



2011 JOINT ANNUAL MEETING
Entomological Society of Canada and the Acadian Entomological Society

RÉUNION CONJOINTE ANNUELLE
Société d'entomologie du Canada et de la Société d'entomologie acadienne



Westin Nova Scotian Hotel, Halifax, NS, 6-9 November 2011
l'hôtel Westin Nova Scotian à Halifax, en N-É, 6-9 novembre 2011



Program at-a-glance

Day	Time	Cash Check	Commonwealth A	Commonwealth B	Harbour Suite A	Harbour Suite B	Atlantic Ballroom	Lunenburg Room	Cornwallis Room	Maritime Room	Boardroom	Northumberland Room
Saturday Nov. 05	07:30-24:00	Registration			ESC Board Meeting (08:30-17:00)							
Sunday Nov. 06	07:00-12:00						Welcome Reception					AV 07:00-18:00
	13:00-16:30	Registration 9:00-13:00 16:30-20:00	Opening Ceremonies Gold Medal Address Plenary Symposium	Poster setup 16:30 - 22:00								
	16:30-18:30											
	18:30-22:00											
	22:00-24:00											
Monday Nov. 07	07:00-08:30											
	08:30-10:00		3. PP: Biocontrol & Ecology		Symp. 1: Pollinators			Symp. 2: Mating Failures	2. PP: Biodiversity & Physiology	1. PP: Forestry		
	10:00-10:30		Break		Break				Break			
	10:30-12:00		3. PP: Biocontrol & Ecology		Symp. 1: Pollinators			Symp. 2: Mating Failures	2. PP: Biodiversity & Physiology	1. PP: Forestry		
	12:00-13:00		Lunch		Lunch				Lunch			
	13:00-15:00	Registration 7:30-8:30 10:00-10:30 12:00-13:00	1. Submitted: Biodiversity (starts at 13:15)	Posters	Symp. 1: Pollinators			Symp. 2: Mating Failures		4. PP: Agriculture & Pollination	Editorial Board Mtg 12:00-14:00	AV 07:00-18:00
	15:00-15:30		Break		Break			Break		Break		
	15:30-17:00		2. Submitted: Microbes & Immunology	PP Dedicated Poster Session								
	17:00-19:00											
	19:00-22:00			Posters	Student Mixer				President's Reception			
	22:00-24:00											
Tuesday Nov. 08	07:00-08:30											
	08:30-10:00		4. Submitted: Biocontrol		Symp. 3: Great Student					Symp. 6: Unearthing Underground Entities		
	10:00-10:30		Break		Break					Break		
	10:30-12:00		5. Submitted: IPM	Posters	Symp. 3: Great Student					Symp. 6: Unearthing Underground Entities		
	12:00-13:00		Lunch		Lunch					Lunch		
	13:00-15:00		6. Submitted: Crop Pests									
	15:00-16:00	Registration 7:30-8:30 10:00-10:30 12:00-13:00	Break& Dedicated Poster Session	Dedicated Poster Session	8. Submitted: Ecology							AV 07:00-18:00
	16:00-16:45		Heritage Lecture		Break & Dedicated Poster Session							
	17:00-18:30			Poster removal								
	18:00-19:00						ESC AGM 17:00-17:45 ESC Gov. Board 17:45-18:30 Banquet Reception in Atlantic Room Mezzanine					
	19:00-23:00											
	23:00-24:00		Banquet									
Wednesday Nov. 07	07:00-12:00											
	8:30-10:00	Registration 7:30-8:30 10:00-10:30	10. Submitted: Pollination / Behaviour / Genetics	9. Submitted: Plant Virus Transmission (starts 8:45)	Symp. 7: CFBC (starts 9:00)					Symp. 8: Evolution & Community Ecology		AV 07:00-10:30
	10:00-10:30			Break								
	10:30-12:00		10. Submitted: Pollination / Behaviour / Genetics		Symp. 7: CFBC							
	12:00-13:00		Lunch									
	13:00-14:00											

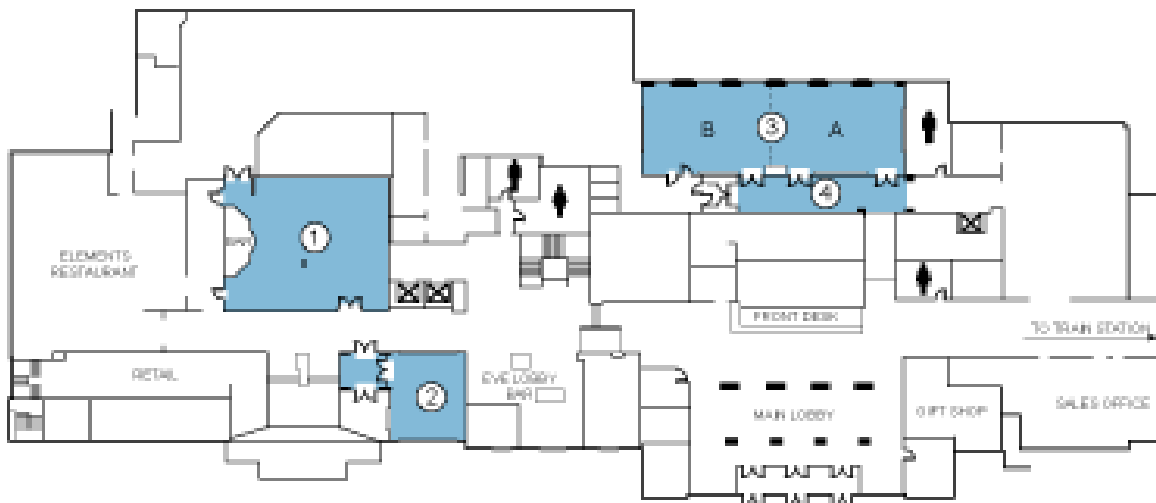
Plenary Sessions & Receptions
Oral Presentations
Poster Presentations
AV Room
AGMs & Board Meetings
Off-site Activities
Nothing scheduled

WESTIN HOTEL Floor Plans



- | | |
|-----------------------|--------------------|
| 1. COMMONWEALTH FOYER | 7. BEDFORD |
| 2. COAT CHECK | 8. FUNDY |
| 3. ATLANTIC FOYER | 9. LUNENBURG |
| 4. ATLANTIC MEZZANINE | 10. NORTHUMBERLAND |
| 5. MARITIME | 11. BOARDROOM |
| 6. TERRACE | |

CONFERENCE LEVEL



- | |
|------------------------|
| 1. TRADEWINDS |
| 2. CORNWALLIS |
| 3. HARBOUR SUITE |
| 4. HARBOUR SUITE FOYER |

LOBBY LEVEL

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Greetings from the President, Entomological Society of Canada

Welcome to Halifax 2011! It is my great pleasure to welcome you all to the Joint Annual Meeting (JAM) of the Acadian Entomological Society (AES) and the Entomological Society of Canada (ESC). The theme of this year's meeting is "Beauty and Impact" and the Local Organizing Committee has worked hard to make this a memorable meeting. The Weston Nova Scotia Hotel is an excellent venue for our scientific and social sessions. The program includes some renowned plenary speakers, a wide variety of symposia, contributed oral and poster presentations, and excellent student presentations. Dan Quiring's Heritage Lecture on "The history of forest entomology in Atlantic Canada" is something not to be missed.

Organizing and staging a national meeting is the result of hard work from many dedicated volunteers. On behalf of the Entomological Society of Canada I would like to thank them all for the many hours they contributed to make this meeting happen. Particular thanks go to Chris Cutler and Kirk Hillier (Meeting Co-chairs), Christine Norohna (AES President), Deb Moreau and Dave McCorquodale who put together the stimulating scientific program, Robert Johns (Treasurer), and Susan Horton, Shawn MacLean and Rick West for Registration and Local Arrangements, both of which are critical to the success of the JAM.

I hope you will have a productive, informative and enjoyable meeting in Halifax.

Peter Mason, ESC President

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

Bienvenue à Halifax 2011! Je suis heureux de vous accueillir à la réunion conjointe annuelle de la Société d'entomologie acadienne (SEA) et de la Société d'entomologie du Canada (SEC). Le thème de cette année est « Beauté et Impact » et le comité organisateur local a fait du bon travail pour rendre cette réunion mémorable. L'hôtel Westin Nova Scotia est un excellent endroit pour nos sessions scientifiques et sociales. Le programme inclut des conférenciers invités connus, une grande variété de symposiums, des communications orales et par affiches, et d'excellentes présentations étudiantes. L'allocution du patrimoine de Dan Quiring sur « L'histoire de l'entomologie forestière dans le Canada Atlantique » est à ne pas manquer.

Organiser et recevoir une réunion nationale est le résultat d'un dur labeur de nombre de volontaires dévoués. Au nom de la Société d'entomologie du Canada, j'aimerais tous les remercier pour les nombreuses heures investies afin de permettre la tenue de cette réunion. Un merci particulier à Chris Cutler et Kirk Hillier (co-présidents de la réunion), Christine Norohna (présidente de la SEA), Deb Moreau et Dave McCorquodale qui ont monté ce programme scientifique stimulant, Robert Johns (trésorier), et Susan Horton, Shawn MacLean et Rick West pour les inscriptions et arrangements locaux, qui sont tous deux critiques pour le succès de la réunion conjointe annuelle.

J'espère que vous aurez une réunion productive, informative et agréable à Halifax.

Peter Mason, Président de la SEC

President's Greeting, Acadian Entomological Society

On behalf of the Acadian Entomological Society, it is my pleasure to welcome you to the joint annual meeting of the Entomological Society of Canada and the Acadian Entomological Society. The theme of this year's meeting is "Beauty and Impact", which encompasses the aesthetic attractiveness of the insects as well as their positive and negative impacts on our lives. Our organizing committee has been working hard to put together a stimulating and enjoyable meeting. We sincerely hope that you enjoy the meeting and get the opportunity to connect with fellow entomologists and be inspired by the new and innovative research ideas being presented. We hope you will also take some time to explore and enjoy Halifax and Nova Scotia.

Christine Noronha
AES President

Mot de bienvenue du président de la Société d'entomologie de l'Acadie

Au nom de la Société d'entomologie acadienne, je suis heureuse de vous accueillir à la réunion conjointe annuelle de la Société d'entomologie du Canada et de la Société d'entomologie acadienne. Le thème de cette année est « Beauté et Impact », qui associe autant l'attractivité esthétique des insectes que leurs impacts positifs et négatifs sur nos vies. Notre comité organisateur a travaillé dur afin de monter une réunion stimulante et agréable à la fois. Nous espérons sincèrement que vous apprécierez cette réunion, que vous aurez l'opportunité de discuter avec vos collègues entomologistes et que vous serez inspirés par les idées de recherche nouvelles et innovantes qui seront présentées. Nous espérons que vous prendrez également le temps d'explorer et d'apprécier Halifax et la Nouvelle-Écosse.

Christine Noronha
Présidente de la SEA



Greetings from the Co-Chairs of the 2011 JAM

Welcome to Halifax and the 2011 JAM! Over the years we have seen the ESC Annual Meeting weave throughout our beautiful country, and we are very pleased that you have now made the trek to the east coast to join us in Halifax. In addition to attending the conference sessions and events, we hope that you will have an opportunity to explore this historic city and its beautiful surrounding areas.

This meeting would not have been possible without the hard work of our organizing committee. Without listing everyone here, we offer sincere thanks to all that were involved. We hope that you enjoy the many presentations and posters, take some time to stroll through the streets of Halifax, catch up with old friends, and make new ones.

Chris Cutler and Kirk Hillier
Conference co-Chairs

Mot de bienvenue des co-présidents de la réunion conjointe annuelle 2011

Bienvenue à Halifax et à la réunion conjointe annuelle 2011! Au fil des années, nous avons vu la réunion annuelle de la SEC se balader au travers de notre beau pays, et nous sommes heureux que vous ayez entrepris le voyage jusqu'à la côte est afin de vous joindre à nous à Halifax. En plus d'assister aux sessions et événements de la conférence, nous espérons que vous aurez la chance d'explorer cette ville historique et ses environs magnifiques.

Cette réunion n'aurait pas été possible sans le travail acharné de notre comité organisateur. Sans nommer tout le monde, nous aimerions remercier sincèrement tous ceux qui se sont impliqués. Nous espérons que vous apprécierez les différentes présentations orales et par affiches, que vous prendrez le temps de vous balader dans les rues de Halifax, et que vous verrez d'anciens amis tout en rencontrant de nouveaux.

Christ Cutler et Kirk Hillier
Co-présidents de la conférence

Schedule of Events

SATURDAY 5 November

08:30 – 17:00 PM **ESC GOVERNING BOARD MEETING** Harbour Suite A

SUNDAY 6 November

Throughout day *Silent Auction items on display* Commonwealth B

09:00 – 13:00 *Registration desk open* Commonwealth Foyer
16:30 – 20:00

09:00 – 13:00 *Uploading presentation files* Northumberland
16:30 – 20:00

13:00 – 13:30 **OPENING CEREMONIES** Commonwealth A

13:30 – 14:00 **GOLD MEDAL ADDRESS** Commonwealth A

Dr. Murray B. Isman
THE BENEFICIARIES OF MY EFFORTS
LES BÉNÉFICIAIRES DE MES EFFORTS

14:00 – 14:30 *Refreshment Break*

14:30 – 16:30 **PLENARY SYMPOSIUM** Commonwealth A

BEAUTY & IMPACT: PERSPECTIVES IN SEEING THE INSECT WORLD

Moderator: Dr. David McCorquodale

Dr. Anthony Shelton
THE IMPACT OF PEST INSECTS ON HUMANS AND OUR ENVIRONMENT,
AND MANAGEMENT TACTICS FOR THE 21ST CENTURY

Dr. Donna Hurlburt
ABORIGINAL TRADITIONAL KNOWLEDGE IN THE ASSESSMENT OF
INSECT SPECIES AT RISK IN CANADA

Ms. Elizabeth Goluch
LIVING JEWELS

Dr. Barrett Klein
INSECT ESTHETICS AND THE IMPORTANCE OF IMAGERY IN ENTOMOLOGY

16:30 – 22:00 *Poster Room Open
for mounting presentations* Commonwealth B

18:30 – 22:00 **WELCOME RECEPTION** Atlantic Ballroom

MONDAY 7 NOVEMBER - AM

Throughout day	<i>Silent Auction items on display</i>	Commonwealth B
07:30 – 08:30	<i>Registration desk open</i>	Commonwealth Foyer
10:00 – 10:30		
12:00 – 13:00		
07:00 – 18:00	<i>Uploading presentation files</i>	Northumberland
10:00 – 10:30	<i>Refreshment Break</i>	
08:30 – 22:00	<i>Poster Room Open for viewing presentations</i>	Commonwealth B
08:30 – 11:30	President's Prize 1: Forestry	Maritime Room
08:30 – 11:45	President's Prize 2: Biodiversity & Physiology	Cornwallis Room
08:30 – 11:30	President's Prize 3: Biocontrol & Ecology	Commonwealth A
08:30 – 12:00	Symposium 1: Pollinators & Pollination	Harbour Suite A&B
08:30 – 12:00	Symposium 2: Mating Failures	Lunenburg Room
12:00 – 13:00	<i>Lunch / Registration desk open</i>	

MONDAY 7 NOVEMBER - PM

12:00 – 14:00	ESC Editorial Board meeting	Boardroom
13:00 – 16:45	President's Prize 4: Agriculture & Pollination	Maritime Room
13:00 – 15:00	Symposium 1: Pollinators & Pollination (cont.)	Harbour Suite A&B
13:00 – 15:00	Symposium 2: Mating Failures (cont.)	Lunenburg Room
13:15 – 15:00	Submitted Papers 1: Biodiversity	Commonwealth A
15:00 - 15:30	<i>Refreshment Break</i>	
15:30 – 16:45	Submitted Papers 2: Microbes & Immunology	Commonwealth A
15:30 – 16:30	President's Prize Poster Judging	Commonwealth B
17:00 - 19:00	Curation Blitz (Nova Scotia Museum, Summer St.)	
19:00 – 22:00	STUDENT MIXER (Students only)	Harbour Suite A&B
19:00 – 22:00	ESC President's Reception (by invitation only)	Cornwallis Room

TUESDAY 8 NOVEMBER - AM

07:30 – 12:00 10:00 – 10:30	<i>Registration desk open</i>	Conference Foyer
07:00 – 18:00	<i>Uploading presentation files</i>	Northumberland
08:00 – 16:00	<i>Poster Room Open for viewing presentations</i>	Commonwealth B
08:30 - 12:00	Symposium 3: Graduate Student Symposium	Harbour Suite A
08:30 -12:00	Symposium 4: Biological Survey of Canada	Atlantic Ballroom
08:30 -11:30	Symposium 5: Insects of Vaccinium	Harbour Suite B
09:00 -11:15	Symposium 6: Unearthing Underground Entities	Maritime Room
08:30 -10:00	Submitted Papers 4: Biological Control	Commonwealth A
10:00 – 10:30	<i>Refreshment Break</i>	Commonwealth B
10:00 – 13:00	<u><i>Final Bids on Silent Auction items</i></u>	Commonwealth B
10:30 -12:00	Submitted Papers 5: Integrated Pest Control	Commonwealth A
12:00 – 13:00	<i>Lunch / Registration desk open</i>	

TUESDAY 8 NOVEMBER - PM

13:00 – 15:00	Symposium 4: Biological Survey of Canada (cont)	Atlantic Ballroom
13:00 – 15:00	Submitted Papers 6: Crop Pests	Commonwealth A
13:00 – 15:00	Submitted Papers 8: Ecology	Harbour Suite B
15:00 -15:30	<i>Refreshment Break</i>	Commonwealth B
15:00 – 16:00	<i>Silent Auction items pickup</i>	Commonwealth B
15:00 – 16:00	DEDICATED POSTER SESSION	Commonwealth B
16:00 – 16:45	ESC HERITAGE LECTURE	Commonwealth A
	Dr. Dan Quiring HISTORY OF FOREST ENTOMOLOGY RESEARCH IN ATLANTIC CANADA	
17:00 – 22:00	<i>All Posters must be taken down</i>	Commonwealth B
17:00 – 17:45	ESC ANNUAL GENERAL MEETING	Atlantic Ballroom

17:45 – 18:30	ESC GOVERNING BOARD MEETING	Atlantic Ballroom
18:00 – 19:00	<i>Pre-Banquet Reception</i>	Atlantic Mezzanine
19:00 – 23:00	ESC BANQUET AND AWARDS	Commonwealth A

WEDNESDAY 9 NOVEMBER

07:30 – 08:30 10:00 – 10:30	<i>Registration desk open</i>	Commonwealth Foyer
07:00 – 10:30	<i>Uploading presentation files</i>	Northumberland
09:00 – 12:00	Symposium 7: Canadian Forum on Biological Control	Harbour Suite A
08:30 – 12:00	Symposium 8: Evolution & Community Ecology	Harbour Suite B
08:45 - 10:00	Submitted Papers 9: Plant Virus Transmission	Commonwealth B
08:30 - 11:45	Submitted Papers 10: Pollination/Behaviour /Genetics	Commonwealth A
10:00 – 10:30	<i>Refreshment Break</i>	
12:00 – 13:00	AES ANNUAL GENERAL MEETING	Harbour Suite B
13:00 – 14:00	AES EXECUTIVE MEETING	Harbour Suite B



Rhimphoctona macrocephala
Photo credit: Jon Sweeney

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

SUNDAY, NOVEMBER 6

13:00 - 14:00

COMMONWEALTH A

OPENING CEREMONIES

MODERATOR: KIRK HILLIER & CHRIS CUTLER

13:00 WELCOME AND AWARDS PRESENTATION

13:30 DR. MURRAY B. ISMAN
GOLD MEDAL ADDRESS:
THE BENEFICIARIES OF MY EFFORTS
LES BÉNÉFICIAIRES DE MES EFFORTS

14:00 Break

SUNDAY, NOVEMBER 6

14:30 - 16:30

COMMONWEALTH A

PLENARY SYMPOSIUM

BEAUTY AND IMPACT: PERSPECTIVES IN SEEING INSECTS

MODERATOR: DAVID MCCORQUODALE

14:30 **Shelton, A.**
THE IMPACT OF PEST INSECTS ON HUMANS AND OUR ENVIRONMENT,
AND MANAGEMENT TACTICS FOR THE 21ST CENTURY

15:00 **Hurlburt, D.**
ABORIGINAL TRADITIONAL KNOWLEDGE IN THE ASSESSMENT OF
INSECT SPECIES AT RISK IN CANADA

15:30 **Goluch, E.**
LIVING JEWELS

16:00 **Klein, B.**
INSECT ESTHETICS AND THE IMPORTANCE OF IMAGERY IN ENTOMOLOGY

MONDAY, NOVEMBER 7

8:30 - 11:30

MARITIME ROOM

PRESIDENT'S PRIZE ORAL COMPETITION, SESSION 1

FORESTRY

MODERATOR: DEAN MOREWOOD

8:30 **Roscoe, L.E., D.B. Lyons, S.M. Smith**
HOST-HABITAT LOCATION USING SEMIOCHEMICALS BY PHASGONOPHORA SULCATA WESTWOOD (HYM:
CHALCIDIDAE), A NATIVE PARASITOID OF AGRILUS PLANIPENNIS FAIRMAIRE (COL: BURPESTIDAE)

8:45 **Du, J., N.J. Holliday**
RESPONSES OF ALEOCHARA BILINEATA AND A. BIPUSTULATA (COLEOPTERA: STAPHYLINIDAE) TO DIMETHYL
DISULPHIDE

9:00 **Fraser, S., D. Quiring**
CAN INSECT PEST DAMAGE BE REDUCED IN BALSAM FIR CHRISTMAS TREE PLANTATIONS THROUGH SELECTIVE
BREEDING?

