fauna of zebrafish (*Danio rerio*) in Bangladesh

Zebrafish, *Danio rerio*, is a well established laboratory species in biomedical research. It has proven to be hugely influential in studies on gene expression of physiological, morphological and behavioural traits. There are surprisingly few data available on zebrafish natural behaviour and ecology. We have participated in an expedition that collected data on geographical distribution, habitat preferences, population structure and parasite load of wild zebrafish in Bangladesh. We found that zebrafish inhabits standing water bodies within the floodplain rather than river environment and that it is the most abundant in shallow lakes, ponds and ditches with rich vegetation at the margins. It is commonly abundant in water bodies with a connection to rice cultivation. We have identified parasite fauna of zebrafish based on a dissection of 120 individual zebrafish and eight additional fish species co-occurring with zebrafish. Our results suggest that there are large differences in parasite abundance and species richness among zebrafish populations from across Bangladesh which may be used in subsequent studies linking genetic background and susceptibility to parasitic diseases.

This project is based on the international cooperation with University of Leicester (United Kingdom), University of Khulna and University of Mymensingh (Bangladesh).

ONDRAČKOVÁ M., SPENCE R., SMITH C., 2006. Occurrence of metazoan parasites of zebrafish *Danio rerio* (Cyprinidae) in Bangladesh. In: Bryja J., Zukal J. (eds), Zoologické dny Brno 2006. Ústav biologie obratlovců AV ČR, Brno; 135.

SPENCE R., RUNA K.F., REICHARD M., HUQ K.A., WAHAB M.A., AHMED Z.F., SMITH C., 2006: The distribution and habitat preferences of the zebrafish in Bangladesh. *Journal of Fish Biology*. 69: 1435–1448.



Field research in Bangladesh. (Photos by M. Reichard and C. Pateman Jones, respectively)

Distribution, ecology and parasites of *Neogobius* fishes in their native and non-native area of distribution

Four Ponto–Caspian gobies of the genus *Neogobius* are regarded as invasive species because of their ability to rapidly establish abundant populations in the non–native areas, as was



Sampling in Bulgarian section of the Danube. (Photo by J. Huml)

documented in Europe and North America. In the non-native range, *Neogobius* spp. may affect local ecosystem directly e.g. by changing food web interactions, or indirectly by acting as a vector for non-native parasites. To explain the successful introductions of *Neogobius* spp. in the Danube River basin, we investigated their distribution, ecology and parasites in both native and non-native range (lower and middle Danube, respectively). We found that *N. melanostomus* and *N. kessleri* dominated in the non-native range whereas *N. fluviatilis* dominated in the native range. Our results of fish distribution support the hypothesis of disjunctive spreading since very low population densities of *N. gymnotrachelus* and especially *N. melanostomus* were registered in the Croatian section of Danube, i.e. in the middle between native and non-native abundant populations. *N. gymnotrachelus* was relatively rare in both examined Danube stretches. *N. kessleri* and *N. melanostomus* reached a bigger size in the non-native area and some differences between populations were found also in the diet.

Parasite fauna of native and non-native populations of *N. kessleri* and *N. melanostomus* showed slight differences in both parasite abundance and parasite species richness. Parasite community in riverine fish did not differ among populations especially in *N. kessleri*; on the other hand, in fish from side-arm system, a habitat untypical for this fish species, the parasite species richness was two times higher than in the river. Parasite fauna of *Neogobius* spp. comprises mainly common and abundant parasites in the particular site showing very low host - specificity. Ponto-Caspian gobies seem to be fish hosts very susceptible to various parasite species and their parasite community reflects the fish feeding strategy and habitat preference.

This project is based on the international cooperation with Bulgarian Academy of Sciences (Bulgaria), University of Osijek (Croatia) and University of Vienna (Austria).

- JURAJDA P., ČERNÝ J., POLAČIK M., VALOVÁ Z., JANÁČ M., BLAŽEK R., ONDRAČKOVÁ M., 2005: The recent distribution and abundance of non-native *Neogobius* fishes in the Slovak section of the River Danube. *Journal of Applied Ichthyology* 21: 319–323.
- JURAJDA P., VASSILEV M., POLAČIK M., TRICHKOVA T., 2006: A first record of *Percottus glenii* (Perciformes: Odontobutidae) in the Danube River in Bulgaria. *Acta Zoologica Bulgarica* 58: 279–282.
- ONDRAČKOVÁ M., DÁVIDOVÁ M., PEČÍNKOVÁ M., BLAŽEK R., GELNAR M., VALOVÁ Z., ČERNÝ J., JURAJDA P., 2005: Metazoan parasites of *Neogobius* fishes in the Slovak section of the River Danube: a preliminary study. *Journal of Applied Ichthyology* 21: 345–349.
- ONDRAČKOVÁ M., TRICHKOVA T., JURAJDA P., 2006: Present and historical occurrence of metazoan parasites in *Neogobius kessleri* (Pisces: Gobiidae) in the Bulgarian Section of the Danube River. *Acta Zoologica Bulgarica* 58: 401–408.



Racer goby *Neogobius gymnotrachelus*. (Photo by P. Jurajda)

Department of Avian Ecology

Head

Ing. Marcel H O N Z A , PhD <honza@brno.cas.cz>
behavioural ecology of birds

Research scientists

Mgr. Tomáš A L B R E C H T , PhD <albrecht@ivb.cz>
ecology of birds

Ing. Miroslav Č A P E K , PhD <capek@brno.cas.cz>
ecology and behaviour of birds, bird parasites

MVDr. Vojtěch M R L Í K , PhD <mrlík@brno.cas.cz; mrlíkv@vfu.cz> -
until December 31, 2005
behaviour of birds and mammals

RNDr. Petr P R O C H Á Z K A , PhD <prochazka@ivb.cz>
ecology of birds

PhD students

Mgr. Radka L E Ž A L O V Á

Mgr. Lenka P O L A Č I K O V Á

Mgr. Milica P O Ž G A Y O V Á

Mgr. Václav Š I C H A

Undergraduates

Bc. Drahomíra F A I N O V Á

Research priorities

Our research focuses on understanding the ecological and evolutionary basis of reproductive strategies. Important goals of this research are to identify the ecological factors that promote parasitic reproductive behaviour, predator avoidance and nest predation. We conduct studies adopting the adaptationist and optimality approach of behavioural ecology to examine fitness costs and benefits of various characters in bird populations. Further we aim at understanding the evolution and signalling function of secondary male ornaments in birds. Using genetic markers we study population differentiation and phylogeography of selected European passerines across migratory divides which are inferred from measurements of stable isotope ratios and ringing recoveries. Our current research also concentrates on patterns of singing activity in passerines and includes studies of parasites associated with birds of the Afrotropical and Neotropical Regions as well.

Selected research results

Extra-pair fertilizations and mechanisms of mate choice

Extra-pair fertilizations (EPF) are frequently documented in songbirds. A costs–benefits approach has frequently been used to understand the evolutionary origin and maintenance of promiscuity in this group. Recent meta-analyses suggest that direct costs to unfaithful females outweigh indirect benefits from infidelity in socially monogamous songbirds, what

indicates that in these taxa, EPF evolved primarily as a self-interest male tactic. We performed a comparative analysis to show that standardized selection gradients acting against female infidelity (direct costs of promiscuity) explain variation in EPF rates at an interspecific level in passerines. This result confirms that costs to females resulting from reduced parental care by cheated males constrain promiscuity in this group. Our data indicate that females exert resistance over EPF when the costs of infidelity are high and, conversely, that the rate of EPF increases when selection on females to defend themselves against EPF attempts by males is weak and costs of infidelity are low. Indirect (genetic) benefits to females should play a central role in choice of extra-pair mate, since female birds do apparently obtain only sperm from these mates. There are two basic models of mate choice in animals, with indicator model proposing an absolute criterion of mate choice such as sexual ornaments, and the other one proposing (dis)similarity between the female and male as the main mechanism. The latter is often called choice of 'genetic compatibility' in recent literature. However, the term 'genetic compatibility' has an existing meaning in speciation and we therefore propose use of the term 'genetic complementarity' over 'genetic compatibility'. This is in agreement with Trivers (1972) who was to our knowledge the first to clearly articulate the phenomenon of mating based on genetic dissimilarity.

