

## **David Boukal – Curriculum Vitae**

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### **Present address and contact details**

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### **Employment history**

#### **2008-2009**

Postdoctoral Fellow, Institute of Marine Research, Bergen, Norway (European Research Network ‘FinE’, 3 months)

#### **2007-2009**

Postdoctoral Fellow, EvoFish research group, Department of Biology, University of Bergen, Bergen, Norway (group of Prof. M. Heino)

#### **2005-2008**

Marie Curie Postdoctoral Fellow, Institute of Marine Research, Bergen, Norway (EU Marie-Curie Research Training Network ‘FishACE’)

#### **2004**

Postdoctoral Fellow, Institute for Biodiversity and Ecosystem Dynamics, Universiteit van Amsterdam, the Netherlands (group of Prof. A. M. de Roos)

#### **2002-present**

Researcher, Department of Theoretical Biology, Institute of Entomology, Biology Centre of the Academy of Sciences of the Czech Republic and (as part-time position) Department of Ecosystems Biology, Faculty of Science, University of South Bohemia, Czech Republic

#### **1997-2002**

Junior Researcher, Department of Theoretical Biology, Institute of Entomology, Biology Centre of the Academy of Sciences of the Czech Republic and (as part-time position) Department of Ecology, Faculty of Biological Sciences, University of South Bohemia, Czech Republic

#### **1995-1997**

Community Service, Jírovcova High School, České Budějovice, Czech Republic

### **Education and degrees**

#### **1994-2002**

PhD studies in applied mathematics (internal 1994/1995, external after 1997), Faculty of Nuclear Sciences and Physical Engineering, Czech Technical University, Prague, Ph.D. degree awarded on March 5, 2002. Thesis title: “Essays on optimal foraging and the Allee effect”, supervisor V. Křivan.

#### **1989-1994**

Undergraduate studies in applied mathematics, Faculty of Nuclear Sciences and Physical Engineering, Czech Technical University, Prague, Ing. degree [equivalent to MSc] awarded on June 8, 1994, with Honours. Thesis title: “Differential equations in population biology”, supervisor V. Křivan.

### **Membership in professional organizations**

- British Ecological Society
- Czech Entomological Society
- European Society for Evolutionary Biology
- European Society for Mathematical and Theoretical Biology
- Wiener Coleopterologischen Verein

### Grants and awards

- “How plastic are freshwater insects? Measuring growth, phenotypic plasticity and evolution in selected taxa” (funded by Grant Agency of the Czech Republic, 2010-2013, PI, 3.664 mio CZK / ~142.000 EUR)
- “Monitoring man-made lakes: what can fisheries data and models tell us?” (funded by EEA and Norwegian Financial Mechanisms, 2009-2010, PI, 85.000 EUR)
- “Modelling individual life histories and population dynamics of predatory aquatic insects: the role of body size” (Marie-Curie Reintegration Grant FP7-PEOPLE-ERG-2008, 2009-2012, PI, 45.000 EUR)
- Young Investigator Award, 2006 (best presentation, 6th Mote international Symposium in Fisheries Ecology, Sarasota, Florida, USA)
- EU SYNTHESYS travel grant, 2005 (short stay at Naturhistorisches Museum, Wien, Austria)
- NATO Science Fellowship, 2004 (postdoc stay at Universiteit van Amsterdam, Netherlands, 5 months)
- “Ecological and evolutionary dynamics of sexual size dimorphism” (postdoc grant No 201/02/D088, Grant Agency of the Czech Republic, 2002-2005, PI, collaboration with Prof. A. M. de Roos, Universiteit van Amsterdam, Netherlands).
- “Allee effect in structured populations” (grant KJB600070602, Grant Agency of the Academy of Sciences of the Czech Republic, 2006-2008, with L. Berec (PI) and J. Eisner).
- “Role of sexual reproduction in population dynamics: models and their application in conservation biology” (grant IAB1007201, Grant Agency of the Academy of Sciences of the Czech Republic, 2002-2004, with L. Berec (PI) and J. Eisner).
- Participation in five other grant projects in the Czech Republic.