9:15 **Gregoire, D.M., D. Quiring, L. Royer**
GOUTING BY BALSAM WOOLLY ADELGID INFLUENCES THE PREFERENCE AND PERFORMANCE OF SUBSEQUENT
DEFOLIATORS

- 9:30 **Maguire, D.Y.**, C.M. Buddle, E.M. Bennett
THE EFFECTS OF LANDSCAPE COMPOSITION ON THE REGULATION OF INSECT HERBIVORY
- 9:45 **Quezada Garcia, R.**, E. Bauce.
HERITABILITY OF LIFE-HISTORY AND METRIC TRAITS OF SPRUCE BUDWORM *CHORISTONEURA FUMIFERANA* (CLEM.) UNDER LABORATORY CONDITIONS
- 10:00 Break**
- 10:30 **Seehausen, L.**, J. Régnière, R. Berthiaume, É. Bauce
INFLUENCE OF PARTIAL CUTTING ON PARASITISM OF THE SPRUCE BUDWORM AND THE HEMLOCK LOOPER
- 10:45 **Veilleux, J.**, N.J. Holliday
BIONOMICS OF THE BANDED ELM BARK BEETLE, *SCOLYTUS SCHEVYREWI*, IN SASKATCHEWAN AND MANITOBA AND IMPLICATIONS FOR DUTCH ELM DISEASE MANAGEMENT
- 11:00 **Veilleux, J.**, J. Leferink, N.J. Holliday
DOES RAPID REMOVAL OF INFECTED TREES REDUCE DUTCH ELM DISEASE INFECTION RATES: A REAL WORLD STUDY?
- 11:15 **Watt, G.A.**, S. Smith, R.A. Fleming
CHANGES IN BOREAL MIXED WOOD FOREST STRUCTURE DUE TO CONTINUOUS SPRUCE BUDWORM ATTACK

MONDAY, NOVEMBER 7

8:30 - 11:45

CORNWALLIS ROOM

PRESIDENT'S PRIZE ORAL COMPETITION, SESSION 2

BIODIVERSITY & PHYSIOLOGY

MODERATOR: GREG POHL

- 8:30 **Blair, M.S.**, T.A. Wheeler
SPATIAL AND TEMPORAL DIVERSITY OF SCATHOPHAGIDAE (DIPTERA) IN NORTHERN CANADA
- 8:45 **Dury, G.**, J. Bede, D. Windsor
EVOLUTION OF LARVAL AGGREGATION IN NEOTROPICAL CHRYSOMELINE LEAF BEETLES
- 9:00 **Ernst, C.**, C. Buddle
SEASONAL CHANGES IN THE FUNCTIONAL ECOLOGY OF SUBARCTIC GROUND-DWELLING ARTHROPOD ASSEMBLAGES
- 9:15 **Grossi, A.**
INFESTATION PARAMETERS OF CHEWING LICE (PHTHIRAPTERA: MENOPONIDAE, PHILOPTERIDAE) ON ADULT AND JUVENILE MALLARDS (*ANAS PLATYRHYNCHOS*) IN MANITOBA
- 9:30 **Loboda, S.**, C. Buddle, K. Sims
A TEMPORAL COMPARISON OF A HIGH ARCTIC SPIDER COMMUNITY (ARANEAE) AT LAKE HAZEN, NUNAVUT
- 9:45 **Mohan, M.**, C.D. Scott-Dupree, G.C. Cutler
MOLECULAR, INDIVIDUAL AND POPULATION-LEVEL CHEMICAL HORMESIS IN GREEN PEACH APHIDS
- 10:00 Break**
- 10:30 **Rivera, J.**
THE FUNCTIONAL DIVERSITY OF THE MANTODEAN OOTHECAE AND THEIR USEFULNESS AS A NOVEL CHARACTER SYSTEM FOR PRAYING MANTID TAXONOMY AND SYSTEMATICS (INSECTA: MANTODEA)
- 10:45 **Zhang, M.Y.**, M.W. Gates, J.D. Shorthouse
TOTAL EVIDENCE APPROACH REVEALS CRYPTIC SPECIES AMONG EURYTOMIDAE (HYMENOPTERA: CHALCIDOIDEA) ASSOCIATED WITH GALLS OF *DIPLOLEPIS* (HYMENOPTERA: CYNIPIDAE) ON ROSES IN CANADA
- 11:00 **Barbar, A.**, S. Sen, C. Béliveau, A. Nisole, M. Cusson
CHARACTERISATION OF FARNESYL DIPHOSPHATE SYNTHASE TYPE-1 AND TYPE-2 IN LEPIDOPTERA

- 11:15 **deSilva, N.**, L. Packer
A REVISION OF THE CLEPTOPARASITIC BEE GENUS *COELIOXYS* (HYMENOPTERA: MEGACHILIDAE) IN CANADA
- 11:30 **Harpur, B.**, A. Zayed
DIVERSITY OF AND SELECTION ON THE HONEY BEE IMMUNE SYSTEM

MONDAY, NOVEMBER 7

8:30 - 11:30

COMMONWEALTH A
BIOCONTROL & ECOLOGY

PRESIDENT'S PRIZE ORAL COMPETITION, SESSION 3

MODERATOR: TERRY GALLOWAY

- 8:30 **Andreassen, L.D.**, S. Whyard, U. Kuhlmann, P.G. Mason, N.J. Holliday
DEVELOPMENT OF MOLECULAR MARKERS TO STUDY THE NATURAL DIET OF A PREDACIOUS BIOLOGICAL CONTROL AGENT
- 8:45 **Ferguson, L.V.**, N.K. Hillier, T.G. Smith
BEHAVIOURAL MODIFICATION IN *CULEX* SPECIES CAUSED BY BLOOD PROTOZOA OF FROGS AND SNAKES
- 9:00 **Flores-Mejia, S.**, V. Fournier, C. Cloutier
EVALUATION OF THE RELATIVE PERFORMANCE OF A HOST -PARASITOID SYSTEM AS AFFECTED BY TEMPERATURE
- 9:15 **Lessard, E.**, G. Boivin
EFFECT OF LOW TEMPERATURES ON EMERGENCE, FECUNDITY, LONGEVITY AND HOST-FEEDING IN *TRICHOGRAMMA BRASSICAE* (HYMENOPTERA: TRICHOGRAMMATIDAE)
- 9:30 **MacEachern, M.C.**, N.S. Boyd, G.C. Cutler
PROSPECTS FOR SPREADING DOGBANE MANAGEMENT WITH THE DOGBANE LEAF BEETLE
- 9:45 **Moffat, C.E.**, J. Pither, R.G. Lalonde, D. Ensing, G. Grosskopf-Lachat, R.A. De Clerck-Floate
HOST CHOICE BY AN OLIGOPHAGEOUS CANDIDATE WEED BIOLOGICAL CONTROL AGENT IN NATIVE RANGE COMMUNITIES
- 10:00 Break**
- 10:30 **Namayandeh, A.**, K.M. Somers, P.J. Dillon
SUBSTITUTING SPACE FOR TIME: EFFECTS OF CHANGE IN TEMPERATURE ALONG LANDSCAPE GRADIENTS ON COMMUNITY OF BENTHIC INVERTEBRATES IN BOREAL SHIELD'S HEADWATER STREAMS OF ONTARIO, CANADA
- 10:45 **Nmor, J.C.**, T. Sunahara, K. Goto, K. Futami, G. Dida, G. Sonye, U. Fillinger, N. Minakawa
PREDICTING BREEDING SITES OF MALARIA VECTORS IN WESTERN KENYA USING TOPOGRAPHIC DERIVATIVES OF DIGITAL ELEVATION MODEL
- 11:00 **Royauté, R.**, C. Buddle, C. Vincent
REPEATABILITY OF BEHAVIOURAL SYNDROMES ACROSS LIFE-STAGES IN THE JUMPING SPIDER *ERIS MILITARIS* (ARANEAE: SALTICIDAE)
- 11:15 **Smallwood, B.**, J.D. Shorthouse
WHAT MAKES CYNIPID GALL WASPS ON ROSES SO DIFFERENT FROM OTHER HERBIVORES?

MONDAY, NOVEMBER 7

8:30 - 12:00

HARBOUR SUITE A&B
POLLINATORS & POLLINATION

SYMPOSIUM 1

ORGANIZER: CORY SHEFFIELD

- 8:30 **Sheffield, C.S.**, J-M. Perron
LÉON PROVANCHER'S CONTRIBUTIONS TO CANADIAN MELITTOLGY

- 9:00 **Dumesh, S.**, L. Packer, C.S. Sheffield, S. Marshall
IDENTIFICATION OF CANADA'S POLLINATORS
- 9:30 **Marshall, S.A.**
IDENTIFYING THE OTHER POLLINATORS
- 10:00 Break**
- 10:30 **Packer, L.**, C.S. Sheffield
BEE BIODIVERSITY
- 11:00 **MacIvor, J.S.**
REVALUING THE URBAN MATRIX WITH CAVITY-NESTING BEES
- 11:30 **Zayed, A.**
THE POPULATION GENETICS OF THE HONEY BEE, *APIS MELLIFERA*

MONDAY, NOVEMBER 7

8:30 - 12:00

LUNENBURG ROOM

SYMPOSIUM 2

MATING FAILURES

MODERATOR: MARC RHAINDS

- 8:30 **Rhains, M.**
MATING FAILURES: HOW DID I GET THERE?
- 9:15 **Régnière, J.**, J. Delisle, D. Pureswaran, R. Trudel
MATING SUCCESS, AN IMPORTANT PROCESS IN SPRUCE BUDWORM (SBW) POPULATION DYNAMICS AND MANAGEMENT
- 10:00 **Break**
- 10:30 **Evenden, M.L.**, B.A. Mori
WHEN MATING DISRUPTION DOES NOT DISRUPT MATING: FITNESS CONSEQUENCES OF DELAYED MATING IN MOTHS
- 11:00 **McNeil, J. N.**, J. Delisle, B. Roitberg
SHOULD ONE PITY THE POOR MIGRANT? THE CASE OF THE SUNFLOWER MOTH (SFM), *HOMOEOSOMA ELECTELLUM*

MONDAY, NOVEMBER 7

13:00 – 16:45

MARITIME ROOM

PRESIDENT'S PRIZE ORAL COMPETITION, SESSION 4

AGRICULTURE & POLLINATION

MODERATOR: LLOYD DOSDALL

- 13:00 **Colwell, M.**, D. Shutler, G. Williams
HONEY BEE HEALTH: ECTO- AND ENDOPARASITES IN THE MARITIMES
- 13:15 **Kher, S.V.**, L.M. Dosedall, H.A. Cárcamo
BIOLOGY OF THE CEREAL LEAF BEETLE, *OULEMA MELANOPUS* (COLEOPTERA: CHRYSOMELIDAE) ON DIFFERENT CEREAL HOSTS AND EXPLORATION OF ANTIBIOTIC CHARACTERS IN EXOTIC WHEAT GERMPLASM
- 13:30 **Mori, B.A.**, M.L. Evenden
DEMONSTRATION OF PHEROMONE-MEDIATED COMMUNICATION DISRUPTION FOR *COLEOPHORA DEAURATELLA* (LEPIDOPTERA: COLEOPHORIDAE)
- 13:45 **Reeh, K.W.**, G.C. Cutler
BIOVECTORING: EFFECTS OF DISPENSER DESIGN ON FORAGING BEHAVIOUR AND DISEASE MANAGEMENT
- 14:00 **Semmler, S.J.**, A.C. Worley, A.R. Westwood
EFFECTS OF FIRE ON COMMUNITY DIVERSITY AND PLANT-POLLINATOR INTERACTIONS IN THE TALL GRASS PRAIRIE

- 14:45 **Stanton, D., L. Dossall, R.C. Yang**
UNDERSTANDING HOST PREFERENCE IN ROOT MAGGOTS (*DELIA* SPP.) (DIPTERA: ANTHOMYIIDAE) IN *BRASSICA NAPUS*
- 15:00 **Break**
- 15:30 **Wilkes, M.A., L. Hermanutz, G.C. Cutler**
RELYING ON "FREE BEES"? LOWBUSH BLUEBERRY CROP POLLINATION IN THE ABSENCE OF COMMERCIAL POLLINATORS
- 15:45 **Stephens, D.T., A.R. Davis**
FLOWER VISITORS AS POTENTIAL POLLINATORS OF A POPULATION OF *VACCINIUM MYRTILLOIDES* AND *V. VITIS-IDAEA* (ERICACEAE) IN CENTRAL SASKATCHEWAN
- 16:00 **Veiga, N., L. Packer**
WILD BEE DIVERSITY RESPONSES TO LARGE-SCALE BURNS IN ARGENTINA
- 16:15 **Horn, M.E., P.G. Kevan**
POLLINATORS IN THE CITY: A COMPARISON OF BEE BIODIVERSITY ACROSS VARIOUS URBAN LAND-USE ZONES IN URBAN, SOUTHERN ONTARIO
- 16:30 **Albert, J. R., Packer, L.**
SOCIAL ORGANIZATION AND NESTMATE RELATEDNESS IN THE PRIMITIVELY EUSOCIAL BEE *HALICTUS FARINOSUS*

MONDAY, NOVEMBER 7

13:00 - 15:00

HARBOUR SUITE A&B

SYMPOSIUM 1

POLLINATORS & POLLINATION

MODERATOR: CORY SHEFFIELD

- 13:00 **Currie, R.W.**
THE STATUS OF HONEY BEES AND HONEY BEE RESEARCH IN CANADA
- 13:30 **Cutler, G.C.**
CONSIDERATIONS WHEN ASSESSING IMPACTS OF PESTICIDES ON BEES
- 14:00 **Taylor-Pindar, A.N., L. Packer**
THE IMPACT OF FIRE ON BEE COMMUNITIES IN OAK SAVANNAH HABITAT, SOUTHERN ONTARIO
- 14:30 **Kevan, P. G.**
INSECT BEHAVIOUR ON FLOWERS: WHY IT MATTERS IN POLLINATION.

MONDAY, NOVEMBER 7

13:00 - 15:00

LUNENBURG ROOM

SYMPOSIUM 2

MATING FAILURES

ORGANIZERS: MARC RHAINDS

- 13:00 **Zayed, A.**
A REVIEW ON THE EFFECTS OF DIPLOID MALE PRODUCTION AND MATING FAILURES IN THE HYMENOPTERA
- 13:30 **Bompard, A., I. Amat, X. Fauvergue, T. Spataro**
DEMOGRAPHICAL CONSEQUENCES OF MATE-FINDING ALLEE EFFECT IN PARASITOIDS: A THEORETICAL APPROACH
- 14:00 **Wogin, M.J., D.R. Gillespie, T. Haye, B.D. Roitberg**
THE STABILIZING EFFECT OF VIRGINITY IN SOLITARY PARASITOIDS PRODUCING FEMALE-BIASED SEX-RATIOS
- 14:30 **Sweeney, J., P. Silk, E. Kettela, M. Rhains, W. MacKay**
PHEROMONE-MEDIATED MATING SUPPRESSION OF AN EXOTIC LONGHORN BEETLE

MONDAY, NOVEMBER 7**13:15 – 14:45****COMMONWEALTH A**

SUBMITTED PAPERS 1

BIODIVERSITY

MODERATOR: SCOTT BROOKS

- 13:15 **Brooks, S.E.**, J.M. Cumming
THE LURKING DIVERSITY OF NEARCTIC *MICROPHORELLA* (DIPTERA: DOLICHOPODIDAE) AND THE ESTABLISHMENT OF A DISTINCTIVE NEW SPECIES GROUP FROM WESTERN NORTH AMERICA
- 13:30 **Cumming, J.M.**, B.J. Sinclair, S.E. Brooks, G.A. Covert
REVISION OF THE NEARCTIC SPECIES OF *HELEODROMIA* HALIDAY (DIPTERA: EMPIDOIDEA: BRACHYSTOMATIDAE)
- 13:45 **Wheeler, T.A.**, A.M. Solecki, J. Wang
CHLOROPIDAE (DIPTERA) OF CHURCHILL: MORPHOLOGY, DNA BARCODES AND ECOLOGY
- 14:00 **Namin, H.H.**, B. Sharanowski, M. Iranpour
DNA FINGERPRINTING OF BLACK-LEGGED *Aedes/Ochlerotatus* SPECIES (DIPTERA: CULICIDAE) OCCURRING IN CANADA
- 14:15 **Cannings, R.A.**
EFFERIA OKANAGANA, A NEW SPECIES OF ROBBER FLY (DIPTERA: ASILIDAE) FROM THE GRASSLANDS OF SOUTHERN BC, CANADA: TAXONOMY, BIOLOGY, DISTRIBUTION AND CONSERVATION STATUS
- 14:30 **Galloway, T.D.**
CHEWING LICE (PHTHIRAPTERA) ON AMERICAN WHITE PELICAN AND DOUBLE-CRESTED CORMORANT (PELECANIFORMES) IN MANITOBA

MONDAY, NOVEMBER 7**15:30 – 16:45****COMMONWEALTH A**

SUBMITTED PAPERS 2

MICROBES & IMMUNOLOGY

MODERATOR: SHELLEY ADAMO

- 15:30 **Adamo, S.A.**
THE CONSEQUENCES OF INTERTWINED PHYSIOLOGICAL SYSTEMS ON INSECT IMMUNE FUNCTION
- 15:45 **Cusson, M.**, A. Nisole, B. Aspirault, M. Landry, C. Béliveau, H. Maaroufi, R. Levesque
NTPASE-LIKE PROTEINS FROM THE BANCHINE ICHNOVIRUS GFIV
- 16:00 **Fairn, E.R.**, S.A. Adamo
IS ENHANCED IMMUNITY AFTER MATING IN FEMALE CRICKETS A BY-PRODUCT OF INCREASED EGG PRODUCTION?
- 16:15 **Peixoto, L.E.**, A.B. Maghodia, C.Y. Olivier, B. Galka, S.J. Perlman
CHARACTERIZATION OF ARSENOPHONUS, A WIDESPREAD INHERITED BACTERIAL ENDOSYMBIONT OF LEAFHOPPERS ACROSS CANADA
- 16:30 Harutyunova, M., K. Harutyunova, G. Gasparyan, A. Grigoryan, V. Tsaturyan, **A. Pepoyan**
QUANTIFICATION OF ENTEROBACTERIACEAE SPECIES FROM *ANOPHELES* MOSQUITOES COLLECTED IN ARMENIA

MONDAY, NOVEMBER 7**15:30 – 16:30****COMMONWEALTH B****DEDICATED POSTER SESSION**

PRESIDENT'S PRIZE POSTER COMPETITION

ORGANIZERS: KENNA MACKENZIE & JON SWEENEY

- 1 **De Silva, E.C.A.**, P.J. Silk, N.K. Hillier, G.C. Cutler
IDENTIFICATION OF SEX PHEROMONE COMPONENTS OF THE BLUEBERRY SPANWORM, *ITAME ARGILLACEARIA* (LEPIDOPTERA)

- 2 **Fauteux, J., G. Moreau**
HOW MUCH IS TOO LITTLE? SHORT-TERM EFFECTS OF DEADWOOD MANAGEMENT STRATEGIES ON SAPROXYLIC BEETLES IN PLANTATIONS
- 3 **Kulkarni, S., L.M. Dossall, C. Willenborg, K.N. Harker, J. Spence**
THE EFFECT OF WEED MANAGEMENT PRACTICES ON THE DISTRIBUTION AND ABUNDANCE OF GROUND BEETLES (COLEOPTERA: CARABIDAE) WITH SPECIAL REFERENCE ON GRANIVOROUS SPECIES
- 4 **Flaherty, L., J. Sweeney, D. Quiring, D. Pureswaran**
STAGE-SPECIFIC PERFORMANCE OF *TETROPIUM FUSCUM* (F.) (COLEOPTERA: CERAMBYCIDAE) IS INFLUENCED BY HOST SPECIES, HOST CONDITION AND TIMING OF ATTACK
- 5 **MacKay, C., K. Hillier, J. Sweeney**
INVESTIGATION OF THE OLFACTORY PHYSIOLOGY OF THE INVASIVE BROWN SPRUCE LONGHORN BEETLE (BSLB), *TETROPIUM FUSCUM* (FABR.) (COLEOPTERA: CERAMBYCIDAE)
- 6 **Namayandeh, A., K.M. Somers, P.J. Dillon, D.V. Beresford**
PRECAMBRIAN SHIELD HEADWATER STREAMS LARVAE CHIRONOMIDAE (DIPTERA:CHIRONOMIDAE) OF ONTARIO, CANADA
- 7 **Orlofske, J.M., D.J. Baird**
AQUATIC INSECT COMMUNITY TRAIT AND TAXONOMIC COMPOSITION IN MESOSCALE FLOW HABITATS
- 8 **Schaefer, P., D.C. Currie**
DIVERSITY AND EVOLUTION OF BITING FLIES IN NORTHERN CANADA – PRELIMINARY DATA FROM THE NORTHERN BIODIVERSITY PROGRAM (NBP)
- 9 **Sim, K.A., S. Loboda, C.M. Buddle, T.A. Wheeler**
MOLECULAR AND MORPHOLOGICAL VARIATION IN THE ARCTIC WOLF SPIDER *PARDOSA GLACIALIS* (ARANEAE, LYCOSIDAE)
- 10 **Charbonneau, L., Shutler, D., Hillier, N.K., Rogers, R.E.L.**
EFFECT OF FUNGAL PARASITES ON HONEY BEE MEMORY AND LEARNING

TUESDAY, NOVEMBER 8

8:30 - 12:00

HARBOUR SUITE A

SYMPOSIUM 3

GRADUATE STUDENTS

ORGANIZER: CHANDRA MOFFAT

- 8:30 **De Silva, W.C., O. Wally, C. Cutler, R. Robinson, A. Critchley, B. Prithiviraj**
POTENTIAL USE OF *ASCOPHYLLUM NODOSUM* (L.) LE JOL. EXTRACTS FOR THE MANAGEMENT OF GREEN PEACH APHID, *MYZUS PERSICAE*
- 9:00 **Horton, S.**
IDENTIFYING THE LOCATIONS, MOVEMENT AND HABITAT OF THE EUROPEAN FIRE ANT, *MYRMICA RUBRA*; AN INVASIVE SPECIES IN THE URBAN/SUBURBAN ENVIRONMENT OF HALIFAX, NOVA SCOTIA
- 9:30 **Rigney, C., A.R. Westwood**
DETERMINATION OF DAKOTA SKIPPER (*HESPERIA DACOTAE*) CRITICAL HABITAT IN MANITOBA: CHARACTERIZATION OF VEGETATION
- 10:00 **Break**
- 10:30 **Pinault, L.L., F.F. Hunter**
DISTRIBUTION AND HABITAT ASSOCIATIONS OF *ANOPHELES* SPP. (DIPTERA: CULICIDAE) IN HIGHLAND ECUADOR - WHAT DOES THIS MEAN FOR MALARIA?

