



Society for Invertebrate Pathology Newsletter

Volume 48 Issue 3

November, 2015

SIP 2016 in France July 24-28, 2016 Bienvenue à Tours ! Welcome to Tours!



***In Tours, we live well, eat well and drink good
On y vit bien, on y mange bien et on y boit bon
and... science is great!!!***

President

Peter Krell, Canada

Vice President

Johannes Jehle, Germany

Past President

Jørgen Eilenberg, Denmark

Secretary

Mary Barbercheck, USA

Treasurer

Stefan Jaronski, USA

Trustees

Surendra Dara, USA

Albrecht Koppenhofer, USA

Ed Lewis, USA

Monique van Oers, The Netherlands

Newsletter Editors

Eric Haas-Stapleton, USA

Jean-Louis Schwartz, Canada

SIP Office

Society for Invertebrate Pathology

PO Box 11

Marceline, MO 64658, USA

Email: sip@sipweb.orgWeb: www.sipweb.org

Phone/Fax: +1- 660-376-3586 (USA)

Table of Contents

From the President	2
Report on SIP 2015	3
Next SIP meeting	4
SIP 2015 Award winners	6
Remembrance	11
Book review	12
News and announcements	14
SIP 2015 pictures	16

Cover page: Plumereau Square
(Place Plumereau) in Tours,
Loire Valley (France)

**From the President**

J'aimerais que nos collègues et amis de France sachent que les événements qui les ont frappés le 13 novembre 2015 à Paris ont été consternants pour les membres de la grande famille de la SIP. Les mots ne suffisent pas à exprimer l'horreur que nous éprouvons face à des actes aussi inhumains. Nous vous offrons, à vous et vos concitoyens, toutes nos condoléances et tout notre soutien, en souhaitant un retour rapide à une vie normale.



Paris, November 13, 2015 happened just as this letter was being written. As individuals and as part of the international SIP family, the wanton and inhuman loss of life and injuries in Paris affects us all. Some of our members are from France and these events impacts on them even more. On behalf of SIP, I extend our deepest condolences to the victims, their family and friends and especially to our SIP colleagues in France.

You may have noticed that we now have two Newsletter Editors, in keeping with previous editor transitions. While Eric Haas-Stapleton, our current Newsletter editor has stepped down, he agreed to remain as Editor Emeritus to act as a mentor for his replacement, Jean-Louis Schwartz. Eric started as a co-editor with Surendra Dara for the June 2011 Newsletter, ushering in the new face of the Newsletter. Eric then transitioned to Editor for the November 2011 Newsletter. Those in the Bacteria Division certainly know of Jean-Louis from his research on Bt toxin. Others will recall Jean-Louis as the face of the 2007 meeting in Quebec City, Canada taking the role of Chair of that meeting. Please join me first in thanking Eric for his previous editorship of the Newsletter and to Jean-Louis for taking over that role. To ease the effort needed by the Newsletter Editor to put out three newsletters per year, please provide Jean-Louis with stories, reports, annotated photographs and respond to specific requests for information in a timely manner.

There are so many SIP meetings to talk about, the one last year in Vancouver Canada, the upcoming one in 2016 in Tours France and in the following year in 2017 to commemorate the Golden Jubilee of our founding as a Society in San Diego USA.

I am sure you will all agree that the choice of venue for the 2015 meeting in Vancouver British Columbia was an excellent one. We can never thank the local organizing committee, under the able direction of Mark Goettel and Todd Kabaluk, too much. They put a lot of heart, energy and innovation into making sure we had a scientifically rigorous though enjoyable and memorable meeting, all the while maintaining their sense of humour. The brand new UBC "Nest" provided the exact facilities needed for the various sessions. The presenters, many of them students, ensured the highest quality of science in invertebrate pathology. Those of us who went to the Cheakamus Centre, learned the finer points of the first nations' dances of the raven, eagle, frog and squirrel as well as learning to catch a salmon with our bare hands. Every meeting seems to have a unique flavour, in this case the availability of early morning Yoga classes, courtesy of Karen Toohey, to prepare participants for a grueling day of science and meetings. Thanks Karen. Elsewhere in this Newsletter you will find the students who were recognized through the many awards that the SIP provides to the youngest of our members. As Monique van Oers and Andreas Linde, co-chairs of the Awards and Student Contest Committee, pointed out before presenting the awards, all the student presenters were win-

ners and should be recognized for their dedication and high quality science and presentation skills. Despite being almost 50 years old, the SIP also boasts some pretty fast runners, particularly Neil Crickmore and Natasha Iwanicki in the top of their class. The race route through the forest and beside a river was very scenic and tranquil but also challenging. "Watch the ground for those exposed roots" they warned the President as he looked straight ahead, but, does he listen?....

A big « merci bien » from all of us to all those involved in organizing Vancouver 2015.

Now that one meeting has ended, the next one begins. Already posted to our Home page is a link to the July 24 to 28, 2016 meeting in Tours, France. Put the dates in your calendar. Elisabeth Herniou is the local organizing committee chair and will have some exciting excursions to choose from. The Vinci International Convention Centre is in central Tours and is literally steps away from the train station, as are local hotels and eateries, or, as they say « en français » "les restaurants". As part of the Loire Valley it is famous for its scenery and vineyards so, while in Tours, why not make a holiday of it as well.

As mentioned in a previous letter we are also planning the Golden Jubilee meeting for 2017 to commemorate 50 years from the founding of the Society. Surendra Dara is leading the organization of that meeting to be held in La Jolla, California (near San Diego). To make that a much anticipated and memorable occasion we have struck a Golden Jubilee Committee which is discussing several possibilities to highlight the meeting and to enhance your experience during our anniversary, and which is soliciting ideas. Contact information can be found from the Home Page, on the About SIP, Committees site.

