



Society for Invertebrate Pathology Newsletter for June 2008

2008 Meeting details
Plenary articles
Book reviews



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Newsletter for June 2008

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Cover image © Nick Jessop (IPARC, Imperial College, UK) of *Distantiella theobromae*, one of several heteropteran pests of cocoa in West Africa and a target for mycoinsecticide control, see page 23.

Editorial

Apart from their tireless production of honey, the economic value of pollination services delivered by the European honey bee, *Apis mellifera*, is impressive; e.g. €4 billion p.a. in the EU and \$16 – 19 billion p.a. in the USA.

As hosts of numerous bacterial, viral, fungal and microsporidian diseases honey bees are also a challenging model for invertebrate pathologists interested in the epidemiology and impact of disease in social insects.

With the continued evolution of new and more virulent diseases, honey bee colony losses have been escalating worldwide. This is exacerbated by the ectoparasitic mite, *Varroa destructor*, which effectively transmits and activates viral disease and is increasingly resistant to synthetic acaricides.

As if this were not enough, a new syndrome called colony collapse disorder (CCD), is currently devastating the bee keeping industry in the USA. Colonies inexplicably 'lose' their workers and this resulted in 50-90% of colonies dying across the USA in 2007. Although particular viruses are implicated in CCD, it remains likely that a cocktail of different diseases and environmental stressors are responsible.

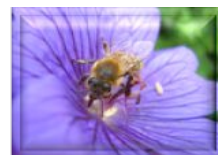
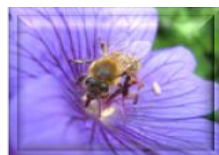
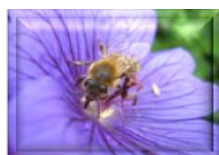
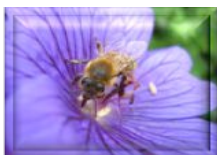
Although CCD has not yet arrived in Europe, increasing honey bee losses remain of considerable concern. Regular national media coverage and continued lobbying of the UK government by the BBKA (British Beekeepers' Association) for more funding on bee health research is evidence of this in the UK. We should not forget too that bumblebees are also in decline and also suffer from numerous diseases.

It is therefore timely that the focus of the plenary session and a cross-divisional symposium at the 2008 annual meeting in Warwick should be bee health and especially CCD.

As a taster two of the plenary speakers have provided us with brief articles describing their take on the key research issues and opportunities in bee health today. We hope these will encourage you to come to Warwick and get the full story!!!

Judith Pell, judith.pell@bbsrc.ac.uk

Paresh Shah, pareshashah@mac.com
(note change of email address)



From the President



Looking forward to seeing you in Warwick, August 3 – 7

Meeting organizers David Chandler, Bryony Bonning, Doreen Winstanley and their hard working committee members have put together a stunning scientific program and great social calendar for attendees at the 41st annual SIP meeting and 9th International Conference on *Bacillus thuringiensis*. Despite competition from the International Congress of Entomology meeting in South Africa, registration has been brisk, and an excellent turnout is expected. Registration is still open at www.ent.iastate.edu/sip/2008.

Congratulations to SIP's new officers and honorary member

The votes are in and SIP's first-ever electronic balloting went without a hitch, or as Teller's Committee members Ellie Groden and Frank Drummond stated "...without any problems and with considerable ease". Hopefully, for our next election (in 2010), more SIP members will participate — though voter participation was decent (153, or about one third of the membership cast their ballots), this is roughly the same number of voters who participated in our previous, paper ballot election.

The only problem that e-voting could not solve was the difficult choices we had to make among such a stellar group of candidates. But choose, we did, and I want to offer my congratulations to your new, 2008 Executive Council, who will take office on August 7, 2008, at the conclusion of the 2008 SIP Business Meeting:

- President: Mark Goettel,
- President-Elect: Lee Solter
- Treasurer: Ann Hajek
- Secretary: Johannes Jehle
- Trustees: Christine Nielsen-LeRoux, Jeff Lord

Also on our ballot this year was the long overdue consideration of Dr. Karl Maramorosch as Honorary Member. The overwhelmingly positive response to Karl's nomination was evidence of the deep regard and affection with which he is held by SIP members. At 93 years old, Karl is still involved in research, and we are honored that he continues to be an active member of our Society.



Honorary Member Karl Maramorosch

Welcome to our new Executive Secretary, Cecilia Schmitt

It is my great pleasure to introduce you to Ms. Cecilia Schmitt, our new Executive Secretary as of April 1, 2008. We had many highly qualified candidates for this position, but our search committee (Jimmy Becnel, Mark Goettel, Peg

Rotstein, Patricia Stock and myself) was won over by Cecilia's experience as the long-time business manager for the Society of Nematologists (SON), by her expertise in accounting, database management and website maintenance and design, and by her professional and friendly personality.

In addition to her part-time position with SIP, Cecilia will continue to serve the membership of SON. Cecilia is also an active participant in her family's farm in Marceline, Missouri.



SIP Executive Secretary Cecilia Schmitt

In the past few months, I have been impressed with Cecilia's competence, her rapid learning curve, and her ability to juggle many projects all at once. As you get to know Cecilia, I am sure that you will share my appreciation for her helpfulness, intelligence and many other good qualities. Although she will not be attending this year's SIP meeting in the U.K., it is very likely that she will be able to meet you all at SIP's 2009 meeting in Park City, Utah, USA.

Fund-raising and fun

After their show-stopping performance at last year's barbeque, where they amazed SIPers with their spoon-playing virtuosity, the talented duo of Fernando Vega and Michael Brownbridge immediately began planning an even more extravagant display of talent for the future SIP

meetings. As a result, the first ever **SIP Auction** will be held this year at the barbeque. The brainchild of Fungus Division Chair Fernando Vega, who immediately selected Michael Brownbridge as auctioneer, the auction promises to be an excellent fund-raising tool for SIP, as well as an entertaining addition to our barbeque. Please see Fernando's announcement on page 18 of this newsletter, and consider donating a book, a photo, or a vintage SIP T shirt, or maybe even some spoons. Who knows? Maybe we can get an encore performance!

On the fund-raising front, thanks to those of you who responded to the fund-raising plea in the February newsletter, with your contributions to SIP's General Fund, and various Endowed Funds. I will have a full accounting of the success of this campaign in Warwick this summer.

Thank you for your vote of confidence

Finally, thank you for allowing me to serve you as President for the past two years. It has been a very rewarding experience to work with the many of you who have volunteered your time and ideas, to see the Society benefit from your hard work, and to be able to welcome such a wealth of experience and leadership in the incoming Council. I hope that the next few months are productive ones for you, and I look forward to seeing you all in Warwick!

A handwritten signature in blue ink that reads "Wendy".

Wendy Gelernter, SIP President

New SIP Office Details

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Plenary Articles

Honey bee genomics and disease resistance

Jay Evans

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Honey bees combat infection by their many parasites and pathogens using immunity and other individual traits along with group traits such as social grooming.

My interests are in the immune traits of honey bees as well as the environmental factors that can improve the odds of bees surviving their battles with pests and pathogens. This work benefits greatly from collaborations with USDA colleagues Judy Chen and Jeffery Pettis, among others.

