Pesticulars

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2018 Symposium

"From Research to Industry and Back"

Monday, March 5, 2018
Scandinavian Community Centre
Burnaby, BC

Summary of the 2018 Symposium

The 2018 PPMABC Symposium and Annual General Meeting was held at the Scandinavian Community Centre in Burnaby, BC.

2018 Panel: "From Research to Industry and Back"

This year's symposium featured our very first panel discussion! The discussion featured topics on bridging the gap between pest management research and industry. Participants (from left to right): Lucian Mircioiu, Bioconcept Pest Management Ltd., Heather Meberg, ES Cropconsult Ltd., Juli Carillo, University of British Columbia, Wim van Herk, Pacific Agri-Food Research Centre (AAFC).

2018 Awards

Thelma Finlayson Lifetime Achievement Award was awarded to Zamir Punja. Jesse MacDonald (bottom left) is shown presenting the award.

The **Student Awards** were given to Simon Fraser University Master of Pest Management students Asim Renyard and Danielle Hoefele. Awards were presented by incoming president Lucian Mircioiu and outgoing president Jen Scholefield.

Asim's presentation was titled: "Identification and testing of the trail pheromone of the carpenter ant, *Camponotus modoc."*

Danielle's presentation was titled: "Synthetic trail pheromone enhances recruitment of European fire ants to food baits."

Good work Asim and Danielle!

From left to right: Lucian Mircioiu, Asim Renyard, Jen Scholefield and Danielle Hoefele.

Thank you to all of our presenters and panel participants!

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The PPMABC welcomes sponsorship from companies interested in supporting the costs associated with our annual AGM. If interested, please contact Tammy McMullan (ppmabc@sfu.ca).

2018 AGM Student Presentations

Presenter: Li Ni
Title: How does Active Flower, a foliar nutrient spray containing boron, inhibit pathogen growth and suppress disease on canola (*Brassica napus* L.) plants?
Abstract: Sclerotinia stem rot (*Sclerotinia sclerotiorum* Lib. De Bary) is a one of the most destructive fungal disease of canola (*Brassica napus* L.). The effect of Active Flower™ (AF), a foliar fertilizer containing 3% boron plus 8:4:12 of N: P: K, in reducing the severity of the disease was evaluated. Fungus was grown in PDB with AF at concentrations of 0, 1, 3 and 5 ml/ L. Growth inhibition was observed at 1 and 3 ml/ L, with the most pronounced effect seen at 3-5 ml/L. Concentrations of 1, 3 and 5 ml/L of AF were applied weekly to canola plants grown under greenhouse conditions. Results showed that AF at 1, 3 and 5 mL/L enhanced boron levels, reduced disease development on detached leaves inoculated with *Sclerotinia*, and increased levels of phenolic compounds in leaves. The effects of AF are possibly mediated through enhanced tolerance of plants to fungal infection.

Presenter: Kate Mill
Title: The lethal and sublethal effects of anti-sea lice pesticides on non-target crustaceans
Abstract: The lethal and sublethal effects of anti-sea lice pesticides on non-target crustaceans
Abstract: Sea lice are a cause of concern in Canada, as outbreaks in fish farms are common and often lead to death of the infected fish. However, the chemicals used to control these outbreaks have been shown to have negative effects on non-target crustaceans such as lobsters and prawns. Salmosan® is an anti-sea lice chemotherapeutant that has received emergency approval in Eastern Canada and may soon be used in BC. This project will investigate the effects of these chemotherapeutants on behavior and molting success of Pacific spot prawns, Pandalus platyceros under multiple pulse and combined stressor scenarios. Preliminary data suggests high concentrations of Salmosan® elicit an avoidance response, and further experiment will investigate this under environmentally relevant mixed stressor exposure scenarios. The results of this project will allow for the improvement of chemical use regulations and protocols, thereby improving our ability to act as stewards of our coastal environments.

Presenter: Elana Varner
Title: Discovery of volatile female house mouse pheromones; Enhancing trap captures and igniting theoretical inquiry
Abstract: Discovery of a novel female house mouse pheromone class, volatiles, that effectively attract male mice. These attractants, coupled with conventional trapping methods, increase captures greatly and provide an effective ecofriendly alternative for industry. Also fueling scientific inquiry, the discovery implicates pheromonal interactions that could further revolutionize how we control rodents!