- 11:00 **Daoust, S.P.**, J. Savage, M. Bélisle, A. Robillard, R. Baeta, J. Brodeur
DIFFERENT LANDSCAPE PARAMETERS ARE PERCEIVED AT DIFFERENT SPATIAL SCALES: INSIGHTS FROM A TRI-TROPHIC SYSTEM WITHIN AGRICULTURAL LANDS
- 11:30 **Curry, C.J.**, R.A. Curry, D.J. Baird
RELATIVE PATTERNS OF LARVAL BIODIVERSITY IN TRICHOPTERA AND ODONATA: THE ROLE OF DISPERSAL ABILITY IN FRESHWATER INSECT BIODIVERSITY ASSESSMENT

TUESDAY, NOVEMBER 8

8:30 - 12:00

ATLANTIC BALLROOM
BIOLOGICAL SURVEY OF CANADA

SYMPOSIUM 4

ORGANIZER: FELIX SPERLING

- 8:30 **Sperling, F.A.H.**, D.B. McCorquodale, D. Giberson
HOW TO COMPLETE A BIOLOGICAL SURVEY OF CANADA
- 8:45 **Baird, D.J.**
BIOMONITORING 2.0: GENERATING AND HARNESSING DATA ON AN EPIC SCALE FOR ECOSYSTEM ASSESSMENT
- 9:15 **Branton, R.M.**
TAKE CARE OF THE ZEROS AND THE NUMBERS WILL TAKE CARE OF THE THEMSELVES
- 9:45 **Desmet, P.**, A. Bruneau
CANADENSYS - MOBILIZING BIODIVERSITY DATA ACROSS CANADA
- 10:00 **Break**
- 10:30 **Huber, D.P.W.**
THE BIOLOGICAL SURVEY OF CANADA: AN OUTSIDER'S WISH LIST
- 10:45 **Klymko, J.**
THE MARITIMES BUTTERFLY ATLAS – A CITIZEN SCIENCE CASE STUDY
- 11:00 **Sharanowski, B.**
BIODIVERSITY FOR EVERYONE: PERSPECTIVES ON ACCESSIBILITY
- 11:30 **Hyde, D.A.**
DEMAND DRIVEN BIODIVERSITY DATA TOWARDS EXPANDED INVESTMENTS IN DATA PUBLICATION AND DEVELOPMENT IN CANADA

TUESDAY, NOVEMBER 8

8:30 – 11:30

HARBOUR SUITE B
INSECTS OF VACCINIUM

SYMPOSIUM 5

ORGANIZERS: PEGGY DIXON & DEB MOREAU

- 8:30 **Hill, N.**
TRIBUTE TO DR. SAM P. VAN DER KLOET AND VACCINIUM
- 9:00 **Sheffield, C.S.**, M. Chagnon, C. Cutler, V. Fournier, J. Moisan-De Serres, M. Wilkes, J. Gibbs
THE BEE POLLINATORS OF LOWBUSH BLUEBERRY
- 9:15 **Renkema, J.M.**
MULCH AND WEED EFFECTS ON BLUEBERRY MAGGOT (DIPTERA: TEPHRITIDAE) DYNAMICS AND HIGHBUSH BLUEBERRY PRODUCTIVITY

- 9:30 **Gaul, S., C. Vincent, K. MacKenzie**
INFLUENCE OF THE BIOASSAY AND BLUEBERRY VOLATILES ON *RHAGOLETIS MENDAX* (DIPTERA:TEPHRITIDAE) RESPONSE
- 9:45 **Moreau, D.L., T. Hueppelsheuser, H. Fraser, P. Fisher, J. Broatch, L. Urbain, J.-P. Legare, K.L. Foster**
MONITORING EFFORTS AND DETECTION OF THE INVASIVE PEST, SPOTTED WING DROSOPHILA (*DROSOPHILA SUZUKII*) ACROSS CANADA: RISK FOR BLUEBERRIES?
- 10:00 **Break**
- 10:30 **Cutler, C.**
TOWARDS ECOLOGICAL MANAGEMENT OF INSECT PESTS IN WILD BLUEBERRY
- 10:45 **Goguen, J., G. Moreau**
HOW CAN WE HELP BLUEBERRIES “FLEE” BEETLES: WITHIN- AND BETWEEN-FIELD FACTORS INFLUENCING THE BLUEBERRY FLEA BEETLE?
- 11:00 **Hillier, N.K., P.L. Dixon**
THE LINGONBERRY FRUITWORM – A RETROSPECTIVE

TUESDAY, NOVEMBER 8

8:30 – 12:00

MARITIME ROOM

SYMPOSIUM 6

UNEARTHING UNDERGROUND ENTITIES

ORGANIZER: KENNA MACKENZIE

- 8:30 **Mackenzie, K.**
INTRODUCTION
- 8:40 **Lowery, D.T.**
MANAGING CUTWORM PESTS OF GRAPES: FROM THE GROUND UP
- 9:10 **Boiteau, G., C. Noronha**
THE AGRICULTURAL UNDERWORLD OF SOIL COLLEMBOLA
- 9:40 **Strongman, D., K. MacKenzie**
DANGER LURKING IN THE SOIL: FUNGAL PATHOGENS OF THE SAWFLY *NEOPAREOPHORA LITURA* (KLUG) IN LOWBUSH BLUEBERRY
- 10:00 **Break**
- 10:30 **MacKenzie, K., D. Moreau**
ROOTING OUT WEEVIL DAMAGE IN STRAWBERRY
- 11:00 **Renkema, J.M., D.H. Lynch, G.C. Cutler, K. MacKenzie, S.J. Walde**
PREDATION BY *PTEROSTICHUS MELANARIUS* (ILLIGER) (COLEOPTERA: CARABIDAE) ON IMMATURE *RHAGOLETIS MENDAX* CURRAN (DIPTERA: TEPHRITIDAE) IN SEMI-FIELD AND FIELD CONDITIONS
- 11:30 **Crotty, F.V., S.M Adl, R.P. Blackshaw, P.J. Murray**
DIFFERENTIATING TROPHIC FEEDING CHANNELS WITHIN THE SOIL FOOD WEB USING STABLE ISOTOPES
- 12:00 **Mackenzie, K.**
WRAPUP

TUESDAY, NOVEMBER 8

8:30 – 10:00

COMMONWEALTH A

SUBMITTED PAPERS 4

BIOLOGICAL CONTROL

MODERATOR: ROB MCGREGOR

- 8:30 **McClay, A.S.**
BIOLOGICAL CONTROL OF SCENTLESS CHAMOMILE IN CANADA – TAKING STOCK AFTER ALMOST TWENTY YEARS
- 8:45 **McGregor, R., J. Bannerman**
EVALUATION OF THE IMPACT OF *PRAON UNICUM* AND *APHIDIUS MATRICARIAE* (HYMENOPTERA: APHIDIIDAE) ON POPULATIONS OF *MYZUS PERSICAE* (HOMOPTERA: APHIDIIDAE) ON GREENHOUSE PEPPERS
- 9:00 **Abagli, A.Z., Alavo, T.B.C., Platzer, E.G.**
EFFET DU NÉMATODE ENTOMOPATHOGÈNE *ROMANOMERMIS IYENGARI* (MERMITHIDAE) SUR LES LARVES DE MOUSTIQUES VECTEURS DE MALADIES EN AFRIQUE DE L'OUEST
- 9:15 **Fields, P.G., W. Taylor, R. Hynes**
PEA PROTEIN EXTRACTS TO CONTROL AND REPEL STORED-PRODUCT INSECTS
- 9:30 **De Clerck-Floate, R.A.**
THE ROLE OF NITROGEN IN HOST CHOICE BY A BIOCONTROL WEEVIL
- 9:45 **Suthisut, D., P. Fields, A. Chandrapatya**
CONTACT TOXICITY OF ESSENTIAL OILS FROM THREE THAI PLANTS (GINGER FAMILY) AND THEIR MAJOR COMPONENTS AGAINST TWO STORED-PRODUCT INSECTS

TUESDAY, NOVEMBER 8

10:30 - 12:00

COMMONWEALTH A

SUBMITTED PAPERS 5

INTEGRATED PEST CONTROL

MODERATOR: PAT MACKAY

- 10:30 **Smith, M.A.H., P.A. MacKay, R.J. Lamb**
TEMPERATURE MODULATION OF PHOTOPERIODISM AND GENETIC VARIABILITY IN THE RESPONSE TO THE END OF THE SEASON IN THE APHID, *ACYRTHOSIPHON PISUM*
- 10:45 **Legault, S., J. Blais, C. Hébert, R. Berthiaume, J. Brodeur**
THE ATYPICAL SEASONAL ECOLOGY OF *TELENOMUS COLORADENSIS* (HYMENOPTERA: SCELIONIDAE) : A MATTER OF HOST AVAILABILITY AND PARASITOID ACTIVITY
- 11:00 **Huber, D.P.W., C. Pitt, J.A. Robert, T.R. Bonnett, J.D. Fraser, C.I. Keeling, J. Bohlmann**
OVERWINTERING AND DEVELOPMENTAL PROTEIN EXPRESSION IN MOUNTAIN PINE BEETLE LARVAE
- 11:15 **Pohl, G.R., C. Jaeger**
BIOLOGY OF *PARACLEMENSIA ACERIFOLIELLA* LEAF-CUTTER MOTHS ON *AMELANCHIER* IN ALBERTA (LEPIDOPTERA: INCURVARIIDAE)
- 11:30 **Nealis, V.G.**
THE PHENOLOGICAL WINDOW FOR WESTERN SPRUCE BUDWORM
- 11:45 **Royer, L., J. Delisle**
ONTOGENIC VARIATIONS IN RESPONSE OF HEMLOCK LOOPER (HL) TO PHYSICAL STIMULI

TUESDAY, NOVEMBER 8

13:00 - 15:00

ATLANTIC BALLROOM

SYMPOSIUM 4

BIOLOGICAL SURVEY OF CANADA

MODERATOR: FELIX SPERLING

- 13:00 **Majka, C.G.**
WILL BIODIVERSITY RESEARCH BECOME EXTINCT IN THE 21ST CENTURY?
- 13:15 **Shorthouse, D.P., D. Mozzherin, D. J. Patterson**
NAMES ARE THE KEY TO THE BIG NEW BIOLOGY: A BOTTOM-UP SOLUTION TO CREATING A MACROSCOPE

- 13:45 **Packer, L.**, C.S. Sheffield
COSEWIC AND BIODIVERSITY SURVEYS
- 14:15 **Sperling, F.**
DISCUSSION
- 14:30 Biological Survey of Canada Annual General Meeting

TUESDAY, NOVEMBER 8

13:00 - 15:00

COMMONWEALTH A

SUBMITTED PAPERS 6

CROP PESTS

MODERATOR: JENNIFER OTANI

- 13:00 **Otani, J.K.**, C. Yoder
PEST STATUS OF THE RED CLOVER CASEBEARER (LEPIDOPTERA: COLEOPHORIDAE: *COLEOPHORA DEAURATELLA*) IN CLOVER SEED PRODUCTION IN THE PEACE RIVER REGION
- 13:15 **Noronha C.**, B. Beaton, S. Mellish
THE DISTRIBUTION OF CLICK BEETLES BELONGING TO THE GENUS *AGRIOTES* IN PEI
- 13:30 **Mason, P.G.**, A. Brauner, M. Appleby, J-F. Landry, J.H. Miall, M. Paibomesai, W.H. Jenner, R. Weiss, O. Olfert, U. Kuhlmann, N. Cappuccino
HOW DOES YOUR GARLIC GROW? THE LEEK MOTH INVASION IN CANADA
- 13:45 Nagalingam, T., **N.J. Holliday**
EFFECT OF *LYGUS LINEOLARIS* ON NAVY BEANS
- 14:00 **Labrie, G.**, J. De Almeida, R. Bernard, O. Lalonde, J.É. Guérin
DEVELOPMENT AND IMPACTS OF *TIPULA PALUDOSA* MEIGEN (DIPTERA: TIPULIDAE) ON FORAGE AND FIELD CROPS
- 14:15 **Hallett, R.H.**, T. Baute
APHID ADVISOR: A SMARTPHONE APP FOR SOYBEAN PEST MANAGEMENT
- 14:30 **Dosdall, L.M.**, K.N. Harker, J.T. O'Donovan
THE IMPORTANCE OF CROP ROTATION FOR MINIMIZING DAMAGE FROM ROOT MAGGOTS (*DELIA* SPP.) IN CANOLA
- 14:45 **Mason, P.G.**, T. Haye, D.R. Gillespie, L.M. Dosdall, U. Kuhlmann, A.B. Broadbent, G.A.P. Gibson
PARASITOID COMMUNITIES OF CABBAGE SEEDPOD WEEVIL: ARE NATIVE SPECIES ENOUGH?

TUESDAY, NOVEMBER 8

13:00 - 15:00

HARBOUR SUITE B

SUBMITTED PAPERS 8

ECOLOGY

MODERATOR: ROBERT LAMB

- 13:00 **Bondrup-Nielsen, S.**
EFFECT OF BODY SIZE AND ENVIRONMENTAL COMPLEXITY ON INTER- AND INTRASEXUAL SELECTION IN THE FORKED FUNGUS BEETLE, *BOLITOTHERUS CORNUTUS* PANZER (COLEOPTERA: TENEBRIONIDAE)
- 13:15 **Knysh, K.M.**, D.J. Giberson, M.R. Van den Heuvel
SPRING WATER ARTHROPODS: CRENOPHILES AT THE EDGE OF AGRICULTURAL FIELDS
- 13:30 **Johns, R.**, K. Ozaki, H. Tobita
DIETARY MIXING OF NEEDLES FROM DIMORPHIC SHOOTS IN LARCH ENHANCES THE PERFORMANCE OF A SPECIALIST SAWFLY

- 13:45 **Lindo, Z., A. Gonzalez**
COMMUNITY DISASSEMBLY AND TROPHIC CONTRACTION OF FOREST FLOOR MICROARTHROPOD COMMUNITY UNDER ENVIRONMENTAL CHANGE
- 14:00 **O'Connell, D.M., W.G. Lee, A. Monks, K.J.M. Dickinson**
FOLIAR DOMATIA AFFECT MITE ASSEMBLAGES ON THE SHRUB *COPROSMA LUCIDA* (RUBIACEAE)
- 14:15 **Hicks, B. (1), D. Marshall**
REPORT OF THE INVASIVE ANT, *MYRMICA RUBRA*, IN NEWFOUNDLAND: WHERE DID IT ORIGINATE AND WHAT IMPACT DOES IT HAVE ON THE NATIVE INVERTEBRATE FAUNA?
- 14:30 **Timms, L.L., C.M. Buddle, T.A. Wheeler**
EXTENDING OUR UNDERSTANDING OF THE MID-LATITUDINAL PEAK IN DIVERSITY OF ICHNEUMONIDAE
- 14:45 **Lamb, R.J., P.A. MacKay, D. Wool**
POPULATION STABILITY OF A TREE-GALLING APHID, *BAIZONGIA PISTACIAE*, AT THREE SPATIAL SCALES

TUESDAY, NOVEMBER 8
DEDICATED POSTER SESSION

15:00 - 16:00

COMMONWEALTH B
SUBMITTED PAPERS

- 11 **Alhudaib, K., A. Ajlan, A. Rezk**
GENETIC STUDY OF TOMATO LEAF MINER, *TUTA ABSOLUTA* (LEPIDOPTERA: GELECHIIDAE), THE NEWLY INVASIVE PEST TO SAUDI ARABIA
- 12 **Ameen, A.O.**
MODELLING THE PHYTOSANITARY RISKS OF TWO EXOTIC PENTATOMIDS WITH PARTICULAR REFERENCE TO CANADA
- 13 **Béliveau, C., B. Boyle, J. Laroche, H. Maaroufi, D. Doucet, C. Lucarotti, F. Sperling, A. Nisole, L. Lumley, B. Brunet, R. Levesque, M. Cusson**
BUDWORM ECO-GENOMICS: APPLICATIONS AND BIOTECHNOLOGY (BEGAB), PART I: THE SPRUCE BUDWORM GENOME SEQUENCING PROJECT
- 14 **Boiteau, G., C. Vincent, F. Meloche, T. C. Leskey, B. G. Colpitts**
VALIDATION OF HARMONIC RADAR FINDERS AS INSECT MONITORING DEVICES
- 15 **Broadbent, B., L. Shipp, L. Gualtieri**
IMPACT OF THE ENTOMOPATHOGENIC FUNGUS, *METARHIZIUM ANISOPLIAE* ON THE NON-TARGET BENEFICIAL PREDATOR, *ORIUUS INSIDIOSUS*
- 16 **Carcamo, H., C. Herle**
PHENOLOGY OF *LYGUS* BUGS AND PARASITISM BY *PERISTENUS* WASPS IN ALFALFA AND CANOLA IN SOUTHERN ALBERTA
- 17 **Cordero, R., D.C. Currie**
DIVERSITY AND BIOGEOGRAPHY OF NORTHERN CANADIAN EPHEMEROPTERA, PLECOPTERA AND TRICHOPTERA: PRELIMINARY DATA FROM THE NORTHERN BIODIVERSITY PROGRAM
- 18 **DaRos, L., J.K. Otani**
ESTIMATING THE IMPACT OF ARTHROPOD PREDATORS PREYING UPON LYGUS NYMPHS IN THE PEACE RIVER REGION OF CANADA
- 19 **Dixon, P., S. Fillmore, S. LeBlanc, L. Madore, S. Mellish, J. Owen, C. Parsons, R. Pemberton, T. Power, V. Zvalo**
ROW COVERS AS PHYSICAL BARRIERS TO CONTROL CABBAGE MAGGOT (*DELIA RADICUM*) IN RUTABAGA

- 20 **Djoumad, A.**, F. Dallaire, C. Beliveau, M. Cusson
FUNCTIONAL ANALYSIS OF POLYDNA VIRUS GENES POTENTIALLY INVOLVED IN DISRUPTING THE DEVELOPMENT OF *CHORISTONEURA FUMIFERANA*
- 21 **Floate, K.D.**, W.U. Blanckenhorn, P. Coghlin, I. Davies, J. Gray, P. Höhn, N. Kadiri, J-P Lumaret, A. Scheffczyk, T. Schmidt, A. Schwarz, T. Sekine, C. Taylor, K. Taylor, J. Römbke
LESSONS LEARNED DURING THE SELECTION OF A DUNG BEETLE SPECIES AS A TEST FOR INSECTICIDAL RESIDUES IN CATTLE DUNG
- 22 **Fuentealba, A.**, É. Bauce
SITE FACTORS AND MANAGEMENT INFLUENCE HOST RESISTANCE TO SPRUCE BUDWORM (*CHORISTONEURA FUMIFERANA* (CLEM.)) IN A SPECIES-SPECIFIC MANNER
- 23 **Gaul, S. O.**, E. N. Estabrooks, C. Vincent, K. MacKenzie
PREDICTED EMERGENCE OF *RHAGOLETIS MENDAX* (DIPTERA:TEPHRITIDAE) IN LOWBUSH BLUEBERRY AND PRESENCE IN NORTH WESTERN NEW BRUNSWICK, CANADA
- 24 **Harper, T.**, C. Hemsworth, J. Bannerman, R. McGregor
MOLECULAR TOOLS FOR PRIMARY AND HYPERPARASITIDS OF APHIDS IN BRITISH COLUMBIA GREENHOUSES
- 25 Heard, K., M. Hajbabaei, **D.J. Baird**
DNA SEQUENCING OF FORMALIN-PRESERVED BULK BIOMONITORING SAMPLES
- 26 Leggett, F., **K. Floate**, P. Coghlin
DETECTION AND DISTRIBUTION OF WOLBACHIA BACTERIA IN INSECT HOSTS DETERMINED USING CONFOCAL MICROSCOPY
- 27 **Lumley, L.**, F. Sperling
LIFE-HISTORY TRAITS MAINTAIN THE GENOMIC INTEGRITY OF SYMPATRIC SPECIES OF THE SPRUCE BUDWORM (*CHORISTONEURA FUMIFERANA*) GROUP ON AN ISOLATED FOREST ISLAND
- 28 **Lumley, L.**, M. Cusson
SCANNING THE GENOME FOR ECOTYPE-SPECIFIC MARKERS, AND LINKING THEM TO GENE FUNCTION IN THE HEMLOCK LOOPER (*LAMBDA FISCELLARIA*)
- 29 **MacQuarrie, C.J.K.**, J Fidgen
ESTIMATING PRESENCE AND INTENSITY OF JACK PINE BUDWORM DEFOLIATION USING BOOSTED REGRESSION TREES
- 30 **Maghodia, A.B.**, C.Y. Olivier, B. Galka, L.E. Peixoto, S. Perlman
DETECTION AND CHARACTERIZATION OF *ARSENOPHONUS* IN LEAFHOPPERS ACROSS CANADA
- 31 **Maghodia, A.B.**, C.Y. Olivier, B. Galka, L.E. Peixoto, S.J. Perlman
DETECTION AND CHARACTERIZATION OF *ARSENOPHONUS*, A WIDESPREAD INHERITED BACTERIAL ENDOSYMBIONT OF LEAFHOPPERS ACROSS CANADA
- 32 **McGregor, R.**, C. Hemsworth
OLFACTORY RESPONSES OF *MICROMUS VARIEGATUS* (NEUROPTERA: HEMEROBIIDAE) TO PEPPER LEAVES INFESTED WITH *MYZUS PERSICAE* AND *AULACORTHUM SOLANI* (HOMOPTERA: APHIDIDAE)
- 33 **Melathopoulos, A.P.**, S.F. Pernal, M.M. Guarna, L.J. Foster
VARIABILITY AND CORRELATIONS AMONG TRAITS ASSOCIATED WITH VARROA MITE RESISTANCE IN A CANADIAN BREEDING POPULATION
- 34 **Moreau, D.L.**, D.B. Strongman, D.J. Hebb, K.L. Foster
MONITORING INSECTS AND THEIR SYMBIONTS IN THE THOMAS BROOK WATERSHED

- 35 **Olivier, C.**, B. Galka, A. Pearce, G. Séguin-Swartz, R. Gugel
 ASTER YELLOW PHYTOPLASMA STRAINS INFECTING PLANTS OF *CAMELINA SATIVA* (L.) CRANTZ IN
 SASKATCHEWAN
- 36 Peach, D.A.H., P.K. Abram, **T. Haye**, P.G. Mason, N. Cappuccino, G. Boivin, U.
 Kuhlmann
 IS MORE REALLY MERRIER? SUPERPARASITISM OF SWEDE MIDGE (*CONTARINIA NASTURTII*) BY *SYNOPEAS*
MYLES
- 37 **Saguez, J.**, J. Attoumbré, P. Giordanengo, S. Baltora-Rosset
 FLAX LIGNANS AND NEOLIGNANS : POTENTIAL BIOPESTICIDES AGAINST *MYZUS PERSICAE*
- 38 **Saguez, J.**, N. Bostanian, C. Vincent
 TOXICOLOGICAL ASSAYS FOR LEAFHOPPERS ASSOCIATED WITH VINEYARDS
- 39 **Scott, I.M.**, Y. Pelletier, K. Kramp, J.T. Arnason, T. Durst, S.R. Sims
 A NOVEL INSECTICIDE SYNERGIST FROM DILL OIL
- 40 **Scott, I.M.**, D.C. MacArthur, J.H. Tolman
 SURVEY FOR NEONICOTINOID-RESISTANCE AND CROSS-RESISTANCE TO ANTHRANILIC DIAMIDES IN
 COLORADO POTATO BEETLE POPULATIONS IN CANADIAN POTATO FIELDS, 2008 – 2011

TUESDAY, NOVEMBER 8

16:00 – 16:45

COMMONWEALTH A

MODERATOR: JEREMY MCNEIL

HERITAGE

16:00 **Quiring, D.**

HISTORY OF FOREST ENTOMOLOGY RESEARCH IN ATLANTIC CANADA

WEDNESDAY, NOVEMBER 9

9:00 – 12:00

HARBOUR SUITE A

SYMPOSIUM 7

CANADIAN FORUM ON BIOLOGICAL CONTROL

ORGANIZERS: LARS ANDREASSEN AND CHANDRA MOFFAT

9:00 **Floate, K.**, W. Watson, R. Weiss, O. Olfert

INTRODUCING NEW SPECIES OF DUNG BEETLES INTO CANADA TO IMPROVE PASTURE PRODUCTIVITY

9:30 **Haye, T.**, P. Mason, D. Gillespie, U. Kuhlmann, L. Andreassen

FROM THEORY TO PRACTISE: PROGRESS AND PROBLEMS IN HOST SPECIFICITY TESTING OF BIOLOGICAL CONTROL AGENTS

10:00 **Break**

10:30 **Gariepy, T.D.**

THE UTILITY OF MOLECULAR DIAGNOSTICS IN BIOLOGICAL CONTROL: EVALUATING TROPHIC INTERACTIONS AND NON-TARGET EFFECTS

11:00 **CFBC Annual General Meeting**

WEDNESDAY, NOVEMBER 9

8:30 - 12:00

HARBOUR SUITE B

SYMPOSIUM 8

EVOLUTION & COMMUNITY ECOLOGY

ORGANIZERS: STEPHEN HEARD AND GAETAN MOREAU

8:30 **Moreau, G.**, J-P. Michaud

DEATH AND SUCCESSION PLANNING: CAN WE TRUST INSECTS TO DO IT RIGHT?