At the genome level, honey bees possess expected members of four pathways implicated in innate immunity (Evans *et al.*, 2006). Nevertheless, bees show substantially fewer paralogs for gene families implicated in pathogen recognition and as immune effectors, when compared to other insects.

This fact, combined with evidence for a lower potential to diversify the immune response via splice variation, suggests 1) that the honey bee immune system is tuned to a narrow set of pathogens, 2) that bees rely on alternate immune processes not found in other insects, or 3) that bees, and perhaps other social insects, are shielded by 'social' mechanisms of disease resistance. We are currently testing these

hypotheses in an attempt to clarify the strengths and weakness of bee defenses (Figures 1, 2).

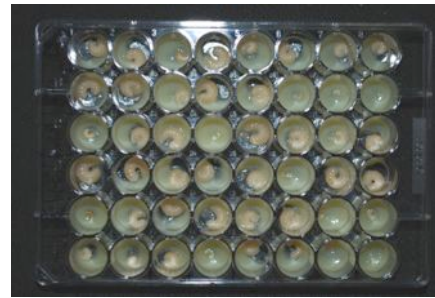


Figure 1: Controlled inoculation of honey bee larvae with bacterial pathogens

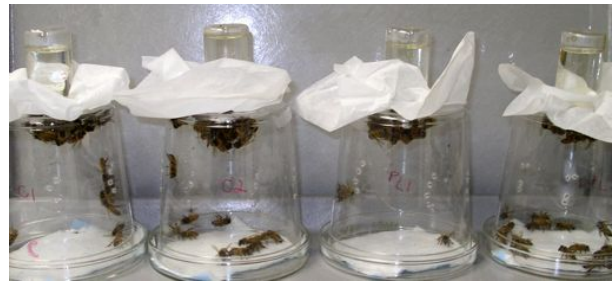


Figure 2: Disposable cup chambers for studying adult bee diseases

Our experimental work has focused mostly on interactions between bees and the bacterial pathogen, *Paenibacillus larvae*, cause of the larval disease American foulbrood (Figure 3).

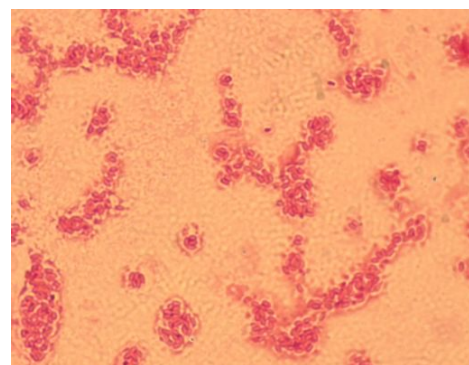


Figure 3. Microscopic spores of *P. larvae*

We are trying to determine what constitutes an effective immune response (Evans, 2006) toward this pathogen, how this translates into colony fitness (Evans and Pettis, 2005) and whether this

response can be enhanced by breeding (Decanini *et al.*, 2007). We are also interested in how viral and microsporidial diseases impact bee colonies, and in developing genomics resources for the widespread microsporidial pathogen *Nosema ceranae*.

Recent dramatic declines in honey bee health, and especially the enigmatic “Colony Collapse Disorder”, might be caused by novel or resurgent parasites or pathogens. We are involved with several efforts seeking to characterize the microbial associates of healthy and declining honey bee colonies (e.g., Cox-Foster *et al.*, 2007, Chen and Evans, 2007, Palacios *et al.*, 2008), as a first step toward experiments aimed at determining pathologies.

Given the diverse zoo of honey bee pathogens and the worldwide importance of bees as pollinators, there is an urgent need to better understand how bees resist and tolerate disease. Genomic sequences for both honey bees (Honey Bee Genome Sequencing Consortium, 2006) and most of the central bee pathogens (e.g., Qin *et al.*, 2006) can be merged with a century of formal pathology to make honey bees a great model for understanding host-pathogen interactions.



Honey bee contemplating its future in the world of genomics (photo credit: Peggy Greb, USDA-ARS)

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Microsporidia infections in pollinating insects

Ingemar Fries

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Microsporidia have had my attention throughout my research career, largely due to the stimulating mentorship of the microsporidiologist Ronny Larsson. I completed my PhD on the microsporidian parasite *Nosema apis* infecting the European honey bee (*Apis mellifera*) in 1988, and have continued to work on the biology of this parasite since then.

Among other things, we have elucidated the mechanism for intercellular spread of this parasite by germination of spores within the host cell cytoplasm (Fries *et al.*, 1992). Infections of *N. apis* have been known from the European honey bee for well over 100 years. The infection is generally assumed to be a factorial disease causing severe problems for beekeepers, particularly if other factors, such as stress and unsuitable food, are also present (Fries, 1993).

Recently, another microsporidian infection is causing concern in beekeeping with European honey bees (Figure 1). The microsporidium *Nosema ceranae*, described only a little more than a decade ago from the Asian honey bee (*Apis cerana*) (Fries *et al.*, 1996), is now found widely spread in populations of the European honey bee (Klee *et al.*, 2007).

While in China studying the host specificity of *N. apis*, I stumbled over this new microsporidium *N. ceranae* and found that both *N. apis* and *N.*

ceranae were cross infective between the Asian and European honey bee (Fries & Feng, 1995).



Figure 1: TEM image of a *Nosema ceranae* spore. Live *N. ceranae* spores measure $4.7 \times 2.7 \mu\text{m}$, which is slightly smaller than *Nosema apis*. *Nosema ceranae* may be more virulent as it appears to replace *N. apis* in European honey bees. From a biodiversity perspective one may wonder whether *N. apis* is an endangered species in need of protection?

Recent data suggest that *N. ceranae* is now replacing *N. apis* in the European honey bee throughout the world suggesting that this new parasite may be more virulent than *N. apis* (Paxton *et al.*, 2007). Data on the comparative pathology of *N. apis* and *N. ceranae* and on the epidemiological consequences of *N. ceranae* infections in European honey bees are badly needed (Figures 2, 3).

In my plenary presentation, I will discuss the current state of knowledge on the relative virulence of *N. ceranae* and *N. apis* in European honey bees.



Figure 2: Beekeepers risk their lives climbing trees to catch swarms. Nevertheless, swarms may be infected by serious honey bee diseases. Commonly, the microsporidium *Nosema apis* is transmitted vertically during the swarm process to new daughter colonies during reproductive swarming. Photo: A. Lindström



Figure 3: Beekeeping with the Asian honey bee *Apis cerana* is practiced in Asia in movable frame hives similar to the European honey bee *Apis mellifera* elsewhere. Parallel use of both species has resulted in interspecific transmission of pathogens, the most spectacular being *Varroa destructor*, now plaguing world beekeeping with European honey bees. Recently, the microsporidium *Nosema ceranae*, also endemic to *Apis cerana*, is spreading in European honey bee populations and is a cause for concern.

From bumble bees (*Bombus* spp.), only one microsporidium has been described, *Nosema bombi* (Fantham & Porter, 1914). This parasite is widespread and, interestingly, it is the same parasitic species that infects a whole range of

different *Bombus* hosts in Europe (Tek Tay *et al.*, 2005) (Figure 4).