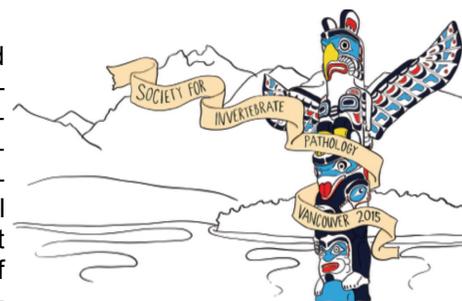
A recent initiative to enhance the international visibility of the SIP and to provide enhanced outreach is the establishment of a SIP Ambassador program. If you would like to be considered as an ambassador for your country or broader geographic area, or would like to nominate a SIP member, please let us know.

Now, before you continue to the rest of the Newsletter, please go to the SIP website and complete your membership form for 2016 if you have not already done so.

Peter Krell

Report on the 48th Annual Meeting of SIP in Vancouver, British Columbia, Canada (August 9-13, 2015)

The International Congress on Invertebrate Pathology and Microbial Control and the 48th Annual Meeting of the Society for Invertebrate Pathology was held 9-13 August, 2015 at the University of British Columbia Campus in Vancouver, British Columbia, Canada. There were 315 registered delegates comprised of 208 regular registrations, 76 students and 31 companions. In addition, an OECD-CRP satellite symposium entitled 'Microsporidia in the Animal to Human Food Chain: An International Symposium to Address Chronic Epizootic Disease' was held on Sunday, 9 August with 90 registrants. The SIP meetings began on Sunday afternoon with a special half-day workshop organized by the Bacteria Division entitled 'Regulatory Considerations for the Commercialization of New Insecticidal Proteins' with 87 registrants. This was followed by the customary evening welcoming mixer. On Monday morning, Dr. Grant Stentiford presented the Founders' Lecture in honor of Phyllis T. Johnson.



On Tuesday afternoon three choices were provided for excursions: 1) 76 delegates chose to visit Britannia Mine followed by sweeping views of Howe Sound, the lush coastal forest, and surrounding mountains via the Sea to Sky Gondola and the Summit Lodge at the top; 2) 90 delegates chose to proceed directly up the Sea to Sky Gondola and a three hour hike on undulating trails in the beauty of the alpine; or 3) 26 delegates enjoyed a First Nations cultural and nature experience at the Cheakamus Centre where "nature is always in session". All groups met at the Centre where 54 delegates took part in the 5K run through a wonderful mixed growth forest with winding streams where sockeye salmon could be seen swimming upstream to their spawning grounds. Unfortunately due to several complications arising from some mix-ups in record keeping at both registration and 5K run site itself, we were unable to accurately collate run times and prize winners. We hope that the runners realize this was a fun-run and forgive us! The day ended with an evening barbeque at the Centre.

A total of 163 oral presentations (1 plenary session, 8 symposia, 4 workshops, and 15 contributed paper sessions) and 112 posters were presented. The SIP2015 Organizing Committee included Todd Kabaluk and Mark Goettel (Co-Chairs), David Theilmann (Treasurer), Jenny Cory and Alida Janmaat (Scientific Program Co-Chairs), Joan Cossentine (Registration Coordinator), Deborah Henderson (Social Activities Coordinator), Paul MacDonald (Event Mobi Program/SIP App), Cheryl Erlandson (Companion Tours) and Beth McCannel and Karen Toohey (Committee Members) as well as help from SIP Divi-

sion Chairs, technical staff and students from Agriculture and Agri-Food Canada's Summerland and Agassiz research centres, and students from Kwantlen Polytechnic University, Simon Fraser University, and University of the Fraser Valley. There were several new items at this meeting. For the first time delegates could take advantage of a computer app (the SIPApp) where they could view the program, list of delegates and presentation abstracts from the comfort of their computer or smart phone. This alleviated the need for printing a Program & Abstracts book for every delegate which not only saved costs, but some trees (or part of one) as well. Seventy-eight delegates chose the option of pre-ordering the Program & Abstracts for a fee. In addition, about 20 delegates and companions started their day with the early morning Yoga sessions that we offered.

The Local Organizing Committee



Next SIP Meeting : Tours, Loire Valley, France July 24-28, 2016



The SIP 2016 Meeting Organizing Committee is pleased to invite you to Tours, France, for the International Congress on Invertebrate Pathology and Microbial Control and the 49th Annual Meeting of the Society for Invertebrate Pathology to be held July 24-28, 2016 at the Vinci Conference Center. The organizing committee is preparing a fantastic scientific and social program. Conveniently located in the city center, the conference center is only a short walk from many hotels, restaurants and Tours' vibrant nightlife. At the heart of the UNESCO Loire Valley World Heritage site, Tours is an ideal base to take a step back in time while visiting castles but also a city that prides itself for its gastronomy.

The meeting website, <http://sip2016tours.org/> will be launched in early 2016. In the meantime, if you have any queries, please e-mail us at contact@sip2016tours.org.



2015 Award Winners

Mauro Martignoni Award: John McMullen II

Title: Phenotypic diversity in the virulence of the entomopathogenic bacterium *Xenorhabdus bovienii* (Gamma-Proteobacteria: Enterobacteriaceae) reveals a type VI secretion system in its pangenome

John McMullen was a M.S. student working at The University of Arizona in the lab of Dr. Patricia Stock, focused on the sequencing and analysis of the transcriptomes of a selection of *Steinernema spp.* The main goal was to assess gene expression of nematodes under various parameters including presence or absence of bacterial symbiont and rearing conditions. Apart from his research career, he participated in numerous science outreach activities with the College of Agriculture and Life Sciences Ambassadors at the University of Arizona and as the student representative of the Nematode Division of SIP. This fall, John began work toward his Ph.D. with Dr. Angela Douglas at Cornell University in the Department of Entomology. He envisions becoming an academic and being able to have an active research program and mentor students in the future.