Presenter: Emily Betz
Title: Managing powdery mildew (*Erysiphe cruciferarum*) on wasabi (*Wasabia japonica*) plants using organic pesticides
Abstract: Wasabi (*Wasabia japonica*) is a cruciferous crop grown for its valuable rhizome which is traditionally used in Japanese cuisine. All parts of the plant are edible, and growers are increasingly interested in marketing both rhizomes and leaves. Foliar pathogens, such as powdery mildew (*Erysiphe cruciferarum*), are currently negatively affecting leaf quality. Applications of Actinovate® SP (*Streptomyces lydicus*), Cueva® Copper Fungicide (Copper Octanoate), Regalia® Maxx (Reynoutria sachalinensis extract), and Rhapsody® ASOTM (Bacillus subtilis) were made at two-week intervals and percentage of leaf surface naturally infected by powdery mildew was assessed over 10 weeks. Data were converted to area under the disease progress curves (AUDPC) for each treatment. Both Cueva and Regalia significantly ($p<0.05$) reduced powdery mildew progression in two trials, while Rhapsody® significantly reduced disease progression in two out of three trials. A third trial for Cueva and Regalia is currently underway.

Presenter: Kari Zurowski
Title: Trade-offs between reproduction and disease resistance in the click beetle *Agriotes obscurus*
Abstract: Reproduction and defense against infection are both costly processes, so trade-offs between them are likely to occur, particularly if resources are limiting. We investigated possible trade-offs in the click beetle *Agriotes obscurus* beetles after challenge with the entomopathogenic

fungus *Metarhizium brunneum*. Adult *A. obscurus* were challenged with varying concentrations of *M. brunneum* and their reproduction was monitored. The timing of oviposition, as well as numbers and sizes of eggs laid, were recorded. As expected, females who were challenged with the pathogen died earlier than unchallenged insects, however, fecundity was not reduced. Differences appear to be related to when the insects started laying eggs, with challenged insects initiating oviposition earlier. This suggests a possible trade-off favouring reproduction over disease resistance.

Presenter: Pauline Deschodt
Title: Can host nutrition modulate disease outcome?
Abstract: Individual hosts are commonly challenged by multiple pathogen species. Yet, studies on insect-pathogen interactions mainly focus on interactions between a single host and a single pathogen. Two (or more) pathogens co-infecting a host may compete directly (interference) or indirectly, for resources or via the host immune system. These competitive interactions could increase or decrease host mortality, or result in no change, as well as alter the transmission of disease within the population. In insects, increased dietary protein can increase survival, to pathogens such as baculoviruses and bacteria, even when nutrition is altered post-infection. However, the role of nutrition in mixed pathogen infections is not known, but is likely to relate to the relative cost of resistance to different pathogen groups. Using the cabbage looper, *Trichoplusia ni*, its nucleopolyhedrovirus (TnSNPV) and the entomopathogenic fungus, *Beauveria bassiana*, we asked whether host nutrition could alter the outcome of a mixed infection. We challenged *T.ni* larvae with either a single pathogen species or two simultaneously; then reared the larvae on an artificial diet differing in levels of two major macronutrients, protein and digestible carbohydrate (quality) or the total amount of these two macronutrients (quantity). The results suggest that the virus and fungus respond differently to host nutritional intake, especially on different ratios of protein and carbohydrate. As expected, poor quantity diet exacerbates the negative effect of pathogen on host survival. Moreover, in co-infection, the effect of diet composition on host mortality is greater at lower pathogen doses. These results indicate that diet could be an important modulator of mixed infections.

Presenter: Dan Peach
Title: Plant essential oils express spatial repellency against mosquitoes
Abstract: We investigated the spatial repellency of several plant essential oils against *Aedes aegypti* mosquitoes. Each of lemongrass (*Cymbopogon flexuousus*) and rosemary (*Rosemariuns officinalis*) oil expressed spatial repellency, and binary combinations of several essential oils showed synergistic repellent effects on mosquitoes. Equivalent field tests support our laboratory repellency data.

