



# *Communication!*



**THE JOINT ANNUAL MEETING OF THE ENTOMOLOGICAL SOCIETY OF CANADA  
AND THE ENTOMOLOGICAL SOCIETY OF BRITISH COLUMBIA**

Coast Plaza Hotel, Vancouver, British Columbia  
Sunday 31 October – Wednesday 3 November, 2010



**LA RÉUNION ANNUELLE CONJOINTE DE LA SOCIÉTÉ D'ENTOMOLOGIE DU CANADA  
ET DE LA SOCIÉTÉ D'ENTOMOLOGIE DE LA COLOMBIE-BRITANNIQUE**

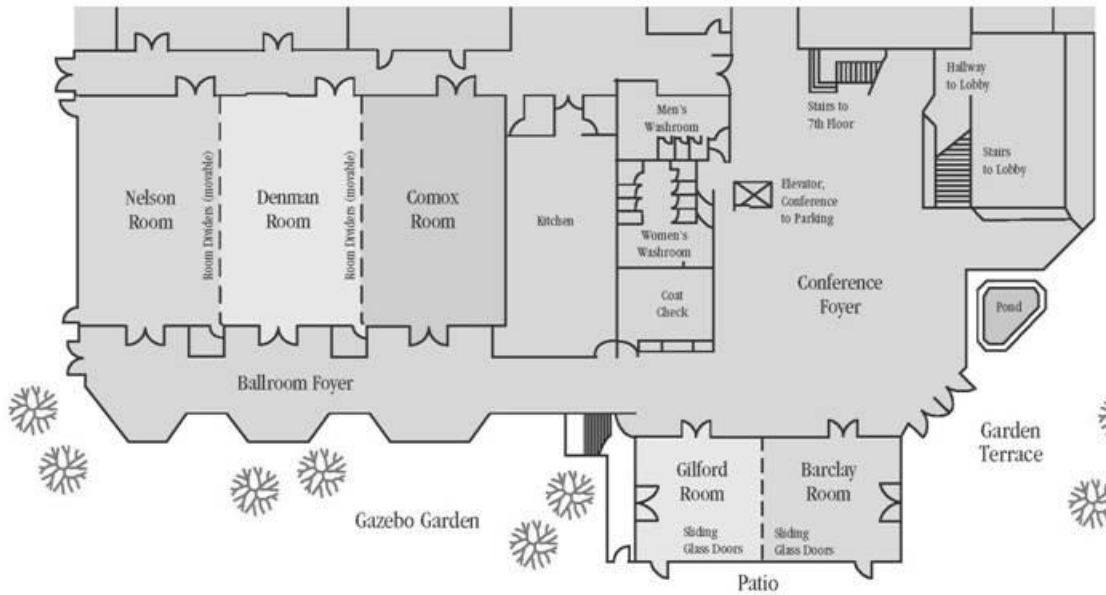
Hôtel Coast Plaza, Vancouver, Colombie-Britannique  
dimanche 31 octobre – mercredi 3 novembre 2010

# ESC JAM 2010 Program - at - a - Glance

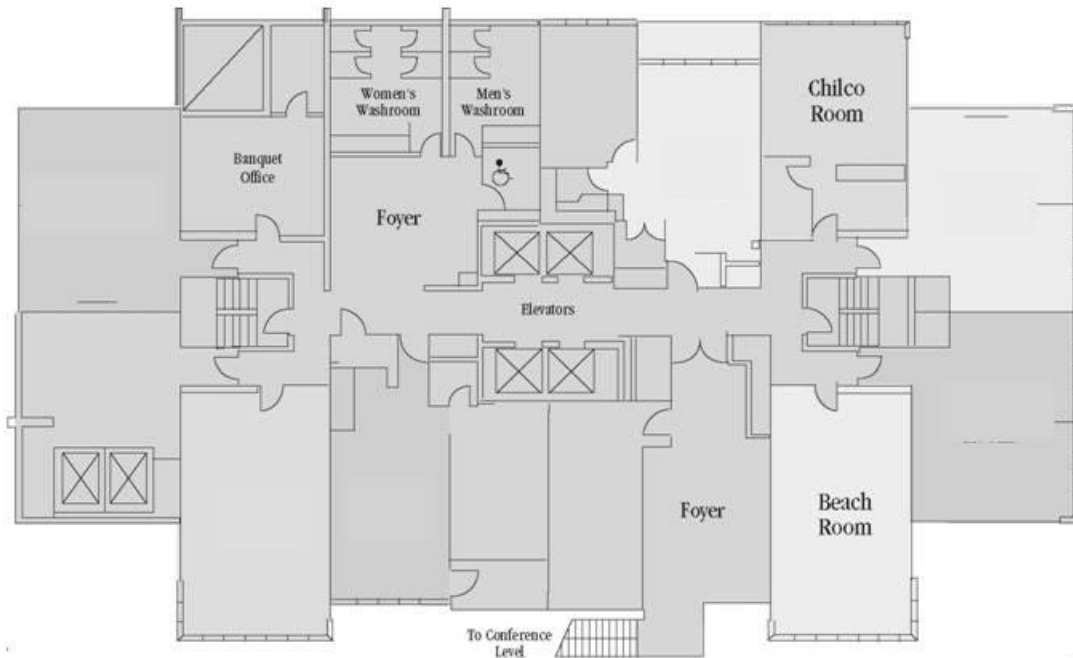
		Ballroom							
Day	Time	Nelson	Denman	Comox	Barclay/Gilford	Beach	Chico	35th Floor	
Sunday Oct 31	13:00 - 16:30	---Opening Ceremonies, Gold medal address, Penary Symposium---				Poster setup 12:00 - 22:00	A/V 9 - 1 4:30 - 8		
	16:30 - 22:00	-----Welcome Reception-----							
Monday Nov 1	8:30 - 10:00	1. PP: Acoustics	2. PP: Forestry	3. PP: Agriculture	Posters	Symp 1: Arachnology	A/V	ESC Editorial Board	
	10:00 - 10:30	Break				Break			
	10:30 - 12:00	1. PP: Acoustics, Chem Ecol	2. PP: Forestry	3. PP: Agriculture		Symp 1: Arachnology			
	12:00 - 13:30	Lunch				Lunch			
	13:30 - 15:00	4. PP: Chem Ecol, Behaviour	5. PP: Ecology	6. PP: Biological Control		Symp 2: Terry Shore Mem'l			
	15:00 - 15:30	Break				Break			
15:30 - 17:00	4. PP: Behaviour, Reproduction	5. PP: Biodiversity & Systematics	6. PP: Pollination	Symp 2: Terry Shore Mem'l					
19:30 - 22:00	-----Student Mixer-----						President's Reception		
Tuesday Nov 2	8:00 - 10:00	Symp 3: Grad Student Start time: 8:30	7. Submitted: Symbionts & vectors	Symp 4: Invertebrates	Posters	Symp 6: Winston Retrospective; Start: 8:30	A/V 7:00 am to 6:00 pm	President's Reception	
	10:00 - 10:30	Break				Break			
	10:30 - 12:00	Symp 3: Grad Student	7. Submitted: Climate & ecology	Symp 5: Community Ecology Start 10:15; End 12:15		Symp 6: Winston Retrospective			
	12:00 - 13:00	Lunch				Lunch			
	13:00 - 15:00	8. Submitted: Agriculture	9. Submitted: Chem Ecol; Biodiv. & Syst	10. Submitted: Biological Control		11. Submitted: Forestry			
	15:00 - 16:00	Break & Dedicated Poster Session				Break, Posters			
16:00 - 16:45	-----Heritage Lecture-----						ESC AGM 17:00 - 17:45 ESC Gov Board 17:45 - 18:30		
17:00 - 18:30	-----Banquet-----				Poster rem oval				
18:00 - 23:00	-----Banquet-----								
Wednesday Nov 3	8:00 - 10:00	Symp 7: MPB genomics	12. Submitted: Agriculture	Symp 8: Invasives	Symp 9: BSC Start time: 8:30	ESBC AGM ESBC Exec meeting	A/V 7 - 8 10-10:30		
	10:00 - 10:30	Break			Break				
	10:30 - 12:00	Symp 7: MPB genomics	12. Submitted: Ecology & Forestry	Symp 8: Invasives	Symp 9: BSC				
	12:00 - 13:00	Lunch			Lunch				
13:00 - 14:00									

- Plenary Sessions
- Oral presentations
- Poster presentations
- AM room
- AGMs and board meetings
- Nothing scheduled

# Coast Plaza Hotel Floor Plans



**Conference Level**



**Upper Conference Level**

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## **Greetings from the President, Entomological Society of Canada**

Welcome to Vancouver 2010! It is my great pleasure to welcome you all to the Joint Annual Meeting (JAM) of the Entomological Societies of British Columbia (ESBC) and Canada (ESC). The theme of this year's meeting is "communication" and the Local Organizing Committee has worked hard to facilitate all types of communication at this meeting. The Coast Plaza Hotel is an excellent venue to support our scientific and social sessions. The program is rich with varied symposia, contributed oral and poster presentations and outstanding student contributions. Connection with friends and colleagues is easy when you are dressed in your finest insect-themed Halloween costume!

Staging a national meeting is the result of hard work from many dedicated volunteers. I would like to thank all of the volunteers for the many hours they contributed to hosting this meeting. Particular thanks go to Bill Riel (General Meeting Chair) and Tom Lowery (ESBC President) for their leadership roles and to Ward Strong and Vince Nealis who put together the stimulating scientific program.

I am sure you will have a productive, informative and enjoyable meeting in Vancouver 2010.

Maya Evenden,                      ESC President

## **Mot de bienvenue du président de la Société d'entomologie du Canada**

Bienvenue à Vancouver 2010! J'ai le grand plaisir de vous souhaiter la bienvenue à la réunion annuelle conjointe (RAC) des sociétés d'entomologie de Colombie-Britannique (SECB) et du Canada (SEC). Le thème de la réunion de cette année est la communication, et le comité d'organisation local a travaillé très dur pour faciliter tous types de communication pendant la réunion. L'hôtel Coast Plaza est un lieu de réunion formidable pour nos sessions scientifiques et sociales. Le programme est truffé de symposia variés, de présentations orales et sous forme de poster, et de contributions étudiantes exceptionnelles. Il est facile d'interagir avec amis et collègues quand on porte son plus beau costume d'insecte pour Halloween!

L'organisation d'une réunion nationale est possible grâce au dévouement de beaucoup de volontaires. J'aimerais remercier tous les volontaires pour les nombreuses heures qu'ils ont dévoué à la réussite de cette réunion. Je remercie tout particulièrement Bill Riel (responsable principal de la réunion) et Tom Lowery (président de la SECB) pour leurs rôles de leaders, ainsi que Ward Strong et Vince Nealis qui ont mis sur pied un programme scientifique exaltant.

Je suis sûr que vous aurez une réunion productive, instructive et agréable à Vancouver 2010.

Maya Evenden,                      présidente de la SEC

## **President's Greeting, Entomological Society of British Columbia**

On behalf of the Entomological Society of British Columbia, I am pleased to welcome you to the Joint Annual Meeting of the Entomological Societies of Canada and British Columbia. The theme of this years' Annual General Meeting is 'Communication'. One might think that advances in electronic communication in its various forms would have reduced the importance of these meetings, but I believe that the opposite is true. Just as honeybees need to participate in the waggle dance in order to fully interpret the message, it is necessary on occasion to get out of the office and meet other researchers face-to-face. I'm certain that all of us have benefited from a talk or poster that we did not initially intend to see. Informal settings undoubtedly foster an exchange of information and greater collaboration. We hope that this meeting provides an opportunity for you to communicate with colleagues in an enjoyable and stimulating environment. Hosting a national meeting of this size requires a large commitment of time from numerous members of the host society. I would like to acknowledge this collective effort and especially thank Bill Riel, Conference Organizing Committee Chair and Conference Treasurer; Ward Strong, Scientific Program Committee Chair; Sheila Fitzpatrick, Local Arrangements Committee Chair; and Jim Corrigan, Program Committee Chair. I hope that you enjoy this 2010 Annual General Meeting and your stay in Vancouver.

Tom Lowery

President of ESBC

## **Mot de bienvenue du président de la Société d'entomologie de Colombie-Britannique**

Au nom de la société d'entomologie de Colombie-Britannique, j'ai le plaisir de vous souhaiter la bienvenue à la réunion annuelle conjointe des sociétés d'entomologie du Canada et de Colombie-Britannique. Le thème de la réunion de cette année est la communication. On pourrait penser que les progrès en matière de communication électronique auraient diminué l'importance de ces réunions. Je pense que le contraire est vrai. Il est parfois nécessaire de sortir du bureau pour rencontrer d'autres chercheurs en personne, de la même façon que les abeilles ont besoin de participer à une danse en rond pour décrire un message. Je suis sûr que chacun d'entre nous a pu bénéficier d'une présentation orale ou d'un poster qu'il n'a pas eu l'intention de voir initialement. Les cadres informels favorisent sans aucun doute l'échange d'information et les collaborations multiples. Nous espérons que cette réunion vous permettra de communiquer avec des collègues dans une ambiance agréable et stimulante. La préparation d'une réunion annuelle de cette ampleur nécessite un grand engagement en matière de temps de nombreux membres de la société hôte. J'aimerais souligner cet effort collectif, et remercier tout particulièrement Bill Riel, responsable du comité d'organisation et trésorier de la conférence, Ward Strong, responsable du programme scientifique, Sheila Fitzpatrick, responsable du comité d'infrastructure locale, et Jim Corrigan, responsable du comité des programmes. J'espère que vous profiterez pleinement de cette réunion annuelle et de votre séjour à Vancouver.

Tom Lowery

président de la SECB

## **Greetings from the Chair of the 2010 JAM**

On behalf of the 2010 organizing committee I wish to welcome you to Vancouver and to thank you for making the effort to attend the 2010 JAM! We have worked hard to bring you an exciting scientific program, delicious West Coast fare and an entertaining social program in the best setting we could find. We hope that, in addition to enjoying all that the conference has to offer, you will take an opportunity to enjoy the beautiful city of Vancouver as you catch up with friends and acquaintances.

Sadly, this year we are missing two pillars of the British Columbia entomological community. This past year, both Rex Kenner and Terry Shore passed away unexpectedly, and their personal and professional contributions are sorely missed. It is to them that we dedicate this conference. Please set aside a moment this week and join me in a toast to the memory of these outstanding men. They would have liked nothing more than for us to have the best time imaginable at this meeting; doing so is a fitting tribute to their lives and their accomplishments.

I sincerely hope that you have a wonderful conference and a fantastic time in Vancouver.

Bill Riel

Conference Chair

## **Mot de bienvenue du président de la RAC 2010**

Au nom du comité d'organisation 2010, je vous souhaite la bienvenue à Vancouver, et vous remercie d'avoir fait l'effort d'assister à la RAC 2010! Nous avons travaillé très dur pour vous apporter un programme scientifique palpitant, des plats de la côte-ouest délicieux, et des activités sociales dans le plus beau décor disponible. Nous espérons qu'en plus de profiter des événements liés à la conférence, vous saisissez l'occasion de profiter de la belle ville de Vancouver en renouant avec vos amis et connaissances.

Cette année, deux piliers de l'entomologie colombo-britannique sont malheureusement absents. Rex Kenner et Terry Shore sont décédés soudainement cette année, et leurs contributions personnelles et professionnelles sont grandement manquées. Nous leur dédions cette conférence. Comme moi, je vous invite cette semaine à prendre un moment pour boire à la santé de ces deux hommes exceptionnels. Ils n'auraient aimé rien de plus que de nous voir profiter pleinement de cette conférence. En faisant cela nous rendons hommage à leurs vies et contributions.

J'espère sincèrement que vous aurez une conférence stimulante et un séjour formidable à Vancouver.

Bill Riel

président de la conférence

## Schedule of Events

### **SUNDAY 31 OCTOBER**

9:00 AM – 1:00 PM; 4:30 – 8:00 PM	<i>Registration desk open</i>	Conference Foyer
9:00 AM – 1:00 PM; 4:30 – 8:00 PM	<i>Uploading presentation files</i>	Chilco Room
12:00 – 10:00 PM	<i>Poster Room Open for mounting presentations</i>	Barclay/Gilford Rooms
1:00 – 6:30 PM	<i>Silent Auction items on display</i>	Conference Foyer

### **SUNDAY 31 OCTOBER - PM**

1:00 – 1:30 PM	<b>OPENING CEREMONIES</b>	Denman/Ballroom
1:30 – 2:00 PM	<b>GOLD MEDAL ADDRESS</b>	Denman/Ballroom

Dr. Charles Vincent

MY PROFESSIONAL ALPHABET, SEASONED WITH PERSONAL REMARKS.  
MON ALPHABET PROFESSIONNEL, ASSAISONNÉ DE REMARQUES PERSONNELLES.

2:00 – 2:30 PM	<i>Refreshment Break</i>	Conference Foyer
2:30 – 4:30 PM	<b>PLENARY SYMPOSIUM</b>	Denman/Ballroom

#### **COMMUNICATION: INSECTS, SCIENTISTS AND THE PUBLIC**

Moderator: Dr. Ward Strong

Dr. Gerhard Gries

MULTIMODAL COMMUNICATION SIGNALS AND FORAGING CUES IN INSECTS AND SPIDERS

Dr. Jeremy McNeil

USING EXAMPLES OF INSECT COMMUNICATION TO COMMUNICATE SCIENCE TO THE PUBLIC

Dr. Jayne Yack

ACOUSTIC COMMUNICATION IN INSECTS: THE MESSAGE IS IN THE MEDIUM

Dr. Mark Winston

WRITING IN BEE TIME: COMMUNICATING SCIENCE TO THE PUBLIC

6:30 – 10:00 PM	<b>OPENING RECEPTION</b>	Denman/Ballroom
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## **MONDAY 1 NOVEMBER - AM**

7:00 – 8:30 AM; 10:00 – 10:30 AM; 12:00 – 1:30 PM	<i>Registration desk open</i>	Conference Foyer
7:00 AM – 6:00 PM	<i>Uploading presentation files</i>	Chilco Room
11:00 AM – 6:00 PM	<i>Silent Auction items on display</i>	Conference Foyer
10:00 – 10:30 AM	<i>Refreshment Break</i>	Conference Foyer
8:30 AM – 10:00 PM	Poster Room Open for viewing presentations	Barclay/Gilford Rooms
8:30 AM – 12:00 PM	Symposium 1 - Arachnology	Beach Room
8:30 AM – 12:00 PM	President's Prize 1 Acoustics / Chemical Ecology	Nelson Room
8:30 AM – 12:00 PM	President's Prize 2 - Forestry	Denman Room
8:30 AM – 12:00 PM	President's Prize 3 - Agriculture	Comox Room

## **MONDAY 1 NOVEMBER - PM**

3:00 – 3:30 PM	<i>Refreshment Break</i>	Conference Foyer
12:00 – 2:00 PM	ESC Editorial Board meeting	Mountain Suite 35 <sup>th</sup> Floor
1:30 – 5:00 PM	Symposium 2 - Terry Shore Memorial	Beach Room
1:30 – 5:00 PM	President's Prize 4 Chemical Ecology / Behaviour / Reproduction	Nelson Room
1:30 – 5:00 PM	President's Prize 5 Ecology / Biodiversity & Systematics	Denman Room
1:30 – 5:00 PM	President's Prize 6 Biological Control / Pollination / Ecology	Comox Room
7:30 – 10:00 PM	<b>STUDENT MIXER</b> (Students only)	Denman/Ballroom
7:30 – 10:00 PM	ESC President's Reception (By invitation only)	English Bay Suite 35 <sup>th</sup> Floor

## **TUESDAY 2 NOVEMBER - AM**

7:00 – 8:30 AM	<i>Registration desk open</i>	Conference Foyer
7:00 AM – 5:00 PM	<i>Uploading presentation files</i>	Chilco Room
10:00 AM – 1:00 PM	<u><i>Bids close on Silent Auction items</i></u>	Conference Foyer
10:00 – 10:30 AM	<i>Refreshment Break</i>	Conference Foyer
8:00 AM – 4:00 PM	Poster Room Open for viewing presentations	Barclay/Gilford Rooms
8:00 AM – 12:00 PM	Submitted Papers 7 Symbionts & Vectors / Climate & Ecology	Denman Room
8:30 AM – 12:00 PM	Symposium 3 - Graduate Students	Nelson Room
8:00 – 10:00 AM	Symposium 4 - Invertebrate Conservation	Comox Room
10:15 AM – 12:15 PM	Symposium 5 – Insect Community Ecology	Comox Room
8:30 AM – 12:00 PM	Symposium 6 Mark Winston Research Retrospective	Beach Room

## **TUESDAY 2 NOVEMBER - PM**

1:00 – 3:00 PM	Submitted Papers 8 – Agriculture	Nelson Room
1:00 – 3:00 PM	Submitted Papers 9 Chemical Ecology / Biodiversity & Systematics	Denman Room
1:00 – 3:00 PM	Submitted Papers 10 – Biological Control	Comox Room
1:00 – 3:00 PM	Submitted Papers 11 – Forestry	Beach Room
3:00 – 4:00 PM	<b>DEDICATED POSTER SESSION</b> / <i>Refreshment Break</i> Barclay/Gilford Rooms - Conference Foyer	
3:00 – 4:00 PM	<u><i>Silent Auction items pickup</i></u>	Conference Foyer
5:00 – 10:00 PM	<u><i>All Posters must be taken down</i></u>	Barclay/Gilford Rooms

## **TUESDAY 2 NOVEMBER - PM**

4:00 – 4:45 PM	<b>ESC HERITAGE LECTURE</b>	Denman/Ballroom
	Dr. Staffan Lindgren	
	TRIPS, TRAPS, TRIUMPHS AND TRIBULATIONS: A JOURNEY FROM CHILDHOOD DREAMS TO A DREAM-CAREER IN ENTOMOLOGY	
5:00 – 5:45 PM	<b>ESC ANNUAL GENERAL MEETING</b>	Beach Room
5:45 – 6:30 PM	<b>ESC GOVERNING BOARD MEETING</b>	Beach Room
6:00 – 7:00 PM	<i>Pre-Banquet Refreshments</i>	Denman/Ballroom
7:00 – 8:30 PM	<b>ESC BANQUET AND AWARDS</b>	Denman/Ballroom
8:30 – 11:00 PM	<b>AN EVENING OF THE BLUES</b> <i>With Mark Hummel and the Blues Survivors</i>	Denman/Ballroom

## **WEDNESDAY 3 NOVEMBER - AM**

	<i>Uploading presentation files</i>	Chilco Room
7:00 – 8:00; 10:00 – 10:30 AM		
10:00 – 10:30 AM	<i>Refreshment Break</i>	Conference Foyer
8:00 AM – 12:00 PM	Submitted Papers 12 Agriculture / Ecology / Forestry	Denman Room
8:00 AM – 12:00 PM	Symposium 7 - MPB Genomics	Nelson Room
8:00 AM – 12:00 PM	Symposium 8 Dealing with Invasive Pests	Comox Room
8:30 AM – 12:00 PM	Symposium 9 Biological Survey of Canada	Barclay/Gilford Rooms

## **WEDNESDAY 3 NOVEMBER - PM**

12:00 – 1:00 PM	<b>ESBC ANNUAL GENERAL MEETING</b>	Barclay/Gilford Rooms
1:00 – 2:00 PM	<b>ESBC EXECUTIVE MEETING</b>	Barclay/Gilford Rooms

## Scientific Program – Symposia, Contributed Papers, President’s Prize and Poster Sessions

**SUNDAY, OCTOBER 31**

**13:00 - 14:00**

**BALLROOM**

OPENING CEREMONIES

MODERATOR: BILL RIEL

13:00 WELCOME AND AWARDS PRESENTATION

13:30 **Vincent, C.**

**GOLD MEDAL ADDRESS:**

MY PROFESSIONAL ALPHABET, SEASONED WITH PERSONAL REMARKS

MON ALPHABET PROFESSIONNEL, ASSAISONNÉ DE REMARQUES PERSONNELLES

14:00 **Break**

**SUNDAY, OCTOBER 31**

**14:30 - 16:30**

**BALLROOM**

PLENARY SYMPOSIUM

COMMUNICATION: INSECTS, SCIENTISTS AND THE PUBLIC

MODERATOR: WARD STRONG

14:30 **Gries, G.**

MULTIMODAL COMMUNICATION SIGNALS AND FORAGING CUES IN INSECTS AND SPIDERS

15:00 **McNeil, J.N.**

USING EXAMPLES OF INSECT COMMUNICATION TO COMMUNICATE SCIENCE TO THE PUBLIC

15:30 **Yack, J.**

ACOUSTIC COMMUNICATION IN INSECTS: THE MESSAGE IS IN THE MEDIUM

16:00 **Winston, M.**

WRITING IN BEE TIME: COMMUNICATING SCIENCE TO THE PUBLIC

**MONDAY, NOVEMBER 1**

**8:30 - 12:00**

**NELSON ROOM**

PRESIDENT'S PRIZE ORAL COMPETITION, SESSION 1

ACOUSTICS, CHEMICAL ECOLOGY

MODERATOR: ART STOCK

8:30 **Bura, V.L.** and J.E. Yack

DEFENSIVE SOUNDS IN BOMBYCOIDEA CATERPILLARS

8:45 **Danci, A.,** S. Takács, C. Inducil, P. Schaefer and G. Gries

DO MALES OF THE PUPAL PARASITOID *PIMPLA DISPARIS* (HYMENOPTERA: ICHNEUMONIDAE) EXPLOIT VIBRATORY AND SEMIOCHEMICAL CUES FROM PARASITIZED HOST PUPAE TO FIND THEM AND TO TIME THE EMERGENCE OF A PROSPECTIVE MATE?

9:00 **Fournier, J-P.** and J. Yack

IF A BIRD FLIES IN THE FOREST, DOES ANYONE HEAR IT?

9:15 **Matheson, S.** and J. Yack

VIBRATORY SIGNALLING IN COLONIAL EARLY INSTAR CATERPILLARS OF THE ARCHED HOOK TIP MOTH, *DREPANA ARCUATA* (DREPANIDAE): COOPERATION OR COMPETITION?

9:30 **Rowland, E.,** P. Belton, P. W. Schaefer and G. Gries

INTRASPECIFIC ACOUSTIC COMMUNICATION AND FUNCTIONALITY OF THE TYMPANATE EAR OF THE EUROPEAN GYPSY MOTH, *LYMANTRIA DISPAR* (L.) (LEPIDOPTERA: NOCTUIDAE: LYMANTRIINAE)

- 9:45 **Scott, J.L.** and J.E. Yack  
THE EVOLUTION OF RITUALIZED VIBRATION-MEDIATED TERRITORIALITY IN CATERpillARS (DREPANIDAE)
- 10:00 Break**
- 10:30 **Sivalingham, S.**, M.L. Reid and J.E. Yack  
ACOUSTIC COMMUNICATION OF THE BARK BEETLE, *IPS PINI* (COLEOPTERA: SCOLYTINAE)
- 10:45 **Teasdale, C.**, S. Takács, G. Judd and G. Gries  
DOES SOUND PLAY A ROLE IN THE SEXUAL COMMUNICATION OF THE RASPBERRY CROWN BORER (LEPIDOPTERA: SESIIDAE)
- 11:00 **Vibert, S.** and G. Gries  
A MEAL OR A MALE? A COMPARISON OF MALE AND PREY VIBRATIONS IN BLACK WIDOWS AND HOBO SPIDERS
- 11:15 **Aurelian, V.M.**, M.L. Evenden and G.J.R. Judd  
CAPTURE OF NON-TARGET ARTHROPODS IN SEMIOCHEMICAL-BAITED TRAPS FOR THE APPLE CLEARWING MOTH *SYNANTHEDON MYOPAEFORMIS* (LEPIDOPTERA: SESIIDAE): POTENTIAL FOR THE DEVELOPMENT OF A BIODIVERSITY ASSESSMENT TOOL
- 11:30 **Eby, C.**, M. Gardiner, R. Gries, G. Judd and G. Gries  
MMMM MILKWEED! UNRAVELING THE COMPLEXITY OF OLFACTORY AND VISUAL CUES THAT ATTRACT THE APPLE CLEARWING MOTH, *SYNANTHEDON MYOPAEFORMIS*, TO NECTAR-RICH MILKWEED PLANTS
- 11:45 **Du, J.** and N. J. Holliday  
RESPONSES OF *ALEOCHARA BILINEATA* AND *ALEOCHARA BIPUSTULATA* (COLEOPTERA: STAPHYLINIDAE) TO DIMETHYL DISULPHIDE

## MONDAY, NOVEMBER 1

8:30 - 12:00

DENMAN ROOM

PRESIDENT'S PRIZE ORAL COMPETITION, SESSION 2

FORESTRY

MODERATOR: LORRAINE MACLAUCHLAN

- 8:30 **Brodersen, G.**, R. Lapointe, G. Thurston, C. Lucarotti and D. Quiring  
EVALUATION OF THE EFFICACY OF TWO NUCLEOPOLYHEDROVIRUSES AGAINST WHITEMARKED TUSsock LARVAE
- 8:45 **Chubaty, A.M.**  
ENERGY RESERVES MODULATE HOST ACCEPTANCE DECISIONS IN MOUNTAIN PINE BEETLES
- 9:00 **Fraser, J.D.**, T.R. Clarke, C.I. Keeling, J. Bohlmann and D.P.W. Huber  
COLD TOLERANCE AND SEASONAL GENE EXPRESSION IN *DENDROCTONUS PONDEROSAE*
- 9:15 **Khadempour, L.**, D.J. Jack, J. Bohlmann and C. Breuil  
SPECIES-SPECIFIC PRIMERS AND QUANTITATIVE PCR FOR MONITORING MOUNTAIN PINE BEETLE FUNGAL ASSOCIATES
- 9:30 **Pitt, C.**, S.J. Seybold, A.T. Thommasen and D.P.W. Huber  
POSSIBLE CHIMERIC SIGNALS IN BARK BEETLE ENZYMES – A MECHANISM FOR DUAL SUBCELLULAR TARGETING OF CYTOCHROMES P450
- 9:45 **Strohm, S.**, M.L. Reid and R.C. Tyson  
MODELLING THE SPREAD AND MANAGEMENT OF MOUNTAIN PINE BEETLE IN BANFF NATIONAL PARK
- 10:00 Break**
- 10:30 **Flaherty, L.**, J. Sweeney, D. Pureswaran and D. Quiring  
EFFECT OF TOP-DOWN AND BOTTOM-UP FACTORS ON THE PERFORMANCE OF THE EXOTIC BROWN SPRUCE LONGHORN BEETLE, *TETROPIUM FUSCUM* (FABR.), IN NOVA SCOTIA

- 10:45 **Jennings, R.G.**  
MITE-INSECT AND FUNGAL-INSECT INTERACTIONS RESULTING FROM THE INTRODUCTION OF THE BROWN SPRUCE LONGHORN BEETLE, *TETROPIUM FUSCUM* (FABR.) INTO NOVA SCOTIA
- 11:00 **Oghiakhe, S.** and N.J. Holliday  
EVALUATION OF INSECTICIDES FOR CONTROLLING OVER-WINTERING NATIVE ELM BARK BEETLE, *HYLURGOPINUS RUFIPES*, IN MANITOBA
- 11:15 **Veilleux, J.** and N.J. Holliday  
BIONOMICS OF THE BANDED ELM BARK BEETLE, *SCOLYTUS SCHEVYREWI*, IN SASKATCHEWAN AND MANITOBA
- 11:30 **Nixon, A.N.** and J. Roland  
EXPERIMENTAL ASSESSMENT OF PREDATION AND PARASITISM ON FOREST TENT CATERPILLAR
- 11:45 **Whitehouse, C.,** W. Strong and M. Evenden  
TRADE-OFFS BETWEEN LONGEVITY AND REPRODUCTION IN *DIORYCTRIA ABIETIVORELLA* GROTE (LEPIDOPTERA: PYRALIDAE)

## MONDAY, NOVEMBER 1

8:30 - 12:00

COMOX ROOM

PRESIDENT'S PRIZE ORAL COMPETITION, SESSION 3

AGRICULTURE

MODERATOR: KENNA MACKENZIE

- 8:30 **Blake, A. J.,** L. M. Dosdall and B. A. Keddie  
THE SYSTEMIC SPATIAL RELATIONSHIPS AMONG SOIL AND PLANT CHARACTERISTICS AND THE DISTRIBUTION OF *CEUTORHYNCHUS OBSTRICTUS* (COLEOPTERA: CURCULIONIDAE) AND ITS PARASITOIDS
- 8:45 **Peach, D.A.H.,** S.M. Fitzpatrick and J. Huber  
SEASONAL ABUNDANCE OF HYMENOPTERAN PARASITOIDS FROM CRANBERRY TIPWORM, *DASINEURA OXYCOCCANA*, COLLECTED FROM CRANBERRY, *VACCINIUM MACROCARPON*, IN PITT MEADOWS, BRITISH COLUMBIA
- 9:00 **Vafaie, E.V.,** S.M. Fitzpatrick and J.S. Cory  
CAN WE USE GREEN PEACH APHIDS TO AUGMENT PARASITOIDS TO MANAGE APHIDS ON Highbush BLUEBERRIES IN BC?
- 9:15 **Manickam, L.,** D.S. Jayas, P.G. Fields and N.D.G. White  
EFFECTS OF LOW AND HIGH TEMPERATURES ON COW PEA BEETLE, *CALLOSOBRUCHUS MACULATUS* (FAB.) (COLEOPTERA: BRUCHIDAE) IN CHICKPEA
- 9:30 **Mori, B.A.,** J. Otani, C. Yoder and M.L. Evenden  
DEVELOPMENT OF A PHEROMONE-BASED MONITORING TOOL FOR *COLEOPHORA DEAURATELLA* (LEPIDOPTERA: COLEOPHORIDAE): RELATIONSHIPS BETWEEN PHEROMONE TRAP CATCH, LARVAL DENSITY AND DAMAGE LEVELS
- 9:45 **Nagalingam, T.** and N.J. Holliday  
*LYGUS LINEOLARIS* INJURY TO NAVY BEANS (*PHASEOLUS VULGARIS* L.) IN THE POD SET AND FILL (R4–R5) STAGE
- 10:00 Break**
- 10:30 **Grigg, K.,** C. Scott-Dupree, I. Scott, R. Harris and K. Carter  
TOLERANCE OF ONTARIO CODLING MOTH, *CYDIA POMONELLA* (L.) POPULATIONS TO REGISTERED INSECTICIDES
- 10:45 **Joshi, N.K.,** L.A. Hull, E.G. Rajotte, G. Krawczyk and K. Naithani  
CODLING MOTH FLIGHT MODELS DIFFER BETWEEN COMMERCIAL AND ABANDONED APPLE ORCHARDS
- 11:00 **Machial, C.** and M. Isman  
ESSENTIAL OILS AND THEIR POTENTIAL FOR THE CONTROL OF *CHORISTONEURA ROSACEANA*, *TRICHOPLUSIA NI*, *DYSAPHIS PLANTAGINEA*, AND *MYZUS PERSICAE*
- 11:15 **Mohan, M.,** K. McNutt and G.C. Cutler  
EFFECT OF SUBLETHAL DOSES OF IMIDACLOPRID AND SPIROTETRAMAT ON GREEN PEACH APHID, *MYZUS PERSICAE*

- 11:30 **Suthisut, D.**, P. Fields and A. Chandrapatya  
FUMIGATION TOXICITY OF ESSENTIAL OILS FROM THREE THAI PLANTS AGAINST A TWO STORED-PRODUCT INSECTS AND A PARASITOID
- 11:45 **Morales-Rodriguez, A.**, A. Ospina, P. Bunger, M. Ivie and K. Wanner  
IDENTIFYING AND SAMPLING THE WIREWORM (COLEOPTERA: ELATERIDAE) SPECIES COMPLEX INFESTING WHEAT AND BARLEY CROPS IN MONTANA

## MONDAY, NOVEMBER 1

8:30 - 12:00

BEACH ROOM

SYMPOSIUM 1

ARACHNOLOGY

ORGANIZER: ROBB BENNETT

- 8:30 **Royaute, R.**, C. Buddle and C. Vincent  
SPIDER PERSONALITY: IMPLICATIONS AND PERSPECTIVES FOR AGROECOLOGY
- 9:00 **Proctor, H.C.**  
SEXUAL CONFLICT AND THE EVOLUTION OF SPERM TRANSFER IN MITES (ACARI)
- 9:30 **Wood, H. R.** Gillespie, C. Griswold and D.O. Elias  
EVOLUTION OF STEALTH *VERSUS* SPEED STRATEGIES OF PREY CAPTURE IN PELICAN AND TRAP-JAW SPIDERS (ARANEAE: ARCHEIDAE, MECYSMAUCHENIIDAE)
- 10:00 **Break**
- 10:30 **Avilés, L.**  
INTRINSIC AND EXTRINSIC FACTORS IN SOCIAL EVOLUTION AND THE GEOGRAPHICAL DISTRIBUTION OF SPIDER SOCIALITY
- 11:00 **Uetz, G.W.**  
MULTIMODAL SIGNALING BEHAVIOR OF WOLF SPIDERS (LYCOSIDAE) IN A COMPLEX ENVIRONMENT
- 11:30 **Mason, A.C.**, D.O. Elias and W.P. Maddison  
COMPLEX SIGNALS: WHAT DO SPIDERS HAVE TO SAY?

## MONDAY, NOVEMBER 1

13:30 - 17:00

NELSON ROOM

PRESIDENT'S PRIZE ORAL COMPETITION, SESSION 4 CHEMICAL ECOLOGY, BEHAVIOUR, REPRODUCTION

MODERATOR: YASMIN AKHTAR

- 13:30 **Woodbury, N.** and G. Gries  
FIREBRATS (*THERMOBIA DOMESTICA*) DEPOSIT AND RESPOND TO MICROBIAL AGGREGATION SIGNALS
- 13:45 **Zahradnik, T.**, W. Strong, R. Bennett, A. Kuzmin, S. Takács and G. Gries  
ATTRACTION CUES OF DOUGLAS-FIR CONE GALL MIDGES IN SEED ORCHARDS
- 14:00 **Ablard, K.**, R. Gries, G. Khaskin, S. Fairhurst, G. Andersen, P.W. Schaefer and G. Gries  
MECHANISMS AND FUNCTIONS OF PRE- AND POST-COPULATORY RITUALS OF THE PARASITOID WASP *OEOENCYRTUS KUVANA* (HYMENOPTERA: ENCYRTIDAE)
- 14:15 **Cook, M.A.**, S. M. Fitzpatrick and B. Roitberg  
HOST ASSOCIATED DIFFERENTIATION IN PEST PHENOLOGY AND REPRODUCTIVE BEHAVIOUR OF *DASINEURA OXYCOCCANA* (DIPTERA: CECIDOMYIIDAE) BETWEEN POPULATIONS ON BLUEBERRY AND CRANBERRY
- 14:30 **Lessard, E.** and G. Boivin  
FEMALE'S PHYSIOLOGICAL CONDITIONS AND HOST-FEEDING BEHAVIOUR IN AN EGG PARASITOID *TRICHOGRAMMA EUPROCTIDIS*

- 14:45 **Peterson, J.H.** and B.D. Roitberg  
NON-TRADITIONAL MATERNAL NEST DEFENCE RELATED TO NEST STATE
- 15:00 Break**
- 15:30 **Bannerman, J.A.**, D.G. Gillespie and B.D. Roitberg  
THE IMPACT OF HEAT WAVES ON APHID-PARASITOID INTERACTIONS AND PARASITOID PERFORMANCE
- 15:45 Roitberg, B. and **J. Reid**  
BITE OR FLIGHT - THE FITNESS TRADEOFF FOR MALARIA VECTOR *ANOPHELES GAMBIAE*
- 16:00 **Abraham, B.** and F.F. Hunter  
DOES A MALE MOSQUITO'S SUGAR DIET AFFECT VITELLOGENESIS IN HIS MATE?
- 16:15 **Somjee, U.**, K. Ablard, B. Crespi, P.W. Schaefer and G. Gries  
LOCAL MATE COMPETITION IN THE SOLITARY PARASITOID WASP *OEENCYRTUS KUVANAE*
- 16:30 **Durocher-Granger, L.**, V. Martel and G. Boivin  
NUMBER AND SIZE OF GAMETES IN THE EGG PARASITOID *TRICHOGRAMMA EUPROCTIDIS*: AN EFFECT ON SPERM AND LARVAL COMPETITION?
- 16:45 **Cockburn, S.** and S. Perlman  
ECOLOGY OF A BACTERIAL SYMBIONT THAT RESCUES FLIES FROM NEMATODE-INDUCED STERILITY

## MONDAY, NOVEMBER 1

13:30 - 17:00

DENMAN ROOM

PRESIDENT'S PRIZE ORAL COMPETITION, SESSION 5

ECOLOGY, BIODIVERSITY & SYSTEMATICS

MODERATOR: LEO RANKIN

- 13:30 **Ethier, J.** and E. Despland  
INTRA-POPULATION VARIATION IN WING COLOUR AND PATTERNS IN THE *MALACOSOMA DISSTRIA* MOTH
- 13:45 **Horton, S.**  
IDENTIFYING THE LOCATIONS, MOVEMENT AND HABITAT OF THE EUROPEAN FIRE ANT, *MYRMICA RUBRA*; AN INVASIVE SPECIES IN HALIFAX, NOVA SCOTIA
- 14:00 **Illerbrun, K.** and Roland, J.  
DIFFERENTIAL PATTERNS OF *PARNASSIUS SMINTHEUS* HERBIVORY ACROSS AN ALPINE MEADOW GRADIENT: EFFECTS OF TREELINE, OVIPOSITION AND SNOW-COVER
- 14:15 **Kharouba, H.M.**, J.T. Kerr and M. Vellend  
PHENOLOGICAL RESPONSES OF CANADIAN BUTTERFLY SPECIES TO RECENT CLIMATE CHANGES
- 14:30 **McCann, S.**, T. Jones, S. O'Donnell and G. Gries  
RATES OF WASP NEST PREDATION BY THE RED-THROATED CARACARA, *IBYCTER AMERICANUS*, A FALCONID SPECIALIST PREDATOR OF NEOTROPICAL SOCIAL WASPS
- 14:45 **Reeh, K.W.** and F.F. Hunter  
THE DISTRIBUTION OF *IXODES SCAPULARIS* SAY (ACARI: Ixodidae) WITHIN SOUTHERN ONTARIO, PREVALENCE OF *BORRELIA BURGENDORFERI* S.L., AND COMPARISON OF CO1 AND 16S SEQUENCES TO DETERMINE GEOGRAPHIC ORIGIN
- 15:00 Break**
- 15:30 **NO PRESENTATION SCHEDULED**
- 15:45 **deWaard, J.R.**, J-F. Landry, and L.M. Humble  
MOLECULAR PHYLOGENIES AND DNA BARCODES: TOOLS FOR FOREST BIODIVERSITY SCIENCE



- 16:00 **Lumley, L.** and F. Sperling  
RELATIVE UTILITY OF MICROSATELLITES, MITOCHONDRIAL DNA, AND ADAPTIVE TRAITS FOR SPECIES IDENTIFICATION IN THE SPRUCE BUDWORM (*CHORISTONEURA FUMIFERANA*) SPECIES COMPLEX
- 16:15 **Schwarzfeld, M.D.** and F.A.H. Sperling  
*OPHION* (ICHNEUMONIDAE) OF WESTERN CANADA: MOLECULES, MORPHOLOGY AND SPECIES DELIMITATION IN A TAXONOMICALLY CHALLENGING GENUS
- 16:30 **Kits, J.H.** and S.A. Marshall  
WING REDUCTION IN THE ARCHIBORBORINI (DIPTERA: SPHAEROCERIDAE): A PHYLOGENETIC PERSPECTIVE
- 16:45 **Zappia, S.** and B. Roitberg  
BUDGETING FOR ENERGY. HOW *ANOPHELELS GAMBIAE* MOSQUITOS BEHAVE WHEN CONFRONTED WITH AN UNOBTAINABLE HOST