John McMullen II with Andreas Linde, Chair, Awards Committee

Paper Presentations

1st Place Paper Presentation Award: Jonathan Wang

Title: A genome wide association study of resistance to *Metarhizium anisopliae*

Jonathan Wang earned a Bachelor's degree in Environmental Science and Policy at the University of Maryland, College Park. In 2014 he began his work on a PhD with Professor Raymond St. Leger. He is studying insect defense and fungal pathogenesis using the two model systems: *Drosophila melanogaster* and *Metarhizium anisopliae*. By studying these systems, a better understanding of insect innate immunity can be reached with applications to biocontrol and human health.



2nd Place Paper Presentation Award: Mark Hanson

Title: Interactions between parasitic nematodes and bacteria in *Drosophila*

Mark Hanson became interested in host-symbiont-parasite relationships as an undergraduate after taking Entomology at the University of Victoria. He later became a tour guide and animal care person at the Victoria Bug Zoo from 2012-2013, where he further developed a passion for insects and other arthropods. In 2013, he earned his BSc in Biology at the University of Victoria. For his Masters thesis research under Steve Perlman's supervision, he is studying *Drosophila* to ask questions about the evolution of immune systems amongst distantly related species, and probe the immune capacities of less-characterized groups of *Drosophila*. In October 2014, he won a best talk award from the Entomological Society of British Columbia during the Annual General Meeting.



3rd Place Paper Presentation Award:

Joanna Fisher

Title: Older beetles are stronger than young: influence of mating and age on susceptibility to a fungal pathogen

Joanna Fisher is currently a PhD student at Cornell University in the lab of Dr. Ann Hajek. Her research focuses on understanding the interactions between the entomopathogenic fungus *Metarhizium brunneum* and the invasive Asian longhorned beetle, *Anoplophora glabripennis*. Experiments were conducted to determine whether *A. glabripennis* could behaviorally elevate their body temperature (behavioral fever) to escape fungal biological control. Additionally, transgenerational immune priming was investigated to understand the impacts of maternal exposure to *M. brunneum* on offspring immunity. Recent work was conducted to investigate the effects of maturation, aging and mating on beetle immunity. Future work will address how fungal infection and sublethal exposure to the pesticide imidacloprid affect the beetle's immune response.



Posters

1st Place Poster Award (ex aequo): Thiago Rodriguez de Castro

Title: Persistence of two Brazilian isolates of *Metarhizium* in a strawberry cropping system using microsatellite markers

Thiago Castro is currently a PhD student in a double degree agreement at University of São Paulo in Brazil and the University of Copenhagen in Denmark. His research project, directed by Italo Delaliber Jr. and Jørgen Eilenberg is to study interactions of entomopathogenic fungi associated with strawberry for developing biocontrol strategies and to integrate these natural enemies with other management strategies in this crop as a part of the IMBICONT Project: Improved Biological Control and IPM in fruits and berries.

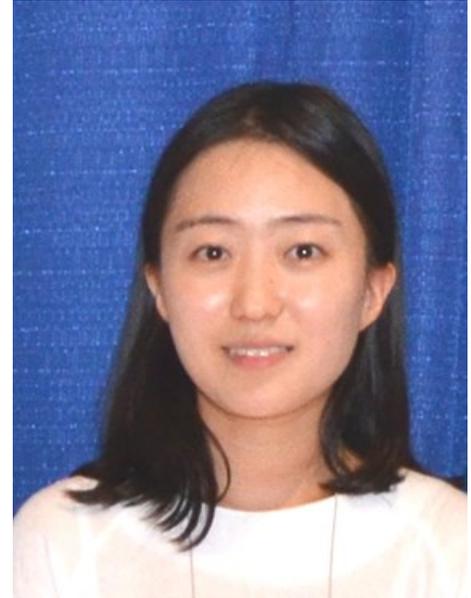
In 2011 Thiago completed a Master's degree from University of São Paulo entitled "Studies for the development of methodology for in vivo production of the fungus *Neozygites floridana* to control the mite *Tetranychus urticae*", where he worked with Italo Delalibera Jr. and Ingeborg Klingen. As an undergraduate in biological sciences, Thiago always was fascinated with the interactions between organisms and this led him to the field of biological control since his first year in the university. He is delighted to have the opportunity to continue his education in this area and looks forward to a career with this topic.



1st Place Poster Award (ex aequo) Seung Hee Lee

Title: Production of porcine parvovirus virus-like particles using baculovirus in the silkworm larvae

Seung Hee Lee is a 2nd year graduate student at the Chungbuk National University (South Korea) in the lab of Professor Soo Dong Woo where she is studying insect pathology and biotechnology. Her research is focused upon producing the porcine parvovirus virus-like particles using baculoviruses in silkworm larvae. To diversify her academic acumen, she has certifications in internship, psychotherapy using insects and English patent writing. She also participates in the Young Generation Forum to discuss the future of science with other students in the natural sciences.



3rd Place Poster Award: Leo Graves

Title: The effects of heterologous p10 expression in *Autographa californica* multicapsid nucleopolyhedrovirus replication in insect cells

Leo's road to a scientific education began in 1999 when he was put in top sets for each of the science disciplines, and found a strong interest in the practical aspects of biology. However, it was not until his undergraduate studies at Oxford Brookes, University in 2005 when he started to develop a strong interest in microbiology and found a strong desire to learn more.

