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Organismal and Evolutionary Biology Research Programme  
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## Publications

### **Dual-stressor selection alters eco-evolutionary dynamics in experimental communities**

Hiltunen, T., Cairns, J., Frickel, J., Jalasvuori, M., Laakso, J., Kaitala, V., Kuenzel, S., Karakoc, E. & Becks, L., Dec 2018, In: *Nature Ecology & Evolution*. 2, 12, p. 1974-1981 8 p.

### **Outside-host phage therapy as a biological control against environmental infectious diseases**

Merikanto, I., Laakso, J. T. & Kaitala, V., 8 Jun 2018, In: *Theoretical Biology and Medical Modelling*. 15, 11 p., 7.

### **Adaptation to fluctuations in temperature by nine species of bacteria**

Saarinen, K., Laakso, J., Lindström, L. & Ketola, T., Mar 2018, In: *Ecology and Evolution*. 8, 5, p. 2901-2910 10 p.

### **Outside-host predation as a biological control against an environmental opportunist disease**

Merikanto, I., Laakso, J. T. & Kaitala, V., 10 Mar 2017, In: *Ecological Modelling*. 347, p. 85-93 9 p.

### **A mechanistic underpinning for sigmoid dose-dependent infection**

Anttila, J. V., Mikonranta, L., Ketona, T., Kaitala, V. T., Laakso, J. T. & Ruokolainen, L., 2017, In: *Oikos*. 126, p. 910-916

### **Evolutionary contribution to coexistence of competitors in microbial food webs**

Hiltunen, T., Kaitala, V., Laakso, J. & Becks, L., 2017, In: *Proceedings of the Royal Society B. Biological Sciences*. 284, 1864, 8 p., 20170415.

### **Population Dynamics, Invasion, and Biological Control of Environmentally Growing Opportunistic Pathogens**

Kaitala, V., Ruokolainen, L., Holt, R. D., Blackburn, J. K., Merikanto, I., Anttila, J. & Laakso, J., 2017, *Modeling the Transmission and Prevention of Infectious Disease*. Hurst, C. J. (ed.). 1. p. ed. Springer, p. 213-245 33 p. (Advances in Environmental Microbiology; no. 4).

### **Environmental variation enables invasions of environmental opportunist pathogens**

Anttila, J. V., Laakso, J. T., Kaitala, V. T. & Ruokolainen, L., Aug 2016, In: *Oikos*. 125, 8, p. 1144-1152 9 p.

### **Different food sources elicit fast changes to bacterial virulence**

Ketola, T., Mikonranta, L., Laakso, J. & Mappes, J., 1 Jan 2016, In: *Biology Letters*. 12, 1, 4 p., 20150660.

### **Within-host evolution decreases virulence in an opportunistic bacterial pathogen**

Mikonranta, L., Mappes, J., Laakso, J. & Ketola, T., 19 Aug 2015, In: *BMC Evolutionary Biology*. 15, 8 p., 165.

### **Protist predation can select for bacteria with lowered susceptibility to infection by lytic phages**

Örmälä-Odegrip, A-M., Ojala, V., Hiltunen, T., Zhang, J., Bamford, J. K. H. & Laakso, J., 7 May 2015, In: *BMC Evolutionary Biology*. 15, 7 p., 81.

### **Environmental variation generates environmental opportunist pathogen outbreaks**

Anttila, J. V., Kaitala, V. T., Laakso, J. T. & Ruokolainen, L., 2015, In: *PLoS One*. 10, 12, 15 p., e0145511.

### **Association of colony morphotypes with virulence, growth and resistance against protozoan predation in the fish pathogen *Flavobacterium columnare***

Zhang, J., Laakso, J., Mappes, J., Laanto, E., Ketola, T., Bamford, J. K. H., Kunttu, H. & Sundberg, L-R., Sep 2014, In: FEMS Microbiology Ecology. 89, 3, p. 553-562 10 p.

**Determining the impact of initial age structure on the recovery of a healthy over-harvested population**

Isomaa, M., Kaitala, V. & Laakso, J., 24 Aug 2014, In: Ecological Modelling. 286, p. 45-52 8 p.