## MONDAY, NOVEMBER 1

13:30 - 17:00

COMOX ROOM

PRESIDENT'S PRIZE ORAL COMPETITION, SESSION 6

BIOLOGICAL CONTROL, POLLINATION

MODERATOR: JUDY MYERS

- 13:30 **Keever, C.**, J.H. Myers and J.S. Cory  
WHO IS CONTROLLING KNAPWEED? AN INVESTIGATION OF *LARINUS* SP. A SUCCESSFUL BIOLOGICAL CONTROL OF KNAPWEED IN BC
- 13:45 **Maguire, D.Y.**, R. Sforza and S.M. Smith  
ALLEE EFFECT, HERBIVORY, AND BIOCONTROL IMPLICATIONS FOR INVASIVE SWALLOW-WORTS
- 14:00 **Moffat, C.E.**, J. Pither, R.G. Lalonde, D. Ensing, G. Grosskopf-Lachat and R.A. De Clerck-Floate  
PREDICTING THE ECOLOGICAL HOST RANGE AND ESTABLISHMENT OF THE GALL WASP *AULACIDEA PILOSELLAE* (HYMENOPTERA: CYNIPIDAE), A PROPOSED BIOLOGICAL CONTROL AGENT OF INVASIVE ALIEN HAWKWEEDS
- 14:15 **Stephens, A.E.A.** and J.H. Myers  
EARLY SEASON FEEDING BY *LARINUS MINUTUS*: INFLUENCE ON THE NEXT GENERATION AND ITS COMPETITOR
- 14:30 **Abram, P.K.**, T. Haye, P.G. Mason, N. Cappuccino, G. Boivin and U. Kuhlmann  
WHAT IS THE POTENTIAL FOR CLASSICAL BIOLOGICAL CONTROL OF THE INVASIVE SWEDE MIDGE IN CANADA USING ITS PARASITIDS FROM EUROPE?
- 14:45 **Andreassen, L.**, U. Kuhlmann, P.G. Mason and N.J. Holliday  
ASSESSMENT OF *ALEOCHARA BIPUSTULATA* (DIPTERA: STAPHYLINIDAE) AS AN ADDITIONAL MORTALITY FACTOR OF *DELIA RADICUM* (DIPTERA: ANTHOMYIIDAE) EGGS IN PRAIRIE CANOLA
- 15:00 Break**
- 15:30 **NO PRESENTATION SCHEDULED**
- 15:45 **Comeau, C.**, J.-P. Privé, and G. Moreau  
LIFE UNDERCOVER: ASSESSING THE ECOLOGICAL IMPACTS OF REFLECTIVE GROUNDCOVERS THROUGH CHANGES IN GROUND BEETLE (COLEOPTERA: CARABIDAE) ASSEMBLAGES
- 16:00 **Gillespie, S.G.**  
DO PARASITES OF BUMBLE BEES IMPACT POLLINATION SERVICE?
- 16:15 **Van Haga, A.**, B.A. Keddie and S.F. Pernal  
THE PATHOLOGY OF CHALKBROOD DISEASE IN HONEY BEE COLONIES
- 16:30 **Williams, G.**, D. Tarpy, D. vanEngelsdorp, M.-P. Chauzat, D. Cox-Foster, K. Delaplane, P. Neumann, J. Pettis, R. Rogers and D. Shutler  
COLONY COLLAPSE DISORDER IN CONTEXT

- 16:45 **Wilson, J.B.**, R.C. Tyson and W.D. Lane  
CONSERVATION OF WILD BEE POPULATIONS: MODELLING WILD AND DOMESTIC BEE DISTRIBUTIONS IN AGRICULTURAL LANDSCAPES

## MONDAY, NOVEMBER 1

13:30 - 17:00

**BEACH ROOM**  
TERRY SHORE MEMORIAL

SYMPOSIUM 2

ORGANIZERS: BILL RIEL AND PETER HALL

- 13:30 **Riel, B.** and P. Hall  
WELCOME AND INTRODUCTORY REMARKS
- 13:35 **McLean, J.A.**  
STARTING DOWN THE RESEARCH ROAD
- 14:00 **Lindgren, B.S.**  
IS PHEROMONE-BASED MASS TRAPPING A REALISTIC MANAGEMENT-ALTERNATIVE FOR BARK BEETLES?
- 14:30 **Safranyik, S.**  
DEVELOPMENT AND SURVIVAL OF THE SPRUCE BEETLE IN STUMPS AND WINDFALL IN CENTRAL BRITISH COLUMBIA
- 15:00 Break**
- 15:30 **Carroll, A.**  
LESSONS LEARNED FROM AN UNPRECEDENTED OUTBREAK: THE MOUNTAIN PINE BEETLE IN WESTERN NORTH AMERICA
- 16:00 **Fall, A.**, T. Shore and B. Riel  
APPROACHES TO MOUNTAIN PINE BEETLE RISK ASSESSMENT
- 16:30 Shore, T., S. Taylor and **A. Stock**  
POSSIBLE ELEMENTS OF A HAZARD RATING SYSTEM FOR THE WESTERN BALSAM BARK BEETLE, *DRYOCOETES CONFUSUS* SWAINE

## TUESDAY, NOVEMBER 2

8:00 - 12:00

**DENMAN ROOM**

SUBMITTED ORAL PRESENTATIONS, SESSION 7

SYMBIONTS & VECTORS, CLIMATE & ECOLOGY

MODERATOR: VINCE NEALIS

- 8:00 **Olivier, C.**, B. Galka, J. Saguez, J. Lasnier, C. Vincent, L. Stobbs and T. Lowery  
WHY PHYTOPLASMA INFECTION IN LEAFHOPPER POPULATION IS ONLY CORRELATED WITH GRAPEVINE YELLOW INCIDENCE IN VINEYARDS FROM QUÉBEC?
- 8:15 **Olivier, C.**, B. Galka, K. Floate, S. Perlman, T. Dumonceau and E. Zchori-Fein  
IDENTIFICATION OF SYMBIONTS IN THE ASTER LEAFHOPPER, *MACROSTELUS QUADRILINEATUS*, THEIR ASSOCIATION WITH PHYTOPLASMA AND THEIR GEOGRAPHICAL DISTRIBUTION IN CANADA
- 8:30 **Saguez, J.**, C. Olivier, B. Galka, J. Lasnier, P. Giordanengo and C. Vincent  
FEEDING BEHAVIOR OF *ERYTHRONEURA* SPECIES (CICADELLIDAE), POTENTIAL VECTORS OF ASTER YELLOWS ON GRAPEVINE
- 8:45 **Perlman, S.J.** and A. Behar  
EVOLUTION OF A *RICKETTSIA* SYMBIONT INFECTING THE COMMON STORED GRAIN PEST, *LIPOSCELIS BOSTRYCHOPHILA* (PSOCOPTERA: LIPOSCELIDAE)
- 9:00 **Leighton, B.J.**, B.D. Roitberg, P. Belton and C.A. Lowenberger  
HOST ANTIBODIES IN MOSQUITO BLOOD MEALS: A POTENTIAL TOOL TO DETECT AND MONITOR INFECTIOUS DISEASE IN WILDLIFE

- 9:15 **Lowenberger, C.**, R. Ursic, G. Jaramillo and C. Ocampo.  
IMMUNE RESPONSES OF *Aedes aegypti* TO DENGUE VIRUS: HOW DOES THE VIRUS ESCAPE HOST RESPONSES?
- 9:30 **Pelletier, Y.** and X. Nie  
APHID VECTORS OF POTATO VIRUS Y; BEHAVIOUR AND DISPERSAL
- 9:45 **Lamb, R.J.**, P. MacKay and A. Alyokhin  
IS POPULATION VARIABILITY STABLE? THREE APHID SPECIES COLONIZING POTATOES OVER SIXTY YEARS
- 10:00 Break**
- 10:30 **Delisle, J.**, L. Royer and A. Labrecque  
WHY BOTHER WITH COLD-HARDINESS OF HEMLOCK LOOPER (HL) EGGS, IF WINTERS ARE GETTING WARMER?  
COLD-HARDINESS OF HEMLOCK LOOPER (HL) EGGS IN WARMER WINTERS
- 10:45 **Royer, L.**, J. Delisle and A. Labrecque  
DOES THE TIMING OF OVIPOSITION AFFECT EGG SURVIVAL IN HEMLOCK LOOPER (HL): AN OBLIGATORY UNIVOLTINE HERBIVORE?
- 11:00 **Walter, D.E.**  
REDISCOVERING A LOST MITE: BARCODES & BIODIVERSITY SURVEYS
- 11:15 **Dosdall, L.M.**, M. Furlong and M. Zalucki  
DEVELOPMENTAL BIOLOGY OF THE DIAMONDBACK MOTH PARASITOID *Diadegma semiclausum* (HYMENOPTERA: ICHNEUMONIDAE) IS AFFECTED BY TEMPERATURE AND HOST PLANT SPECIES
- 11:30 **Roland, J.** and S. Matter  
INCREASED CLIMATE VARIABILITY REDUCES POPULATION GROWTH: ALPINE *Parnassius smintheus* BUTTERFLIES AND THE PACIFIC DECADAL OSCILLATION
- 11:45 **Doyle, A.** and J. Roland  
THE EFFECTS OF HERBIVORY-INDUCED CHANGES IN HOST-PLANT QUALITY ON *Parnassius smintheus* LARVAL GROWTH

## TUESDAY, NOVEMBER 2

8:30 - 12:00

NELSON ROOM

SYMPOSIUM 3

GRADUATE STUDENT SYMPOSIUM

ORGANIZER: CHANDRA MOFFAT

- 8:30 **Wogin, M.J.**, D.R. Gillespie, T. Haye, and B.R. Roitberg  
INTRA- AND INTERSPECIFIC COMPETITION BETWEEN PARASITOIDS OF THE CABBAGE SEEDPOD WEEVIL: EFFECTS ON SEX RATIOS AND CONSEQUENCES FOR BIOLOGICAL CONTROL.
- 9:00 **Thielman, A.** and F.F. Hunter  
INVESTIGATION OF CRYPTIC SPECIES STATUS WITHIN *Anopheles* (DIPTERA: CULICIDAE) SPECIES IN CANADA USING A MULTIDISCIPLINARY APPROACH
- 9:30 **Ryan, K.**, P. de Groot and S.M. Smith  
INTERACTIONS BETWEEN THE INTRODUCED WOODWASP *Sirex noctilio*, COMPETING PHLOEM- AND WOOD-BORING BEETLES, AND THEIR FUNGAL ASSOCIATES
- 10:00 Break**
- 10:30 **Gibson, J.F.**  
WHEN GENES AND GENITALIA COME TOGETHER: THE UTILIZATION OF BOTH MOLECULAR AND MORPHOLOGICAL DATA IN A SYSTEMATIC REVISION OF CONOPIDAE (DIPTERA)
- 11:00 **Jack, D.**, J. McLean, G. Weetman and C. Breuil  
IT IS NOT EASY BEING GREEN. WHY FERTILIZER AND CLIMATE AT THE MOUNTAIN PINE BEETLE RANGE LIMIT DID NOT STOP THE EPIDEMIC

- 11:30 **Borkent, C.J.** and T.A. Wheeler  
SYSTEMATICS OF *LEPTOMORPHUS* AND THE PHYLOGENY OF THE TRIBE SCIOPHILINI (DIPTERA: MYCETOPHILIDAE)

## TUESDAY, NOVEMBER 2

8:00 - 10:00

COMOX ROOM

SYMPOSIUM 4

INVERTEBRATE CONSERVATION

ORGANIZER: JENNY HERON

- 8:00 **Heron, J.**  
WELCOME AND INTRODUCTION
- 8:05 **Scudder, G.G.E.**  
PROTECTING BRITISH COLUMBIA'S ENDANGERED INSECTS
- 8:20 **Steensma, K.,** P. Lilley and H. Zandberg.  
LIFE HISTORY AND HABITAT REQUIREMENTS FOR OREGON FOREST SNAIL, *ALLOGONA TOWNSENDIANA*,  
IMPLICATIONS FOR HABITAT PROTECTION AND MANAGEMENT
- 8:35 **Desjardins, S.**  
MONITORING THREATENED BUTTERFLY SPECIES USING MARK-RECAPTURE
- 8:50 **Elle, E.** and L.A. Neame  
HABITAT FRAGMENTATION AND POLLINATOR DIVERSITY IN BC'S ENDANGERED GARRY OAK ECOSYSTEM
- 9:05 **McCorquodale, D.B.,** S.M. Marriott and D.J. Giberson  
CONSERVATION STATUS OF LADY BEETLES IN CANADA: DO ANY FIT COSEWIC CRITERIA?
- 9:20 **Pohl, G.,** R.A. Cannings and G.G.E. Scudder  
TITLE: LEPIDOPTERA IN BRITISH COLUMBIA - A BIODIVERSITY PERSPECTIVE
- 9:35 **Heron, J.**  
ASSESSING THE CONSERVATION STATUS OF BRITISH COLUMBIA'S INVERTEBRATE GROUPS
- 9:50 GENERAL DISCUSSION & CONCLUSIONS

## TUESDAY, NOVEMBER 2

10:15 - 12:15

COMOX ROOM

SYMPOSIUM 5

INSECT COMMUNITY ECOLOGY

ORGANIZER: ROB MCGREGOR

- 10:15 **Roitberg, B.**  
INSECT COMMUNITY ECOLOGY: WHAT IS IT?
- 10:35 **Flaherty, L.,** D. Pureswaran and J. Sweeney  
IMPACT OF THE NATIVE COMMUNITY ON THE POPULATION ECOLOGY OF THE BROWN SPRUCE LONGHORN BEETLE,  
*TETROPIUM FUSCUM* (FABR.) (COLEOPTERA: CERAMBYCIDAE), AN INVASIVE ALIEN FOREST INSECT IN ATLANTIC  
CANADA
- 10:55 **Srivastava, D.**  
COMPOSITION OF BROMELIAD-INSECT FOOD WEBS AFFECTS CROSS-ECOSYSTEM INTERACTIONS
- 11:15 **Carriere, Y.**  
BT CROP EFFECTS ON NON-TARGET ARTHROPODS
- 11:35 **Lindo, Z.**  
PATTERNS OF CANOPY MICROARTHROPODS – FROM BRYOSPHERE TO BIOSPHERE

- 11:55 **Gillespie, D.**, G.-M. Wu and B. Roitberg  
COMMUNITIES IN CRISIS - EFFECTS OF DISTURBANCE AND PERTURBATION ON COMMUNITY STRUCTURE AND FUNCTION

## TUESDAY, NOVEMBER 2

8:30 - 12:00

BEACH ROOM

SYMPOSIUM 6

MARK WINSTON RETROSPECTIVE

ORGANIZER: KENNA MACKENZIE

- 8:30 **MacKenzie, K.**  
INTRODUCTION
- 8:40 **Taylor, O.**  
THE EARLY YEARS
- 9:00 **Foster, L.**  
CONTRIBUTIONS TO SCIENCE AND SOCIAL INSECTS
- 9:30 **Currie, R.**  
CONTRIBUTIONS TO APPLIED APICULTURE RESEARCH
- 10:00 Break**
- 10:30 **van Westendorp, P.**  
CONTRIBUTIONS TO BEEKEEPING
- 11:00 **Borden, J.H.**, C.G. Lait, E. Kovacs, O.G. Moeri, C.M. Machial, and M. Campbell  
SUPERBOOST: MARK WINSTON'S LEGACY LIVES ON IN A NEW PRODUCT BASED ON THE HONEY BEE BROOD PHEROMONE
- 11:20 **Scott-Dupree, C.** and L. Morandin  
MENTORING AND SUPERVISION
- 11:50 **MacKenzie, K.**  
SUMMARY

## TUESDAY, NOVEMBER 2

13:00 - 15:00

NELSON ROOM

SUBMITTED ORAL PRESENTATIONS, SESSION 8

AGRICULTURE

MODERATOR: TRACY HUEPPELSHEUSER

- 13:00 **Acheampong, S.**, H. Thistlewood, M. Thurston, C. Leaming, D. Holder, L. Edwards and B. Sinclair  
*DROSOPHILA SUZUKII*, A NEW PEST OF STONE FRUITS AND GRAPES IN BRITISH COLUMBIA
- 13:15 **Labrie, G.**, J. De Almeida, S. Rioux, A. Vanasse, D. Pageau and J.-N. Couture  
INVASIVE INSECT SPECIES OF CANOLA IN QUEBEC, CANADA
- 13:30 **Bostanian, N.J.**, M. Lefebvre and H.M.A. Thistlewood  
TOXIC EFFECTS OF 'SIX REDUCED RISK' INSECTICIDES TO *GALENDROMUS OCCIDENTALIS*
- 13:45 **Fields, P.G.**, W. Taylor and R. Hynes  
EFFICACY OF EXTRACTS FROM PILOT-PLANT -SCALE ISOLATION OF BOTANICAL INSECTICIDES FROM PEA FLOUR AGAINST STORED-PRODUCT INSECTS
- 14:00 **Tansey, J.A.** and L.M. Dossall  
EVALUATION OF *DELIA RADICUM*-RESISTANT CANOLA GERMPLASM
- 14:15 Gharalari, A.H., **M.A.H. Smith**, S.L. Fox and R.J. Lamb  
BEHAVIOUR OF *SITODIPLOSIS MOSELLANA* ON SPRING WHEAT WITH AND WITHOUT OVIPOSITION DETERRENCE

- 14:30 **Gress, J.C.**, D.K. Weaver and K.W. Wanner  
MOLECULAR BIOLOGY OF THE WHEAT STEM SAWFLY, *CEPHUS CINCTUS*
- 14:45 **Kher, S. V.**, L. M. Dosdall and H. A. Cárcamo  
CHANGES IN THE DISTRIBUTION AND ABUNDANCE OF THE CEREAL LEAF BEETLE, *OULEMA MELANOPUS* (COLEOPTERA: CHRYSOMELIDAE), A NEW INVASIVE PEST OF CEREALS IN WESTERN CANADA AND STRATEGIES FOR ITS SUSTAINABLE MANAGEMENT

## TUESDAY, NOVEMBER 2

13:00 - 15:00

DENMAN ROOM

SUBMITTED ORAL PRESENTATIONS, SESSION 9  
MODERATOR: ZOE LINDO

CHEMICAL ECOLOGY, BIODIVERSITY & SYSTEMATICS

- 13:00 **Jorgensen, J.** and K.W. Wanner  
CANDIDATE SEX PHEROMONE RECEPTOR GENES IDENTIFIED FROM YUCCA MOTHS
- 13:15 **Waliwitiya, R.**, R. Nicholson, and C. Lowenberger  
EFFECTS OF PLANT DERIVED COMPOUNDS AND OTHER NEUROACTIVE CHEMICALS ON FLIGHT MOTOR ACTIVITY AND WING BEAT FREQUENCY IN THE BLOWFLY *PHAENICIA CERICATA*
- 13:30 **Wanner, K.W.**, P. Bungler and J. Allen  
SEX PHEROMONE RECEPTOR EVOLUTION IN MOTH GENUS *OSTRINIA*
- 13:45 **Scott, C.E.**, S. Vibert and G. Gries  
COURTSHIP BEHAVIOUR AND MATING SUCCESS IN THE BLACK WIDOW *LATRODECTUS HESPERUS*
- 14:00 **Bergeron, C.** and J. Spence  
ECOSITE CLASSIFICATION AS BIODIVERSITY SURROGATE FOR ROVE BEETLES
- 14:15 **Joy, J.**  
EVOLUTIONARY DETERMINANTS OF DIVERSIFICATION IN CECIDOMYIID FLIES
- 14:30 **Bouchard, P.**  
FAMILY-GROUP NAMES IN COLEOPTERA
- 14:45 **Bennett, A.M.R.**  
NATURAL HISTORY AND SYSTEMATICS OF THE FAMILY ICHNEUMONIDAE (HYMENOPTERA)

## TUESDAY, NOVEMBER 2

13:00 - 15:00

COMOX ROOM

SUBMITTED ORAL PRESENTATIONS, SESSION 10  
MODERATOR: JUDY MYERS

BIOLOGICAL CONTROL

- 13:00 **Erlandson, M.A.**, U. Toprak, S. Harris, D.D. Hegedus and D.A. Theilmann.  
*MAMESTRA CONFIGURATA* INSECT INTESTINAL MUCINS ARE TARGETS FOR NUCLEOPOLYHEDROVIRUS EHANCINS
- 13:15 **Maghodia, A.B.**, M. Fang, M.A. Erlandson and D.A. Theilmann  
THE BACULOVIRUS CORE GENE, ODV-E56, IS ESSENTIAL FOR ORAL INFECTION OF HOST INSECTS
- 13:30 **Myers, J.H.**, J.S. Cory, J. Ericsson and M. Tseng  
FOOD LIMITATION DOES NOT INCREASE SUSCEPTIBILITY TO VIRAL INFECTION IN WESTERN TENT CATERPILLARS
- 13:45 **Boisclair J.**, G. Richard, M. Lefebvre, S. Todorova, F. Pelletier, É. Lucas and M. Grenier  
USE OF *TRICHOGRAMMA OSTRINIAE* TO CONTROL EUROPEAN CORN BORER (*OSTRINIA NUBILALIS*) IN SWEET PEPPER IN QUEBEC, CANADA
- 14:00 **Haye, T.** and M. Kenis  
BIOLOGICAL CONTROL OF THE LILY LEAF BEETLE

- 14:15 Hoffman, M. and **R. McGregor**  
LABORATORY EVALUATION OF *PRAON UNICUM* SMITH (HYMENOPTERA: APHIDIIDAE) FOR BIOLOGICAL CONTROL OF APHIDS ON GREENHOUSE PEPPERS IN BRITISH COLUMBIA
- 14:30 **McGregor, R.** and M. Hoffman  
*MICROMUS VARIEGATUS* (FABRICIUS) (NEUROPTERA, HEMEROBIIDAE): A NEW PREDATOR FOR MANAGEMENT OF APHIDS ON GREENHOUSE PEPPERS IN BRITISH COLUMBIA
- 14:45 **Zanuncio, J.C.**, T.V. Zanuncio, M.A. Soares, and J.E. Serrão  
PREDATORS AND PARASITIDS IN THE BIOLOGICAL CONTROL OF LEPIDOPTERA DEFOLIATORS OF EUCALYPT IN BRAZIL

## TUESDAY, NOVEMBER 2

13:00 - 15:00

BEACH ROOM

SUBMITTED ORAL PRESENTATIONS, SESSION 11

FORESTRY

MODERATOR: LISA POIRIER

- 13:00 **Reid, M.L.** and M.K. Trzcinski  
HOST USE BY MOUNTAIN PINE BEETLES: SEARCHING FOR GENERALITIES
- 13:15 **Lusebrink, I.**, M.L. Evenden and N. Erbilgin  
ROLE OF DROUGHT IN MEDIATING HOST TREE DEFENCES AGAINST THE MOUNTAIN PINE BEETLE
- 13:30 Clark, E.L., A.L. Carroll and **D.P.W. Huber**  
THE LEGACY OF ATTACK: IMPLICATIONS OF VERY HIGH PHLOEM RESIN MONOTERPENE LEVELS IN MASS ATTACKED LODGEPOLE PINES FOLLOWING SUCCESSFUL MOUNTAIN PINE BEETLE, *DENDROCTONUS PONDEROSAE* HOPKINS, COLONIZATION
- 13:45 **Brunet, B.**, A. Hundsdörfer and F. Sperling  
PHENOLOGY OF OUTBREAKING POPULATIONS OF THE WESTERN SPRUCE BUDWORM, *CHORISTONEURA OCCIDENTALIS*, IN SOUTHWEST ALBERTA
- 14:00 **Poirier, L.M.**  
PRODUCTION OF LATE BUDS BY DOUGLAS-FIR IN CENTRAL BRITISH COLUMBIA FOLLOWING DEFOLIATION BY WESTERN SPRUCE BUDWORM, *CHORISTONEURA OCCIDENTALIS* FREE. (LEPIDOPTERA: TORTRICIDAE)
- 14:15 **Carleton, D.** and D. Quiring  
COMMERCIAL THINNING INCREASES THE SUSCEPTIBILITY OF BALSAM FIR TO THE BALSAM WOOLLY ADELGID
- 14:30 **Lumley, L.** and M. Cusson  
GENETIC IDENTIFICATION OF HEMLOCK LOOPER (*LAMDINA FISCELLARIA*) BIOTYPES USING SINGLE NUCLEOTIDE POLYMORPHISMS (SNPs)
- 14:45 **Fraser, S.**  
GENETICALLY-BASED RESISTANCE OF BALSAM FIR (*ABIES BALSAMEA*) TO THREE INSECT PESTS

## TUESDAY, NOVEMBER 2

16:00 - 16:45

BALLROOM

HERITAGE LECTURE

MODERATOR: WARD STRONG

- 16:00 **Lindgren, B.S.**  
TRIPS, TRAPS, TRIUMPHS AND TRIBULATIONS: A JOURNEY FROM CHILDHOOD DREAMS TO A DREAM-CAREER IN ENTOMOLOGY

**WEDNESDAY, NOVEMBER 3**

**8:00 - 12:00**

**DENMAN ROOM**

SUBMITTED ORAL PRESENTATIONS, SESSION 12

AGRICULTURE, ECOLOGY, FORESTRY

MODERATOR: BABITA BAINS

- 8:00 **Noronha, C.**  
CAN CROP ROTATION BE USED TO MANAGE WIREWORM DAMAGE IN POTATOES?
- 8:15 **Vernon, B.** and W. van Herk  
WIREWORM CONTROL: THE HIGHER THE POPULATION, THE LOWER THE AMOUNT OF INSECTICIDE NEEDED TO KILL THEM
- 8:30 **Ericsson, J.**, G. Wong, J. Myers and C. Lowenberger.  
SELECTION FOR RESISTANCE TO BIOLOGICAL INSECTICIDES ALTERS INSECT HOST IMMUNITY
- 8:45 **Miresmailli, S.**, R. Gries, G. Gries, R.H. Zamar and M.B. Isman  
POPULATION DENSITY AND FEEDING DURATION OF CABBAGE LOOPER LARVAE ON TOMATO PLANTS ALTER LEVELS OF PLANT VOLATILE EMISSIONS
- 9:00 Smith M.A.H., **P.A. MacKay** and R.J. Lamb  
TEMPERATURE MODULATION OF PHOTOPERIODISM AND THE TIMING OF LATE-SEASON CHANGES IN LIFE HISTORY FOR THE PEA APHID, *ACYRTHOSIPHON PISUM*
- 9:15 **Guarna, M.M.**, R. Parker, A.P. Melathopoulos, K. Moon, A.P.M. Tam, N. Stoynov, R. White, S F. Pernal and L J. Foster  
DISEASE RESISTANCE MARKERS IDENTIFIED BY QUANTITATIVE PROTEOMICS
- 9:30 **van Herk, W.**, Bob Vernon and Ted Labun  
WHO'S EATING OUR WHEAT? SURPRISING RESULTS FROM A NATIONAL WIREWORM SURVEY IN CANADA
- 9:45 **Tyson, R.C.**, J.B. Wilson and W.D. Lane  
A DIFFUSION-BASED MODEL TO PREDICT TRANSGENIC SEED CONTAMINATION IN BEE-POLLINATED CROPS
- 10:00 Break**
- 10:30 Gilbert, N., **D.A. Raworth** and G.R. Allen  
CABBAGE BUTTERFLIES RESPOND TO THE QUESTION - WHY SEX?
- 10:45 **Evenden, M.L.**, B.C. Jones and C.G. Elliott  
EFFECT OF LARVAL NUTRITION ON MOTH DISPERSAL AND FITNESS IN THE FOREST TENT CATERPILLAR, *MALACOSOMA DISSTRIA* (LEPIDOPTERA: LASIOCAMPIDAE)
- 11:00 **MacQuarrie, C.J.K.**  
MORTALITY SCHEDULE OF EMERALD ASH BORER ALONG A TEMPORAL GRADIENT OF INVASION IN THE URBAN FOREST
- 11:15 **Kamunya E.W.**, J.R. Spence and W.J.A. Volney  
MAINTAINING MOTH DIVERSITY IN BOREAL FORESTS: SLASH-BURNING AS A MANAGEMENT TOOL COMPLEMENTARY TO RETENTION HARVEST
- 11:30 **Klimaszewski, J.**  
REVIEW OF ADVENTIVE SPECIES OF COLEOPTERA RECORDED FROM EASTERN CANADA
- 11:45 **Lee, S.-I.**, J. Spence and D. Langor  
SAPROXYLIC BEETLE RESPONSES TO AGGREGATED RETENTION PATCHES IN BOREAL WHITE SPRUCE STANDS



**WEDNESDAY, NOVEMBER 3**

**8:00 - 12:00**

**NELSON ROOM**

SYMPOSIUM 7

MOUNTAIN PINE BEETLE SYSTEM GENOMICS

ORGANIZER: DEZENE HUBER

- 8:00 **Bohlmann, J.** and Members of the Tria II Project Consortium ([www.thetriaproject.ca](http://www.thetriaproject.ca))  
REASONING FOR A MOUNTAIN PINE BEETLE SYSTEM GENOMICS PROJECT
- 8:10 **Keeling, C.I.**, H. Henderson, M. Li, H.K. Dullat, M. Yuen, D.P.W. Huber, S.J. Jones, and J. Bohlmann  
MOUNTAIN PINE BEETLE GENOMICS
- 8:30 **Arango-Velez, A.**, M. Meents, L. Galindo, W. El Kayal, J. Linsky and J. Cooke  
INFLUENCE OF WATER DEFICIT ON THE MOLECULAR RESPONSES OF PINES TO INFECTION BY MOUNTAIN PINE BEETLE FUNGAL ASSOCIATES
- 8:50 DiGuistini, S., Y. Wang, T. Wang, L. Lim, S.M. Alamouti, S. Jones, J. Bohlmann and **C. Breuil**  
DO *GROSMANNIA CLAVIGERA* AND OTHER MOUNTAIN PINE BEETLE ASSOCIATES TOLERATE TERPENES OR USE THEM AS CARBON SOURCES?
- 9:10 **Murray, B.W.**, N.D.G. Samarasekera, C. Boone, N.V. Bartell, B.S. Lindgren, P. James, J.E.K. Cooke, C.S. Davis, K.E. Mock and D. Coltman  
MOUNTAIN PINE BEETLE SYSTEM GENOMICS: MICROSATELLITE ANALYSIS OF MOUNTAIN PINE BEETLE OUTBREAK IN WESTERN CANADA
- 9:30 Tsui, C.K.M., A.D. Roe, Y.A. El-Kassaby<sup>1</sup>, A.V. Rice, S.M. Alamouti, F.A.H. Sperling, J.E.K. Cooke, J. Bohlmann, C. Breuil and **R.C. Hamelin**  
POPULATION STRUCTURE AND MIGRATION PATTERN OF THE MOUNTAIN PINE BEETLES FUNGAL ASSOCIATE *GROSMANNIA CLAVIGERA*
- 9:50 Break**
- 10:30 Roe, A.D., A.V. Rice, D.W. Coltman, J.E.K. Cooke, and **F.A.H. Sperling**  
COMPARATIVE PHYLOGEOGRAPHY, GENETIC DIFFERENTIATION, AND CONTRASTING REPRODUCTIVE MODES IN THREE FUNGAL SYMBIONTS OF A MULTIPARTITE BARK BEETLE SYMBIOSIS
- 10:50 **James, P.M.A.**, D. Coltman, B. Murray, R. Hamelin and F.A.H. Sperling  
LANDSCAPE SCALE GENOMIC INTERACTIONS AMONG PINE, FUNGI, AND MOUNTAIN PINE BEETLE IN WESTERN CANADA
- 11:10 **Aukema, B.**, Honey-M.C. de la Giroday, and K. Sambaraju  
CAN GENOMICS DATA PROVIDE INSIGHT ON THE LOCATION OF TREE-KILLING MOUNTAIN PINE BEETLES AT THE LANDSCAPE SCALE?
- 11:30 **Hauer, G.** and J. Anderson  
FACTORS GOVERNING INVESTMENT DECISIONS IN SOLID WOOD FOREST PRODUCTS AND BIOENERGY FACILITIES IN FORESTS UNDER RISK OF MOUNTAIN PINE BEETLE ATTACK
- 11:50 **Cooke, J.E.K.** and Members of the Tria II Project Consortium ([www.thetriaproject.ca](http://www.thetriaproject.ca))  
AN INTEGRATED, GENOMICS-BASED APPROACH TO UNDERSTANDING THE MOUNTAIN PINE BEETLE SYSTEM

**WEDNESDAY, NOVEMBER 3**

**8:00 - 12:00**

**COMOX ROOM**

SYMPOSIUM 8

DEALING WITH INVASIVE PESTS

ORGANIZERS: TOM LOWERY AND GABRIELLA ZILAHIBALOGH

- 8:00 **Zilahi-Balogh, G.**, J. Richardson, T. Kimoto and J. Smith.  
THE CANADIAN FOOD INSPECTION AGENCY'S APPROACH TO INVASIVE ALIEN SPECIES

- 8:30 **Humble, L.M.** and J.R. deWaard  
UTILIZATION OF MOLECULAR TECHNIQUES FOR THE DETECTION AND IDENTIFICATION OF INVASIVE FOREST PESTS
- 9:00 **Mason, P.G.**, D.R. Gillespie, T. Haye and U. Kuhlmann.  
BIOLOGICAL CONTROL OF ARTHROPODS IN CANADA: WHAT HAVE WE LEARNED AND WHERE ARE WE HEADED?
- 9:30 **Lowery, D.T.**  
INVASIVE PESTS OF GRAPEVINES IN BRITISH COLUMBIA
- 10:00 Break**
- 10:30 **Sweeney, J.**, P. Silk, L. Flaherty, D. Pureswaran, J.M. Gutowski and J.E. Hurley  
CASE HISTORY OF AN INVASIVE FOREST INSECT: THE BROWN SPRUCE LONGHORN BEETLE, *TETROPIUM FUSCUM* (F.), IN NOVA SCOTIA
- 11:00 **Judd, G.J.R.**, M. Aurelian, K. Bedford and C. Eby  
INVASION OF APPLE CLEARWING MOTH, *SYNANTHEDON MYOPAEFORMIS*: FROM DETECTION TO AREA-WIDE MANAGEMENT
- 11:30 **Fitzpatrick, S.M.**, D. Holden, M. Damus, B.J. Sinclair, T. Hueppelsheuser, S. Acheampong and M. Sweeney  
COOPERATIVE EFFORTS TO DETECT AND MANAGE THE TINY INVADER *DROSOPHILA SUZUKII* IN CANADA

### WEDNESDAY, NOVEMBER 3

8:30 - 12:00

BARCLAY/GILFORD ROOM

SYMPOSIUM 9 ARTHROPODS OF CANADIAN GRASSLANDS (BIOLOGICAL SURVEY OF CANADA)

ORGANIZER: KEVIN FLOATE

- 8:30 **Floate, K.D.**  
INTRODUCTION AND OVERVIEW OF THE GRASSLANDS PROJECT
- 8:40 **Shorthouse, J.D.**  
CYNIPID GALLS OF PRAIRIE WILD ROSES
- 9:00 **Floate, K.D.**  
INSECTS OF CATTLE DUNG
- 9:20 **Timlick, B.**, N.D.G. White, P. Fields, C. Demianyk and D. Jayas  
ARTHROPODS OF STORED CEREALS, OILSEEDS AND THEIR PRODUCTS IN CANADA: ARTIFICIAL ECOSYSTEMS ON GRASSLANDS
- 9:40 **De Clerck-Floate, R.** and H. Cárcamo  
DELIBERATE INTRODUCTIONS OF ARTHROPODS ON GRASSLANDS
- 10:00 Break**
- 10:30 **Wrubleski, D.** and L. Ross  
ARTHROPODS OF PRAIRIE WETLANDS
- 10:50 **Heron, J.**  
IDENTIFICATION AND PROTECTION OF ENDANGERED GRASSLAND SPECIES
- 11:10 ANNUAL GENERAL MEETING OF THE BIOLOGICAL SURVEY OF CANADA

**TUESDAY, NOVEMBER 2**  
**DEDICATED POSTER SESSION**

**15:00 - 16:00**

**BARCLAY/GILFORD ROOM**  
PRESIDENT'S PRIZE POSTER COMPETITION

ORGANIZER: CHANDRA MOFFAT

- 1 **Alhudaib, K.** and A. Ajlan  
AL-WIJAM, DATE PALM PHYTOPLASMA, AND ITS INSECT VECTORS IN SAUDI ARABIA
- 2 **Bain, J.N.**, S.M. Fitzpatrick and S. Mathur  
COMPARISON OF TRAP TYPES AND LIQUID BAITS FOR DETECTING SPOTTED WING DROSOPHILA, *DROSOPHILA SUZUKII*, IN BERRY CROPS
- 4 **Best, L.R.**, J. Gibbs and C. Sheffield  
THE APIFAUNA OF BRITISH COLUMBIA: UTILIZING INTEGRATIVE TAXONOMY IN BIODIVERSITY SURVEYS
- 7 **Clark, E.L.**, R. Isitt, Y. Yu, E. Plettner and D.P.W. Huber  
TESTING NOVEL COMPOUNDS FOR THE POTENTIAL BEHAVIORAL CONTROL OF THE RED FLOUR BEETLE, *TRIBOLIUM CASTANEUM*
- 8 **Elwell, S.** and E. Elle  
LIVESTOCK GRAZING AND POLLINATOR COMMUNITIES OF THE SOUTH OKANAGAN, BRITISH COLUMBIA
- 13 **Gielens, G.** and E. Elle  
POLLINATOR ASSEMBLAGE AFFECTS WILDFLOWER REPRODUCTION IN THE GARRY OAK ECOSYSTEM
- 15 **Grégoire, D.**  
EFFECTS OF BALSAM WOOLLY ADELGID (*ADELGES PICEAE*) ON BALSAM FIR AND THE PERFORMANCE OF SUBSEQUENT HERBIVORES
- 16 **Hart, M.**, P. Belton and G. Gries  
FREQUENCY-SPECIFIC DETECTION OF COURTSHIP SOUNDS BY TWO TYPES OF EARS IN THE INDIANMEAL MOTH, *PLODIA INTERPUNCTELLA*
- 19 **Illerbrun, K.** and Roland, J.  
HOST FINDING BY LATE-INSTAR *PARNASSIUS SMINTHEUS* LARVAE
- 20 **Irwin, C.**, C. Scott-Dupree, R. Harris, J. Tolman and H. Fraser  
POTENTIAL OF THE ANTHRANILIC DIAMIDE INSECTICIDE - CYAZYPYR - AS A SEED TREATMENT ON SPRING CANOLA FOR CONTROL OF FLEA BEETLES AND ITS NON-TARGET EFFECT ON HONEY BEES
- 24 **Leroux, A.L.** and N.J. Holliday  
PARASITISM OF THE BIOLOGICAL CONTROL AGENT *HYLES EUPHORBIAE* (LEPIDOPTERA: SPHINGIDAE) BY *WINTHEMIA DATANAE* (DIPTERA: TACHINIDAE): A NEW HOST RECORD
- 26 **McClure, M.**, M. Ralph and E. Despland  
GROUP LEADERSHIP DEPENDS ON ENERGETIC STATE IN A NOMADIC COLLECTIVE FORAGING CATERPILLAR
- 28 **Mori, B.A.** and M.L. Evenden  
POTENTIAL FOR THE DEVELOPMENT OF PHEROMONE-BASED COMMUNICATION DISRUPTION TO CONTROL *COLEOPHORA DEAURATELLA* (COLEOPHORIDAE: LEPIDOPTERA): A MAJOR PEST OF RED CLOVER (*TRIFOLIUM PRATENSE* L.)
- 30 **Mudavanhu, P.**, P. Addison and K.L. Pringle.  
THE DEVELOPMENT OF EARLY MONITORING TOOLS FOR THE OBSCURE MEALYBUG *PSEUDOCOCCUS VIBURNI* (SIGNORET) (HEMIPTERA: PSEUDOCOCCIDAE) USING PHEROMONE-BAITED TRAPS
- 31 **Nagalingam, T.** and N.J. Holliday  
EFFECT OF *LYGUS LINEOLARIS* FEEDING ON DIFFERENT GROWTH STAGES OF NAVY BEANS (*PHASEOLUS VULGARIS* L.)

- 35 **Ramanaidu, K.** and G.C. Cutler  
IMPACT OF MOVENTO®, BOTANIGARD® AND SERENADE® ON BUMBLE BEE MICRO-COLONY DEVELOPMENT
- 36 **Reeh, K.W.** and G.C. Cutler  
BUMBLE BEES AS VECTORS OF BIOLOGICAL CONTROL AGENTS FOR DISEASE CONTROL IN LOWBUSH BLUEBERRY
- 38 **Romero, W.,** C. Scott-Dupree, G. Murphy, T. Blom and R. Harris  
CONTROL METHODS FOR INSECT PESTS ON CUTTINGS. A REDUCED RISK APPROACH
- 40 **Schotzko, K.G.** and B.S. Lindgren  
EFFECT OF *FORMICA ASERVA* FOREL (HYMENOPTERA: FORMICIDAE) COLONIES ON GROUND BEETLE (COLEOPTERA: CARABIDAE) ASSEMBLAGES IN CENTRAL BRITISH COLUMBIA CLEARCUTS
- 41 **Schwarzfeld, M.D.** and F.A.H. Sperling  
THE IMPACT OF FOREST HARVESTING ON A BOREAL PARASITOID (HYMENOPTERA: ICHNEUMONIDAE) COMMUNITY
- 44 **Stanton, D.,** L. Dosedall and R.C. Yang  
ASSOCIATIONAL RESISTANCE IN A MIXED REFUGE APPLICATION FOR MANAGEMENT OF ROOT MAGGOT (*DELIA* SPP.) (DIPTERA: ANTHOMYIIDAE) IN *BRASSICA NAPUS*
- 45 **Stephens, A.E.A.** and J.H. Myers  
PATTERNS OF DAMAGE BY MULTIPLE BIOLOGICAL CONTROL AGENTS ON WEEDS
- 47 **Tabacaru, C.A.,** J. Park and N. Erbilgin  
PLAYING WITH FIRE: EFFECTS OF PRESCRIBED BURNS ON MOUNTAIN PINE BEETLE POPULATIONS

## **TUESDAY, NOVEMBER 2**

**15:00 - 16:00**

**BARCLAY/GILFORD ROOM**

### **DEDICATED POSTER SESSION**

SUBMITTED POSTERS

ORGANIZER: CHANDRA MOFFAT

- 3 **Berry, K.** and L.M. Poirier  
INFLUENCE OF LIGHT ON TRAP CATCHES OF MOSQUITOES IN NORTH-CENTRAL BRITISH COLUMBIA
- 5 Dubuc, J.F., T. Jobin and **N.J. Bostanian**  
EFFICACY OF CYANTRANILIPROLE CYAZYPYR® FOR CABBAGE MAGGOT MANAGEMENT
- 6 **Ensing, D.,** C. E. Moffat and J. Pither  
THE POTENTIAL FOR INVASION AND BIOLOGICAL CONTROL OF TWO EUROPEAN HAWKWEEDS, *PILOSELLA CAESPITOSA* AND *PILOSELLA GLOMERATA*
- 9 Fife, D., **T. Haye** and E. Gerber  
DOES PARASITISM REDUCE THE EFFICACY OF *CEUTORHYNCHUS CONSTRICTUS* (COLEOPTERA: CURCULIONIDAE), A POTENTIAL BIOLOGICAL CONTROL AGENT FOR GARLIC MUSTARD?
- 10 **Floate, K.D.,** W. Watson, R. Weiss and O. Olfert  
CLIMEX MODELS FOR POTENTIAL DISTRIBUTIONS OF *ONTHOPHAGUS TAURUS* AND *DIGITONTHOPHAGUS GAZELLA* (SCARABAEIDAE) IN NORTH AMERICA
- 11 **Floate, K.D.** and P.C. Coghlin  
CONSEQUENCES OF *WOLBACHIA* BACTERIA IN POPULATIONS OF THE WASP, *TRICHOMALOPSIS SARCOPHAGAE* (PTEROMALIDAE)
- 12 **Gradish, A.,** C. Scott-Dupree and C. Cutler  
SUB-LETHAL EFFECTS OF REDUCED-RISK INSECTICIDES FOR WILD BLUEBERRY PEST MANAGEMENT ON ALFALFA LEAFCUTTER BEES (*MEGACHILE ROTUNDATA*)
- 14 **Hueppelsheuser, T.,** M. Sweeney, S. Fitzpatrick, K. Sakalauskas, C. Teasdale and B. Sinclair  
*DROSOPHILA SUZUKII* IN BRITISH COLUMBIA BERRY CROPS: CAN WE EFFECTIVELY MONITOR AND CONTROL THIS NEW PEST?