ALBRECHT T., KREISINGER J., PIÁLEK J., 2006. The strength of direct selection against female promiscuity is associated with rates of extrapair fertilizations in socially monogamous passerines. *American Naturalist* 167: 739-744.

PIÁLEK J., ALBRECHT T., 2005. Choosing mates: compatible versus complementary genes. *Trends in Ecology & Evolution* 20: 63.

Coevolution between European hosts and their brood parasites

Successive adaptations and counteradaptations by avian brood parasites and their hosts provide some of the best examples of direct coevolution in nature. Successfully parasitized hosts often raise only the cuckoo young and have zero reproductive success. This creates conditions for coevolutionary arms race between hosts and parasites. We studied both adaptations of the hosts and counteradaptations of the parasites, respectively.

We tested experimentally responses of the hosts towards multiple cuckoo parasitism and suggest that when the parasitism rate reaches high levels, e.g. at the beginning of the coevolutionary arms race, defense against multiple parasitism may be an important component of host's adaptation to brood parasitism in general. Other major adaptations are those related to the parasitic egg. We evaluated the puncture resistance hypothesis for the occurrence of thick-shelled eggs in common cuckoo by investigating costs of cuckoo egg ejection in four *Acrocephalus* warblers. Last but not least, we tested great reed warbler discrimination against two cuckoo morphs in two areas with different parasitism rates and proportions of the two morphs. Our results suggest that both local parasitism pressure and relative abundance of the two colour morphs of a brood parasite may significantly influence host defences. Finally, we studied laying strategy of cuckoo that is well-synchronized with that of the host. This matching of laying patterns with those of the hosts suggests an adaptive response to ensure optimal hatchability of the cuckoo eggs and to avoid multiple parasitism of the same nest even under heavy pressures of brood parasitism.

ANTONOV, A., STOKKE, B. G., MOKSNES, A., HONZA, M., 2006: Eggshell strength of an obligate brood parasite: a test of the puncture resistance hypothesis. *Behavioral Ecology and Sociobiology* 60: 11-18

- HONZA M., MOSKÁT C., 2005: Antiparasite behaviour in response to experimental brood parasitism in the great reed warbler: a comparison of single and multiple parasitism. *Annales Zoologici Fennici* 42: 627–633.
- HONZA M., ŠICHA V., PROCHÁZKA P., LEŽALOVÁ R., 2006: Host nest defense against a color-dimorphic brood parasite: great reed warblers (*Acrocephalus arundinaceus*) versus common cuckoos (*Cuculus canorus*). *Journal of Ornithology* 147: 629–637.
- MOSKÁT C., BARTA Z., HAUBER M.E., HONZA M., 2006: High synchrony of egg laying in common cuckoos *Cuculus canorus* and their great reed warbler *Acrocephalus arundinaceus* hosts. *Ethology, Ecology and Evolution* 18: 159–167.

Savi's warbler: A model species for studying the patterns of singing activity

Males of many bird species spend enormous amounts of time singing, which may amount to several hundred thousand songs per season. They sing in order to acquire a mate and to defend a territory and its resources or to minimize the risk of cuckoldry by neighbouring males and to maximize the probability of their own successful extrapair copulations. Diel patterns of singing vary among bird species in aspects such as the timing of peaks through the day or night and throughout the season.

We studied seasonal and diel patterns of singing activity of Savi's warblers *Locustella luscinioides* in two areas of Central Europe 300 km apart, over a period of 18 years. We assess about 4,600 records of individuals singing. Males were found to exhibit similar singing activity in both study sites. They started to sing after arrival at the beginning of April and peaked from the end of April to the beginning of May. Thereafter, their singing activity was lower but more



A male Savi's warbler singing. (Photo by L. Hlášek)

stable for a relatively long period from mid-May to mid-July. At the end of July, males sang only sporadically and singing activity ceased at the beginning of August. At the beginning and towards the end of the song-period males sang sporadically whereas in the period of the highest singing activity they sang over the entire 24-h period. During the whole song-period, there was a significant difference in singing activity between daylight and the dark (67.2 and 32.8%, respectively). However, the period of daylight was longer. Average singing activity showed similar levels in daylight and the dark with mean numbers of 5.9 and 6.6 males per hour, respectively. Major changes in singing activity were related to the twilight periods. There were distinctive dawn and dusk choruses. In the morning, Savi's warblers exhibited similar levels of singing activity over 3 h of the dark before twilight, singing reached its highest level at twilight and 1 h after twilight. During the evening, singing activity reached its highest-level 1 h before twilight, while during twilight it was decreasing, with a considerable decline 1 h after nightfall.

KLOUBEC B., ČAPEK, M., 2005: Seasonal and diel budgets of song: a study of Savi's warbler (*Locustella luscinioides*). *Journal of Ornithology* 146: 206-214.

International cooperation

Coevolution between an African brood parasite and its hosts

The red-chested cuckoo parasitizes many passerines in Africa, but some common species sympatric with the brood parasite are rarely used as hosts. Since very little is known about



M. Honza and M. I. Cherry at the field station in the Ndumo Game Reserve, South Africa. (Archives of the Ndumo Game Reserve)

brood parasitism on this continent, we experimentally tested responses of three turdid hosts to parasitism with artificial cuckoo egg. Our results support the hypothesis that rejection behaviour in two species (olive thrush, Kurrichane thrush) evolved as defence against interspecific parasitism, with thrushes appearing to be ahead in the host–parasite arms-race. The Cape robin, by contrast, appears not to reject cuckoo eggs, either because it is unable to recognize them, or because the cost associated with removal may be too high.

This study was made in collaboration with the University of Stellenbosch (Matieland, South Africa) and it was supported by a John Ellerman Fellowship.

HONZA M., KUIPER S.M., CHERRY M.I., 2005. Behaviour of African turdid hosts towards experimental parasitism with artificial red-chested cuckoo *Cuculus solitarius*. *Journal of Avian Biology* 36: 517–522.

Parasites associated with birds native to rainforests on the Caribbean slope of Costa Rica

We undertook our research of ectoparasites on birds of the Cordillera de Talamanca mountain range in Limón province, southeastern Costa Rica. In the rainy season of 2004 (August through September), we sequentially studied birds at two locations (Hitoy Cerere Biological Reserve and Barbilla National Park) on the Caribbean slope differing in elevation and habitat character. A total of 530 individuals of 79 bird species were examined. In this contribution we focus on chewing lice (Phthiraptera) and mites (Acari: Macronyssidae) associated with hummingbirds (Trochilidae), typical antbirds (Thamnophilidae), ground antbirds (Formicariidae), manakins (Pipridae) and grosbeaks (Cardinalidae) inhabiting lowland tropical rainforests.



M. Čapek examining a long-tailed hermit *Phaethornis superciliosus* in the laboratory of Hitoy Cerere Biological Reserve, Costa Rica, August 19, 2004. (Photo by M. Havlíček)

We found five chewing lice species belonging to the genera *Formicaphagus*, *Machaerilaemus* and *Myrsidea* of which three are the species new to science. They and their type hosts are as follows: *Formicaphagus tyrannina* ex *Cercomacra tyrannina* (Thamnophilidae), *Myrsidea mcleannani* ex *Phaenostictus mcleannani* (Thamnophilidae) and *Myrsidea klimesi* ex *Formicarius analis* (Formicariidae). These are the first records of *Myrsidea* from members of the passerine families Thamnophilidae and Formicariidae. Mites were represented by three species of the genus *Pellonyssus* of which *P. cyanoides* from *Cyanocopsa cyanoides* is the species new to science.

Scientists from the University of Veterinary and Pharmaceutical Sciences in Brno, the Institute of Vertebrate Biology AS CR in Brno, the Institute of Parasitology AS CR in České Budějovice (Czech Republic) and the University of Queensland in Brisbane (Australia) collaborated on the work. We are grateful to the Ministerio del Ambiente y Energía de Costa Rica for permission to conduct our study.