Figure 4: Numerous bumble bee species are infected by the same microsporidian parasite, *Nosema bombi*. These include the bumble bee *Bombus hortorum* pictured here. Photo: Nico Vereecken

The phylogenetic distance between different species of bumble bees strongly suggests horizontal parasite transmission between host species in the field, otherwise host-parasite co-speciation would have been likely. Experiments demonstrate that *N. bombi* can have severe fitness effects on the host (Otti & Schmid-Hempel, 2006).

Concerns have been raised that transportation of bumble bees may introduce *N. bombi* into bumble bee populations where the parasite was not previously endemic (Thorpe, 2005). It remains to be determined whether the decline in some bumble bee populations in North America could be connected to the introduction of *N. bombi*, through use of bumble bees of European origin for pollination purposes.

With German and American colleagues we have described (new genus and species) and documented the incidence and pathology of the only microsporidian infection described from a solitary bee (Fries *et al.*, 1999). This is *Antonospora scoticae* (Figure 5) infecting the fat body cells of the sand bee *Andrena scoticae* (Figure 6).

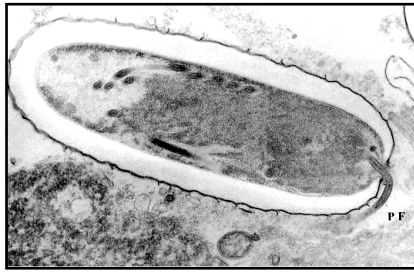


Figure 5: TEM image of an *Antonospora scoticae* spore. Live *A. scoticae* spores measure 6.8 x 2.7 μm . *Antonospora scoticae* is the only microsporidian infection described from solitary bees – no doubt more remains to be described from these important pollinators.

The infections may appear with extreme prevalence in both males and females in infected populations, but the fitness consequences for infected hosts remain unknown (Paxton *et al.*, 1997). The same research team have now extended these insights into the pathology of *Nosema bombi* in bumble bees (Fries *et al.*, 2001) and to microsporidian genetics in general O'Mahony *et al.*, 2007).



Figure 6: *Andrena scotica*, the only solitary bee where a microsporidian infection, *Antonospora scoticae*, has been documented. Photo: Rob Paxton.

Undoubtedly, only a fraction of microsporidian infections in pollinating insects are known. The *A. scoticae* infection was found by chance because this bee was dissected for other reasons (Paxton *et al.*, 1997).

The infections found in honey bees and bumble

bees are better known since diseases of these hosts are systematically investigated because they are economically important to apiculturists and bumble bee breeders.

To fully appreciate the impact of Microsporidia on pollinating insects a thorough survey for infections is needed, combined with measurements of fitness effects due to infection and I hope to discuss this in more detail in the plenary presentation.

Currently my research focus remains on microsporidian infections of honey bees and bumble bees but also on the epidemiology and virulence of other honey bee pathogens with emphasis on transmission issues within and between colonies and the population dynamics, biology and control of the mite *Varroa destructor*.

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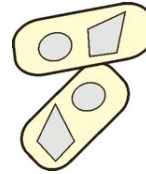
Paxton RJ, Klee J, Korpela S & Fries I (2007) *Nosema ceranae* has infected *Apis mellifera* in Europe since at least 1998 and may be more virulent than *Nosema apis*. *Apidologie* 38, 558-565.

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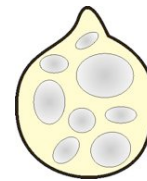
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Warwick Meeting Division Logos

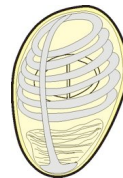
The following logos will be used on signs to indicate Division talks and sessions:



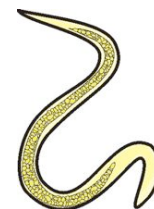
BACTERIA DIVISION



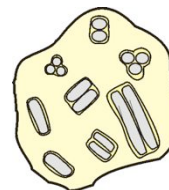
FUNGI DIVISION



MICROSPORIDIA DIVISION

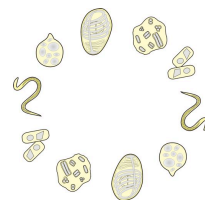


NEMATODE DIVISION



VIRUS DIVISION

MICROBIAL CONTROL



The logos were designed by Lynda Castle at Rothamsted Research for the meeting.

SIP Annual Meeting, 3-7 August 2008

Scientific Program

The list of scheduled symposia and workshops of the SIP 2008 meeting is presented in this Newsletter and is also available on-line at the meeting web site. The printed Program and Abstract book will be available only to those registered for the meeting. *Note: You can search submitted abstracts on the meeting website using the "Submission explorer" tool bar.*

Presentations

Contributed oral presentations will be limited to 12 minutes with an additional 3 minutes for answering questions. Because of concurrent sessions, moderators will be instructed to keep to the scheduled times. Digital projection and PC computer equipment will be provided. Invited speakers in the Plenary Session and Division symposia will have 25 minutes with 5 minutes for questions, except for speakers participating in the following symposia who should divide 120 minutes by the number of speakers to calculate the time each speaker will have:

- Virulence factors in fungal pathogens: A comparative approach
- Regulatory and market barriers for approval of microbial control products
- Microsporidia of aquatic arthropods
- Comparative genomics of DNA viruses
- Pathogens of bees
- Utilizing insect pathogens in green pest management systems

PowerPoint slide presentations: Speakers are strongly encouraged to upload PowerPoint presentations by July 30. Details will be posted on the meeting web site by early July. Powerpoint 2003 will be used at the conference.

Fonts: Choose a standard font to ensure compatibility

Graphics: PowerPoint files will load faster if the graphics file size is kept to a minimum. When scanning images or embedding images in your

presentation, we recommend a 200 dpi setting at most. Viewing on screen is 72 dpi.

Naming files: Last Name_Session Title_Day Presenting (e.g. Chandler_Virus2_Tuesday or for symposium talks: Chandler_MCSymp_Monday).

Uploading files: Before uploading files, check the presentation for MAC to PC incompatibilities if applicable. There will be opportunity to review presentations in the Speaker Ready Room prior to giving your presentation. Please bring a back-up on a CD or memory stick. If presentations contain video clips, put the video clip file in the same folder as the related PowerPoint file and upload the entire file. Be sure to label the folder, the PowerPoint file, and the movie clips with the speaker's name in case they get separated during uploading.

Poster presentations

Posters should be approximately 841 mm (2.75 ft) wide by 594 mm (1.95 ft) tall. Each poster board is 841 mm square. **Please note the size of these posters:** They are smaller and will require a different strategy for preparation than for posters at previous SIP meetings. An example of a poster of the appropriate dimensions is provided on the "Call for Papers" page of the meeting website.