During the final year of his undergraduate studies in Biotechnology at Oxford Brookes University, he worked with Professor Robert Possee at The Centre of Ecology and Hydrology (CEH), for which he developed a fond interest in caterpillars and their associated viruses. Beginning in 2010 he worked as a Quality Control Biochemist for a pharmaceutical company called Allergy Therapeutics UK, Worthing to detect animal and food pollens using ELISA and SDS-PAGE. After two years and a promotion he had the urge to develop and learn so that he could offer more to such a company, and decided to join a PhD program at Oxford Brookes University. He is currently on a full time PhD Research Studentship in the Insect Virology Research Group where he is working on the role of baculovirus P10 protein and its functional domains. Through this research, he has learned a range of biological techniques including: cloning, cell culture, virus harvesting, plaque assays, and various microscopy techniques including confocal, transmission electron microscopy (EM) and scanning block face – scanning EM. For his award winning 2015 poster, he modeled the 3D structures of the P10 protein with the goal of visualizing how the P10 protein may function in a cell.



2015 Student Travel Award Winners

Bacteria Division

Barbara Domanska, University of Sussex, Sussex, UK

Anne Karpinski, Max Plank Institute for Chemical Ecology, Jena, Germany

Diseases of Beneficial Invertebrates Division

Bas Verbruggen, University of Exeter, UK

Henriette Knispel, Institute for Bee Research Hohen Neuendorf and Free University, Berlin Germany

Fungi Division

Maya Raad, BioProtection Research Center, Lincoln University, Lincoln, New Zealand

Brain Lovett, University of Maryland, College Park, USA

Microbial Control Division

Ana Moldovan, Moldova State University, Chisinau, Republic of Moldova

Katharina Saar, Technische Universität Darmstadt, Germany

Nematode Division

Silvia Libro, New England Biolabs and Northeastern University, Boston, USA

Isis A. L. Caetano, Cornell University, Ithaca, USA

Virus Division

Irene Kasindi Meki, Wageningen University, Wageningen, The Netherlands

Aleksej Stevanovic, The University of Queensland, Brisbane, Australia

Ryuhei Koksho, The University of Tokyo, Japan

Remembrances

Harold Lincoln "Harry" Zimmack

February 12, 1925 - May 20, 2012

Indiana, USA

Dr. Harold Lincoln Zimmack passed away on May 20, 2012. Harry was born in Chicago, Illinois on Lincoln's birthday, February 12, 1925. He earned his B.S. in Zoology from Eastern Illinois University and his M.S. and Ph.D. degrees in Entomology from Iowa State University. After earning his doctorate in 1956, he began his teaching career at Eastern Kentucky University, then moved to Muncie, Indiana, in 1963 to teach at Ball State University. During his 27 years as a biology professor at Ball State, he obtained the University's first National Science Foundation Research Grant, pioneering radiobiological studies in insect pathology, and was recognized as one of the world's foremost authorities on the European corn borer. He and his students studied effects of *Nosema (Perezia) pyrausta*, *Vairimorpha (Nosema) necatrix*, *Bacillus thuringiensis*, *Bacillus subtilis*, *Bacillus megaterium*, *Serratia marcescens*, *Clostridium putrefaciens* and *Escherichia coli* on corn borers, as well as infection methods and synergistic effects of multiple pathogens. He was a mentor and friend to all of his students. He loved research and inspiring students and was a judge and chair of the annual award evaluation committee for the Indiana Science Talent Search for 25 years. Professional memberships included the Entomological Society of America, the Society of Invertebrate Pathology, the American Institute of Biological Sciences and the Indiana Academy of Science.



Harry coached Eastern Kentucky University's baseball team in 1957 and played concurrently as the captain of 5 local softball teams in Muncie until age 67. His ping pong skills earned him an exhibition match against table tennis world champion Marty Riesman in 1950. He worked tirelessly for 45 years contouring his land, developing a well stocked pond, and hand planting over 25,000 trees and countless flowers to create an idyllic paradise on his 25 acre estate. His favorite hobbies were fishing, mowing, and the Civil War.

Harry was married to Barbara Jean (née Keen) for 56 years until her death in 2008. He is survived by his children, Cinda (Brent) Terry, John Mark, and Lissa (Lou) Schiller; grandchildren, Chance, Lauren, Heather, Holly, and Christina; great grandchildren, Avery and Elise. Services were held on Tuesday, May 29, 2012 at Hazelwood Christian Church in Muncie, Indiana.

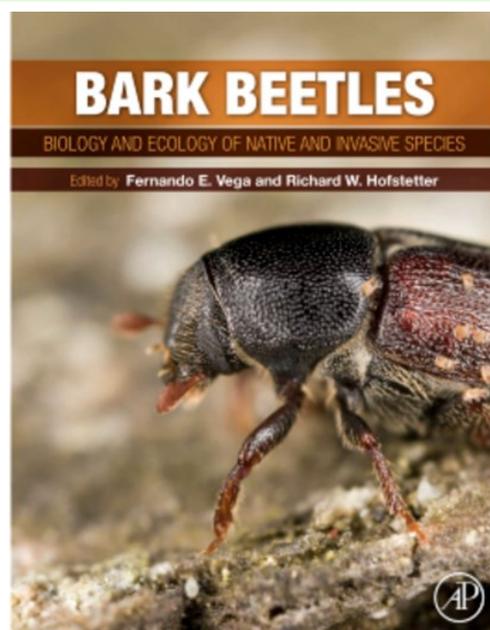
Excerpted and modified from The Star Press, Muncie, Indiana, Sunday, May 27, 2012

Book Review

Bark Beetles: Biology and Ecology of Native and Invasive Species
Fernando E. Vega and Richard W. Hofstetter, editors
Academic Press, San Diego
US\$130
ISBN: 978-0-12-417156-5

George Poinar, Jr., Department of Integrative Biology, Oregon State University, Corvallis, OR 97331.
poinarg@science.oregonstate.edu

This large book of 620 pages, written by an international selection of authors, consists of 15 chapters covering all particulars of Bark Beetles (Scolytinae) and Pinhole Beetles (Platypodinae). There is a brief index of 6 pages at the end of the book. Throughout the book, the numerous color photographs and illustrations are a definite plus and add a touch of aesthetics to the work. This book contains a wealth of information on all aspects of bark beetles and is a welcome and essential tome for foresters, entomologists and all growers of crops affected by bark and pinhole beetles. Invertebrate pathologists will find Chapters 1, 3, 6 - 8, 10 and 11 of particular interest as aspects of biological control, pathogens or symbiotic associations are covered. The editors are to be applauded for organizing such a comprehensive compendium. A synopsis of each chapter is provided below.