- 17 **Jensen, L.B.M.**, and D.T. Lowery  
GRAPE LEAF RUST MITE, *CALEPITRIMERUS VITIS*, A NEW PEST OF BRITISH COLUMBIA GRAPES
- 18 Johns, R.C., J. Boone, J.J. Leggo, S. Smith, **D. Carleton** and D.T. Quiring  
DAILY FORAGING PATTERNS AND BEHAVIORS OF *PIKONEMA ALASKENSIS* LARVAE WITHIN THE CROWN OF JUVENILE BLACK SPRUCE
- 21 **Johnson, T.S.** and A. Janmaat  
IS SELECTION OF LARGE HOST PLANTS FOR OVIPOSITION BY *GALERUCELLA CALMARIENSIS* AN EXAMPLE OF THE PLANT VIGOR HYPOTHESIS?
- 22 **Lanthier, M.**, S. Peters and J. Merrick  
TESTING NEWER INSECTICIDES AGAINST INSECT BORERS OF NURSERY TREE PRODUCTION IN THE BC INTERIOR
- 23 **Mathur, S.**, B.J. Sinclair, M.A. Cook and S.M. Fitzpatrick  
DEVELOPMENT OF PCR-BASED MOLECULAR MARKERS TO DIFFERENTIATE *DASINEURA OXYCOCCANA* REARED FROM CRANBERRY, *VACCINIUM MACROCARPON*, OR BLUEBERRY, *V. CORYMBOSUM*
- 25 **Mostafa, A.**, T. Lowery, L. Jensen and K. DeGlow  
BIOLOGICAL ASPECTS OF CLIMBING CUTWORM (LEPIDOPTERA: NOCTUIDAE) ATTACKING GRAPES IN THE OKANAGAN VALLEY, BRITISH COLUMBIA
- 27 **McGinnis, S.M.**, P. K. Abram, T. Haye, P.G. Mason, N. Cappuccino, G. Boivin and U. Kuhlmann  
FACTORS AFFECTING STAGE-SPECIFIC MORTALITY: DOES THE SWEDE MIDGE HAVE AN ACHILLE'S HEEL?
- 29 **Norouzi, J.** and B.D. Roitberg  
EFFECTS OF TEMPERATURE FLUCTUATION ON PARASITOID'S REPRODUCTION
- 32 Pearce, A., **B. Galka**, R. Gugel, and C. Olivier  
INCIDENCE OF PHYTOPLASMA-INFECTED LEAFHOPPERS IN ACCESSIONS OF *CAMELINA SATIVA* (L.) CRANTZ
- 33 **Neame, L.A.** and E. Elle  
WILD BEE CONTRIBUTION TO GROUND CROP POLLINATION IN OKANAGAN AND SIMILKAMEEN VALLEYS OF BEITISH COLUMBIA
- 34 **Quan, E.**, P. Abram, T. Haye, P. Mason, N. Cappuccino, G. Boivin and U. Kuhlmann  
DOES LARVAL STAGE MATTER TO PARASITIDS OF SWEDE MIDGE?
- 37 **Rochefort, S.**, R. Berthiaume, C. Hébert and É. Bauce  
INFLUENCE OF TEMPERATURE, HOST TREE AND GEOGRAPHICAL LOCALIZATION ON HEMLOCK LOOPER OVERWINTERING CAPACITIES
- 39 **Saguez, J.**, C. Vincent, J. Lasnier and P. Giordanengo  
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**Médaille d'or de la Société d'entomologie du Canada**

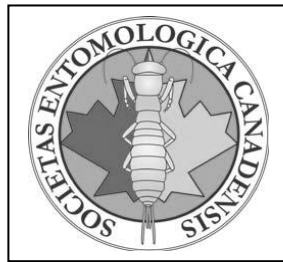
pour souligner la contribution exceptionnelle en entomologie canadienne

**2010**

présenté à

**CHARLES VINCENT**

à Vancouver, Colombie-Britannique, le 31 octobre 2010



**Entomological Society of Canada Gold Medal**

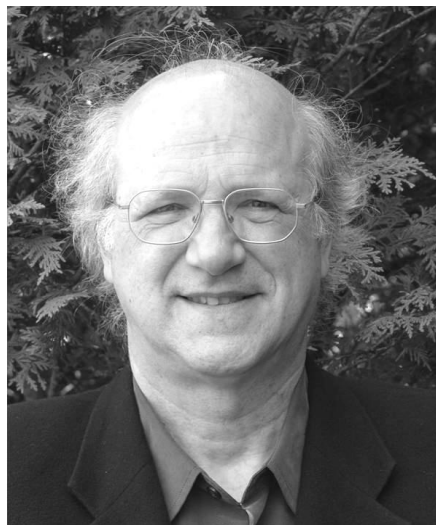
for Outstanding Achievement in Canadian Entomology

**2010**

presented to

**CHARLES VINCENT**

at Vancouver, British Columbia, 31 October 2010



Le lauréat 2010 de la médaille d'or de la société d'entomologie du Canada pour contributions exceptionnelles dans le domaine de l'entomologie est le Dr. Charles Vincent. Ce prix récompense ses contributions en tant que scientifique en gestion des insectes ravageurs, éditeur et auteur d'ouvrages, de chapitres de livres et d'articles scientifiques, professeur et mentor de jeunes entomologistes, ainsi que ses efforts inlassables en soutien à l'entomologie au Canada.

Charles est scientifique principal au ministère de l'Agriculture et de l'Agroalimentaire du Canada, professeur adjoint à l'université McGill (campus MacDonald) et à l'université du Québec à Montréal, et professeur invité à l'université de Picardie Jules Verne (Amiens, France). Sa recherche porte sur le contrôle et la gestion des insectes ravageurs en agriculture à l'aide de méthodes de lutte biologique et physique. Il a contribué 152 articles scientifiques évalués par des pairs, 21 ouvrages édités, 4 articles de fond, 36 chapitres de livres, et plus de 1000 autres publications et présentations.

Au sein d'une équipe multi-disciplinaire, Charles a conçu des programmes qui ont diminué l'utilisation d'insecticides dans les vignobles de manière considérable (environ 50%). Charles a pris part au développement et à l'homologation de Virosoft CP4, le premier insecticide viral homologué au Canada pour usage agricole. De plus, il a fait partie de l'équipe de développement de l'insecticide botanique Requiem<sup>®</sup>, homologué aux Etats-Unis en 2008.

Charles a formé 36 étudiants gradués et a encadré 6 postdoctorants et 75 stagiaires. Chaque année depuis 2000, il enseigne un atelier de travail à l'université de Picardie Jules Verne portant sur la rédaction scientifique en biologie et en médecine. En plus de l'encadrement direct de personnes, il contribue à la sensibilisation du public à l'entomologique. Chaque année depuis 1996, sous l'auspice de "la société pour la promotion de la science et de la technologie du Québec", Charles donne des cours en gestion des insectes pendant 3 jours à des enfants d'écoles primaires et secondaires dans le Grand Montréal.

Charles a travaillé sans relâche à promouvoir l'entomologie au Canada et au niveau international. Il est actif au sein de plusieurs organisations, ayant été président de la société d'entomologie du Canada en 2003, et responsable principal des trois réunions nationales SEQ/SEC, dont une (en 2000) organisée en partenariat avec la société d'entomologie des Etats-Unis. Il est aussi membre de longue date de la société d'entomologie du Québec, et y a occupé plusieurs postes, notamment comme représentant de la SEQ au conseil gouvernant de la SEC (1987-1990). Sur le plan international, il a organisé des symposia lors du congrès international d'entomologie en 1988, 2000, 2004 et en 2008.

Vue l'ampleur de ses contributions à la recherche en entomologie, à l'éducation d'entomologistes, de gestionnaires d'insectes ravageurs et du grand public, et de son engagement continu au sein de nos sociétés d'entomologie nationale et régionales, Charles Vincent est un lauréat très méritant de la médaille d'or de la société d'entomologie du Canada.

The 2010 recipient of the Entomological Society of Canada's Gold Medal Award for outstanding achievement in entomology is Dr. Charles Vincent. This award recognizes his contributions as a scientist in insect pest management, an editor and author of scientific books, chapters and articles, a teacher and mentor to young entomologists, and for his tireless efforts in support of Canadian entomology.

Charles is a principle scientist with Agriculture and Agri-Food Canada, an adjunct professor at McGill University (Macdonald Campus) and the Université du Québec à Montréal, and is an invited professor at the Université de Picardie Jules Verne (Amiens, France). His research programs have focused on the control and management of insect pests in agricultural systems using biological and physical control methods. He has contributed 152 scientific peer-reviewed papers, 21 edited books, 4 refereed review papers, 36 book chapters, and more than 1000 other publications and presentations.

As part of a multi-disciplinary team, Charles developed programs that have substantially (ca. 50%) decreased the use of insecticides in vineyards. Charles was involved in the research, development and registration of Virosoft CP4, the first viral insecticide registered for agricultural use in Canada, and was part of a team that developed the botanical insecticide Requiem<sup>®</sup>, registered in the U.S.A in 2008.

Charles has trained 36 graduate students and mentored 6 post-doctoral fellows and 75 interns. Every year since 2000, he has taught a workshop on scientific writing in biology and medicine at the Université de Picardie Jules Verne. Beyond this direct mentorship, he has actively encouraged entomological awareness in the community. Every year since 1996, under the auspices of the "Société pour la promotion de la science et de la technologie du Québec", Charles gives 3 days of lectures on insect management to the children (primary and secondary schools) of greater Montreal.

Charles has worked tirelessly to promote entomology in Canada and internationally. He has been active in several organizations, serving as President of the Entomological Society of Canada (2003) and as Chair of three SEQ/ESC national meetings, one of which (2000) was also a joint meeting with the Entomological Society of America. A long-time member of the Société d'Entomologie du Québec, he has contributed in many capacities, among these as SEQ representative to ESC Governing Board (1987-1990). Internationally, he organized symposia for the International Congress of Entomology in 1988, 2000, 2004, and 2008.

Charles Vincent's wide-ranging contributions to entomological research, to the education of entomologists, pest management practitioners, the public, and his lifelong commitment to our national and regional entomological societies make him a very deserving recipient of the Gold Medal from the Entomological Society of Canada.



## Previous recipients / Récipiendaires antérieurs

1962 R.F. Morris  
1963 A.W.A. Brown  
1964 R. Glen  
1965 M.L. Prebble  
1966 C.W. Farstad  
1967 B.N. Smallman  
1968 W.G. Wellington  
1969 K.E.F. Watt  
1970 C.S. Holling  
1971 J.G. Rempel  
1972 R.W. Salt  
1973 B. Hocking  
1974 P.S. Corbet  
1975 G.G.E. Scudder  
1976 B.P. Beirne  
1977 J.A. Downes  
1978 R.W. Stark  
1979 G.P. Holland  
1980 G.E. Ball  
1981 D.K. McE. Kevan  
1982 E.G. Munroe  
1983 F.L. McEwen  
1984 K.G. Davey  
1985 R.N. Sinha

1986 E.J. Leroux  
1987 J.N. McNeil  
1988 J.H. Borden  
1989 M. Mackauer  
1990 S. Tobe  
1991 R.G.H. Downer  
1992 G.B. Wiggins  
1993 No Award  
1994 T. Royama  
1995 R.A. Brust  
1996 J. Kukalova-Peck  
1997 P. Harris  
1998 D.M. Rosenberg  
1999 L. Masner  
2000 B.J.R. Philogene  
2001 J. R. Spence  
2002 R.J. Lamb  
2003 H. Danks  
2004 J. Myers  
2005 P. Kevan  
2006 R. Ring  
2007 C. Gillott  
2008 B. Roitberg  
2009 N. Holliday

Charles Vincent - Working with a harmonic radar device in Fredericton, N.B.



**Entomological Society of Canada C. Gordon Hewitt Award**

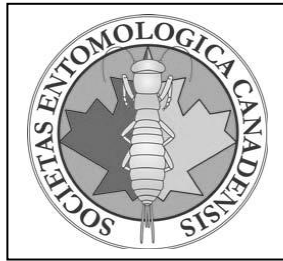
for Outstanding Achievement by a Canadian Entomologist under 40 years of age

**2010**

presented to

**DEZENE P W HUBER**

at Vancouver, British Columbia, 31 October 2010



**Prix C. Gordon Hewitt de la Société d'entomologie du Canada**

Pour souligner la contribution exceptionnelle d'un entomologiste canadien de moins de 40 ans

**2010**

présenté à

**DEZENE P W HUBER**

à Vancouver, Colombie-Britannique, le 31 octobre 2010



The 2010 recipient of the C. Gordon Hewitt Award is Dr. Dezene Huber. Using bark beetles as a model system, Dezene is at the forefront of integrating the latest opportunities in genomic research with an active field program in insect ecology.

Dezene received his PhD from Simon Fraser University in 2001. His doctoral dissertation investigated non-host volatiles as potential management tools for bark beetles. Collectively, publications from his PhD work have been cited nearly 200 times. After completing his dissertation, he pursued postdoctoral studies at UBC with Jörg Bohlmann, working on molecular approaches to understanding host defenses. He went on to the University of California-Davis, where he worked with Steven Seybold on the role of P450 genes in detoxification of host tree compounds, again in bark beetle systems.

In 2005, Dezene returned to Canada to accept a Canada Research Chair at the University of Northern British Columbia. Dezene currently is a project leader at UNBC, working with a team of three scientist colleagues and multiple postdoctorals, graduate students, and support staff. He has authored or co-authored more than 25 journal articles and book chapters, 9 proceedings, holds 2 patents, and has given more than 60 invited and submitted presentations. His *h*-index is already 11 (Google Scholar 22 Feb 2010), indicating that 11 of his publications have already been cited a minimum of 11 times – a notable accomplishment for an early-career scientist.

Dezene is a very dedicated teacher and mentor. He has supervised 7 graduate students and postdoctorals, served on 15 graduate supervisory committees and employed and/or supervised 14 undergraduate students in research projects. He routinely teaches several graduate and undergraduate courses per year. His diverse outreach activities include speaking at elementary schools, judging science fairs, and sharing his entomological expertise with the media and various stakeholder groups.

Dezene has a strong record of service to our entomological societies at the provincial and national levels. He has served on the Executive of the ESBC since 2007, and has been a member of the ESC Science and Policy Education Committee since 2008. He is actively involved with the 2010 Vancouver JAM, serving on the Scientific Program, Student Program and Photography Committees.

Dezene Huber's work links applied science, ecology and molecular biology. He has quickly established a well-funded and productive research program that is at the cutting edge of entomological research in Canada. He is committed to sharing his expertise inside and beyond the university and readily steps in when hands are needed to support entomological work of any nature. He is an outstanding young leader in Canadian entomology and a deserving winner of the C. Gordon Hewitt Award.

Le lauréat 2010 du prix C. Gordon Hewitt est le Dr. Dezene Huber. Dezene est à l'avant-garde de l'intégration des dernières tendances en recherche génomique avec de la recherche de terrain sur l'écologie des insectes, en utilisant comme système modèle le dendroctone du pin.

Dezene a obtenu un doctorat de l'université Simon Fraser en 2001. Sa thèse de doctorat portait sur l'utilisation de volatiles non-hôtes comme méthode de gestion possible du dendroctone du pin. Les publications découlant de son doctorat ont été citées presque 200 fois. Après son doctorat, Dezene a fait des études postdoctorales avec Jörg Bohlmann à UBC, travaillant sur les approches moléculaires utilisées pour mieux comprendre les systèmes de défenses des plantes hôtes. Suite à cela, il a travaillé avec Steven Seybold à l'université de Californie-Davis sur le rôle des gènes P450 dans la détoxification des composés d'arbres hôtes dans le cadre de la recherche sur les dendroctones du pin.

En 2005, Dezene est revenu au Canada pour commencer une chaire de recherche du Canada à l'université du nord de la Colombie-Britannique (UNBC). Dezene est maintenant chef de projet à UNBC, où il travaille avec trois autres collègues scientifiques ainsi que plusieurs postdoctorants, étudiants gradués, et membres de personnel de soutien. Il est l'auteur et le co-auteur de plus de 25 articles scientifiques et chapitres de livres, et de 9 comptes-rendus. Il a également 2 brevets à son actif, et a donné plus de 60 présentations soumises ou invitées. Son index *h* est déjà 11 (Google Scholar, 22 février 2010), ce qui veut dire que 11 de ses publications ont déjà été citées au moins 11 fois – un grand accomplissement pour un scientifique en début de carrière.

Dezene est un enseignant et mentor très dévoué. Il a supervisé 7 étudiants gradués et postdoctorants, a été membre de 15 comités de supervision graduée, et a supervisé les projets de recherche de 14 étudiants de premier cycle. Chaque année, il enseigne plusieurs cours de premier, deuxième et troisième cycle universitaire. Il prend part activement à la sensibilisation du public en donnant des présentations dans des écoles primaires, en servant comme juré dans des expo-sciences, et en partageant ses connaissances en entomologie avec les médias et divers groupes de parties prenantes.

Dezene est très actif dans nos sociétés d'entomologie au niveau provincial et national. Il est membre du comité exécutif de la SECB depuis 2007, et membre du comité de politique scientifique et d'éducation de la SEC depuis 2008. Il est impliqué dans l'organisation de la RAC 2010 à Vancouver en tant que membre des comités du programme scientifique, du programme étudiant, et de la photographie.

Dezene Huber a très rapidement mis sur pied un programme de recherche bien financé et productif, qui est à l'avant-garde de la recherche entomologique au Canada. Sa recherche crée des liens entre les sciences appliquées, l'écologie, et la biologie moléculaire. Il est dévoué au partage de ses connaissances aussi bien au sein de l'université et en dehors, et prête souvent main forte à toutes sortes de tâches entomologiques. Dezene est un jeune leader exceptionnel en entomologie canadienne, et un lauréat très méritant du prix C. Gordon Hewitt.

## Previous recipients / Récipiendaires antérieurs

1975 R.P. Bodnaryk  
1976 B.S. Heming  
1977 J.H. Borden  
1978 S.B. Mciver  
1979 J.N. McNeil  
1980 H.V. Danks  
1981 G.H. Gerber  
1982 S.S. Tobe  
1983 No Award  
1984 No Award  
1985 M.L. Winston  
1986 No Award  
1987 No Award  
1988 G. Boivin  
1989 S.A. Marshall  
1990 B. Roitberg  
1991 M. Isman

1992 D.L. Johnson  
1993 S.M. Smith  
1994 D.T.W. Quiring  
1995 D. Langor  
1996 T.J. Lysyk  
1997 J. Brodeur  
1998 No Award  
1999 T. Wheeler  
2000 K.D. Floate  
2001 R.S. Bourchier  
2002 No Award  
2003 H. Proctor  
2004 No Award  
2005 D. Hegedus  
2006 C. Buddle  
2007 M. Evenden  
2008 No Award  
2009 S. VanLaerhoven

Dezene Huber and family - Doing some informal biting-fly research.



## **Norman Criddle Award**

The Norman Criddle Award is presented by the Entomological Society of Canada to non-professional entomologists who, through their passion for insects, have made significant contributions to entomology in Canada. In 2010, this recognition is given to Dennis St. John.

Dennis is an avid lepidopterist who has made his home in the south Okanagan since 1981. His interest in insect conservation began with a survey of Okanagan butterflies in 1995 and continues to the present day. Dennis has produced a checklist of butterflies of the south Okanagan. He has spent many hours volunteering with local naturalist groups and is a member of the Southern Interior Invertebrates Recovery Team. He has presented numerous butterfly talks to community groups, lead butterfly outings as part of the annual Meadowlark Festival in Penticton, and contributed photographs and information to various butterfly-related publications.

Dennis has made many valuable contributions to entomology and conservation in BC, so we are pleased to present the Norman Criddle Award to him at the 2010 ESC-ESBC Joint Annual Meeting in Vancouver, British Columbia.



### **Prix Norman Criddle**

Le prix Norman Criddle est présenté par la société d'entomologie du Canada aux entomologistes non professionnels qui, à travers leurs passions pour les insectes, ont contribué de manière importante à l'entomologie au Canada. En 2010, ce prix est décerné à Dennis St. John.

Dennis est un lepidopteriste avéré qui vit au sud de l'Okanagan depuis 1981. Son intérêt pour la conservation des insectes a commencé en 1995 avec un recensement des papillons de l'Okanagan qui continue à ce jour. Dennis a créé une liste des papillons du sud de l'Okanagan. Il a passé de nombreuses heures à faire du volontariat pour divers groupes de naturalistes locaux, et est membre du "Southern Interior Invertebrates Recovery Team". Il a donné de nombreuses présentations orales sur les papillons dans des groupes communautaires, a dirigé des sorties papillons dans le cadre du festival annuel "Meadowlark" à Penticton, et a contribué des photos et de l'information à diverses publications sur les papillons.

Dennis a contribué de manière importante et variée à l'entomologie et à la conservation en C-B, et nous sommes enchantés de lui décerner le prix Norman Criddle à la réunion annuelle 2010 SEC-SECB à Vancouver, en Colombie-Britannique.

Dennis St. John - Sharing his passion for entomology in BC's Okanagan Valley.



### Previous recipients / Récipiendaires antérieurs

1977 Terry Galloway  
1978 ?  
1979 ?  
1980 ?  
1981 Buck Goodwin  
1982 ?  
1983 Ron Hooper  
1984 ?  
1985 ?  
1986 Paul Klassen  
1987 ?  
1988 ?  
1989 No award  
1990 John and Bertha Carr  
1991 ?  
1992 John Kozial  
1993 ?

1994 William B. Preston  
1995 Jim Troubridge  
1996 Paul Brunelle  
1997 Ruby Larson  
1998 ?  
1999 Bernie Gollop  
2000 Stéphane Le Tirant  
2001 Ross Layberry  
2002 Robyn Underwood  
2003 Rex Kenner  
2004 Henry Hensel  
2005 Gary Anweiler  
2006 André Beaudoin  
2007 Anna L. Leighton  
2008 Jay Cossey  
2009 Robert Wrigley

## General Information

**Oral Presentations:** Regular oral presentations and student competition talks should be 13 minutes long with two additional minutes allowed for questions, for a total of 15 minutes per presentation. At 11 minutes, moderators will stand up, as an indication that there are 2 minutes of speaking time left. At 13 minutes, moderators will give a verbal reminder to the speakers that they have two minutes left to finish their presentations. Moderators will strictly adhere to the 15 minute time limit; there are multiple concurrent sessions being conducted at the meeting and all must run on schedule.

**Audio-Video Centre:** The Audio-Visual Centre is located in the Chilco Room on the Upper Conference Level. This location is where presentation files will be uploaded onto our computer system and the room will have facilities for speakers to review their talks. The A-V Centre will be open on the following schedule:

Sunday, October 31	9:00 AM – 1:00 PM; 4:30 – 8:00 PM
Monday, November 1	7:00 AM – 6:00 PM
Tuesday, November 2	7:00 AM – 5:00 PM
Wednesday, November 3	7:00 – 8:00; 10:00 – 10:30 AM

**We require that presentation files be uploaded at least one day prior to your presentation.** Speakers who upload their presentation files while their session is in progress will have the uploading time deducted from their 15-minute speaking allotment. Please use a Memory Stick (USB thumb drives) to transfer files. The 2010 JAM will be using Microsoft PowerPoint or Adobe Reader for all presentations. We will be operating PC-based computers running in Windows7. You will **not** be able to use your own computer. It is each speaker's responsibility to ensure that your file format is compatible with Microsoft PowerPoint (Office 2007 version) or Adobe Acrobat (Reader) 9 for PCs, and that your memory stick is readable on PC laptops.

Files must be named in the following format:

Last Name\_First Initial (Listed Presenter)\_Date\_Session\_Start Time\_Room

**Example: Jack\_D\_Nov1\_President's Prize1\_8:30\_Nelson**

**Poster Presentations:** The posters presentations are located in the Barclay/Gilford Rooms on the Conference level of the venue. Posters can be put up on Sunday, October 31 from Noon -10 PM. Pins will be provided and presenters are requested to place their posters in the areas assigned to them.

All poster presenters are asked to be at their posters for the Dedicated Poster Session on Tuesday, November 2 from 3-4 PM.

All posters must be taken down by 10 PM on Tuesday, November 2. Posters cannot remain up overnight, as the Barclay/Gilford Rooms are needed for oral presentations on Wednesday morning. Please note that any posters remaining up after 10:00 PM on Tuesday might not be returned to authors.

**Registration Desk:** The Registration Desk is located in the Conference Foyer. The desk will be open from:

Sunday, October 31	9:00 AM – 1:00 PM; 5:00 – 8:00 PM
Monday, November 1	7:00 – 8:30, 10:00 – 10:30 AM; 12:00 – 1:30 PM



Tuesday, November 2 7:00 – 8:30 AM

The Registration Desk will not be staffed during scientific sessions, and will be closed for the duration of the meeting after 8:30 AM on Tuesday morning. Attendees needing to register after that time must contact Dr. Sheila Fitzpatrick, Local Arrangements Chair, at the meeting venue.

**Location of Events and Facilities** (please refer to Floor Plans on page 1 of this Program): Registration, Information, Silent Auction and Merchandise desks are located in the Foyer of the Conference Level of the Coast Plaza Hotel. All oral and poster presentations take place on the Conference Level (Nelson, Denman, Comox, Ballroom, Barclay/Gilford rooms), or the Upper Conference Level (Beach Room) of the hotel. The Audio-Visual Centre is located in the Chilco Room on the Upper Conference Level. The ESC Editorial Board Meeting and the ESC President's Reception take place on the 35<sup>th</sup> floor.

**Refreshment breaks:** Coffee, tea (both: regular and decaf), water, soft drinks, juice and light snacks will be served in the Conference Foyer on the following schedule:

Sunday, October 31	2:00 - 2:30 PM	
Monday, November 1	10:00 - 10:30 AM	3:00 - 3:30 PM
Tuesday, November 2	10:00 - 10:30 AM	<b>3:00 - 4:00 PM*</b>
Wednesday, November 3	10:00 - 10:30 AM	

\* Tuesday PM break is also the Dedicated Poster Session, with Authors at their presentations in the Barclay/Gilford Rooms.

**Social Functions:** All except the President's Reception to be held in Denman/Ballroom.

Sunday, October 31	Opening Reception (Bug/Halloween costumes optional!)	6:30 - 10:00 PM
Monday, November 1	Students Mixer (Students only) President's Reception (by Invitation)	7:30 - 10:00 PM 7:30 - 10:00 PM
Tuesday, November 2	ESC Banquet & Awards An Evening of the Blues	6:00 - 8:30 PM 8:30 - 11:00 PM

**Society Meetings:**

Monday, November 1	<b>ESC Editorial Board</b> (35 <sup>th</sup> Floor - Editorial Board Members only)	12:00 - 2:00 PM
Tuesday, November 2	<b>ESC Annual General Meeting</b> (Beach Room - Open to all ESC Members) <b>ESC Governing Board Meeting</b> (Beach Room - Governing Board Members only)	5:00 - 5:45 PM 5:45 - 6:30 PM
Wednesday, November 3	<b>ESBC Annual General Meeting*</b> (Barclay/Gilford Rooms - Open to all ESBC Members) * Light snacks provided. <b>ESBC Executive Meeting</b> (Barclay/Gilford Rooms – ESBC Executive Members only)	12:00 - 1:00 PM 1:00 - 2:00 PM

**Merchandise-Silent Auction:** Merchandise (beer mugs & T-shirts) featuring the JAM 2010 logo will be offered for sale in the Conference Foyer during the off-session hours of

the meeting. A limited edition of prints of the Logo design, signed by the artist, also will be available for purchase.

The Graduate students will be conducting a Silent Auction of items of entomological interest in the Conference Foyer from Sunday through Tuesday. Deadline to get your bids in is 1:00 PM, Tuesday, November 2. Items must be picked up during the Refreshment Break/Poster Session between 3 and 4 PM on that day.

## Information générale

**Présentations orales:** les présentations orales standards ainsi que les présentations étudiantes en compétition ne doivent pas dépasser 15 minutes, soit 13 minutes de présentation plus 2 minutes pour des questions. A la 11ème minute, le modérateur se lèvera pour indiquer qu'il ne reste plus que 2 minutes pour parler. A la 13ème minute, le modérateur donnera un signal verbal pour indiquer qu'il ne reste plus que 2 minutes pour finir la présentation. Les modérateurs seront stricte par rapport à la limite de 15 minutes, car plusieurs séances de présentations ont lieu en même temps, et il est donc nécessaire de respecter l'horaire.

**Centre audiovisuel:** Le centre audiovisuel se trouve dans la salle Chilco à l'étage supérieur de la conférence. Cette salle est dédiée au transfert de fichiers de présentation dans notre système informatique. Les participants peuvent également utiliser cette salle pour passer leur présentation en revue.

Le centre audiovisuel sera ouvert pendant les heures suivantes:

Dimanche, 31 octobre	9h00-13h00 et 16h30-20h00
Lundi, 1er novembre	7h00-18h00
Mardi, 2 novembre	7h00-17h00
Mercredi, 3 novembre	7h00-8h00 et 10h00-10h30

**Les fichiers doivent être transférés au plus tard un jours avant la présentation.**

Tout orateur qui fait un transfert de fichier durant sa séance de présentation aura ce temps déduit des 15 minutes allouées. Veuillez utiliser une clé USB pour le transfert de fichiers. Les logiciels de présentation utilisés à la RAC 2010 sont Microsoft PowerPoint et Adobe Reader. Nous utilisons des ordinateurs PC avec comme système d'exploitation Windows 7. Vous ne pouvez **pas** utiliser votre propre ordinateur. Chaque orateur doit s'assurer que son fichier est compatible avec Microsoft PowerPoint (version Office 2007) ou Adobe Acrobat (Reader) 9 pour PC, et que sa clé USB puisse être reconnue par un ordinateur portable PC.

Les fichiers doivent être nommés comme suit:

Nom de famille\_Premier initial (du présentateur sur la liste)\_date\_séance\_heure\_salle

**Exemple: Jack\_D\_Nov1\_President's Prize 1\_8:30\_Nelson**

**Présentations d'affiches:** Les présentations d'affiches auront lieu dans la salle Barclay/Gilford à l'étage principal de la conférence. Vous pouvez accrocher votre affiche dans la salle dimanche 31 octobre entre midi et 22h00. Des punaises seront disponible et les présentateurs sont priés d'accrocher leur affiche à l'emplacement attribué.

Tous les présentateurs d'affiche sont priés d'être près de leur affiche pendant la séance d'affiches, qui a lieu mardi 2 novembre de 15h à 16h.

Toutes les affiches devront être enlevées d'ici au mardi 2 novembre à 22h. Comme la salle Barclay/Gilford est utilisée pour des présentations orales mercredi matin, les affiches ne peuvent pas rester accrochées pendant la nuit du mardi. Toute affiche encore dans la salle après 22h mardi soir risque d'être gardée par les organisateurs.

**Bureau d'inscription:** Le bureau d'inscription se trouve dans le foyer à l'étage principal de la conférence. Le bureau sera ouvert pendant les heures suivantes:

Dimanche, 31 octobre	9h00-13h00 et 17h00-20h00
Lundi, 1er novembre	7h00-8h30, 10h00-10h30 et 12h00-13h30
Mardi, 2 novembre	7h00-8h30

Le bureau d'inscription ne sera pas occupé pendant les séances scientifiques, et il sera fermé définitivement mardi matin à partir de 8h30. Toute personne voulant s'inscrire après cela devra contacter le Dr. Sheila Fitzpatrick, responsable du comité d'infrastructure locale.

**Lieux** (voir les plans d'étages en page 1 du programme):

Inscriptions, information, vente aux enchères silencieuse, et vente de marchandises ont tous lieu dans le foyer de l'étage principal de la conférence, à l'hôtel Coast Plaza. Les présentations orales et d'affiches ont lieu à l'étage principal de la conférence (salles Nelson, Denman, Comox, Barclay/Gilford, et salle de bal) ou à l'étage supérieur de la conférence (salle Beach). Le centre audiovisuel se trouve dans la salle Chilco à l'étage supérieur de la conférence. La réunion du comité de rédaction SEC ainsi que la réception du président de la SEC ont lieu au 35ème étage de l'hôtel.

**Pauses rafraîchissement:** Café, thé (normal ou décafé pour chacun), eau, boissons gazeuses, jus, et hors-d'oeuvres seront servis dans le foyer de la conférence pendant les heures suivantes:

Dimanche, 31 octobre	14h00-14h30
Lundi, 1er novembre	10h00-10h30 et 15h00-15h30
Mardi, 2 novembre	10h00-10h30 et <b>15h00-15h30*</b>
Mercredi, 3 novembre	10h00-10h30

\* La pause de mardi après-midi est aussi dédiée à la séance d'affiches, qui a lieu dans la salle Barclay/Gilford.

**Activités sociales:** Tous sauf la réception du président ont lieu dans la salle Denman/Bal.

Dimanche, 31 octobre	Réception d'ouverture (Costumes insecte/Halloween facultatifs)	18h30-22h00
Lundi, 1er novembre	Soirée étudiante (seulement pour étudiants)	19h30-22h00
	Réception du président (sur invitation)	19h30-22h00
Mardi, 2 novembre	Banquet SEC & remise de prix	18h00-20h30
	Une soirée de Blues	20h30-23h00

### Réunions des sociétés:

Lundi, 1er novembre	<b>Comité de rédaction SEC</b> 12h00-14h00 (35ème étage – seulement pour membres du comité)
Mardi, 2 novembre	<b>Réunion générale annuelle SEC</b> 17h00-17h45 (Salle Beach – ouvert à tous les membres SEC) <b>Réunion du comité de direction SEC</b> 17h45-18h30 (Salle Beach – seulement pour membres du comité)
Mercredi, 3 novembre	<b>Réunion générale annuelle SECB*</b> 12h00-13h00 (salle Barclay/Gilford – ouvert à tous les membres SEBC) * hors-d'oeuvres servis <b>Réunion du comité exécutif SECB</b> 13h00-14h00 (salle Barclay/Gilford – seulement pour membres du comité)

**Marchandises et vente aux enchères silencieuse:** Des verres à bière et des t-shirts portant le logo de la RAC 2010 seront vendus dans le foyer de la conférence en dehors des séances de présentations. Nous avons aussi un nombre limité de tirages du logo signés par l'artiste à vendre.

Les étudiants gradués organisent une vente aux enchères silencieuse d'articles d'intérêt entomologique dans le foyer de la conférence, de dimanche à mardi. Vous avez jusqu'au mardi 2 novembre à 13h pour faire des offres aux enchères. Les articles devront être ramassés mardi entre 15h et 16h, durant la pause rafraîchissement/séance d'affiches.



## Presentation Abstracts / Résumés des présentations

**Ablard, K.** (1), R. Gries (1), G. Khaskin (1), S. Fairhurst (1), G. Andersen (1), P.W. Schaefer (2) and G. Gries (1)  
(1) Department of Biological Sciences, Simon Fraser University, Burnaby, BC; (2) United States Department of Agriculture, Agricultural Research Service, Beneficial Insects Introduction Research Laboratory, Newark, DE, USA.  
MON NOV 01, 14:00 ORAL PRESIDENT'S PRIZE: BEHAVIOUR

### **Mechanisms and functions of pre- and post-copulatory rituals of the parasitoid wasp *Ooencyrtus kuvanae* (Hymenoptera: Encyrtidae)**

The parasitoid wasp *Ooencyrtus kuvanae* emerges en masse from gypsy moth host egg masses. Males pheromone-tag females for their harem prior to engaging them in a pre-copulatory ritual, followed by mating, and a post-copulatory ritual. We investigated mechanisms and functions of the pre- and post-copulatory ritual using high-speed cinematography, gas chromatographic-mass spectrometric analyses of the insects' body washes, and behavioural bioassays. The harem strategy relies on specimen-specific pheromones used by both sexes in mate recognition and assessment. Pre- and post-copulatory rituals entail physical interactions that function to respectively put a female into, and take her out of, a trance-like state.

**Abraham, B.** and F.F. Hunter  
Department of Biological Sciences, Brock University, ON  
MON NOV 01, 16:00

ORAL PRESIDENT'S PRIZE: REPRODUCTION

### **Does a male mosquito's sugar diet affect vitellogenesis in his mate?**

Male mosquitoes transfer accessory gland proteins (AGPs) along with sperm during mating. In the female, these AGPs exert their influence on reproductive genes that control vitellogenesis and ovulation. We are testing the hypothesis that mates of males consuming different sugar meals (e.g. nectar or Homopteran honeydew) will exhibit varying levels of induction of key vitellogenic genes. The current study uses two-step RT-PCR to investigate how different sugar meals influence AGP-induced up-regulation of vitellogenin mRNA in *Anopheles stephensi*. Preliminary results will be presented.

**Abram, P.K.** (1), T. Haye (2), P.G. Mason (3), N. Cappuccino (1), G. Boivin (4) and U. Kuhlmann (2)  
(1) Department of Biology, Carleton University, Ottawa, ON; (2) CABI Europe- Switzerland, Delémont, Switzerland; (3) Eastern Cereal and Oilseed Research Centre, Agriculture and Agri-Food Canada, Ottawa, ON; (4) Centre de Recherche et de Développement en Horticulture, Agriculture et Agroalimentaire Canada, Saint-Jean-sur-Richelieu, QC  
MON NOV 01, 14:30 ORAL PRESIDENT'S PRIZE: BIOLOGICAL CONTROL

### **What is the potential for classical biological control of the invasive swede midge in Canada using its parasitoids from Europe?**

The invasive swede midge *Contarinia nasturtii* (Diptera: Cecidomyiidae), native to Europe, is a major pest of crucifer crops in eastern Canada and threatens canola production as its geographical range continues to expand. The midge has no effective natural enemies in Canada, prompting a search of its native range for parasitoids. The distribution, biology and host range of the most common swede midge parasitoids found thus far are presented, with a discussion of their potential as classical biological control agents in Canada.

**Acheampong, S.** (1) H. Thistlewood (2), M. Thurston (3), C. Leaming (3), D. Holder (4), L. Edwards (5) and B. Sinclair (6)

(1) Ministry of Agriculture and Lands, Kelowna, BC; (2) Agriculture and Agri-Food Canada, Pacific Agri-Food Research Centre, Summerland, BC; (3) Okanagan Tree Fruit Cooperative, Kelowna, BC; (3) Okanagan Tree Fruit Cooperative, Penticton, BC; (4) Farmquest Consulting Ltd., Creston, BC; (5) Cawston, BC; (6) Canadian Food Inspection Agency, Ottawa, ON  
TUE NOV 02, 13:00 ORAL SUBMITTED: AGRICULTURE

***Drosophila suzukii*, a new pest of stone fruits and grapes in British Columbia**

Spotted wing drosophila, *Drosophila suzukii* is an invasive pest from Asia that was first detected in the interior of British Columbia in September 2009. We present a summary of the results of monitoring of adult populations with apple cider vinegar-baited traps in ca. 340 locations in 2010. We discuss a combined industry-government response including provision of diagnostic tools, emergency use registrations for four insecticides, and an extensive communications effort with factsheets, warning posters, talks to growers, weekly updates, and visits to fruit stands. We present a summary of reported damage to crops, challenges experienced in crop protection and sanitation, and some thoughts for the future.

**Alhudaib, K.** and A. Ajlan

Department of Plant Protection, King Faisal University, Al-Hasa, Saudi Arabia.  
PRESIDENT'S PRIZE POSTER #1

**Al-Wijam, date palm phytoplasma, and its insect vectors in Saudi Arabia**

Date palm, (*Phoenix dactylifera* L.), is one of the most important cash crops in Saudi Arabia, where 23 million trees produce 970,488 tons of dates annually. A disease called Al-Wijam (Phytoplasma) has been affecting date palm in Saudi Arabia. Main symptoms are yellow streaking and a marked reduction in fruit and stalk size, which leads to failure in fruit production at harvest. The 16S rDNA sequences of the phytoplasma identified in date palm (DQ913090) and *Cicadulina bipunctata* (Melichar) (DQ913091) were 100% identical in between and 98% with that of aster yellows phytoplasma (AF322644) from 16SrI, *Candidatus* Phytoplasma asteris group.

**Andreassen, L.**(1), U. Kuhlmann (2), P.G. Mason (3) and N.J. Holliday (1)

(1) Department of Entomology, University of Manitoba, Winnipeg, MB; (2) CABI Europe — Switzerland, 1 rue de Grillons, 2800 Delémont, Switzerland; (3) Eastern Cereal and Oilseed Research Centre, Agriculture and Agri-Food Canada, Ottawa, ON  
MON NOV 01, 14:45 ORAL PRESIDENT'S PRIZE: BIOLOGICAL CONTROL

**Assessment of *Aleochara bipustulata* (Diptera: Staphylinidae) as an additional mortality factor of *Delia radicum* (Diptera: Anthomyiidae) eggs in prairie canola**

If *A. bipustulata* is introduced into Canadian prairie canola crops, it will become part of a diverse guild of beetles predatory on *D. radicum* eggs. Two representative species from this guild were used in laboratory and field cage experiments, to determine whether mortality inflicted by *A. bipustulata* is additional to, or a replacement of, mortality inflicted by the current guild. The results will be discussed in the context of evaluation of *A. bipustulata* as a candidate biological control agent.

**Arango-Velez, A., M.** Meents, L. Galindo, W. El Kayal, J. Linsky and J. Cooke

University of Alberta, Department of Biological Sciences, Edmonton, AB  
WED NOV 03, 08:30 SYMPOSIUM 7: MOUNTAIN PINE BEETLE SYSTEM GENOMICS

**Influence of water deficit on the molecular responses of pines to infection by mountain pine beetle fungal associates**

Ecological studies suggest that water deficit may compromise pine defenses against mountain pine beetle (*Dendroctonus ponderosae*) attack, but evidence at the molecular level is lacking. We tested this hypothesis by analyzing expression profiles for several defense-associated genes in lodgepole pine (*P. contorta*), jack pine (*P. banksiana*) and their hybrids subjected to both water deficit and inoculation by *Grosmannia clavigera*, a mountain pine beetle fungal associate. Physiological parameters were measured to assess effects of water deficit and fungal inoculation on the trees. Our results showed that even under mild water deficit, constitutive and/or induced responses of some defense-related genes were altered.

**Aukema, B.**, Honey-M.C. de la Giroday and K. Sambaraju

Canadian Forest Service; University of Northern British Columbia, Prince George, BC

WED NOV 03, 11:10

SYMPOSIUM 7: MOUNTAIN PINE BEETLE SYSTEM GENOMICS

**Can genomics data provide insight on the location of tree-killing mountain pine beetles at the landscape scale?**

We have developed a suite of landscape-level statistical models for inference on the locations of tree-killing populations of mountain pine beetle. Typically, these models contain three components: intricate environmental covariates reflecting insect development and phenology, and coarse spatial and temporal terms indicating presence/absence of beetles to contend with spatiotemporal variability. Here, we test whether information on the types of beetle populations - using genomics information - can improve model output.

**Aurelian, V.M.** (1), M.L. Evenden (1) and G.J.R. Judd (2)

(1) Department of Biological Sciences, CW 405 Biological Sciences building, University of Alberta, Edmonton, AB; (2) Agriculture and Agri-Food Canada, Pacific Agri-Food Research Centre, Summerland, BC

MON NOV 01, 11:15

ORAL PRESIDENT'S PRIZE: CHEMICAL ECOLOGY

**Capture of non-target arthropods in semiochemical-baited traps for the apple clearwing moth *Synanthedon myopaeformis* (Lepidoptera: Sesiidae): potential for the development of a biodiversity assessment tool**

Semiochemical-based mass trapping to control the apple clearwing moth is currently being studied in apple orchards in the Okanagan and Similkameen Valleys, BC. We investigated the non-target arthropods captured in semiochemical-baited traps in orchards under conventional and organic management regimes. There were significantly fewer non-target arthropods captured in traps in conventional than in organic orchards. Also, more non-target arthropods were captured in kairomone-baited food traps than traps baited with apple clearwing moth sex pheromone. The kairomone-baited traps captured a broad spectrum of non-target arthropods (99 families) and should be developed as a biodiversity assessment tool.