- 9:00 James, P.M.A., D. Coltman, B. Murray, R. Hamelin, **F.A.H. Sperling**
SPATIAL GENETIC CORRELATIONS AMONG SPECIES IN THE MOUNTAIN PINE BEETLE SYSTEM
- 9:30 **Buddle, C.M.**
ON THE VAGARIES OF SPIDER COMMUNITY ECOLOGY
- 10:00 **Break**
- 10:30 **Floate, K.**, N. Isabe, R. Footitt
GENETIC TYPING OF HOSTS AND APHIDS PROVIDES NEW INSIGHTS ON GALLING ARTHROPODS OF HYBRID COTTONWOODS
- 11:00 **Knee, W.**
CRYPTIC SPECIES COMPLEX REVEALED IN WIDESPREAD GENERALIST MITE SPECIES ASSOCIATED WITH CARRION-FEEDING BEETLES
- 11:30 **Heard, S.**
PARALLEL (OR NOT) DIVERSIFICATION AMONG INSECT HERBIVORES OF GOLDENRODS

WEDNESDAY, NOVEMBER 9

8:45 - 10:00

COMMONWEALTH B

SUBMITTED PAPERS 9

PLANT VIRUS TRANSMISSION

MODERATOR: TBA

- 8:45 **Pelletier, Y.**
THE ROLE OF HOST-PLANT SELECTION BEHAVIOUR IN PVY TRANSMISSION BY APHIDS
- 9:00 **Olivier, C.**, B. Galka, C. Vincent, J. Saguez, L. Stobbs
BIODIVERSITY OF ASTER YELLOW PHYTOPLASMA STRAINS IN *MACROSTELLES QUADRILINEATUS* IN CANADA, BASED ON THE 16SR GENE SEQUENCING
- 9:15 **Nanayakkara, U.N.**, Y. Pelletier, M.G. Giguère
DEVELOPMENT OF A METHOD FOR EVALUATION OF ACQUISITION POTENTIAL OF POTATO VIRUS Y (PVY) BY DIFFERENT APHID SPECIES
- 9:30 **Boquel, S.**, A. Ameline, P. Giordanengo
VECTOR PROPENSITY OF APHIDS TO TRANSMIT POTATO VIRUS Y (PVY) TO POTATO

WEDNESDAY, NOVEMBER 9

8:30 – 11:45

COMMONWEALTH A

SUBMITTED PAPERS 10

POLLINATION, BEHAVIOUR & GENETICS

MODERATOR: DAVE SHUTLER

- 8:30 **Hicks, B.**
THE CONTRIBUTION OF DIFFERENT SIZED NATIVE BEES TO BLUEBERRY POLLINATION IN EASTERN NEWFOUNDLAND
- 8:45 **O'Connell D.M.**, S.D. Wratten, M.A. Gillespie
FLORAL RESOURCE PROVISION IN BIOLOGICAL CONTROL: THE EFFECT ON MULTI-TROPHIC INTERACTIONS IN BRASSICAS
- 9:00 Frost, E. H., **D. Shutler**, N.K. Hillier
EFFECTS OF COLD IMMOBILIZATION AND RECOVERY PERIOD ON HONEYBEE LEARNING, MEMORY, AND RESPONSIVENESS TO SUCROSE
- 9:15 **Hillier, N.K.**
EFFECTS OF OCTOPAMINE ON OLFACTORY SENSITIVITY AND LEARNING IN MOTHS

- 9:30 **Blake, A. J.**, L. M. Dosdall, J.A. Tansey
NUTRITIONAL EFFECTS ON THE VISUAL APPEARANCE OF CANOLA AND ITS ATTRACTIVENESS TO THE CABBAGE SEEDPOD WEEVIL
- 9:45 **Martel, V.**, F. Schlyter, R. Ignell, P. Anderson
NOT ONLY THIRSTY FOR BLOOD: MOSQUITOES FEEDING ON A CATERPILLAR
- 10:00 **Break**
- 10:30 **Erlandson, M.**, U. Toprak, D. Baldwin, C. Gillott, D. Hegedus
SYNTHESIS AND ARCHITECTURE OF THE *MAMESTRA CONFIGURATA* PERITROPHIC MATRIX
- 10:45 **Saindon, J.P.**, B.J. Sinclair
HOW MUCH GENE FLOW IS REQUIRED TO IMPEDE ADAPTATION? AN ARTIFICIAL SELECTION *DROSOPHILA* MODEL
- 11:00 **Minaei, S.**, A. Zayed
MOLECULAR EVOLUTION AND ITS GENOMIC CORRELATES IN THE HONEYBEE
- 11:15 **Carleton, D.**, Silk, P., Eveleigh, Eldon
SURVEY TECHNIQUES FOR THE BALSAM GALL MIDGE, GAGNE *PARADIPLOSIS TUMIFEX* (DIPTERA: CECIDOMYIIDAE) WITHIN CHRISTMAS TREE PLANTATIONS OF CENTRAL NEW BRUNSWICK.



Calliphora vomitoria
Photo credit: Doug Strongman

Entomological Society of Canada Gold Medal

for Outstanding Achievement in Canadian Entomology

2011

presented to

MURRAY B. ISMAN

at Halifax, Nova Scotia, 6 November 2011



Médaille d'or de la Société d'entomologie du Canada

pour souligner la contribution exceptionnelle en entomologie canadienne

2011

présenté à

MURRAY B. ISMAN

à Halifax, Nouvelle-Écosse, le 6 novembre 2011

The 2011 recipient of the Entomological Society of Canada Gold Medal Award for outstanding achievement in entomology is Professor Murray B. Isman. An accomplished scholar, Professor Isman has made many fundamental discoveries in the field of insect chemical ecology and important contributions to the chemistry and mode of action of botanical pesticides.

A tenured professor in the Faculty of Land and Food Systems at the University of British Columbia (UBC) since 1988, and currently Dean of that Faculty, Professor Isman completed a BSc in zoology at UBC in 1975 and an MSc at the same institution in 1977, where he studied the sequestration of cardenolides in milkweed bugs. He then moved on to do a PhD at the University of California (UC)-Davis, where he worked on the role of phenolic plant compounds on the biology of tomato-feeding insects. In 1983, after 2 years of postdoctoral work on insect growth inhibitors in desert plants at UC-Irvine, he accepted a position as Assistant Professor at UBC in the Department of Plant Science. He became a full professor in 1994.

If Professor Isman is such a respected authority in his discipline throughout the world, it is, in part, because he has skillfully managed to make important contributions to both the fundamental and applied branches of his discipline, collaborating with both academic and industrial partners. For example, he and his team have demonstrated that the biological activity of neem-based insecticides depends largely on the presence of the principal constituent, azadirachtin, while minor components play little role in efficacy. Conversely, he has shown that minor constituents of essential oils can have an important synergistic insecticidal effect. His research has also shown that natural mixtures of constituents found in botanical insecticides can delay or prevent habituation to feeding deterrents. His work on botanicals has been instrumental in the development of essential-oil-based insecticides marketed by EcoSMART Technologies Inc., relevant for industrial, agricultural and consumer markets, now available in over 10,000 retail outlets in the USA and sold in 11 other countries. Professor Isman has had a remarkably productive career. Having received over \$4 million of extramural funding, he has more than 180 publications, including 3 that have been cited over 200 times, according to the ISI Science Citation Index, and has co-edited 2 books. Over the past 27 years, he has been involved in the teaching of nine separate courses and has served as external examiner for doctoral theses in several countries around the world. He has also been a devoted mentor, playing a role in the training of 24 graduate students, 12 postdoctorals and 14 visiting scholars.

Professor Isman's outstanding career has been recognized by previous awards, including the Society's C. Gordon Hewitt Award in 1991, the Bronze Medal from the International Society of Chemical Ecology in 1997, and his appointment as a Distinguished Scholar in the Peter Wall Institute for Advanced Studies at UBC in 2004.

With respect to his contributions to the affairs of scientific societies, Prof. Isman has served as President of the International Society of Chemical Ecology, the Phytochemical Society of North America and the Entomological Society of British Columbia, and has been a member of various Entomological Society of Canada committees.

Le récipiendaire 2011 de la Médaille d'or de la Société d'entomologie du Canada pour une contribution exceptionnelle en entomologie est Professeur Murray B. Isman. Chercheur accompli, Professeur Isman a fait plusieurs découvertes fondamentales en écologie chimique des insectes et a apporté des contributions importantes sur la chimie et le mode d'action des pesticides botaniques. Professeur à la Faculté « Land and Food Systems » à l'Université de Colombie-Britannique (UBC) depuis 1988 et présentement doyen de cette faculté, Professeur Isman a complété un baccalauréat en zoologie à l'UBC en 1975 et une maîtrise dans le même établissement en 1977, où il a étudié la séquestration des cardénolides chez les punaises *Oncopeltus fasciatus*. Il a ensuite déménagé pour faire un doctorat à l'Université de Californie (UC)-Davis, où il a travaillé sur le rôle des composés phénoliques des plantes sur la biologie des insectes se nourrissant de tomates. En 1983, après un post-doctorat de 2 ans sur les inhibiteurs de croissance des insectes dans les plantes désertiques à l'UC-Irvine, il a accepté un poste de professeur assistant à l'UBC au département des sciences des plantes. Il est devenu professeur en 1994.

Si Professeur Isman est une autorité aussi respectée dans sa discipline à travers le monde, c'est parce qu'il a habilement réussi à apporter des contributions importantes autant dans les branches fondamentales qu'appliquées de sa discipline, collaborant avec des partenaires académiques et industriels. Lui et son équipe ont par exemple démontré que l'activité biologique des insecticides à base de neem dépend largement de la présence du constituant principal, l'azadirachtine, alors que des composants mineurs ne jouent qu'un rôle mineur dans son efficacité. De la même façon, il a montré que les composants mineurs des huiles essentielles peuvent avoir un effet insecticide synergique important. Ses recherches ont également montré que des mélanges naturels de composés trouvés dans des insecticides botaniques peuvent retarder ou prévenir l'habituation aux anti-appétants. Ses travaux en botanique ont été précieux dans le développement d'insecticides à base d'huile essentielle mis en marché par EcoSMART Technologies Inc., insecticides importants pour les marchés industriels, agricoles et de consommation, maintenant disponible dans plus de 10 000 détaillants aux É.U. et vendus dans plus de 11 pays.

Professeur Isman a eu une carrière incroyablement productive. Ayant reçu plus de 4 millions de dollars de financement extramural, il a plus de 180 publications, incluant 3 qui ont été citées plus de 200 fois selon le ISI Science Citation Index, et a co-édité 2 livres. Durant les 27 dernières années, il a été impliqué dans l'enseignement de 9 cours distincts et a servi d'examineur externe pour des thèses de doctorat dans de nombreux pays. Il a également été un mentor dévoué, jouant un rôle dans la formation de 24 étudiants gradués, 12 postdoctoraux et 14 professeurs invités.

La formidable carrière du Professeur Isman a été reconnue par différents prix, incluant le prix C. Gordon Hewitt de la SEC en 1991, la Médaille de bronze de la Société internationale d'écologie chimique (ISCE) en 1997, et sa nomination en tant que Professeur distingué (« Distinguished Scholar ») à l'Institut Peter Wall pour les études avancées de l'UBC en 2004.

Pour ce qui est de sa contribution dans les affaires des sociétés scientifiques, Professeur Isman a servi en tant que Président de la Société internationale d'écologie chimique (ISCE), la Société phytochimique d'Amérique du Nord et la Société d'entomologie de Colombie-Britannique, et il a été membre de différents comités de la Société d'entomologie du Canada.

Previous recipients / Récipiendaires antérieurs

1962 R.F. Morris	1987 J.N. McNeil
1963 A.W.A. Brown	1988 J.H. Borden
1964 R. Glen	1989 M. Mackauer
1965 M.L. Prebble	1990 S. Tobe
1966 C.W. Farstad	1991 R.G.H. Downer
1967 B.N. Smallman	1992 G.B. Wiggins
1968 W.G. Wellington	1993 No Award
1969 K.E.F. Watt	1994 T. Royama
1970 C.S. Holling	1995 R.A. Brust
1971 J.G. Rempel	1996 J. Kukalova-Peck
1972 R.W. Salt	1997 P. Harris
1973 B. Hocking	1998 D.M. Rosenberg
1974 P.S. Corbet	1999 L. Masner
1975 G.G.E. Scudder	2000 B.J.R. Philogene
1976 B.P. Beirne	2001 J. R. Spence
1977 J.A. Downes	2002 R.J. Lamb
1978 R.W. Stark	2003 H. Danks
1979 G.P. Holland	2004 J. Myers
1980 G.E. Ball	2005 P. Kevan
1981 D.K. McE. Kevan	2006 R. Ring
1982 E.G. Munroe	2007 C. Gillott
1983 F.L. McEwen	2008 B. Roitberg
1984 K.G. Davey	2009 N. Holliday
1985 R.N. Sinha	2010 C. Vincent
1986 E.J. Leroux	

Murray B. Isman



GOLD MEDAL ADDRESS

The Beneficiaries of My Efforts

Murray B. Isman

Being recognized by one's peers for a collection of accomplishments attained over many years makes one pause to reflect on the true value or impact of those accomplishments and who may have benefited from them. Founded on a natural curiosity and love of insects, my graduate research culminated in publication of a number of papers in peer-reviewed journals, producing the excitement and satisfaction of making "original contributions to knowledge", presumably of benefit to a wide scientific audience. Embarking on an academic career, I realized that I had responsibilities to both undergraduate and graduate students, but with those responsibilities, opportunities to have a positive influence on their education and moreover, to stimulate their own curiosities about insects. Seeing undergraduates choose to pursue graduate research in entomology, and graduate students eventually launch their own careers in entomology makes it easy to justify them as beneficiaries of my pedagogical efforts. However, university students constitute a very receptive audience. What of the wider community? A source of frustration for many scientists including entomologists is that most of the lay public just "don't get" what we do, and in particular, don't see the value in much entomological research. At the extreme, friends and family are amused if not dumbfounded that our research is funded by federal (or provincial) tax dollars. It certainly became easier to justify my research to a lay audience after I began conducting research for and providing consulting to a fledgling company specializing in natural pesticides. Some of my research efforts over the past 15 years have contributed to the development of consumer products now sold in over 10,000 retail outlets in the USA as well as agricultural, professional and animal health products sold in more than 10 countries. Helping to develop pesticides that are safer to the user and the environment (and cost effective) has created an entire new category of beneficiaries of my research – home-owners and pest management professionals. For me, this has been a satisfying addition to those in the scientific community who are more appreciative of things like journal publications, symposium presentations and other research "outputs" that are mostly viewed as trivia by many in the general public and the "working world". Over time I came to realize that in industrialized countries botanical insecticides are for the most part specialty or niche products – useful in certain contexts but unlikely to displace synthetic or microbial pesticides for most applications. Where botanicals should have the greatest impact is in developing countries – where the issue of food security eclipses that of environmental protection, and where the vast majority of human poisonings from conventional pesticides occur. I have thus in recent years turned my attention to the development and implementation of crude botanical preparations for pre- and post-harvest pest management in areas such as eastern Indonesia, Ecuador and sub-Saharan Africa. In the end, even modest incremental improvements in protection of food in these largely impoverished tropical regions may have a profound effect on human wellbeing, making rural populations in these regions the beneficiaries of my efforts that I prize the most.

Les bénéficiaires de mes efforts

Murray B. Isman

Être reconnu par ses pairs pour un ensemble d'accomplissements effectués au cours des années amène à faire une pause et à réfléchir sur la vraie valeur ou l'impact de ces accomplissements et de ceux qui en ont bénéficié. Fondée sur une curiosité naturelle et un amour des insectes, ma recherche graduée a culminé par la publication d'un nombre d'articles dans des revues à comité de lecture, amenant l'excitation et la satisfaction d'apporter des contributions originales à la connaissance, probablement pour une large audience scientifique. Débutant une carrière scientifique, j'ai réalisé que j'avais des responsabilités autant envers les étudiants de premier cycle que les étudiants gradués, mais avec ces responsabilités venaient des opportunités d'avoir une influence positive sur leur éducation et, encore mieux, de stimuler leur curiosité à propos des insectes. Voir des étudiants de premier cycle décider d'entreprendre des études graduées en entomologie, et des étudiants gradués débiter leur propre carrière en entomologie justifie amplement qu'ils soient les bénéficiaires de mes efforts pédagogiques. Cependant, les étudiants universitaires constituent une audience très réceptive. Qu'en est-il de la communauté plus large? Une des sources de frustration pour beaucoup de scientifiques est que le public ne comprenne pas ce que nous faisons, et plus particulièrement ne voit pas la valeur de la plupart de la recherche entomologique. À l'extrême, les amis et la famille sont amusés, s'ils ne sont pas sidérés que nos recherches soient financées par les taxes fédérales (ou provinciales). Il devient certainement plus facile de justifier mes recherches à une audience profane après le début de mes recherches et de mes consultations pour une nouvelle compagnie spécialisée en pesticides naturels. Une partie des efforts de recherche des 15 dernières années a contribué au développement de produits de consommation maintenant vendus dans plus de 10 000 détaillants aux États-Unis, ainsi que des produits agricoles, professionnels, et de santé animale dans plus de 10 pays. Aider à développer des pesticides qui sont plus sécuritaires pour l'utilisateur et l'environnement (et financièrement efficaces) a créé une nouvelle catégorie de bénéficiaires pour mes recherches – les propriétaires de maison et les professionnels en gestion des ravageurs. Pour moi, cela a été une satisfaction additionnelle à celles de la communauté scientifique qui est plus appréciative de choses comme les publications dans des revues, les symposiums et les autres rendements en recherche qui sont considérés comme triviaux par la plupart du grand public et du monde du travail. Avec le temps, j'ai réalisé que dans les pays industrialisés, les insecticides botaniques sont pour la plupart des produits spécialisés – utiles dans certains contextes, mais peu probables de remplacer les pesticides synthétiques et microbiens pour la plupart des applications. Là où les insecticides botaniques devraient avoir le plus grand impact est dans les pays en développement – là où la question de la sécurité de la nourriture éclipse celle de la protection de l'environnement, et où la grande majorité des empoisonnements humains par les pesticides conventionnels se produisent. J'ai donc récemment tourné mon attention vers le développement et l'implantation de préparations botaniques brutes pour la gestion des ravageurs pré- et post-récolte dans des endroits tels que l'est de l'Indonésie, l'Équateur et l'Afrique sub-saharienne. Même des améliorations modestes dans la protection de la nourriture dans ces régions tropicales largement appauvries peuvent avoir un effet important sur le bien-être humain, faisant des populations rurales de ces régions les bénéficiaires de mes efforts auxquels j'accorde le plus d'importance.

Entomological Society of Canada C. Gordon Hewitt Award

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

2011

presented to

KIRK HILLIER

at Halifax, Nova Scotia, 6 November 2011



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

2011

présenté à

KIRK HILLIER

à Halifax, Nouvelle-Écosse, le 6 novembre 2011

The 2011 recipient of the C. Gordon Hewitt Award is Dr Neil Kirk Hillier. An Associate Professor in the Department of Biology at Acadia University, Dr Hillier has become a prominent figure in insect pheromone research in Canada. Broad in scope, his research has both basic and applied components, and incorporates elements of chemical ecology, agriculture, behaviour and neuroscience. His most significant contributions pertain to olfactory processing of insect pheromones and the genetic control of pheromone perception.

In 1998, Dr Hillier completed a BSc degree in biology at Memorial University, and undertook a PhD in the same institution, where he studied the use of semiochemicals for pest monitoring with Professor Dave Larson and Dr Peggy Dixon (Agriculture and Agri-Food Canada). He graduated in 2002 and undertook a postdoctoral fellowship in the laboratory of Professor Neil Vickers, at the University of Utah. There, he initially studied courtship in moths, but eventually sought training in insect neurophysiology and became a leading expert in sensory recordings made from insect antennae. He was recruited as Assistant Professor by Acadia in 2007 and promoted to Associate Professor in 2010. He was also Visiting Scientist at the Theodor Boveri Institut and the Max Planck Institut für Chemische Ökologie, both in Germany, in 2006 and 2007, respectively.

Dr Hillier's research program aims at acquiring a better understanding of insect olfactory processing and the relationship between odours and insect behaviour. More specifically, his research is concerned with mapping of olfactory receptor neurons, identification of previously undescribed male pheromone-sensitive sensilla and modification of insects using interspecific tissue transplants. Dr Hillier has also developed a regional network of collaborators with whom he works on applied aspects of entomology, including the chemical ecology and management of lowbush blueberry and vineyard pests.

Dr Hillier has already had remarkable success in obtaining research grants. Upon accepting his position at Acadia, he was successful in securing a \$349,000 Canadian Foundation for Innovation grant, which he used to develop a neurophysiology facility known as the Chemical Analysis and Bioimaging Laboratory. Dr Hillier has also been successful in obtaining funding from various other sources, including a recent \$6.9M collaborative grant from the Atlantic Canada Opportunity Agency, awarded for applied work on the use of pheromones for insect pest management.

Dr Hillier has authored or co-authored 12 peer-reviewed papers, including 1 in the prestigious Proceedings of the National Academy of Sciences, and has several others in preparation as well as some in non-refereed publications. Known for his outstanding communication skills, he has given numerous invited lectures and over 24 conference presentations. He has contributed to the teaching of 6 courses at Acadia, where he has also supervised 35 graduate, honours and summer students. In 2009, he was awarded an Acadia Student Union Teaching Recognition Award.

Finally, Dr Hillier has provided dedicated service to the ESC, which he joined in 2000. Since 2004, he has been an active and valued member of the Marketing Committee and has chaired this committee since 2007. In addition, he has been a member of the AES since 1999 and is Co-chair of this year's ESC-AES Joint Annual Meeting.

Le récipiendaire 2011 du prix C. Gordon Hewitt est Dr Neil Kirk Hillier. Professeur associé au département de biologie de l'Université Acadia, Dr Hillier est devenu une figure importante dans la recherche sur les phéromones d'insectes au Canada. Portant sur un vaste domaine, ses recherches couvrent autant des aspects fondamentaux qu'appliqués, et elles incorporent des éléments d'écologie chimique, agriculture, comportement et neurosciences. Ses contributions les plus importantes concernent le traitement olfactif des phéromones d'insectes et le contrôle génétique de la perception des phéromones.