Chapter 1. K.F. Raffa, J. -C. Grégoire and B. S Lindgren. Natural History and Ecology of Bark Beetles. The authors discuss life cycles, reproductive strategies, feeding substrates, gender roles and symbiotic associations of bark beetles.

Chapter 2. J. Hulcr, T. H. Atkinson, A. I. Cognato, B. H. Jordal and D. D. McKenna. Morphology, Taxonomy and Phylogenetics of Bark Beetles. This chapter provides the basic foundation of the book. A detailed section on bark beetle morphology, together with a discussion of current terms, some of which are controversial, provide an excellent aid for those wishing to identify or describe specimens. Tables listing all bark beetle genera and species, including fossils, are also very useful.

Chapter 3. L. R. Kirkendall, P. H. W. Biedermann and B. H. Jordal. Evolution and Diversity of Bark and Ambrosia beetles. The authors discuss the evolution, ecology, feeding preferences and mating patterns of both bark and ambrosia beetles. The topic of parental care is introduced with examples of how adult beetles clear frass from egg tunnels and block the entrance of the tunnels to keep predators and parasites out. Female beetles use frass mixed with resin for this purpose while male platypodines often block the entrance with long cylinders of wood fibers.

Chapter 4. A. S. Weed, M. P. Ayres and B. J. Bentz. Population Dynamics of Bark Beetles. The authors discuss the effects of bark beetle associates and host response on abundance and population dynamics over space and time. They then discuss bark beetle mass attacks that can overwhelm the tree's defenses. Without mass attacks, most bark beetles are resigned to develop in dead or dying trees, where there are no resin vapors or flowing, viscous deposits to block their entrance.

Chapter 5. P. Krokene. Conifer Defense and Resistance to Bark Beetles. The chapter begins with an interesting overview of the anatomical basis of conifer defenses, separating them into preformed defenses and induced defenses. Preformed defenses include terpenoids and phenolics in the bark and sapwood. Induced defenses involve the formation of traumatic resin ducts in the sapwood and the formation of wound periderm. While these defenses must be effective in many instances, bark beetles still seem to get through them to reach the cambial layer, which is defenseless.

Chapter 6. R.W. Hofstetter, J. Dinkins-Bookwalter, T. S. Davis and K. D. Klepzig. Symbiotic Associations of Bark Beetles. This chapter discusses a variety of microorganisms that occur in the body cavity, gut or

on the body surface of bark beetles. Some of these associates are helpful, some innocuous and some harmful. Beneficial symbionts are often essential for normal development of the brood. Examples are ambrosia fungi that establish themselves on the tunnel walls and supply nutrients to the developing larvae and symbiotic bacteria that neutralize plant defenses. The various symbiont categories include fungi, yeasts, bacteria, mites, nematodes and viruses.

Chapter 7. R. Wegensteiner, B. Wermelinger and M. Hermann. Natural Enemies of Bark Beetles: Predators, Parasitoids, Pathogens and Nematodes. This chapter provides an engaging synopsis of the many enemies of bark beetles, including birds, parasitic wasps and a wide range of pathogens such as viruses, bacteria, fungi, microsporidia, gregarines and nematodes.

Each of Chapters 8-11 focus on a particular genus of bark beetle, especially among those that are known to kill or severely damage their plant host.

Chapter 8. D. L. Six and R. Bracewell. Dendroctonus. The authors list 19 species (20 are included in the species list in Chapter 2), most of which occur in the New World and most of which attack pines. Adults carry symbiotic fungi in sac and pit mycangia on their exoskeleton and in their gut. All species are discussed in relation to their biology and host preferences.

Chapter 9. A. I. Cognato. Biology, Systematics and Evolution of Ips. Some 45 species in this genus are distributed in both the New and Old Worlds. Most attack dead or dying pine and spruce trees but a few attack healthy trees and such infestations can prove lethal, especially during instances of high beetle density and periods of drought. An annotated list of the species is provided, along with their distribution, principal hosts, morphological diagnoses and phylogenetic analysis.

Chapter 10. F. Lieutier, B. Långström and M. Faccoli. The Genus Tomicus. The authors provide sections on the taxonomy, morphology, phylogeny, life history, biology, ecology and geographic distribution of members of *Tomicus*, as well as a list of species with their tree hosts. Additional details on biotic associations, including symbionts, predators and parasites and population dynamics (which is closely associated with tree resistance and environmental conditions) are provided for selected species.

Chapter 11. F. E. Vega, F. Infante and A. J. Johnson. Hypothenemus, with Emphasis on the Coffee Berry Borer. The authors provide sections on generic characters that have been used to identify the 181 known species in the genus as well as notes on the life cycles and host plants. The remainder of the chapter deals with the most studied member of the genus, namely *H. hampei*, the Coffee Berry Borer. Sections on the biology of *H. hampei* include controlling infestations with repellents, plant resistance and biological and cultural control methods.