**Avilés, L.**

University of British Columbia, Vancouver, BC

MON NOV 01, 10:30

SYMPOSIUM 1: ARACHNOLOGY

**Intrinsic and extrinsic factors in social evolution and the geographical distribution of spider sociality**

The geographical distribution of social species provides clues to understanding the evolution of sociality. Social spiders have distinctly tropical distributions. This latitudinal pattern is replicated altitudinally in *Anelosimus* spiders: social species are restricted to low to mid-elevation areas, subsocial species predominate at higher elevations and latitudes. We postulate that this results from the interaction of web morphology with gradients of (1) prey size and (2) intensity of precipitation and abundance of potential ant predators. In the lowland rainforest, large complex webs are subject to rain damage but may provide better protection against predators and increased ability to capture large prey, thus favouring large social groups over solitary spiders.

**Bain, J.N.** (1,2), S.M. Fitzpatrick (1) and S. Mathur (1)

(1) Agriculture and Agri-Food Canada, Pacific Agri-Food Research Centre, Agassiz, BC; (2) Simon Fraser University, Department of Biological Sciences, Burnaby, BC

PRESIDENT'S PRIZE POSTER #2

**Comparison of trap types and liquid baits for detecting spotted wing drosophila, *Drosophila suzukii*, in berry crops**

Spotted wing drosophila, *Drosophila suzukii* (Matsumura) (Diptera: Drosophilidae) (SWD), became a serious pest of soft fruit and berries in western North America in 2009. Female SWD use a serrated ovipositor to puncture ripening fruit and deposit eggs beneath the skin. Larvae develop in the fruit. In 2010, early detection of adult SWD was the cornerstone of cultural and chemical management. We compared a homemade trap with the Contech Fruit Fly Trap™, and compared apple cider vinegar with yeast-sugar-water baits. Each trap and bait combination trapped more females than males throughout the season.

**Bannerman, J.A.**(1), D.G. Gillespie (1,2) and B.D. Roitberg (1)

(1) Department of Biological Sciences, Simon Fraser University, Burnaby, BC; (2) Pacific Agri-Food Research Centre, Agriculture and Agri-Food Canada, Agassiz, BC

MON NOV 01, 15:30

ORAL PRESIDENT'S PRIZE: BEHAVIOUR

**The impact of heat waves on aphid-parasitoid interactions and parasitoid performance**

A primary prediction of current global climate change models is an increase in the frequency and magnitude of extreme temperature events. These temperature events, heat waves for example, have the potential to influence species interactions, and will impact a wide range of physiological and behavioural processes, particularly in ectotherms. We examined the impact of moderate and severe heat waves on the second and third trophic levels of a plant-aphid-parasitoid community. We examined the influence of heat waves three ways, looking at overall community impacts, impacts on wasp performance, and impacts on wasp oviposition decisions.

**Bennett, A.M.R.**

Canadian National Collection of Insects, Ottawa, ON

TUE NOV 02, 14:45

ORAL SUBMITTED: BIODIVERSITY & SYSTEMATICS

**Natural history and systematics of the family Ichneumonidae (Hymenoptera)**

The Family Ichneumonidae is the largest family of insects in the Nearctic Region with nearly 5000 described species and many more undescribed or not yet recorded in the region. I will present a general overview of the natural history of the family, put into context with an ongoing morphological and molecular phylogenetic analysis aimed at resolving the relationships among the 40 subfamilies.

**Bergeron, C.** and J.Spence

University of Alberta, Edmonton, AB

TUE NOV 02, 14:00

ORAL SUBMITTED: BIODIVERSITY & SYSTEMATICS

**Ecosite classification as biodiversity surrogate for rove beetles**

In this paper, we investigate the landscape association between tree and rove beetle species. We use different land cover datasets to assess how they predict rove beetle diversity. We demonstrate that provincial forest inventory does predict a portion of the rove beetle diversity, but field survey of the trees performs better. Land cover data about ecosite classification performs even better and is therefore an interesting tool for coarse filter conservation approach and biodiversity monitoring programs to manage on the forested landscape.

**Berry, K.** and L.M. Poirier

Ecosystem Science and Management Program, University of Northern British Columbia, Prince George, BC

SUBMITTED POSTER #3

**Influence of light on trap catches of mosquitoes in north-central British Columbia**

West Nile virus was first detected in southern BC in August 2009. Monitoring of vector mosquito species includes trapping adult females in CDC miniature light traps. My goal was to improve the efficiency of these traps by removing light, which can attract both moths and humans. Mosquitoes were trapped for two consecutive nights during two weeks in July and August using traps with and without light. The mosquito species and numbers caught did not differ when light was removed, but fewer moths were caught. This trapping method may be beneficial in areas with high moth populations and those with human traffic.

**Best, L.R.**, J. Gibbs and C. Sheffield

Packer Lab, York University, Toronto, ON, Canada.

PRESIDENT'S PRIZE POSTER #4

**The apifauna of British Columbia: utilizing integrative taxonomy in biodiversity surveys**

Bees provide an essential service in many agro- and terrestrial ecosystems through insect mediated pollination. Yet this species rich clade remains poorly studied in British Columbia. Intensive melittological surveys throughout the interior of British Columbia, followed by traditional morphological taxonomic approaches, in conjunction with mtDNA barcoding, has enabled the identification of 64 new provincial records, and 25 new national records. Further mtDNA sequence data suggests both cryptic and undescribed species within several genera. Integrative taxonomy provides a comprehensive and efficient means to document diverse and little studied faunas.



**Blake, A. J.** (1), L. M. Dossall (2) and B. A. Keddie (1)

(1) Department of Biological Sciences, University of Alberta, Edmonton, AB; (2) Department of Agricultural, Food and Nutritional Science, University of Alberta, Edmonton, AB

MON NOV 01, 08:30

ORAL PRESIDENT'S PRIZE: AGRICULTURE

**The systemic spatial relationships among soil and plant characteristics and the distribution of *Ceutorhynchus obstrictus* (Coleoptera: Curculionidae) and its parasitoids**

In an effort to allow site-specific management of *Ceutorhynchus obstrictus* we evaluated the relationships among *C. obstrictus* adults, larvae and their parasitoids as well as underlying soil and plant variables using structural equation modeling. The results from one site-year support previous work showing that *C. obstrictus* distributions are correlated with plant nutrients; unfortunately no similar relationship was found in the second site-year. Our models also suggest larval infestations are greatest in areas of low plant density and plant vigor.

**Bohlmann, J.** and Members of the Tria II Project Consortium ([www.thetriaproject.ca](http://www.thetriaproject.ca))

University of British Columbia, Vancouver, BC

WED NOV 03, 08:00

SYMPOSIUM 7: MOUNTAIN PINE BEETLE SYSTEM GENOMICS

**Reasoning for a mountain pine beetle system genomics project**

The Tria Project has developed an interdisciplinary approach to study the mountain pine beetle system. At the genomic level we comprehensively investigate interactions of bark beetles, beetle associated fungi, and host pine trees. Genomic studies include genome sequencing and analysis of individual biological system components, functions of the genomes in the context of physiology and interactions of the biological system, as well as population and landscape level genome analyses of the mountain pine beetle system. The genomic studies inform improved ecological modeling, prediction of mountain pine beetle dynamics, and economic forecasting of impacts of the mountain pine beetle system.

**Boisclair J.** (1), G. Richard (1), M. Lefebvre (1), S. Todorova (2), F. Pelletier (1), É. Lucas (3) and M. Grenier (1)

(1) Institut de recherche et de développement en agroenvironnement (IRDA), Saint-Hyacinthe, QC; (2) Anatis Bioprotection, Saint-Jacques-le-Mineur, QC; (3) Université du Québec à Montréal, Montréal, QC

TUE NOV 02, 13:45

ORAL SUBMITTED: BIOLOGICAL CONTROL

**Use of *Trichogramma ostrinae* to control European corn borer (*Ostrinia nubilalis*) in sweet pepper in Quebec, Canada**

The efficacy of *Trichogramma ostrinae* to control European corn borer (ECB) was evaluated in sweet pepper on a vegetable farm in Saint-Paul d'Abbotsford, Québec in 2009. Four releases of 250,000 trichogramma wasps per hectare were compared to untreated plots. Field emergence rate was high ranging from 79.0 to 87.1%. Percentage of egg masses which were entirely parasitized in the release plots was 55.6 %. In these plots, the percentage of fruits with ECB damage was 5.7 % and significantly lower than the damage observed in the untreated plots (9.7%). In 2010, the evaluation was repeated at IRDA research station, Saint-Hyacinthe.

**Borden, J.H.** (1), C.G. Lait (1), E. Kovacs (1), O.G. Moeri (1), C.M. Machial (1) and M. Campbell (2)

(1) Contech Enterprises Inc., Delta, BC; (2) Campbell's Gold Honey Farm and Meadery, Abbotsford, BC

TUE NOV 02, 11:00

SYMPOSIUM 6: MARK WINSTON RETROSPECTIVE

**SuperBoost: Mark Winston's legacy lives on in a new product based on the honey bee brood pheromone**  
(No Abstract Submitted)

**Borkent, C.J.** and T.A. Wheeler

Department of Natural Resource Sciences, Macdonald Campus, McGill University, Ste-Anne-de-Bellevue, QC  
TUE NOV 02, 11:30

SYMPOSIUM 3: GRAD STUDENT SYMPOSIUM

**Systematics of *Leptomorphus* and the phylogeny of the tribe Sciophilini (Diptera: Mycetophilidae)**

The Mycetophilidae, or fungus gnats, is a diverse family of Diptera with over 4100 species in 135 genera. They are a dominant insect group in moist habitats, particularly forests, where they play a major role in decomposition of fungi and wood. Recent phylogenetic work on the Mycetophilidae provides good support for the monophyly of the subfamily Mycetophilinae and its' two tribes, but the monophyly of the four tribes in the other subfamily, the Sciophilinae, remains uncertain. One of the five largest genera in the tribe Sciophilini is *Leptomorphus* Curtis, which is found worldwide except Australasia and Antarctica. The genus currently contains 28 extant species in four subgenera, and has no hypothesis of phylogenetic relationships. Here I report the results of a worldwide revision of this genus, along with a phylogeny of the species relationships. Sixteen new species were discovered and the resulting change to the biogeographic distribution of the genus is discussed. A dataset of adult morphological characters was analyzed, using parsimony, to reconstruct a phylogeny of the species relationships. This yielded a number of monophyletic species-groups, and called into question the validity of the subgenera and some species synonymizations. I also used morphological characters to explore the phylogeny of the tribe Sciophilini, which currently contains ~540 species in 38 genera. I present the first phylogeny including all genera assigned to the tribe. The resulting relationships between the genera and the taxonomic limits of both the tribe and the genera are discussed. The new information from these studies will require changes to the mycetophilid classification.

**Bostanian, N.J** (1)., M. Lefebvre (2) and H.M.A. Thistlewood (3)

(1) Horticultural Research and Development Center, Agriculture and Agri-Food Canada, St. Jean-sur-Richelieu, QC; (2) Université du Québec à Montréal, Département des sciences biologiques, Montréal, QC; (3) Pacific Agri-Food Research Centre, Agriculture and Agri-Food Canada, Highway 97, Summerland, BC

TUE NOV 02, 13:30

ORAL SUBMITTED: AGRICULTURE

**Toxic effects of 'six reduced risk' insecticides to *Galendromus occidentalis***

Six reduced risk insecticides were evaluated for their effects on *Galendromus occidentalis*. The modified excised leaf disc method was used to measure toxicity on adults, larvae, eggs and fecundity. Chlorantraniliprole and flubendiamide were innocuous to all growth stages of the predator. Novaluron, clothianidin, spinetoram and spirotetramat showed some toxicity on at least one growth stage. The label rate of spinetoram was 14.02 fold the LC50 value whereas the label rate of clothianidin was 6.09 fold the LC50 value. Field evaluations in orchards should take into account these findings along with the intended use and the abundance of the predator.

**Bouchard, P.**

Agriculture and Agri-Food Canada Canadian National Collection of Insects, Arachnids and Nematodes, Ottawa, ON  
TUE NOV 02, 14:30

ORAL SUBMITTED: BIODIVERSITY & SYSTEMATICS

**Family-group names in Coleoptera**

Data on extant and fossil Coleoptera family-group names are summarized for the first time. We report family-group names based on 4627 distinct type genera. Names are listed in a classification framework. A list of necessary changes due to Priority and Homonymy problems, and actions taken, is given. Current usage of names was conserved, whenever possible, to promote stability of the classification.

**Brodersen, G.**(1), R. Lapointe (2), G. Thurston (3), C. Lucarotti (3) and D. Quiring (1)

(1) Faculty of Forestry and Environmental Management, University of New Brunswick, Fredericton, NB; (2) Sylvar Technologies Inc., Fredericton, NB; (3) Natural Resources Canada, Canadian Forest Service, Fredericton NB

MON NOV 01, 08:30

ORAL PRESIDENT'S PRIZE: FORESTRY

**Evaluation of the efficacy of two nucleopolyhedroviruses against whitemarked tussock larvae**

Two nucleopolyhedroviruses isolated from whitemarked tussock moth (WMTM, *Orgyia leucostigma*) and Douglas-fir tussock moth (*Orgyia pseudotsugata*) were fed to WMTM larvae in a range of concentrations. The influence of virus, dose and larval instar at inoculation on larval mortality was determined in laboratory bioassays. A field study evaluated the influence of host tree, virus and dose on larval mortality. Implications of the results for biocontrol of WMTM will be discussed.

**Brunet, B.** (1), A. Hundsdörfer (2) and F. Sperling (1)

(1) Department of Biological Sciences, University of Alberta, Edmonton, AB; (2) Alberta Sustainable Resource Development, Government of Alberta, Edmonton, AB

TUE NOV 02, 13:45

ORAL SUBMITTED: FORESTRY

**Phenology of outbreaking populations of the western spruce budworm, *Choristoneura occidentalis*, in southwest Alberta**

In 2009, a phenology study was conducted on outbreaking populations of western spruce budworms, *Choristoneura occidentalis*, on *Picea glauca* and *Pseudotsuga menziesii* in southwest Alberta. Phenology models were developed to investigate the degree of synchrony between host and insect. A high-degree of synchrony is evident with peak instar occurrences overlapping with distinct shoot development stages of each host, and differences between budworm populations are reflective of their host species.

**Bura, V.L.** and J.E. Yack

Carleton University, Ottawa, ON, Canada

MON NOV 01, 08:30

ORAL PRESIDENT'S PRIZE: ACOUSTICS

**Defensive sounds in Bombycoidea caterpillars**

Caterpillar acoustic communication is an area of study that has been little documented but is currently gaining more experimental evidence. We conducted a survey of 42 Bombycoidea caterpillars to examine the diversity and function of sound production. Sounds were recorded in 15 species, and 4 different mechanisms are reported: mandibular clicking and stridulation, and air expulsion through spiracles and buccal cavity. Based on experimental trials all sounds are defensive in nature, functioning to startle and/or warn predators of a chemical defense. Sound characteristics and preliminary predator trials suggest these sounds are directed at avian predators and possibly bats and rodents.

**Carleton, D.** and D. Quiring

Faculty of Forestry and Environmental Management. University of New Brunswick, Fredericton, NB

TUE NOV 02, 14:15

ORAL SUBMITTED: FORESTRY

**Commercial thinning increases the susceptibility of balsam fir to the balsam woolly adelgid**

The balsam woolly adelgid, (*Adelges piceae* Ratz.) is a pest of true firs (*Abies* spp.). Precommercial and commercial thinning, which reduces the density of young and older trees, respectively, increases tree growth but can alter tree susceptibility to insect pests. Using a paired design, we compared the incidence of gouting by the adelgid in precommercially and adjacent commercially thinned stands of *Abies balsamea* in Nova Scotia. Our results suggest that commercial thinning increases the level of damage caused by *A. piceae* during the first five years following commercial thinning.

**Carriere, Y.**

University of Arizona, Tucson, AZ, USA

TUE NOV 02, 11:15

SYMPOSIUM 5: INSECT COMMUNITY ECOLOGY

**Bt crop effects on non-target arthropods**

The effect on biodiversity of crops producing toxins from the soil bacterium *Bacillus thuringiensis* (Bt) has been the subject of considerable discussion and research. Nevertheless, data show that Bt crops mainly have neutral local effects on non-target arthropods when changes in insecticide applications are considered. Regional effects of Bt crops on pest population density can be negative or positive. Such landscape effects could have important consequences for insect communities when they affect insecticide use.

**Carroll, A.**

University of British Columbia, Dept of Forest Sciences, Vancouver, BC

MON NOV 01, 03:30

SYMPOSIUM 2: TERRY SHORE MEMORIAL

**Lessons learned from an unprecedented outbreak: the mountain pine beetle in western North America**

Considerable resources have been devoted to mitigating the impacts of the ongoing mountain pine beetle outbreak in western Canada. This has afforded a unique opportunity to researchers and forest managers to investigate many aspects of the mountain pine beetle's ecology, population dynamics and management. This paper will review and contextualize advances in our understanding of the causes and consequences of such an unprecedented forest disturbance event.

**Chubaty, A.M.**

Department of Biological Sciences, Simon Fraser University, Burnaby, BC

MON NOV 01, 08:45

ORAL PRESIDENT'S PRIZE: FORESTRY

**Energy reserves modulate host acceptance decisions in mountain pine beetles**

I tested the role of energy reserves on the host tree acceptance of mountain pine beetle (MPB) adults on host trees. Newly-emerged adult MPBs were kept at either high or low temperatures, depleting their lipid reserves at different rates, and thus to different levels. Beetles were introduced onto girdled lodgepole pine trees of either poor or high quality, and their willingness to accept the host was measured. Survival analysis showed low energy beetles accepted both poor quality trees sooner than did high energy beetles, and beetles on good quality trees accepted sooner than beetles on poor quality trees.

Clark, E.L. (1), A.L. Carroll (2) and **D.P.W. Huber** (1)

(1) University of Northern British Columbia, Ecosystem Science and Management Program, Prince George, BC; (2) University of British Columbia, Department of Forest Sciences, University of British Columbia, Vancouver, BC

TUE NOV 02, 13:30

ORAL SUBMITTED: FORESTRY

**The legacy of attack: implications of very high phloem resin monoterpene levels in mass attacked lodgepole pines following successful mountain pine beetle, *Dendroctonus ponderosae* Hopkins, colonization**

Mountain pine beetles, *Dendroctonus ponderosae*, face increasing chemical defenses during colonization of host tissues. We sampled lodgepole pines at four locations and found that trees that died contained extremely high levels of seven common monoterpenoids in late-August compared to in early-July. Trees that survived did not retain high monoterpenoid levels. Thus, larvae; symbiotic fungi; predators and parasitoids; and other associates face harsher chemical conditions than do initial colonists.

**Clark, E.L.** (1), R. Isitt (1), Y. Yu (2), E. Plettner (2) and D.P.W. Huber (1)

(1) Ecosystem Science and Management Program, University of Northern British Columbia, Prince George, BC (2) Department of Chemistry, Simon Fraser University, Burnaby, BC

PRESIDENT'S PRIZE POSTER #7

**Testing novel compounds for the potential behavioral control of the red flour beetle, *Tribolium castaneum***

The red flour beetle (*Tribolium castaneum*) is a pest of grain products. Due to concerns over consequences of insecticide use there is interest in developing alternative methods of pest control. Novel compounds were tested for possible behavioral modification properties. Adult beetles were presented with control and treated flour disks to test effects on searching and feeding. This work may provide new control techniques and insight into insect sensory and behavioral physiology.

**Cockburn, S.** and S. Perlman  
Department of Biology, University of Victoria, Victoria, BC  
MON NOV 01, 16:45

ORAL PRESIDENT'S PRIZE: REPRODUCTION

**Ecology of a bacterial symbiont that rescues flies from nematode-induced sterility**

Inherited bacteria are increasingly considered to be crucial components of an insect immune systems. My research characterizes a recently discovered strain of *Spiroplasma* that protects the fly *Drosophila neotestacea* from the sterilizing effects of a parasitic nematode (*Howardula aoronymphium*). *Spiroplasma* appears to be increasing in frequency and spreading westward across North America. I identified *Spiroplasma*-infected flies in British Columbia for the first time, and present several lines of evidence that suggest there is a strong selective pressure for *Spiroplasma* to continue to spread. In addition, I explore the defensive properties of *Spiroplasma* by testing its ability to protect flies from a bacterial pathogen.

**Comeau, C.** (1), J.-P. Privé (2) and G. Moreau (1)

(1) Université de Moncton, Moncton, NB, Canada; (2) Hervé J. Michaud Experimental Farm, Agriculture and Agri-Food Canada, St-Joseph-de-Kent, NB, Canada

MON NOV 01, 15:45

ORAL PRESIDENT'S PRIZE: ECOLOGY

**Life undercover: assessing the ecological impacts of reflective groundcovers through changes in ground beetle (Coleoptera : Carabidae) assemblages**

Reflective floating groundcovers are relatively new agricultural management tools used in temperate regions where light is a limiting factor to crop productivity. Although the effects of groundcovers on plants have been extensively studied, little is known about their ecological impacts on higher trophic levels. To assess this, ground beetles were collected by pitfall trapping from groundcover treated and control plots. The results indicated that groundcovers had little impact on carabid assemblages whereas inter-annual and between-site effects had considerable impact. It is thus suggested that reflective floating groundcovers pose no threat to agroecosystem integrity.

**Cook, M.A.** (1), S. M. Fitzpatrick (2) and B. Roitberg (1)

(1) Simon Fraser University, Department of Biological Sciences, Burnaby, BC; (2) Agriculture and Agri-Food Canada, Pacific Agri-Food Research Centre, Agassiz, BC

MON NOV 01, 14:15

ORAL PRESIDENT'S PRIZE: BEHAVIOUR

**Host associated differentiation in pest phenology and reproductive behaviour of *Dasineura oxycoccana* (Diptera: Cecidomyiidae) between populations on blueberry and cranberry**

In British Columbia, *Dasineura oxycoccana* was initially found on highbush blueberry, *Vaccinium corymbosum*, and has recently become a pest of cranberry, *V. macrocarpon*. *Dasineura oxycoccana* has the potential to form host races on these two crops. Data on *D. oxycoccana* phenology indicate a high potential for gene flow between populations on blueberry and cranberry. However, results from mating experiments indicate that *D. oxycoccana* populations from these two crops do not interbreed.

**Cooke, J.E.K.** and Members of the Tria II Project Consortium ([www.thetriaproject.ca](http://www.thetriaproject.ca))

University of Alberta, Department of Biological Sciences, Edmonton, AB

WED NOV 03, 11:50

SYMPOSIUM 7: MOUNTAIN PINE BEETLE SYSTEM GENOMICS

**An integrated, genomics-based approach to understanding the mountain pine beetle system**

The ever-increasing extent of the current mountain pine beetle epidemic challenges forest practitioners to understand how this outbreak grew to its present state, and develop measures to deal with the unrelenting spread of this forest pest. Tria 2 project members are using genomics to address long-standing gaps in our knowledge about this complex system. Researchers in this project have developed genomic resources for mountain pine beetle, its fungal associates, and pine hosts. These resources are being used in novel collaborations between molecular biologists and researchers in other disciplines to investigate the mountain pine beetle system in unique and innovative ways.

**Currie, R.**

University of Manitoba, Winnipeg, MB

TUE NOV 02, 09:30

SYMPOSIUM 6: MARK WINSTON RETROSPECTIVE

**Contributions to Applied Apiculture Research**

(No Abstract Submitted)

**Danci, A.** (1), S. Takács (1), C. Inducil (1), P. Schaefer (2) and G. Gries (1)

(1) Simon Fraser University, Burnaby, BC; (2) USDA, Beneficial Insects Introduction Research Laboratory, Newark, DE, USA.  
MON NOV 01, 08:45 ORAL PRESIDENT'S PRIZE: ACOUSTICS

**Do males of the pupal parasitoid *Pimpla disparis* (Hymenoptera: Ichneumonidae) exploit vibratory and semiochemical cues from parasitized host pupae to find them and to time the emergence of a prospective mate?**

Males of the parasitoid wasp *Pimpla disparis* arrive at parasitized host pupae in time for the emergence of a prospective mate. We have previously shown that vibratory cues associated with the developing parasitoid (DEPA) inside host pupae change overtime and could be monitored by males. Using video and Doppler laser vibrometry recordings as well as behavioural experiments, we have tested whether a monitoring male and DEPA exchange signals. Moreover, we present data showing that parasitized host pupae and/or DEPA emit semiochemicals that males could exploited to find such pupae and possibly gauge the time of emergence of a prospective mate.

**De Clerck-Floate, R.** and H. Cárcamo

Agriculture and Agri-Food Canada, Lethbridge Research Centre, Lethbridge, AB

WED NOV 03, 09:40 SYMPOSIUM 9: ARTHROPODS OF CANADIAN GRASSLANDS (BIOLOGICAL SURVEY OF CANADA)

**Deliberate introductions of arthropods on grasslands**

Classical biological control typically involves the deliberate introduction of arthropod natural enemies of either pest arthropods or plants from the pest's place of origin. This useful tool in the mitigation of foreign pests has been applied in Canadian agro-ecosystems (i.e., crops and rangelands) for over 50 years, with several noted successes. Success here, also means long-term establishment of these organisms in our habitats so that they are available to control pest resurgences. This presentation will highlight the most common new additions to the arthropod communities of crops and grasslands in western Canada due to past releases of classical biocontrol agents.

**Delisle, J.** (1), L. Royer (2) and A. Labrecque (1)

(1) Natural Resources Canada, Canadian Forest Service, Laurentian Forestry Centre, Sainte-Foy, Québec, QC; (2) Natural Resources Canada, Canadian Forest Service, Atlantic Forestry Centre, Corner Brook, NL

TUE NOV 02, 10:30

ORAL SUBMITTED: CLIMATE & ECOLOGY

**Why bother with cold-hardiness of hemlock looper (HL) eggs, if winters are getting warmer? Cold-hardiness of hemlock looper (HL) eggs in warmer winters**

For many freeze-intolerant insects, the supercooling point (SCP) is not a reliable index of their cold-hardiness. As HL eggs exhibit a high capacity for supercooling, they were used to verify the accuracy of this statement. Firstly, we examined the relationship between their overwintering mortality and minimum daily temperatures recorded in the field. Secondly, we assessed their low-temperature tolerance by subjecting them to a combination of subzero temperatures above the SCP and exposure durations. Our findings indicate that HL is a chill susceptible species. The potential of HL to expand up north in response to warmer winters will be discussed.

**Desjardins, S.**

University of British Columbia-Okanagan, Department of Mathematics, Statistics and Physics, Kelowna, BC

TUE NOV 02, 08:35

SYMPOSIUM 4: INVERTEBRATE CONSERVATION

**Monitoring threatened butterfly species using mark-recapture**

The Southern Mountain population of the Mormon Metalmark, *Apodemia mormo*, was designated by COSEWIC as endangered in 2003. The habitat for this medium size butterfly consists of steep embankments on gravelly soils that contain snow buckwheat (*Eriogonum niveum*), the only known larval foodplant for this species. The species is extirpated from the Okanagan Valley, and the existing population in the Similkameen region is fragmented and prone to extreme fluctuations. To inform the decision-making process and ensure the success of the recovery program, a comprehensive study of the Mormon Metalmark population that combines mark-recapture surveys and genetic diversity studies was conducted in 2005-2008. In this talk, I will present the results of the mark-recapture surveys and discuss what we've learned so far from our field investigations about the butterflies' dispersal abilities and habitat requirements.

**deWaard, J.R.** (1,2), J-F. Landry (3) and L.M. Humble (1,4)

(1) University of British Columbia, Department of Forest Sciences, Forestry Sciences Centre, Vancouver, BC; (2) Royal British Columbia Museum, Entomology, Victoria, BC; (3) Agriculture and Agri-Food Canada, Canadian National Collection of Insects, Arachnids and Nematodes, Ottawa, ON; (4) Natural Resources Canada, Canadian Forest Service, Pacific Forestry Centre, Victoria, BC

MON NOV 01, 15:45

ORAL PRESIDENT'S PRIZE: BIODIVERSITY & SYSTEMATICS

**Molecular phylogenies and DNA barcodes: tools for forest biodiversity science**

Phylogenetic trees and DNA barcodes are two recent additions to the tool belt of the forest biodiversity scientist. They now make it possible to effectively assess multiple levels of diversity — species, genetic, and phylogenetic. Their integration into faunal inventories and monitoring programs therefore facilitates a more holistic approach to estimating diversity. We describe our work developing and employing these tools in British Columbia, to construct local inventories and to facilitate assessments of lepidopteran diversity across disturbance gradients. We highlight the benefits these approaches provide relative to traditional techniques, as well as the remarkable interplay between the three levels of diversity.

DiGuistini, S. (1), Y. Wang (1), T. Wang (1), L. Lim (1), S.M. Alamouti (1), S. Jones (2), J. Bohlmann (3) and **C. Breuil** (1)

(1) Dept. of Wood Science, University of British Columbia, Vancouver, BC; (2) BC Cancer Agency Genome Sciences Centre, Vancouver, BC; (3) Michael Smith Laboratories, University of British Columbia, Vancouver, BC

WED NOV 03, 08:50

SYMPOSIUM 7: MOUNTAIN PINE BEETLE SYSTEM GENOMICS

**Do *Grosmannia clavigera* and other mountain pine beetle associates tolerate terpenes or use them as carbon sources?**

The tree-killing fungus *Grosmannia clavigera* (Gc) is carried by the mountain pine beetle (MPB). We provide insights into how Gc interacts with defence chemicals in a pine host, especially oleoresin terpenoids. RNA-seq data indicate that terpenoids induce a substantial antimicrobial stress in Gc, and suggest that the fungus may detoxify these chemicals. Initially, ABC transporters related to multidrug resistance are highly induced; deleting one of them reduces Gc's monoterpene tolerance. Gc and some other MPB fungal associates can use monoterpenes as a carbon source. We will discuss the potential metabolic process involved in monoterpene utilization.

**Dosdall, L.M.** (1), M. Furlong (2) and M. Zalucki

(1) Department of Agricultural, Food and Nutritional Science, University of Alberta, Edmonton, AB; (2) School of Biological Sciences, University of Queensland, St. Lucia, Queensland, Australia

TUE NOV 02, 11:15

ORAL SUBMITTED: CLIMATE & ECOLOGY

**Developmental biology of the diamondback moth parasitoid *Diadegma semiclausum* (Hymenoptera: Ichneumonidae) is affected by temperature and host plant species**

We investigated effects of constant rearing temperature and brassicaceous host plant species on several developmental parameters of *Diadegma semiclausum*, the major larval parasitoid of diamondback moth in Australia. As expected, temperature had highly significant effects on several developmental parameters and effects were often quadratic with increasing temperature. Host plant species, comprising *Brassica napus*, *Brassica rapa*, and *Brassica oleracea*, also affected development of the parasitoid and significant interactions were observed between plant species and rearing temperature for several developmental parameters. The study has important implications for climate change because survival and development of the parasitoid and its host vary considerably at higher rearing temperatures.

**Doyle, A.** and J. Roland

University of Alberta, Edmonton, AB

TUE NOV 02, 11:45

ORAL SUBMITTED: CLIMATE & ECOLOGY

**The effects of herbivory-induced changes in host-plant quality on *Parnassius smintheus* larval growth**

*Parnassius smintheus* (Rocky Mountain apollo) larvae feed exclusively on the perennial succulent *Sedum lanceolatum*. In a two-year study, we assess the effects of herbivory on the quality of *S. lanceolatum* as a food source for *P. smintheus* larvae. We evaluate how both within-season damage and damage from the previous season affect larval growth with the goal of understanding the time scale on which herbivory-induced changes in host-plant quality occur in this alpine system.

**Du, J.** and N. J. Holliday

Department of Entomology, University of Manitoba, Winnipeg, MB

MON NOV 01, 11:45

ORAL PRESIDENT'S PRIZE: CHEMICAL ECOLOGY

**Responses of *Aleochara bilineata* and *Aleochara bipustulata* (Coleoptera: Staphylinidae) to dimethyl disulphide**

*Aleochara bilineata* and *A. bipustulata* adults are predators and larvae are parasitoids of *Delia radicum*. Dimethyl disulphide (DMDS) attracts adult beetles to pitfall traps, but its biological role is unknown. In still air, DMDS arrested first instar larvae of both *Aleochara* spp.; in *A. bilineata* this response was more evident in light than dark. DMDS increased frequency of parasitism of *D. radicum* puparia by *A. bilineata* larvae. In still air, adult *A. bilineata* showed no response to DMDS.

Dubuc, J.F., T. Jobin and **N.J. Bostanian**

Minor Use Pesticide Program, Agric. & Agri-Food Canada, St. Jean-sur-Richelieu, QC

SUBMITTED POSTER #5

**Efficacy of cyantraniliprole Cyazypyr® for cabbage maggot management**

Cabbage maggot, *Delia radicum*, L. is a serious pest of radish and *Brassica* crops. Commercially acceptable management of this pest is based on the use of pesticides as other methods are unavailable. This study reports the efficacy of cyantraniliprole to manage cabbage maggot in radishes (Escala cv). Six treatments were compared: two cyantraniliprole drenches, two cyantraniliprole seed treatments, a Pynrex® drench and an untreated control. cyantraniliprole drench treatment gave the best results, as it significantly reduced maggots when compared with the control.

**Durocher-Granger, L.** (1), V. Martel (2) and G. Boivin (3)

(1)McGill University, Department of Natural Resource Sciences, Ste-Anne-de-Bellevue, QC; (2)UMR 6553 Écobio, Paysage – Changements climatiques – Biodiversité, Université de Rennes I, Campus Beaulieu, Rennes Cédex, France; (3)CRDH, Agriculture and Agri-Food Canada, Saint-Jean-sur-Richelieu, QC

MON NOV 01, 16:30

ORAL PRESIDENT'S PRIZE: REPRODUCTION

**Number and size of gametes in the egg parasitoid *Trichogramma euproctidis*: an effect on sperm and larval competition?**

In parasitoids, the size of the adult is influenced by the size and quality of the host in which it develops. Body size is generally positively correlated with several adult fitness proxies (fecundity, longevity and mating capacity). The number and quality of gametes produced by an individual will also directly influence its fitness. Gamete production in relation to adult body size was studied in *Trichogramma euproctidis* Girault (Hymenoptera: Trichogrammatidae). The number of oocytes, volume of oocytes and sperm length were all positively significantly correlated to body size. Reproductive investment will be discussed in the context of sperm and larval competition.

**Eby, C.** (1,2), M. Gardiner (2), R. Gries (1), G. Judd (2) and G. Gries (1)

(1) Simon Fraser University, Burnaby, BC; (2) Pacific Agri-Food Research Centre, Summerland, BC

MON NOV 01, 11:30

ORAL PRESIDENT'S PRIZE: CHEMICAL ECOLOGY

**MMM Milkweed! Unraveling the complexity of olfactory and visual cues that attract the Apple Clearwing Moth, *Synanthedon myopaeformis*, to nectar-rich milkweed plants**

The Apple Clearwing Moth, *Synanthedon myopaeformis*, is a novel exotic insect pest of apple orchards in BC. Adult moths feed on nectar of diverse flowers. In choice experiments, we have determined that showy milkweed, *Asclepias speciosa*, is a preferred nectar source. To determine whether the plant's foliage or flower, or the flower scent or color, attract the moths, we have designed field experiments that eliminated or enhanced one or more of these cues. Visual cues were eliminated by obscuring flowers with stained cheesecloth, and olfactory cues were enhanced by disseminating synthetic floral scent via piezoelectric sprayers paired with plants.



**Elle, E.** and L.A. Neame

Department of Biological Sciences, Simon Fraser University, Burnaby, BC

TUE NOV 02, 08:50

SYMPOSIUM 4: INVERTEBRATE CONSERVATION

**Habitat fragmentation and pollinator diversity in BC's endangered Garry oak ecosystem**

Habitat fragmentation is an important driver of population declines and extinction. We estimated pollinator diversity in 19 habitat fragments ranging from 0.3 to 32 ha. Pan-trapping and netting surveys captured 4376 bees and pollinating flies comprising 137 species from 45 genera. There was no overall reduction in diversity in smaller fragments, but community composition shifted; ground nesters were less abundant and diverse in small fragments, syrphids were more abundant, but other guilds (cavity nesters and cleptoparasites) had no response. These results suggest that pollinator responses to fragmentation are complex, and nesting requirements must be considered in conservation planning.

**Elwell, S.** and E. Elle

Department of Biological Sciences, Simon Fraser University, Vancouver, BC

PRESIDENT'S PRIZE POSTER #8

**Livestock grazing and pollinator communities of the south Okanagan, British Columbia**

Agricultural development is a major threat to species diversity, and the loss of pollinating insects can lead to losses of pollination-dependent plants. To investigate the impact of livestock grazing on shrubsteppe pollinator communities, we netted insects on wildflowers at four grazed/ungrazed site pairs. We caught approximately 3,000 insects on 47 wildflower species over five months. More insects were caught at ungrazed sites, which had more wildflower species available for netting. When standardized by effort, grazing reduced capture rates in some site pairs. Future analysis will investigate changes in pollinator community composition resulting from differences in wildflower availability.

**Ensing, D.,** C. E. Moffat and J. Pither

The University of British Columbia, Okanagan Campus, Kelowna, BC

SUBMITTED POSTER #6

**The potential for invasion and biological control of two European hawkweeds, *Pilosella caespitosa* and *Pilosella glomerata***

European hawkweeds (*Pilosella* spp., formerly *Hieracium* subgenus *Pilosella*), recently introduced in North America, are invasive and have likely not yet reached equilibrium population levels. A Bioclimatic Envelope Model (BEM) will be developed for *Pilosella caespitosa* and *P. glomerata*, based on data collected in the native range. BEMs will also be developed for three proposed biocontrol agents: the gall wasps *Aulacidea subterminalis* and *A. pilosellae* (Hymenoptera: Cynipidae), and the hover-fly *Chelosia urbana* (Diptera: Syrphidae). Ranges representing *Pilosella* invasion potential will be compared to the insects' potential ranges in order to inform and maximize biocontrol efforts.

**Ericsson, J.** (1), G. Wong (1), J. Myers (2) and C. Lowenberger (1).

1) Department of Biological Sciences, Simon Fraser University, Burnaby BC; 2) Department of Zoology, University of British Columbia, Vancouver, BC

WED NOV 03, 08:30

ORAL SUBMITTED: AGRICULTURE

**Selection for resistance to biological insecticides alters insect host immunity**

*Bacillus thuringiensis* (Bt) is used extensively to control insect pests. We have evaluated the fitness costs associated with resistance in our Bt-resistant *T. ni* colony (Bt-R) and its isogenic reverted-susceptible descendants (Bt-S) to identify, quantify, and compare their fitness parameters. Bt-S insects had more circulating hemocytes and produced a 'stronger' immune response after ingestion or injection of Bt, or injection of non-pathogenic bacteria. The injection of Bt was lethal to both lines. The differences in immune responses suggest there is a cost to resistance that might be exploited to reduce pest populations using other biological control agents.

**Erlandson, M.A.** (1,2), U. Toprak (2), S. Harris (1), D.D. Hegedus (1) and D.A. Theilmann (3).

(1) Saskatoon Research Centre, Agriculture and Agri-Food Canada, Saskatoon, SK; (2) Department of Biology, University of Saskatchewan, Saskatoon, SK; and (3) Pacific Agri-Food Research Centre, Agriculture and Agri-Food Canada, Summerland, BC  
TUE NOV 02, 13:00

ORAL SUBMITTED: BIOLOGICAL CONTROL

***Mamestra configurata* insect intestinal mucins are targets for nucleopolyhedrovirus ehancins**

Nucleopolyhedroviruses (NPV) are insect specific pathogens that infect host larvae upon ingestion of virus occlusion bodies. In order that primary virus infection of midgut epithelial cells can proceed, virions must cross the peritrophic matrix (PM), a protective sheath that lines most insect midguts. A few NPV encode metalloproteases, referred to as ehancins, and these have been implicated in enhancing the infectivity of baculoviruses. In this study we show that MacoNPV ehancin specifically degrades certain types of insect intestinal mucins, which are key structural proteins in insect PM, and provide evidence that this interaction increases the infectivity and virulence of this NPV for insect hosts.

**Ethier, J.** and E. Despland

Concordia University, Montreal, QC  
MON NOV 01, 13:30

ORAL PRESIDENT'S PRIZE: ECOLOGY

**Intra-population variation in wing colour and patterns in the *Malacosoma disstria* moth**

*M. disstria* is a pest insect found across North America. Populations experience periodic outbreaks, during which these insects may damage large areas of economically important forests. This study investigates a possibly genetically determined wing colour dimorphism in the adult moth. The survival and successful development of adults of different colour morphs may be differentially affected by larval conditions, which could lead to density-dependant fluctuations in wing colour and patterns.

**Evenden, M.L.** (1), B.C. Jones (2) and C.G. Elliott (3)

(1) Department of Biological Sciences, University of Alberta, Edmonton, AB; (2) Alberta Sustainable Resource Development, Southern Rockies Area; (3) Department of Biological Sciences, Grant MacEwan University, Edmonton, AB  
WED NOV 03, 10:45

ORAL SUBMITTED: FORESTRY

**Effect of larval nutrition on moth dispersal and fitness in the forest tent caterpillar, *Malacosoma disstria* (Lepidoptera: Lasiocampidae)**

*Malacosoma disstria* experiences cyclical population changes and at high densities feeding can impact habitat quality. We test the effect of larval nutrition on moth dispersal and fitness. Moths at low density flew farther than those at high density only when larval nutrition was variable and not when fed similar food. Moth size and age influenced dispersal capacity. Well-fed insects developed faster and were heavier than medium-fed and starved insects. Larval nutrition did not influence mating success but significantly affected female fecundity.

**Fall, A.** (1), T. Shore (2) and B. Riel (2)

(1) Gowland Technologies, Victoria, BC; (2) Canadian Forest Service, Victoria, BC  
MON NOV 01, 04:00

SYMPOSIUM 2: TERRY SHORE MEMORIAL

**Approaches to mountain pine beetle risk assessment**

Appropriate methods to assess risk of bark beetle infestations at the landscape scale depend on questions to address, information available, and the history and scale of an outbreak. Methods range from simple empirical correlations to complex systems models, and differ in spatial and temporal precision, processes included, and outputs. We present a gradient for classifying and comparing methods, illustrated via four methods that we have applied to examine risk of mountain pine beetle attack in lodgepole pine forests. We view bark beetle risk assessment methods as a toolkit from which appropriate approaches can be selected for a given task.

**Fields, P.G.** (1), W. Taylor (2) and R. Hynes (2)

(1) Cereal Research Centre, Agriculture and Agri-Food Canada, Winnipeg, MB; (2) Saskatoon Research Centre, Agriculture and Agri-Food Canada, Saskatoon, SK

TUE NOV 02, 13:45

ORAL SUBMITTED: AGRICULTURE

**Efficacy of extracts from pilot-plant -scale isolation of botanical insecticides from pea flour against stored-product insects**

Protein-rich pea flour is toxic and repellent to stored-product insects. The active compounds are a 37 amino acid peptide and saponins. A pilot-plant-scale extraction of the active compounds was carried out on 500 kg of protein-rich pea flour. The extract was toxic to the adults of *Sitophilus oryzae* (rice weevil) and *Cryptolestes ferrugineus* (rusty grain beetle) but not *Tribolium castaneum* (red flour beetle).

Fife, D., **T. Haye** and E. Gerber

CABI Europe - Switzerland, Delémont, Switzerland.

SUBMITTED POSTER #9

**Does parasitism reduce the efficacy of *Ceutorhynchus constrictus* (Coleoptera: Curculionidae), a potential biological control agent for garlic mustard?**

The seed-feeding weevil, *Ceutorhynchus constrictus*, is being considered for biological control of garlic mustard, an invasive weed in eastern North America. In 2009, the exotic wasp, *Trichomalus perfectus*, was reported being accidentally introduced into eastern Canada. In Europe, it is known to be the main parasitoid of another seed-feeder, the cabbage seedpod weevil, *C. obstrictus*, which is also an invasive pest on canola in Canada. Here we investigate if *T. perfectus* would attack and potentially reduce the efficacy of *C. constrictus*, when released for biological control of garlic mustard in Canada.