DUSBÁBEK F., LITERÁK I., ČAPEK M., HAVLÍČEK M., 2006: Three species of the genus *Pellonyssus* (Acari: Macronyssidae) including a new species from Costa Rican birds. *International Journal of Acarology* 32: 175-178.

SYCHRA O., LITERÁK I., ČAPEK M., HAVLÍČEK M., 2006: Chewing lice (Phthiraptera) from typical antbirds and ground antbirds (Passeriformes: Thamnophilidae, Formicariidae) from Costa Rica, with descriptions of three new species of the genera *Formicaphagus* and *Myrsidea*. *Zootaxa* 1206: 47-61.

Department of Mammalian Ecology

Head

Assoc. Prof. RNDr. Petr K O U B E K , PhD <koubek@brno.cas.cz>
wildlife ecology and ethology

Research scientists

Mgr. Miroslava B A R A N Ā E K O V Ā , PhD <barancekova@ivb.cz>
wildlife ecology

Assoc. Prof. Ing. Jaroslav Ā E R V E N Ý , PhD <jardaryscerveny@brno.cas.cz>
wildlife ecology

RNDr. Marta H E R O L D O V Ā , PhD <heroldova@ivb.cz>
feeding ecology of small mammals

RNDr. Miloslav H O M O L K A , PhD <homolka@ivb.cz>
feeding ecology of herbivorous mammals

Mgr. Eva J Ā N O V Ā , PhD <janova.eva@seznam.cz>
ecology of small mammals

Ing. Jiří K A M L E R , PhD <kamler@ivb.cz>
wildlife ecology

Mgr. Klára P E T R Ž E L K O V Ā , PhD <petrzekova@ivb.cz>
primatology

Mgr. Jarmila P R O K E Š O V Ā , PhD <jprokesova@ivb.cz>
wildlife ecology

Assoc. Prof. Mgr. Vladimír S L Ā D E K , PhD <sladekv@yahoo.fr>
anthropology

Mgr. Jan Z U K A L , PhD <zukal@ivb.cz>
ecology and ethology of bats

PhD students

Mgr. Jana B E D N Ā Ř O V Ā

Mgr. Hana B E R K O V Ā

Ing. Jiří H O N Z Í R E K

Mgr. Michaela N O V Ā K O V Ā

Mgr. Peter V A L L O

Mgr. Martin P O K O R N Ý

Undergraduates

Radim P L H A L

Technicians

Marta H A M A N O V Ā

Jiří C H A M R

Research priorities

Research is focused on the ecology of selected mammalian groups. The results of investigations are aimed to improve management of forest stands, game management, rodent pest control, and protection of biodiversity.

Main research topics:

- feeding ecology of large herbivores and their impact on vegetation
- foraging ecology and anti-predator strategies of bats

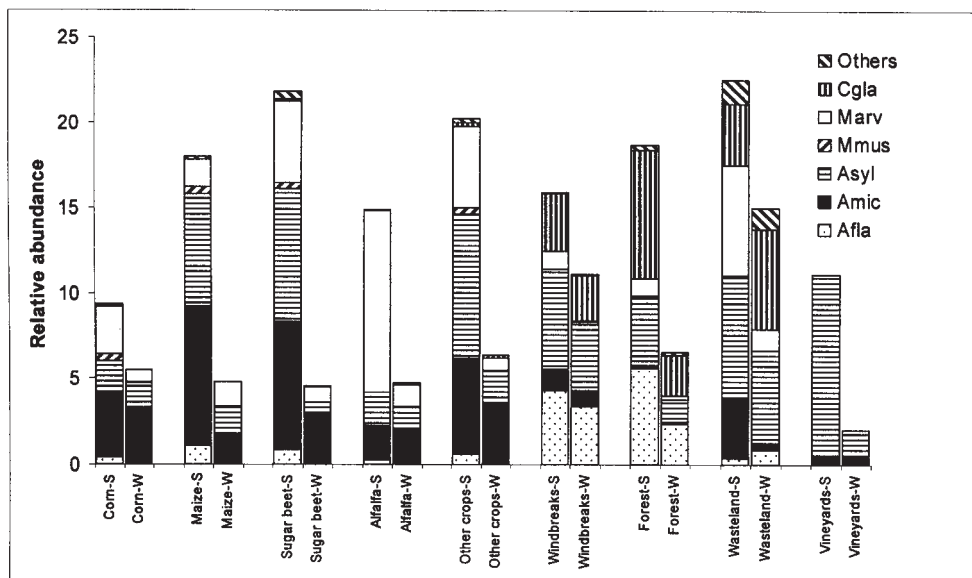
- ecology and behaviour of large carnivores, and foraging ecology and distribution of mustelids
- synecology of small terrestrial mammals
- diversity and ecology of small mammals and ungulates of West Africa

Selected research results

Structure and diversity of small mammal communities in agriculture landscape

Result of six year trappings (51,480 trap/nights, total catch 5,536 small terrestrial mammals) in various field crops and other habitats in a poorly wooded agricultural landscape of southern Moravia (Czech Republic) were presented. Fourteen small mammal species were captured; the relative population density and dominance of each species in each crop and other habitats were evaluated. According to Renkonen's index of similarity small mammal communities could be divided into two main groups: the first comprised windbreaks, small woods and fallow land with high dominance of species with affinity to forest environment; the other group is formed by open habitat communities. These were again divided into two groups: perennial crop group (as alfalfa) and one-year crop group (as corn, sugar beet, maize, and other crops). In the first group with forest affinity a higher diversity of small mammal community compared to second, open habitat one has been found. Changes of diversity index values according to the agrotechnical changes were also evaluated.

HEROLDOVÁ M., BRYJA J., ZEJDA J., TKADLEC E., 2007: Structure and diversity of small mammal communities in agriculture landscape. *Agriculture, Ecosystems & Environment* 120: 206-210.

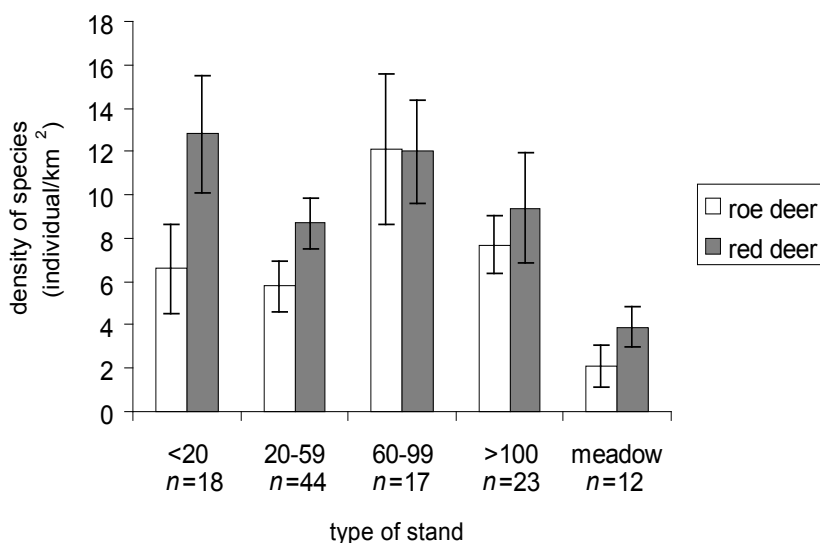


Relative abundance and community structure in spring+summer (S) and autumn+winter (W) samples in habitats studied. Cgla - *Clethrionomys glareolus*, Marv - *Microtus arvalis*, Mmus - *Mus musculus*, Asyl - *Apodemus sylvaticus*, Amic - *A. microps*, Afla - *A. flavicollis*.