Chapter 12. S.M. Smith and J. Hulcr. Scolytus and other Economically Important Bark and Ambrosia Beetles. There are some 127 species of *Scolytus* globally and the authors provide a section on the overview of the genus with comments on the diagnosis, taxonomic history and biology, and then discuss economically important species. A similar outline is followed for the following 11 other genera of economically important bark beetles, which are *Polygraphus*, *Pseudohylesinus*, *Dryocoetes*, *Xyleborus*, *Euwallacea*, *Xylosandrus*, *Trypodendron*, *Pityophthorus*, *Conophthorus*, *Gnathotrichus* and *Monarthrum*.

Chapter 13. B. J. Bentz and A. M. Jönsson. Modeling Bark Beetle Response to Climate Change. Based on climatic records, temperatures in the Northern hemisphere have risen during the past 1400 years. Since many aspects of bark beetle biology are temperature dependent, climate change can affect bark beetle population dynamics, which in turn are associated with host survival in living trees harboring bark beetles.

Chapter 14. C.F. Fettig and J. Hilszczański. Management Strategies for Bark Beetles in Conifer Forests. This chapter synthesizes information related to the management of bark beetles in conifer forests and presents a case study on the management of *Ips typographus* in central Europe.

Chapter 15. J. -C. Grégoire, K. F. Raffa and B. S. Lindgren. Economics and Politics of Bark Beetles. The economic consequences of bark beetle outbreaks are discussed and a case study of *Ips typographus*, the most damaging bark and wood boring insect attacking living spruce trees throughout Eurasia, is presented.

News and Announcements

Microsporidia in the Animal to Human Food Chain: An International Symposium to Address Chronic Epizootic Disease

Sponsored by the Organisation for Economic Co-operation and Development Co-operative Research Program
and the Society for Invertebrate Pathology

A special symposium focused on Microsporidia as emerging pathogens in the global food chain was held on the campus of the University of British Columbia in Vancouver, BC, Canada, on August 9, 2015. Fourteen on-site speakers and video presentations by two off-site speakers addressed microsporidian phylogeny, pathology, disease models, zoonoses and disease emergence in humans, terrestrial and aquatic food animals, companion animals and beneficial insects. The symposium was organized by Drs. James Becnel, Lee Solter, Grant Stentiford and Louis Weiss, and additional speakers were Drs. Susan Bjornson (Canada), Mark Brown (UK), Elizabeth Didier (USA), Mark Freeman (UK and Malaysia), Patrick Keeling (Canada), Michael Kent (USA), Kristina Rösler (Germany), Karen Snowden (USA), Julia Sokolova (USA), Emily Troemel (USA), and Bryony Williams (UK). Dr. Primal Silva (Canada), representing OECD-CRP, opened the symposium. Proceedings of the symposium are available on the SIP website. OECD-CRP provided travel grants for ten speakers and the Society for Invertebrate Pathology provided the venue. Approximately 50 scientists attended the symposium.



OECD-CRP Symposium speakers and organizers

Dr. Primal Silva (Canada), representing OECD-CRP, opened the symposium. Proceedings of the symposium are available on the SIP website. OECD-CRP provided travel grants for ten speakers and the Society for Invertebrate Pathology provided the venue. Approximately 50 scientists attended the symposium.

Let's start our new membership campaign!

from Surendra Dara, Chair of the Membership Committee

Dear SIP members,

SIP provides an excellent platform for its members to present their research, share their ideas, develop collaborations, form professional relationships and collectively contribute to sustainable production systems through microbial control and more. The majority of the SIP membership is from North America, Australia, New Zealand and Europe, and we would like to encourage scientists and students from other countries who are interested in any and all aspects of invertebrate pathology to join SIP, engage in stimulating scientific interactions and enjoy the benefits of membership. President Peter Krell and I have been discussing a program to encourage existing members to reach out to professional colleagues in their respective regions and around the world to encourage them to join SIP. Compared to that of several professional societies, our membership fee is very reasonable and affordable to those in different parts of the world.

Here are some ideas about which we would like to get your feedback:

1. design a membership campaign and consider providing incentives for new members and those who recruit new members;
2. motivate SIP scientists to encourage their contacts, colleagues and students to join SIP;
3. work with other professional societies, universities, publishing companies, and other sources to help with the membership campaign.



Looking forward to hearing from you with some great ideas. Please send them to me at: skdara@ucanr.edu

Calling all Ambassadors

from Peter Krell, President



SIP is seeking nominations for Ambassadors to represent SIP in their geographic area. For those who attended the Annual General Meeting in Vancouver, you will already know that the Council and the floor authorized the establishment of a SIP Ambassador Program. The program, borrowed from a similar one used by the American Society of Microbiology, would help to raise our international profile and enhance our outreach opportunities. The SIP Ambassadors would develop and maintain connections with local invertebrate pathologists at various academic, government, industry and other institutional organizations that have an interest in invertebrate pathology.

The SIP ambassadors would familiarize themselves and communicate with fellow local invertebrate pathologists, and raise the profile of SIP in their area, consult with local colleagues about how SIP could provide outreach (e.g. mentoring, developing collaborations, exchanging samples, going to conferences) and, in concert with the Membership Committee, encourage their colleagues to join the SIP by pointing out the advantages of becoming members.

If you are interested in being a SIP Ambassador for your country or region, or would like to nominate someone, please inform me (pkrell@uoguelph.ca) or Surendra Dara (skdara@ucanr.edu), Chair of the Membership Committee, with details.