**Association of colony morphotype on virulence, growth and resistance against protozoan predation in the fish pathogen *Flavobacterium columnare***

Zhang, J., Laakso, J., Mappes, J., Laanto, E., Ketola, T., Bamford, J., Kunttu, H. & Sundberg, L-R., 2014, In: FEMS Microbiology Ecology. 89, p. 553-562 10 p.

**Coincidental Loss of Bacterial Virulence in Multi-Enemy Microbial Communities**

Zhang, J., Ketola, T., Örmälä, A-M., Mappes, J. & Laakso, J., 2014, In: PLoS One. 9, 11, 11 p., 111871.

**Invasion Ability and Disease Dynamics of Environmentally Growing Opportunistic Pathogens under Outside-Host Competition**

Merikanto, I., Laakso, J. T. & Kaitala, V., 2014, In: PLoS One. 9, 11, 21 p., 113436.

**Precautionary management of Baltic Sea cod (*Gadus morhua callarias*) under different environmental noise and harvesting strategies**

Isomaa, M., Kaitala, V. & Laakso, J., 2014, In: Boreal Environment Research. 19, 1, p. 39-50 12 p.

**Top-down effects of a lytic bacteriophage and protozoa on bacteria in aqueous and biofilm phases**

Zhang, J., Örmälä-Odegrip, A-M., Mappes, J. & Laakso, J., 2014, In: Ecology and Evolution. 4, 23, p. 4444-4453 10 p.

**Resource Availability and Competition Shape the Evolution of Survival and Growth Ability in a Bacterial Community**

Pekkonen, M., Ketola, T. & Laakso, J., 30 Sep 2013, In: PLoS One. 8, 9, p. e76471 12 p., e76471.

**Baltic cod (*Gadus morhua callarias*) recovery potential under different environment and fishery scenarios**

Isomaa, M., Kaitala, V. & Laakso, J., 24 Sep 2013, In: Ecological Modelling. 266, p. 118-125 8 p.

**Fluctuating temperature leads to evolution of thermal generalism and preadaptation to novel environments**

Ketola, T., Mikonranta, L., Zhang, J., Saarinen, K., Örmälä, A-M., Friman, V-P., Mappes, J. & Laakso, J., 2013, In: Evolution. 67, 10, p. 2936-2944 9 p.

**Loss of competition in the outside host environment generates outbreaks of environmental opportunist pathogens**

Anttila, J., Ruokolainen, L., Kaitala, V. & Laakso, J., 2013, In: PLoS One. 8, 8, 9 p., e71621.

**The relative importance of competition and predation in environment characterized by resource pulses - an experimental test with a microbial community**

Hiltunen, T. & Laakso, J., 2013, In: BMC Ecology. 13, 8 p., 29.

**Temporal changes in species interactions in simple aquatic bacterial communities**

Pekkonen, M. & Laakso, J., 17 Sep 2012, In: BMC Ecology. 12, 18, 11 p.

**Females prefer bold males; An analysis of boldness, mate choice and bacterial resistance in the field cricket *Gryllus integer***

Kortet, R., Niemelä, P. T., Vainikka, A. & Laakso, J., 2012, In: Ecological Parasitology and Immunology. 1, 235580, 6 p.

**Interactive effects between diet and genotypes of host and pathogen define the severity of infection**

Zhang, J., Friman, V-P., Laakso, J. & Mappes, J., 2012, In: Ecology and Evolution. 2, 9, p. 2347-2356 10 p.

**Life history trade-offs and relaxed selection can decrease bacterial virulence in environmental reservoirs**

Mikonranta, L., Friman, V-P. & Laakso, J., 2012, In: PLoS One. 7, 8, p. e43801 9 p.

**Outside-host growth of pathogens attenuates epidemiological outbreaks**

Merikanto, I., Laakso, J. & Kaitala, V., 2012, In: PLoS One. 7, 11, p. e50158 8 p.