Density and distribution of deer in a floodplain forest

Data on the density and distribution of deer help to protect artificial plantations and naturally regenerating stands against browsing damage, to select suitable additional feeding places and to assist in rational game management. Habitat selection by deer is best viewed as a trade-off between selection of cover and selection of food. High primary production, high biodiversity of the floodplain forest ecosystem and agricultural fields situated along the forest offer very specific conditions, which can significantly influence habitat selection of deer species living there. We analysed density and distribution of red deer and roe deer in relation to habitat structure and distribution of food sources during winters 2001–2004 in a floodplain forest along the Morava River. Densities of both species were relatively high (red and roe deer, 9.6 and 7.0 ind./km² respectively). Red deer preferred forest stands with dense cover (60–80 %) and a diversified shrub layer (more than three tree species). Roe deer mainly used old stands of age 50–99 years with a high cover of canopy layer and conversely low cover of herb layer, dominated by bramble. A positive relationship between the distributions of both species was detected. Inter-specific spatial interference was not observed, despite their high densities in the study area.

PROKEŠOVÁ J., BARANČEKOVÁ M., HOMOLKA M., 2006: Density of red deer and roe deer and their distribution in relation to different habitat characteristics in a floodplain forest. *Folia Zoologica* 55: 1–14.



Average values of the roe and red deer density (individual/km²) in forest stands of different age and in meadows.

Flight activity of bats during non-hibernation period

We studied the flight activity of bats under three different conditions: a) emergence and return activity of bats in maternity colonies [1], b) foraging activity of bats [2 and 3], and c) flight activity in the entrance of natural karstic cave [4].

Parameters of return activity generally occurred at lower light intensities than those of emergence at six maternity colonies of pipistrelle bats (*Pipistrellus pipistrellus* and *P. pygmaeus*) in NE Scotland. Therefore, the interval between dawn return and sunrise was generally longer



Křivé Lake (floodplain forest) where the highest bat flight activity was recorded. (Photo by Z. Řehák)

than that between sunset and dusk emergence. Emergence and return were equal in duration. Bats clustered more on emergence in comparison with return during pregnancy and lactation, whereas during postlactation this trend was reversed [1].

The foraging activity of bats was studied in karstic area and various natural forests. Bat detectors were used to record echolocation calls of bats on line transects during the first half of the night. *Myotis daubentonii* was the most numerous species. The number of bat species was the highest in rocky habitats, and the lowest in agrocoenoses. The greatest intensity of flight activity of the bat community was observed over ponds and streams [2]. Generally, the level of flight activity of bats detected in lowland forests was significantly higher compared to the activity in mountain forests. The highest activity was recorded in the floodplain forest. On the contrary, the mountain spruce forest was utilized by bats only scarcely. In lowland forests, the highest activity was registered in the pregnancy period and it gradually decreased towards the end of the season. In mountain forests, the level of activity was rather well-balanced throughout the season. In spite of that the lowest activity was obtained in pregnancy period. In all forest habitats, the flight activity was higher at the beginning of the night than before midnight [3].

Activity patterns of bats were recorded automatically with a double infrared light barrier at the entrance of Kateřinská cave (Czech Republic) too. Five periods were defined on the basis of bat flight activity. All periods showed a non-random temporal distribution and a concentration of flight activity around specific time. There was a positive correlation between the number of bat passes through the entrance and outside ambient temperature and a negative correlation between the number of passes and barometric pressure. Rain had no significant effect on the level of bat activity [4].

1. PETRŽELKOVÁ K.J., DOWNS N.C., ZUKAL J., RACEY P.A., 2006. A comparison between emergence and return activity in pipistrelle bats *Pipistrellus pipistrellus* and *P. pygmaeus*. *Acta Chiropterologica* 8: 381–390.
2. ZUKAL J., ŘEHÁK Z., 2006. Flight activity and habitat preference of bats in a karstic area, as revealed by bat detectors. *Folia Zoologica* 55: 273–281.
3. SIMPROVÁ, P. 2006: Časové změny v letové aktivitě společenstva netopýrů v lesním prostředí [Temporal changes in flight activity of a bat community in forest habitat]. *Bakalářská práce, PŘF MU*: 46 pp.
4. BERKOVÁ H., ZUKAL J., 2006. Flight activity of bats at the entrance of a natural cave. *Acta Chiropterologica* 8: 187–195.

Applications of Research Results

Evaluation of game damage to the field crops

Field crops are extensively damaged by large herbivores in many localities of the Czech Republic. To judge the impact of herbivores on the yield of crop, plants at an early stage of development were experimentally clipped to simulate browsing varying in intensity. In some fields we evaluated the extent and economic effect of wild herbivore damage on main field crops. We also analysed and developed a new method for assessing the damage to crops. The manual elaborated features free living game which cause serious damage to field crops. Pictures of main types of damage to crops are also included.

In general, damage to leaves caused only a small reduction of the yield. Winter wheat or barley crops were not influenced by a considerable reduction of leaves. Only yield of sun flower and winter rape was significantly lower in defoliated plants. Crop damages at the later stages of plant development were more important. In fields connected to the forest edge 5–50% plants were damaged. Our method allows to make accurate estimates of the extent of damages. The study provides practical guidelines for state agencies, wildlife managers and farmers.



Wild boar rooting in a pasture. (Photo by J. Kamler)



Result of roe deer browsing on sunflower. (Photo by J. Kamler)

- CERKAL R., DVORÁK J., KAMLER J., VEJRAŽKA K., 2006. Poškození porostů ječmene býložravci [Game damages to barley]. In: Zimolka J. (ed.), Ječmen – formy a užitkové směry v České republice. Profi Press, Praha; 120–125.
- DVORÁK J., HOMOLKA M., HEROLDOVÁ M., KAMLER J., CERKAL R., LUJC J., SKLÁDANKA J., DOLEŽAL P., 2006. Atlas poškození polních plodin – savci [Atlas of game damages to field crops]. Mendelova zemědělská a lesnická univerzita, Brno, 35 pp.
- KAMLER J., HOMOLKA M., HEROLDOVÁ M., DVORÁK J., 2005. Volně žijící býložravci a polní plodiny [Free living ungulates and field crops]. *Folia Venatoria* 35: 205–210.

International Cooperation

Feeding behaviour, parasite infections and self-medicative abilities of an introduced chimpanzee population

The chimpanzee population on Rubondo Island results from an introduction of 17 individuals in the late 60ties and it is the only example of a viable, long-term self-sustaining released chimpanzee population with a minimum of human intervention at the time of release and afterwards. Our on-going research is aimed to study these chimpanzees as a model population adapted to a new environment from the aspects of feeding behaviour, self-medication, and parasite exchange among released chimpanzees and colobus monkeys (*Colobus guaraza*) and indigenous velvet monkeys (*Cercopithecus aethiops*). Obtained results will contribute to our understanding of chimpanzee behavioural and ecological flexibility and are supposed to help to increase the success of next releases.

We examined the relationship between fruit availability, dietary composition and grouping in the descendents of an introduced chimpanzee population on Rubondo Island. Tree fruit

availability was positively correlated with rainfall, with a period of relative tree fruit scarcity corresponding with the long dry season. Liana fruit availability was not related to rainfall, and lianas exhibited more stable fruiting patterns across seasons. Fruits made up the majority of chimpanzee diet, with lianas accounting for 35% of dietary fruit species. Fruits of the liana *Saba comorensis* were available during all months of phenological monitoring, but they were consumed more when tree fruit was scarce, suggesting that *S. comorensis* fruits may be a fallback food for Rubondo chimpanzees. There were no increases in consumption of lower-quality plant parts between seasons, and there were no changes in nesting group size between seasons. These results contrast with evidence from several endemic chimpanzee study sites, and indicate that Rubondo chimpanzees may experience fewer ecological constraints on dietary quality and grouping patterns.

We identified three nematode species not previously reported in chimpanzees (*Pan troglodytes*) introduced on Rubondo Island, Tanzania: *Protopharynx muricola*, *Subulura* sp., and *Anatrichosoma* sp. The chimpanzee pinworm, *Enterobius anthropopitheci* was redescribed based on light and scanning electron microscopy of both sexes collected from the feces of Rubondo chimpanzees.