Velcro or pins for poster boards will be provided. Posters should be set up in the Arts Centre Gallery where coffee and tea breaks will be held, by 14:00 h on Monday 4 August and removed by 18:00 h on Thursday 7 August. Boards will be labeled by division and poster number. Authors are expected to attend their poster at the scheduled time slot as follows:

Poster session / Division

I. 5 August 10:30 to 12:30 h; Fungi, Bacteria

II. 6 August 16:30 to 18:30 h; Viruses, Microsporidia, Nematodes, Microbial Control

SIP 2008 Meeting Schedule

Please note: this schedule is subject to change

Sunday, August 3

SIP Council Meeting; Registration; Welcome Mixer

Monday, August 4

Registration; Opening Ceremony; Founder's Lecture

Plenary Session: Honey Bee Colony Collapse Disorder

Organizers: Diana Cox-Foster and Bryony Bonning

Dennis van Engelsdorp, Pennsylvania State Department of Agriculture, Harrisburg, PA, USA
[Colony Collapse Disorder: CSI in the bee hive](#)

Ingemar Fries, Swedish University of Agricultural Sciences, Sweden
[Microsporidia infections in pollinating insects](#)

Jay Evans, USDA, ARS, Beltsville, Maryland, USA
[Applied beonomics: Molecular studies of honey bee disease and resistance](#)

Diana Cox-Foster, Pennsylvania State University, USA
"The role of viruses in CCD"

Cross-Divisional Symposium: Invertebrate pathogens as models for basic ecological and evolutionary principles

Organizer: Elizabeth Davidson

Jenny Cory, Algoma University College and Simon Fraser University, Canada
[Where theory meets reality: Viral disease in field populations of forest Lepidoptera](#)

Amy Pederson, University of Sheffield, UK
[Baculoviruses as a model of host shifts and disease emergence](#)

Tom Little, University of Edinburgh, UK
[Host-parasite coevolution under environmental variation](#)

Michael Bonsall, Oxford University, UK
[The evolutionary ecology of Bt](#)

Contributed papers: Fungi 1 and Microsporidia

Symposium: Utilizing insect pathogens in green pest management systems

Organizers: Dawn H. Gouge, Michael Wilson, and Michael Brownbridge

Michael Brownbridge, AgResearch Ltd., New Zealand
[The long and winding road - discovery to commercial product: Are we there yet?](#)

Keith Davies, Rothamsted Research, UK
[Exploiting tritrophic interactions: Biological control of an obligate pest by its obligate parasite](#)

Ralf Ehlers, Christian-Albrechts-University Kiel, Germany
[Proposals for improved registration requirements for microbial biological control agents](#)

Dawn H. Gouge, University of Arizona, USA
[Use of microbial agents in urban pest management systems](#)

Judith Pell, Rothamsted Research, UK
[Conservation biological control strategies with entomopathogenic fungi: Potential and perspectives](#)

Peters Arne, e-nema, Germany
[Entomopathogenic nematode market diversity](#)

Contributed papers: Bacteria 1 and Viruses 1

Division business meetings: Virus, Nematode, Microsporidia, Fungi, Bacteria

Division Workshops:
Virus Division: [Invertebrate Virus Discovery](#)

Nematode Division: [Nematode-bacterium associations](#)

Microsporidia Division: [Use of QPCR to quantify microsporidia infection](#)

Fungus Division: [Web-based molecular phylogenetic identification resources for *Beauveria* and *Metarhizium*](#)

Tuesday, August 5

5K Run/Walk

Symposium: Virulence factors in fungal pathogens: A comparative approach

Organizer: Enrique Quesada-Moraga

Raymond St. Leger, University of Maryland, USA
[Pathogenicity determinants of the entomopathogenic fungi *Metarhizium anisopliae*](#)

Tariq Butt, University of Wales, Swansea, UK
[Attenuation of virulence of fungal entomopathogens](#)

Michael Bidochka, Brock University, Canada
[Developing insect models for the study of human fungal pathogens](#)

Martin Egan, University of Exeter, UK
[Investigating the biology of plant infection by the rice blast fungus *Magnaporthe oryzae*](#)

Alice Churchill, Department of Plant Pathology, Cornell University, USA
[Are there overlaps between virulence factors of fungal pathogens of arthropods, plants and vertebrates?](#)

Contributed papers: Viruses 2 and Nematodes 1

Posters I: Fungi and Bacteria

Optional Excursion; BBQ

Wednesday, August 6

Symposium: Entomopathogenic bacteria other than *Bacillus*

Organizers: Christina Nielsen-LeRoux and Juan-Luis Jurat-Fuentes

This symposium is dedicated to the memory of Dr. Carleen Collins, University of Washington, Seattle, USA

Onya Opota, Ecole Polytechnique Federale de Lausanne, Switzerland
[Drosophila host defense against *Pseudomonas entomophila*](#)

Mark Hurst, AgResearch, Lincoln, New Zealand
[Virulence determinants of *Yersinia entomophaga* MH96: a Genomic perspective](#)

Richard ffrench-Constant, Centre for Ecology and Conservation, University of Exeter, Penryn, UK
[Insecticidal toxins from *Photorhabdus*: comparative genomics and Rapid Virulence Annotation \(RVA\)](#)

Trevor Jackson, AgResearch, Lincoln, New Zealand
[Pathogenesis of *Serratia entomophila* \(Enterobacteriaceae\) towards the New Zealand grass grub *Costelytra zealandica*](#)

Symposium: Microsporidia of aquatic arthropods

Organizer: Regina G. Kleespies

Miroslav Hyliš, Charles University, Czech Republic
[Microsporidian parasite of caddis flies \(Trichoptera\) with comment to phylogeny and classification of Microsporidia in general](#)

Judith E. Smith, University of Leeds, UK
[Evolutionary interactions between microsporidia and their hosts: Lessons from an ancient lake](#)

Rémi A. Wattier, Université de Bourgogne, France
[Microsporidia in freshwater Amphipods: costs and benefits](#)

Ellen Decaestecker, K.U.Leuven - Campus Kortrijk, Belgium
[Coevolutionary dynamics of host-parasite interactions in natural *Daphnia* populations](#)

James J. Becnel, USDA, ARS, Gainesville, FL, USA
[Epizootiological studies of *Amblyospora camposi* \(Microsporidia: Amblyosporidae\) in *Culex renatoi* \(Diptera: Culicidae\) and *Paracyclops fimbriatus fimbriatus* \(Copepoda: Cyclopidae\) in a bromeliad habitat](#)

Grant D Stentiford, CEFAS Weymouth Laboratory, UK

[Intranuclear microsporidians in crustaceans: the genus *Enterospora*](#)

Contributed papers: Fungi 2 and Viruses 3

Symposium: Entomopathogenic nematode application technology in IPM

Organizers: Claudia Dolinski and David Shapiro-Ilan

Peters Arne, e-Nema, Ralsdorf, Germany
[Current status in application technology](#)

Ed Lewis, University of California, Davis, USA,
David Shapiro-Ilan, USDA-ARS, Byron, GA, USA,
and **Claudia Dolinski**, Universidade Estadual do Norte Fluminense, Brazil
[Cadaver application](#)

Keith Walters and **Richard Glass**, Central Science Laboratory, Sand Hutton York, UK
[Above ground and cryptic habitats application](#)

Lerry Lacey, USDA-ARS, Wapato, WA, USA
[Enhancing post-application survival of entomopathogenic nematodes](#)

Discussion leader Denis Wright, Imperial College, University of London, UK

Contributed papers: Bacteria 2, Microbial Control 1 and Viruses 4

Student Workshop: [Spreading the word: Skills for communicating science and getting it funded](#)

JIP Editorial Board Meeting

Symposium: Pathogens of Bees

Organizer: Ingemar Fries

Elke Genersch, Molekulare Mikrobiologie und Bienenkrankheiten Länderinstitut für Bienenkunde, Hohen Neuendorf, Germany

[New insights into American foulbrood pathogenesis](#)