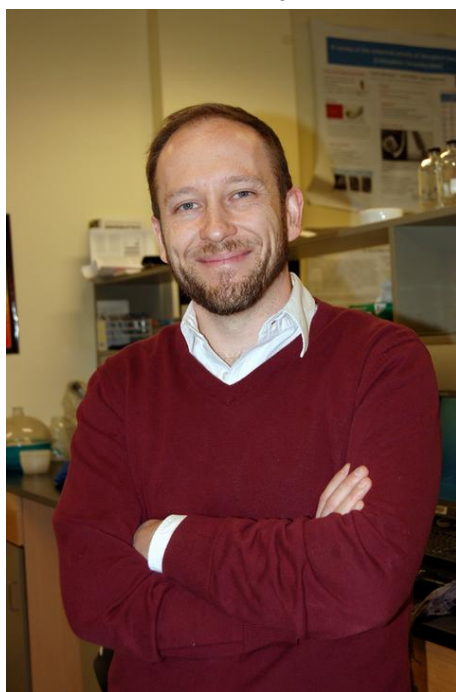
En 1998, Dr Hillier a terminé un baccalauréat en biologie à l'Université Memorial, où il a également entrepris un doctorat sur l'utilisation des substances sémiocimiques dans la gestion des ravageurs avec Prof. Dave Larson et Dr Peggy Dixon (Agriculture et agroalimentaire Canada). Il a gradué en 2002 et entrepris un postdoctorat dans le laboratoire de Prof. Neil Vickers à l'Université de l'Utah. Il y a d'abord étudié les parades sexuelles chez les papillons, mais s'est éventuellement tourné vers une

formation en neurophysiologie de l'insecte et est devenu un expert dans les enregistrements sensoriels des antennes des insectes. Il a été recruté comme professeur assistant par Acadia en 2007, et a été promu professeur associé en 2010. Il a également été chercheur invité au Theodor Boveri Institut et au Max Planck Institut für Chemische Ökologie, tous deux situés en Allemagne, respectivement en 2006 et 2007. Le programme de recherches de Dr Hillier vise à obtenir une meilleure compréhension du traitement de l'olfaction chez les insectes et de la relation entre les odeurs et le comportement des insectes. Plus particulièrement, ses recherches s'appliquent à la cartographie des neurones récepteurs olfactifs, à l'identification de sensilles mâles sensibles aux phéromones non-décrites précédemment et à la modification des insectes en utilisant des transplants de tissus interspécifiques. Dr Hillier a également développé un réseau régional de collaborateurs avec qui il travaille sur des aspects appliqués de l'entomologie, incluant l'écologie chimique et la gestion de ravageurs du bleuet à feuilles dentelées et des vignes.

Dr Hillier a déjà eu un succès incroyable dans l'obtention de subventions de recherche. Depuis le début de son poste à Acadia, il a réussi à obtenir une subvention de 349 000\$ de la Fondation canadienne pour l'innovation qu'il a utilisé pour développer une installation de neurophysiologie connue comme le laboratoire d'analyse chimique et de bioimagerie. Dr Hillier a également réussi à obtenir des financements de différentes autres sources, incluant une subvention collaborative récente de 6.9 M\$ de l'Agence de promotion économique du Canada atlantique, accordée pour des travaux appliqués sur l'utilisation de phéromones pour la gestion des insectes ravageurs.

Dr Hillier a écrit ou coécrit 12 articles avec comité de révision, incluant 1 dans la prestigieuse revue *Proceedings of the National Academy of Sciences*, et en a plusieurs autres en préparation, ainsi que des articles sans comité de révision. Connu pour ses incroyables talents en communication, il a donné de nombreuses conférences invitées et plus de 24 présentations dans des congrès. Il a contribué à l'enseignement de 6 cours à Acadia, où il a également supervisé 35 étudiants diplômés, de premier cycle et d'été. En 2009, il a reçu un le prix *Acadia Student Union Teaching Recognition Award* pour ses enseignements. Finalement, Dr Hillier s'est impliqué de façon dédiée à la SEC qu'il a jointe en 2000. Depuis 2004, il est un membre actif et important du comité du marketing et il préside ce comité depuis 2007. De plus, il est membre de la SEA depuis 1999 et co-organise la réunion conjointe annuelle SEC-SEA de cette année.

Kirk Hillier



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. Bouchier
2002 No Award
2003 H. Proctor
2004 No Award
2005 D. Hegedus
2006 C. Buddle
2007 M. Evenden
2008 No Award
2009 S. VanLaerhoven
2010 D. Huber

BERT AND JOHN CARR AWARD

In 2010, the ESC saw the creation of a new award, the Carr Award, which is named in honour of Bert and John Carr, who left a legacy of entomological knowledge resulting from the collection and taxonomy of several hundred thousand North American beetle specimens. This award has been made possible by the Carrs' desire to see an interest in science and nature carried through to the next generation. This is a cash award (\$500) in support of research activities by individuals who study insect faunistics, or the natural history and taxonomy of Canada's insect fauna. Although preference is given to applications by amateurs, applications by students and others are also considered.

The first recipient of the Carr award is Dr Zoë Lindo who, at the time of submitting her application, was a postdoctoral fellow at McGill University. Dr Lindo received her BSc in ecology and MSc in soil ecology from the University of Calgary where she became interested in soil microarthropods and, in particular, oribatid mites (Acari: Oribatida). In 2004, Dr Lindo returned to her home town of Victoria, to complete her PhD in community ecology at the University of Victoria (2008), where she explored the biodiverse mite communities in temperate rainforest canopy systems. From 2008 to 2011, Dr Lindo was a postdoctoral fellow at McGill University, working on sub-arctic moss-microarthropod communities and their response to climate change and habitat fragmentation. In September 2011, Dr Lindo will become an Assistant Professor at the University of Western Ontario in London.

Dr Lindo describes herself as a biodiversity scientist, a term adopted to encompass the breadth of research in the areas of community ecology, soil ecology, acarology, and taxonomy/systematics. Support from the Carr Award will allow her to compile a comprehensive list of oribatid mite species for British Columbia, contribute to the E-fauna of BC webpages, and write a manuscript for *The Canadian Entomologist*. To date, this project includes an estimated 314 species for British Columbia, of which an estimated 109 species are currently undescribed.

Zoë Lindo



PRIX BERT ET JOHN CARR

En 2010, la SEC a vu la création d'un nouveau prix, le prix Carr, nommé en l'honneur de Bert et John Carr qui ont laissé un héritage de connaissances entomologiques provenant de la collecte et de la taxonomie de plusieurs centaines de milliers de spécimens de coléoptères d'Amérique du nord. Ce prix voit le jour grâce au désir de Bert et John Carr de voir leur intérêt dans les sciences et la nature être transmis aux prochaines générations. Il s'agit d'un prix en argent (500\$) afin de soutenir les activités de recherche par des individus qui étudient la faunistique des insectes, ou l'histoire naturelle et la taxonomie de la faune d'insectes au Canada. Bien que la préférence soit donnée aux amateurs, les demandes d'étudiants et autres sont aussi considérées.

Le premier récipiendaire du prix Carr est Dr Zoë Lindo qui, au moment de la demande, était chercheuse postdoctorale à l'Université McGill. Dr Lindo a obtenu son baccalauréat en écologie et sa maîtrise en écologie du sol de l'Université de Calgary où elle s'est intéressé aux microarthropodes du sol et, plus particulièrement, des acariens oribates (Acari : Oribatida). En 2004, Dr Lindo est retournée dans sa ville natale Victoria afin de compléter un doctorat en écologie des communautés à l'Université de Victoria (2008) où elle a exploré la biodiversité des communautés d'arthropodes dans les canopées des forêts tempérées humides. De 2008 à 2011, Dr Lindo a fait un post-doctorat à l'Université McGill sur les communautés de mousses et microarthropodes subarctiques et leur réponse aux changements climatiques et à la fragmentation des habitats. En septembre 2011, Dr Lindo deviendra assistante professeure à l'Université Western Ontario à London.

Dr Lindo se décrit comme une scientifique de la biodiversité, un terme adopté afin d'inclure la diversité des domaines de recherche de l'écologie des communautés, l'écologie du sol, l'acarologie et la taxonomie/systématique. Le soutien du prix Carr lui permettra de compiler une liste exhaustive des espèces d'acariens oribates de Colombie-Britannique, de contribuer à la page « E-fauna of BC » et d'écrire un article pour *The Canadian Entomologist*. A ce jour, le projet inclut une estimation de 314 espèces de Colombie-Britannique, incluant environ 109 espèces non décrites.



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 2011, this recognition is given to Linda and Peter Payzant who are both retired electrical engineers. Linda was born in Ottawa and educated at Carleton University and Nova Scotia Technical College; Peter was born in Montreal and educated at Dalhousie University and Nova Scotia Technical College. They met in graduate school and discovered a shared interest in natural history. Peter's interest in insects dates from a childhood meeting with biologist Pierre Taschereau at a YMCA camp, and Linda had a long-standing interest in birding. Initially, they did considerable collecting, focussing mainly on moths. During this period staff at the Nova Scotia Museum, notably Barry Wright and Fred Scott, were particularly supportive. Their collection was eventually deposited with the Nova Scotia Department of Natural Resources, and the Payzants now use a camera in their field work.

The Payzants were thrilled to be among the first to record the arrival of Large Yellow Underwing *Noctua pronuba* (L.) in the province at Waverley in 1980, and the arrival of Common Ringlet *Coenonympha tullia* (Müller, 1764), at Brier Island in 1992. They have served on the boards of several amateur naturalist organizations, organized the first breeding bird atlas project for the Maritime Provinces, led many butterfly field trips and for 13 years conducted a yearly NABA butterfly count in the Halifax area. They worked on field checklists of the butterflies and the odonates of Nova Scotia, and currently maintain a website devoted to the butterflies of Nova Scotia (www.novascotiabutterflies.ca).

They have combined their interest in entomology with a love of travel. Linda has been stung by an inch ant (*Myrmecia* sp.) in Australia and infested with chiggers in Trinidad; Peter has been bitten by a tsetse fly in Kenya and stung by a paper wasp in the Galapagos. Both have marvelled at Birdwing butterflies in Papua New Guinea and Blue Morphos in Costa Rica.

While they have no formal training in biology, they have derived a great deal of pleasure from their amateur efforts, and look forward to many more years of learning about entomology, and in particular butterflies and moths. Linda and Peter Payzant have made many valuable contributions to entomology and conservation in Atlantic Canada, so we are pleased to present the Norman Criddle Award to both at the 2011 ESC-AES Joint Annual Meeting in Halifax, Nova Scotia.

Linda and Peter Payzant



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 2011, ce prix est décerné à Linda et Peter Payzant sont tous deux ingénieurs électriques retraités. Linda est née à Ottawa et a fait ses études à l'Université Carleton et à l'Université technique de Nouvelle-Écosse; Peter est né à Montréal et a fait ses études à l'Université Dalhousie et à l'Université technique de Nouvelle-Écosse. Ils se sont rencontrés lors de leurs études graduées et se sont découvert un intérêt commun pour l'histoire naturelle. L'intérêt de Peter pour les insectes remonte à une rencontre avec le biologiste Pierre Taschereau dans un camp YMCA lors de son enfance, et Linda avait un intérêt de longue date pour les oiseaux. Au départ, ils ont fait un travail de collecte considérable, se concentrant principalement sur les papillons de nuit. Durant cette période, les employés du Musée de la Nouvelle-Écosse, notamment Barry Wright et Fred Scott, les ont particulièrement soutenu. Leur collection a éventuellement été déposée au Département des ressources naturelles de Nouvelle-Écosse, et les Payzant utilisent maintenant une caméra pour leur travail de terrain.

Les Payzant étaient excités d'être parmi les premiers à rapporter l'arrivée de la fiancée *Noctua pronuba* (L.) dans la province à Waverley en 1980, et l'arrivée du fadet des tourbières *Coenonympha tullia* (Müller, 1764), à Brier Island en 1992. Ils ont servi sur le conseil d'administration de plusieurs organisations de naturalistes amateurs, ont organisé le premier projet d'atlas des oiseaux nicheurs pour les provinces maritimes, ont mené plusieurs sorties de terrain pour la collecte de papillons et, durant 13 ans, ils ont annuellement conduit le décompte NABA des papillons dans la région d'Halifax. Ils ont travaillé sur une liste de terrain des papillons et odonates de Nouvelle-Écosse, et maintiennent présentement un site Internet dédié aux papillons de Nouvelle-Écosse (www.novascotiabutterflies.ca).

Ils ont combiné leur intérêt en entomologie avec un amour du voyage. Linda a été piquée par une fourmi (*Myrmecia* sp.) en Australie et a été infestée par des rougets à Trinidad ; Peter a été mordu par une mouche tsésé au Kenya, et piqué par une guêpe à papier dans les Galápagos. Tous deux ont été émerveillés par les papillons aux ailes d'oiseaux en Papouasie Nouvelle-Guinée et par les morphos bleus au Costa Rica.

Bien qu'ils n'aient aucune formation formelle en biologie, ils ont retiré un grand plaisir de leurs efforts amateurs, et espèrent encore apprendre sur l'entomologie pendant de nombreuses années, en particulier sur les papillons de jour et de nuit.

Linda et Peter Payzant ont apporté des contributions importantes à l'entomologie au Canada Atlantique, et nous sommes enchantés de lui décerner le prix Norman Criddle à la reunion annuelle 2011 SEC-SEA à Halifax, en Nouvelle-Écosse.

Previous recipients / Récipiendaires antérieurs

1977 Terry Galloway	2000 Stéphane Le Tirant
1981 Buck Goodwin	2001 Ross Layberry
1982 Alan Hanks	2002 Robyn Underwood
1983 Ron Hooper	2003 Rex Kenner
1986 Paul Klassen	2004 Henry Hensel
1990 John and Bertha Carr	2005 Gary Anweiler
1992 John Kozial	2006 André Beaudoin
1993 Jim Troubridge	2007 Anna L. Leighton
1996 Paul Brunelle	2008 Jay Cossey
1997 Ruby Larson	2009 Robert Wrigley
1999 Bernie Gollop	2010 Dennis St. John

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 Northumberland Room on the Conference/first floor 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, November 6	9:00 – 13:00; 16:30 – 20:00
Monday, November 7	7:00 – 18:00
Tuesday, November 8	7:00 – 17:00
Wednesday, November 9	7:00 – 8:00; 10:00 – 10:30

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 2011 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_Nov7_President's Prize1_8:30_Commonwealth A

Poster Presentations: The posters presentations are located in the Commonwealth B Room on the Conference/first floor level of the venue. Posters can be put up on Sunday, November 6 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 7 from 3-4 PM.

All posters must be taken down by 10 PM on Tuesday, November 7. Posters cannot remain up overnight, as the Commonwealth B Room is needed for meetings on Wednesday. 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 Commonwealth Foyer. The desk will be open from:

Sunday, November 6	9:00 – 13:00 ; 17:00 – 20:00
Monday, November 7	7:00 – 8:30, 10:00 – 10:30; 12:00 – 13:00
Tuesday, November 8	7:00 – 8:30

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. Shawn MacLean or Ms. Susan Horton, 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 Commonwealth Foyer of the Conference Level of the Westin Hotel. All oral and poster presentations take place on the Conference/first floor level (Commonwealth A, Commonwealth B, Atlantic Ballroom, Lunenburg Room, Maritime, Boardroom), or the Lobby/ground floor level (Harbour Suite A, Harbour Suite B, Cornwallis) of the hotel. The Audio-Visual Centre is located in the Northumberland Room on the Conference/first floor Level. The ESC Editorial Board Meeting will take place in Boardroom. The ESC President's Reception will take place in the Cornwallis room..

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

Sunday, November 6	14:00 - 14:30	
Monday, November 7	10:00 - 10:30	15:00 - 15:30
Tuesday, November 8	10:00 - 10:30	15:00 - 16:00 *
Wednesday, November 9	10:00 - 10:30 AM	

* Tuesday PM break is also the Dedicated Poster Session, with Authors at their presentations in the Commonwealth B Room.

Social Functions:

Sunday, November 6	Opening Reception	18:30 - 22:00	Atlantic Ballroom
Monday, November 7	Students Mixer (Students only)	19:30 - 22:00	Harbour Suite A&B
	President's Reception (by Invitation)	19:30 - 22:00	Cornwallis Room
Tuesday, November 8	ESC Banquet Reception	18:00 – 19:00	Atlantic Mezzanine
	ESC Banquet & Awards	19:00 – 23:00	Commonwealth A

Society Meetings:

Monday, November 7	ESC Editorial Board	12:00 - 14:00
	(Boardroom - Editorial Board Members only)	
Tuesday, November 8	ESC Annual General Meeting	17:00 - 17:45
	(Atlantic Ballroom - Open to all ESC Members)	
	ESC Governing Board Meeting	17:45 - 18:30 PM
	(Atlantic Ballroom - Governing Board Members only)	
Wednesday, November 9	AES Annual General Meeting*	12:00 - 13:00 PM
	(Harbour Suite B - Open to all AES Members)	
	AES Executive Meeting	13:00 - 14:00 PM
	(Harbour Suite B – AES Executive Members only)	

Merchandise-Silent Auction: T-shirts featuring the JAM 2011 logo will be offered for sale in the Commonwealth Foyer during the off-session hours of the meeting. The Graduate students will be conducting a Silent Auction of items of entomological interest in the Commonwealth Foyer from Sunday through Tuesday. Deadline to get your bids in is 13:00, Tuesday, November 8. Items must be picked up during the Refreshment Break/Poster Session between 3 and 4 PM on that day.

Informations générales

Communications orales : Les communications orales régulières et les communications pour le prix des étudiants doivent durer 13 minutes suivies de deux minutes supplémentaires pour des questions, pour un total de 15 minutes par communication. Après 11 minutes, les modérateurs se lèveront afin d'indiquer qu'il ne reste que deux minutes de présentation. Après 13 minutes, les modérateurs donneront un rappel verbal qu'il ne reste que deux minutes aux présentateurs pour finir leur communication. Les modérateurs adhéreront de façon rigoureuse à la limite de 15 minutes : il y aura des sessions parallèles durant la réunion, et elles doivent donc respecter les horaires.

Centre audiovisuel : Le centre audiovisuel est situé dans la salle Northumberland au premier étage. C'est dans cette salle que les fichiers de présentations devront être téléchargés sur les ordinateurs et la salle sera équipée afin que les présentateurs puissent réviser leur communication.

Le centre audiovisuel sera ouvert aux horaires suivants :

Dimanche, 6 novembre	9h00 – 13h00; 16h30 – 20h00
Lundi, 7 novembre	7h00 – 18h00
Mardi, 8 novembre	7h00 – 17h00
Mercredi, 9 novembre	7h00 – 8h00; 10h00 – 10h30

Nous demandons que les fichiers de présentations soient téléchargés au moins un jour avant votre présentation.

Les présentateurs qui téléchargeront leur fichier alors que leur session est en cours auront le temps de téléchargement déduit de leurs 15 minutes de présentation. Veuillez utiliser une clé USB afin de transférer les fichiers. La réunion conjointe annuelle 2011 utilisera Microsoft PowerPoint ou Adobe Reader pour toutes les présentations. Nous utiliserons des ordinateurs PC opérant sous Windows7. Vous ne pourrez **pas** utiliser votre propre ordinateur. Chaque présentateur 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_Première initiale (du présentateur)_Date_Session_Heure_Salle

Exemple : Jack_D_Nov7_President's Prize 1_8:30_Commonwealth A

Présentations par affiches : Les présentations par affiches auront lieu dans la salle Commonwealth B au premier étage. Vous pouvez accrocher votre affiche dans la salle dimanche 6 novembre entre midi et 22h00. Des punaises seront disponibles et les présentateurs sont priés d'accrocher leur affiche à l'emplacement attribué. Tous les présentateurs d'affiches sont priés d'être près de leur affiche pendant la séance d'affiches, qui a lieu mardi 7 novembre de 15h à 16h.

Toutes les affiches devront être enlevées au plus tard mardi 7 novembre à 22h. Comme la salle Commonwealth B 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 ne pas être retournée aux participants.

Table d'inscription: La table d'inscription se trouve dans le foyer Commonwealth. Le bureau sera ouvert pendant les heures suivantes :

Dimanche, 6 novembre	9h00-13h00 et 17h00-20h00
Lundi, 7 novembre	7h00-8h30, 10h00-10h30 et 12h00-13h30
Mardi, 8 novembre	7h00-8h30

La table d'inscription ne sera pas ouverte pendant les sessions scientifiques, et sera fermée définitivement mardi matin à partir de 8h30. Toute personne voulant s'inscrire après cela devra contacter Dr. Shawn MacLean ou Mme Susan Horton, responsables du comité d'infrastructure locale.

Localisation des évènements et installations (voir les plans en page 1 de ce programme) :

Les inscriptions, informations, enchères silencieuses et ventes de marchandises auront lieu dans le foyer Commonwealth au niveau des conférences de l'hôtel Westin. Toutes les communications orales et par affiches auront lieu au premier étage (Commonwealth A, Commonwealth B, salle de bal Atlantic, salle Lunenburg, salle Maritime, salle Boardroom), ou au rez-de-chaussée (Suite Harbour A, Suite Harbour B, salle Cornwallis) de l'hôtel. Le centre audiovisuel est situé dans la salle Norhumberland du premier étage. La réunion du comité de rédaction aura lieu dans la salle Boardroom. La réception du président aura lieu dans la salle Cornwallis.

Pauses rafraîchissement : Café, thé (normal ou décaféiné), eau, boissons gazeuses, jus, et hors-d'œuvre seront servis dans le foyer Commonwealth aux heures suivantes :

Dimanche, 6 novembre	14h00-14h30
Lundi, 7 novembre	10h00-10h30 et 15h00-15h30
Mardi, 8 novembre	10h00-10h30 et 15h00-16h00*
Mercredi, 9 novembre	10h00-10h30

* La pause de mardi après-midi est dédiée à la séance d'affiches, qui a lieu dans la salle Commonwealth B.