**Fitzpatrick, S.M.** (1), D. Holden (2), M. Damus (3), B.J. Sinclair (4), T. Hueppelsheuser (5), S. Acheampong (6) and M. Sweeney (5)

(1) Agriculture and Agri-Food Canada, Pacific Agri-Food Research Centre, Agassiz, BC; (2) Canadian Food Inspection Agency, Burnaby, BC; (3) Canadian Food Inspection Agency, Ottawa, ON; (4) Canadian Food Inspection Agency, Ottawa, ON; (5) British Columbia Ministry of Agriculture and Lands, Abbotsford, BC; (6) British Columbia Ministry of Agriculture and Lands, BC

WED NOV 03, 11:30

SYMPOSIUM 8: DEALING WITH INVASIVE PESTS

**Cooperative efforts to detect and manage the tiny invader *Drosophila suzukii* in Canada**

Spotted wing drosophila, *Drosophila suzukii* (Matsumura) (Diptera: Drosophilidae) (SWD), is native to Asia where its native habitat ranges from northern China and southern Siberia to northern India south and east to Hainan Island in China. It is also known from Japan, Korea, Thailand and Burma. In 2009, SWD was detected in fruit-growing areas of California, Oregon, Washington, Florida and British Columbia. Unlike other drosophilids, SWD is a fearsome invader because females oviposit directly in ripening fruit on the plant. In 2010, SWD is under threat from a network of Canadian and American entomologists working to detect, forecast and manage this pest on fruit crops in western North America.

**Flaherty, L.** (1), D. Pureswaran (1) and J. Sweeney (2)

(1) University of New Brunswick; (2) Atlantic Forestry Centre, Canadian Forest Service

TUE NOV 02, 10:35

SYMPOSIUM 5: INSECT COMMUNITY ECOLOGY

**Impact of the native community on the population ecology of the brown spruce longhorn beetle, *Tetropium fuscum* (Fabr.) (Coleoptera: Cerambycidae), an invasive alien forest insect in Atlantic Canada**

Exotic species face a suite of novel interactions in their new environment. Their ability to establish and spread depends on the outcome of these interactions, as well as the physical environment. The brown spruce longhorn beetle, *Tetropium fuscum* (Fabr.), was introduced to Nova Scotia from Europe approximately 20 years ago. It is not considered a pest in Europe, but in Canada can kill apparently healthy trees. We will discuss the current status of this invasive beetle in Canada and describe the novel interactions between *T. fuscum* and its new community, especially as they relate to its successful establishment and spread.

**Flaherty, L.**(1,2), J. Sweeney (2), D. Pureswaran (3) and D. Quiring (1)

(1) Faculty of Forestry and Environmental Management, University of New Brunswick, Fredericton, NB; (2) Atlantic Forestry Centre, Canadian Forest Service, Fredericton, NB; (3) Laurentian Forestry Centre, Canadian Forest Service, Sainte-Foy, Québec QC

MON NOV 01, 10:30

ORAL PRESIDENT'S PRIZE: FORESTRY

**Effect of top-down and bottom-up factors on the performance of the exotic brown spruce longhorn beetle, *Tetropium fuscum* (Fabr.), in Nova Scotia**

In its native Europe, *Tetropium fuscum* (Fabr.) colonizes moribund trees and is not considered a pest. In Nova Scotia, this exotic cerambycid can kill apparently healthy spruce. We are investigating the influence of top-down and bottom-up factors on *T. fuscum* performance in Canada using manipulative field experiments. Performance is higher on stressed than on healthy trees when *T. fuscum* is protected from natural enemies, but parasitism rates are higher on stressed trees when unprotected. Although parasitism is lower on healthy trees, *T. fuscum* development time is extended, reducing fitness. Experiments evaluating the effect of tree species are ongoing.

**Floate, K.D.**

Agriculture and Agri-Food Canada, Lethbridge Research Centre, Lethbridge, AB

WED NOV 03, 09:00

SYMPOSIUM 9: ARTHROPODS OF CANADIAN GRASSLANDS (BIOLOGICAL SURVEY OF CANADA)

**Insects of Cattle Dung**

Fresh cattle dung is a nutrient-rich habitat that quickly is colonized by a speciose and abundant assemblage of organisms. The ease with which it is manipulated using artificially-formed pats (size, shape, site and time of deposition), the speed of community succession, and the complex interactions among its diverse inhabitants, combine to make the dung pat a fascinating model ecosystem for scientific study. This talk provides a general overview on the identity and ecology of arthropods associated with cattle dung on Canadian grasslands, summarizing patterns of arthropod succession, and some of the more intriguing aspects of the cow pat community.

**Floate, K.D.** (1), W. Watson (2), R. Weiss (3) and O. Olfert (3)

(1) Lethbridge Research Centre, Agriculture and Agri-Food Canada, Lethbridge, AB; (2) North Carolina State University, Raleigh, NC, USA; (3) Saskatoon Research Centre, Agriculture and Agri-Food Canada, Saskatoon, SK

SUBMITTED POSTER #10

**CLIMEX models for potential distributions of *Onthophagus taurus* and *Digitonthophagus gazella* (Scarabaeidae) in North America**

The dung beetles *Onthophagus taurus* and *Digitonthophagus gazella* (Scarabaeidae) are being assessed for introduction into Canada to accelerate the degradation of cattle dung on pastures. We developed CLIMEX models that predict establishment of *O. taurus* across most of southern Canada, whereas *D. gazella* is predicted to remain restricted to the United States. Subsequent field studies show that *O. taurus*, but not *D. gazella*, can overwinter and complete a generation in southern Alberta.

**Floate, K.D.** and P.C. Coghlin

Lethbridge Research Centre, Agriculture and Agri-Food Canada, Lethbridge, AB

SUBMITTED POSTER #11

**Consequences of *Wolbachia* bacteria in populations of the wasp, *Trichomalopsis sarcophagae* (Pteromalidae)**

*Wolbachia* are maternally-inherited bacteria that alter the reproductive success of their insect hosts to spread infections in the host population. For the parasitoid wasp, *Trichomalopsis sarcophagae*, infected males mated to uninfected females produced only male offspring. All other crosses produced ca. 2 females for every male. In lab cultures, we found that starting infection levels of 5% in the host population were not sustained, whereas levels of 10% reached 20% after 10 generations. Infection levels of 25 and 50% approached 100% after 8 and 5 generations, respectively.

**Foster, L.**

University of British Columbia, Vancouver, BC

TUE NOV 02, 09:00

SYMPOSIUM 6: MARK WINSTON RETROSPECTIVE

**Contributions to Science and Social Insects**

(No Abstract Submitted)

**Fournier, J-P.** and J. Yack

Department of Biology, Carleton University, Ottawa, Ontario, Canada.

MON NOV 01, 09:00

ORAL PRESIDENT'S PRIZE: ACOUSTICS

**If A Bird Flies In The Forest, Does Anyone Hear It?**

Insectivorous birds impose strong selection pressures on insect sensory systems. We tested the hypothesis that flying birds produce passive acoustic cues to insect prey. We recorded the flight sounds of two species of insectivorous birds (*Sayornis phoebe* and *Poecile atricapillus*) as they attacked insects. Sounds were broadband, repetitive signals, (500 Hz to 90 kHz, with most energy at 5-10 kHz). Neurophysiological recordings showed that the auditory system of moths (*Trichoplusia ni*) reliably encoded the temporal pattern of a bird's attack flight. Our results demonstrate that birds provide potential acoustic cues to insect prey and may pose a selection pressure on their hearing.

**Fraser, J.D.** (1), T.R. Clarke (1), C.I. Keeling (2), J. Bohlmann (2) and D.P.W. Huber (1)

(1) Ecosystem Science and Management Program, The University of Northern British Columbia, Prince George, BC; (2) Michael Smith Laboratories, The University of British Columbia, Vancouver, BC

MON NOV 01, 09:00

ORAL PRESIDENT'S PRIZE: FORESTRY

**Cold tolerance and seasonal gene expression in *Dendroctonus ponderosae***

During winter months, *Dendroctonus ponderosae*, the mountain pine beetle, is exposed to sub-zero temperatures. An understanding of how cryoprotectant gene expression is seasonally and temporally regulated is of significant importance. We report findings from a gene expression study on a single mountain pine beetle population over the course of 25 weeks. At least two genes in the glycerol biosynthetic pathway show evidence of differential regulation in response to autumn and spring temperatures.

**Fraser, S.**

Population Ecology Group, Faculty of Forestry and Environmental Management, University of New Brunswick, Fredericton, NB

TUE NOV 02, 14:45

ORAL SUBMITTED: FORESTRY

**Genetically-based resistance of balsam fir (*Abies balsamea*) to three insect pests**

The balsam twig aphid (*Mindarus abietinus*), balsam gall midge (*Paradiplosis tumifex*) and the balsam woolly adelgid (*Adelges piceae*) are major pests of balsam fir in Christmas tree plantations. To evaluate the potential to breed insect-resistant trees, I measured densities of the three species on balsam fir clones in New Brunswick and Nova Scotia. A significant proportion of the variation in densities of each of the three insects was attributable to clone in both provinces.

Gharalari, A.H. (1), **M.A.H. Smith** (2), S.L. Fox (2) and R.J. Lamb (2)

(1) Department of Entomology, Plant Pests and Diseases Research Institute, Tehran, Iran; (2) Cereal Research Centre, Winnipeg, MB

TUE NOV 02, 14:15

ORAL SUBMITTED: AGRICULTURE

**Behaviour of *Sitodiplosis mosellana* on spring wheat with and without oviposition deterrence**

Wheat varieties with oviposition deterrence to wheat midge, *Sitodiplosis mosellana* (Géhin) (Diptera: Cecidomyiidae), can reduce seed damage. The behaviour of ovipositing females on spring wheat with and without oviposition deterrence was investigated to account for observed differences in egg allocation on the two wheat types. The length of time required to lay an egg and mean egg-batch size were similar, but females spent nearly twice as long on non-deterrent wheat than on deterrent wheat. Results are discussed with reference to possible mechanisms.

**Gibson, J.F.**

Agriculture and Agri-Food Canada, Canadian National Collection of Insects, Arachnids, and Nematodes, Ottawa, ON; and  
Department of Biology, Carleton University, Ottawa, ON

TUE NOV 02, 10:30

SYMPOSIUM 3: GRAD STUDENT SYMPOSIUM

**When genes and genitalia come together: the utilization of both molecular and morphological data in a systematic revision of Conopidae (Diptera)**

Conopidae is a fascinating family of parasitic flies. Most species are endoparasitoids of bees and wasps as larvae, while members of one subfamily (Stylogasterinae) attack cockroaches and crickets. They are economically and ecologically important as parasitoids of important pollinators. Despite the fact that over eight hundred species have been described, there has been very little phylogenetic and higher-level taxonomic work completed on Conopidae. No phylogeny for the family has been attempted and species concepts are based on external features only. Even placement within Schizophora has been a source of debate. Genitalic and molecular characters have not yet been used to test species or generic concepts. My revision of the family began with a phylogeny of Schizophora recovered from a ten-gene molecular data set. By placing the family in this way, I was able to determine the nearest sister group to Conopidae. Using representatives of this sister group (Lauxaniidae) as outgroup and 64 ingroup taxa from 24 conopid genera, I generated a five-gene DNA sequence dataset. At the same time, I coded over 150 morphological characters for over 100 conopid species. The combined molecular and morphological data was used to generate a phylogeny of the genera of Conopidae. Parsimony and Bayesian analyses were performed on the complete dataset to produce a preferred phylogenetic hypothesis. All four current subfamilies are recovered as monophyletic with strong support. Also recovered with strong support is the previously proposed subfamily Zodioninae. Stylogasterinae is recovered as sister to the remaining Conopidae.

**Gielens, G. and E. Elle**

Simon Fraser University, Department of Biological Sciences, Burnaby BC

PRESIDENT'S PRIZE POSTER #13

**Pollinator assemblage affects wildflower reproduction in the Garry oak ecosystem**

Plant reproduction can be limited by inadequate pollen transfer by insects, a concern in Canada's endangered Garry oak ecosystem (GOE). The number and identity of pollinating insects can affect pollen limitation (PL) if insects differ in pollen transfer ability. We estimated PL of three wildflowers over two years at six sites in the GOE, and characterized the pollinator assemblage by netting floral visitors on each wildflower. We found that both PL and the pollinator assemblage differed across sites and years. We suggest that pollinating insects in the GOE differ in their effectiveness because of variation in body size and behavior.

**Gilbert, N. (1), D.A. Raworth (2) and G.R. Allen (3)**

(1) Genetics Field Station, University of Cambridge, Cambridge, United Kingdom; (2) Agriculture and Agri-Food Canada, Agassiz, BC Canada; (3) School of Agricultural Science/TIAR, University of Tasmania, Hobart Tasmania, Australia

WED NOV 03, 10:30

ORAL SUBMITTED: ECOLOGY

**Cabbage butterflies respond to the question - Why sex?**

Studies on three continents from 1984 to 2009 have revealed an ecological-genetical interaction in the cabbage butterfly, *Pieris rapae* (L.). Weather-induced truncation selection results in decreased responsive to directional selection (RDS), but RDS is rapidly restored. Restoration of RDS is critical to maintain population variance. Sexual recombination is the only known mechanism that can rapidly restore RDS and hence, the genetic variation needed to match environmental variation.

**Gillespie, D.** (1), G.-M. Wu (1) and B. Roitberg (2)

(1) Agriculture & Agri-Food Canada, Agassiz, BC; (2) Simon Fraser University, Burnaby, BC

TUE NOV 02, 11:55

SYMPOSIUM 5: INSECT COMMUNITY ECOLOGY

**Communities in crisis - effects of disturbance and perturbation on community structure and function**

Communities of organisms are subject to disturbance and perturbation from both abiotic and biotic causes. The effects of disturbance and perturbation on community structure and performance should depend on both the nature of the event and on the nature of the community. The extent, severity and duration of perturbation, the strength of the interactions between species, and species richness, should moderate the effects of perturbation on communities. Communities consisting of a single, tri-trophic food web should be highly susceptible to disturbance and perturbation and communities consisting of many, interacting, multi-trophic food webs should be highly resilient. We discuss the implications of these ideas in the context of both managed and natural ecosystems.

**Gillespie, S.G.**

University of Massachusetts, Amherst, MA, USA

MON NOV 01, 16:00

ORAL PRESIDENT'S PRIZE: POLLINATION

**Do parasites of bumble bees impact pollination service?**

The impacts of parasitism on host interactions with other organisms are well documented in the context of predation, but not mutualism. I asked how parasitism by conopid flies affected bumble bee foraging behavior by manipulating parasitism in the field and measuring pollination on live plants in the lab. Parasitism did not change bee behavior but flowers visited by parasitized bees set more, heavier seeds than those visited by healthy bees. Some unmeasured aspect of bee behavior, such as grooming, may be altered by parasitism in a way that increased pollinator service.

**Gradish, A.** (1), C. Scott-Dupree (1) and C. Cutler (2)

(1) School of Environmental Sciences, University of Guelph, Guelph, ON; (2) Department of Environmental Sciences, Nova Scotia Agricultural College, Truro, NS

SUBMITTED POSTER #12

**Sub-lethal effects of reduced-risk insecticides for wild blueberry pest management on alfalfa leafcutter bees (*Megachile rotundata*)**

Alfalfa leafcutter bees (*Megachile rotundata*) are important managed pollinators of wild blueberry in Atlantic Canada. blueberry spanworm (*Itame argillacearia*), a major defoliator of blueberry, is present mainly at bloom and controlled with insecticides. Therefore, larval leafcutter bees may be provided with contaminated pollen and nectar collected from treated flowers, possibly resulting sub-lethal effects on their development. The use of bee-friendly insecticides is therefore essential; however, few data exist on the toxicity of insecticides to *M. rotundata*. Our study investigated the potential sub-lethal effects of some insecticides currently registered for or with promise for use in spanworm management on wild blueberry.

**Grégoire, D.**

University of New Brunswick, Fredericton NB

PRESIDENT'S PRIZE POSTER #15

**Effects of Balsam Woolly Adelgid (*Adelges piceae*) on balsam fir and the performance of subsequent herbivores**

The balsam woolly adelgid is a serious pest of true fir. This study has also found negative effects of adelgid infestation on the performance of two defoliators; the balsam fir sawfly and spruce budworm. Larval feeding and female oviposition behaviours may also be affected by the adelgid. The effects of *Adelges piceae* on the anatomy and chemistry of the balsam fir are also under investigation. Through this analysis I hope to determine the mechanism underlying how this adelgid is causing the observed reduction in sawfly and budworm performance and what this might mean for fir ecosystems.

**Gress, J.C.** (1), D.K. Weaver (2) and K.W. Wanner (1)

(1) Dept. of Plant Sciences and Plant Pathology, Montana State University, Bozeman MT; (2) Dept. of Land Resources and Environmental Science, Montana State University, Bozeman MT, USA

TUE NOV 02, 14:30

ORAL SUBMITTED: AGRICULTURE

**Molecular biology of the wheat stem sawfly, *Cephus cinctus***

The wheat stem sawfly, *Cephus cinctus*, is considered one of the most important insect pests of wheat in Montana and the northern Great Plains region, causing estimated annual losses of \$100 million. Little or no molecular biology information is available for this important insect pest. We sequenced its antennal transcriptome using high throughput 454 DNA sequencing to identify 64 odorant receptor genes. By identifying and characterizing highly expressed and sex-biased odorant receptor genes we will use a “reverse chemical ecology” approach to identify additional attractive odors.

**Gries, G.**

Department of Biological Sciences, Simon Fraser University, Burnaby, BC

SUN OCT 31, 14:30

PLENARY SYMPOSIUM

**Multimodal communication signals and foraging cues in insects and spiders**

Drawing on superb work by my students and associates, I will highlight the various types of communication signals and foraging cues in insects and spiders we currently study in our laboratory, including marker pheromones in wasps, microbes in thysanurans, sound in moths, vibratory communication signals in black widow and hobo spiders, and cone-derived electromagnetic foraging cues in conophagous insects. I will showcase German cockroaches to exemplify the complexity and diversity of signal modalities that are integrated by a single insect species. I will use German cockroaches to introduce evidence for a heretofore unknown (but still hardly understood) modality of communication.

**Grigg, K.** (1), C. Scott-Dupree (1), I. Scott (2), R. Harris (1) and K. Carter (3)

(1) School of Environmental Sciences, University of Guelph, Guelph, ON; (2) Southern Crop Protection and Food Research Centre, Agriculture and Agri-Food Canada, London, ON; (3) Ontario Ministry of Agriculture, Food and Rural Affairs, Simcoe Resource Centre, Simcoe, ON

MON NOV 01, 10:30

ORAL PRESIDENT'S PRIZE: AGRICULTURE

**Tolerance of Ontario codling moth, *Cydia pomonella* (L.) populations to registered insecticides**

The codling moth (CM) is a major pome fruit pest throughout the world. Recent reports from growers in Ontario suggest decreased CM control using registered insecticides. This study investigates the effectiveness of currently registered and novel insecticides for CM management in orchards. Direct contact bioassays were conducted on male CM from orchards in Essex and Norfolk Counties during 2009 and 2010. Diet bioassays were conducted on CM larvae collected from damaged fruit and corrugated cardboard tree bands in orchards from both regions. The potential development of strain-tolerance in CM to selected insecticides was observed in some southern Ontario orchard strains.

**Guarna, M.M.** (1), R. Parker (1), A.P. Melathopoulos (2), K. Moon (1), A.P.M. Tam (1), N. Stoyanov (1), R. White (3), S F. Pernal (2) and L J. Foster (1)

(1) Center for High Throughput Biology and Department of Biochemistry & Molecular Biology, University of British Columbia, Vancouver, BC; (2) Agriculture and Agri-Food Canada, Beaverlodge, AB; (3) Statistical Consulting and Research Laboratory, Department of Statistics, University of British Columbia, Vancouver, BC

WED NOV 03, 09:15

ORAL SUBMITTED: AGRICULTURE

**Disease resistance markers identified by quantitative proteomics**

Defense mechanisms against pathogens in social insects include both immunological and behavioural responses. Hygienic Behaviour (HyBe) of honey bees (*Apis mellifera*) is a complex colony level trait that can be used to selectively breed bees for increase resistance to disease. By quantitative mass spectrometry-based proteome profiling of antennal samples in parallel with field testing, we have identified markers of HyBe. These biomarkers can be used in marker-assisted selection (MAS) to facilitate the identification and breeding of bee stocks with higher resistance to disease.



**Hart, M.,** P. Belton and G. Gries  
Simon Fraser University, Burnaby, BC  
PRESIDENT'S PRIZE POSTER #16

**Frequency-specific detection of courtship sounds by two types of ears in the Indianmeal moth, *Plodia interpunctella***

The tympanal organ of the Indianmeal moth, *Plodia interpunctella*, is known to be sensitive to ultrasonic foraging cues from bats and click signals from prospective mates. However, male moths wing fanning while courting females also produce sounds outside the detection range of the tympanal organ. We present data revealing that the moths' antennae could be detecting the wingbeat frequency of male moths. These results imply that Indianmeal moths use two types of ears for efficient detection of all frequency components associated with the males' courtship sounds.

**Hauer, G.** (1) and J. Anderson (1,2)

(1) Department of Rural Economy, University of Alberta, Edmonton, AB; (2) Department of Biological Sciences, University of Alberta, Edmonton, AB

WED NOV 03, 11:30

SYMPOSIUM 7: MOUNTAIN PINE BEETLE SYSTEM GENOMICS

**Factors governing investment decisions in solid wood forest products and bioenergy facilities in forests under risk of mountain pine beetle attack**

The opportunity to salvage MPB killed trees could lead to increased investment in wood product and/or bioenergy facilities. In determining whether to invest in a particular facility, firms consider three factors: (i) predicted market prices for wood products and bioenergy, (ii) fibre availability based on predictions for MPB spread, and (iii) how carbon markets are predicted to evolve. We are developing a stochastic programming model that optimizes profits to a representative firm under various scenarios for the above three factors. We will then use sensitivity analysis to estimate the conditions required for each facility to be the optimal investment.

**Haye, T.** and M. Kenis

CABI Europe-Switzerland, Delémont, Switzerland

TUE NOV 02, 14:00

ORAL SUBMITTED: BIOLOGICAL CONTROL

**Biological control of the lily leaf beetle**

The lily leaf beetle, *Lilioderis lili*, has spread into five Canadian provinces in the 60 years since its introduction into North America. It is a serious pest of native and ornamental lilies and a candidate for biological control given that it is well regulated by larval parasitoids, not only at natural sites but also in private gardens and lily plantations. The most suitable species, the eulophid *Tetrastichus setifer* was recently approved by the CFIA for release in Canada. Here we present long-term data on parasitism in Europe and implications for biological control in Canada.

**Heron, J.**

British Columbia Ministry of Environment, Wildlife Science Section, Vancouver, BC

TUE NOV 02, 09:35

SYMPOSIUM 4: INVERTEBRATE CONSERVATION

**Assessing the conservation status of British Columbia's invertebrate groups**

British Columbia's insect biodiversity is estimated at greater than 40,000 species. Yet little is known about the distribution, abundance, life history or habitat requirements and assessing the conservation status of most invertebrate groups is an overwhelming task for conservation biologists. This talk will provide an overview of the recent invertebrate groups ranked by the B.C. Conservation Data Centre (Orthoptera, some moth families and Coccinellidae) and priorities for inclusion under the new provincial Conservation Framework.

**Heron, J.**

Wildlife Science Section, B.C. Ministry of Environment, Vancouver, BC

WED NOV 03, 10:50

SYMPOSIUM 9: ARTHROPODS OF CANADIAN GRASSLANDS (BIOLOGICAL SURVEY OF CANADA)

**Identification and Protection of Endangered Grassland Species**

Grassland ecosystems and the invertebrate communities within them are some of the most threatened in Canada. The identification, conservation assessment and protection of invertebrate fauna within grasslands are challenges conservation practitioners face when trying to effectively protect these species. Threats such as invasive species, land development, and pesticide applications are difficult to mitigate when faced with further challenges such as a lack understanding of these invertebrate communities. An overview of the process of identifying endangered grassland species, comparison of protection mechanisms for grasslands and the challenges conservation practitioners face will be presented, with examples drawn from approaches used by all levels of government across Canada.

**Hoffman, M. and R. McGregor**

Institute of Urban Ecology, Douglas College, New Westminster, BC

TUE NOV 02, 14:15

ORAL SUBMITTED: BIOLOGICAL CONTROL

**Laboratory evaluation of *Praon unicum* Smith (Hymenoptera: Aphidiidae) for biological control of aphids on greenhouse peppers in British Columbia**

Greenhouse pepper growers in British Columbia encounter persistent problems with management of both green peach aphid (*Myzus persicae*) and foxglove aphid (*Aulacorthum solani*). In this project, we seek to evaluate new parasitoid species for aphid management in BC greenhouses. *Praon unicum* was recently collected in a survey of parasitoids of pepper-associated aphids in the Fraser Valley. Here, we present the results of laboratory evaluations of *P. unicum* including aphid-instar preferences and relative parasitism rates of *M. persicae* and *A. solani*.

**Horton, S.**

Saint Mary's University, Halifax, NS

MON NOV 01, 13:45

ORAL PRESIDENT'S PRIZE: ECOLOGY

**Identifying the locations, movement and habitat of the European fire ant, *Myrmica rubra*; an invasive species in Halifax, Nova Scotia**

*Myrmica rubra*, commonly known as the European Fire Ant, is an invasive species in North America. This pestiferous ant, aggressive in its introduced habitat, is now causing many residents to be unable to use their outdoor property. This polygenous and polydomous species is adaptable and has a wide tolerance of temperature, moisture, and disturbance, and little interspecific competition or predators. The research identifies some of the ecological parameters of the habitat in an urban environment including soil and vegetation preferences, and the temporal and spatial movement in the Halifax Regional Municipality. A GIS map is used for analysis.

**Hueppelsheuser, T.** (1), M. Sweeney (1), S. Fitzpatrick (2), K. Sakalauskas (3), C. Teasdale (4) and B. Sinclair (5)  
(1) Ministry of Agriculture and Lands, Abbotsford, BC; (2) Agriculture and Agri-Food Canada, Pacific Agri-Food Research Centre, Agassiz, BC; (3) BC Blueberry Council, Abbotsford, BC; (4) ES Cropconsult Ltd., Surrey, BC; (5) Canadian Food Inspection Agency, Ottawa, ON

SUBMITTED POSTER #14

***Drosophila suzukii* in British Columbia berry crops: Can we effectively monitor and control this new pest?**

Spotted wing drosophila, *Drosophila suzukii* is an invasive pest from Asia that was first detected in coastal British Columbia in September 2009. The results of monitoring adult populations with wet traps in berry growing regions and research on monitoring methodology in south western BC in 2010 are presented. Resources for these initiatives resulted from industry and government cooperation, both in Canada and in the western United States, where the pest is also present. Specific activities include development of diagnostic tools, emergency use registrations for four insecticides, and extensive outreach by means of factsheets, presentations at grower events, weekly written updates, and visits to fruit stands, farms, and packers.

**Humble, L.M.** (1) and J.R. deWaard (2)

(1) Natural Resources Canada, Victoria, BC; (2) University of British Columbia, Vancouver, BC

WED NOV 03, 08:30

SYMPOSIUM 8: DEALING WITH INVASIVE PESTS

**Utilization of molecular techniques for the detection and identification of invasive forest pests**

The detection of non-indigenous introductions is often hampered by the inability to separate introduced taxa from closely related native taxa as a consequence of the lack of reference material and/or taxonomic keys or the inability to reliably identify immature life stages. The development of a DNA library for the mitochondrial gene cytochrome C oxidase I and its associated analytical tools by the Barcode of Life Network show great promise in enabling the rapid recognition of non-indigenous introductions. We provide multiple examples of the application of DNA barcoding to the recognition of non-indigenous species.

**Illerbrun, K.** and Roland, J.

University of Alberta, Edmonton, AB

MON NOV 01, 14:00

ORAL PRESIDENT'S PRIZE: ECOLOGY

**Differential patterns of *Parnassius smintheus* herbivory across an alpine meadow gradient: effects of treeline, oviposition and snow-cover**

We examined variation in the feeding habits of alpine *Parnassius smintheus* larvae in relation to distance from treeline, exploring oviposition and spring snow-melt timing as potential explanations and speculating on likely consequences of climate-mediated treeline encroachment. Larvae fed more intensively on their host, *Sedum lanceolatum*, away from treeline despite its relative paucity, and despite fitness penalties associated with the plant's herbivory-induced chemical defenses. Oviposition location is insufficient to explain this pattern, but snow cover may create an enemy-free space for hosts near treeline, reducing effective host abundance.

**Illerbrun, K.** and Roland, J.

University of Alberta, Edmonton, AB

PRESIDENT'S PRIZE POSTER #19

**Host finding by late-instar *Parnassius smintheus* larvae**

Determining the host-finding abilities of phytophagous insects is challenging, because laboratory experiments seldom replicate the confounding effects of fine-scale local topography and micrometeorology. We assessed host-finding by late-instar *Parnassius smintheus* larvae with a 2-choice Y-olfactometer, incorporating an arena to more realistically recreate typical larval habitat while still allowing precise control over scent diffusion. Larvae showed a significant tendency to orient toward their host, *Sedum lanceolatum*, but began to avoid their hosts in the wandering period immediately preceding pupation.

**Irwin, C.** (1), C. Scott-Dupree (1), R. Harris (1), J. Tolman (2) and H. Fraser (3)

(1) School of Environmental Sciences, University of Guelph, Guelph, ON; (2) Southern Crop Protection and Food Research Centre, Agriculture and Agri-Food Canada, London, ON; (3) Ontario Ministry of Agriculture, Food, and Rural Affairs, Vineland, ON

PRESIDENT'S PRIZE POSTER #20

**Potential of the anthranilic diamide insecticide - Cyazypyr - as a seed treatment on spring canola for control of flea beetles and its non-target effect on honey bees**

The striped flea beetle (SFB) and crucifer flea beetle (CFB) are two of the primary pests of canola in Canada. Cyazypyr, a reduced risk insecticide, could provide CFB/SFB control on canola as a seed treatment. Due to the systemic nature of seed treatments, the potential for insecticide exposure to bees foraging in flowering canola exists. The efficacy and biological persistence of three seed treatments were assessed, and sticky cards were used to determine if CFB and SFB have synchronous population dynamics. Honey bees were exposed to field grown treated canola flowers in a lab bioassay.

**Jack, D.** (1), J. McLean (1), G. Weetman (1) and C. Breuil (2)

(1) Department of Forest Sciences, Faculty of Forestry, University of British Columbia, Vancouver, BC; (2) Department of Wood Science, Faculty of Forestry, University of British Columbia, Vancouver, BC

TUE NOV 02, 11:00

SYMPOSIUM 3: GRAD STUDENT SYMPOSIUM

**It is not easy being green. Why fertilizer and climate at the mountain pine beetle range limit did not stop the epidemic**

This four year study examined the response of recent mountain pine beetle attack to fertilizer treatments in a mature mixed species Montane Spruce forest in the Southern Interior Forest Region of British Columbia. The study area was situated near the limit of the beetles' climatic (elevation) range. Over 5,000 lodgepole pine trees were monitored in thirty 40m x 40m plots and in the fall of 2006, ten replications of three fertilizer treatments (0, 200, and 400 kg N/ha) were randomly applied. Brood development and success was monitored on every attacked tree. The mature tree responses to the fertilizer treatments were assessed by evaluating the nitrogen concentrations in both phloem and needles. Tree cores have been used to assess tree vigour of mountain pine beetle attacked trees in the fertilized plots. Climatic data collected at the site and within the phloem was used to investigate how degree days affect the lifecycle of the beetle during multiple attack periods. By the second year after fertilization the 400 Kg N/ha treatment resulted in a significant dynamic wound response in the lodgepole pine trees. At the end of four years the increased tree defences were no match for the immigrating beetles arriving early in the summer from the lower elevation epidemic. The earlier arrival permitted the beetles to move from a hemivoltine to a univoltine life cycle. At the end of four years the majority of the pine component within all plots had succumbed to the beetle pressure proving once again, "it's not easy being green."

**James, P.M.A.** (1), D. Coltman (1), B. Murray (2), R. Hamelin (3) and F.A.H. Sperling (1)

(1) Dept. of Biological Sciences, University of Alberta, Edmonton, AB; (2) Dept. of Ecosystem Science and Management, University of Northern British Columbia, Prince George, BC; (3) Dept. of Forest Sciences, University of British Columbia, Vancouver, BC.

WED NOV 03, 10:50

SYMPOSIUM 7: MOUNTAIN PINE BEETLE SYSTEM GENOMICS

**Landscape scale genomic interactions among pine, fungi, and mountain pine beetle in western Canada**

The mountain pine beetle outbreak in western Canada is the result of interactions among the beetle itself, host pine trees, and associated pathogenic fungi. Understanding how gene flow and spatial genetic structure in each species is influenced by the other species in the outbreak system as well as spatial context is important to better understand these complex relationships and to inform management practices. Using a landscape genetics approach we examined genetic differentiation within each species involved in the outbreak system as a function of spatial landscape features and neutral genetic structure of associated species.

**Jennings, R.G.**

University of New Brunswick (Fredericton Campus), Fredericton, NB; Canadian Forest Service, Atlantic Forestry Centre, Fredericton, NB

MON NOV 01, 10:45

ORAL PRESIDENT'S PRIZE: FORESTRY

**Mite-insect and fungal-insect interactions resulting from the introduction of the brown spruce longhorn beetle, *Tetropium fuscum* (Fabr.) into Nova Scotia**

The introduction of *Tetropium fuscum* (Fabr.) (Coleoptera: Cerambycidae) to North America may have created various new associations between available beetles, mites, and fungi. Similarly, the beetle may have introduced other organisms from Europe that live in or on it. I am investigating the community of mite species associated with *T. fuscum* and the native beetles *Tetropium cinnamopterum* and *Dendroctenus rufipennis*, as well as the role of *Ophiostoma tetropii* Mathiesen (Ascomycota: Ophiostomatales), an exotic fungus found on beetles in its native range in northeastern Europe and in Canada, in *T. fuscum* – host tree interactions.

**Jensen, L.B.M.** and D.T. Lowery  
AAFC-PARC, Summerland, B.C.  
SUBMITTED POSTER #17

**Grape leaf rust mite, *Calepitrimerus vitis*, a new pest of British Columbia grapes**

Bronzing of grape leaves by the grape leaf rust mite, *Calepitrimerus vitis*, was discovered in the interior of BC in 2009. Leaf damage is not thought to reduce the current year's growth or affect fruit quality, but it is a predictor of large wintering populations that can cause significant damage to buds, shoots and fruit the following spring. In 2010, grapevines in several locations displayed severely stunted shoots with distorted leaves. Studies indicate that outbreaks of rust mite result from sprays that damage predator populations, while control is best achieved with sprays of sulphur-based fungicides early in the season.

Johns, R.C. (1,2), J. Boone (3), J.J. Leggo (4), S. Smith (5), **D. Carleton** (2) and D.T. Quiring (2)  
(1) Natural Resources Canada, Canadian Forest Service - Atlantic Forestry Centre, Fredericton, NB; (2) Population Ecology Group, Faculty of Forestry and Environmental Management, University of New Brunswick, Fredericton, NB; (3) Parks Branch, City of Saskatoon, Saskatoon, SK; (4) Athabasca University, Athabasca, AB; (5) Faculty of Forestry, University of Toronto, Ontario  
SUBMITTED POSTER #18

**Daily foraging patterns and behaviors of *Pikonema alaskensis* larvae within the crown of juvenile black spruce**

Many insects partition their foraging activities in response to spatial and temporal variations in microclimatic conditions. We carried out field studies to determine the daily foraging patterns of late-instar larvae of yellowheaded spruce sawfly, *Pikonema alaskensis* Roh., in the upper and lower crown of young, open-grown black spruce. Larval activity was not affected by crown level, but varied significantly throughout the day. The majority of larvae fed from 09:00 to 20:00 and rested during the night. Dispersal occurred for brief periods during the morning and afternoon. Feeding and resting were significantly correlated with temperature, humidity, and insolation.

**Johnson, T.S.** and A. Janmaat  
University of the Fraser Valley, Abbotsford, BC  
SUBMITTED POSTER #21

**Is selection of large host plants for oviposition by *Galerucella californiensis* an example of the plant vigor hypothesis?**

To test if female *Galerucella californiensis* preferentially oviposit on tall *Lythrum salicaria* plants to provide a better substrate for larvae, eggs from 40 stems of varying heights were removed and the stems bagged. Ten larvae were added to each stem and allowed to feed for two weeks. Larval mass, plant moisture, biomass and leaf toughness were measured. Larval mass did not vary significantly based on stem height, though number of egg masses was significantly dependent on stem height. This suggests females are preferentially choosing tall plants for oviposition, though not to provide a more suitable food source for the larvae.

**Jorgensen, J.** and K.W. Wanner  
Montana State University, Department of Plant Sciences, Bozeman, MT  
TUE NOV 02, 13:00 ORAL SUBMITTED: CHEMICAL ECOLOGY

**Candidate sex pheromone receptor genes identified from yucca moths**

Yucca moths (Lepidoptera: Prodoxidae) are members of the Monotrypa, an archaic group of Lepidoptera. Species in the genus *Tegeticula* are obligate pollinators of yucca, and this system is used to study their coevolution. Our objective is to explore the depth of the sex pheromone receptor lineage within the Lepidoptera. High throughput 454 DNA sequencing was used to sequence a cDNA library constructed from yucca moth heads plus antennae. Three cDNAs with homology to known Lepidoptera sex pheromone receptors have been identified.

**Joshi, N.K.** (1,2), L.A. Hull (2), E.G. Rajotte (3), G. Krawczyk (4) and K. Naithani (5)

(1) Pennsylvania State University, Department of Entomology, University Park, PA, USA; (2) Pennsylvania State University - Fruit Research & Extension Center, Entomology, PA, USA; (3) Pennsylvania State University, Department of Entomology, University Park, PA, USA; (4) Pennsylvania State University - Fruit Research & Extension Center, Entomology, Biglerville, PA, USA; (5) Pennsylvania State University, Program in Ecology, University Park, PA, USA.

MON NOV 01, 10:45

ORAL PRESIDENT'S PRIZE: AGRICULTURE

#### **Codling moth flight models differ between commercial and abandoned apple orchards**

The codling moth (CM) is a serious internal fruit-feeding pest of apples. Accurately predicting the timing of CM flight and egg-hatch allows growers to understand and control local populations of CM. The current CM-PETE (prediction extension timing estimator) model has never been validated in Pennsylvania apple orchards. Therefore, studies were conducted to develop and compare the CM flight models in commercial and abandoned apple orchards during 2007 and 2008. The CM flight patterns as predicted by constrained and unconstrained models in commercial and abandoned orchards were different than the flight patterns predicted by the currently used CM-PETE model.

**Joy, J.**

Simon Fraser University, Burnaby, BC

TUE NOV 02, 14:15

ORAL SUBMITTED: BIODIVERSITY & SYSTEMATICS

#### **Evolutionary determinants of diversification in cecidomyiid flies**

Phytophagous insects comprise the bulk of the world's biological diversity, and understanding the evolutionary processes driving their diversification is a central theme in evolutionary biology. The ecologically specialized relationship between gall-inducing midges and their host plants make them ideal systems for examining causal mechanisms of evolutionary diversification. In this study, increases in cecidomyiid diversity between host-plant taxa are associated with increases in plant range, lineage age, and architectural complexity and decreases in plant insularity.

**Judd, G.J.R.** (1), M. Aurelian (2), K. Bedford (1) and C. Eby (3)

(1) Agriculture and Agri-Food Canada, Pacific Agri-Food Research Centre, Summerland, BC; (2) Department of Biological Sciences, University of Alberta, Edmonton, AB; (3) Department of Biological Sciences, Simon Fraser University, Burnaby, BC

WED NOV 03, 11:00

SYMPOSIUM 8: DEALING WITH INVASIVE PESTS

#### **Invasion of apple clearwing moth, *Synanthedon myopaeformis*: from detection to area-wide management**

Apple clearwing moth was discovered in BC in 2005. By 2008, 97% of apple acreage within the Similkameen Valley, of which 40% is organic, was infested. Movement of infested rootstocks has spread the insect to adjacent valleys and other provinces. All apple trees older than three years are infested, but dwarfing trees, grown on clonal rootstocks, in industry-standard high-density plantings, are most impacted. Population densities of this cryptic wood-boring pest are limiting organic controls. Multi-tactical management programs combining pesticides and semiochemical-based mating disruption, mass trapping and attract-and-kill are being explored within the context of an area-wide apple pest management program.

**Kamunya E.W.** (1), J.R. Spence (1) and W.J.A. Volney (2)

(1) University of Alberta, Edmonton, AB; (2) Canadian Forest Service Northern Forestry Centre, Edmonton, AB

WED NOV 03, 11:15

ORAL SUBMITTED: FORESTRY

#### **Maintaining moth diversity in boreal forests: Slash-burning as a management tool complementary to retention harvest**

We used boreal macro-moths to investigate the ecological benefits of prescribed burns on harvested deciduous and coniferous forest stands. Light trap catches from stands harvested to 10% retention (SH) and then burned and others harvested to the same prescription and un-burned (SB), were compared against uncut stands of both forest-types. Both SB and SH had a significant negative effect on abundance, richness and moth species composition. Moth response to both forms of disturbance did not differ between forest-types or from each other, suggesting that short-term negative effects of SH and SB treatments on moth communities are comparable.

**Keeling, C.I.** (1), H. Henderson (1), M. Li (1), H.K. Dullat (1), M. Yuen (1), D.P.W. Huber (2), S.J. Jones (3) and J. Bohlmann (1)

(1) University of British Columbia, Vancouver, BC; (2) University of Northern British Columbia, Prince George, BC; (3) Canada's Michael Smith Genome Sciences Centre, Vancouver, BC

WED NOV 03, 08:10

SYMPOSIUM 7: MOUNTAIN PINE BEETLE SYSTEM GENOMICS

### **Mountain pine beetle genomics**

Until recently, our understanding of the mountain pine beetle (MPB, *Dendroctonus ponderosae*) has been limited by the lack of sequence information. However, within the Tria Project ([www.thetriaproject.ca](http://www.thetriaproject.ca)) we have created extensive transcriptome and genome sequence resources for the MPB that have allowed us to begin to examine the various processes of host colonization at the molecular level. In addition, we have obtained transcriptomic and proteomic data of specific tissues to guide the identification and functional characterization of genes involved in the processes of olfaction and pheromone biosynthesis, and our progress to date will be described.

**Keever, C.** (1), J.H. Myers (2) and J.S. Cory (1)

(1) Biological Sciences, Simon Fraser University, Burnaby, BC; (2) Department of Zoology, University of British Columbia, Vancouver, BC

MON NOV 01, 13:30

ORAL PRESIDENT'S PRIZE: BIOLOGICAL CONTROL

### **Who is controlling knapweed? An investigation of *Larinus* sp. a successful biological control of knapweed in BC**

Two species of *Larinus* were introduced for the biological control of knapweeds in BC. Both introductions from Europe were initially from mixed populations of weevils including some from nontarget host plants. We are using molecular and morphological techniques in an attempt to determine if one or two species have established in BC, if they are hybridizing, and if they correspond to the European populations from which they are to have originated.

**Khadempour, L.** (1), D.J. Jack (1), J. Bohlmann (1,2) and C. Breuil (1)

(1) Faculty of Forestry, University of British Columbia, Vancouver, BC; (2) Michael Smith Laboratories, University of British Columbia, Vancouver, BC

MON NOV 01, 09:15

ORAL PRESIDENT'S PRIZE: FORESTRY

### **Species-specific primers and quantitative PCR for monitoring mountain pine beetle fungal associates**

The mountain pine beetle is symbiotically associated with different ophiostomatoid fungi. The most frequently isolated associates are the blue-staining pine pathogens *Grosmannia clavigera* and *Leptographium longiclavatum*, the less pathogenic *Ophiostoma montium*, and an undescribed *Ceratocystiopsis* species. Our objective was to develop species-specific quantitative PCR primers that target the beetle's major fungal associates and to use these tools to monitor the relative abundance of the fungi through four stages of the lifecycle of the beetle. The changes in relative abundance will provide insight into the ecology of these fungi and the mountain pine beetle.