### Further professional / research experience

- Co-organizer of workshop on size-structured population models, Umeå, Sweden, 2007.
- Co-organizer of four internal workshops of EU Marie-Curie Research Training Network FishACE, 2006-2008.
- Member of local organizing committee, international workshop FITOP'98, Č. Budějovice, 1998.
- Supervisor of undergraduate theses on population dynamics modelling / freshwater insects, Faculty of Science, University of South Bohemia, Czech Republic, 2005-present.
- Co-supervisor during four-week biodiversity survey and field course on aquatic insects, Burma, 2003 (in collaboration with Naturhistorisches Museum, Wien, Austria).
- Associate editor, *European Journal of Entomology*, 2010-present.
- Editorial board member, *Acta Entomologica Musei Nationalis Pragae*, 2006-present.
- Editorial board member, *Klapalekiana* (journal of the Czech Entomological Society), 1997-2009.
- Co-founder and steering member of Water Beetle Group of Czech Entomological Society, 1996-present.
- Regular short/mid-long stays at Naturhistorisches Museum, Wien, Austria, 1993-2002.
- Peer reviews for international journals (*American Naturalist*, *Behavioral Ecology*, *Bulletin of Mathematical Biology*, *Conservation Biology*, *Ecology*, *Ecology Letters*, *European Journal of Entomology*, *Evolutionary Applications*, *ICES Journal of Marine Science*, *Journal of Animal Ecology*, *Proceedings B*, *Oikos*, *Population Ecology*, *Theoretical Population Biology*, *Zootaxa*).
- Reviews for *Zentralblatt MATH*, 1999-
- Regular participation at international conferences on mathematical modelling, population dynamics and evolutionary ecology (1-2 annually).

### Modelling skills

- Evolutionary dynamics: adaptive dynamics and quantitative genetics approaches, with applications to life history evolution
- Population dynamics: analytical and numerical tools for ODEs, including bifurcation software (XPPAUT, MatCont and Content); numerical analyses of models of structured populations (EBT package); individual-based models (IBMs): formulation and basic analyses
- Programming: C, Mathematica, basic knowledge of R and Matlab

### Fieldwork/experimental skills

- sampling of freshwater insect communities
- faunistic inventories and habitat quality assessments for local authorities (water beetles)
- simple field and laboratory experiments (predation, cannibalism and IG predation in freshwater insects; water beetle behaviour; mark-recapture)
- identification expertise (water beetles of Central Europe; superfamily Dryopoidea worldwide)

**Language skills**

English (fluent), German (moderate), French (moderate), Russian and Norwegian (basic).

**Student supervision**

Students of the Faculty of Science, University of South Bohemia, Č. Budějovice, unless stated otherwise.

**Probíhající práce / Ongoing theses**

*Luboš Havlan*: Morphological determinants of size-selective predation in freshwater insects (MSc, 2009-2011)

*Monika Hokrová* (Pedagogical Faculty, University of South Bohemia, Č. Budějovice): Impact of habitat and body coloration on behaviour of selected freshwater insects (MSc, 2009-2013)

*Jan Klečka*: Community assembly in reclaimed sandpit pools (MSc, 2008-2010)

*Viola Pavlová*: Population dynamics of fish stocks in man-made reservoirs (PhD, co-supervisor, 2009-2012)

*Miroslav Peroutka*: Role of cannibalism and intra-guild predation in freshwater insects (BSc, 2010-2011)

**Ukončené práce / Completed theses**

*Markéta Nyklíčková*: Habitat choice in diving beetles (BSc, 2006-2009)

*Luboš Havlan*: Size-selective predation in freshwater insects (BSc, 2006-2009)

*Jan Klečka*: Long-term monitoring of water beetle community in an alder carr (BSc, 2005-2008)

*Terezie Stachová*: Models of intraguild predation and competition in large carnivores (MSc, 2005-2007)

## Publications

Total of 44 publications, including 21 peer-reviewed papers and 11 book chapters.