Mark Brown, University of Dublin Trinity College, Ireland

[Nosema in bumble bees: steps towards understanding](#)

Joachim de Miranda, Swedish University of Agricultural Sciences, Sweden and Queens University, Belfast, UK

[Sexual transmission of Deformed wing virus in honeybees](#)

Rosalind James, USDA, ARS, Logan, UT, USA
[Epizootiological aspects of chalkbrood infections in the alfalfa leafcutting bee](#)

Denis Anderson, CSIRO, Canberra, Australia
[Co-evolution of Asian honeybees and their parasitic mites](#)

Contributed papers: Bacteria 3, Microbial Control 2 and Viruses 5

Posters II: Viruses, Microsporidia, Microbial Control, Nematodes

COST meeting

Division business meeting: Microbial Control

Microbial Control Workshop: Biological Solutions to Pest Control

Organizer: Kenneth E. Narva

Andrew Brown, Becker Underwood, UK
[Challenges in commercialization of micro- and macro-biologicals](#)

Jarrold E. Leland, Novozymes Biologicals Inc., USA
[Development of microbial biopesticides based on entomopathogenic fungi: Research to commercialization](#)

Kenneth E. Narva, Dow AgroSciences, USA

[Field performance of novel stacked Bt products for protection against corn insects](#)

Yongjun Lin, Huazong University, Wuhan, China
[The production of dual Bt insect-resistant transgenic rice](#)

Mickey Taylor, Insectigen, USA
[Development and prospects for the BtBooster platform technology](#)

Thomas Clark, Monsanto, USA
[RNAi and Bt protein approaches to corn rootworm control](#)

Ramon Georgis, Valent BioSciences, USA
[Bacillus thuringiensis - based products: Forever young](#)

Thursday, August 7

Symposium: Commercialization and quality control of bacterial insecticides

Organizers: Ralf Udo Ehlers and Sergio Franceschini

Terry Benson, Valent BioSciences, USA
[Bt standards and the importance of quality control of Bt products](#)

C-Y Chen, Certis USA
[Bacterial insecticides, commercial development and quality control](#)

Sergio Franceschini, Intrachem Production, Grassobbio, Italy
[Impact of regulations on commercialization of bacterial insecticides](#)

Ralf-Udo Ehlers, University of Kiel, Germany
[Proposals for a balanced regulation of microbial biocontrol agents - results of the REBECA Action](#)

Symposium: Comparative genomics of DNA viruses

Organizer: Elisabeth Herniou

Jonathan Filee, CNRS, Gif sur Yvette, France

[Evidence for extensive lateral acquisition of cellular genes by nucleocytoplasmic large DNA viruses](#)

Jean-Michel Claverie, CNRS, Marseilles, France
[Mimivirus and Mimiviridae: Toward a new family of large DNA viruses](#)

Robert Harrison, USDA, ARS, Beltsville, MD, USA
[Structural divergence among genomes of closely related baculoviruses and its implications for baculovirus evolution](#)

Yongjie Wang, DLR Rheinpfalz, Germany
[The genome of *Oryctes rhinoceros* nudivirus: a missing link that solves some mysteries of invertebrate virus evolution](#)

Jean-Michel Drezen, IRBI, Université Tours, France
[Wasp-bracovirus associations: The grail quest for the ancestor virus](#)

Contributed papers: Microbial Control 3 and Pathogens of Bees

SIP Annual Business Meeting

Symposium: Role of disease in regulation of non-pest populations

Organizers: Helen Roy, Judith Pell and John Burand

Nicolai vitt Meyling and **Jorgen Eilenberg**, University of Copenhagen, Denmark
[Specialist and generalist entomopathogenic fungi infecting non-pest insects: Implications for ecosystem services and relevance of behavioural ecology](#)

Rosemary Hails, NERC Centre for Ecology and Hydrology, Oxford, UK
[Covert viruses in wild populations](#)

Leellen Solter, Illinois Natural History Survey, Illinois, USA
[Microsporidian disease in beneficial insects](#)

Helen Hesketh, NERC Centre for Ecology and Hydrology, Oxford, UK

[Methods for studying pathogens in natural populations; recent developments and future thoughts](#)

Contributed papers: Bacteria 4, Nematodes 2

Symposium: Regulatory and market barriers for approval of microbial control products

Organizer: David Chandler

Mark Whittaker, Biosphere Biopesticide Consulting, Harrogate, UK

[Commercial development of microbial control products: the way ahead](#)

Wyn Grant, University of Warwick, UK

[Regulatory innovation and biopesticide commercialization](#)

John Dale, Pesticides Safety Directorate, York, UK

[Microbial control products: The regulatory challenge](#)

Ramon Georgis, Valent BioSciences, USA

[Commercialisation of microbial control products: The industry perspective](#)

Alastair Bailey, Kent Business School, UK

[Understanding the adoption of alternative pest management strategies: An economist's view](#)

Contributed papers: Viruses 6, Bacteria 5

Banquet and Awards Ceremony at the Britannia Royal Court Hotel

SIP 2008 Meeting Web Pages

Information about the meeting venue, scientific programme, travel arrangements and accommodation can be found on the following pages:

<http://www.ent.iastate.edu/sip/2008/details>

<http://www.ent.iastate.edu/sip/2008/gettingthere>

<http://www.ent.iastate.edu/sip/2008/accommodation>

<http://www.ent.iastate.edu/sip/2008/tours>

<http://www.ent.iastate.edu/sip/2008/attractions>

<http://www.ent.iastate.edu/sip/2008/maps>

<http://www.ent.iastate.edu/sip/2008/other>

<http://www.ent.iastate.edu/sip/2008/visa>



Auction

Fun and fund-raising at the SIP BBQ



A new event starting with the Warwick meeting will be an auction, which is intended to serve as a fund-raiser for the Society. The auction will be held during the barbecue and this year Michael Brownbridge will serve as the auctioneer.

Help us make the auction a success by donating items such as those listed below:

- Books of interest to our field, old and new. Many SIP members have written or edited books and will hopefully be able to donate an autographed copy
- Magazines with invertebrate pathology-related material
- Teaching materials such as microscope slides with specimens, posters, etc.
- Invertebrate-related food/healthy items, e.g. slugs, *Cordyceps*, insects, etc.
- Naming opportunity: Scientists that frequently describe organisms could sell the rights for a new species to be named as wished by the winning bidder.

- Crafts related to invertebrates (e.g. ceramics, earrings, pendants, etc.)
- Postcards related to invertebrates including those created by SIP members
- Memorable photographs of SIP members, SIP events, etc.
- Portraits by Surendra Dara to be done on-site
- Vintage SIP 5k race t-shirts
- Special poster from the Warwick meeting

If you plan to donate an item, please send a description (and a photo, if possible) to Fernando.Vega@ars.usda.gov. **Descriptions should be emailed to Fernando by July 18th.**

Please bring your donated items with you to the meeting. Or, if you wish to mail them to the UK in advance of the meeting, send them to:

Dr Judith Pell

Centre for Soils and Ecosystem Function

Department of Plant and Invertebrate Ecology

Rothamsted Research

Harpenden

Hertfordshire

AL5 2JQ

UNITED KINGDOM

A list of the items to be auctioned will be emailed to SIP members prior to the meeting and will also be distributed with the Registration materials. All items should be paid for and claimed at the end of the auction.