HASEGAWA H, IKEDA Y, FUJISAKI A, MOSCOVICE L.R, PETRZELKOVA K.J., KAUR T, HUFFMAN M.A., 2005: Morphology of chimpanzee pinworms, *Enterobius (Enterobius) anthropopitheci* (Geddoelst, 1916) (Nematoda: Oxyuridae), collected from chimpanzees, *Pan troglodytes*, on Rubondo Island, Tanzania. *Journal of Parasitology* 91: 1314-1317.

MOSCOVICE L. R., ISSA M.H., PETRZELKOVA K.J., KEULER N.S., SNOWDON C.T., HUFFMAN M.A., 2007: Fruit availability, chimpanzee diet and grouping patterns on Rubondo Island, Tanzania. *American Journal of Primatology* 69: 1-16.

PETRZELKOVA K.J., HASEGAWA H., MOSCOVICE L.R., KAUR T, ISSA M., HUFFMAN M.A., 2006: Parasitic nematodes in the chimpanzee population on Rubondo Island, Tanzania. *International Journal of Primatology* 27:767-777.

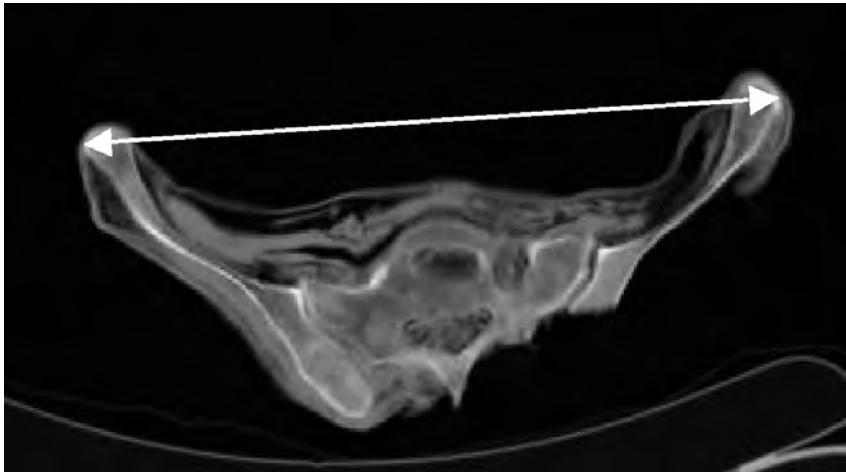


Mother and baby chimpanzee. (Photo by K. J. Petrželková)

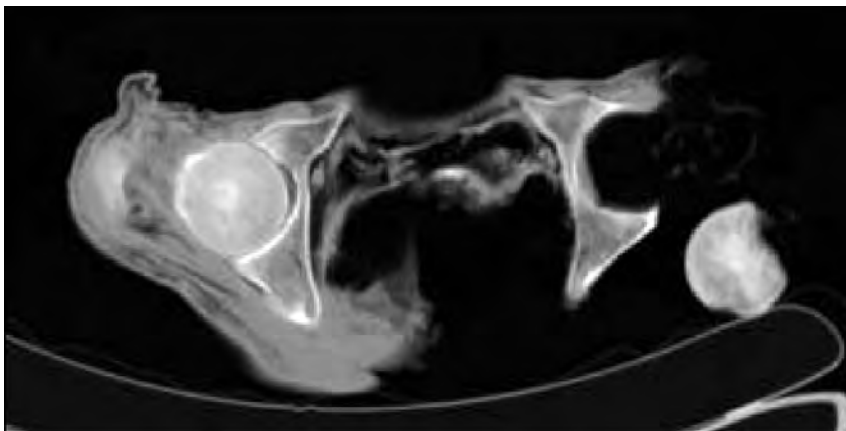
Body proportion and bone biomechanics of the Tyrolean “Iceman” (Ötzi)

Body mass and structural properties of the femoral and tibial midshafts of the “Iceman” (Ötzi), a late Neolithic (5200 BP) mummy found in the Tyrolean Alps, are determined from computed tomographic scans of his body, and compared with those of a sample of 139 males spanning the European Early Upper Paleolithic through Bronze Age. Two methods, based on femoral head breadth and estimated stature and bi-iliac (pelvic) breadth, yield identical body mass estimates of 61 kg for the Iceman. In combination with his estimated stature of 158 cm, this indicates a short but relatively wide, or stocky body compared to our total sample. His femur is about average in strength for Neolithic males, but his tibia is well above average. His femur also shows adaptations for his relatively broad body (mediolateral strengthening), while his tibia shows adaptations for high mobility over rough terrain (anteroposterior strengthening). In many respects his tibia more closely resembles those of European Mesolithic rather than Neolithic males, which may reflect a more mobile lifestyle than was characteristic of most Neolithic males, perhaps related to a pastoral subsistence strategy. There are indications that mobility in

(a)



(b)



Transverse CT scans through pelvic region (a) and CT scans of femoral heads used for body size estimate (b) (Iceman, 5200 B.P.). Left femur is postmortem dislocated from acetabulum.

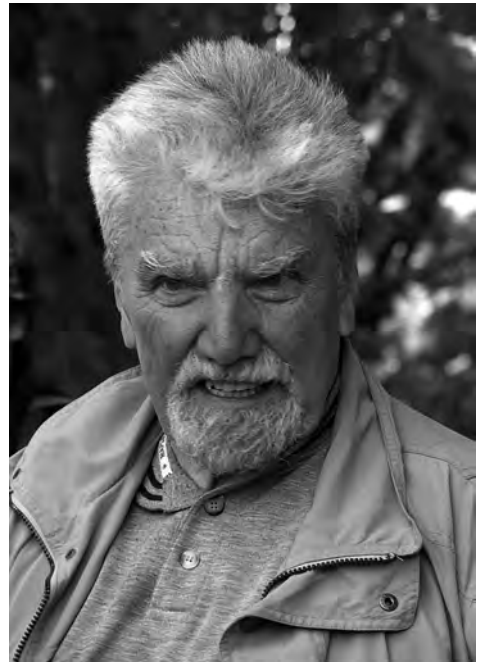
general declined between the European Mesolithic and Neolithic, and that body size and shape may have become more variable throughout the continent following the Upper Paleolithic.

The research was led by Christopher Ruff (Johns Hopkins University School of Medicine) with cooperation from United States (Brigitte Holt, University Massachusetts; William A. Murphy, University of Texas), Czech Republic (Vladimír Sládek, Institute of Vertebrate Biology) and Austria (Margit Berner, Naturhistorisches Museum; Dieter zur Nedden, Wolfgang Recheis, University of Innsbruck; Horst Seidler, University of Vienna).

RUFF C., HOLT B., SLÁDEK V., BERNER M., MURPHY W.A., NEDDEN D., SEIDLER H., RECHEIS W., 2006: Body size, body proportions, and mobility in the Tyrolean "Iceman". *Journal of Human Evolution* 51: 91-101.

OBITUARY

Zdeněk Veselovský (1928–2006)



Zdeněk Veselovský at the Prague Zoo in the summer of 2006 (photo by A. Pospěch).

Professor Zdeněk Veselovský was a distinguished zoologist who was a source of great inspiration to generations of ornithologists, mammalogists, and behavioural biologists in the Czech Republic. He was born in Jaroměř on 26 August 1928 and died on 24 November 2006 in Prague.

Zdeněk Veselovský was a naturalist of very broad competence, and his skills for popularization of the animal world to wide public were particularly recognized and appreciated. He was the author of more than 100 research papers and he published 35 books and textbooks. He had worked for almost 30 years as the director of the Prague ZOO (1959–1988), and he was later appointed as the professor of zoology at universities in České Budějovice and Prague.

He was a research fellow of the Institute during a short period in 1992 and 1993. This employment, provided by the Academy of Sciences, was quite important for Zdeněk Veselovský, because it enabled him to continue his scientific career in uneasy times of his life.

Zdeněk Veselovský was a man with great enthusiasm, curiosity and love of nature. His deep knowledge and warm friendly personality will be greatly missed by many.