**Kharouba, H.M.** (1), J.T. Kerr (2) and M. Vellend (1)

(1) Department of Zoology, University of British Columbia, Vancouver, BC; (2) Department of Biology, University of Ottawa, Ottawa, ON

MON NOV 01, 14:15

ORAL PRESIDENT'S PRIZE: ECOLOGY

### **Phenological responses of Canadian butterfly species to recent climate changes**

Here, we investigate whether butterfly species' phenologies are advancing in response to recent climate warming using georeferenced collection records from across Canada over the past 130 years. Mean collection date (an estimate of peak flight date) for the majority of species occurred earlier in the year with warmer spring temperatures and over the past 130 years. Moreover, spring temperatures have increased across these weather stations for most species. Our results suggest that Canadian butterfly species' phenologies are responding directly to temperature changes and that we may be able to detect these changes using collection records in many species across broad geographic areas.

**Kher, S. V.** (1), L. M. Dosdall (1) and H. A. Cárcamo (2)

(1) Department of Agricultural, Food and Nutritional Science, University of Alberta, Edmonton, AB; (2) Agriculture and Agri-Food Canada, Lethbridge, AB

TUE NOV 02, 14:45

ORAL SUBMITTED: AGRICULTURE

**Changes in the distribution and abundance of the cereal leaf beetle, *Oulema melanopus* (Coleoptera: Chrysomelidae), a new invasive pest of cereals in western Canada and strategies for its sustainable management**

The research presented here deals with the spread and distribution of an alien invasive pest of cereals, the cereal leaf beetle, *Oulema melanopus* (Coleoptera: Chrysomelidae), recently discovered in the prairies of Canada, and its principal biological control agent, *Tetrastichus julis*. Aspects of the field population dynamics of *O. melanopus* along with the distribution pattern of *T. julis* and estimation of its levels of parasitism will be discussed. Finally, we will present preliminary results of trials to understand host non-preference mechanisms to identify resistant germplasm.

**Kits, J.H.** and S.A. Marshall

School of Environmental Sciences, University of Guelph, Guelph, ON

MON NOV 01, 16:30

ORAL PRESIDENT'S PRIZE: BIODIVERSITY & SYSTEMATICS

**Wing reduction in the Archiborborini (Diptera: Sphaeroceridae): a phylogenetic perspective**

Many species of Diptera are strong and agile fliers, and over 95% of species have the ability to fly. However, loss of flight through wing reduction is has occurred repeatedly in a few clades. Here we examine the evolution of wing loss in the Archiborborini (Diptera: Sphaeroceridae) based on a phylogeny of the group. This tribe contains at least 27 species with some form of wing reduction, apparently representing 8 separate evolutionary events. We review the habitats and known biology of these flies in relation to their loss of flight, and discuss our current knowledge of wing reduction in the Sphaeroceridae.

**Klimaszewski, J.**

Natural Resources Canada, Canadian Forest Service, Laurentian Forestry Centre, Sainte-Foy, Québec, QC

WED NOV 03, 11:30

ORAL SUBMITTED: FORESTRY

**Review of adventive species of Coleoptera recorded from eastern Canada**

The first comprehensive account of adventive species of Coleoptera recorded from Atlantic Canada and Quebec is provided. Currently, 510 adventive species in 290 genera and 48 families of beetles are presented. Of these, 418 species are recorded from Quebec, 283 from New Brunswick, 357 from Nova Scotia, 198 from Prince Edward Island, and 195 species from insular Newfoundland and Labrador combined. The most adventive species are in the families Staphylinidae (120), Curculionidae (85), Carabidae (45) and Chrysomelidae (43). The adventive species constitute approximately 14.6% of the total species in 48 beetle families with adventive species in the region.

**Labrie, G.** (1), J. De Almeida (1), S. Rioux (2), A. Vanasse (3), D. Pageau (4) and J.-N. Couture (5)

(1) Centre de recherche sur les grains Inc. (CÉROM), St-Mathieu-de-Beloeil, QC; (2) Centre de recherche sur les grains Inc. (CÉROM), Québec, QC; (3) Université Laval, Département de Phytologie, Québec, QC; (4) Agriculture et Agroalimentaire Canada, Normandin, QC; (5) MAPAQ, Centre de services agricoles de Lévis, Lévis, QC

TUE NOV 02, 13:15

ORAL SUBMITTED: AGRICULTURE

**Invasive insect species of canola in Quebec, Canada**

The objective of our study was to determine the presence and incidence of invasive pest species in canola fields of Quebec. In 2009 and 2010, fields in 8 areas were sampled with traps, sweep net and damage by cabbage seedpod weevil (CSW) and parasitism were evaluated on 400 siliques. CSW and pollen beetle (*Meligethes viridescens*) were discovered in all areas. Swede midge, *Contarinia nasturtii*, appeared in 7 areas. For the first time, two parasitoids of CSW were observed, *Mesopolobus gemellus* and *Trichomalus perfectus*. Incidence of these invasive species will be discussed in regard of integrated pest management in canola.



**Lamb, R.J.** (1), P. MacKay (1) and A. Alyokhin (2)

(1) Department of Entomology, University of Manitoba, Winnipeg, MB; (2) School of Biology and Ecology, University of Maine, Orono, ME, USA

TUE NOV 02, 09:45

ORAL SUBMITTED: SYMBIONTS & VECTORS

**Is population variability stable? Three aphid species colonizing potatoes over sixty years**

Populations of three aphid species in potatoes showed no evidence of approaching equilibrium over 6 decades, based on population variability (PV, a proportion between 0 and 1) and abundance. *Macrosiphum euphorbiae* showed moderately high population variability (PV = 0.585), one unusually stable decade and no trend in abundance, whereas *Myzus persicae* (PV = 0.771) and *Aphis nasturtii* (PV = 0.830) showed high population variability and dramatic declines in abundance. No evidence of a more-time-more-variation effect was detected. The dynamic and species-specific characteristics of population variability assure that inter-specific comparisons must be considered cautiously.

**Lanthier, M.**, S. Peters and J. Merrick

CropHealth Advising & Research, Kelowna, BC

SUBMITTED POSTER #22

**Testing newer insecticides against insect borers of nursery tree production in the BC Interior**

Field trials started in 2009 to verify efficacy of newer pesticides against common tree borers. These products are low toxicity to humans and the environment and would replace conventional pesticides of higher toxicity being de-registered by the federal government. For Lepidoptera, use of mating disruption has proved very effective against peach tree borer *Synanthedon exitiosa* and ash-lilac borer *Podosesia syringae* (both Sesiidae). For Coleoptera, early results are promising against bronze birch borer *Agrilus anxius* (Buprestidae) and white pine weevil *Pissodes strobi* (Curculionidae). Work remains to be done for the poplar borer *Saperda calcarata* (Cerambycidae).

**Lee, S.-I.** (1), J. Spence (1) and D. Langor (2)

(1) Department of Renewable Resources, University of Alberta, Edmonton, AB; (2) Canadian Forest Service, Northern Forestry Centre, Edmonton, AB

WED NOV 03, 11:45

ORAL SUBMITTED: FORESTRY

**Saproxylc beetle responses to aggregated retention patches in boreal white spruce stands**

Green tree retention has been proposed and developed as a way of conserving biodiversity for the ecological sustainability. To understand the role of aggregated patches in relation to effects of sizes and surrounded matrices on deadwood-associated (saproxylc) beetle assemblages, we compared beetles among two sizes of aggregated retention patches (0.20 and 0.46 ha) within backgrounds of different harvest intensity at the EMEND (Ecosystem Management Emulating Natural Disturbance) research site.

**Leighton, B.J.**, B.D. Roitberg, P. Belton and C.A. Lowenberger

Department of Biological Sciences, Simon Fraser University, Burnaby, BC

TUE NOV 02, 09:00

ORAL SUBMITTED: SYMBIONTS & VECTORS

**Host antibodies in mosquito blood meals: A potential tool to detect and monitor infectious disease in wildlife**

When a mosquito bites its host, it carries away blood containing specific antibodies that can identify infectious disease in the vertebrate host. If antibodies, specific for agents of disease, can be detected in blood-fed mosquitoes, then the collection and immunological assay of mosquitoes could be used to detect and monitor infectious disease in wildlife. Mosquitoes fed on blood containing a specific antibody were assayed using ELISA to determine the limits of detection. Blind tests simulating the assay of feral mosquitoes detected positive mosquitoes with few false negatives and no false positives.

**Leroux, A.L.** and N.J. Holliday  
Department of Entomology, University of Manitoba, Winnipeg, MB  
SUBMITTED POSTER #24

**Parasitism of the biological control agent *Hyles euphorbiae* (Lepidoptera: Sphingidae) by *Winthemia datanae* (Diptera: Tachinidae): a new host record**

Leafy spurge, *Euphorbia esula* L. (Euphorbiaceae), is an invasive perennial weed for which a number of biological control agents have been released in Canada. In surveys of biological control agents in *E. esula* patches in Spruce Woods Provincial Park, Manitoba, tachinid eggs were detected on final instar larvae of *Hyles euphorbiae* L. (Lepidoptera: Sphingidae). The tachinids were reared and identified as the Nearctic species *Winthemia datanae* (Townsend) (Diptera: Tachinidae). *Hyles euphorbiae* is a new host record for *W. datanae*. Mechanisms by which the new host association arose are discussed.

**Lessard, E.** (1,2) and G. Boivin (1,2)

(1) Department of Natural Resource Sciences, Macdonald Campus, McGill University, Ste-Anne-de-Bellevue, QC; (2) Agriculture and Agri-Food Canada, Saint-Jean-sur-Richelieu, QC

MON NOV 01, 14:30

ORAL PRESIDENT'S PRIZE: BEHAVIOUR

**Female's physiological conditions and host-feeding behaviour in an egg parasitoid *Trichogramma euproctidis***

Host-feeding, which is defined as the consumption of host haemolymph and tissues, occurs in females *Trichogramma euproctidis*. Previous studies have demonstrated that host-feeding affects negatively the size of progeny by decreasing the resources available for the developing immature, but enhances the egg production of the host-fed mother. We tested the hypothesis that female's physiological conditions such as the female age can have an impact on the duration and occurrence of this behaviour. Our results suggest that old and young females show small differences in host-feeding behaviour.

**Lindgren, B.S.**

University of Northern British Columbia, Prince George, BC

TUE NOV 02, 15:00

HERITAGE LECTURE

**Trips, traps, triumphs and tribulations: A journey from childhood dreams to a dream-career in entomology**

Growing up, most young people dream of their future, and I was no different. Biology in general, and insects and spiders in particular fascinated me most. A number of people, notably my parents and a number of scientists encouraged me to nurture my interests, and were instrumental in allowing my dreams to come to fruition. In this presentation, I will share with you my journey from a boy obsessed with turning over rocks and collecting insects and spiders in Sweden, to a professor essentially making a living by collecting insects in one of the most beautiful parts of the world.

**Lindgren, B.S.**

University of Northern British Columbia, Prince George, BC

MON NOV 01, 02:00

SYMPOSIUM 2: TERRY SHORE MEMORIAL

**Is pheromone-based mass trapping a realistic management-alternative for bark beetles?**

Starting about 30 years ago and continuing for several decades, there was a flourish of activity leading to the characterization and identification of semiochemicals for bark and ambrosia beetles. In 1979, Terry Shore and I both started our careers with research aimed at the application of these compounds for the control of ambrosia beetles by mass trapping in coastal British Columbia. There is still some controversy as to the usefulness of mass trapping for scolytine beetles. I will briefly discuss some of the challenges and opportunities associated with bark and ambrosia beetle mass trapping.

**Lindo, Z.**

McGill University, Montreal, QC  
TUE NOV 02, 11:35

SYMPOSIUM 5: INSECT COMMUNITY ECOLOGY

**Patterns of canopy microarthropods – from bryosphere to Biosphere**

Exploring how patterns of community composition change across spatial scales is important for conservation of biodiversity, as it may reveal the sources of diversity and elucidate the processes that create or maintain diversity. In temperate rainforests, epiphytic moss mats contain a species rich microarthropod community dominated by oribatid mites (Acari: Oribatida). These arboreal communities may disperse long distances via aerial mechanisms yet be constrained by environmental factors at local scales within a tree. From individual moss mats (the bryosphere) to across multiple forest watersheds (Clayoquot Sound UNESCO Biosphere Reserve) these studies investigate patterns of arboreal oribatid mite communities.

**Lowenberger, C.** (1), R. Ursic (1), G. Jaramillo (2) and C. Ocampo (2).

(1) Department of Biological Sciences, Simon Fraser University, Burnaby BC; (2) CIDEIM, Cali, Valle del Cauca, Colombia  
TUE NOV 02, 09:15

ORAL SUBMITTED: SYMBIONTS & VECTORS

**Immune responses of *Aedes aegypti* to Dengue virus: How does the virus escape host responses?**

Dengue virus, transmitted by *Aedes aegypti*, is the most important arbovirus that affects humans: 100 million new infections and 20,000 deaths occur each year. No vaccines or antiviral drugs are available. All populations of *Ae. aegypti* do not support the virus. In Cali Colombia, approximately 25% of the population are resistant to Dengue. We selected strains of *Ae. aegypti* that are susceptible or refractory and compared their immune responses to Dengue virus by measuring the expression of specific immune genes and inhibitors of apoptosis. Resistance appears to be determined by the relative expression of immune genes and inhibitors.

**Lowery, D.T.**

Agriculture and Agri-Food Canada, Pacific Agri-Food Research Centre, Summerland, BC  
WED NOV 03, 09:30

SYMPOSIUM 8: DEALING WITH INVASIVE PESTS

**Invasive pests of grapevines in British Columbia**

Grapes, *Vitis* sp., are not native to the Okanagan Valley, B.C., and the first plantings ca. 1850 would have been attacked by a small number of endemic polyphagous insects. A few pests were added over the next 100 years until industry expansion and importation of nursery material resulted in a rapid rise in new introductions, including a number of pests specific to grapes. This presentation will present information on invasive pests of grapes in BC, describe several new and potential mite and insect pests, and discuss measures to prevent introductions and mitigate damage in the future.

**Lumley, L.** (1,2) and F. Sperling (1)

(1) Department of Biological Sciences, University of Alberta, Edmonton, AB; (2) Laurentian Forestry Centre, Canadian Forest Service, Quebec City, QC  
MON NOV 01, 16:00

ORAL PRESIDENT'S PRIZE: BIODIVERSITY & SYSTEMATICS

**Relative utility of microsatellites, mitochondrial DNA, and adaptive traits for species identification in the spruce budworm (*Choristoneura fumiferana*) species complex**

Species identifications have been historically difficult in the spruce budworm (*Choristoneura fumiferana*) group, an important insect pest complex. We compared the relative utility of microsatellites and mitochondrial DNA, both putatively neutral markers, with adaptive life history traits for identifying eight currently recognized species sampled across North America. An integrative approach, using both adaptive and neutral markers, allowed for the discrimination of more biologically relevant species units than did the use of putatively neutral molecular markers alone. Incongruence between adaptive traits and neutral markers suggests that these species have diverged via natural selection in spite of some gene flow.

**Lumley, L.** and M. Cusson

Laurentian Forestry Centre, Canadian Forest Service, Quebec City, QC  
TUE NOV 02, 14:30

ORAL SUBMITTED: FORESTRY

**Genetic identification of hemlock looper (*Lamdina fiscellaria*) biotypes using single nucleotide polymorphisms (SNPs)**

The hemlock looper, *Lamdina fiscellaria* (Lepidoptera: Geometridae), is a serious pest of conifer trees in eastern North America, and is particularly problematic on balsam fir in Quebec and the Atlantic provinces. Two biotypes have been detected which differ in number of larval instars and in severity of outbreak. Through developing EST libraries as well as targeting candidate genes, we have been able to detect single nucleotide polymorphisms (SNPs) to differentiate between these biotypes. We also discuss possible adaptive mechanisms that may associate with differences in biotype traits based on identification of genes containing biotype-specific SNPs.

**Lusebrink, I.** (1), M.L. Evenden (1) and N. Erbilgin (2)

(1) Department of Biological Sciences, University of Alberta, Edmonton, AB; (2) Department of Renewable Resources, University of Alberta, Edmonton, AB

TUE NOV 02, 13:15

ORAL SUBMITTED: FORESTRY

**Role of drought in mediating host tree defences against the mountain pine beetle**

The mountain pine beetle has destroyed 16.3 million ha of lodgepole pine forest in BC and has moved eastwardly into the hybrid zone of lodgepole x jack pine in AB. Little is known about the potential environment- host- beetle interaction in the beetle's expanded range east of the Rocky Mountains. Here, we assess the chemical response of mature lodgepole pines, jack pines, and their hybrids to different environmental conditions (water vs. no water) and biological treatments that stimulate tree defences and emulate beetle attack. Host chemical response to treatments will be linked to beetle fitness.

**Machial, C.** (1,2) and M. Isman (2)

(1) Contech Enterprises Inc., Delta, BC; (2) University of British Columbia, Vancouver, BC

MON NOV 01, 11:00

ORAL PRESIDENT'S PRIZE: AGRICULTURE

**Essential oils and their potential for the control of *Choristoneura rosaceana*, *Trichoplusia ni*, *Dysaphis plantaginea*, and *Myzus persicae***

The use of essential oils for the control of the obliquebanded leafroller, *Choristoneura rosaceana* (Lepidoptera: Tortricidae), the cabbage looper, *Trichoplusia ni* (Lepidoptera: Noctuidae), the rosy apple aphid, *Dysaphis plantaginea* (Homoptera: Aphididae), and the green peach aphid, *Myzus persicae* (Homoptera: Aphididae) was investigated. Of the essential oils tested, patchouli demonstrated significant activity against all insects, while thyme, lavender, citronella, lemongrass and garlic oils showed activity against one or more of the insect species. The potential for the inclusion of essential oils in an essential oil-based insecticide is discussed.

**MacKenzie, K.**

Agriculture Canada, Summerland, BC

TUE NOV 02, 08:30

SYMPOSIUM 6: MARK WINSTON RETROSPECTIVE

**Introduction**

As a professor in the Department of Biological Sciences for over thirty years, Mark Winston led a research program in insect behavioural sciences focussing on bee biology, apiculture and pollination. During this time, he published some 150 articles and 6 books; mentored a great many individuals including 8 PhD and 21 Masters students; spoke to academic, beekeeping and public audiences; and received numerous awards for his contributions in both science and communications. In 2002, he left the research world and moved to the Morris J. Wosk Centre for Dialogue where he continues to inspire students. This symposium, set up to honour Mark's achievements, will review his contributions to science, apiculture and beekeeping.

**MacQuarrie, C.J.K.**

Canadian Forest Service – Great Lakes Forestry Centre, Sault Ste. Marie, ON

WED NOV 03, 11:00

ORAL SUBMITTED: FORESTRY

**Mortality schedule of emerald ash borer along a temporal gradient of invasion in the urban forest**

Determining the relative effect of different mortality factors on the population dynamics of emerald ash borer (EAB) is necessary to aid management of this invasive pest. Three populations of EAB in Ontario that have been established for different time periods were sampled at regular intervals during the summer of 2010. A portion of these samples were placed into rearing while the remainder were destructively sampled to obtain the EAB larvae and adults. The survivorship of EAB exposed to mortality was then compared to the survivorship of individuals from the same sites that were reared.

**Maghodia, A.B.** (1), M. Fang (2), M.A. Erlandson (1) and D.A. Theilmann (2)

(1) Saskatoon Research Centre, Agriculture and Agri-Food Canada, Saskatoon, SK; (2) Pacific Agri-Food Research Centre, Agriculture and Agri-Food Canada, Summerland, BC

TUE NOV 02, 13:15

ORAL SUBMITTED: BIOLOGICAL CONTROL

**The baculovirus core gene, odv-e56, is essential for oral infection of host insects**

The Baculoviridae are double-stranded DNA viruses that are pathogens of insects, mainly from the orders Lepidoptera, Hymenoptera, and Diptera. To determine the role of baculovirus core gene (odv-e56) in the baculovirus life cycle, we used an *Autographa californica* multiple nucleopolyhedrovirus (AcMNPV) bacmid system to generate odv-e56 knock-out and repair viruses. Fluorescence and light microscopy revealed that the knock-out virus showed normal levels of budded virus replication and produced normal occlusion bodies in cell culture. However, odv-e56 knock-out virus was unable to infect the midgut tissues of *Trichoplusia ni* larvae when inoculated per os.

**Maguire, D.Y.** (1), R. Sforza (2) and S.M. Smith (1)

(1) Faculty of Forestry, University of Toronto, Toronto, ON; (2) European Biological Control Laboratory, USDA-ARS, Montpellier, France

MON NOV 01, 13:45

ORAL PRESIDENT'S PRIZE: BIOLOGICAL CONTROL

**Allee effect, herbivory, and biocontrol implications for invasive swallow-worts**

Positive density-dependant responses to their own density (i.e., "Allee effects") has unique implications for the management of invasive weeds. The exotic vines *Vincetoxicum rossicum* and *V. nigrum* (swallow-wort) are invading forested landscapes and threatening native species diversity in eastern Canada and USA. We quantified the impact of herbivory by a potential biocontrol agent, *Chrysochus asclepiadeus* (Chrysomelidae) on *Vincetoxicum* spp. fitness at different plant densities to assess how Allee effects could influence biocontrol programs.

**Manickam, L.** (1,2), D.S. Jayas (2), P.G. Fields (3) and N.D.G. White (3)

(1) Indian Institute of Crop Processing Technology, Thanjavur, Tamil Nadu, India; (2) Department of Biosystems Engineering, University of Manitoba, Winnipeg, MB; (3) Cereal Research Centre, Agriculture & Agri-Food Canada, Winnipeg, MB

MON NOV 01, 09:15

ORAL PRESIDENT'S PRIZE: AGRICULTURE

**Effects of low and high temperatures on cow pea beetle, *Callosobruchus maculatus* (Fab.) (Coleoptera: Bruchidae) in chickpea**

Chick pea (*Cicer arietinum* L) is an important pulse crop grown all over the world and rich in protein. The whole grain of chickpea is damaged by the cowpea seed beetle, *Callosobruchus maculatus* (Fab.); the most important storage insect. The experiments were conducted in glass vials covered with perforated lids with 600- $\mu$ m wire mesh to find out the most tolerance stage of insect, required temperature and duration to kill the various stages. The vials with life stages were exposed to 42°C and 0°C for various periods with four replications. The pupal stage was found to be the most tolerant stage.

**Mason, A.C.** (1), D.O. Elias (2) and W.P. Maddison (3)

(1) University of Toronto, Toronto, ON; (2) University of California, Berkeley, Berkeley, CA, USA; (3) University of British Columbia & Beaty Biodiversity Museum, Vancouver, BC

MON NOV 01, 11:30

SYMPOSIUM 1: ARACHNOLOGY

**Complex signals: what do spiders have to say?**

The interaction between complex sexually selected traits produced in different sensory modalities (multimodal signals) is poorly understood. Theory predicts that animals will emphasize the most conspicuous, least costly and most "honest" displays and de-emphasize others: *i.e.*, complexity is inversely related between suites of traits. We studied the interaction between the elaborate visual ornamentation and complex substrate-borne songs that characterize male *Habronattus* jumping spiders to examine the evolution of display complexity. Contrary to expectations, complexity of visual and substrate-borne displays were positively correlated, suggesting selection for suites of multimodal traits rather than specialization in either modality alone. We discuss these results and their implication in signal processing and evolution.

**Mason, P.G.** (1), D.R. Gillespie (2), T. Haye (3) and U. Kuhlmann (3).

(1) Agriculture and Agri-Food Canada, Ottawa, ON; (2) Agriculture and Agri-Food Canada, Agassiz, BC; (3) CABI Europe-Switzerland, Delémont, Switzerland.

WED NOV 03, 09:00

SYMPOSIUM 8: DEALING WITH INVASIVE PESTS

**Biological control of arthropods in Canada: what have we learned and where are we headed?**

Since its beginnings in 1882, biological control of arthropod pests in Canada has evolved from the simple release of a native parasitoid, *Trichogramma minutum*, to control imported currantworm, *Nematus ribesii*, in Ontario gardens to the highly scientific assessment of the potential risk posed to native biodiversity by exotic parasitoids targeting invasive alien species. The discipline integrates taxonomy, general biology, behaviour, chemical ecology, and physiology in experimental studies that generate data to objectively assess the release of a potential agent. This rigorous approach promises to increase the probability of success of releases, while protecting native biodiversity and other environmental and economic values.

**Matheson, S.** and J. Yack

Carleton University, Ottawa, ON

MON NOV 01, 09:15

ORAL PRESIDENT'S PRIZE: ACOUSTICS

**Vibratory signalling in colonial early instar caterpillars of the arched hook tip moth, *Drepana arcuata* (Drepanidae): cooperation or competition?**

Early instar caterpillars often live gregariously but little is known about their communication systems. This study characterizes and tests the function of complex vibratory signals in colonial early instars of *Drepana arcuata*. Caterpillars make 4 types of vibratory signals: anal scraping, buzz scraping, mandible scraping and mandible drumming. Experimental and correlational analyses tested three hypotheses to explain the function of signaling: a) spacing between individuals, b) recruitment of conspecifics, and c) coordination of behaviour. Results provide greatest support for spacing, suggesting that caterpillars are constructing 'vibratory fences'. Predictions for feeding coordination and recruitment were also supported.

**Mathur, S.** (1), B.J. Sinclair (2), M.A. Cook (3) and S.M. Fitzpatrick (1)

(1) Agriculture and Agri-Food Canada, Pacific Agri-Food Research Centre, Agassiz, BC; (2) Canadian Food Inspection Agency, Entomology – Ontario Laboratory, Ottawa, ON; (3) Simon Fraser University, Department of Biological Sciences, Burnaby, BC

SUBMITTED POSTER #23

**Development of PCR-based molecular markers to differentiate *Dasineura oxycoccana* reared from cranberry, *Vaccinium macrocarpon*, or blueberry, *V. corymbosum***

*Dasineura oxycoccana* (Johnson) (Diptera: Cecidomyiidae) reared from cranberry or blueberry in British Columbia are similar morphologically but different in some life history traits. To seek genetic differences between *D. oxycoccana* from cranberry and from blueberry, a 780 base pair fragment of cytochrome oxidase 1 (COI) gene was sequenced and analysed. COI sequences showed 9.2 - 10.5% divergence between *D. oxycoccana* from cranberry and from blueberry. To identify and discriminate *D. oxycoccana* originating from each plant, we developed specific PCR primers based on COI sequences. In a duplex PCR assay, these primers successfully discriminated *D. oxycoccana* originating from cranberry or blueberry.

**McCann, S.** (1), T. Jones (1), S. O'Donnell (2) and G. Gries (1)

(1) Department of Biological Sciences, Simon Fraser University, Burnaby, BC; (2) Department of Psychology, University of Washington, Seattle, WA, USA

MON NOV 01, 14:30

ORAL PRESIDENT'S PRIZE: ECOLOGY

**Rates of wasp nest predation by the Red-throated Caracara, *Ibycter americanus*, a falconid specialist predator of Neotropical social wasps**

Ants are often considered the preeminent predators of social wasps in Neotropical rainforests, but the predatory impact of vertebrate predators is not well known. We studied the prey spectrum of *I. americanus* by video recording chick provisioning behavior in French Guiana. Of 378 food items brought to chicks, 259 were wasp nests of diverse genera. By extrapolating the rate of chick provisioning to the population of adult birds and by comparing this rate to reported rates of predation by army ants, we conclude *I. americanus* could rival the predatory impact of army ants on populations of social wasps.

**McClure, M.**, M. Ralph and E. Despland

Biology Department, Concordia University, Montreal, QC

PRESIDENT'S PRIZE POSTER #26

**Group leadership depends on energetic state in a nomadic collective foraging caterpillar**

Activity synchrony between individuals is necessary to derive the benefits that ensue from an aggregated lifestyle. Which individuals decide which activities to perform and when to perform them is therefore a fundamental question. This study was undertaken to determine if certain individuals of *Malacosoma disstria* are more likely to be consistent group leaders, or if transient leaders could be predicted by the differences in energetic states.

**McCorquodale, D.B.** (1), S.M. Marriott (2) and D.J. Giberson (2)

(1) Department of Biology, Cape Breton University, Sydney, NS; (2) Department of Biology, University of Prince Edward Island, Charlottetown, PE

TUE NOV 02, 09:05

SYMPOSIUM 4: INVERTEBRATE CONSERVATION

**Conservation status of lady beetles in Canada: Do any fit COSEWIC criteria?**

The most common lady beetles in southern Canada are non-native species. Some native species show reduced geographic ranges. These native species seem to be prime candidates for listing by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Do they fit the necessary criteria? Geographic range, locations, population trends, and risk factors are used to assign risk categories. The data required to assess the COSEWIC criteria are more difficult to obtain for lady beetles than better known taxa such as birds and mammals. Lady beetles provide a good illustration of the difficulties in protecting insect species.

**McGinnis, S.M.** (1,3), P. K. Abram (2), T. Haye (3), P.G. Mason (4), N. Cappuccino (2), G. Boivin (5) and U. Kuhlmann (3)

(1) Department of Biology, University of Victoria, Victoria, BC; (2) Department of Biology, Carleton University, Ottawa, ON; (3) CABI Europe-Switzerland, Delémont, Switzerland; (4) Research Centre, Agriculture and Agri-Food Canada, Ottawa, ON; (5) Centre de Recherche et de Développement en Horticulture, Agriculture et Agroalimentaire Canada, Saint-Jean-sur-Richelieu, QC  
SUBMITTED POSTER #27

**Factors affecting stage-specific mortality: Does the swede midge have an Achilles' heel?**

Designing a biological control program for an invasive pest relies on documenting the mortality factors affecting different life stages. Life stage-specific mortality factors of the swede midge, *Contarinia nasturtii*, an invasive pest of *Brassica* spp. in Canada, were examined under field conditions in its native European range. Both natural enemies (parasitoids and ground predators) and abiotic factors contribute to life-stage specific mortality.

**McGregor, R.** and M. Hoffman

Institute of Urban Ecology, Douglas College, New Westminster, BC

TUE NOV 02, 14:30

ORAL SUBMITTED: BIOLOGICAL CONTROL

***Micromus variegatus* (Fabricius) (Neuroptera, Hemerobiidae): A new predator for management of aphids on greenhouse peppers in British Columbia**

Biological control does not consistently provide adequate management of green peach (*Myzus persicae*) and foxglove (*Aulacorthum solani*) aphids on pepper crops in British Columbia (BC) greenhouses. *Micromus variegatus* (Fabricius) (Neuroptera: Hemerobiidae) was collected in a recent survey of aphid parasitoids in BC. Here, we present laboratory data on relative consumption rates of *M. persicae* and *A. solani* by *M. variegatus* and discuss the potential contribution of this predator to aphid management in BC pepper greenhouses.

**McLean, J.A.**

Professor Emeritus, Department of Forest Sciences, Faculty of Forestry, University of British Columbia.

MON NOV 01, 01:35

SYMPOSIUM 2: TERRY SHORE MEMORIAL

**Starting down the Research Road**

Terry's graduate school years coincided with my first years as an assistant professor at UBC Forestry. My introduction to this promising young Canadian occurred during the research study he carried on the western spruce budworm as part of his B.Sc. Honours program. I was impressed with his interest and intellectual curiosity. Terry worked in very well with others who were in my lab at the time including Peter Hall, Tom Maher and Jose Zaniccio. Terry's success in his baccalaureate program was followed by direct entry into a Ph.D. program. His research topic this time was centered on a pheromone-based pest management program for several species of ambrosia beetles at the old Chemainus Sawmill on Vancouver Island. I will always remember Terry, and Peter, for their support and efforts to introduce me to Canadian ways.

**McNeil, J.N.**

Department of Biology, The University of Western Ontario, London, ON

SUN OCT 31, 15:00

PLENARY SYMPOSIUM

**Using examples of insect communication to communicate science to the public**

While a significant proportion of the general public will exhibit a "yuk" reaction when one talks about organisms like insects, snakes and bats they still have a fascination for "creepy-crawlies. This somewhat contradictory state offers a wonderful opportunity to use entomology in activities related to the public awareness of science. I will discuss how I use examples of insect communication when speaking to different sectors of the general public (as wide ranging as school children to politicians) about the importance of both basic and applied science.

**Miresmailli, S.** (1) , R. Gries (2) , G. Gries (2) , R.H. Zamar (3) and M.B. Isman (4)

(1) Energy BioSciences Institute, Department of Entomology, University of Illinois at Urbana-Champaign, Urbana, IL, USA; (2)

Department of Biological Sciences, Simon Fraser University, Burnaby, BC; (3) Department of Statistics, University of British Columbia, Vancouver, BC; (4) Faculty of Land and Food Systems, University of British Columbia, Vancouver, BC

WED NOV 03, 08:45

ORAL SUBMITTED: AGRICULTURE

**Population density and feeding duration of cabbage looper larvae on tomato plants alter levels of plant volatile emissions**

As part of their indirect defense, plants under herbivore attack release herbivore induced volatile chemicals. Working with larvae of the cabbage looper, *Trichoplusia ni*, and tomato plants and using an ultra fast gas chromatograph (the zNose) for volatile analyses, we studied the effect of larval density and feeding duration on levels of plant volatile emissions. This information may help in the development of a pest monitoring system that is based on herbivore-induced plant volatiles.



**Moffat, C.E.** (1), J. Pither (1), R.G. Lalonde (1), D. Ensing (1), G. Grosskopf-Lachat (2) and R.A. De Clerck-Floate (3)

(1) University of British Columbia, Okanagan Campus, Kelowna, BC; (2) CABI Europe-Switzerland, Delémont, Switzerland; (3) Agriculture and Agri-Food Canada, Lethbridge, AB

MON NOV 01, 14:00

ORAL PRESIDENT'S PRIZE: BIOLOGICAL CONTROL

**Predicting the ecological host range and establishment of the gall wasp *Aulacidea pilosellae* (Hymenoptera: Cynipidae), a proposed biological control agent of invasive alien hawkweeds (*Pilosella* spp., formerly *Hieracium* subgenus *Pilosella*)**

European hawkweeds, invasive in North America, continue to spread in the absence of specialized natural enemies. The gall wasp *A. pilosellae* is reported to develop on at least eleven species in the genus, but has been observed to select only a subset of these species when they co-occur. Investigations into factors that may influence establishment and host plant species selection of *A. pilosellae* were conducted in the central European native range of these species in the summer of 2010. Preliminary findings of the associations between multiple abiotic and biotic factors, and the presence and density of *A. pilosellae* will be presented.

**Mohan, M.**, K. McNutt and G.C. Cutler

Department of Environmental Science, Nova Scotia Agricultural College, Truro, NS

MON NOV 01, 11:15

ORAL PRESIDENT'S PRIZE: AGRICULTURE

**Effect of sublethal doses of imidacloprid and spirotetramat on green peach aphid, *Myzus persicae***

Chemical hormesis is a biphasic toxicological response displaying low-dose stimulation and high-dose inhibition, a phenomenon observed in a wide array of organisms and chemical stressors. We are using an aphid-potato model to study insecticide-induced hormesis in insects, a system that has proven to be useful in the past. Effects of sublethal imidacloprid and spirotetramat concentrations on nymphs and adults are being examined and data collection on fecundity, survivorship, life-stage duration and body size is ongoing. Further work will utilize a combination of biochemical and molecular methods to elucidate enzymatic and hormonal mechanisms that drive chemical hormesis in *M. persicae*.

**Morales-Rodriguez, A.**, A. Ospina, P. Bungler, M. Ivie and K. Wanner

Department of Plant Sciences & Plant Pathology Montana State University, Bozeman, MT, USA

MON NOV 01, 11:45

ORAL PRESIDENT'S PRIZE: AGRICULTURE

**Identifying and sampling the wireworm (Coleoptera: Elateridae) species complex infesting wheat and barley crops in Montana**

Wireworms are the most important soil insect pest of wheat and barley in Montana. In general, wireworms are attracted to most types of bait, including wheat, wheat/corn mixtures, oatmeal, and grain sorghum seeds as well as pieces of carrot and potato. We compared the effectiveness of four different designs of underground pitfall trap baited with a wheat/barely seed mixture in spring wheat, barley and lentil fields at sites across Montana during 2010. Total trap catches and seasonal and species distribution among sites and traps will be summarized. Preliminary data demonstrating the use of DNA barcoding (COI gene sequences) to identify wireworm species will be presented.

**Mori, B.A.** (1), J. Otani (2), C. Yoder (3) and M.L. Evenden (1)

(1) Department of Biological Sciences, University of Alberta, Edmonton, AB; (2) Agriculture and Agri-food Canada, Beaverlodge Research Station, Beaverlodge, AB; (3) Alberta Agriculture, Food and Rural Development, Spirit River, AB

MON NOV 01, 09:30

ORAL PRESIDENT'S PRIZE: AGRICULTURE

**Development of a pheromone-based monitoring tool for *Coleophora deauratella* (Lepidoptera: Coleophoridae): Relationships between pheromone trap catch, larval density and damage levels**

The red clover casebearer (RCC), *Coleophora deauratella*, is an invasive pest of clover (*Trifolium* spp. L.) throughout Canada. In the Peace River region of Alberta, larval infestations of RCC can cause 99.5% seed loss. A two-component sex pheromone blend containing a 100:10 ratio of Z-7-dodecenyl acetate to Z-5-dodecenyl acetate was used in non-saturating Unitraps to monitor adult male RCC throughout the flight season in Alberta. Sweep net samples and pheromone-baited trap capture were compared to larval infestations and seed damage levels at the same sites to determine if male trap capture is predictive of larval populations and crop damage.

**Mori, B.A.** and M.L. Evenden  
Department of Biological Sciences, University of Alberta, Edmonton, AB  
PRESIDENT'S PRIZE POSTER #28

**Potential for the development of pheromone-based communication disruption to control *Coleophora deauratella* (Coleophoridae: Lepidoptera): a major pest of red clover (*Trifolium pratense* L.)**

The red clover casebearer (RCC) is an introduced pest to North America. In the Peace River Region (AB), infestations of RCC in clover (*Trifolium* spp.: Fabaceae) can cause up to 99.5% seed loss. We tested the hypothesis that sex pheromone-mediated communication would be disrupted by application of synthetic pheromone in small plot field trials. Rope dispensers (Shin Etsu, Japan) and puffers (Suterra, OR, USA) formulated with the RCC pheromone consisting of a 10:1 ratio of Z-7-dodecenyl acetate and Z-5-dodecenyl acetate were tested. Moth capture was significantly reduced in rope dispenser pheromone-treated plots as compared to non-treated control plots.

**Mostafa, A.**, T. Lowery, L. Jensen and K. DeGlow  
Pacific Agri-food Research Centre (PARC), Agriculture and Agri-food Canada, Summerland, BC  
SUBMITTED POSTER #25

**Biological aspects of climbing cutworm (Lepidoptera: Noctuidae) attacking grapes in the Okanagan Valley, British Columbia**

*Abagrotis orbis*, *A. nefascia* and *A. reedi* are the major species of cutworms attacking grape buds in the spring in south central B.C.; resulting in hollowed out buds and in consequence reducing wine quality. Developmental times of these species in the laboratory on pinto bean-based artificial diet at different temperatures and photo periods showed similarities in some aspects like days to adult eclosion. However, survival varied under different temperatures for the three species. Females showed high reproductive potential and reproductive elasticity during rearing in the lab.

**Mudavanhu, P.**, P. Addison and K.L. Pringle.  
Department of Conservation Ecology and Entomology, Faculty of AgriSciences, Stellenbosch University, Matieland, South Africa  
PRESIDENT'S PRIZE POSTER #30

**The development of early monitoring tools for the obscure mealybug *Pseudococcus viburni* (signoret) (Hemiptera: Pseudococcidae) using pheromone-baited traps**

The absence of effective monitoring on farms has resulted in an increase in mealybug populations in pome fruit orchards in the Western Cape Province recently. An effective monitoring system improves pest detection and provides information early in season at low mealybug densities making it possible to target and schedule control actions. The use of pheromone-baited traps as early monitoring tools for *P. viburni* was investigated. There was a positive and significant relationship between the fruit infestation and number of adult males caught in pheromone-baited traps. An action threshold based on trap catch data was determined.

**Murray, B.W.**, N.D.G. Samarasekera, C. Boone, N.V. Bartell, B.S. Lindgren, P. James, J.E.K. Cooke, C.S. Davis, K.E. Mock and D. Coltman  
University of Northern British Columbia, Prince George, BC

WED NOV 03, 09:10

SYMPOSIUM 7: MOUNTAIN PINE BEETLE SYSTEM GENOMICS

**Mountain pine beetle system genomics: microsatellite analysis of mountain pine beetle outbreak in western Canada**

Microsatellite markers were developed to infer current dispersal patterns, long-term phylogeographic processes and to study adaptive changes. Information on "neutral" microsatellite variation in beetles from 49 sampling locations throughout BC and AB shows a North-South population structure that is supported by: Bayesian structure analysis; North-South genetic relationships and diversity gradients; and the lack of isolation by distance in the northernmost cluster. Our findings are consistent with spatiotemporal analyses of the current epidemic that supports a multi-center hypothesis. Northern outbreaks are consistent with an expansion out of Tweedsmuir Provincial Park while Southern outbreaks are consistent with multiple centers of origin.

**Myers, J.H.** (1), J.S. Cory (2), J. Ericsson (2) and M. Tseng (1)

(1) Department of Zoology, University of British Columbia, Vancouver, BC; (2) Biological Sciences, Simon Fraser University, Burnaby, BC

TUE NOV 02, 13:30

ORAL SUBMITTED: BIOLOGICAL CONTROL

**Food limitation does not increase susceptibility to viral infection in western tent caterpillars**

Western tent caterpillars exhibit dramatic population cycles, and peaks are often associated with both food limitation and epizootics of nucleopolyhedrovirus (NPV). In laboratory experiments, we tested if food-limitation reduced larval immunocompetence, and increased susceptibility to NPV. Hemocyte numbers did not differ but fully-fed larvae had higher phenoloxidase levels. Food limitation did not increase susceptibility to NPV. Rather, food limited larvae, and their offspring, may be slightly more resistant to viral infection. Food limitation can influence the population decline however through reducing moth fecundity and promoting larval movement and thus enhancing virus transmission.

**Nagalingam, T.** and N.J. Holliday

Department of Entomology, University of Manitoba, Winnipeg, MB

MON NOV 01, 09:45

ORAL PRESIDENT'S PRIZE: AGRICULTURE

***Lygus lineolaris* injury to navy beans (*Phaseolus vulgaris* L.) in the pod set and fill (R4–R5) stage**

*Lygus lineolaris* feeds preferentially on rapidly growing plant tissues. In navy beans at the R4–R5 stage, distribution of feeding injury among and within bean pods was quantified in controlled conditions by caging *L. lineolaris* adults or 5th instar nymphs on the pods from a single inflorescence for 5 days. The majority of feeding on developing pods occurred in the area of the funicle, through which nutrients flow to the developing seed. The effect of this injury on seed weight was examined.

**Nagalingam, T.** and N.J. Holliday

Department of Entomology, University of Manitoba, Winnipeg, MB

PRESIDENT'S PRIZE POSTER #31

**Effect of *Lygus lineolaris* feeding on different growth stages of navy beans (*Phaseolus vulgaris* L.)**

*Lygus lineolaris* and other plant bugs are sometimes controlled with insecticides in dry edible beans, but there is little information on the nature of injury and damage to the crop. In the laboratory, we investigated the relative vulnerability of different growth stages to *L. lineolaris* by confining 5th instar nymphs or adults to reproductive structures of navy bean plants for 5 days, and characterizing the injury by light microscopy. The type of injury was related to the plant growth stage.

**Neame, L.A.** and E. Elle

Simon Fraser University, Burnaby, BC

SUBMITTED POSTER #33

**Wild bee contribution to ground crop pollination in Okanagan and Similkameen valleys of British Columbia**

Recent concern over honeybee declines has highlighted the need for research on the contribution of wild bees to crop pollination. We assessed visit rate of wild bees on tomato and squash in the Okanagan and Similkameen Valleys of British Columbia. Though incidence of bumblebees in tomato is generally low, one bumblebee visits many flowers while foraging, sufficient for full fruit set. In squash we observed seven species of wild bees, and though honeybees are frequent floral visitors, on some farms wild bees contribute substantially to pollination. Our results suggest wild bees can buffer some crops from honeybee losses.