**Phage-driven loss of virulence in a fish pathogenic bacterium**

Laanto, E., Bamford, J., Laakso, J. & Sundberg, L-R., 2012, In: PLoS One. 7, 12, p. e53157 8 p.

**Predation and resource fluctuations drive eco-evolutionary dynamics of a bacterial community**

Hiltunen, T., Friman, V-P., Kaitala, V., Mappes, J. & Laakso, J., 2012, In: Acta Oecologica. 38, p. 77-83 7 p.

**Species dynamics alter community diversity–biomass stability relationships**

Fowler, M., Laakso, J., Kaitala, V., Ruokolainen, L. & Ranta, E., 2012, In: Ecology Letters. 15, 12, p. 1387–1396 10 p.

**Pulsed-resource dynamics increase the asymmetry of antagonistic coevolution between a predatory protist and a prey bacterium**

Friman, V-P., Laakso, J., Koivu-Orava, M. & Hiltunen, T., Dec 2011, In: Journal of Evolutionary Biology. 24, 12, p. 2563-2573 11 p.

**Pulsed-resource dynamics constrain the evolution of predator–prey interactions**

Laakso, J. & Friman, V-P., Mar 2011, In: American Naturalist. 177, 3, p. 334-345 12 p.

**High temperature and bacteriophages can indirectly select for bacterial pathogenicity in environmental reservoirs**

Friman, V-P., Hiltunen, T., Jalasvuori, M., Lindstedt, C., Laanto, E., Örmälä, A-M., Laakso, J., Mappes, J. & Bamford, J., 2011, In: PLoS One. 6, 3, p. e17651 7 p.

**Increased survival during famine improves fitness of bacteria in a pulsed-resource environment**

Pekkonen, M., Korhonen, J. & Laakso, J. T., 2011, In: Evolutionary Ecology Research. 13, 1, p. 1-18 18 p.

**Predation on multiple trophic levels shapes the evolution of pathogen virulence**

Friman, V-P., Lindstedt, C., Hiltunen, T., Laakso, J. & Mappes, J., 2009, In: PLoS One. 4, 8, p. e6761 1 p.

**Availability of prey resources drives evolution of predator-prey interaction**

Friman, V-P., Hiltunen, T., Laakso, J. & Kaitala, V., 2008, In: Proceedings of the Royal Society B. Biological Sciences. 275, 1643, p. 1625-1633 9 p.

**Detecting compensatory dynamics in competitive communities under environmental forcing**

Ranta, E., Kaitala, V., Fowler, M. S., Laakso, J., Ruokolainen, L. & O'Hara, R., 2008, In: Oikos. 117, 12, p. 1907-1911 5 p.

**Temporal variability in detritus resource maintains diversity of bacterial communities**

Hiltunen, T., Laakso, J. T., Kaitala, V., Suomalainen, L-R. & Pekkonen, M. H., 2008, In: Acta Oecologica. 33, 3, p. 291-299

**The structure and strength of environmental variation modulate covariance patterns: a reply to Houlahan et al. 2008**

Ranta, E., Kaitala, V., Fowler, M., Laakso, J., Ruokolainen, L. & O'Hara, R., 2008, In: Oikos. 117, 12, p. 1914 1 p.

**Interactions between environmental variability and immigration rate control patterns of species diversity**

Hiltunen, T., Laakso, J. & Kaitala, V., 2006, In: Ecological Modelling. 194, p. 125-131 7 p.

**Population dynamic consequences of adaptive growth rate in fluctuating environment**

Laakso, J., Kaitala, V. & Ranta, E., 2006, In: Ecological Modelling. 194, p. 132-140 9 p.

**Non-linear biological responses to environmental noise affect population extinction risk**

Laakso, J., Kaitala, V. & Ranta, E., Jan 2004, In: *Oikos*. 104, 1, p. 142-148 7 p.

**Evolution of Hsp90 expression in *Tetrahymena thermophila* (Protozoa, Ciliata) populations exposed to thermally variable environments**

Ketola, T., Laakso, J., Kaitala, V. & Airaksinen, S., 2004, In: *Evolution*. 58, p. 741-748 8 p.