### Papers – Web of Science (14)

V. Pavlová, L. Berec, **D.S. Boukal** (in press). Caught between two Allee effects: trade-off between reproduction and predation risk. *Journal of Theoretical Biology*.

**D.S. Boukal**, L. Berec (2009). Modelling mate-finding Allee effects and populations dynamics, with applications in pest control. *Population Ecology* 51:445–458.

**D.S. Boukal**, L. Berec, V. Křivan (2008). Does sex-biased predation stabilize or destabilize predator-prey dynamics? *PLoS ONE* 3: e2687.

A. Deredec, L. Berec, **D.S. Boukal**, F. Courchamp (2008). Are non-sexual models appropriate for predicting the impact of virus-vectored immunocontraception? *Journal of Theoretical Biology* 250: 281-290.

M. Heino, L. Baulier, **D.S. Boukal**, E.S. Dunlop, S. Eliassen, K. Enberg, C. Jørgensen, Ø. Varpe (2008). Evolution of growth in Gulf of St Lawrence cod? *Proceedings of the Royal Society B-Biological Sciences* 275: 1111-1112.

C. Jørgensen, K. Enberg, E.S. Dunlop, R. Arlinghaus, **D.S. Boukal**, K. Brander, B. Ernande, A. Gårdmark, F. Johnston, S. Matsumura, H. Pardoe, K. Raab, A. Silva, A. Vainikka, U. Dieckmann, M. Heino, A.D. Rijnsdorp (2008). The role of fisheries-induced evolution – response. *Science* 320: 48-50.

**D.S. Boukal**, M.W. Sabelis, L. Berec (2007). How predator functional responses and Allee effects in prey affect the paradox of enrichment and population collapses. *Theoretical Population Biology* 72: 136-147.

C. Jørgensen, K. Enberg, E.S. Dunlop, R. Arlinghaus, **D.S. Boukal**, K. Brander, B. Ernande, A. Gårdmark, F. Johnston, S. Matsumura, H. Pardoe, K. Raab, A. Silva, A. Vainikka, U. Dieckmann, M. Heino, A.D. Rijnsdorp (2007). Managing evolving fish stocks. *Science* 318: 1247-1248.

A.M. de Roos, **D.S. Boukal**, L. Persson (2006). Evolutionary regime shifts in age and size at maturation of exploited fish stocks. *Proceedings of the Royal Society B-Biological Sciences* 273: 1873-1880.

L. Berec, P.J. Schembri, **D.S. Boukal** (2005). Sex determination in *Bonellia viridis* (Echiura: Bonelliidae): population dynamics and evolution. *Oikos* 108: 473-484.

L. Berec, **D.S. Boukal** (2004). Role of mate search, mate choice and divorce rate in population dynamics of sexually reproducing species. *Oikos* 104: 122-132.

**D.S. Boukal**, L. Berec (2002). Single-species models of the Allee effect: extinction boundaries, sex ratios and mate encounters. *Journal of Theoretical Biology* 218: 375-394.

L. Berec, **D.S. Boukal**, M. Berec (2001). Linking the Allee effect, sexual reproduction, and temperature-dependent sex determination via spatial dynamics. *American Naturalist* 157: 217-230.

**D.S. Boukal**, V. Křivan (1999). Lyapunov functions for Lotka-Volterra predator-prey models with optimal foraging behavior. *Journal of Mathematical Biology* 39: 493-517.

### Other peer-reviewed papers (7)

J. Kodada, **D.S. Boukal** (2000). *Monstrosostea solivaga* new genus and species of aberrant terrestrial dryopid from southern India (Coleoptera: Dryopidae). *Entomological Problems* 31: 129-136.