AWARDS

In 2004, Zdeněk Hubálek was awarded the Prize of the Academy of Sciences of the Czech Republic for his studies on biology of West Nile virus, the agent of encephalitis in some vertebrates including humans. The results were published in 17 scientific papers and received a wide international response (the principal 1999 paper has been cited 224 times up to February 2007). Zdeněk Hubálek's long-term research concentrates on the ecology of arthropod-borne viruses and bacteria pathogenic for vertebrates, such as arboviruses and Lyme disease borreliae, and his papers have been cited almost 1 400 times. He has been assessing potential role of free-living birds in dispersal of pathogenic bacteria and viruses and is involved in the EDEN project of the 6th Framework Programme (West Nile virus, tick-borne diseases). Z. Hubálek is a member of two expert commissions of WHO.



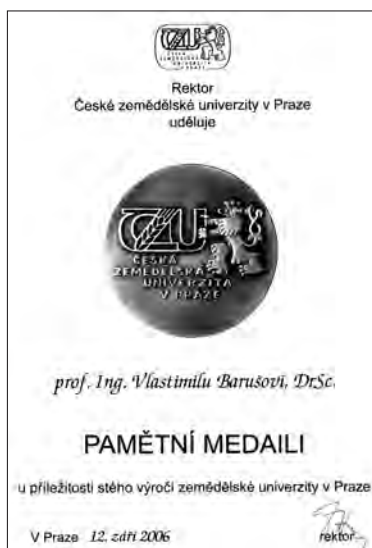
Zdeněk Hubálek (right) receives the 2004 Prize of the Academy of Sciences of the Czech Republic from the former president of the Academy of Sciences of the Czech Republic Helena Illnerová (left). Archives of the Press Department of the AS CR.

In 2005, Martin Reichard was awarded the Otto Wichterle Prize for his studies on general processes in population, behavioural and evolutionary biology. He uses fishes as a model group. His current research has concentrated on the evolution of reproductive strategies and mating systems, co-evolutionary dynamics and the effect of individual behaviour on population processes. He further investigates the ecology of early developmental stages of fish with a special attention to larval dispersal and the effects of biotic and abiotic factors on the success of natural reproduction. He is also involved in several projects on the ecology of tropical fishes in Senegal, Bangladesh, and China.



The Otto Wichterle Prize award ceremony 2005. Martin Reichard (left) receives the Otto Wichterle Prize for young scientists from the president of the Academy of Sciences of the Czech Republic Václav Pačes (right). Photo by M. Hužvářová.

In 2006, the rector of Czech University of Agriculture in Prague awarded Vlastimil Baruš, director of the former Institute of Vertebrate Zoology and the Institute of Systematic and Ecological Biology CS AS, a commemorative medal which was struck in honour of the 100th anniversary of the university.



Commemorative medal of Czech University of Agriculture in Prague.

INTERNATIONAL ACTIVITIES

The Institute's international collaboration is a very important part of its all research activities. Our scientists work in close collaboration and exchange their views with scholars from various institutions in many countries. Each department is involved in various forms of international co-operation and we have recently been participating in 20 international projects including six projects within the EU Sixth Framework Programme. We have been deriving much benefit from established links with foreign laboratories, however, we use any opportunity to find new contacts. The Institute organizes scientific meetings, offers study visits to foreign students and supports participation of our specialists in major scientific events abroad. Great emphasis is placed on young scientist-centred educational stays. Our scientists are members of 38 international organizations and 8 editorial boards, respectively.

International scientific meetings organized by the Institute

- 8th SE European Bird Migration Network Workshop, Prague, Czech Republic, February 2-5, 2006

The 8th Workshop of Southeast European Bird Migration Network (SEEN) was jointly organized by the Institute of Vertebrate Biology and the Faculty of Science of Charles University. SEEN workshops present a fruitful discussion platform for investigators of avian migration along the less studied southeastern European flyway. A total of 46 participants from 15 countries attended the workshop. The majority of the studies reported on results of orientation experiments, however, several participants demonstrated that also other approaches, such as satellite telemetry or stable isotope analysis are being adopted. These modern methods have challenged the traditional view of avian migrations and enable to answer hitherto unthinkable questions. An important lecture was held by Zdeněk Hubálek from the Department of Medical Zoology, Institute of Vertebrate Biology of the ASCR on avian influenza, followed by a discussion how the network could contribute to the understanding of possible spread of the H5N1 virus. The next workshop will be held in Kraków in 2007.

- Conference “Zoologické dny 2006” [Zoological Days 2006], Brno, February 9-10, 2006

Long-term tradition of the “Zoological days” conference goes back to 1969 and it is connected with the Institute of Vertebrate Biology and the former Institute of Vertebrate Zoology. Nevertheless, its scope and contents has changed as all lifestyle in the Czech Republic after the velvet revolution in 1989. Former meeting of Czech and Slovak zoologists serving as forum of the Czech Zoological Society (co-organizer) became a serious yearly scientific conference where mainly students and young researchers present actual results of their research focussed on various aspects of both vertebrate and invertebrate zoology. The student competition is organized thanks to the sponsorship of the OLYMPUS company which became a regular co-operative partner of the conference. In 2006, six students received awards for their outstanding presentations. Since students presented at least half of all posters and lectures (total number of presentations: 143 lectures and 136 posters) this sponsorship was a great help. Since 2003, the conference has been held at the Faculty of Science, Masaryk University Brno (co-organizer) and approximately 350 both professional and amateur zoologists from the Czech and Slovak Republics participated in it every year.



Participants of the conference watching a presentation in a lecture theatre at Masaryk University (photo by M. Stanko).

Participation in international conferences

- ESF BIRD Final Conference, Wilhelmshaven, Germany, February 16–20, 2005
- Man and Biosphere Meeting, Simenti, Senegal, March 1–2, 2005
- Annual International Symposium FSBI: Fish Habitat Ecology and Conservation, Bangor, Wales, United Kingdom, July 18–22, 2005
- 9th International Congress of Mammalogy, Sapporo, Japan, July 31 – August 5, 2005
- 10th Congress of European Society for Evolutionary Biology, Krakow, Poland, August 15–20, 2005
- 29th Ethological Conference, Budapest, Hungary, August 20–27, 2005
- 5th Conference of the European Ornithologists' Union, Strasbourg, France, August 20–23, 2005
- 10th European Bat Research Symposium, Galway, Ireland, August 21–26, 2005
- Applied Ornithology 2005, Zvolen, Slovakia, September 16–17, 2005
- 13th Meeting of the International Hamsterworkgroup, Illmitz, Austria, October 14–17, 2005
- 5th Asia-Pacific Congress of Entomology, Jeju, South Korea, October 18–21, 2005
- European Otter Workshop, Padula, Italy, October 20–23, 2005
- Ecology of Stream Fish: State of the Art and Future Prospects II, León, Spain, June 12–16, 2006
- EIFAC International Symposium, Mondsee, Austria, June 12–17, 2006
- 11th International Behavioral Ecology Congress, Tours, France, July 23–29, 2006
- Genetics of speciation, Vancouver, Canada, July 21–24, 2006
- Behavioral Ecology Congress, Tours, France, July 23–30, 2006
- International Congress of Parasitology, Glasgow, United Kingdom, August 6–11, 2006

- 24th International Ornithological Congress, Hamburg, Germany, August 13–19, 2006
- 36th International Conference, International Association for Danube Research, Vienna, Austria, September 4–8, 2006
- Applied Ornithology 2006, Zvolen, Slovakia, September 8–9, 2006