The auction is being organized by Michael Brownbridge, Judy Pell, Helen Roy, Paresh Shah, and Fernando E. Vega.

Book Reviews

From Biological Control to Invasion: the Ladybird *Harmonia axyridis* as a Model Species

Editors: Helen E. Roy and Eric Wajnberg.

Published by Springer, 2008.

At the beginning of March 2008 the residents of Scandinavia were informed that the "monster" ladybird was marching north. Øystein Størkersen of the Norwegian Directorate for Nature Management told the general public, in an article in a large daily newspaper, that if they happened to see a Harlequin ladybird (*Harmonia axyridis*) they should kill it. The rationale was that extreme measures were needed to avoid an ecological catastrophe.

This somewhat drastic response to reports of the Harlequin ladybird in Scandinavia may not be so drastic. In this recently published book, which is a reprint of a special issue of Biocontrol Volume 53 Issue 1 (2008), a synthesis of current research on *H. axyridis* is presented. One hopes that decision makers throughout Europe will purchase and read this book so that their tactics for controlling the problem will be well-informed.

The story of the Harlequin ladybird is an example of biological control gone wrong. The beetle, which originates from Asia, was released in the United States as early as 1916 but was not reported as established until 1988. In Europe it occurred later and the beetle has been commercially available since the middle of the 1990s. The ladybird has contributed to improvements in biological control but has rapidly become both a nuisance pest and a threat to endemic ladybirds.

In 18 articles the present state of the occurrence of *H. axyridis* is explored, thoughts on how risk assessment should be done in the future are presented and numerous biological studies are reported. These include articles on the interactions between the Harlequin ladybird and invertebrate pathogens. In the papers presenting

analysis of the spread of the beetle in Europe a common prediction is made: that the advance of *H. axyridis* will continue across Europe.

Future control methods will probably have to target the kind of damage the Harlequin ladybird is expected to cause. The prevention of aggregations in houses and fruit damage could be based on trapping partly using semiochemicals. This would hopefully provide species specific control. The issue of the threat *H. axyridis* poses to other predatory ladybirds is much more difficult and our present level of knowledge must be raised to meet this challenge.

The story of the transformation of a valued biological control agent into an unwanted invasive alien species makes for fascinating reading. Even more intriguing are the many exciting ideas and research lines that are put forth in this book. It should be a valued addition to our libraries and to our teaching materials. This book is certainly useful for both practitioners of pest management and conservation biology.

Barbara Ekbom

Professor of Entomology, Department of Ecology, Swedish University of Agricultural Sciences, Uppsala, Sweden.



Use of Entomopathogenic Fungi in Biological Pest Management

Editors: Sunday Ekesi and Nguya K. Maniania.

Published by Research Signpost, 2007.

The editors have assembled an internationally well known group of experts on fungal pathogens of insects and other invertebrate pests. The book comprises 11 chapters written by 22 authors from nine countries: Denmark, France, Kenya, New Zealand, South Africa, Thailand, United Kingdom, United States of America and Zimbabwe.

Virtually every topic on entomopathogenic fungi is covered. The subjects range from details regarding a single genus or closely related groups of fungi to thorough coverage of topics such as the ecology of fungi and their use in biological control. Each chapter is richly referenced in abbreviated format.

The book opens with a rarely covered topic, the etymology of generic names of entomopathogenic fungi by Fernando Vega. This provides up to date information on the derivation of 26 generic names. As Dr. Vega so eloquently states it, "scientific names are the currency of biology, evoking the unique features and characteristics of a species".

Charlotte Nielson *et al.* cover the survival, most notably winter survival, of entomophthoralean fungi of aphids and flies in unfavorable environments and its effect on conservation biological control. The chapter describes general life cycles and the structures responsible for survival in the environment amongst other topics.

The following chapter by Claire Vidal and Jaques Fargues provides a broad overview of climatic constraints to the use of fungal biopesticides, particularly those based on the Hypocreales, in several habitats and against a variety of pest insects. Subjects receiving the most attention are the effect of temperature, moisture and UV radiation and the potential of formulation for overcoming suboptimal conditions.

Drion Boucias *et al.* report detailed information on the genus *Hirsutella* ranging from taxonomy and morphology, host range including mites, nematodes and several insects, to pathology and cultivation.

The soil ecology of Ascomycetes (principally *Beauveria* spp. *Isaria* (*Paecilomyces*) spp. and *Metarhizium anisopliae*) by Stefan Jaronski provides a comprehensive review of the available literature. The chapter covers these fungi as soil organisms, their persistence in soil and the several biotic and abiotic factors influencing persistence and infectivity. The effect of formulation on the activity of Hypocreales used for microbial control is also presented.

Judith Pell introduces the concepts, theory, and practice of using ecological approaches to pest management with entomopathogenic fungi. She discusses how fungi are components of the agroecosystem, how they are currently used and the agricultural and environmental factors that can enhance or limit their effectiveness. She concludes the chapter by summarizing opportunities for the future using ecological strategies for integrated pest management of insect pests with entomopathogenic fungi.

Helen Roy *et al.* discuss the potential of manipulating insect behaviour as a strategy for pest control with fungi. Some of the subjects covered include: how sublethal or pre-mortality behaviours such as changes in food consumption and altered reproduction can reduce population growth. Emphasis is placed on altered behaviour due to fungal infection that can enhance pathogen dissemination. For example, some fungus-killed insects such as *Musca domestica* are more attractive to mate seeking males. Pheromones and other attractants can lure and infect pest insects and facilitate autodissemination of the fungus. They point out that some altered behaviours, such as behavioural fever, can reduce or even eliminate host mortality.

Optimization of bioassay precision to better determine the potential of entomopathogenic fungi is presented by Justin Hatting and Stephen

Wraight. Emphasis is placed on the bioassay of a variety of Hypocreales and Entomophthorales against aphids and whiteflies. They address standardization of several factors including application methods and other factors that influence the activity of the pathogens and, therefore, the results of the bioassays.

The role of entomopathogenic fungi in the integrated management of fruit flies is presented by Sunday Ekesi *et al.* The authors begin their chapter by listing several pest flies in the Tephritidae, their economic importance and a variety of methods for their control. The role of natural infections as well as applied fungal biopesticides is presented along with options for the use of biopesticides in IPM programmes. Application methods, including autodissemination of fungi, are covered in detail.

The microbial control of ticks, written by Nguya (Jean) Maniania provides the reader with information on the species of entomopathogenic fungi that have been used against or found in ticks. He presents how these fungi can be used for control of these important vectors of human and animal diseases. The chapter is concluded with several future research needs.

The final chapter of the book by Michael Brownbridge and Travis Glare covers the impact of entomopathogenic fungi on non-target soil dwelling invertebrates including commercially important insects, natural enemies and endangered species. The authors use earthworms and Collembola as models for the effect of applied fungi on non-target organisms. Collembolans, for example, have been naturally associated with several naturally occurring fungi. Although laboratory exposures to fungi may infect collembolans, the authors conclude that field-applied mycopathogens pose no significant threat to Collembola or earthworms and that they may be considered as fundamentally safe. The authors also recommend several additional research subjects that could provide useful information on the safety of entomopathogenic fungi for non-target organisms in the soil environment.