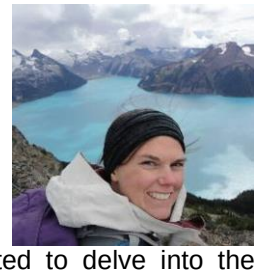
Presenter: Asim Renyard
Title: Identification and testing of the trail pheromone of the carpenter ant, *Camponotus modoc*
Abstract: Trail pheromone-containing hindgut extract of the carpenter ant *Camponotus modoc* was analyzed by coupled gas chromatographic-electroantennographic detection (GC-EAD) and GC-mass spectrometry. Testing complete and partial blends of all six antennally-active candidate pheromone components in behavioral bioassays revealed that 2,4-dimethyl-5-hexanolide is the key pheromone component eliciting trail-following behaviour in *C. modoc*.

Presenter: Danielle Hoefele
Title: Synthetic trail pheromone enhances recruitment of European fire ants to food baits
Abstract: In both laboratory and field experiments, we show that synthetic trail pheromone (3-ethyl-2,5-dimethylpyrazine) of the invasive European fire ant (EFA), *Myrmica rubra,* enhances recruitment of EFA nest mates to food baits. The application of trail pheromone technology may become an important tactic of an integrated EFA management strategy.

PPMABC Executive

President: Jen Scholefield

Jen graduated from SFU's Master of Pest Management program in April 2015, having studied interactions between various microbial control agents of insect pests. She spent the summer of 2015 working with Culex Environmental in integrated mosquito management, managing research projects in BC and Ontario. Jen is now working for ES Cropconsult as a supervisor in blueberry IPM. She is excited to delve into the practical (and outdoor) side of pest management, having spent much of her Masters in the lab infecting cabbage loopers!



Vice-President: Lucian Mircioiu

Lucian got his start in pest management more than 20 years ago at the Forest Research and Management Institute, in Brasov, Romania, where he worked as a research engineer and scientific researcher in forest protection and pest management. Before that, he had obtained his M. Sc. in Forestry (1997) and B. Sc. in Siviculture (1996) at Transilvania University in Romania. After moving to Canada, Lucian continued his studies at Simon Fraser University, where he graduated the Master of Pest Management in 2004. He continued his profession as an IPM coordinator at Bioconcept Pest Management Ltd, a 15 years old company that provides solutions for urban, agricultural and forest pests. Lucian is also a trainer and examiner for pesticide applicator certification exam in British Columbia.

Webmaster: Kari Zurowski

Kari completed her BSc (Biology Honours) at the University of the Fraser Valley in Abbotsford, BC. She is currently at SFU completing her MPM under the supervision of Dr. Jenny Cory. Kari's research concerns reproductive trade-offs in *Agriotes obscurus* click beetles.

Treasurer: Tammy McMullan

Currently a Senior Lecturer at SFU: since 1988, Tammy has taught a wide range of courses, including graduate-level field courses in pest management. Tammy has held numerous Research Assistant positions and been involved in several research projects on a wide variety of insect pests, served as Director of the BC Entomological Society, and has previously held the positions of Secretary and Student Representative.

Secretary: Heather Coatsworth

Heather completed her BSc (Zoology) at the University of Guelph, and is a currently working on her PhD at Simon Fraser University in Dr. Carl Lowenberger's laboratory. She is interested in teasing apart refractory mechanisms in mosquitoes in an effort to genetically modify them to stop the spread of disease causing viruses such as Dengue and Zika.

Membership Director: Jesse MacDonald

Jesse completed his BSc (Life and Earth Sciences) at UBC in Vancouver while working student positions in his hometown of Summerland at the Pacific Agricultural Research Centre. After graduation, he started in a technician position in the Minor Use Pesticides Program and eventually moved to the Agriculture and Agri-Food Research Centre in Agassiz, during which time he completed his MPM (Plant Pathology) on plant diseases of wasabi through SFU. He eventually transferred back to the Summerland centre and his hometown, where he continues to be involved in various pest management projects, and also grows peaches and apples commercially.

Student Representative: Pauline Deschodt

Pauline completed her BSc (Biology) at the University of Faidherbe (France), completed her Masters in Pest Management at Montpellier SupAgro (France) and is a currently working on her PhD at Simon Fraser University in Dr. Jenny Cory's lab. She is interested in microbiological control and host-pathogen interactions within the host as well as within the host population.