2015 Insect Pathology Short Course

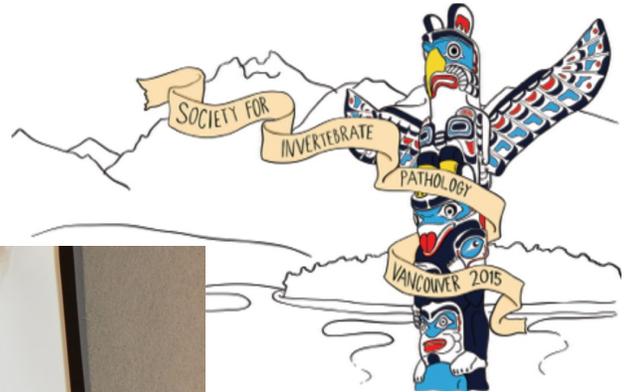
Held on the campus of Cornell University in Ithaca, NY, June 8-12, 2015, the Insect Pathology Short Course hosted the most international group of participants in the history of the course. Twenty-four participants hailed from Brazil, Canada, Croatia, France, Mexico, Pakistan and the US, and represented academic institutions (graduate students and faculty), industry and the USDA. The enthusiastic group studied all pathogen groups (bacteria, viruses, fungi, nematodes and protozoans) in lectures and the laboratory, and participated in a field collection of insects that yielded a wide variety of pathogens and parasites. The course was organized and instructed by Drs. Ann Hajek, Richard Humber, Louela Castrillo, David Shapiro-Ilan and Lee Solter.



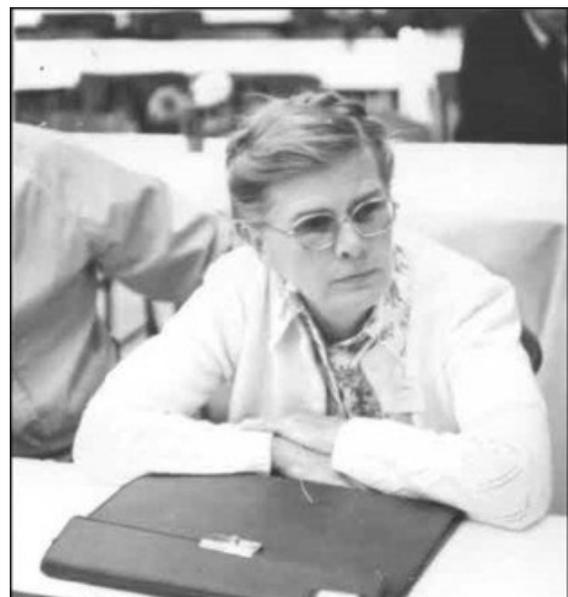
The President is traveling the world!

SIP colleagues Peter Krell and Rosie Dorrington, along with her students Janet Awando and Mart-Mari de Bruyn discussing viral ecology at Nottingham Lodge near Rhodes University, Georgetown South Africa during a self catered (by Rosie) Safari. The day before Peter Krell had a chance to visit another SIP member, Sean Moore, and had a tour of his baculovirus production facility at River Biosciences in Port Elizabeth, South Africa.

Founder's Lecture 2015



Grant Stentiford presenting the Founders' Lecture
in honor of Phyllis Johnson



The SIP Council 2014-2015 and (past) Presidents

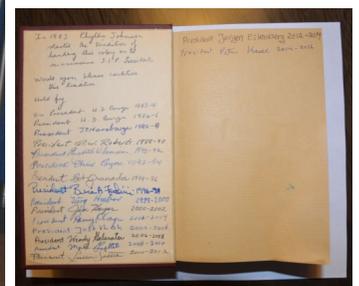


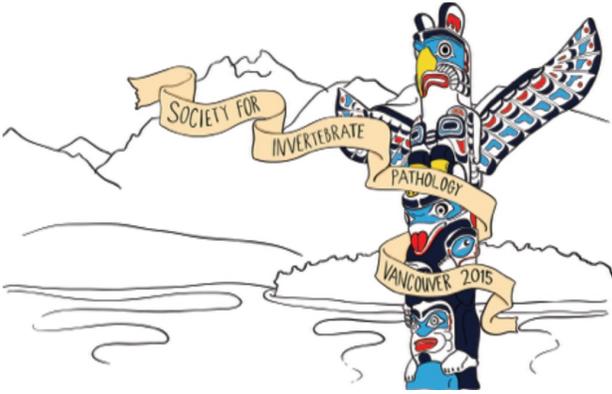
Left to right: Monique Van Oers (Trustee), Johannes Jehle (Vice President), Martin Erlandson (Viruses), Jørgen Eilenberg (Past President), Surendra Dara (Trustee), Ed Lewis (Trustee), Mary Barbercheck (Secretary), Stefan Jaronski (Treasurer), David Shapiro-Ilan (Nematodes), Albrecht Koppenhofer (Trustee), Baltasar Escriche (Bacteria), Kelly Bateman (Diseases of Beneficial Insects), Peter Krell (President), Nicolai vitt Meyling (Fungi), Travis Glare (Microbial Control). *Missing:* Susan Bjornson (Microsporidia).



Left to right: Johannes Jehle (2016/2018), Jørgen Eilenberg (2012/2014), Peter Krell (2014/2016), Don Roberts (1988/1990), Leellen Solter (2010/2012), Mark Goettel (2008/2010), Harry Kaya (2002/2004), Just Vlak (2004/2006), Elizabeth Davidson (1990/1992), Brian Federici (1996/1998).