**Nonlinear biological responses to disturbance affect population extinction risk**

Laakso, J., Kaitala, V. & Ranta, E., 2004, In: *Oikos*. 104, p. 142-148

**Environmental noise and population dynamics of the ciliated protozoa *Tetrahymena thermophila* in aquatic microcosms**

Laakso, J., Loytynoja, K. & Kaitala, V., Sep 2003, In: *Oikos*. 102, 3, p. 663-671 9 p.

**Nonlinear biological responses to disturbance: consequences on population dynamics**

Laakso, J., Kaitala, V. & Ranta, E., 2003, In: *Ecological Modelling*. 162, p. 247-258

**The ecology of recovery**

Gardmark, A., Enberg, K., Ripa, J., Laakso, J. & Kaitala, V., 2003, In: *Annales Zoologici Fennici*. 40, 2, p. 131-144 14 p.

**How does environmental variation translate into biological processes?**

Laakso, J., Kaitala, V. & Ranta, E., Jan 2001, In: *Oikos*. 92, 1, p. 119-122 4 p.

**Visibility of the environmental noise modulating population dynamics**

Ranta, E., Lundberg, P., Kaitala, V. & Laakso, J., 22 Sep 2000, In: *Proceedings of the Royal Society B. Biological Sciences*. 267, 1455, p. 1851-1856 6 p.

**Impacts of wood ants (*Formica aquilonia* Yarr.) on the invertebrate food web of the boreal forest floor**

Laakso, J. & Setälä, H., 2000, In: *Annales Zoologici Fennici*. 37, 2, p. 93-100 8 p.

**Sensitivity of primary production to changes in the architecture of belowground food webs**

Laakso, J. & Setälä, H., Oct 1999, In: *Oikos*. 87, 1, p. 57-64 8 p.

**Population- and ecosystem-level effects of predation on microbial-feeding nematodes**

Laakso, J. & Setälä, H., Aug 1999, In: *Oecologia*. 120, 2, p. 279-286 8 p.

**Short-term effects of wood ants (*Formica aquilonia* Yarr.) on soil animal community structure**

Laakso, J., Mar 1999, In: *Soil Biology & Biochemistry*. 31, 3, p. 337-343 7 p.

**Plant effects on the soil community: A microcosm experiment**

Katajisto, J., Huhta, T. & Laakso, J., 1999, In: *European Journal of Soil Biology*. 35, 1, p. 17-21 5 p.

**Composition and trophic structure of detrital food web in ant nest mounds of *Formica aquilonia* and in the surrounding forest soil**

Laakso, J. & Setälä, H., Mar 1998, In: *Oikos*. 81, 2, p. 266-278 13 p.

**Nest mounds of red wood ants (*Formica aquilonia*): hot spots for litter-dwelling earthworms**

Laakso, J. & Setälä, H., Aug 1997, In: *Oecologia*. 111, 4, p. 565-569 5 p.

**Impact of soil faunal structure on decomposition and N-mineralisation in relation to temperature and moisture in forest soil**

Sulkava, P., Huhta, V. & Laakso, J., 1996, In: *Pedobiologia*. 40, p. 505-513 9 p.

## Projects

### **The Centre of Excellence in Biological Interactions (BIOINT)**

Sundström, L., Kokko, H., Bos, N., Freitak, D., Salmela, H., Helanterä, H., Johansson, H., Laakso, J., Seppä, P., Lindström, S., Morandin, C., Paviola, J., Pekkonen, M., Pulliainen, U., Ozan, M., Schultner, E., Stucki, D., Wolf, J., Galarza, J., Kulmuni, J., Hakala, S. M. & Dhaygude, K.  
01/01/2012 → 31/12/2017

## Activities

### **Finnish Plant Science days**

Jouni Laakso (Attendee)  
25 May 2016 → 26 May 2016

### **Pre-examination of PhD thesis**

Jouni Laakso (Pre-examiner)  
Feb 2016

### **Swiss National Science Foundation (External organisation)**

Jouni Laakso (Assessment)  
Jan 2016

### **Is silver birch growth and nitrogen allocation affected by kin recognition?**

Jouni Laakso (Co-supervisor)  
Jun 2015 → ...