Activités sociales :

Dimanche 6 novembre	Réception d'ouverture	18h30-22h00	Salle de bal Atlantic
Lundi 7 novembre	Cocktail étudiant (seulement pour les étudiants)	19h30-22h00	Suites Harbour
	Réception du président (sur invitation seulement)	19h30-22h00	Salle Cornwallis
Mardi 8 novembre	Accueil au banquet SEC	18h00-19h00	Salle de bal Atlantic
	Banquet SEC & remise de prix	19h00-22h00	Commonwealth A

Réunions de la Société :

Lundi 7 novembre	Comité de rédaction de la SEC (Boardroom – Membres du comité seulement)	12h00-14h00
Mardi 8 novembre	Assemblée générale annuelle de la SEC (Salle de bal Atlantic – Ouverte à tous les membres)	17h00-17h45
	Réunion du conseil exécutif de la SEC (Salle de bal Atlantic – Membres du conseil seulement)	17h45-18h30
Mercredi 9 novembre	Assemblée générale annuelle de la SEA* (Salle Suite Harbour B – Ouverte à tous les membres de la SEA)	12h00-13h00
	Réunion du conseil exécutif de la SEA (Salle Suite Harbour B – Membres du conseil exécutif de la SEA seulement)	13h00-14h00

Marchandises et vente aux enchères silencieuse: Des marchandises (t-shirts) portant le logo de la réunion conjointe annuelle 2011 seront vendus dans le foyer Commonwealth en dehors des sessions de présentations. Les étudiants gradués organisent une vente aux enchères silencieuse d'articles d'intérêt entomologique dans le foyer Commonwealth, de dimanche à mardi. Vous avez jusqu'au mardi 8 novembre à 13h pour faire des offres aux enchères. Les articles devront être ramassés mardi entre 15h et 16h, durant la pause rafraîchissement/session d'affiches.

Presentation Abstracts / Résumés des présentations

Abagli, A.Z. (1), Alavo, T.B.C.(1), Platzer, E.G.(2)

(1) Laboratoire d'Entomologie appliquée, Université d'Abomey-Calavi, BENIN; (2) Department of Nematology, University of California, Riverside, CA, USA

TUESDAY, NOV 8 AT 9:00

SUBMITTED ORAL

Effet du nématode entomopathogène *Romanormis iyengari* (Mermithidae) sur les larves de moustiques vecteurs de maladies en Afrique de l'Ouest

Le présent travail a évalué au laboratoire, l'effet du nématode entomopathogène *Romanormis iyengari* sur les larves des moustiques *Anopheles gambiae* et *Culex quinquefasciatus* respectivement vecteur du paludisme et de la filariose lymphatique en Afrique de l'Ouest. Les tests ont été réalisés contre les trois premiers stades larvaires de ces moustiques collectés dans les marécages de Cotonou au Bénin. Deux différentes concentrations de nématodes pré-parasitiques ont été expérimentées, à savoir : 5 et 10 nématodes pour une larve. Après infection, les larves de moustiques sont quotidiennement observées au stéréomicroscope afin de déterminer le nombre de larves mortes ainsi que le nombre de nématodes post-parasitiques qui émergent des cadavres. Les résultats ont montré que pour les deux concentrations de nématode, 100% des larves L1 d'*A. gambiae* meurent 24 heures après infection tandis que les larves de *C. quinquefasciatus* de ce stade meurent à 100% au 7ème jour seulement après infection pour la concentration de 10 nématodes. Pour les deux concentrations, les larves L2 et L3 d'*A. gambiae* meurent à 100% au bout du 7ème jour après infection. Les L2 et L3 de *C. quinquefasciatus* meurent plus tardivement. De plus, la moyenne de nématodes post-parasitiques qui émergent d'une larve d'*A. gambiae* est plus élevée que celle de nématodes post-parasitiques qui émergent de *C. quinquefasciatus*. Ces données indiquent que les larves d'*A. gambiae* sont plus sensibles au *R. iyengari* que celles de *C. quinquefasciatus*. La possibilité d'utiliser *R. iyengari* pour la lutte anti-vectorielle en Afrique de l'Ouest est discutée.

Adamo, S.A.

Department of Psychology and Neuroscience, Dalhousie University, Halifax, NS

MONDAY, NOV 7 AT 15:30

SUBMITTED ORAL

The consequences of intertwined physiological systems on insect immune function

Immune systems exist within a web of connections to other physiological systems. This talk explores some of the connections between the insect immune system, the stress response, and lipid metabolism. The multiple interconnections between these two ancient physiological responses may explain some of the seemingly paradoxical effects of stressful stimuli on immune function in both invertebrates and vertebrates.

Albert, J. R., Packer, L.

Department of Biology, York University, Toronto, ON

MONDAY, NOV 7 AT 16:30

PRESIDENT'S PRIZE - ORAL

Social Organization and nestmate relatedness in the primitively eusocial bee *Halictus farinosus*

By comparing microsatellite alleles between nestmates of the bee *Halictus farinosus* we reveal kin relationships and determine that *H. farinosus* workers are producing reproductive offspring. In addition microsatellite allele data indicate that this species is mostly monandrous. This study improves our understanding of social interactions and social organization in the eusocial halictids and allows us to examine the predictions of inclusive fitness theory in a primitively eusocial bee species.

Alhudaib, K. (1), **A. Ajlan** (1), A. Rezk(2)

(1) Department of Arid Land Agriculture ; (2) Department of Agricultural Biotechnology, College of Agricultural and Food Sciences, King Faisal University, Saudi Arabia

TUESDAY, NOV 8 AT 15:00

SUBMITTED POSTER

Genetic study of tomato leaf miner, *Tuta absoluta* (Lepidoptera: Gelechiidae), the newly invasive pest to Saudi Arabia

The newly invasive *Tuta absoluta* is a threat to tomato production in Saudi Arabia. It was detected in Spain in 2006 then spread to Europe and Mediterranean region. It reached to Tabuk and Hail, Saudi Arabia in 2010, while to Alhassa in 2011. Genomic DNA was extracted from Alhassa population. PCR amplified was used to determine the mtDNA gene encoding cytochrome oxidase I (COI) primers (Cifuentes *et al.*, 2011). The COI sequence of *Tuta absoluta*-Alhassa compared with others isolate and had 99% identity with Spain (HQ873080). This result demonstrates first sequence of COI of *Tuta absoluta* from Saudi Arabia population.

Ameen, A.O.

Plant Health Risk Assessment Unit, Science Branch, Canadian Food Inspection Agency, Ottawa, ON

TUESDAY, NOV 8 AT 15:00

SUBMITTED POSTER

Modelling the phytosanitary risks of two exotic pentatomids with particular reference to Canada

CLIMEX, a bioclimatic modelling software, was used to predict areas in Canada where the Brown marmorated stink bug (BMSB), *Halyomorpha halys* (Stål), and Bagrada bug (BG), *Bagrada hilaris* (Burmeister), may be able to survive and establish if accidentally introduced. These exotic pentatomids are currently absent in Canada but have each established in the US and parts of Europe. The polyphagous feeding habit of these bugs makes them significant phytosanitary threats to Canada. Recent Canadian interception records indicate a high probability of introduction of these pests. Bioclimatic models were developed to explore establishment potentials as well as the potentials of these bugs to cause significant economic impact. Preliminary results indicate that the probability of establishment is higher for BMSB than BG. BMSB may be able to survive and complete 1 generation in some parts of Canada, but it is doubtful if there are enough degree-days to ensure the survival of BG. If established, BMSB would have significant economic impact initially as a nuisance pest in urban areas and may become a significant agricultural pest over time.

Andreassen, L.D. (1), S. Whyard (2), U. Kuhlmann (3), P.G. Mason (4), N.J. Holliday (1)

(1) Department of Entomology, University of Manitoba, Winnipeg, MB; (2) Department of Biological Sciences, University of Manitoba, Winnipeg, MB; (3) CABI Europe — Switzerland, Delémont, Switzerland (4) Eastern Cereal and Oilseeds Research Centre, Agriculture and Agri-Food Canada, Ottawa, ON

MONDAY, NOV 7 AT 8:30

PRESIDENT'S PRIZE - ORAL

Development of molecular markers to study the natural diet of a predacious biological control agent

Aleochara bipustulata (Coleoptera: Staphylinidae) may be introduced to Canada for control of *Delia radicum* (Diptera: Anthomyiidae), although knowledge about what adult *A. bipustulata* eat is currently scant. Markers to detect remains of immature *D. radicum*, and non-target Carabidae, in *A. bipustulata* guts were tested for specificity and sensitivity in the laboratory. Application of these techniques to *A. bipustulata* collected in its native range will inform judgement about its specificity as a predator.

Baird, D.J.

Environment Canada, Canadian Rivers Institute, Department of Biology, University of New Brunswick, Fredericton, NB

TUESDAY, NOV 8 AT 8:45

INVITED SYMPOSIA

Biomonitoring 2.0: generating and harnessing data on an epic scale for ecosystem assessment

Biomonitoring is currently restricted to one-at-a-time site-level assessments of general ecological impairment. Statistical methods for the extraction of stressor-specific diagnostic patterns from noisy ecological data exist, yet their use is restricted by their limited quantity and patchy spatial coverage, reflecting the gnarly nature of biological observation. Here, I illustrate the potential of high-throughput DNA sequencing to transform the scale and accuracy of biological observation.

Barbar, A. (1), S. Sen (2), C. Béliveau (3), A. Nisole (3), M. Cusson (1,3)

(1) Department of Biochemistry, Laval University, Québec, QC; (2) Department of Chemistry, The College of New Jersey, Ewing, NJ, USA; (3) Natural Resources Canada, Canadian Forest Service, Laurentian Forestry Centre, Québec City, QC

MONDAY, NOV 7 AT 11:00

PRESIDENT'S PRIZE - ORAL

Characterisation of farnesyl diphosphate synthase type-1 and type-2 in Lepidoptera

Farnesyl diphosphate synthase (FPPS) is a key enzyme in the biosynthesis of juvenile hormone. It catalyzes the condensation of isopentenyl diphosphate with dimethylallyl diphosphate, generating farnesyl diphosphate. FPPS is a single-copy gene in most insects but the Lepidoptera produce two distinct homologs. We measured the abundance and distribution of their transcripts in different tissues of two lepidopteran species and we assessed the enzymatic activity of the recombinant proteins in vitro.

Béliveau, C. (1), B. Boyle (2), J. Laroche (2), H. Maaroufi (2), D. Doucet (3), C. Lucarotti (4), F. Sperling (5), A. Nisole (1), L. Lumley (1), B. Brunet (5), R. Levesque (2), M. Cusson (1)

(1) Natural Resources Canada, Canadian Forest Service (NRCan-CFS), Laurentian Forestry Centre, Quebec, QC; (2) Institut de biologie intégrative et des systèmes, Université Laval, Québec, QC; (3) NRCan-CFS, Great-Lakes Forestry Centre, Sault Ste. Marie, ON; (4) NRCan-CFS, Atlantic Forestry Centre, Fredericton, NB; (5) Department of Biological Sciences, University of Alberta, Edmonton, AB

TUESDAY, NOV 8 AT 15:00

SUBMITTED POSTER

Budworm Eco-Genomics: Applications and Biotechnology (BEGAB), part I: the spruce budworm genome sequencing project

The spruce budworm (SBW) is one of the most destructive forest insect pests in Canada, with cyclical outbreaks causing growth losses and mortality. Current management approaches rely on the application of Bt to stands where populations have reached outbreak levels. As a first step towards developing alternative management strategies and new pest control products, we undertook the sequencing of the SBW genome. Here we report on the strategy used and the progress made in genome assembly.

Blair, M.S., T.A. Wheeler

Natural Resources Sciences, Macdonald Campus, McGill University, Ste-Anne-de-Bellevue, QC

MONDAY, NOV 7 AT 8:30

PRESIDENT'S PRIZE - ORAL

Spatial and temporal diversity of Scathophagidae (Diptera) in northern Canada

Although the Arctic is the subject of current interest because of the biotic impact of climate change, we lack baseline data on many taxa. Because Diptera are especially dominant in the Arctic, they are a logical study group. I will assess the spatial distribution of selected Diptera from the north boreal to the high arctic at 12 sites across Canada. I will also analyse temporal patterns, comparing selected families from the 1947-1962 Northern Insect Survey to current patterns at the same sites. This presentation will focus on Scathophagidae, a diverse group of calyptrate flies in the north.

Blake, A. J., L. M. Dossall, J.A. Tansey

Department of Agricultural, Food and Nutritional Science, 410 Agriculture/Forestry Centre, University of Alberta, Edmonton, AB

WEDNESDAY, NOV 9 AT 9:30

SUBMITTED ORAL

Nutritional effects on the visual appearance of canola and its attractiveness to the cabbage seedpod weevil

The objective of this study was to determine the effects of nitrogen and sulfur fertilization on the visual appearance of *Brassica napus* L. flowers and foliage, and the behavioral responses of *Ceutorhynchus obstrictus* (Marsham) adults to these plants. Preliminary results suggest nitrogen fertilization decreases the foliar reflectance of green wavelengths (~550 nm) and decreases attractiveness to females while increasing attractiveness to males.

Boiteau, G. (1), C. Vincent (2), F. Meloche (3), T. C. Leskey (4), B. G. Colpitts (5)

(1) Agriculture and Agri-Food Canada, Potato Research Station, Fredericton, NB; (2) Agriculture and Agri-Food Canada, Horticulture Research and Development Centre, Saint-Jean-Sur-Richelieu, QC; (3) Agriculture and Agri-Food Canada, Eastern Cereal and Oilseed Research Centre, Ottawa, ON; (4) USDA-ARS Appalachian Fruit Research Station, Kearneysville, WV, USA; (5) Department of Electrical and Computer Engineering, University of New Brunswick, Fredericton, NB

TUESDAY, NOV 8 AT 15:00

SUBMITTED POSTER

Validation of harmonic radar finders as insect monitoring devices

Harmonic radar technology is becoming widely adopted for the study or monitoring of a wide range of organisms. Adoption is proceeding despite limited information on detection and recovery rates or on relative impact of additional electronic tag load on mobility. A custom-designed portable harmonic radar was used over four years to quantify those factors for three insect pests: plum curculio, western corn rootworm and Colorado potato beetle. Results validate the method as long as tags are adapted to each species and the scanning procedure to the vegetative architecture.

Boiteau, G. (1), C. Noronha (2)

(1) Agriculture and Agri-Food Canada, Potato Research Centre, Fredericton, NB; (2) Agriculture and Agri-Food Canada, Crops and Livestock Research Centre, Charlottetown, PE

TUESDAY, NOV 8 AT 9:10

INVITED SYMPOSIA

The agricultural underworld of soil Collembola

Studies of agricultural soil mesofauna have been largely limited to summer. A multi-year project is looking at the biological significance of overwinter changes in the abundance and diversity of Collembola on the soil properties of Canadian cropping systems. The presentation will address challenges of having to sample the mesofauna across seasons. Preliminary results will be used to discuss the relative advantages of behavioural and flotation methods to extract insects from the samples

Bompard, A. (1), I. Amat (2), X. Fauvergue (3), T.Spataro (1)

(1) Laboratoire Ecology et Evolution, UMR CNRS 7625, Paris, France; (2) Laboratoire de Biometrie Biométrie et Biologie Evolutive, UMR CNRS 5558, Lyon, France; (3) Interactions Biotiques et Santé Végétale, UMR INRA-CNRS-UNS, Sophia Antipolis, France

MONDAY, NOV 7 AT 13:30

INVITED SYMPOSIA

Demographical consequences of mate-finding Allee effect in parasitoids: a theoretical approach

Parasitoids are key organisms for ecosystem management and biological control. The tight host-parasitoid interaction can lead to recurrent low population densities. Besides, virgin females of haplo-diploid species are able to produce males. Therefore, the demographical consequences of mate-finding Allee effect in parasitoid populations are uncertain. To tackle this question, we developed host-parasitoid models. Results suggest this Allee effect in parasitoids may be less innocuous than foreseen.

Bondrup-Nielsen, S.

Department of Biology, Acadia University, Wolfville, NS

TUESDAY, NOV 8 AT 13:00

SUBMITTED ORAL

Effect of body size and environmental complexity on inter- and intrasexual selection in the Forked Fungus Beetle, *Bolitotherus cornutus* Panzer (Coleoptera: Tenebrionidae)

The Forked Fungus Beetle is sexually dimorphic with males possessing pronotal horns. Horn size for males as well as body size of both male and female differ. It has been shown that large males or males with large horns mate preferentially. Given sexual selection theory, males should choose large bodied females but how does the complexity of the habitat affect mate selection? The results of this experiment indicates that males do choose large bodied females but only in simple environments.

Boquel, S., A. Ameline, P. Giordanengo

Université de Picardie Jules Verne, Laboratoire de Biologie des Entomophages, Amiens Cedex, France

WEDNESDAY, NOV 9 AT 9:30

SUBMITTED ORAL

Vector propensity of aphids to transmit Potato Virus Y (PVY) to potato

Potato virus Y (PVY) is a phytovirus transmitted in a non-persistent fashion by aphids to a broad range of plants. With the aim to evaluate the ability to transmit PVY to potato plants of different aphid species (colonizing or not), we measured the vector activity (behavioural component) and vector efficiency (acquisition and inoculation) involved in non-persistent viruses spread. This work brings new insights into our understanding of the mechanisms governing the PVY epidemiological dynamics.

Branton, R.M.

Ocean Tracking Network, Dalhousie University, Halifax, NS

TUESDAY, NOV 8 AT 9:15

INVITED SYMPOSIA

Take Care of the Zeros and the Numbers Will Take Care of the Themselves

Why do databases generally do include zero observations and is this necessarily a good thing? What is the Ocean Tracking Network and how can it help revitalize the Biological Survey of Canada? By looking at these and other questions, I hope to provide some insight into how modern computer systems can help biologists improve that way they manage their research data and in doing so advance the quality of their research.

Broadbent, B. (1), L. Shipp (2), L. Gualtieri (1)

(1) Agriculture and Agri-Food Canada (AAFC), London, ON; (2) AAFC, Harrow, ON

TUESDAY, NOV 8 AT 15:00

SUBMITTED POSTER

Impact of the entomopathogenic fungus, *Metarhizium anisopliae* on the non-target beneficial predator, *Orius insidiosus*

The minute pirate bug, *Orius insidiosus* (Hemiptera: Anthocoridae) is a predator of greenhouse insect pests, including *Lygus* nymphs. Targeting *Lygus* with the entomopathogenic fungus, *Metarhizium anisopliae* will also impact the beneficial *Orius*. In a lab study, an airbrush sprayer was used to treat both *Lygus* and *Orius* adults with 2 X 10⁶ viable spores/ml. Insect mortality was checked daily for 12 days and food and water in vials were replaced daily. In three replicated tests, the mean check mortality of *Lygus* was 12.3% and *Orius* was 15.3%; whereas the mean treatment mortality of *Lygus* was 61.7% but *Orius* was only 16.4%. This indicated no impact on the mortality of the non-target at the concentration tested.

Brooks, S.E., J.M. Cumming

Agriculture and Agri-Food Canada, C.E.F., Ottawa, ON

MONDAY, NOV 7 AT 13:15

SUBMITTED ORAL

The lurking diversity of Nearctic *Microphorella* (Diptera: Dolichopodidae) and the establishment of a distinctive new species group from western North America

Microphorella is a little known genus of tiny (1–3 mm) empidoid flies that are typically found along river banks and streams. The genus currently comprises 16 described species including five from the Nearctic Region. Recent field work and collection-based research has revealed an additional 17 or so undescribed species from western North America, including a distinctive new species group that is established in honour of Canadian National Collection dipterists Jim Chillcott and Dick Vockeroth.

Buddle, C.M.

Department of Natural Resource Sciences, McGill University, Montreal, QC

WEDNESDAY, NOV 9 AT 9:30

INVITED SYMPOSIA

On the vagaries of spider community ecology

We continue to lack a clear explanation about the main forces that structure communities of spiders, despite a large body of research. Using case studies of spiders living in Canadian forests, and in the tundra, I will examine critically the evolutionary and ecological process that might underpin how spider assemblages are structured. I will specifically investigate the role of biogeographic barriers, metabolic ecology, competition, and random processes.

Cannings, R.A.

Royal British Columbia Museum, Victoria, BC

MONDAY, NOV 7 AT 14:15

SUBMITTED ORAL

***Efferia okanagana*, a new species of robber fly (Diptera: Asilidae) from the grasslands of southern BC, Canada: taxonomy, biology, distribution and conservation status**

Efferia okanagana is described from southern BC, Canada. The species belongs to the *E. arida* species group; *E. coulei* Wilcox is its closest sympatric relative. Dissected terminalia of both male and female are illustrated. The new species has an early flight period (May and June) and lives in low-elevation grasslands dominated by Bluebunch Wheatgrass (*Pseudoroegneria spicata*), especially where the soil is gravelly. It is considered a potential species at risk and the Committee on the Status of Endangered Wildlife In Canada (COSEWIC) has commissioned a report on its status.

Carcamo, H., C. Herle

Lethbridge Research Centre, AAFC, AB

TUESDAY, NOV 8 AT 15:00

SUBMITTED POSTER

Phenology of *Lygus* bugs and parasitism by *Peristenus* wasps in alfalfa and canola in southern Alberta

Lygus bugs (Hemiptera: Miridae) are primary pests in seed alfalfa and intermittent in canola. Our objectives were to document the species composition and phenology of *Lygus* and to describe rates of parasitism in the two crops and non cultivated habitats. The dominant species were *L. elisus*, *L. keltoni* and *L. borealis* with the latter more common in alfalfa. Rates of parasitism reached 80% in uncultivated hedge mustard, were intermediate in weedy alfalfa (~50%) and near zero in canola.

Carleton, D. (1), Silk, P. (2), Eveleigh, Eldon (2)

(1) Forest Protection Limited, Fredericton, NB Canada; (2) Natural Resources Canada, Canadian Forest Service, Fredericton, NB Canada

WEDNESDAY, NOV 9 AT 11:15

SUBMITTED ORAL

Survey techniques for the Balsam Gall Midge, Gagne *Paradiplosis tumifex* (Diptera: Cecidomyiidae) within Christmas tree plantations of central New Brunswick.

Balsam gall midge, *Paradiplosis tumifex* Gagne (Diptera: Cecidomyiidae) is an economically important pest to the commercial Christmas tree industry in Canada and the United States. Many studies have been conducted on this insect, yet little is known about its inter-crown or its inter-tree distribution. As a result, monitoring efforts may be inefficient and potentially misleading. We conducted a series of experiments to elucidate timing of attack as well as patterns of galling in Christmas tree farms in central New Brunswick.

Charbonneau, L., Shutler, D., Hillier, N.K., Rogers, R.E.L.

Acadia University, Wolfville, NS

MONDAY, NOV 7 AT 15:30

SUBMITTED POSTER

Effect of fungal parasites on honey bee memory and learning

Western honey bees face a range of challenges that in recent years have led to significant population declines and concomitant economic impacts for agriculture. Nosemosis is a fungal infection of honey bees caused by *Nosema apis* and recently detected *Nosema ceranae*. Little is known of effects of *N. apis* or *N. ceranae* on honey bee learning and memory. We used the proboscis extension reflex model to test if learning and memory are compromised by infections with *N. apis*, *N. ceranae* or co-infection.

Colwell, M. (1), D. Shutler (1), G. Williams (2)

(1) Acadia University, Wolfville, NS; (2) Swiss Bee Research Centre, Research Station Agroscope Liebefeld-Posieux, Bern, Switzerland

MONDAY, NOV 7 AT 13:00

PRESIDENT'S PRIZE - ORAL

Honey bee health: ecto- and endoparasites in the Maritimes

Western honey bees (*Apis mellifera*) provide invaluable services to humans by pollinating crops. However, declines of honey bee populations have been reported from many areas of North America. Understanding bee health could be important to preventing further bee loss. Aspects of bee health include nutrition, exposure to pesticides, and parasites. As part of a larger study of bee health in Maritime beekeeping operations, two parasites, *Nosema* spp. and *Varroa destructor*, were quantified when bees were pollinating apples, blueberries, or cranberries, as well as in the post-crop season. Lab analyses are ongoing.