Membership in international organizations

ALBRECHT T.	International Society for Behavioral Ecology (ISBE)
BARUŠ V.	Sociedad Cubana de Parasitología Animal, honorary chairman
BÍMOVÁ B.	International Mammalian Genome Society
BRYJA J.	Steering Committee of European Science Foundation
ČAPEK M.	IOC Standing Committee on Ornithological Nomenclature
ČERVENÝ J.	Ad Hoc Group for Environmental Problems of COST (Council for Research and Development, EU) Czech National Committee of the MAB Programme Working Group for Large Carnivores Initiative for Europe
GVOŽDÍK L.	American Society of Ichthyologists and Herpetologists American Society of Naturalists British Herpetological Society Society for the Study of Amphibians and Reptiles Society for the Study of Evolution Steering Committee of European Science Foundation
HONZA M.	Steering Committee of European Science Foundation
JURAJDA P.	Fisheries Society of British Isles
MARTÍNKOVÁ N.	Society of Systematic Biologists
MRLÍK V.	Peregrine Fund, World Center for Birds of Prey Working Group for Montagu's Harrier World Working Groups on Birds of Prey and Owls
KOUBEK P.	Working Group for Large Carnivores Initiative for Europe
PIÁLEK J.	European Society for Evolutionary Biology International Mammalian Genome Society Societas Europea Herpetologica Society for the Study of Amphibians and Reptiles Society for the Study of Evolution
PROCHÁZKA P.	Deutsche Ornithologen-Gesellschaft
REICHARD M.	Association for the Study of Animal Behaviour British Ecological Society European Society for Evolutionary Biology Fisheries Society of the British Isles
SLÁDEK V.	Paleoanthropology Society (USA)
ZIMA J.	Czech National Committee of the IUBS International Advisory Board, BIOTER Centre of Excellence (EU) Insectivores Specialists Group SSC IUCN International <i>Sorex araneus</i> Cytogenetics Committee Rodents Specialists Group SSC IUCN Societas Europaea Mammalogica

Membership in editorial boards

BARUŠ V.	Transactions of the Zoological Society of India Helminthologia
BLAHÁK, P.	Folia Zoologica (managing editor)
GVOŽDÍK, L.	Folia Zoologica
HONZA M.	Folia Zoologica
HUBÁLEK Z.	Cryobiology Folia Parasitologica
KOUBEK, P.	Folia Zoologica
LUSK S.:	Folia Zoologica
PEŇÁZ M.	Folia Zoologica (editor-in-chief) Quaderni E.T.P. - Journal of Freshwater Biology Polskie Archiwum Hydrobiologii
SLABÁKOVÁ H.	Folia Zoologica
ZIMA J.	Hystrix - Italian Journal of Mammalogy Folia Zoologica

EDUCATION AND TEACHING ACTIVITIES

The Institute lays great emphasis on education and teaching activities. In 2005–2006, we gave lectures at seven faculties of seven universities and supervised 61 undergraduates and 53 postgraduates from 11 faculties of eight universities. Another important fact is that 19 and 9 students supervised by the staff succeeded in obtaining their MSc and PhD degrees, respectively. We have accreditation from the Ministry of Education, Youth and Sports of the Czech Republic to perform post-gradual studies in zoology at the Faculty of Science, Masaryk University in Brno, and the Faculty of Biological Sciences, South Bohemian University in České Budějovice. We participate in research projects carried out in two joint laboratories, "Evolutionary Genetics of Animals" (established by the Department of Zoology, Faculty of Science, Charles University in Prague, the Institute of Animal Physiology and Genetics AS CR in Liběchov and the Institute of Vertebrate Biology in Brno) and "Ichthyoparasitology - The Centre of Basic Research" (established by the Faculty of Science, Masaryk University in Brno and the Institute of Vertebrate Biology in Brno). These laboratories provide a firm basis for better interaction between the Academy of Sciences CR and universities, which helps to make the institute attractive to students. Moreover, the scientists of the Institute are members of scientific councils and boards at universities.

Teaching at universities

Lecturer	Subject	2005 hours	2006 hours	Faculty/ University
Albrecht T.	Modern statistical methods	20	20	6
Bryja J.	Molecular ecology	24	24	1
	Population ecology	8	8	1
Čapek M.	Ornithology	48	48	1
Červený J.	Vertebrate Zoology	28	28	7
	Field course of zoology	60	60	2
	Zoology for game-keepers	26	26	7
Halouzka J.	Tutorials in immunology	8	8	1
Honza M.	Ecology of birds	26	26	1
Hubálek Z.	Fundamentals of microbiology	30	30	1
	Microbial zoonoses and sapronoses	30	30	1
	Tutorials in microbiology	60	60	1
Jurajda P.	Ecology of fish	26	26	1
Koubek P.	Game biology	22	22	1
Lusk S.	Ichthyology	36	36	1
Prokeš M.	Ichthyology	4	4	3
Sládek V.	Biological anthropology 2	54	54	4
	Biological anthropology for archeologists 1	65	65	4
	Biological anthropology for archeologists 2	65	65	4
	Human variability and adaptability	54	54	4
	Locomotor system 1	65	65	4
	Tutorials in anthropology	13	13	4
Svobodová J.	Animal ecology	14	14	7
	Biodiversity	3	3	7
	Ecological methods	8	8	7
	Field course of nature preservation	42	42	7
	Field course of zoology	17	17	7

	General ecology	28	28	7	
	Zoology	52	52	7	
Tkadlec E.	Life history	30	30	5	
	Population ecology	45	45	5	
	Scientific methodology	30	30	5	
	Time series in ecology	15	15	5	
	Tutorials (MSc students)	30	30	5	
	Tutorials (PhD students)	20	20	5	
Zima J.	Biodiversity	26+26	26+26	1,6	
	Field course of zoology	42	42	6	
	Genetical methods in zoology	12	12	6	
	Systematics and phylogeny of vertebrates	13	13	6	
Zukal J.	Behavioral ecology	45	45	1	
	Ethology	26	26	1	
	Chiropterology	22	22	1	
Total	16	42	1333	1333	7/7

¹ Faculty of Science, Masaryk University, Brno

² Department of General Zoology, University of Essen

³ Faculty of Agronomy, Mendel University of Agriculture and Forestry, Brno

⁴ Faculty of Humanities, University of West Bohemia, Plzeň

⁵ Faculty of Science, Palacký University, Olomouc

⁶ Faculty of Science, Charles University, Prague

⁷ Faculty of Forestry and Environment, Czech University of Agriculture, Prague

Undergraduate students working in the Institute and/or supervised by the Institute's fellows in 2005-2006

Student	Supervisor/ Consultant	2005	2006	Defended the theses	Faculty/ University
Bartoňová E.	Lusková V.	+	+		1
Bednářová J.	Zukal J.	+	+		1
Bejdák P.	Bryja J.		+		1
Bémová P.	Bryja J.	+		2005	9
Bencová V.	Bryja J.	+		2005	1
Bendová P.	Jurajda P.	+	+		7
Daniszová K.	Červený J.	+	+	2006	8
Dařenová E.	Bryja J.	+	+	2006	1
Doležálková I.	Hubálek Z.		+		1
Dufková P.	Piálek J.	+	+	2006	9
Fainová D.	Procházka P.		+		9
Fornůsková A.	Bryja J.		+		1
Franěk J.	Zukal J.	+	+	2006	1
Friedl L.	Sládek V.	+	+	2006	6
Gryc L.	Zukal J.	+	+	2006	1
Hnojská V.	Sládek V.		+		6
Hrabec M.	Kamler J.	+	+		3
Hoening V.	Hubálek Z.	+	+		1
Jamrich A.	Gvoždík L.	+	+	2006	11
Janková J.	Hubálek Z.	+	+		1
Jarošová V.	Hubálek Z.	+	+		1
Javůrková V.	Albrecht T.	+	+		7