**Nixon, A.N.** and J. Roland

Department of Biological Sciences, University of Alberta, Edmonton, AB

MON NOV 01, 11:30

ORAL PRESIDENT'S PRIZE: FORESTRY

**Experimental assessment of predation and parasitism on forest tent caterpillar**

Forest tent caterpillar (FTC; *Malacosoma disstria*) outbreaks are a major disturbance in the boreal forest. The spatial patterns of outbreaks may respond to forest composition if biological processes governing outbreaks, such as predation and parasitism, differ with forest composition. I used exclosures to determine FTC mortality caused by predators and parasitoids in aspen and mixedwood forest stands. Results suggest little difference in natural enemy-caused mortality can be attributed to local stand characteristics. However, this study demonstrates that generalist predation causes high early-instar mortality and indicates that later mortality caused by parasitoids and predators may not be compensatory.

**Noronha, C.**

Crops and Livestock Research Centre, AAFC, Charlottetown, PE

WED NOV 03, 08:00

ORAL SUBMITTED: AGRICULTURE

**Can crop rotation be used to manage wireworm damage in potatoes?**

Wireworm damage to potato tubers can result in serious economic losses for producers. The lack of efficacious insecticides in Canada and increasing wireworm pressure has intensified the need to evaluate other management strategies. The effectiveness of a three year crop rotation on tuber damage was evaluated, with buckwheat, alfalfa, brown mustard or the standard barley/clover grown in years one and two, and potato in year three. Results showed a significant decrease in tuber damage and an increase in marketable tuber yield following the brown mustard and buckwheat rotations when compared to the alfalfa and barley/clover rotations. Details of this study will be discussed.

**Norouzi, J.** and B.D. Roitberg

Department Biological Sciences, Simon Fraser University, Burnaby, BC

SUBMITTED POSTER #29

**Effects of temperature fluctuation on parasitoid's reproduction**

Rapid changes in climatic conditions can be indicative of deteriorating conditions for parasitoids and therefore alter the behavioral dynamics of host-parasitoid systems. Such changes can play a role in parasitoids' life expectancy; thus affect parasitoids' oviposition "decisions". The effects of experimentally generated temperature fluctuations on parasitoids' patch allocation time; oviposition rate and sex ratio of their progeny will be discussed.

**Oghiakhe, S.** and N.J. Holliday

Department of Entomology, University of Manitoba, Winnipeg, MB

MON NOV 01, 11:00

ORAL PRESIDENT'S PRIZE: FORESTRY

**Evaluation of insecticides for controlling over-wintering native elm bark beetle, *Hylurgopinus rufipes*, in Manitoba**

Insecticide applications to the base of healthy elm trees are used to control overwintering *Hylurgopinus rufipes*, the vector of Dutch elm disease, in Manitoba. Chlorpyrifos is registered and effective but may soon become unavailable and alternatives are needed. Basal applications of candidate insecticides were made, and residual efficacy assessed with a bark disk bioassay. Chlorpyrifos and bifenthrin provided 100% control for two years. Permethrin and carbaryl rapidly became ineffective.

**Olivier, C.** (1), B. Galka (1), J. Saguez (2), J. Lasnier (3), C. Vincent (2), L. Stobbs (4) and T. Lowery (5)  
(1) Agriculture and Agri-Food Canada, Saskatoon, SK; (2) Agriculture and Agri-Food Canada, Saint-Jean-Sur-Richelieu, QC; (3) CoLab R&D, div. AgCord inc., Granby, QC; (4) Agriculture and Agri-Food Canada, Vineland, ON; (5) Agriculture and Agri-Food Canada, Summerland, BC

TUE NOV 02, 08:00

ORAL SUBMITTED: SYMBIONTS & VECTORS

**Why phytoplasma infection in leafhopper population is only correlated with grapevine yellow incidence in vineyards from Québec?**

A survey of grapevine yellows caused by phytoplasma and their insect vectors were conducted in Canadian vineyards. Leafhopper population and grapevine were sampled in vineyards from British Columbia, Ontario and Québec in 2006, 2007 and 2008. Phytoplasma strains were detected and identified using PCR tests. Grapevine yellows incidence was very low in British Columbia and varied in Ontario and Québec. Correlation between the % of infection among the leafhopper vectors and the incidence of grapevine yellows is discussed.

**Olivier, C.** (1), B. Galka (1), K. Floate (2), S. Perlman (3), T. Dumonceau (1) and E. Zchori-Fein (4)  
(1) Agriculture and Agri-Food Canada, Saskatoon, SK; (2) Agriculture and Agri-Food Canada, Lethbridge, AB; (3) University of Victoria, BC; (4) Agricultural Research Organization, Israel

TUE NOV 02, 08:15

ORAL SUBMITTED: SYMBIONTS & VECTORS

**Identification of symbionts in the aster leafhopper, *Macrosteles quadrilineatus*, their association with phytoplasma and their geographical distribution in Canada**

In Canada, Aster yellows diseases, caused by phytoplasma, are mostly transmitted by the aster leafhopper, *Macrosteles quadrilineatus*. Populations of aster leafhoppers were sampled in various crops in Saskatchewan, Ontario, British Columbia and Québec, and screened for the presence of phytoplasma and bacterial symbionts using PCR with specific primers based on 16S rRNA-encoding genes and the chaperonin 60 universal target. Symbionts belonging to *Arsenophonus* and *Wolbachia* genera were detected in aster leafhopper and phytoplasma belonging to the AY group were detected in many plants in most provinces. Correlation between the presence of specific symbionts, phytoplasma infection and geographical distribution is discussed.

**Peach, D.A.H.** (1,2), S.M. Fitzpatrick (1) and J. Huber (3)

(1) Agriculture and Agri-Food Canada, Pacific Agri-Food Research Centre, Agassiz, BC; (2) Simon Fraser University, Department of Biological Sciences, Burnaby, BC; (3) Agriculture and Agri-Food Canada, Eastern Cereals and Oilseeds Research Centre, Ottawa, ON

MON NOV 01, 08:45

ORAL PRESIDENT'S PRIZE: AGRICULTURE

**Seasonal abundance of hymenopteran parasitoids from cranberry tipworm, *Dasineura oxycoccana*, collected from cranberry, *Vaccinium macrocarpon*, in Pitt Meadows, British Columbia**

Cranberry tipworm, *Dasineura oxycoccana* (Johnson) (Diptera: Cecidomyiidae) is a pest of cranberry, *Vaccinium macrocarpon* Ait., in North America. We recorded the first instance of two species of parasitoids in the families Eulophidae and Platygasteridae emerging from *D. oxycoccana* collected in British Columbia in 2009. Here we report seasonal abundance of the two species — *Aprostocetus* sp. near *marylandensis* and *Platygaster* sp. — from the same location in 2009 and 2010, noting the different patterns between years and discussing conservation of these beneficials on cranberry farms.

Pearce, A., **B. Galka**, R. Gugel and C. Olivier

Agriculture and Agri-Food Canada

SUBMITTED POSTER #32

**Incidence of phytoplasma-infected leafhoppers in accessions of *Camelina sativa* (L.) Crantz**

The oilseed *Camelina sativa* (L.) Crantz has recently gained economic importance in the Canadian agricultural sector. However, little is known about its susceptibility to certain pathogens. In 2009, six accessions were tested for the presence of aster yellows (AY) phytoplasma. Five of the 19 leafhopper species captured in the field plots tested positive for the presence of phytoplasma DNA. Differences in susceptibility to AY were observed among accessions. Location of phytoplasma DNA within individual plants, and potential impact of leafhopper vectors is also discussed.

**Pelletier, Y.** and X. Nie

Potato Research Centre, Agriculture and AgriFood Canada, Fredericton, NB

TUE NOV 02, 09:30

ORAL SUBMITTED: SYMBIONTS & VECTORS

**Aphid vectors of potato virus Y; behaviour and dispersal**

Potato virus Y is transmitted to potato in a non-persistent manner by many aphid species, some of which do not colonize this crop. The behavior of several aphid species on potato, a plant species that is not colonized by these aphids, was described and compared with that of the potato colonizing aphids. On the other hand, we developed a protocol to trap and determine if the aphids are carrying PVY. This allows the identification of the aphid species involved in PVY transmission in a field situation.

**Perlman, S.J.** and A. Behar

Department of Biology, University of Victoria, Victoria, BC

TUE NOV 02, 08:45

ORAL SUBMITTED: SYMBIONTS & VECTORS

**Evolution of a *Rickettsia* symbiont infecting the common stored grain pest, *Liposcelis bostrychophila* (Psocoptera: Liposcelidae)**

Inherited bacterial symbionts are ubiquitous and important players in insect ecology. We studied *Liposcelis bostrychophila*, a common parthenogenetic kitchen pest that harbours an enigmatic strain of *Rickettsia*, which previous studies have speculated may be essential. Surprisingly, molecular characterization revealed that this strain is *Rickettsia felis*, an emerging human pathogen common in cat fleas. We have also identified *R. felis* in two wild sexual populations of *L. bostrychophila*, ruling out a causal role for *Rickettsia* in parthenogenesis. Culture-independent surveys and antibiotic curing experiments suggest that *R. felis* is not essential for its host.

**Peterson, J.H.** and B.D. Roitberg

Simon Fraser University - Evolutionary and Behavioural Ecology Research Group, Burnaby, BC

MON NOV 01, 14:45

ORAL PRESIDENT'S PRIZE: BEHAVIOUR

**Non-traditional maternal nest defence related to nest state**

Nest defence traditionally increases as the size and value of the nest rises and then decreases as offspring begin to be able to avoid predation. However, nest defence decisions in many solitary bees pose an interesting variation to traditionally studied organisms. The mother's final investment of sealing the nest entrance provides greater nest protection and therefore a second increase to the value of all the nests offspring. Solitary bee nest defence levels are examined at various nest states.

**Pitt, C.** (1), S.J. Seybold (2), A.T. Thommasen (1) and D.P.W. Huber (1)

(1) University of Northern British Columbia, Prince George, BC (2) United States Department of Agriculture – Forest Service, Davis, CA, USA

MON NOV 01, 09:30

ORAL PRESIDENT'S PRIZE: FORESTRY

**Possible chimeric signals in bark beetle enzymes – a mechanism for dual subcellular targeting of cytochromes P450**

Cytochrome P450 enzymes have roles in detoxification as well as in the synthesis and turnover of hormones, pheromones, and other molecules. Most detoxifying P450s anchor in the endoplasmic reticulum, but there are several mammalian P450 variants that also target to mitochondria via cleaved, chimeric peptide signals. We produced recombinant bark beetle P450s that were induced by feeding. Analyses of multiple cellular compartments revealed the presence of two differently sized isoforms. Signal-detecting software was used to probe these peptides for complex targeting features.

**Pohl, G.** (1), R.A. Cannings (2) and G.G.E. Scudder (3)

(1) Natural Resources Canada, Canadian Forest Service, Edmonton, AB; (2) Royal British Columbia Museum, Victoria, BC; (3) Beaty Biodiversity Centre and Department of Zoology, University of British Columbia, Vancouver, BC

TUE NOV 02, 09:20

SYMPOSIUM 4: INVERTEBRATE CONSERVATION

**Title: Lepidoptera in British Columbia - a biodiversity perspective**

A list of the Lepidoptera of British Columbia has been compiled by the authors, based on historical checklists, taxonomic publications, and specimens in major public insect collections. The state of knowledge of the Lepidoptera fauna of BC is discussed, and the activities of major historical collectors and compilers is reviewed. Over 2600 species from 64 families are reported from BC, although the number of resident species is thought to be considerably higher. Taxonomic and geographical areas requiring further inventory work are identified, and several species of conservation interest are discussed.

**Poirier, L.M.**

Ecosystem Science and Management Program, University of Northern British Columbia, Prince George, BC

TUE NOV 02, 14:00

ORAL SUBMITTED: FORESTRY

**Production of late buds by Douglas-fir in central British Columbia following defoliation by western spruce budworm, *Choristoneura occidentalis* Free. (Lepidoptera: Tortricidae)**

Outbreaks of western spruce budworm, *Choristoneura occidentalis* Free., now occur much farther north than they have historically. Affected Douglas-fir in the north appeared to lack significant numbers of adventitious buds, possibly reducing their ability to compensate for defoliation. Larvae were reared on potted Douglas-fir and the production of adventitious buds by these trees was compared to production by manually defoliated and healthy trees. The short growing season may reduce the trees' ability to produce late buds, or may leave the larvae feeding actively on late buds. Fewer late buds could result in more pronounced impacts of defoliation in the north.

**Proctor, H.C.**

University of Alberta, Edmonton, AB

MON NOV 01, 09:00

SYMPOSIUM 1: ARACHNOLOGY

**Sexual conflict and the evolution of sperm transfer in mites (Acari)**

Sexual conflict can result in sex-specific behavioural and morphological tactics to gain control over egg fertilization. Genital arms-races may result and have been documented in insects and vertebrates. An extreme tactic, traumatic insemination, is well known in bedbugs (Heteroptera: Cimicidae) but also occurs in other arthropods. Here I provide morphological evidence that, in mites, (a) genital arms-races may be occurring and (b) traumatic insemination evolved at least twice. In both of the latter cases, novel sclerotized copulatory pores have evolved allowing female genital morphology to 'catch up' to that of males. Conversely, long intromittent genitalia in females and recessed copulatory pores in males have evolved in several feather mite families.

**Quan, E.** (1,3), P. Abram (2), T. Haye (3), P. Mason (4), N. Cappuccino (2), G. Boivin (5) and U. Kuhlmann (3)

(1) Department of Biology, Simon Fraser University, Burnaby, BC; (2) Department of Biology, Carleton University, Ottawa, ON; (3) CABI Europe-Switzerland, Delémont, Switzerland; (4) Eastern Cereal and Oilseed Research Centre, Agriculture and Agri-Food Canada, Ottawa, ON; (5) Centre de Recherche et de Développement en Horticulture, Agriculture et Agroalimentaire Canada, Saint-Jean-sur-Richelieu, QC

SUBMITTED POSTER #34

**Does larval stage matter to parasitoids of swede midge?**

Two parasitoid wasps, the platygastriid *Synopeas myles* and the pteromalid *Macroglenes chalybeus* attack swede midge *Contarinia nasturtii* (Diptera: Cecidomyiidae), in its native European range. Very little is known about the biology of these two species, an understanding of which is crucial for the development of an effective classical biological control program against swede midge in Canada. The susceptibility of different host stages and its implications for parasitoid fitness and sex ratio were investigated, providing the foundation for future study of the two parasitoids.

**Ramanaidu, K.** and G.C. Cutler  
Dept. Environmental Sciences, Nova Scotia Agricultural College, Truro, NS  
PRESIDENT'S PRIZE POSTER #35

**Impact of Movento®, Botanigard® and Serenade® on bumble bee micro-colony development**

We evaluated the toxicity of the biopesticides Serenade® (*Bacillus subtilis*) and Botanigard® (*Beauveria bassiana*), and the reduced-risk insecticide Movento® (spirotetramat) to *Bombus impatiens* housed in micro-colonies over 60 days. When ingested, field rates of Movento caused high mortality after a week, while Serenade reduced drone production and consumption of diluted honey. Field rates of Movento applied topically reduced drone production, but drone production varied following topical treatments of either biopesticide. Ingestion of a 2x-field rate solution of Serenade increased pre-oviposition time. Interestingly, in some cases drone production and survival was stimulated by exposures to low concentrations of products.

**Reeh, K.W.** (1,2) and F.F. Hunter (2)

(1) Department of Environmental Sciences, Nova Scotia Agricultural College, Truro, NS; (2) Department of Biological Sciences, Brock University, St. Catharines, ON

MON NOV 01, 14:45

ORAL PRESIDENT'S PRIZE: ECOLOGY

**The distribution of *Ixodes scapularis* Say (Acari: Ixodidae) within southern Ontario, prevalence of *Borrelia burgdorferi* s.l., and comparison of CO1 and 16S sequences to determine geographic origin**

During October and November 2009, 55 person-hours of drag-sampling were performed at 32 sites (17 locations) in southern Ontario to determine the distribution of the blacklegged tick (*Ixodes scapularis*). 309 adult blacklegged tick specimens (1 nymph) were captured at four locations and subsequently tested for *Borrelia burgdorferi*. Point Pelee National Park, Long Point Provincial Park and Wainfleet Bog were known to have established populations, while Rock Point Provincial Park represented a new find. The prevalences of *B. burgdorferi* at the four locations were 24.14%, 60.00%, 44.44% and 0%, respectively. Preliminary analyses of CO1 and 16S sequences revealed no geographical patterns.

**Reeh, K.W.** and G.C. Cutler

Department of Environmental Sciences, Nova Scotia Agricultural College, Truro, NS Canada

PRESIDENT'S PRIZE POSTER #36

**Bumble bees as vectors of biological control agents for disease control in lowbush blueberry**

The use of bees as vectors of biocontrol agents has been demonstrated in greenhouses and some small acreage berry crops. However, overall the technique has been underexplored as a pest management tactic, and little is known about the effects of biocontrol loads and dispenser design on bee activities. Field experiments in May and June 2010 examined the dispersal of the fungal antagonist *Clonostachys rosea* by the bumble bee *Bombus impatiens* in lowbush blueberry, *Vaccinium angustifolium*. Data analysis is ongoing to compare two different dispenser designs for effects on bee foraging, aggressiveness, and biocontrol product distribution.

**Reid, M.L.** (1) and M.K. Trzcinski (2)

(1) Biological Sciences and Environmental Science Program, University of Calgary, Calgary, AB; (2) Dept. of Fisheries and Oceans, Dartmouth, NS

TUE NOV 02, 13:00

ORAL SUBMITTED: FORESTRY

**Host use by mountain pine beetles: searching for generalities**

The success of mountain pine beetles, *Dendroctonus ponderosae* (Coleoptera: Scolytinae) is commonly thought to increase with the diameter of their host trees, attributed to reduced defences of old trees and thicker phloem. Host choice may influence this outcome. We examined tree traits and beetle response for naturally attacked trees at 7 sites in Banff National Park. Tree diameter did not consistently predict age, phloem thickness or recent growth rate. Attack density increased with recent growth rate, not tree diameter. However, beetle success decreased with recent growth rate. Tree traits other than diameter are important in host use.



**Rochefort, S.** (1), R. Berthiaume (1), C. Hébert (2) and É. Bauce (1)

(1) Département des sciences du bois et de foresterie, Faculté de foresterie, de géographie et de géomatique, Université Laval, QC; (2) Natural Resources Canada, Canadian Forest Service, Laurentian Forestry Center, QC

SUBMITTED POSTER #37

**Influence of temperature, host tree and geographical localization on hemlock looper overwintering capacities**

Three populations of hemlock looper from different localization were reared under controlled conditions and fed on three host plants: white spruce, balsam fir and white birch. Eggs obtained from these rearing were placed under natural conditions from November to April. Supercooling points and anti-freeze contents were evaluated throughout the winter. Eggs were also exposed at different temperatures and period of time. Hemlock looper eggs reached very low supercooling points (<-45°C) during winter and the major anti-freeze product found was the trehalose. Temperatures, period of exposure, tree species and localization have an impact on the survival rate of hemlock looper eggs.

Roe, A.D., A.V. Rice, D.W. Coltman, J.E.K. Cooke and **F.A.H. Sperling**

Dept. Biological Sciences, University of Alberta, Edmonton, AB

WED NOV 03, 10:30

SYMPOSIUM 7: MOUNTAIN PINE BEETLE SYSTEM GENOMICS

**Comparative phylogeography, genetic differentiation, and contrasting reproductive modes in three fungal symbionts of a multipartite bark beetle symbiosis**

Multipartite symbioses are complex symbiotic relationships involving multiple interacting partners. Using blue stain fungi (Ophiostomataceae) associated with outbreaking populations of the mountain pine beetle (*Dendroctonus ponderosae*) in western Canada, we applied phylogenetic, population genetic, and demographic approaches to identify similar and contrasting phylogeographic patterns among three fungal species. These three species showed significant population differentiation, forming northern and southern populations, despite dramatic differences in haplotype diversity and some interspecific incongruence. By comparing species simultaneously, we were able to identify differences in reproductive mode and recombination rate that explain observed patterns of incongruence among the fungal partners of this multipartite symbiosis.

**Roitberg, B.**

Simon Fraser University, Burnaby, BC

TUE NOV 02, 10:15

SYMPOSIUM 5: INSECT COMMUNITY ECOLOGY

**Insect community ecology: What is it?**

Community Ecology, the study of interacting species that occupy a given area, means different things to different people depending upon their perspectives or interests. Here, I briefly outline a general conceptual structure for defining such interactions that includes both direct and indirect processes, density and trait mediated effects, spatial context and the impact of phenotypic plasticity of individuals on community level outcomes. I will then introduce each of the remaining talks from this symposium by describing how such studies fit into this general scheme and how they inform us regarding community structure and function.

Roitberg, B. and **J. Reid**

Behavioural Ecology Research Group, Department of Biological Sciences, Simon Fraser University, Burnaby, BC

MON NOV 01, 15:45

ORAL SUBMITTED: BEHAVIOUR

**Bite or flight - the fitness tradeoff for malaria vector *Anopheles gambiae***

We investigated how the mosquito *Anopheles gambiae* responds to disturbance, while varying size and energy state of the mosquito. This may provide insights regarding the tradeoff between the evolutionary fitness payoffs of a blood meal, used primarily for reproductive purposes (Foster, 1995), balanced against the dangers of host defence. To accomplish this, a bifactorial experiment was designed, resulting in six distinct treatment groups. Mosquitoes during experimentation were allowed to blood feed for 2 minutes, at which point their response to a sharp jerk of the arm (the putative defence cue) was observed. Results to be discussed.

**Roland, J.** (1) and S. Matter (2)

(1) Dept of Biological Sciences, University of Alberta, Edmonton, AB; (2) Dept of Biological Sciences, University of Cincinnati, Cincinnati, OH, USA

TUE NOV 02, 11:30

ORAL SUBMITTED: CLIMATE & ECOLOGY

**Increased climate variability reduces population growth: alpine *Parnassius smintheus* butterflies and the Pacific Decadal Oscillation**

We examined the effects of short term 'climate' variability in the form of the Pacific Decadal Oscillation (PDO) on the rate of population change for 21 sub-populations of the alpine butterfly *Parnassius smintheus* from 1995 through 2009. Populations showed positive growth at intermediate values of PDO, but declined at extreme positive and negative values of PDO. Rate of population change was most strongly affected during the winter compared with other seasons, suggesting that egg survival is poor in both cold wet (snowy) winters and warm dry (no snow) winters, and also suggesting a limited opportunity for adaptation to variable climate.

**Romero, W.** (1), C. Scott-Dupree (1), G. Murphy (2), T. Blom (3) and R. Harris (1)

(1) School of Environmental Sciences, University of Guelph, Guelph, ON; (2) Ontario Ministry of Agriculture, Food and Rural Affairs, Vineland Station, Vineland ON; (3) Plant Agriculture, University of Guelph, Guelph, ON

PRESIDENT'S PRIZE POSTER #38

**Control methods for insect pests on cuttings. A reduced risk approach**

In the Ontario floricultural greenhouse industry, attention has focused on controlling insect pests that may be coming in on imported cuttings. There is a major concern: the influx of what could potentially be large numbers of insect pests places constant pressure on integrated pest management programs. Using reduced risk control methods would permit growers to establish insect pest-free and insecticide residue-free cuttings from the outset. Hot water and reduced risk insecticides have been tested for the control of western flower thrips and silverleaf whitefly in chrysanthemum and poinsettia cuttings. An overview of the study and results obtained will be discussed.

**Rowland, E.** (1), P. Belton (1), P. W. Schaefer (2) and G. Gries (1)

(1) Department of Biological Sciences, Simon Fraser University, Burnaby, BC; (2) United States Department of Agriculture, Agricultural Research Service-North Atlantic Area, Beneficial Insects Introduction Research, Newark, DE, USA.

MON NOV 01, 09:30

ORAL SUBMITTED: ACOUSTICS

**Intraspecific acoustic communication and functionality of the tympanate ear of the European gypsy moth, *Lymantria dispar* (L.) (Lepidoptera: Noctuidae: Lymantriinae)**

Pheromonal communication in lymantriid moths is well documented but little is known about acoustic communication systems in these moths. Acoustic signals of gypsy moth, *Lymantria dispar*, were acquired, characterized and bioassayed for their role in mate location or courtship behaviour. Results indicate that acoustic signals from flying males at close range induce movement in pheromone-emitting females which provides visual signals that could orient males toward females. Laser interferometry reveals tuning of the female tympanum to specific frequency components produced by flying conspecific males. These results demonstrate sex-specific functional roles of sound, with males sending and females receiving acoustic signals.

**Royaute, R.** (1,2), C. Buddle (1) and C. Vincent (2)

(1) McGill University, Montreal, QC; (2) Agriculture and AgriFood Canada

MON NOV 01, 08:30

SYMPOSIUM 1: ARACHNOLOGY (ROBB BENNETT)

**Spider personality: implications and perspectives for agroecology**

Recent developments in behavioural ecology emphasize "animal personalities" or "behavioural syndromes": temporally consistent suites of behaviours correlated across ecological gradients (e.g. predation pressure). These can be of interest in agroecology as indicators of whether certain populations of natural enemies may be better at regulating pests than others. We developed methods for testing correlations between activity, aggressiveness, boldness, exploration and voracity in the field and laboratory for *Eris militaris* (Araneae: Salticidae), a jumping spider common in apple orchards. We observed a shift in personality between immature and penultimate stages in a non-insecticide treated orchard and compared *E. militaris* personality in a treated and non-treated orchard.

**Royer, L.** (1), J. Delisle (2) and A. Labrecque (2)

(1) Natural Resources Canada, Canadian Forest Service, Atlantic Forestry Centre, Corner Brook, NL; (2) Natural Resources Canada, Canadian Forest Service, Laurentian Forestry Centre, Sainte-Foy, Québec, QC

TUE NOV 02, 10:45

ORAL SUBMITTED: CLIMATE & ECOLOGY

**Does the timing of oviposition affect egg survival in hemlock looper (HL): an obligatory univoltine herbivore?**

Under global warming, insects are expected to initiate reproduction earlier in the season and consequently their eggs may suffer from being exposed too long at warm temperatures. To verify this, HL eggs were produced at four different dates (July 1, July 15, August 1, August 15) and then kept at 15, 20, 25°C or outdoors until September 1. After spending winter outdoors, all eggs were incubated at 15 °C to monitor percent and time to egg hatch. Our results confirmed that prolonged exposure of HL eggs to warm temperatures is detrimental for their survival and this may prevent populations to further expand.

**Ryan, K.** (1), P. de Groot (2) and S.M. Smith (1)

(1) University of Toronto, Toronto, ON; (2) Canadian Forest Service, Sault Ste. Marie, ON

TUE NOV 02, 09:30

SYMPOSIUM 3: GRAD STUDENT SYMPOSIUM

**Interactions between the introduced woodwasp *Sirex noctilio*, competing phloem- and wood-boring beetles, and their fungal associates**

*Sirex noctilio* is a significant pest in its introduced range in the southern hemisphere where it causes considerable mortality in non-native pines. In its native Eurasian range however, *S. noctilio* is of little concern due perhaps to its interactions with a well-developed community of pine inhabiting insects. If such interactions occur, they may limit the woodwasp's impact in its newly introduced range in North America. My research addresses two broad questions: 1) Does *S. noctilio* share its habitat with other insects and if so, whom? 2) Are there signs that co-habitants affect *S. noctilio*, and if so how might such interactions occur? Field studies were conducted to identify associated insect species from *S. noctilio*-infested pines. The wasp was sometimes found alone in a tree, in most cases it was found with bark and/or cerambycid beetle species, most commonly the pine shoot beetle. I found no sign of intra-tree partitioning between wasps and beetles, but there was evidence that woodwasps were less abundant, but larger, when beetles were also present. Experiments showed that indirect interactions can occur between the two groups via fungal associates of one or both. In the laboratory, the woodwasp fungal symbiont was outcompeted by two beetle-associated fungi over a range of temperatures. However, under field conditions, the woodwasp was able to detect and avoid ovipositing in areas inoculated with one of these two fungi. These results show that insects co-habiting pine with *S. noctilio* have potential to exert a measure of biological control on this insect.

**Safranyik, S.**

Canadian Forest Service (Retired)

MON NOV 01, 02:30

SYMPOSIUM 2: TERRY SHORE MEMORIAL

**Development and survival of the spruce beetle in stumps and windfall in central British Columbia**

Data from a seven-year field study of spruce beetle population dynamics is analysed with respect to the effects of spruce windthrow and logging residue on adult emergence, adult size and sex ratio, and brood development and survival within three different spruce habitat types from central British Columbia.

**Saguez, J.** (1), C. Vincent (1), J. Lasnier (2) and P. Giordanengo (3)

(1) Agriculture and Agri-Food Canada, Saint-Jean-sur-Richelieu, QC; (2) CoLab R&D, div. AgCord inc., Granby, QC; (3) Université de Picardie Jules Verne, Amiens, France

SUBMITTED POSTER #39

**Effects of oil treatments on the colonization behavior and the development of *Erythroneura vitis* (Cicadellidae) on grapevine**

We tested the effects of three oil formulations on *Erythroneura vitis*, a leafhopper that is carrier of phytoplasmas associated with grapevine. *E. vitis* nymphs and adults were allowed to choose between untreated vs. oil-treated grapevines. The development and mortality of nymphs following oil treatment were also investigated. The potential use of oils to manage grapevine leafhoppers will be discussed.

**Saguez, J.** (1), C. Olivier (2), B. Galka (2), J. Lasnier (3), P. Giordanengo (4) and C. Vincent (1)  
(1) Agriculture and Agri-Food Canada, Saint-Jean-sur-Richelieu, QC; (2) Agriculture and Agri-Food Canada, Saskatoon, SK; (3) CoLab R&D, div. AgCord inc., Granby, QC; (4) Université de Picardie Jules Verne, Amiens, France  
TUE NOV 02, 08:30 ORAL SUBMITTED: SYMBIONTS & VECTORS

**Feeding behavior of *Erythroneura* species (Cicadellidae), potential vectors of aster yellows on grapevine**  
Seven species of *Erythroneura* collected from vineyards in British Columbia, Ontario and Quebec were carriers of aster yellow phytoplasmas. The feeding behavior of *Erythroneura elegantula*, *E. vitis* and *E. ziczac* was investigated by electropenetography and histological studies. Although phytoplasmas have been typically described in phloem, we observed that these three *Erythroneura* spp. do not feed on this tissue, thereby questioning the ability of these species to serve as vectors of phytoplasmas on grapevine.

**Schotzko, K.G.** and B.S. Lindgren  
Ecosystem Science and Management Program, University of Northern British Columbia, Prince George, BC  
PRESIDENT'S PRIZE POSTER #40

**Effect of *Formica aserva* Forel (Hymenoptera: Formicidae) colonies on ground beetle (Coleoptera: Carabidae) assemblages in central British Columbia clearcuts**  
Ground beetles (Coleoptera: Carabidae) and ants (Hymenoptera: Formicidae) may occupy similar guilds, and potential interactions between foraging ants and ground beetles may influence interpretation of disturbance effects on ground beetle assemblages. We examined the effect of *Formica aserva* Forel on ground beetle assemblages in a recent clearcut east of Prince George, British Columbia. Areas with relatively high density of observed *F. aserva* nests were compared to areas with no observed *F. aserva* nests using Nordlander pitfall traps to assess the effect of *F. aserva* nest density on the activity abundance, diversity and community structure of ground beetles.

**Schwarzfeld, M.D.** and F.A.H. Sperling  
Department of Biological Sciences, University of Alberta, Edmonton, AB  
MON NOV 01, 16:15 ORAL PRESIDENT'S PRIZE: BIODIVERSITY & SYSTEMATICS

***Ophion* (Ichneumonidae) of western Canada: Molecules, morphology and species delimitation in a taxonomically challenging genus**  
*Ophion* is a genus of large nocturnal Ichneumonidae. Although common in most habitats and easily collected at lights, the Nearctic *Ophion* are almost unknown. Of the estimated 50 species, only 12 have been described. I am conducting a taxonomic study of Canadian *Ophion*, with an emphasis on western Canada. I am sequencing mitochondrial (COI) and nuclear (ITS2, CAD) regions. Morphological analysis includes characters used in other geographic regions, previously unexamined characters, and wing morphometrics. Preliminary results and implications of these analyses will be discussed.

**Schwarzfeld, M.D.** and F.A.H. Sperling  
Department of Biological Sciences, University of Alberta, Edmonton, AB  
PRESIDENT'S PRIZE POSTER #41

**The impact of forest harvesting on a boreal parasitoid (Hymenoptera: Ichneumonidae) community**  
I conducted this study at the EMEND research site, in northwestern Alberta. I collected ichneumonids from 4 harvesting treatments, 8 years post-harvest, to assess the impact of variable retention harvesting on the ichneumonid community. A total of 47,726 ichneumonids from 23 subfamilies were collected. Three subfamilies were further identified to species, with a total of 2336 specimens in 55 species. Species-richness was highest in clearcut sites, but did not differ among the other treatments. Four subfamilies and one species were significant indicators of the uncut stands.

**Scott, C.E.**, S. Vibert and G. Gries  
Simon Fraser University, Burnaby, BC  
TUE NOV 02, 13:45

ORAL SUBMITTED: CHEMICAL ECOLOGY

**Courtship behaviour and mating success in the black widow *Latrodectus hesperus***

In the western black widow spider sexual dimorphism is pronounced. Due to the larger size and aggressiveness of females, courtship can be costly for males. Using video recordings and laser Doppler vibrometry, we analyzed the complex sequence of courtship behaviours and the vibrations associated with them. We found that the female must enter a quiescent state before copulation ensues. We tested whether male size, the frequency and duration of particular behaviours such as “web reduction”, and the sequence of events are correlated with mating success and quiescence induction.

**Scott, J.L.** and J.E. Yack  
Carleton University, Ottawa, ON  
MON NOV 01, 09:45

ORAL PRESIDENT'S PRIZE: ACOUSTICS

**The evolution of ritualized vibration-mediated territoriality in caterpillars (Drepanidae)**

Our study focuses on evolution of vibration-mediated territorial signals in caterpillars (Drepanidae), where some species defend silken leaf shelters using ritualized vibratory displays. Vibration signals, territorial behaviours, and signal-producing structures were examined and mapped onto a molecular phylogeny created using three genes (CAD, ND1 and 28S). Our results support the hypothesis that ritualized acoustic signals, including anal scraping, mandible drumming and mandible scraping are derived from non-signaling aggressive behaviours including walking toward, hitting, pushing and biting an intruder. We also show that certain life-history characters have played a role in shaping the diversity of signals found in these caterpillars today.

**Scott-Dupree, C.** (1) and L. Morandin (2)  
(1) University of Guelph, Guelph, ON; (2) University of California, Berkeley, CA  
TUE NOV 02, 11:20

SYMPOSIUM 6: MARK WINSTON RETROSPECTIVE

**Mentoring and Supervision**  
(No Abstract Submitted)

**Scudder, G.G.E.**

Beaty Biodiversity Centre and Department of Zoology, University of British Columbia, Vancouver, BC  
TUE NOV 02, 08:05

SYMPOSIUM 4: INVERTEBRATE CONSERVATION

**Protecting British Columbia's endangered insects**

Although there are over 600 potentially rare and endangered insect species in the province, not all need legal listing. Even if this were deemed desirable, most would be found to be data deficient. Insect conservation efforts in British Columbia have lagged well behind the conservation initiatives for other endangered species in the biota. Because of limited choices and opportunities, future entomological efforts should be selective, and where possible, integrated with other conservation plans. Entomologists should concentrate on clearly endangered insect species that occupy specialized and unique habitats, not favoured by other endangered species. In particular, in selected communities, such as the Antelope-brush ecosystem, they should use legally listed endangered insects as umbrella taxa.

Shore, T. (1), S. Taylor (1) and **A. Stock** (2)  
(1) Canadian Forest Service, Victoria, BC; (2) British Columbia Ministry of Forests, Nelson, BC  
MON NOV 01, 04:30

SYMPOSIUM 2: TERRY SHORE MEMORIAL

**Possible elements of a Hazard Rating System for the Western Balsam Bark Beetle, *Dryocoetes confusus* Swaine**

Tree and site characteristics were compared between subalpine fir stands with and without western balsam bark beetle infestations. Significant differences in age, density, latitude, and slope were found between infested and uninfested stands. A discriminant function analysis model using slope, density, and age predicted 77% of the unattacked stands and 71% of the attacked stands correctly. The results suggest that site and stand characteristics may be useful for developing a susceptibility rating of subalpine fir stands to western balsam bark beetle attack.

**Shorthouse, J.D.**

Department of Biology, Laurentian University, Sudbury, ON

WED NOV 03, 08:40

SYMPOSIUM 9: ARTHROPODS OF CANADIAN GRASSLANDS (BIOLOGICAL SURVEY OF CANADA)

**Cynipid Galls of Prairie Wild Roses**

The 12 species of gall-inducing *Diplolepis* (Cynipidae, Hymenoptera) found on wild roses of Canada's prairie grasslands serve as ideal models for studying life history strategies, host specificity, dispersal, community ecology, and zoogeography. In contrast to most phytophages that feed externally, *Diplolepis* are internal feeders that control the development and physiology of attacked host organs, making them the most specialized arthropods found on the prairies. Numerous species of inquilines and parasitoids attack inducer larvae resulting in gall-specific component communities that provide clues to the evolution of complex insect assemblages.

**Simon, F** (1), L. Andreassen (2), T. Haye (1), N.J. Holliday (2), P.G. Mason (3) and U. Kuhlmann (1)

(1) CABI Europe - Switzerland, Delémont, Switzerland; (2) Department of Entomology, University of Manitoba, Winnipeg, MB; (3) Research Centre, Agriculture and Agri-Food Canada, Ottawa, ON

SUBMITTED POSTER #42

**Do *Aleochara bipustulata* (Coleoptera: Staphylinidae) larvae prefer *Delia radicum* (Diptera: Anthomyiidae) puparia over smaller host species?**

*Aleochara bipustulata* larvae can develop in puparia of some acalyprate Diptera species, but the adult beetles that emerge are relatively small, and so may incur a fitness penalty. Larvae of *A. bipustulata* were given a choice between *D. radicum* and *Piophilina casei* puparia buried in sand in a Petri dish arena. The effects on larval choice of distance between candidate hosts and of relative densities of host species were evaluated, and the consequences for fitness will be discussed.

**Sivalinghem, S.** (1), M.L. Reid (2) and J.E. Yack (1)

(1) Department of Biology, Carleton University, Ottawa, Ontario; (2) Department of Biological Sciences, University of Calgary, Calgary, AB

MON NOV 01, 10:30

ORAL PRESIDENT'S PRIZE: ACOUSTICS

**Acoustic communication of the bark beetle, *Ips pini* (Coleoptera: Scolytinae)**

Bark beetles produce acoustic signals during stress, mating and aggressive contexts, but nothing is known about signal reception and processing. To better understand receptive mechanisms, it is essential to first understand the characteristics and transmission properties of the signals. In this study, we used pine engravers, *Ips pini*, and recorded their acoustic signals, and described their temporal and spectral characteristics. Our study demonstrates that bark beetles produce both air and substrate-borne vibrations, and air-borne vibrations contain substantive ultrasonic frequency components. Our study provides insights into the complexity and functional significance of acoustic communication in bark beetles, and possible sensory mechanisms.

Smith M.A.H. (1), **P.A. MacKay** (2) and R.J. Lamb (1)

(1) Cereal Research Centre, Agriculture and Agri-Food Canada, Winnipeg, MB; (2) Department of Entomology, University of Manitoba, Winnipeg, MB

WED NOV 03, 09:00

ORAL SUBMITTED: AGRICULTURE

**Temperature modulation of photoperiodism and the timing of late-season changes in life history for the pea aphid, *Acyrtosiphon pisum***

The role of day-length and temperature in initiating the seasonal change from parthenogenetic to sexual reproduction by pea aphid was investigated to determine selection pressures affecting timing. Over four seasons, a clone was sampled from field cages throughout late summer in southern Manitoba, Canada, and laboratory-reared to determine the phenotypes of progeny produced as the season progressed. Males and mating females appeared later when August was warm than when it was cool. The timing of seasonal changes was adapted to minimize physiological time to the end of the season, which maximized the number of asexual summer generations.

**Somjee, U.** (1), K. Ablard (1), B. Crespi (1), P.W. Schaefer (2) and G. Gries (1)

(1) Department of Biological Sciences, Simon Fraser University, Burnaby, BC; (2) United States Department of Agriculture, Agricultural Research Service, Beneficial Insects Introduction Research Laboratory, Newark, DE

MON NOV 01, 16:15

ORAL PRESIDENT'S PRIZE: BEHAVIOUR

**Local mate competition in the solitary parasitoid wasp *Ooencyrtus kuvanae***

As predicted by the local mate competition theory, with increasing numbers of *Ooencyrtus kuvanae* foundresses on a gypsy moth host egg mass, the proportions of emerging sons increased. In contrast, the presence of a sibling or a non-sibling female during oviposition did not affect the sex ratio of offspring produced. The *O. kuvanae* system differs from others in that wasp larvae do not compete for local resources and thus do not distort the sex ratio. Thus, the sex ratio of emergent son and daughter wasps is due entirely to the sex allocation by ovipositing wasp foundresses on host egg masses.

**Soroka, J.J.** and L.F. Grenkow

Agriculture and Agri-Food Canada, Saskatoon Research Centre, Saskatoon, SK

SUBMITTED POSTER #43

**Effects of previous crop stubble type on canola injury by root maggots**

Because in-crop control of root maggots (*Delia* spp., Agromyzidae) currently is unavailable in Canadian canola production, if certain stubble types caused canola to suffer less damage from root maggots, producers in areas of high risk of maggot damage could use selective crop rotation as a method of decreasing root maggot injury. This study investigated damage levels of root maggots to roots of *Brassica rapa* and *B. napus* plants seeded into wheat, pea, and canola stubble, and into fallow land, with unexpected results.

**Srivastava, D.**

University of British Columbia, Vancouver, BC

TUE NOV 02, 10:55

SYMPOSIUM 5: INSECT COMMUNITY ECOLOGY

**Composition of bromeliad-insect food webs affects cross-ecosystem interactions**

Ecosystems may affect each other through trophic interactions or the transfer of subsidies. We examined effects of two spider species on aquatic invertebrates and ecosystem processes within water-filled bromeliads. One spider species reduced oviposition by terrestrial adults with aquatic larval stages, but indirectly facilitated some invertebrates with entirely aquatic lifecycles. This compensation between non-insect and insect invertebrates prevented cross-ecosystem effects of spiders on decomposition. The other spider species directly contributed allochthonous nitrogen to bromeliads from prey capture. Thus the composition of both terrestrial and aquatic food webs may affect the strength of cross-ecosystem interactions.

**Stanton, D.** (1,2), L. Dossall (1) and R.C. Yang (1,3)

(1) University of Alberta, Edmonton, AB; (2) Pioneer Hi-Bred Production Ltd. Edmonton, AB; (3) Alberta agriculture food and rural development, Edmonton, AB

PRESIDENT'S PRIZE POSTER #44

**Associational resistance in a mixed refuge application for management of root maggot (*Delia* spp.) (Diptera: Anthomyiidae) in *Brassica napus***

Management of *Delia* spp. (Diptera: Anthomyiidae) in western Canada using resistant *Brassica napus* could increase yields. Mixed refuge field experiments examining associational resistance and host selection within stands were conducted in 2010. Experiments utilized resistant *B. napus* derived from interspecific crosses with *Sinapis alba* identified in previous studies. Effect of relative mixtures on larval infestation and root damage were determined. Host selection within mixed stands was examined to determine effectiveness of mixed refuge as a resistance management tool. Concurrent experiments examining the effects of mixed refuge in canola hybrid production in prairie wide yield trials will determine the agronomic implications of mixed refuge applications to canola.

**Steensma, K.** (1), P. Lilley (2) and H. Zandberg (2).

(1) Environmental Studies Program, Trinity Western University, Langley, BC; (2) A Rocha Canada, Surrey, BC  
TUE NOV 02, 08:20

SYMPOSIUM 4: INVERTEBRATE CONSERVATION

**Life History and Habitat Requirements for Oregon Forest snail, *Allogona townsendiana*, implications for habitat protection and management**

Density, reproduction, and habitats were assessed in a population of the endangered Oregon forestsnail, *Allogona townsendiana*, over four years. Snail density ranged from 0.4-1.9/m<sup>2</sup> in optimal habitat. Mating peaked in March-April; pairs of snails mated in proximity to woody debris and stinging nettle, *Urtica dioica*. Nesting peaked in April-May, resulting in clutch sizes of 34 eggs. Hatching occurred 63 days after oviposition; by one month most juveniles dispersed from nests. Snails tracked with harmonic radar aestivated in late summer and hibernated within leaf litter and soil in winter. A typical life span of at least five years was estimated.