Cordero, R. (1), D.C. Currie (1,2)

(1) Ecology & Evolutionary Biology, University of Toronto, Toronto, ON; (2) Royal Ontario Museum, Toronto, ON

TUESDAY, NOV 8 AT 15:00

SUBMITTED POSTER

Diversity and biogeography of northern Canadian Ephemeroptera, Plecoptera and Trichoptera: Preliminary data from the Northern Biodiversity Program

Preliminary results are presented on the diversity and distribution of northern Canadian mayflies, stoneflies and caddisflies (the EPTs). Standardized collections were taken from 12 sites across the Boreal, Subarctic, and Arctic Ecoclimatic Zones of Canada. DNA barcoding is critical for identifying the immature stages of EPTs, and can also provide insights into phylogeographical patterns. Contemporary collections will be compared against those made during the 1947-1962 Northern Insect Survey.

Crotty, F.V. (1), S.M Adl (1), R.P. Blackshaw (2), P.J. Murray (3)

(1) Dalhousie University, Halifax, NS; (2) University of Plymouth, Plymouth, Devon, UK; (3) Rothamsted Research, North Wyke, Okehampton, Devon, UK

TUESDAY, NOV 8 AT 11:30

INVITED SYMPOSIA

Differentiating Trophic Feeding Channels within the Soil Food Web Using Stable Isotopes

Within the soil decomposer food web there is a huge diversity of species, but little niche specialisation. There are few methods that can be used to determine feeding preferences of the soil fauna *in situ*, but a technique using stable isotopes has been developed to track consumption and assimilation through the trophic levels. Concentrating on the bacterial feeding channel; experiments testing the amount of consumption of both enriched bacteria and protozoa by the soil fauna were performed to assess the movement of bacterially sourced C and N within the test soils. Results showed that some invertebrates were highly labelled in both the enriched bacterial experiment and enriched protozoan experiment indicating consumption had occurred. These experiments together within the bacterial feeding pathway start to show the links between the different trophic levels and track the flow of C and N through the system.

Cumming, J.M. (1), B.J. Sinclair(1), S.E. Brooks (1), G.A. Coovert (2)

(1)Canadian National Collection of Insects, K.W. Neatby Building, C.E.F., Ottawa, ON; (2)Laurelville, OH, USA

MONDAY, NOV 7 AT 13:30

SUBMITTED ORAL

Revision of the Nearctic species of *Heleodromia* Haliday (Diptera: Empidoidea: Brachystomatidae)

The Nearctic species of *Heleodromia*, previously known from a single species from New Mexico, are revised. Six species are now known from the Region, including four that are Holarctic and three that are new to science. Diagnostic features and known distributions are outlined. Apparent Asia-Nearctic disjunct sister-group relationships are discussed.

Currie, R.W.

Department of Entomology, Faculty of Agricultural and Food Sciences, University of Manitoba, Winnipeg, MB

MONDAY, NOV 7 AT 13:00

INVITED SYMPOSIA

The status of honey bees and honey bee research in Canada

Honey bees are eusocial insects with fascinating behavioural and physiological mechanisms. They are also the most economically important pollinator in the world. Canada has over 600,000 colonies of bees that produce about 75 million pounds of honey annually. More importantly, honey bees contribution to crop pollination is estimated to be over 2 billion dollars. Beekeepers have been suffering from major colony losses that are associated with multiple factors that interact to cause winter loss of colonies. Significant progress has been made in understanding which of the factors are most critical in affecting bee survival and which are most likely to target for management to mitigate colony loss.

Curry, C.J. (1), R.A. Curry (1), D.J. Baird (1,2)

(1) Canadian Rivers Institute and Department of Biology, University of New Brunswick, Fredericton, NB; (2)

Environment Canada, Water Science and Technology Division

TUESDAY, NOV 8 AT 11:30

INVITED SYMPOSIA

Relative patterns of larval biodiversity in Trichoptera and Odonata: the role of dispersal ability in freshwater insect biodiversity assessment

There is considerable debate over the importance of spatial processes in structuring freshwater insect communities. Poorly dispersing groups should demonstrate greater spatial autocorrelation independent of environmental variation. To test this hypothesis, we surveyed larval Odonata and Trichoptera diversity in three New Brunswick watersheds. The groups were correlated in their spatial patterns of richness and compositional variation, displayed similar magnitude of compositional variation, and did not demonstrate differing levels of spatial autocorrelation. These results speak to the relative homogeneity of riverine insect assemblages in Atlantic Canada, and suggest that dispersal related patterns are not a major issue for regional biodiversity assessment.

Cusson, M. (1,2), A. Nisole (1,3), B. Aspirault (2), M. Landry (2), C. Béliveau (1), H. Maaroufi (3), R. Levesque (3)

(1) Natural Resources Canada, Canadian Forest Service, Laurentian Forestry Centre, Québec, QC; (2) Département de biochimie, de microbiologie et de bio-informatique, Université Laval, Québec, QC; (3) Institut de biologie intégrative et des systèmes, Université Laval, Québec, QC

MONDAY, NOV 7 AT 15:45

SUBMITTED ORAL

NTPase-like proteins from the banchine ichnovirus GfIV

Many endoparasitic wasps inject a polydnavirus (PDV) into their caterpillar hosts during oviposition. PDVs associated with ichneumonid parasitoids are referred to as “ichnoviruses” (IV) and are found only in wasps of the subfamilies Campopleginae and Banchinae. The virus of the banchine wasp *Glypta fumiferanae* (GfIV) differs considerably from those of the more extensively studied campoplegine IVs. Here we report on the characterization of the “NTPase-like genes”, which are unique to this PDV.

Cutler, C.

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

TUESDAY, NOV 8 AT 10:30

INVITED SYMPOSIA

Towards ecological management of insect pests in wild blueberry

Growers of wild (syn. 'lowbush') blueberries, an important crop in eastern Canada, must manage a number of defoliating and fructivorous insects throughout the season. Like other cropping systems, insect pest management in wild blueberry has traditionally relied upon applications of broad-spectrum chemical insecticides. Continued competitiveness of the industry, however, demands more ecological approaches. I will provide an overview of key pests of wild blueberry and highlight research in my lab that is attempting to establish alternative means for their management.

Cutler, G.C.

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

MONDAY, NOV 7 AT 13:30

INVITED SYMPOSIA

Considerations when assessing impacts of pesticides on bees

Questions of impacts of pesticides on bees have been studied for decades and continue to be a 'hot-button' issue among entomologists, toxicologists, beekeepers, pesticide regulators, and the public. The topic is complex because multiple layers of data analysis are required, but also because passionate ideologies often come into play. I will discuss the interplay between these elements and present data to illustrate factors that must be considered when determining risk of pesticides to bees.

Daoust, S.P. (1), J. Savage (2), M. Bélisle (3), A. Robillard (3), R. Baeta (3), J. Brodeur (1)

(1) Université de Montréal, Montréal, QC; (2) Bishop's University, Sherbrooke, QC; (3) Université Sherbrooke, Sherbrooke, QC

TUESDAY, NOV 8 AT 11:00

INVITED SYMPOSIA

Different landscape parameters are perceived at different spatial scales: insights from a tri-trophic system within agricultural lands

We studied the effects of landscape structure on the trophic interactions between a bird host, its blowfly ectoparasites and their parasitoid wasps. All three organisms revealed scale dependent responses to landscape. These functional scales changed with the landscape parameter modeled. The abundances of birds and insects were lower in highly intensive landscapes, this trend being most pronounced at higher trophic levels.

DaRos, L., **J.K. Otani**

(1) Agriculture and Agri-Food Canada, Beaverlodge Research Farm, Beaverlodge, AB; (2) University of British Columbia, Vancouver, BC

TUESDAY, NOV 8 AT 15:00

SUBMITTED POSTER

Estimating the impact of arthropod predators preying upon *Lygus* nymphs in the Peace River region of Canada

Lygus bugs (Miridae: *Lygus* spp.) are a native pest complex that damage canola (*Brassica napus*). Predators were sweep-net collected in 2010 and 2011 from canola or alfalfa field crops grown near Beaverlodge, AB. The results of caging ladybird beetle adults and nymphs (*C. septempunctata* and *C. trifasciata*), damselbug adults and nymphs (*N. roseipennis* and *N. alternates*), lacewing larvae (*M. emuncta*) or crab spiders (*M. vatia*) isolated with third, fourth and fifth instar nymphs will be presented.

De Clerck-Floate, R.A.

Agriculture and Agri-Food Canada, Lethbridge, AB

TUESDAY, NOV 8 AT 9:30

SUBMITTED ORAL

The role of nitrogen in host choice by a biocontrol weevil

Host plant N can influence the preference and performance of some insects, but little is known on how it may affect the expression of host range for those used in weed biocontrol. The oligophagous root weevil, *Mogulones crucifer*, is a successful biocontrol agent of houndstongue (HT) in Canada, and benefits from increased host N. An experiment was conducted using HT and a native host species to determine if added N alters non-target attack. Plant species nor N affected adult feeding choice, but more eggs were laid in HT overall and there was a greater preference for N-added HT plants.

De Silva, W.C (1), O. Wally (1), C. Cutler (1), R. Robinson (1), A. Critchley(2), B. Prithiviraj(1)

(1) Department of Environmental Sciences, Nova Scotia Agricultural College, Truro, NS; (2) Acadian Seaplants Limited, Dartmouth, NS

TUESDAY, NOV 8 AT 8:30

INVITED SYMPOSIA

Potential use of *Ascophyllum nodosum* (L.) Le Jol. Extracts for the Management of Green peach aphid, *Myzus persicae*

Brown seaweed, *Ascophyllum nodosum* extracts (ANE) increase plant growth and imparts resistance against biotic and abiotic stresses. Arabidopsis plants, which are susceptible to green peach aphids (GPA), were used to determine whether application of ANE can confer protection against GPA. ANE treatment improved chlorophyll content, biomass and yield while delaying senescence under GPA pressure. This observed improved plant growth was due to ANE imparted tolerance against GPA in Arabidopsis.

De Silva, E.C.A. (1), P.J. Silk (2), N.K. Hillier (3), G.C. Cutler (1)

(1) Nova Scotia Agriculture College, Truro, NS; (2) Atlantic Forestry Centre, Fredericton, NB; (3) Acadia University, Wolfville, NS

MONDAY, NOV 7 AT 15:30

PRESIDENT'S PRIZE POSTER

Identification of sex pheromone components of the blueberry spanworm, *Itame argillacearia* (Lepidoptera)

The blueberry spanworm, *Itame argillacearia* Packard, is an important defoliator of lowbush blueberries in eastern North America. Analyses of virgin female sex pheromone gland extracts by gas chromatography/mass spectrometry (GC/MS) suggests chiral alkenyl epoxides represent the sex pheromone of *I. argillacearia*. The enantiomeric composition of the pheromone has yet to be fully determined, but male moth antennae displayed strong excitation responses to these constituents in GC-electroantennogram detection experiments.

deSilva, N., L. Packer

York University, Department of Biology, Toronto, ON

MONDAY, NOV 7 AT 11:15

PRESIDENT'S PRIZE – ORAL

A revision of the cleptoparasitic bee genus *Coelioxys* (Hymenoptera: Megachilidae) in Canada

Bees of the genus *Coelioxys*, like many other cleptoparasitic bee groups, are relatively poorly studied and uncertainties pertaining to species level classification still exist. Represented by over 480 species worldwide, these parasitic bees are known to attack a variety of hosts. Until now only 14 species have been recognized in Canada. Recent collecting events and the examination of museum specimens, coupled with an integrative taxonomic approach, has revealed a total of 18 species within 6 subgenera, including 3 new species records, and 1 new to science.

Desmet, P., A. Bruneau

Université de Montréal Biodiversity Centre, Montreal, QC, Canada

TUESDAY, NOV 8 AT 9:45

INVITED SYMPOSIA

Canadensys - Mobilizing biodiversity data across Canada

The mission of Canadensys (www.canadensys.net) is to unlock the rich biodiversity information found in biological collections. Headquartered at the Université de Montréal Biodiversity Centre, the network unites 35 researchers and 30 collections (botanical gardens, herbaria, entomological and mycological collections). Canadensys collectively holds over 13 million specimens, of which $\pm 20\%$ are now databased and soon will be published on its portal, accessible for surveys of Canadian biodiversity.

Dixon, P. (1), S. Fillmore (2), S. LeBlanc (3), L. Madore (4), S. Mellish (5), J. Owen (3), C. Parsons (1), R. Pemberton (3), T. Power (1), V. Zvalo (6)

(1) Agriculture and Agri-Food Canada (AAFC), St. John's, NL; (2) AAFC, Kentville, NS; (3) AAFC, Bouctouche, NB; (4) Department of Natural Resources, Corner Brook, NL; (5) Department of Agriculture, Charlottetown, PEI; (6) Agrapoint, Kentville, NS

TUESDAY, NOV 8 AT 15:00

SUBMITTED POSTER

ROW COVERS AS PHYSICAL BARRIERS TO CONTROL CABBAGE MAGGOT (*DELIA RADICUM*) IN RUTABAGA

Long-lasting row covers (Wondermesh® and Proteknet®) were tested on commercial vegetable farms in NB, NL, NS and PEI in 2011. We report on their ease of use and ability to exclude cabbage maggot and compare sand bags and plastic pegs as anchors for the covers.

Djoumad, A., F. Dallaire, C. Beliveau, M. Cusson

Laurentian Forestry Centre, Canadian Forest Service, Natural Resources Canada, QC

TUESDAY, NOV 8 AT 15:00

SUBMITTED POSTER

Functional analysis of polydnavirus genes potentially involved in disrupting the development of *Choristoneura fumiferana*

Tranosema rostrale ichnovirus (TrIV) is transmitted by the parasitic wasp *T. rostrale* to its host, *Choristoneura fumiferana*, during oviposition. In the parasitized larva, viral genes are expressed that induce pathologies that benefit the immature wasp, including inhibition of metamorphosis. TrV1 and TrFrep1 are the two most strongly expressed TrIV genes, suggesting a role in developmental disruption. Their role in blocking metamorphosis is being examined using RNAi and cell transfection assays.

Dosdall, L.M. (1), K.N. Harker (2), J.T. O'Donovan (2)

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

TUESDAY, NOV 8 AT 14:30

SUBMITTED ORAL

The importance of crop rotation for minimizing damage from root maggots (*Delia* spp.) in canola

Replicated field studies were undertaken during 2008 to 2010 inclusive at five sites in Alberta and Saskatchewan to test the hypothesis that shortened canola rotations can result in increased damage by larval root maggots. The studies involved several different rotational regimes in test plots. Results of these tests will be presented, as well as responses of the principal natural enemy of root maggots, the predator-parasitoid *Aleochara bilineata*.

Du, J., N.J. Holliday

Department of Entomology, University of Manitoba, Winnipeg, MB

MONDAY, NOV 7 AT 8:45

PRESIDENT'S PRIZE - ORAL

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

Aleochara bilineata and *A. bipustulata* are natural enemies of *Delia radicum*, and are attracted to dimethyl disulphide (DMDS)-baited traps. In the laboratory, both *Aleochara* responded similarly to DMDS: larvae were arrested by DMDS and preferred to attack *D. radicum* puparia associated with DMDS. In still air, adults were uninfluenced by DMDS. In a Y-tube olfactometer, newly-emerged adults of both sexes avoided DMDS-laden air; after 10 days mated females were attracted to DMDS but males were not.

Dumesh, S. (1), L. Packer (1), C. Sheffield (1), S. Marshall (2)

(1) Department of Biology, York University, Toronto, ON; (2) School of Environmental Sciences, University of Guelph, Guelph, ON

MONDAY, NOV 7 AT 9:00

INVITED SYMPOSIA

Identification of Canada's pollinators

With studies of pollinators and pollination increasing in Canada, more reliable means of species-level identification are required, especially considering that no keys are available for many groups of pollinators. Using a combination of user-friendly keys, high-quality images, and through the integration of molecular methods (to facilitate sex associates, colour variation, etc. in poorly-studied groups), reliable means to accurately identify pollinating insects in Canada are being developed. The progress is presented here.

Dury, G. (1,2), J. Bede (1), D. Windsor (2)

(1) McGill University, Plant Science Department, Ste-Anne-de-Bellevue, QC; (2) Smithsonian Tropical Research Institute, Panama City, PN, Panama

MONDAY, NOV 7 AT 8:45

PRESIDENT'S PRIZE - ORAL

Evolution of larval aggregation in neotropical Chrysomeline leaf beetles

The larvae of some herbivore insects group in a circle for defence: this is called cycloalexy. I will study the evolution of grouping and cycloalexy in two neotropical leaf beetle genera; *Platyphora* and *Proseicela*. Not all have cycloalexy: some are solitary or gregarious but not cycloalexic, enabling comparisons. In Panama and Ecuador, I collected specimens and assigned larval behaviour categories: solitary, gregarious, or cycloalexic. To infer a molecular phylogeny, I will amplify sequences from four genes using PCR. I will infer trees, then map larval behaviour onto them and test evolutionary scenarios.

Erlandson, M. (1,2), U. Toprak (2,3), D. Baldwin (1), C. Gillott (2), D. Hegedus (1)

(1) Agriculture and Agri-Food Canada, Saskatoon Research Centre, Saskatoon, SK; (2) Department of Biology, University of Saskatchewan, Saskatoon, SK; (3) Department of Plant Protection, College of Agriculture, University of Ankara, Turkey

WEDNESDAY, NOV 9 AT 10:30

SUBMITTED ORAL

Synthesis and architecture of the *Mamestra configurata* peritrophic matrix

In many insects, the midgut is lined with a semi-permeable sheath called the peritrophic matrix (PM) which is composed of chitin and proteins. The PM is intimately associated with digestive processes and forms a protective barrier. Genomic and proteomic approaches were used to identify the proteins associated with the *Mamestra configurata* PM. Structural proteins (peritrophins) and enzymes were integral components of the PM. Structural proteins included mucin and non-mucin peritrophins, whereas enzymes included chitin modifying and digestive enzymes. Chitin is a key structural component of PM and transcripts for several enzymes involved in its metabolism were identified in cDNA libraries of *M. configurata* midgut tissues. These included chitin synthase B, chitinase and chitin deacetylase 1. Quantitative PCR was used to examine the expression of these genes in different regions of the larval midgut at different stages of instar development.

Ernst, C., C. Buddle

McGill University, Macdonald Campus, Ste-Anne-de-Bellevue, QC

MONDAY, NOV 7 AT 9:00

PRESIDENT'S PRIZE - ORAL

Seasonal changes in the functional ecology of subarctic ground-dwelling arthropod assemblages

Although northern arthropods have adapted to cope with harsh environmental conditions, they are still influenced by local climate; a region's assemblage may change throughout the active season, reflecting climate-mediated effects on activity levels. Since activity levels influence the provision of ecological functions, this measure can act as a proxy for the effects of climate on the contributions of arthropods to food webs. Ground-dwelling arthropods were collected from pan and pitfall traps in Kugluktuk (NU) in 2010. Arthropod activity levels over the summer months are compared to variation in local climate to test the relationship between food web structure and climate.

Evenden, M.L. (1), B.A. Mori (1)

(1) Department of Biological Sciences, University of Alberta, Edmonton, AB

MONDAY, NOV 7 AT 10:30

INVITED SYMPOSIA

When mating disruption does not disrupt mating: fitness consequences of delayed mating in moths

The goal of pheromone-based mating disruption is to interfere with mate finding but mating is not always interrupted but can be delayed. We use a meta-analysis to assess the consequences of delayed mating on female moth performance. The analysis showed mating delay had a negative effect on female fecundity and fertility and a positive effect on adult longevity and pre-oviposition period. Results varied slightly by family, feeding guild and reproductive strategy.

Fairn, E.R., S.A. Adamo

Department of Psychology, Dalhousie University, Halifax, NS

MONDAY, NOV 7 AT 16:00

SUBMITTED ORAL

Is enhanced immunity after mating in female crickets a by-product of increased egg production?

Reproduction and immunity are both metabolically costly and these costs lead to tradeoffs between these two functions. Interestingly, mated female Texas field crickets (*Gryllus texensis*) exhibit both increased egg production and greater survival of bacterial infection than virgins. We will present preliminary results of a study investigating whether the enhanced resistance after mating could be a by-product of increased egg production.

Fauteux, J., G. Moreau

Université de Moncton, Moncton, NB, Canada

MONDAY, NOV 7 AT 15:30

PRESIDENT'S PRIZE - POSTER

How much is too little? Short-term effects of deadwood management strategies on saproxylic beetles in plantations

We examined the short-term response of saproxylic beetles to forest management practices that affect the amount of downed and standing deadwood (snags) in white spruce plantations located in a range of landscape contexts. Beetles were sampled using flight intercept traps placed at increasing distances from a road edge. Traps were also installed in mature, natural forests to evaluate how plantation management affects beetle communities.

Ferguson, L.V., N.K. Hillier, T.G. Smith

Acadia University, Wolfville, NS

MONDAY, NOV 7 AT 8:45

PRESIDENT'S PRIZE - ORAL

Behavioural modification in *Culex* species caused by blood protozoa of frogs and snakes

Host-seeking behaviour of *Culex territans* infected with *Hepatozoon clamatae*, and *C. pipiens* infected with *H. sipedon*, was recorded to determine if parasite manipulation occurred. Host-seeking behaviour did not change over the course of the infection in either species. Paired choice trials allowed *C. territans* to choose between infected and uninfected frogs. Results indicate that mosquitoes do not distinguish between uninfected frogs and frogs with low infections; however, a slight trend suggests that mosquitoes may preferentially choose frogs with high infections.

Fields, P.G. (1), W. Taylor (2), 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

TUESDAY, NOV 8 AT 9:15

SUBMITTED ORAL

Pea protein extracts to control and repel 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. Three pilot-plant-scale extractions of the active compounds were carried out on 500 kg of protein-rich pea flour. The extract was toxic and repellent to the adults of *Sitophilus oryzae* (rice weevil) and *Cryptolestes ferrugineus* (rusty grain beetle). It was repellent but not toxic to *Tribolium castaneum* (red flour beetle) adults.