D. Trávníček, **D.S. Boukal**, M. Boukal, P. Jeziorski (1997). Faunistic records from the Czech Republic 69. *Klapalekiana* 33: 123-127.

M.A. Jäch, **D.S. Boukal** (1997). The genus *Hedyselmis* Hinton (Coleoptera, Elmidae). *Entomological Problems* 28: 111-116.

M.A. Jäch, **D.S. Boukal** (1997). Description of two new genera of Macronychini: *Aulacosolus* and *Nesonychus* (Coleoptera: Elmidae). *Koleopterologische Rundschau* 67: 207-224.

**D.S. Boukal** (1997). A revision of the genus *Austrolimnius* Carter & Zeck from New Guinea and Moluccas (Coleoptera, Elmidae). *Annalen des Naturhistorischen Museums in Wien* 99B: 155-215.

M.A. Jäch, **D.S. Boukal** (1996). Description of two new riffle beetle genera from peninsular Malaysia (Coleoptera: Elmidae). *Koleopterologische Rundschau* 66: 179-189.

M.A. Jäch, **D.S. Boukal** (1995). Rudielmis gen.n. from South India (Coleoptera: Elmidae). *Koleopterologische Rundschau* 65: 149-157.

### Book chapters, supplements (11)

**D.S. Boukal**, M. Boukal, M. Fikáček, J. Hájek, J. Klečka, S. Skalický, J. Šťastný, D. Trávníček (2007). Katalog vodních brouků České republiky / Catalogue of water beetles of the Czech Republic. *Klapalekiana* 43, Supplementum: 1-289. (in Czech and English).

M. Papáček, **D.S. Boukal**, J. Matěna, J. Petr, T. Soldán (2006). Vodní hmyz [Aquatic insects]. Pp. 203-210 in V. Dudák, ed. *Novohradské hory a Novohradské předhoří - příroda, historie, život*. [Novohradské hory Mountains and Novohradské předhoří Foothills - Environment, History, Life]. Miloš Uhlíř - Baset, Praha (in Czech).

**D.S. Boukal** (2005). Hydraenidae (vodanovití) / Scirtidae / Psephenidae / Limnichidae / Dryopidae / Elmidae. Pp. 419-421 / 450-451 / 458 / 459 / 460-461 / 462-463 in J. Farkač, D. Král, M. Škorpík, eds. *Červený seznam ohrožených druhů České republiky. Bezobratlí*. [Red list of threatened species in the Czech Republic. Invertebrates]. Agentura ochrany přírody a krajiny ČR, Praha (in Czech and English).

**D.S. Boukal** (2004). Vodní brouci (Coleoptera). [Water beetles (Coleoptera)]. Pp. 136-144 in M. Papáček, ed. *Biota Novohradských hor: Modelové taxony, společenstva a biotopy*. [Biota of the Novohradské hory Mts.: Model taxa, communities, and habitats.] Jihočeská Univerzita, České Budějovice (in Czech).

J. Kodada, **D.S. Boukal** (2003). Dryopidae: II. Description of *Ceradryops matei* sp.n. from Hong Kong, and synonymical note on the genus *Uenodryops* Satô (Coleoptera). Pp. 136-144 in M.A. Jäch & L. Ji, eds. *Water Beetles of China, Vol. III. Zoologisch-Botanische Gesellschaft in Österreich and Wiener Coleopterologenverein, Wien*.

M.A. Jäch, **D.S. Boukal** (1995). Elmidae: 2. Notes on Macronychini, with description of four new genera from China (Coleoptera). Pp. 299-323 in M.A. Jäch, L. Ji, eds. *Water Beetles of China, Vol. I. Zool.-Bot. Ges. Wien*.

### Other papers, reports and conference proceedings (12)

**D.S. Boukal**, E.S. Dunlop, M. Heino, U. Dieckmann (2008). Fisheries-induced evolution of body size and other life history traits: the impact of gear selectivity. *ICES CM 2008/F:07* (conference proceedings).