### **Is silver birch herbivory affected by kin recognition?**

Jouni Laakso (Co-supervisor)  
Jun 2015 → ...

### **Trends in Microbiology (Journal)**

Jouni Laakso (Reviewer)  
2015 → ...

### **LUOVA (External organisation)**

Jouni Laakso (Expert member)  
Sep 2014 → ...

### **BMC Microbiology (Journal)**

Jouni Laakso (Reviewer)  
2014 → ...

### **PLoS One (Journal)**

Jouni Laakso (Reviewer)  
2014 → ...

### **Disturbance, generalism and invasiveness: Experimental evolution tests with bacteria**

Jouni Laakso (Co-supervisor)  
1 Jan 2012 → 8 Jan 2016

### **PhD thesis supervision**

Jouni Laakso (Supervisor)  
Jan 2012 → 29 Apr 2016

**Microbial Ecology (Journal)**

Jouni Laakso (Reviewer)

2012 → ...

**Ministry of Education (External organisation)**

Jouni Laakso (Expert)

2012

**Modelling ecological and evolutionary dynamics of opportunist pathogens**

Jouni Laakso (Supervisor)

2012 → 29 Apr 2016

**Mathematical models of environmental opportunist pathogen dynamics**

Jouni Laakso (Supervisor)

Apr 2011 → 29 May 2015

**Ecological interactions in the evolution of virulence and in disease dynamics among opportunistic pathogens**

Jouni Laakso (Supervisor)

Jan 2011 → Jan 2012

**Modelling ecological and evolutionary dynamics of opportunist pathogens and their parasitic phages**

Jouni Laakso (Co-supervisor)

2011 → ...

**Longitudinal monitoring of parasites in individual wild primates**

Jouni Laakso (Member of thesis committee / follow-up group)

Aug 2010 → Mar 2015

**Pathogen-host interactions between an environmentally transmitted bacterium *Serratia marcescens* and its insect hosts**

Jouni Laakso (Co-supervisor)

Jun 2010 → Feb 2015

**Phage-bacteria antagonistic coevolution is influenced by protozoan predation**

Jouni Laakso (Co-supervisor)

May 2010 → Nov 2011

**An invasive ectoparasite of cervids, the deer ked: dispersion, cold tolerance and predation**

Jouni Laakso (Member of thesis committee / follow-up group)

2010 → 2012

**Effects of ecological factors on dominance and immune defence in crayfish**

Jouni Laakso (Member of thesis committee / follow-up group)

2010 → 2015

**Host-pathogen interaction: *Flavobacterium columnare* and its bacteriophages**

Jouni Laakso (Member of thesis committee / follow-up group)

2010 → 2013

**Journal of Theoretical Biology (Journal)**

Jouni Laakso (Reviewer)

2010 → ...

**Implications of bacterial viruses on pathogenic bacteria: from natural microbial communities to therapeutic applications**

Jouni Laakso (Supervisor)

Aug 2009 → 10 Apr 2015

**Evolutionary consequences of environmental variability and genetic stress**

Jouni Laakso (Post doc mentor)  
1 Jan 2009 → 31 Dec 2011

**Predation-induced changes in *Serratia marcescens* virulence**

Jouni Laakso (Co-supervisor)  
Dec 2008 → Jun 2010

**Impact of biotic and abiotic factors on bacterial virulence**

Jouni Laakso (Supervisor)  
Apr 2008 → Apr 2013

**Ohjaaja väitöskirjassa: Impact of biotic and abiotic factors on bacterial virulence**

Jouni Laakso (Supervisor)  
Apr 2008 → 6 Apr 2013

**Evolution of competitive interactions in periodic environment**

Jouni Laakso (Supervisor)  
2007 → Apr 2009

**Evolution of competitive interactions in fluctuating environments**

Jouni Laakso (Supervisor)  
2005 → 2013

**Temporally fluctuating resource availability and evolution of predator-prey interactions**

Jouni Laakso (Co-supervisor)  
2005 → 2010