The book is intended for the general scientific community and will provide researchers, teachers and students with, not only broad knowledge of

entomopathogenic fungi, but also information upon which to base strategies for their use in biological pest management. Considering the spectrum of information on the biology, ecology and role that entomopathogenic fungi play, or can play, in integrated management of insect and other invertebrate pests, this book is a must for anyone working with or interested in working with entomopathogenic fungi.

Lerry Lacey

Research Entomologist, USDA-ARS, Wapato, Washington, USA.



Lerry after finishing the book review

Notices and announcements

Donate to SIP: a little bit goes a long way

At US\$30 per year, SIP membership dues are lower than those of most other professional societies. The dues have intentionally been kept low to encourage the involvement of scientists from less developed countries in the Society.

However, SIP has been operating at a deficit for many years and the General Fund has come close to dipping below US\$ 100,000 which has implications in the running of the Society and organisation of the Annual meetings.

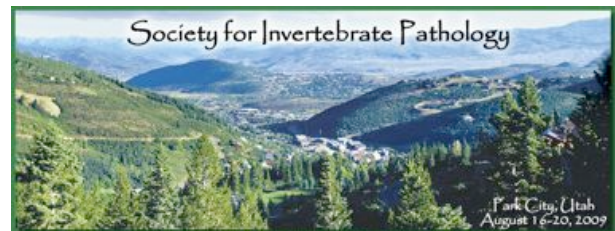
Officers on the SIP Council are working on several different approaches to both raise and to save money, but your help is needed as well.

SIP is running an appeal asking members to make tax deductible donations. Individual donations can be allocated for general operations or used for specific activities such as the Martignoni Endowment Fund or the Lomer Memorial fund.

Further details can be found at <http://www.sipweb.org/donations.cfm>.



SIP Annual Meeting in 2009



The local organisers are pleased to invite you to participate in next year's 2009 SIP Annual Meeting in Park City, Utah, August 16 – 20. We are planning an outstanding scientific program on all facets of invertebrate pathology, and we encourage you to select this venue to present your latest concepts and research findings. Park City is an attractive old mining town about 35 minutes from Salt Lake City that has been revamped in recent years. It hosted the 2002 Winter Olympics, and our meeting will be centered at the hotel that was the TV nexus for that event. August is the wrong season for winter sports, but there are many other sport and entertainment activities available; including, in fact, an all-year winter-sport training facility without snow!

By the time you read this message you will have completed your arrangements for the 2008 SIP meeting in Warwick, UK. So, you now have time to start thinking about 2009. Please keep Park City (Utah) in mind in constructing your 2009 schedule and budget. We are looking forward with pleasure to hosting you in the mountains of Utah!

Conference Co-Chairs

Donald W. Roberts, **(Local Arrangements)**

dwroberts@biology.usu.edu

Rosalind James, **(Scientific Program)**

Rosalind.James@ARS.USDA.GOV

Conference Management Team

Lisa B. Anderson

lisa.anderson@usu.edu

www.conference.usu.edu

The Julius Kühn Institute, Germany

From January 2008, the BBA (Federal Biological Research Centre for Agriculture and Forestry) has changed title to the Julius Kühn Institute and is part of the new Federal Research Centre for Cultivated Plants, following mergers between various federal research institutes.

SIP Members Regina Kleespies, Kerstin Jung, Dietrich Stephan, Gisbert Zimmermann and Jürg Huber (Past SIP President) are in the Institute for Biological Control of JKI.

The title for the institute was chosen to honour one of the earliest German scientists to carry out research in the agricultural sciences and plant pathology.

For more information on JKI see http://www.jki.bund.de/cIn_045/nn_813794/EN/Home/homepage_node.html_nnn=true

Information supplied by Regina G. Kleespies, Chair, Microsporidia Division



WANTED: Bugs - dead or dying !!!



A project between Ghanaian researchers and the International Pesticide Application Research Centre, UK, would like to obtain samples of insects possibly infected by mycopathogens.

One aim of the project includes developing fungi to use as microbial control agents against cocoa pests.

For more information please get in touch with one of the contacts listed below:

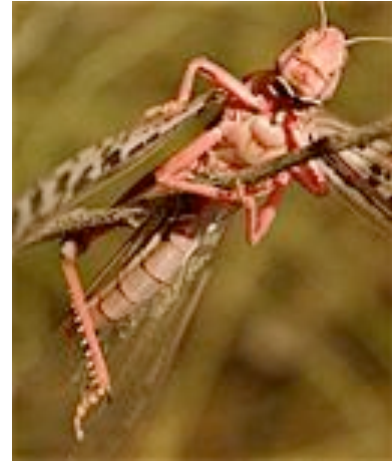
- The Entomology Division (Dr A. R. Cudjoe i/c), CRIG, New Tafo Akim, Ghana
- Prof. K. Afreh Nuamah, ARPISS Programme, University of Ghana, Legon, Accra, Ghana
- Dr Roy Bateman, IPARC, Imperial College London, Ascot, SL5 7PY, UK

The Daegu Protocol

In an open letter to the Entomological Society of America, the Royal Entomological Society (UK) and the Entomological Society of Korea, T.A. Miller, C.A. Wozniak and R.I. Rose (USA) provided information earlier this year on the Daegu Protocol developed at a conference held in Korea in August 2007.

This protocol attempts to provide guidance in developing regulatory pathways for new plant protection technologies, such as transgenic and para-transgenic (symbiont vectoring) methods for insect control.

The authors state there will be a closed meeting in July 2008 to address the issue “Can biotechnology provide new tools for locust control?”, following a request from Moroccan authorities.



Delicious fried in a drizzle of *Metarhizium* ULV

Two web sites on international development

The *Science and Development Network* at <http://www.SciDev.Net> has very comprehensive coverage of science and technology in the developing world. The Chris Lomer Travel Award, also open to non-SIP members, was listed at <http://www.scidev.net/Grants/> during the last three rounds for applications.

The *New Agriculturist* at <http://www.new-ag.info/> focuses more specifically on agriculture in less developed countries, covering plant protection, animal health, new technologies and policy issues.

USDA Southern Region Committee on Discovery of Entomopathogens and their Integration and Safety in Pest Management Systems

Members of the Committee met between 4th and 5th March 2008 at the Wildlife Prairie Park, Hannah City, Illinois. State, USDA and other representatives exchanged research findings and discussed potential collaborations.



In memory of Dr Roland Brousseau

Employees at the NRC Biotechnology Research Institute (NRC-BRI) are mourning the loss of Dr Roland Brousseau, a valued colleague and respected researcher who passed away suddenly on May 26th in Montréal.

Dr Brousseau's career at NRC spanned more than three decades. In 1977, after obtaining his PhD in Chemistry at Harvard under the Nobel Prize laureate Dr. Robert Woodward, Roland joined the NRC Institute for Biological Sciences (NRC-IBS) as a research officer. While at NRC-IBS, he helped to create the first synthetic human insulin gene with Dr Saran Narang.

In 1985, he headed the DNA Synthesis Group at NRC-BRI, and later went on to become Leader of the Environmental Genomics Group. In 1986 he helped to form the Biocide network, a consortium of Canadian universities, NRC and the Canadian Forestry Service.

His research focused on the area of bacterial pathogens, including insecticidal pathogens of interest in biological control and the identification/characterization of complex microbial communities in human health and the environment using DNA microarrays. Roland was one of the early pioneers in mode of action studies with Bt toxins.