Heino, M., **Boukal, D. S.**, Falkenhaus, T., Piatkowski, U., Porteiro, F.M., & Sutton, T.T. 2008. Length structure of deep-pelagic fishes sheds new light to their life histories. *ICES CM 2008/C:14* (conference proceedings).

Heino, M., **Boukal, D. S.**, Falkenhaus, T., Piatkowski, U., Porteiro, F.M., & Sutton, T.T. 2008. Size structure, age-size dynamics and life history variation. *ICES CM 2008/F:13* (conference proceedings).

R. Arlinghaus, **D.S. Boukal**, U. Dieckmann, E.S. Dunlop, K. Enberg, B. Ernande, A. Gårdmark, M. Heino, F. Johnston, C. Jørgensen, S. Matsumura, H. Pardoe, K. Raab, A.D. Rijnsdorp, A. Silva, A. Vainikka (2007). *Report of the Study Group on Fisheries Induced Adaptive Change (SGFIAC)*. 26 Feb-2 Mar 2007, Lisbon, Portugal.

**D.S. Boukal**, A.M. de Roos, L. Persson (2006). Late or partial fishing moratoria can lead to irreversible changes in age and size at maturation. *ICES CM 2006/H:05* (conference proceedings).

**D.S. Boukal**, J. Klečka, T. Soldán (2006). Vodní hmyz řeky Malše v okolí Českých Budějovic. (Aquatic insects of the Malše River in the environs of České Budějovice). *Sborník Jihočeského muzea v Českých Budějovicích, Přírodní Vědy* 46: 206-214. (In Czech, English summary).

**D.S. Boukal**, M. Fikáček, J. Hájek, J. Šťastný, D. Trávníček (2003). Water beetles of the Novohradské hory Mts. Pp. 163-174 in M. Papáček, ed. *Biodiverzita a přírodní podmínky Novohradských hor II*. [Biodiversity and natural conditions of the Novohradské hory Mts. II.] South Bohemian University and Institute of Entomology AS CR, České Budějovice (conference proceedings).

J. Šťastný, M. Boukal, **D.S. Boukal**, J. Hájek (1999). Coleoptera: Hydradephaga. Pp. 241-250 in V. Opravilová, J. Vaňhara, I. Sukop, eds. *Aquatic Invertebrates of the Pálava Biosphere Reserve of UNESCO*. Folia Fac. Sci. Nat. Univ. Masarykianae Brunensis, Biologia, 101.

D. Trávníček, **D.S. Boukal**, M. Boukal (1999). Coleoptera: Hydrophiloidea. Pp. 251-261 in V. Opravilová, J. Vaňhara, I. Sukop, eds. *Aquatic Invertebrates of the Pálava Biosphere Reserve of UNESCO*. Folia Fac. Sci. Nat. Univ. Masarykianae Brunensis, Biologia, 101.

**D.S. Boukal** (1999). Coleoptera: Dryopoidea and Eucinetoidae. Pp. 263-268 in V. Opravilová, J. Vaňhara, I. Sukop, eds. *Aquatic Invertebrates of the Pálava Biosphere Reserve of UNESCO*. Folia Fac. Sci. Nat. Univ. Masarykianae Brunensis, Biologia, 101.

**D.S. Boukal**, S. Skalický (1996). Coleoptera: Dryopoidea. Pp. 435-438 in R. Rozkošný, J. Vaňhara, eds. *Terrestrial Invertebrates of the Pálava Biosphere reserve of UNESCO, III*, Folia Sci. Nat. Univ. Masarykianae Brunensis, Biologia 94.

**D.S. Boukal** (1995). Coleoptera: Hydrophiloidea. Pp. 367-368 in R. Rozkošný, J. Vaňhara, eds. *Terrestrial Invertebrates of the Pálava Biosphere reserve of UNESCO, II*, Folia Sci. Nat. Univ. Masarykianae Brunensis, Biologia 93.