Kalinová Z.	Koubek P.		+		10
Konečná G.	Jurajda P.		+		1
Konečný A.	Bryja J.	+		2005	1
Koubínová D.	Zima J.	+	+		8
Koubová M.	Svobodová J.	+	+		9
Křížová P.	Bryja J.		+		1
Loudová J.	Svobodová J.	+	+		10
Mazurová E.	Jurajda P.	+	+		1
Měřáková E.	Gvoždík L.		+		1
Michálek B.	Tkadlec E.	+	+		7
Mikeska M.	Čapek M.	+		2005	2
Mrštný L.	Červený J.	+	+	2006	10
Nentvichová M.	Červený J.	+	+	2006	10
Novák Z.	Červený J.	+		2005	8
Ondrouchová H.	Bryja J.		+		1
Pankowská A.	Sládek V.	+	+		6
Paták Ladislav	Tkadlec E.	+	+		1
Patzenhauerová H.	Bryja J.	+	+		1
Patzenhauerová H.	Bryja J.	+		2005	1
Petrášová I.	Reichard M.		+		1
Polačik M.	Jurajda P.	+	+		1
Promerová M.	Bryja J.	+	+		1
Průchová E.	Sládek V.	+		2005	5
Průchová E.	Sládek V.	+	+	2006	6
Rybaříková J.	Honza M.	+		2005	1
Řežucha R.	Reichard M.		+		1
Simprová P.	Zukal J.		+		1
Slavíková K.	Zukal J.	+	+		1
Staněk D.	Zukal J.	+	+		1
Suvorov P.	Albrecht T.	+	+		8
Svobodová P.	Hubálek Z.		+		1
Šovčík P.	Prokeš M.	+	+		4
Štrom V.	Reichard M.		+		1
Švanyga J.	Jurajda P.	+	+		1
Tkadlčíková R.	Tkadlec E.	+	+		7
Vávra F.	Tkadlec E.	+	+		7
Vinkler M.	Albrecht T.	+	+		8
Vrtílek M.	Reichard M.		+		1
Zemanová B.	Bryja J.	+	+	2006	1
Zifčák P.	Tkadlec E.	+	+		7
Total 61	20	46	54	19	11/8

¹ Faculty of Science, Masaryk University, Brno

² Faculty of Arts, Masaryk University, Brno

³ Faculty of Forestry and Wood Technology, Mendel University of Agriculture and Forestry, Brno

⁴ Faculty of Agronomy, Mendel University of Agriculture and Forestry, Brno

⁵ Faculty of Humanities, University of West Bohemia, Plzeň

⁶ Faculty of Arts, University of West Bohemia, Plzeň

⁷ Faculty of Science, Palacký University, Olomouc

⁸ Faculty of Science, Charles University, Prague

⁹ Faculty of Biological Sciences, University of South Bohemia, České Budějovice

¹⁰ Faculty of Forestry and Environment, Czech University of Agriculture, Prague

¹¹ Faculty of Science, Komenský University, Bratislava, Slovakia

PhD students working in the Institute and/or supervised by the Institute's fellows in 2005-2006

Student	Supervisor/ Consultant	2005	2006	Defended the theses	Faculty/ University
Barančeková M.	Koubek P.	+		2005	1
Bednářová J.	Zukal J.	+	+		1
Berková H.	Zukal J.	+	+		1
Bimová B.	Piálek J.	+	+		5
Čížková D.	Bryja J.		+		1
Daďourek M.	Tkadlec E.	+	+		4
Dufková P.	Piálek J.		+		6
Ďureje E.	Piálek J.	+	+		1
Dvořák J.	Gvoždík L.	+	+		1
Fejková P.	Červený J.	+	+		5
Foltánková V.	Reichard M.	+	+		1
Gregor P.	Tkadlec E.	+	+		4
Hájková P.	Jurajda P.	+	+		1
Hejtmánková M.	Gvoždík L.	+	+		4
Honzírek J.	Koubek P.	+	+		2
Horák A.	Piálek J.	+	+		6
Horák V.	Lusk S.	+		2005	1
Hulová Š.	Bryja J.		+		6
Janáč M.I	Jurajda P.	+	+		1
Jánová E.	Tkadlec E.	+	+		1
Kocurová M.	Červený J.	+	+		5
Konečná M.	Reichard M.		+		1
Konečný A.	Bryja J.	+	+		1
Lazarová J.	Zima J.	+		2005	5
Ležalová R.	Honza M.	+	+		6
Lisická L.	Tkadlec E.	+	+		4
Losík J.	Tkadlec E.	+	+		4
Mendel J.	Lusková V.	+	+		1
Měštková L.	Červený J.	+	+		5
Mikulíček P.	Piálek J.	+		2005	5
Němečková I.	Mrlík V.	+	+	2006	1
Nová P.	Zima J.	+	+	2006	5
Novák V.	Zukal J.	+	+		1
Nováková M.	Koubek P.	+	+		1
Pokorný M.	Zukal J.	+	+		1
Polačík M.	Jurajda P.	+	+		1
Polačiková L.	Honza M.	+	+		1
Poláková R.	Bryja J.		+		1
Požgayová M.	Honza M.	+	+		1
Prokešová J.	Homolka M.	+		2005	1
Sychra J.	Adámek Z.	+	+		1
Šicha V.	Honza M.	+	+		1
Šikutová S.	Halouzka J.	+	+		1
Švanyga J.	Jurajda P.	+	+		1
Thelenová J.	Tkadlec E.	+	+		4
Třebatická L.	Tkadlec E.	+	+		4
Valová Z.	Jurajda P.	+	+		1
Vallo P.	Koubek P.	+	+		1
Varfálvyová D.	Tkadlec E.	+	+		4
Vetešník L.	Lusk S.	+		2005	3

Vyskočilová M.	Piálek J.	+		2005	1
Zachařová J.	Červený J.	+	+		5
Zemanová B.	Bryja J.		+		1
Total	53	16	47	46	9
					6/5

¹ Faculty of Science, Masaryk University, Brno

² Faculty of Forestry and Wood Technology, Mendel University of Agriculture and Forestry, Brno

³ Faculty of Agronomy, Mendel University of Agriculture and Forestry, Brno

⁴ Faculty of Science, Palacký University, Olomouc

⁵ Faculty of Science, Charles University, Prague

⁶ Faculty of Biological Sciences, University of South Bohemia, České Budějovice

EDITORIAL ACTIVITIES

The „Institute“ publishes the international journal „*Folia Zoologica*“. The journal is covered by many reference journals, including the Current Contents. The current value of the impact factor for 2005 amounts 0.585.

Publisher and address of Editorial Office:

Institute of Vertebrate Biology AS CR, v. v. i. Květná 8, 603 65 Brno, Czech Republic.
e-mail: editorfz@brno.cas.cz

Editor-in-Chief: Milan P E Ň Á Z , Brno
Associate Editors: Gordon H. C O P P , Lowestoft
Richard H.K. M A N N , Huntingdon
Christopher F. M A S O N , Colchester

Managing Editor: Pavel B L A H Á K , Brno

Subject Editors:
mammalogy: Jan Z I M A
ornithology: Marcel H O N Z A
herpetology: Lumír G V O Ž D Í K
ichthyology: Stanislav L U S K
monographs: Petr K O U B E K
book reviews: Hana S L A B Á K O V Á

Folia Zoologica appears in three series:

- (1) basic series – published quarterly, 4 issue s, 1 volume per year
- (2) *Folia Zoologica Monographs* – published occasionally
- (3) *Folia Zoologica Supplements* – published occasionally, usually containing contributions from important international meetings

From 2005 through 2006, altogether 102 papers were published (2005: 57, 2006: 45) of which 48 articles concerning ichthyology (2005: 24, 2006: 24), 37 mammalogy (2005: 30, 2006: 17), 15 ornithology (2005: 12, 2006: 3) one batrachology (2006), and one article was interdisciplinary (2005), respectively.

The authors originate from 26 countries, as follows: Czech Republic 75 articles (2005: 52, 2006: 23), Spain 32 (2005: 12, 2006: 20), Poland 24 (2005: 11, 2006: 13), Germany 19 (2005: 13, 2006: 6), United Kingdom 17 (2005: 5, 2006: 12), Portugal 16 (2005: 3, 2006: 13), Slovakia 16 (2005: 10, 2006: 6), China 15 (2005: 13, 2006: 2), Croatia 15 (2005: 10, 2006: 5), Turkey 14 (2005: 9, 2006: 5), Italy 13 (2005: 8, 2006: 5), Belgium 11 (2005), Russia 9 (2005: 8, 2006: 1), Greece 8 (2005: 5, 2006: 3), Argentina 7 (2005: 4, 2006: 3), Hungary 5 (2005: 3, 2006: 2), Austria 4 (2005: 1, 2006: 3), Iran 4 (2006), Slovenia 4 (2005), Belarus 3 (2005), France 3 (2005: 1 2006: 2), Finland 2 (2006), New Zealand 2 (2005: 1, 2006: 1), Lithuania 1 (2006), Uganda 1 (2006), and USA 1 (2006), respectively.