When Jean-Louis Schwartz joined his team in 1991, together they started to characterize some of the initial steps in the binding, integration and pore-forming abilities of Bt toxins. Along with the crystallography group at his institute, Roland formed part of the team that determined the atomic structure of the first lepidopteran Bt cry protein, a major step in advancing our knowledge of the physiology of these insecticidal proteins.

Due to his expanding interest in DNA microarray technology, Roland developed the CryArray DNA chip allowing the screening of all known classes and subclasses of *cry* genes in Bt isolates. Another exciting feature of the chip was that it was

designed to discover unknown genes having only partial similarities to known gene classes.

Apart from his interest in toxin structure, Roland was also interested in the genetic responses of lepidopteran insects to Cry toxins which lead to the development of a *Choristoneura fumiferana* stress gene chip.

While attending Biocontrol Network conferences, discussions with Dave Theilmann and Martin Erlandson led to Roland expanding his DNA chip expertise to include designing a baculovirus genomic chip in order to follow temporal gene expression during infection.



Dr Roland Brousseau

Roland was an active member of the Biocontrol Network and served on the organizing committee for the 2007 SIP Annual Meeting in Quebec City.

He co-authored more than 100 peer-reviewed research articles.

Roland Brousseau is survived by his wife Ann Marie and son Patrick.

Positions Available

Postdoctoral Research Associate, Manhattan, KS, USA

Expires: 31 July 2008

A Postdoctoral position is available at Kansas State University for a joint NIH- and USDA-funded project to investigate the mechanisms of baculovirus and arbovirus pathogenesis.

We are determining how viruses establish systemic infections, are available for transmission, and the role of a viral encoded fibroblast growth factor in this process (Virology, 2007, 365:70).

Applicants should have a Ph.D. in Molecular and Cellular Biology, Microbiology, or related field, strong background in molecular biology, preferably with experience in virology or entomology, and have published in international peer-reviewed journals.

Submit curriculum vitae, a brief overview of prior experience and interests, and three letters of reference to: Dr. A. L. Passarelli, Kansas State University, Division of Biology, 116 Ackert Hall, Manhattan, KS 66506.

E-mail: lpassar@ksu.edu.

<http://www.ksu.edu/biology/employment.html>

Review of applications will begin June 1, 2008 and will continue until the position is filled.

KSU is an equal opportunity employer and highly encourages diversity among its employees.

Post doctoral research associate, Panama City, Florida, USA

Expires: 31 August 2008

A Postdoctoral Research Associate position in the area of Insect Pathology is available at the John A. Mulrennan, Sr., Public Health Entomology Research and Education Center, Florida A & M University (<http://www.pherec.org>).

The research focus will be USDA-funded molecular genetic studies of mosquitocidal bacterial toxins.

A Ph.D. in Entomology, Molecular Biology or closely related field, and experience in molecular cloning are required. Experience with bioinformatics and protein purification is preferred.

Please submit a letter of interest, curriculum vitae, and names, phone numbers and email addresses of three references to Dr. Hyun-Woo Park, Florida A & M University, John A. Mulrennan, Sr., Public Health Entomology Research and Education Center, 4000 Frankford Avenue, Panama City, FL 32405.

Email: hyun-woo.park@famu.edu

Tel: 850-872-4184 extension 35

<http://www.pherec.org/>

Screening of applicants will continue until the position is filled.

**Post doctoral and post graduate positions,
University of Tours, France**

**Insect Biology Research Institute (IRBI)
UMR CNRS 6035**

**Postdoctoral Research Associate: Comparative
Genomics of Polydnviruses and Insect Viruses**

- Starting Salary € 30,000 p. a.
- Starting from January 2009; initially 2 years funding
- Closing date 31st October 2008

**Postgraduate Research Assistant / Ingénieur
d'étude: Baculovirus Adaptation to Insect Hosts**

- Starting Salary € 23,180 p. a.
- Starting date: October 2008; initially 4 years funding
- Closing date 31st July 2008

We are seeking to recruit two scientists to join a new team lead by Dr Elisabeth Herniou and funded by the European Research Council (ERC) to work on the adaptation of virus genomes to insect immunity.

A solid background in bioinformatics and comparative genomics is required for the postdoctoral research associate as the project will consist in analysing the genomes of 2 polydnviruses and comparing them to insect viruses.

The postgraduate research assistant will be in charge of setting up insect cultures and running selection and bioassay experiments with baculoviruses.

Fluency in French is not essential but would be a bonus.

Please contact Dr Elisabeth Herniou for more information

Email: e.herniou@imperial.ac.uk

Position Wanted

Submitted by Dr. Aasidhara Padoley

**Post Doctoral Research Associate in Insect
Virology**

Location desired: USA (West)

I am an Entomologist from India and received my PhD in Dec. 2007. My thesis title was "Studies on the transmission and persistence of nucleopolyhedrovirus (NPV) infection during development of the silkworm, *Bombyx mori* L."

My objective is to contribute to the field of biological sciences (Entomology, Zoology, Sericulture, Biotechnology) by assuming a challenging post-doctoral research and development opportunity. Therefore, I am seeking a post doctoral fellowship which would increase the value of beneficial insects and may throw light on some aspects that can help us understand the persistence and transmission of Baculoviruses in insects.

My research could help in advancement of methods (pathological kits) for viral transmission techniques which could help in eradication of virus infection in insects. My laboratory skills include insect rearing (*Bombyx mori*, *Antheraea mylitta* and *Locusta migratoria*), egg card preparation, acid treatment of eggs, protein estimation, virus identification, virus purification, microtechniques (Rocking and Rotary), SDS-PAGE, insect morphology, insect pathology and chemical analysis (oil and grease, hydrocarbon, heavy metal estimation in water and sediments etc.).

I completed my Masters in Zoology with specialization in Entomology during 2000-2002. I have also done a diploma course in Sericulture (2002-2003) where I learned insect rearing at Nagpur University, India after which I pursued my PhD in Zoology (2003-2006).

Contact information: Dr. Aasidhara S. Padoley,
118, ParishramApts., Laxminagar West, Nagpur
440 022, Maharastra, INDIA

E-mail address: aasidharapadoley@gmail.com



41ST ANNUAL MEETING of THE SOCIETY
for INVERTEBRATE PATHOLOGY and
9TH INTERNATIONAL CONFERENCE ON
Bacillus thuringiensis



3rd-7th August 2008 at the University of Warwick, UK



The world's foremost conference on
invertebrates and their diseases

Deadline for late registration is Friday July
25, 2008

For information or to register your place,
visit the website or email us

www.sipweb.org or
Email: info@sipwarwick.ac.uk

Highlights of this year's meeting include

Conference Plenary Session: Honey bee colony collapse disorder

Symposia:

- Invertebrate pathogens as models for ecology and evolution
- Parasites as natural regulators of invertebrate populations
- Utilising insect pathogens in green pest management systems
- Virulence factors in fungal pathogens
- Bee virus diseases
- Microsporidia of aquatic arthropods
- Socio-economic barriers to biopesticide commercialisation
- Comparative genomics of DNA viruses

Offered Papers:

- Bacteria
- Viruses
- Nematodes
- Microsporidia
- Fungi
- Microbial Control