Presidents' signature pages in Robert's Rules of Order

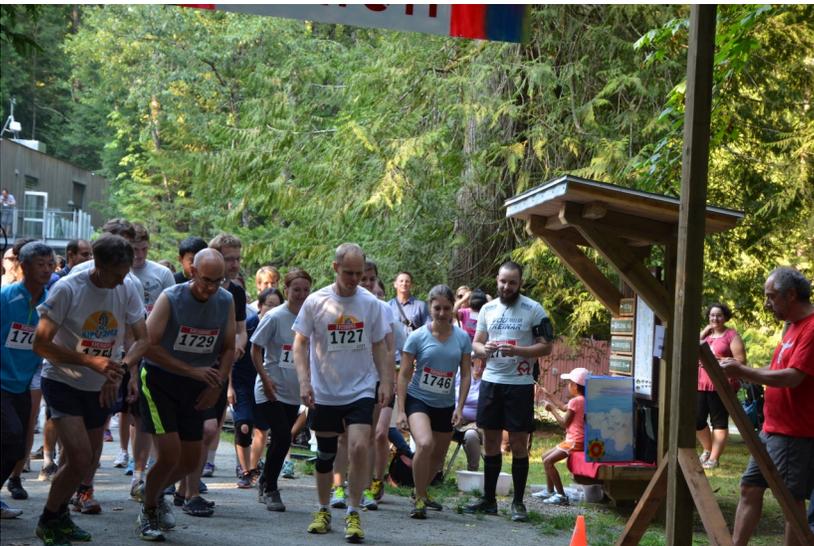
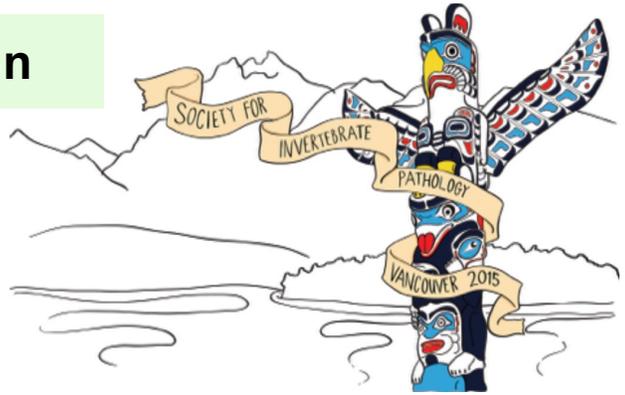




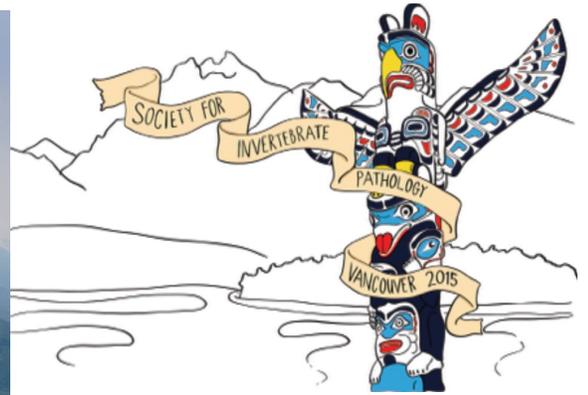
**Scenes of daily life
at
SIP 2015**



SIP 2015 5K Race and Excursion



Neil Crickmore and Natasha Iwanicki



Ann Hajek

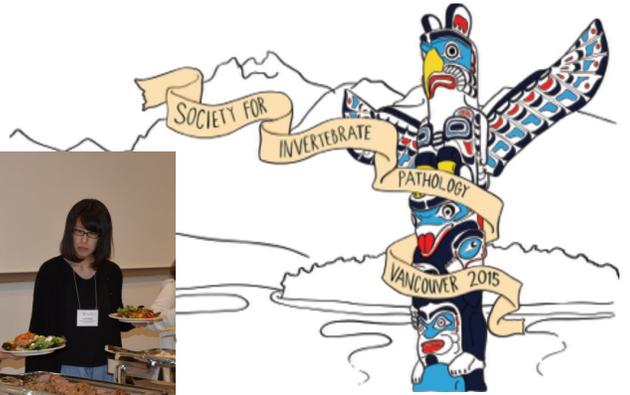


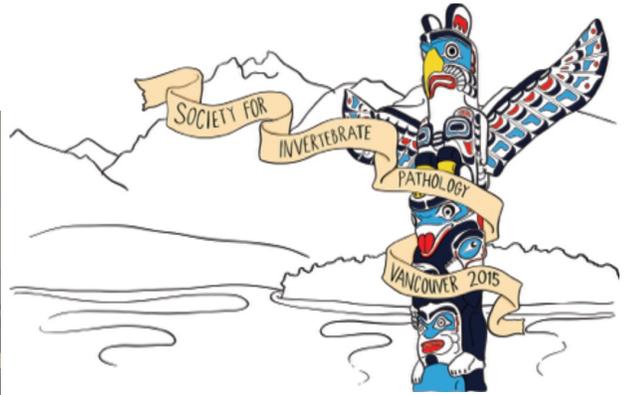
Roger Frutos



Rollie Clem and Lorena Passarelli

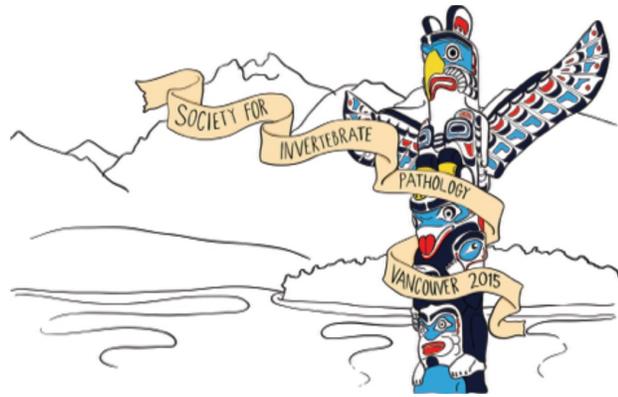
SIP 2015 Banquet







2015 Co-chairs and still friends!



From SIP 2015

to SIP 2016 ...



Our next meeting's Chair (Chairs?)