**Stephens, A.E.A.** and J.H. Myers

Department of Zoology and Biodiversity Research Centre, University of British Columbia, Vancouver, BC

MON NOV 01, 14:15

ORAL PRESIDENT'S PRIZE: BIOLOGICAL CONTROL

**Early season feeding by *Larinus minutus*: influence on the next generation and its competitor**

*Larinus minutus* and *Urophora affinis* are biological control agents of diffuse knapweed *Centaurea diffusa*. Both species occur as larvae in the seed-heads of diffuse knapweed and as such compete directly for this resource. However, *L. minutus* also feeds on the stems and leaves on the knapweed plant prior to laying eggs in the seed-heads. This feeding damage has the potential to affect the species which occur later in the seed-head and thus the interactions between the seed-head species. The early feeding damage by *L. minutus* may also alter the level of damage that the larvae inflict

**Stephens, A.E.A.** and J.H. Myers

Department of Zoology and Biodiversity Research Centre, University of British Columbia, Vancouver, BC

PRESIDENT'S PRIZE POSTER #45

**Patterns of damage by multiple biological control agents on weeds**

In weed biocontrol, multiple agents are often introduced to control a target weed. While we tend to assume that damage will be additive (damage occurring when two agents are on a plant can be predicted from the damage done by both agents occurring alone), this may not always be the case. We reviewed the literature to determine how common non-additive patterns are and whether their occurrence can be predicted. Optimal for biocontrol are combinations of species that cause greater than additive damage to plants and predicting these combinations could increase the efficiency of agent introductions

**Strohm, S.** (1), M.L. Reid (2) and R.C. Tyson (1)

(1) University of British Columbia Okanagan, Kelowna, BC; (2) University of Calgary, Calgary, AB

MON NOV 01, 09:45

ORAL PRESIDENT'S PRIZE: FORESTRY

**Modelling the spread and management of mountain pine beetle in Banff National Park**

While millions of dollars have been spent managing the current Mountain Pine Beetle (MPB) outbreak in BC and Alberta, the effectiveness of management has had limited evaluation. Banff National Park has engaged in MPB management activities in part of its landscape since 1998, and previous analysis of the data yielded mixed conclusions on the effectiveness of Banff's removal of individual infested trees. We present a mathematical model for beetle spread in heterogeneous landscapes that can be used to determine the relative importance of MPB production and dispersal for population growth and spread, and to assess the effectiveness of management approaches.



**Suthisut, D.** (1,2), P. Fields (1) and A. Chandrapatya (2)

(1) Cereal Research Centre, Agriculture & Agri-Food Canada, Winnipeg, MB; (2) Department of Entomology, Faculty of Agriculture, Kasetsart University, Bangkok, Thailand

MON NOV 01, 11:30

ORAL PRESIDENT'S PRIZE: AGRICULTURE

**Fumigation toxicity of essential oils from three Thai plants against a two stored-product insects and a parasitoid**

Fumigation toxicity of essential oils from three rhizomes *Alpinia conchigera*, *Zingiber zerumbet*, *Curcuma* sp. and their constituents, camphene, camphor, 1-8 cineole,  $\alpha$ -hemulene, isoborneol,  $\alpha$ -pinene,  $\beta$ -pinene and terpinen-4-ol were tested against eggs, larvae pupae and adults of *Sitophilus zeamais* and *Tribolium castaneum*. Essential oils from *A. conchigera* were toxic, the other plants were not. Eggs and pupae were the most resistant stages. Terpinen-4-ol and 1-8 cineole were most toxic of the pure compounds. The parasitoid, *A. calandrae* was more sensitive than its host.

**Sweeney, J.** (1), P. Silk (1), L. Flaherty (1,2), D. Pureswaran (3), J.M. Gutowski (4) and J.E. Hurley (1)

(1) Natural Resources Canada, Canadian Forest Service-Atlantic Forestry Centre, Fredericton, NB; (2) Faculty of Forestry and Environmental Management, University of New Brunswick, Fredericton, NB; (3) Natural Resources Canada, Canadian Forest Service-Laurentian Forestry Centre, Sainte-Foy, QC; (4) European Centre for Natural Forests, Forest Research Institute, Białowieża, Poland.

WED NOV 03, 10:30

SYMPOSIUM 8: DEALING WITH INVASIVE PESTS

**Case history of an invasive forest insect: the brown spruce longhorn beetle, *Tetropium fuscum* (F.), in Nova Scotia**

The brown spruce longhorn beetle, *Tetropium fuscum* (F.) (Coleoptera: Cerambycidae) has been established in Nova Scotia since at least 1990 but was not discovered until 1999 when large numbers of dying red spruce were observed in Point Pleasant Park, Halifax. It has since been detected in nine counties in Nova Scotia. I will present a brief history of the infestation from eradication attempts to current efforts to slow its spread, highlight results of research that have been applied in operational survey and regulatory programs, and present data from recent studies testing pheromone-based tactics for population suppression.

**Sweeney, J.D.**, P.J. Silk, J.E. Hurley and W. MacKay

Natural Resources Canada, Canadian Forest Service, Fredericton, NB

SUBMITTED POSTER #46

**Pheromone-based population suppression of the invasive longhorn beetle, *Tetropium fuscum* (F.)**

Fuscumol, the sex/aggregation pheromone of the brown spruce longhorn beetle, *Tetropium fuscum* (F.), was formulated at 10% concentration in Hercon bioflakes® and applied twice at a rate of 2.75 kg/ha to 4 ha plots in mature red spruce forest to test its efficacy at population suppression by mating disruption. Mean catch in pheromone-baited traps was not affected but treated plots had significant reductions in the percentage of mated females, percentage of bait logs infested, and mean density of *T. fuscum* larvae per m<sup>2</sup> in bait logs compared to untreated plots. Trials are being repeated in 2010 to confirm efficacy.

**Tabacaru, C.A.** (1), J. Park (2) and N. Erbilgin (1)

(1) University of Alberta, Edmonton, AB; (2) Parks Canada

PRESIDENT'S PRIZE POSTER #47

**Playing with fire: effects of prescribed burns on mountain pine beetle populations**

Prescribed fires are used in Alberta to remove lodgepole pine as potential hosts of mountain pine beetles (MPB), but partly burned, yet live—and therefore stressed—trees may be more susceptible to attack. We investigate how prescribed fires influence MPB across a landscape, whether burned stands are sinks or sources, and the explanations available for these responses. Preliminary results, reflecting the flight period immediately after summer fires, indicate that moderately burned trees are attacked more frequently and more intensively than lightly burned and unburned trees.

**Tansey, J.A.** and L.M. Dosdall

University of Alberta, Dept. of Agricultural, Food and Nutritional Science, Edmonton, AB

TUE NOV 02, 14:00

ORAL SUBMITTED: AGRICULTURE

**Evaluation of *Delia radicum*-resistant canola germplasm**

The cabbage root maggot (CRM), *Delia radicum* L. (Diptera: Anthomyiidae) is a serious pest of canola in Canada. Canola (primarily *Brassica napus*) is susceptible to this insect. *Sinapis alba* is resistant and a potential source of resistance to CRM in canola germplasm derived from intergeneric crosses. Results indicate differences in the olfactory responses of CRM among, and levels of antixenosis and antibiosis resistance to CRM expressed by some *S. alba* x *B. napus* lines.

**Taylor, O.**

University of Kansas, Lawrence, Kansas, USA

TUE NOV 02, 08:40

SYMPOSIUM 6: MARK WINSTON RETROSPECTIVE

**The early years**

(No Abstract Submitted)

**Teasdale, C.** (1), S. Takács (1), G. Judd (2) and G. Gries (1)

(1) Simon Fraser University, Burnaby, BC; (2) Pacific Agri-food Research Centre, Summerland, BC

MON NOV 01, 10:45

ORAL PRESIDENT'S PRIZE: ACOUSTICS

**Does sound play a role in the sexual communication of the Raspberry Crown Borer (Lepidoptera: Sesiidae)**

Many insects use multi-modal signals for sexual communication. In the Lepidoptera, female-produced sex pheromones play a key role in long-distance attraction of males, but at close range acoustic signals are more effective than pheromones in guiding mate-seeking males to the microlocation of a "calling" female. This may explain why pheromone-emitting females of the Raspberry Crown Borer (RCB), *Pennisetia marginata* (Lepidoptera: Sesiidae), wing fan and produce distinct humming sounds. Wing fanning sounds were recorded in the laboratory, and characterized. The behavioural response of male RCB to played-back female wing fanning sound was tested in field experiments during RCB flight in August.

**Thielman, A.** and F.F. Hunter

Department of Biological Sciences, Brock University, St. Catharines, ON

TUE NOV 02, 09:00

SYMPOSIUM 3: GRAD STUDENT SYMPOSIUM

**Investigation of cryptic species status within *Anopheles* (Diptera: Culicidae) species in Canada using a multidisciplinary approach**

*Anopheles* mosquitoes are common throughout North America, knowledge of anopheline species in Canada is limited primarily to morphological data collected during the 1970s. Current *Anopheles* research in malaria-endemic regions has revealed that many "species" are complexes of isomorphic species distinguishable based on other types of data, such as polytene chromosome and DNA sequence data. Members of species complexes often differ in behavioural and/or ecological traits, such as host feeding preference and/or larval habitat preference, which can affect their ability to transmit disease. The objective of my research was to investigate the cryptic species status of *Anopheles* mosquitoes in Canada using a multidisciplinary approach. Specimens were collected from across Canada and examined using morphological, molecular, and ecological data. Minor morphological characteristics of eggs, larvae and adults were studied and suggested that cryptic species may occur in Canada. The sequences of ribosomal (ITS1 and ITS2) and mitochondrial (COI) DNA were analyzed and the levels of inter- and intraspecific variation measured. ITS2 lengths ranged from 375 to 422bp, except *Anopheles earlei*, whose ITS2 fragment was ~800bp. Intraspecific variation within ITS2 was negligible, but high levels of intraspecific variation within ITS1 were observed. ITS1 sequences were much larger, ranging from 600 to 4000bp. An 806bp fragment of the COI gene was also examined. In addition, ecological data recorded during specimen collection was analysed to determine larval habitat preferences. The results of these studies and a discussion of the cryptic species status of *Anopheles* mosquitoes in Canada will be presented.

**Timlick, B.** (1), N.D.G. White (2), P. Fields (2), C. Demianyk (2) and D. Jayas (3)

(1) Canadian Grain Commission, Winnipeg, MB; (2) Agriculture and Agri-Food Canada, Cereal Research Centre, Winnipeg, MB; (3) Department of Biosystems Engineering, University of Manitoba, Winnipeg, MB

WED NOV 03, 09:20

SYMPOSIUM 9: ARTHROPODS OF CANADIAN GRASSLANDS (BIOLOGICAL SURVEY OF CANADA)

**Arthropods of Stored Cereals, Oilseeds and their Products in Canada: Artificial Ecosystems on Grasslands**

Stored bulk grains are immature ecosystems that serve as a primary resource to many insects, mites and microflora species. Western Canada produces over 80 million tonnes of grains that are initially stored on farm for various durations throughout the year. Like other arthropods, development in stored products is governed by temperature and moisture, which in the case of stored grains can be controlled in order to mitigate damage from pests and maintain quality. Past and current storage practices and how abiotic forces interact with them are reviewed to demonstrate how arthropods survive in stored grains. Some of the arthropods associated with stored grains are reviewed with discussion on evolution of the species complex.

Tsui, C.K.M. (1), A.D. Roe (2), Y.A. El-Kassaby (1), A.V. Rice (2), S.M. Alamouti (3), F.A.H. Sperling (2), J.E.K. Cooke (2), J. Bohlmann (1,4), C. Breuil (3) and **R.C. Hamelin** (1,5)

(1) Department of Forest Sciences, University of British Columbia, Vancouver, BC; (2) Department of Biology, University of Alberta, Edmonton, AB; (3) Department of Wood Science, University of British Columbia, Vancouver, BC; (4) Michael Smith Laboratory, University of British Columbia, Vancouver, BC; (5) Natural Resources Canada, Laurentian Forestry Centre, Quebec, QC

WED NOV 03, 09:30

SYMPOSIUM 7: MOUNTAIN PINE BEETLE SYSTEM GENOMICS

**Population structure and migration pattern of the mountain pine beetles fungal associate *Grosmannia clavigera***

We investigated the population structure of the fungus *Grosmannia clavigera* (Gc), using 8 microsatellite markers in 335 individuals from 19 populations in western North America. Our objective is to assess population structure in this important fungal symbiont of the mountain pine beetle and determine if we can assess migration patterns. High haplotype diversity was found, with over 250 unique haplotypes from 335 individuals. The observed clonal lineages were rare, showing the fungus reproduces sexually. Within-population difference among individuals accounted for 85.8% of genetic variations. Bayesian analyses identified four genetic clusters, corresponding to major geographic regions. The reduced genetic diversity in fungal populations in north-western BC cluster may be subject to genetic drift due to population crash. The general agreement in apparent north-south differentiation of MPB and *G. clavigera* populations seemed to confirm their symbiotic relationships. Two genetic clusters located North and West of the Rockies consisted of many individuals admixed from all populations. In addition, the patterns of diversity and the individual assignment test in the fungal associate suggests that the migration across the Rocky Mountains occurred via a northeastern corridor, concordant with predictions from meteorological and MPB movement data. Understanding the pathogen's population structure, in association with its beetle symbiont, provided insights into the population structure of the epidemic fungus and the patterns of spread, as well as methods for disease monitoring.

**Tyson, R.C.** (1), J.B. Wilson (1) and W.D. Lane (2)

(1) University of British Columbia Okanagan, Kelowna, BC; (2) Pacific Agri-Food Research Centre, Summerland, BC

WED NOV 03, 09:45

ORAL SUBMITTED: AGRICULTURE

**A diffusion-based model to predict transgenic seed contamination in bee-pollinated crops**

The adventitious presence of transgenic seed in conventional crops is a pressing issue. While outcrossing levels have been described in wind-pollinated, or both wind- and insect-pollinated crops, much less is known about pollen dispersal in exclusively insect-pollinated crops. We report experimental work on apple pollen, and use this data to develop a mathematical model for honeybee-mediated pollen dispersal and subsequent transgenic seed distribution. The model is used to predict the percent transgenic seed in neighbouring conventional trees. The model may be useful for determining distributions on transgenic seed plantings needed to allow for an adventitious presence of, for example, 0.9%.

**Uetz, G.W.**

University of Cincinnati, Cincinnati, OH, USA

MON NOV 01, 11:00

SYMPOSIUM 1: ARACHNOLOGY

**Multimodal signaling behavior of wolf spiders (Lycosidae) in a complex environment**

I review research on the effect of environmental complexity on signal production/transmission and receiver responses of *Schizocosa ocreata* wolf spiders in complex forest floor habitats. Males court females using multimodal (visual and seismic) signals containing information useful in mate choice by females. Substrate, light level, and reflectance spectrum differentially affect transmission and detection of individual signal modes, and as a consequence, signal active space varies with modality. Signalling by courting males may be perceived by "eavesdropping" competitors or predators as well as by receptive females. Multimodal signalling behavior may therefore be subject to multiple opposing selective forces.

**Vafaie, E.V.** (1,2), S.M. Fitzpatrick (1) and J.S. Cory (2)

(1) Agriculture and Agri-Food Canada, Pacific Agri-Food Research Centre, Agassiz, BC; (2) Simon Fraser University, Department of Biological Sciences; BC

MON NOV 01, 09:00

ORAL PRESIDENT'S PRIZE: AGRICULTURE

**Can we use green peach aphids to augment parasitoids to manage aphids on highbush blueberries in BC?**

*Praon unicum*, the earliest emerging and most abundant parasitoid of the common highbush blueberry aphid, *Ericaphis fimbriata*, is being studied for use in a mass rearing and release program for aphid population management. The possibility of using an alternative host, the green peach aphid (*Myzus persicae*) reared on pepper plants to rear *P. unicum* is being investigated. Data will be presented on the effect of host aphid on true fecundity of *P. unicum* on *E. fimbriata*, realized fecundity data, as well as field observations of aphid mummies.

**Van Haga, A.**(1,2), B.A. Keddie (2) and S.F. Pernal (1)

(1) Agriculture and Agri-food Canada, Beaverlodge Research Farm, Beaverlodge, AB; (2) Department of Biology, University of Alberta, Edmonton, AB

MON NOV 01, 16:15

ORAL PRESIDENT'S PRIZE: POLLINATION

**The pathology of chalkbrood disease in honey bee colonies**

Chalkbrood is an economically important disease of honey bee larvae (*Apis mellifera* L.) caused by the spore-forming heterothallic fungus *Ascosphaera apis* (Maassen ex Claussen) Olive and Spiltoir. The characteristic chalk-like larval cadavers (mummies) produced can be black or white. Diseased larvae are white if a single strain is more successful in colonizing a larva and remains unmated or if mated, do not produce black fruiting bodies before the cadaver hardens. In artificially infected package colonies twice as many black mummies than white mummies were produced. Once uncapped, worker bees removed black mummies faster than white mummies from the brood cell.

**van Herk, W.** (1), Bob Vernon (1) and Ted Labun (2)

(1) Agriculture and AgriFood Canada, Pacific AgriFood Research Centre, Agassiz, BC; (2) Syngenta Crop Protection Canada Inc., Calgary, ON

WED NOV 03, 09:30

ORAL SUBMITTED: AGRICULTURE

**Who's eating our wheat? Surprising results from a national wireworm survey in Canada**

Despite a century of research, relatively little is known about the species of wireworm (Coleoptera: Elateridae) attacking crops in Canada. As different wireworm species have different ecologies, behaviours, and responses to insecticides, knowledge of the species encountered in the field is considered essential to effective management. Results from a first ever, national wireworm survey, conducted between 2007 and 2010, explains why farmers are often not aware of wireworm infestations in their fields and reveals just how little we know about the wireworm species attacking crops in Canada.

**van Westendorp, P.**

BC Ministry of Agriculture, Abbotsford, BC

TUE NOV 02, 10:30

SYMPOSIUM 6: MARK WINSTON RETROSPECTIVE

**Contributions to Beekeeping**

(No Abstract Submitted)

**Veilleux, J.** and N.J. Holliday

Department of Entomology, University of Manitoba, Winnipeg, MB  
MON NOV 01, 11:15

ORAL PRESIDENT'S PRIZE: FORESTRY

**Bionomics of the banded elm bark beetle, *Scolytus schevyrewi*, in Saskatchewan and Manitoba**

The arrival of *Scolytus schevyrewi* in the Canadian Prairies poses challenges for Dutch elm disease management: its hosts include American elm and it can carry spores of *Ophiostoma novo-ulmi*. In 2009, *S. schevyrewi* adults were collected on baited sticky traps between June and the end of September, with peak catches in early September. In Siberian elm trap logs, eggs successfully developed into adults and overwintering larvae survived prairie winter conditions and emerged as adults in the spring.

**Vernon, B.** and W. van Herk

Agriculture and Agri-Food Canada, Pacific Agri-Food Research Centre, Agassiz, BC  
WED NOV 03, 08:15

ORAL SUBMITTED: AGRICULTURE

**Wireworm control: The higher the population, the lower the amount of insecticide needed to kill them**

The management of various wireworm species in various agricultural crops has traditionally involved the use of organochlorine, organophosphate and carbamate insecticides applied to soil or seed. Many of these insecticides are now obsolete worldwide, or soon will be, and wireworms and damage are reported to be on the rise globally. Some modern-day insecticides will manage damage by wireworms on various crops, but do so through long term intoxication (neonicotinoids) or repulsion (pyrethroids), and populations are not generally reduced. This paper describes a number of newly developed approaches to managing crop damage and eliminating wireworm populations with minute amounts of insecticide per hectare.

**Vibert, S.** and G. Gries

Gries lab, Simon Fraser University, Burnaby, BC  
MON NOV 01, 11:00

ORAL PRESIDENT'S PRIZE: ACOUSTICS

**A meal or a male? A comparison of male and prey vibrations in black widows and hobo spiders**

Spiders build webs to capture prey but also use them as a communication medium during courtship. Courting males must advertise their presence to the female without being mistaken for prey. Using laser Doppler vibrometry we characterized vibrations produced by struggling prey and courting males on the webs of the hobo spider *Tegenaria agrestis*, and the black widow *Latrodectus hesperus*. We compared the two types of vibrations both within and between species. Our results show that prey and male vibrations differ in black widows but not hobo spiders.

**Vickers, P.M.** (1), L.A. Bittner (1) and D.T. Lowery (2)

(1) Agriculture and Agri-Food Canada Southern Crop Protection and Food Research Centre, Vineland, ON; (2) Agriculture and Agri-Food Canada Pacific Agriculture Research Centre, Summerland, BC  
SUBMITTED POSTER #48

**Aphid transmission of the Ontario isolate of plum pox virus**

In Ontario, plum pox virus (PPV) is vectored from plum, peach, or dwarf flowering almond, to peach seedlings by the spirea aphid, *Aphis spireaecola* (Patch), and the green peach aphid, *Myzus persicae* (Sulzer). Virus transmission rates varied significantly depending on the species of the virus source plant and the healthy test plant. Acquisition of PPV by *M. persicae* from infected peach fruit was greatly reduced compared with acquisition from leaves. Results of this research indicate that the Ontario isolate of PPV-D appears to be well adapted to peach.

**Vincent, C.**

Centre de Recherche et de Développement en Horticulture, Agriculture et agro-alimentaire Canada, Saint-Jean-sur-Richelieu, QC

SUN OCT 31, 13:30

GOLD MEDAL ADDRESS

**My professional alphabet, seasoned with personal remarks**

Since my graduation from McGill University in 1983, the job market, including entomology, has considerably changed. For the benefit of my colleagues, my presentation will address several important elements related to work, as I experienced them during my career. These elements, related to the philosophy and methods of work, as well as the balance between professional and personal life, transcend entomology. The lessons learned should appeal to a large public. The elements will be treated alphabetically according to keywords, either in French or English.

**Mon alphabet professionnel, assaisonné de remarques personnelles**

Depuis ma graduation de l'Université McGill en 1983, le marché du travail, ce qui inclut l'entomologie, a grandement changé. Pour le bénéfice de mes collègues, ma présentation traitera de plusieurs éléments importants reliés au travail, tels que je les ai vécus lors de ma carrière. Ces éléments, qui ont trait à la philosophie et aux méthodes de travail, de même qu'à l'équilibre entre la vie professionnelle et la vie privée, transcendent le domaine de l'entomologie. Les leçons qui en découlent devraient être utiles à un large public. Les éléments seront abordés alphabétiquement selon des mots clés, soit en français, soit en anglais.

**Waliwitiya, R., R. Nicholson and C. Lowenberger**

Department of Biological Sciences, Simon Fraser University, Burnaby, BC

TUE NOV 02, 13:15

ORAL SUBMITTED: CHEMICAL ECOLOGY

**Effects of plant derived compounds and other neuroactive chemicals on flight motor activity and wing beat frequency in the blowfly *Phaenicia sericata***

We evaluated the effects of 15 plant terpenoids and 10 other known neuroactive compounds on the flight muscle impulses (FMI) and wing beat frequencies (WBF) of tethered blowflies (*Phaenicia sericata*). The comparison of electrophysiological responses to novel compounds with known insecticides allows us to assign a putative mode of action to unknown compounds which then can be confirmed biochemically, reducing the time required to confirm the modes of action of novel insecticides. This approach can then be carried over to studies involving other insects or environments (aquatic vs terrestrial) to predict the usefulness of new compounds as novel insecticides.

**Walter, D.E.**

Royal Alberta Museum, Edmonton, AB

TUE NOV 02, 11:00

ORAL SUBMITTED: CLIMATE & ECOLOGY

**Rediscovering a lost mite: barcodes & biodiversity surveys**

The Alberta Biodiversity Monitoring Institute is a bold attempt to survey the Province of Alberta on a 20 km grid (1656 sites) for a several taxa including oribatid mites (Acari: Oribatida), a group used to estimate the integrity of soil systems. We use traditional morphological identification and the barcode region of the *cox1* gene to evaluate variability and as a quality control technique. I present results on the geographical and within site variation in bisexual and parthenogenetic species and on the use of the *cox1* gene and morphology to rediscover a previously unidentifiable species with a lost type.

**Wanner, K.W., P. Bunger and J. Allen**

Montana State University, Department of Plant Sciences, Bozeman, MT, USA.

TUE NOV 02, 13:30

ORAL SUBMITTED: CHEMICAL ECOLOGY

**Sex pheromone receptor evolution in moth genus *Ostrinia***

Research during the last decade has resulted in exceptional progress towards understanding the molecular mechanisms of insect olfaction, including identifying the first moth sex pheromone receptors from the silkworm *Bombyx mori*. This progress has provided the basis to study the evolution of sex pheromone detection among closely related species, such as moths in the genus *Ostrinia* that have been used as a model. We have identified and characterized six sex pheromone receptor genes from the European and Asian corn borers. Patterns of pheromone receptor gene evolution in the Lepidoptera will be discussed.

**Whitehouse, C.** (1), W. Strong (2) and M. Evenden (1)

(1) Department of Biological Sciences, University of Alberta, Edmonton, AB; (2) British Columbia Ministry of Forests, Kalamalka Forestry Centre, Vernon, BC

MON NOV 01, 11:45

ORAL PRESIDENT'S PRIZE: FORESTRY

**Trade-offs between longevity and reproduction in *Dioryctria abietivorella* Grote (Lepidoptera: Pyralidae)**

*Dioryctria abietivorella* is a long-lived moth that mates multiple times and the females produce eggs throughout adulthood. We assessed the importance of adult weight, wing area, mating status and, for females, fecundity in predicting lifespan. We measured the lifespan of virgin and mated male and female *D. abietivorella* and the fecundity of virgin and mated females. Virgin moths live longer than mated moths, while mated females have greater potential lifetime fecundity than virgins. There is a trade-off between longevity and reproduction in this species in which larval-derived resources are directed to reproduction that results in a shortened adult lifespan.

**Williams, G.** (1,2), D. Tarpay (3), D. vanEngelsdorp (4), M.-P. Chauzat (5), D. Cox-Foster (4), K. Delaplane (6), P. Neumann (7,8), J. Pettis (9), R. Rogers (10) and D. Shutler (2)

(1) Department of Biology, Dalhousie University, Halifax, NS; (2) Department of Biology, Acadia University, Wolfville, NS; (3) Department of Entomology, North Carolina State University, Raleigh, NC, USA; (4) Department of Entomology, The Pennsylvania State University, University Park, PA, USA; (5) French Food Safety Agency (AFSSA), Sophia-Antipolis, France; (6) Department of Entomology, University of Georgia, Athens, GA, USA; (7) Swiss Bee Research Centre, Agroscope Liebefeld-Posieux Research Station ALP, Bern, Switzerland; (8) Department of Zoology and Entomology, Rhodes University, Grahamstown, South Africa; (9) United States Department of Agriculture – Agricultural Research Service, Beltsville, MD, USA; (10) Ecotoxicology, Bayer CropScience, Research Triangle Park, NC, USA

MON NOV 01, 16:30

ORAL PRESIDENT'S PRIZE: POLLINATION

**Colony Collapse Disorder in context**

Recent large-scale die-offs of western honey bees (*Apis mellifera*) around the world are of extreme concern because of humanity's increasing reliance on pollinator-dependent crops. Although declines in honey bee populations have occurred in the past, the magnitude and speed of these recent declines are unprecedented. Often in the media, and sometimes in the scientific literature, these losses are inappropriately attributed to "Colony Collapse Disorder" or CCD, which is characterized by a rapid disappearance of adult bees from colonies containing brood and food stores but lacking damaging levels of parasitic *Varroa destructor* mites or *Nosema microsporidians*. Here, we tell the truth.

**Wilson, J.B.** (1), R.C. Tyson (1) and W.D. Lane (2)

(1) University of British Columbia Okanagan, Kelowna, BC; (2) Pacific Agri-Food Research Centre, Summerland, BC

MON NOV 01, 16:45

ORAL PRESIDENT'S PRIZE: POLLINATION

**Conservation of wild bee populations: Modelling wild and domestic bee distributions in agricultural landscapes**

Honeybee pollination services are directly responsible for as much as 1/3 of North American foods, but honeybee population survival is under threat. In some regions, wild bee populations may occur in sufficient densities to provide the necessary pollination services. Little is known however, about the spatial distribution of wild bee populations, or the effects of habitat fragmentation, size of crop area, and competition with honeybees. We present a mathematical model for bee movement in wild and cultivated landscape, and use the model to investigate the distribution of the wild and domestic bee populations. Implications for wild bee conservation are discussed.

**Winston, M.**

Centre for Dialogue, Simon Fraser University, Harbour Centre, Vancouver, BC

SUN OCT 31, 16:00

PLENARY SYMPOSIUM

**Writing in bee time: communicating science to the public**

Scientists communicate most effectively when we address our passionately felt beliefs about the myriad issues that science raises for the human condition and spirit. Good public writing takes place at the intersection of the deeply personal and the profoundly incomprehensible questions: Who are we, why are we here, what ethical boundaries should define and limit our activities, where do our responsibilities lie? I'll be reading from various writings about bees to illustrate a range of communication styles and content that enter the realm beyond data.

**Wojin, M.J.** (1), D.R. Gillespie (2), T. Haye (3) and B.R. Roitberg (1)

(1) Simon Fraser University, Evolution and Behavioural Ecology Research Group, Biological Sciences, Burnaby, BC; (2) Agriculture & Agri-Food Canada, Pacific Agri-Food Research Centre, Agassiz, BC; (3) CABI Europe Switzerland, CH-2800 Delemont, Switzerland

TUE NOV 02, 08:30

SYMPOSIUM 3: GRAD STUDENT SYMPOSIUM

**Intra- and interspecific competition between parasitoids of the cabbage seedpod weevil: Effects on sex ratios and consequences for biological control**

In any classical biological control programme, it is important to not only to assess potential non-target effects, but also to have an in-depth knowledge of the ecosystem. Intra-guild competition can have unpredictable effects, potentially disrupting biological control of the pest in question. *Trichomalus perfectus* and *Mesopolobus morys* are the two main European parasitoids of the cabbage seedpod weevil. Both are candidates for introduction as classical biological control agents in Canada. In order to determine the ideal biological control community for this system, we examined the effects of intra- and interspecific parasitoid competition in field and laboratory experiments. We found no increase in host suppression with more than one species present, suggesting that a multiple-species introduction would not be more effective at controlling pest populations than a single-species introduction. Although neither species is superior in its competitive ability or host suppression efficacy, there were some notable trends in the outcomes of competition. In particular, *T. perfectus* produced a female-biased offspring sex ratio in response to increasing intraspecific competition. This result is contrary to the sex ratio predicted by local mate competition theory, and may be due to both maternal behaviour and differential larval mortality of the sexes. We use a theoretical approach to explore how this shift might affect biological control of the cabbage seedpod weevil, incorporating potential influence of increased virginity in the population.

**Wood, H.** (1), R. Gillespie (1), C. Griswold (2) and D.O. Elias (1)

(1) University of California, Berkeley, Berkeley, CA, USA; (2) California Academy of Sciences, San Francisco, CA, USA

MON NOV 01, 09:30

SYMPOSIUM 1: ARACHNOLOGY

**Evolution of stealth versus speed strategies of prey capture in pelican and trap-jaw spiders (Araneae: Archaeidae, Mecysmaucheniidae)**

Highly modified carapaces in archaeid, mecysmaucheniid, and pararchaeid spiders allow for relatively unconstrained jaw movements and have given rise to remarkable predatory strategies. Archaeids employ "attack at a distance" strategies. Mecysmaucheniids and pararchaeids have independently evolved "trap-jaw" mechanisms (unknown in other arachnids) to snatch prey with lightning speed – mecysmaucheniid jaws snap shut at speeds of up to 12.7 m/s. Variation in archaeid and mecysmaucheniid carapace and jaw shape (and jaw-closing speed in mecysmaucheniids) allows testing of hypotheses of predatory strategy evolution. Sympatric species among these spiders allow examination of the functional and adaptive values of these morphological and behavioural traits and exploration of hypotheses of relationship between biomechanics and community assembly/ecology.

**Woodbury, N.** and G. Gries

Simon Fraser University, Burnaby, BC

MON NOV 01, 13:30

ORAL PRESIDENT'S PRIZE: CHEMICAL ECOLOGY

**Firebrats (*Thermobia domestica*) deposit and respond to microbial aggregation signals**

Aggregations improve an insect's survival or reproductive success by increasing predator vigilance or by facilitating location of food, shelter or mates. These aggregations are known to form in response to pheromones, sound and visual signals, phagostimulants and specific abiotic conditions. Here, we reveal a novel type of insect aggregation signal that is microbial in origin and serves to arrest firebrats (*Thermobia domestica*) wherever microclimatic conditions are suitable for firebrat survival and reproduction.



**Wrubleski, D.** (1) and L. Ross (2)

(1) Institute for Wetland and Waterfowl Research, Ducks Unlimited Canada, Stonewall, MB; (2) Native Plant Solutions, Ducks Unlimited Canada, Winnipeg, MB

WED NOV 03, 10:30

SYMPOSIUM 9: ARTHROPODS OF CANADIAN GRASSLANDS (BIOLOGICAL SURVEY OF CANADA)

### **Arthropods of prairie wetlands**

The southern portions of Manitoba, Saskatchewan and Alberta are covered with millions of small water-filled depressions called prairie potholes. These wetlands provide habitat for a diverse array of aquatic arthropods, which provide an important food resource for the abundant waterfowl that use these wetlands for breeding. However, more information is needed on taxonomic composition and basic ecology so that we can better understand their role in the wetland trophic dynamics and functioning. This information would also help us to better understand the factors that regulate community composition and abundance, and how agriculture and other impacts are contributing to losses of wetland biodiversity and functioning.

**Yack, J.**

Department of Biology, Carleton University

SUN OCT 31, 15:30

PLENARY SYMPOSIUM

### **Acoustic communication in insects: the message is in the medium**

Insects provide an amazing opportunity to explore the sensory world (Umwelt) of animals, and to ask questions about the function and evolution of unique communication systems. Using specialized equipment, a bit of imagination and some luck, we have had the opportunity to discover novel ears in butterflies and caterpillars, cryptic and complex vibratory messaging in miniature caterpillars and beetles, worms (honorary bugs) that can be 'charmed' by vibrations, and some bizarre sounds that would surprise the most experienced naturalist. I will talk about some of this research, and the media used by insects and scientists to deliver their messages.

**Zahradnik, T.** (1), W. Strong (2), R. Bennett (3), A. Kuzmin (1), S. Takács (1) and G. Gries (1)

(1) Simon Fraser University, Burnaby, BC; (2) Ministry of Forests and Range, Kalamalka Forestry Centre, Vernon, BC; (3) Ministry of Forests and Range, Saanichton Forestry Centre, Saanichton, BC

MON NOV 01, 13:45

ORAL PRESIDENT'S PRIZE: CHEMICAL ECOLOGY

### **Attraction cues of Douglas-fir cone gall midges in seed orchards**

The Douglas-fir cone gall midge, *Contarinia oregonensis*, is part of the cone-feeding insect guild. In early spring, females seek developing Douglas-fir cones as oviposition sites. We tested whether differences in cone colour or the infrared signature of cones, needles, or branches mediate the females' oviposition behaviour. We demonstrated that cone color varies greatly but *C. oregonensis* shows no preference for cones with specific colors or for any artificial cone colors. Instead, they preferred heated traps (with a strong IR signature) over cooled traps, especially traps that resembled Douglas-fir branches irradiated by the sun.

**Zanuncio, J.C.**, T.V. Zanuncio, M.A. Soares and J.E. Serrão

Universidade Federal de Viçosa, Viçosa, Minas Gerais State, Brasil

TUE NOV 02, 14:45

ORAL SUBMITTED: BIOLOGICAL CONTROL

### **Predators and parasitoids in the biological control of Lepidoptera defoliators of eucalypt in Brazil**

Lepidoptera defoliator pests are found in eucalypt plantations in Brazil which have, at least, 30% of native vegetation areas preserved by Brazilian laws. This situation strengthens the natural and applied biological control. Studies with predators of the *Podisus*, *Brontocoris* and *Supputius* (Heteroptera: Pentatomidae) genera aim estimating their potential spread, number of individuals released and efficiency. Parasitoid wasps as *Palmistichus elaeisis* and *Trichospillus diatraeae* (Hymenoptera: Eulophidae) are reared with *Bombyx mori* (Lepidoptera: Bombycidae), *Anticarsia gemmatalis* (Lepidoptera: Noctuidae) or *Tenebrio molitor* (Coleoptera: Tenebrionidae). Predator-parasitoid interactions show that they can be combined, which make biological control more effective in eucalypt reforested areas in Brazil.

**Zappia, S.** and B. Roitberg

Department of Biological Sciences, Simon Fraser University, Burnaby, BC

MON NOV 01, 16:45

ORAL PRESIDENT'S PRIZE: ECOLOGY

**Budgeting for energy. How *Anopheles gambiae* mosquitoes behave when confronted with an unobtainable host**

*Anopheles gambiae* (Diptera:Culicidae), the main vector of malaria, emerges as a small and energy deficient adult mosquito. Little is known about how its energy state influences its movements in the environment and its response to hosts. In this study we analyze the movement of mosquitoes under different energetic states when confronted with an unobtainable host and an alternative sugar food source. Our results are presented and discussed.

**Zilahi-Balogh, G.** (1), J. Richardson (2), T. Kimoto (2) and J. Smith (3).

(1) CFIA, Kelowna, BC; (2) CFIA, Burnaby, BC; (3) CFIA, Victoria, BC

WED NOV 03, 08:00

SYMPOSIUM 8: DEALING WITH INVASIVE PESTS

**The Canadian Food Inspection Agency's approach to invasive alien species**

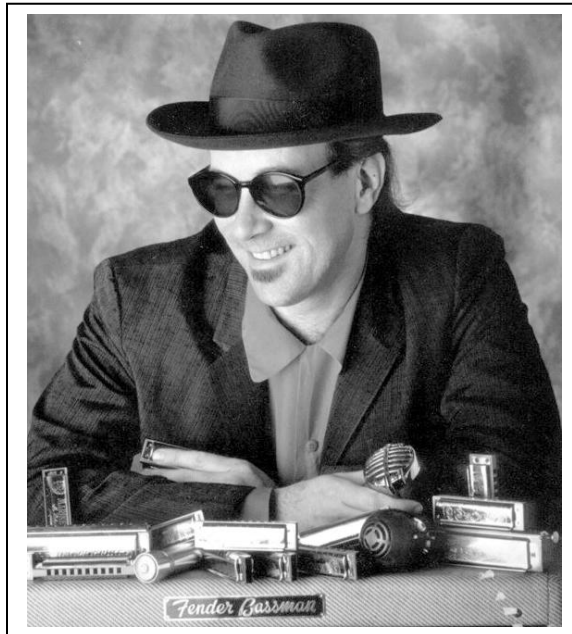
The CFIA has a long history mitigating pest introductions. As a signatory to the International Plant Protection Convention, the CFIA is obligated to base phytosanitary measures on standards set by the IPPC. The plant health mandate is to protect plant health and productivity by preventing the introduction and spread of quarantine pests that threaten Canada's agriculture, forestry and horticultural resources through science based regulation and enforcement. Mitigation approaches used by CFIA include risk assessments, surveillance, importation and domestic movement restrictions, import control and inspection, and eradication. The CFIA also collaborates with partners to address research gaps in pest biology and the development of diagnostic and detection tools.



## **ESC Banquet Entertainment**

### **Mark Hummel with Rusty Zinn and the Blues Survivors**

Mark Hummel (<http://www.markhummel.com/index.html>) has been spreading the gospel of swinging West Coast jump blues throughout North America and Europe for the last thirty years. Mark has a deserved reputation as one of the very best harmonica players in the world and one of the hardest-working performers on the blues circuit. He also has a strong connection to entomology – along with a small, select group of other blues masters, Mark has an arthropod species named after him (albeit as yet unpublished). The Entomological Societies of Canada and British Columbia are pleased and honoured to present Mark Hummel backed by Rusty Zinn and the Blues Survivors in concert at the JAM 2010 Banquet.



### **Divertissement durant le banquet SEC**

#### **Mark Hummel and the Blues Survivors**

Mark Hummel (<http://www.markhummel.com/index.html>) a répandu l'évangile du swinging West Coast jump blues à travers l'Amérique du nord et l'Europe durant ces trente dernières années. Mark a comme réputation (très méritée) d'être l'un des meilleur joueur d'harmonica, et un des artiste de blues qui travaille le plus dur. Il est également très lié à l'entomologie, et comme quelques autres grands artistes de blues, a le privilège d'avoir une espèce d'arthropode portant son nom (bien que pas encore publié). Les sociétés d'entomologie du Canada et de Colombie-Britannique ont le grand plaisir et l'honneur de présenter Mark Hummel accompagné de Rusty Zinn and the Blues Survivors au banquet de la RAC 2010.

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**Translation:** Maxence Salomon

**Awards:** Leo Rankin

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**Fundraising, Art & Merchandise:** Tom Lowery, Lorraine Maclauchlan

**Entertainment:** Robb Bennett, Bill Riel

**Volunteers-at-Large:** Jeremy deWaard, Jennifer Heron

**Student Competition Judges:** Patrice Bouchard, Paul Fields, Brian Galka, Patricia Jaramillo, Geneviève Labrie, Zoe Lindo, Chris MacQuarrie, Tammy McMullan, Debra Moreau, Dean Morewood, Ayman Mostafa, Lisa Poirier, Jens Roland, Julien Saguez, Cynthia Scott-Dupree, Juliana Soroka, Jon Sweeney, Gabriella Zilahi-Balogh

## The 2010 JAM Logo / Logo de la RAC

### *Bumble Bee Dance*

By Michael Blackstock

This image was commissioned by the Entomological Society of British Columbia for the 2010 Joint Annual Meeting with the Entomological Society of Canada. “Bumble Bee Dance” was created by the First Nations artist, Michael Blackstock. Michael is a member of the Gitksan nation, and holds the name Ama Goodim Gyet. This is his third commission for our Society.

The inspiration for this piece is the round dance and waggle dances of honeybees. The print symbolizes communication among bees, and the circle of life that they are so integral to in our world. The inner circle represents the flower, with the red parts of the image simultaneously representing pollen sacks on the bees’ legs and pollen on the stamens of the flower. The yellow of the bees in the outer circle of the image represents the sun, because honeybees use the angle from the sun to indicate the direction of a food source in their dances. A key design theme is to “interweave” the bees using northwest coast design symmetry.

In First Nations cultures, the bumble bee can represent a messenger, honesty and drive (hardworking).

**A limited edition run of signed prints are available for sale. See the Merchandise Desk in the Conference Foyer for details.**

### *La danse du bourdon*

par Michael Blackstock

Cette image fut commanditée par la société d’entomologie de Colombie-Britannique pour la réunion annuelle conjointe 2010 avec la société d’entomologie du Canada. “La danse du bourdon” a été créée par Michael Blackstock, un artiste des Premières Nations. Micheal fait partie de la nation Gitxan, et se nomme Ama Goodim Gyet. Ceci est sa troisième commande pour notre société.

L’inspiration pour cette oeuvre vient de la danse en rond et de la danse frétilante des abeilles. L’oeuvre représente la communication entre abeilles et le cercle de vie dont elles font partie intégrante. Le cercle intérieur représente une fleur, et les sacs rouges représentent à la fois les sacs de pollen sur les pattes des abeilles et le pollen sur les étamines de la fleur. Le jaune des abeilles sur le cercle extérieur du motif représente le soleil, car les abeilles utilisent l’angle du soleil pour indiquer la direction d’une source de nourriture. Un thème clef du motif est d’entrelacer les abeilles en utilisant le style symétrique de l’art de la côte nord-ouest.

Dans la culture des Premières Nations, le bourdon peut représenter un messenger, l’honnêteté, et l’esprit de motivation (travailleur).

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