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

(1) Population Ecology Group, Faculty of Forestry and Environmental Management, University of New Brunswick, Fredericton, NB; (2) Natural Resources Canada, Canadian Forest Service, Atlantic Forestry Centre, Fredericton, NB; (3) Natural Resources Canada, Canadian Forest Service, Laurentian Forest Centre, Quebec, QC

MONDAY, NOV 7 AT 15:30

PRESIDENT'S PRIZE - POSTER

Stage-specific performance of *Tetropium fuscum* (F.) (Coleoptera: Cerambycidae) is influenced by host species, host condition and timing of attack

In its native Europe, *Tetropium fuscum* (F.) (Coleoptera: Cerambycidae) colonizes weakened Norway spruce, *Picea abies* (L.) Karst., and is not considered a pest. In Nova Scotia, this beetle can kill apparently healthy red spruce, *Picea rubens* Sarg.. The ability of *T. fuscum* to colonize healthier trees in Canada than in Europe may be related to the novelty of the host and/or its new natural enemy complex. We evaluated the impact of these factors on *T. fuscum* performance by exposing developing larvae to different tree species, tree conditions, and levels of protection from natural enemies. Survival and development rate was greater on stressed than on healthy trees, and there was no effect of exposure to natural enemies, contrary to previous results. Preliminary results indicate that survival is reduced on Norway compared to red spruce, and in both host species there appears to be an effect of timing of attack.

Floate, K.D. (1), W.U. Blanckenhorn (2), P. Coghlin (1), I. Davies (3), J. Gray (4), P. Höhn (5), N. Kadiri (6), J-P Lumaret (6), A. Scheffczyk (7), T. Schmidt (8), A. Schwarz (9), T. Sekine (9), C. Taylor (3), K. Taylor (4), J. Römbke (7)

(1) Lethbridge Research Center, Agriculture and Agri-Food Canada, Lethbridge, AB; (2) University of Zurich, Switzerland; (3) Covance Laboratories Ltd., UK; (4) Huntingdon Life Sciences, UK; (5) Eurofins GmbH, Germany; (6) University of Montpellier, France; (7) ECT Oekotoxikologie GmbH, Germany; (8) Harlan Laboratories Ltd., Switzerland; (9) IBACON GmbH, Germany

TUESDAY, NOV 8 AT 15:00

SUBMITTED POSTER

Lessons learned during the selection of a dung beetle species as a test for insecticidal residues in cattle dung

An international 'ring' test was performed to test the suitability of *Onthophagus nuchicornis* and *O. taurus* (Coleoptera: Scarabaeidae) in bioassays to detect residues of veterinary pharmaceuticals in cattle dung. Both were suitable, but the non-diapausing *O. taurus* allows for greater flexibility in the timing of such tests. Because *O. nuchicornis* has an obligate diapause, it is difficult to rear in lab culture.

Floate, K. (1), N. Isabel (2), R. Footitt (3)

(1) Lethbridge Research Centre, Agriculture and Agri-Food Canada, Lethbridge, AB; (2) Natural Resources Canada, Canadian Forest Service, Laurentian Forestry Centre, Québec, QC; (3) Eastern Cereal and Oilseed Research Centre, Agriculture and Agri-Food Canada, Ottawa, ON

WEDNESDAY, NOV 9 AT 10:30

INVITED SYMPOSIA

Genetic typing of hosts and aphids provides new insights on galling arthropods of hybrid cottonwoods

Three species of cottonwood (*Populus* spp.) overlap and hybridize in the drainage of the Oldman River in southern Alberta. Genetic typing of 724 trees shows that the genetic complexity of this hybrid swarm is structured along an elevational gradient, with consequences for the distribution and evolution of associated gall-formers. These new data contribute to ongoing research that clarifies how hybridization between host species affects their parasites.

Floate, K. (1), W. Watson (2), R. Weiss (3), 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

WEDNESDAY, NOV 9 AT 9:00

INVITED SYMPOSIA

Introducing new species of dung beetles into Canada to improve pasture productivity

In 2009 and 2010, two species of dung beetles new to Canada were released onto pastures in southern Alberta to accelerate the degradation of cattle dung. Here I review the history of the project and its ongoing status as a novel example of a low risk 'biocontrol' program with potentially large benefits.

Flores-Mejia, S. (1), V. Fournier (2), C. Cloutier (1)

(1) Département de Biologie, Université Laval, Pavillon Alexandre-Vachon, Québec, QC; (2) Département de Phytologie, Université Laval, Université Laval, Québec, QC

MONDAY, NOV 7 AT 9:00

PRESIDENT'S PRIZE - ORAL

Evaluation of the relative performance of a host-parasitoid system as affected by temperature

We evaluated nine host-parasitoid systems formed by three biotypes of the aphid *Macrosiphum euphorbiae* on three host plants, and *Aphidius ervi* as the parasitoid, at six constant temperatures using the ratio of each organism's RGR (relative growth rate) as the evaluation tool. In the range of experimental temperatures, the RGR trend is linear for the aphid while it reaches its maximum between 24 and 28°C for the parasitoid depending plant-host biotype. In general, the RGR ratio shows that the aphid's performance is lower than the parasitoid's at all temperatures where around 20°C the parasitoid's performance is at its best.

Fraser, S., D. Quiring

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

MONDAY, NOV 7 AT 9:00

PRESIDENT'S PRIZE - ORAL

Can insect pest damage be reduced in balsam fir Christmas tree plantations through selective breeding?

Balsam woolly adelgid (*Adelges piceae*), gall midge (*Paradiplosis tumifex*) and twig aphid (*Mindarus abietinus*) are major pests in balsam fir Christmas tree plantations. A two year field study of balsam fir in clonal orchards was conducted to determine if insect resistance is a heritable trait. Results indicate that a significant proportion of damage is attributed to clone. Variation in resistance, trait heritability and correlations between resistance and other desirable traits will be discussed.

Frost, E. H., D. Shutler, N.K. Hillier
Biology, Acadia University, Wolfville, NS
WEDNESDAY, NOV 9 AT 9:00

SUBMITTED ORAL

Effects of cold immobilization and recovery period on honeybee learning, memory, and responsiveness to sucrose

Insect learning and memory are commonly evaluated using Pavlovian techniques based on proboscis extension reflexes (PER). However, methods to immobilize insects before PER tests are inconsistent. Ice-chilling decreased PER more so than refrigeration or freezing, but not 24 h recall of odor. Responsiveness to sucrose was not affected by cooling method, but responsiveness was significantly lower among honey bees left to recover for only 0.75 h versus 1.5 or 3 h. Our results suggest that inconsistencies in cold immobilization methods could confound interpretation and comparison of results from a large body of work on honey bee learning and memory.

Fuentealba, A., É. Bauce

Département des sciences du bois et de la forêt, Université Laval,
TUESDAY, NOV 8 AT 15:00

SUBMITTED POSTER

Site factors and management influence host resistance to spruce budworm (*Choristoneura fumiferana* (Clem.)) in a species-specific manner

Spruce budworm (*Choristoneura fumiferana* (Clem.)) is the most destructive insect pest in the maritime and boreal forests of North America. Field rearing experiments of spruce budworm were conducted along with foliar chemical analyses through a gradient of stand thinning density and site drainage quality in the Montmorency experimental forest to evaluate the impact of these factors on host tree resistance. Our results show that thinning reduced balsam fir (*Abies balsamea* (L.) Mill)) resistance one year after treatment, except on hydric drainage. Three years after treatment we observed the opposite response, suggesting that thinning may be use as preventive control measure.

Galloway, T.D.

Department of Entomology, University of Manitoba, Winnipeg, MB
MONDAY, NOV 7 AT 14:30

SUBMITTED ORAL

Chewing lice (Phthiraptera) on American White Pelican and Double-crested Cormorant (Pelecaniformes) in Manitoba

Pelicans (n=29) were infested by *Colpocephalum unciferum*, *Piagetiella peralis* and *Pectinopygus tordoffi* (prevalence - 93.1, 100 and 100%; mean intensity - 258.2, 519.4 and 546.6, respectively). *Piagetiella peralis* infested the body and pouch; only adults inhabited the pouch. Cormorants (n=54) were infested by *Eidmanniella pellucida* and *Pectinopygus farallonii* (prevalence - 75.9 and 98.1%; mean intensity - 226.7 and 380.6, respectively). Males predominated in *P. peralis* and *Pectinopygus* spp.

Garipey, T.D.

Southern Crop Protection and Food Research Centre, Agriculture and Agri-Food Canada, London, ON
WEDNESDAY, NOV 9 AT 10:30

INVITED SYMPOSIA

The utility of molecular diagnostics in biological control: evaluating trophic interactions and non-target effects

Molecular techniques have revolutionized the field of diagnostics. In applied entomology, these tools are often used for insect identification and systematics, and more recently, to gain a better understanding of trophic interactions between pests, parasitoids, and predators. Here, progress and prospects in the area of molecular diagnostics in arthropod biocontrol research are discussed.

Gaul, S. O. (1), E. N. Estabrooks (2), C. Vincent (3), K. MacKenzie (1)

(1) AAFC-AAC, Atlantic Food and Horticulture Research Centre, Kentville, NS; (2) Evans and Associates Agricultural Consulting, New Maryland, NB; (3) AAFC-AAC Horticulture Research and Development Centre, Saint-Jean-sur-Richelieu, QC

TUESDAY, NOV 8 AT 15:00

SUBMITTED POSTER

Predicted emergence of *Rhagoletis mendax* (Diptera:Tephritidae) in lowbush blueberry and presence in north western New Brunswick, Canada

The distribution of *Rhagoletis mendax*, RM, the blueberry fruit fly, is expanding within eastern Canada. To investigate the distribution within NB, yellow sticky traps were placed at 11 selected sites north and west of known areas of blueberry maggot infestation. Fruit was harvested and larval counts were obtained. Adult flies were trapped in 4 fields, and larvae were found in fruit from 2 fields of the 11 sites monitored. The RM counts and site characteristics are presented. The predicted date of first capture of RM is calculated to be July 22 (female) and July 26 (male) in northwestern NB.

Gaul, S. (1), C. Vincent (2), K. MacKenzie (1)

(1) AAFC-AAC, Atlantic Food and Horticulture Research Centre, Kentville, NS; (2) AAFC-AAC Horticulture Research and Development Centre, Saint-Jean-sur-Richelieu, QC

TUESDAY, NOV 08 AT 9:30

INVITED SYMPOSIA - VACCINIUM

Influence of the bioassay and blueberry volatiles on *Rhagoletis mendax* (Diptera:Tephritidae) response

Rhagoletis mendax, RM, a quarantine pest of blueberries, utilizes semiochemical, visual, and tactile cues to locate host fruit suitable for oviposition. Following identification of volatiles in fruit, we selected synthetic volatiles to assess the response of RM using wind tunnels and Y-tubes plus lowbush blueberry field trials. Bioassay response was location of the flies. Field response was trap captures and infestation in fruit surrounding traps. Bioassay conditions and impact of volatiles on RM response are assessed. Female RM responded to volatiles in bioassays and in the field

Goguen, J. (1), G. Moreau (1)

(1) Université de Moncton, Moncton, NB

TUESDAY, NOV 08 AT 10:45

INVITED SYMPOSIA

How can we help blueberries “flee” beetles: within- and between-field factors influencing the Blueberry flea beetle

To develop a prediction model for *Altica sylvia* in commercial blueberry fields, we examined how environmental factors affect larval development, crop defoliation, and both within- and between-field distributions of flea beetles. Adult densities could be used to predict the average level of defoliation the following year but results suggest that edge effects and spatial variability of *A. sylvia* need to be considered to improve scouting and management methods of this insect.

Goluch, E.

Halifax, NS

SUNDAY, NOV 6 AT 15:30

PLENARY

Living Jewels

Insects have long since been an attraction to me. As a child, I saw iridescent bluebottle flies as treasures and collected them as such. In recent years, my focus has been almost exclusively on the insect world. Using metalsmithing skills, I create one of a kind, larger than life, highly detailed metal insects, incorporating gold, silver, enamel and gemstones in their construction. Each insect has a secret space containing treasure, as well as decorative details which evoke elements of insect life, lore and environment. While showing images of my work, I will speak about the beauty that I perceive in insects and their world and the lasting impact that they have had on my work. This presentation will be accompanied with several sculptures and an invitation to have a close up look at the real thing.

Gregoire, D.M. (1), D. Quiring (1), L. Royer (2)

(1) University of New Brunswick (2) Canadian Forest Service, Corner Brook, NL

MONDAY, NOV 7 AT 9:15

PRESIDENT'S PRIZE - ORAL

Gouting by balsam woolly adelgid influences the preference and performance of subsequent defoliators

In Newfoundland, over 80% of balsam fir trees contain swollen nodes (gout) caused by feeding by balsam woolly adelgid (*Adelges piceae*). In manipulated field experiments, survival of balsam fir sawfly (*Neodiprion abietis*) and the size of eastern spruce budworm (*Choristoneura fumiferana*) survivors was reduced when larvae developed on branches with high levels of gout. Preferences varied among species and development stage (i.e., feeding larva versus ovipositing adult).

Grossi, A.

University of Manitoba, Faculty of Agricultural and Food Sciences, Department of Entomology, Winnipeg MB

MONDAY, NOV 7 AT 9:15

PRESIDENT'S PRIZE - ORAL

Infestation parameters of chewing lice (Phthiraptera: Menoponidae, Philoptera) on adult and juvenile Mallards (*Anas platyrhynchos*) in Manitoba

Mallards (*Anas platyrhynchos*) are host to seven species of chewing lice. Birds were salvaged and washed to remove lice. Prevalence and intensity of adult versus juvenile lice on mallards are compared. Mean abundance, in decreasing order for genera of lice, was *Anatoecus* (4.8), *Anaticola* (3.4), *Holomenopon* (1.7) and *Trinoton* (1.3). Prevalence and mean intensity of infestation were higher in adult (65.8%, 50.7, respectively) than juvenile mallards (21.4%, 8.5, respectively).

Hallett, R.H. (1), T. Baute (2)

(1) University of Guelph, Guelph, ON; (2) Ontario Ministry of Food, Agriculture & Rural Affairs
TUESDAY, NOV 8 AT 14:15

SUBMITTED ORAL

Aphid Advisor: a Smartphone App for soybean pest management

Aphid Advisor is a pilot decision-making tool for growers and crop consultants to help determine whether a control action is warranted for Soybean Aphids (*Aphis glycines*) on soybeans. Based on the scientific literature and research conducted at University of Guelph, this app uses aphid and natural enemy numbers, and aphid population growth rates, to indicate whether there are enough natural enemies to keep aphid populations below action thresholds or if an insecticide application is needed.

Harper, T., C. Hemsworth, J. Bannerman, R. McGregor

Institute of Urban Ecology, Douglas College, New Westminster, BC
TUESDAY, NOV 8 AT 15:00

SUBMITTED POSTER

Molecular tools for primary and hyperparasitoids of aphids in British Columbia greenhouses

Several species of primary parasitoids are released for management of aphids in pepper greenhouses in British Columbia. Hyperparasitoids invade greenhouses during the growing season and may disrupt aphid control. We have developed species-specific DNA markers for five primary and two hyperparasitoid species using the mitochondrial COI gene. These markers should facilitate monitoring of these species in greenhouses and evaluation of the effects of hyperparasitoids on aphid biological control.

Harpur, B., A. Zayed

Department of Biology, York University, Toronto, ON
MONDAY, NOV 7 AT 11:30

SUBMITTED ORAL

Diversity of and selection on the honey bee immune system

Invertebrates have an innate immune system, and unlike the adaptive immune system of vertebrates it does not make use of antibodies to target specific pathogens. Instead, the innate immune system—composed of the IMD pathway, the JAK/STAT pathway, and the Toll pathway—recognizes and responds to broad classes of pathogens. The pathways of invertebrate innate immunity are all highly conserved within and across insect taxa, with the potential exception of social insects. The honey bee, for example, has the three innate immune pathways but each is composed of substantially fewer genes relative to other insect taxa. This is surprising considering both that as a social species and as a species that has been transported globally, honey bees should face a greater pressure from pathogens than solitary species. The question then arises as to how honey bees respond and adapt to pathogens. Here, I explore the variation and search for signs of selection within the honey bee's Toll pathway.

Harutyunova, M. (1), K. Harutyunova (1), G. Gasparyan (2), A. Grigoryan (2), V. Tsaturyan (3), **A. Pepoyan** (2)

(1) Institute of Molecular Biology of NAS RA, Yerevan, RA; (2) State Agrarian University of Armenia, RA; (3) Yerevan State Medical University, Yerevan, RA
MONDAY, NOV 7 AT 16:30

SUBMITTED ORAL

Quantification of Enterobacteriaceae species from *Anopheles* mosquitoes collected in Armenia

The important role of various Enterobacteriaceae species from mosquito midgut microflora on inhibiting the development of *Plasmodium* it is known. The aim of these investigations was quantification of Enterobacteriaceae from the midgut microflora of *Anopheles* mosquito, collected from the different regions of Armenia. The differences in the number of CFU between Enterobacteriaceae counts depending on the species, gender and the locations of mosquito population it have been revealed. The results can be important for the development of strategies on microbial control of malaria.

Haye, T. (1), P. Mason (2), D. Gillespie (3), U. Kuhlmann (1), L. Andreassen (1,4)

(1) CABI Europe-Switzerland, Delémont, Switzerland; (2) Eastern Cereal and Oilseed Research Centre, Agriculture and Agri-Food Canada, Ottawa, ON; (3) Pacific Agri-Food Research Centre, Agriculture and Agri-Food Canada, Agassiz, BC; (4) University of Manitoba, Department of Entomology, Winnipeg, MB
WEDNESDAY, NOV 9 AT 9:30

INVITED SYMPOSIA

From theory to practise: progress and problems in host specificity testing of biological control agents

Within the last ten years, new guidelines were developed to improve host specificity testing in biological control. Here I review how the new guidelines prove themselves in practise, using three potential biological control agents for insect pests in Canada as case studies.

Heard, K. (1), M. Hajbabaie (2), **D.J. Baird** (1)

(1) Environment Canada, Canadian Rivers Institute and Department of Biology, University of New Brunswick; (2) University of Guelph, Guelph, ON

TUESDAY, NOV 8 AT 15:00

SUBMITTED POSTER

DNA sequencing of formalin-preserved bulk biomonitoring samples

Sample preservation is a key issue determining the recoverability of DNA sequence information from biomonitoring samples. Previous studies have suggested that the use of formalin for preservation of samples in the field should not continue, yet there is also evidence that DNA can be recovered successfully from such material. Here we examine the ability to obtain short and long sequence read information from field samples and examine the practical implications for field sampling programs.

Heard, S.

Department of Biology, University of New Brunswick, Fredericton, NB

WEDNESDAY, NOV 9 AT 11:30

INVITED SYMPOSIA

Parallel (or not) diversification among insect herbivores of goldenrods

Insect communities associated with the goldenrods *Solidago altissima* and *S. gigantea* include multiple herbivores and parasitoids that have made host shifts between goldenrods and then evolved pairs of host-specialist forms. Among host shifters, evolution has been parallel in some ways (e.g., shift direction) but not others (e.g., shift timing). I discuss implications for plant-insect community structure, and suggest connections between parallelism and herbivore use of host-plant trait space.

Hicks, B. (1), D. Marshall (2)

(1) College of the North Atlantic, Carbonear, NL; (2) Department of Biology, Memorial University of Newfoundland, St. John's, NL

TUESDAY, NOV. 8 AT 14:15

SUBMITTED ORAL

Report of the invasive ant, *Myrmica rubra*, in Newfoundland: Where did it originate and what impact does it have on the native invertebrate fauna?

The European Fire Ant, *Myrmica rubra*, was recently recorded for the first time in Newfoundland. This talk will outline the known distribution of the ant in Newfoundland and will report on its impact on the native invertebrate fauna. Additional molecular biology data will be presented that will provide answers to its origin of introduction to the province.

Hicks, B

College of the North Atlantic, Carbonear, NL

WEDNESDAY, NOV 09 AT 8:30

SUBMITTED ORAL

The contribution of different sized native bees to blueberry pollination in Eastern Newfoundland

Exclusion cages of different mesh size was used to determine the contribution made to lowbush blueberry fruit set by different sized native bees in eastern Newfoundland. The small (eg. *Lassioglossum* (Evyllaenus) *quebecensis* Halictidae) and medium (e.g. *Andrena carolina* Andrenidae) sized bees contribute as much or more to pollination than the larger *Bombus* species. The open cages produced berries with more seeds per berry but there was no difference in the size of the berries between the cages.

Hillier, N.K.

Biology, Acadia University, Wolfville, NS

WEDNESDAY, NOV 9 AT 9:15

SUBMITTED ORAL

Effects of Octopamine on olfactory sensitivity and learning in moths

Within insect fauna, octopamine (OA) has an important behavioural role in motivation and sensory sensitivity, as well as in reinforcement of learned behaviours. Differential effects of OA on sensillar olfactory physiology of Heliothine moths will be presented. Furthermore, the effects of OA on olfactory learning and memory are tested in relation to physiological state in relation to recall through a learning assay, the proboscis extension reflex (PER).

Hillier, N.K. (1), P.L. Dixon (2)

(1) Acadia University, Wolfville, NS; (2) Agriculture and Agri-Food Canada, Atlantic Cool Climate Crop Research Centre, St. John's, NL

TUESDAY, NOV 8 AT 11:00

INVITED SYMPOSIA

The Lingonberry Fruitworm – A Retrospective

The lingonberry is a low-growing ericaceous shrub with a circumboreal distribution. *Grapholita libertina* (Heinr.) is a North American tortricid moth whose larvae feed within lingonberry fruit. In Newfoundland, we see an intersection between the largest commercial lingonberry harvest in North America, and this insect pest species not recorded from Europe. The importance of this berry, along with reflections on research of this relatively unfamiliar *Vaccinium* pest species will be discussed.

Horn, M.E., P.G. Kevan

University of Guelph, Guelph, ON

MONDAY, NOV 7 AT 16:15

PRESIDENT'S PRIZE - ORAL

Pollinators in the city: A comparison of bee biodiversity across various urban land-use zones in urban, southern Ontario

Pollinators, especially bees, have been suffering massive population declines. Pan traps were used to assess the abundance and diversity of bees in four types of urban land-use zones (green, industrial, new residential and old residential) in Guelph, Cambridge, Kitchener and Waterloo. Over 107 species of bees from 25 genera were collected. Abundance and diversity of bees did not vary based on city land-use. Both abundance and diversity were higher at specific sites with naturalized areas.

Horton, S.

Saint Mary's University, Halifax, NS

TUESDAY, NOV 8 AT 9:00

INVITED SYMPOSIA

Identifying the locations, movement and habitat of the European Fire Ant, *Myrmica rubra*; an invasive species in the urban/suburban environment of Halifax, Nova Scotia

Myrmica rubra, also known as the European Fire Ant, is a pestiferous, invasive species in N.A. It administers a painful sting, and causes many residents to be unable to use their outdoor property. Locations in HRM were mapped, and habitat characteristics were measured and compared to nest densities. No strong correlations were found but comparing urban habitat to other invasive and native environments showed preferences and high adaptability. Public feedback indicates an eruption is occurring.

Huber, D.P.W.

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

TUESDAY, NOV 8 AT 10:30

INVITED SYMPOSIA

The Biological Survey of Canada: An outsider's wish list

Throughout its three decade history, the Biological Survey of Canada has provided vital information to entomologists working in Canada. One of the stated objectives of the BSC is to "provide universal access to biodiversity information." Speaking as an entomologist who makes no claim to being a taxonomist, what does the BSC currently offer to non-taxonomists, and how can it continue to be improved to increase its usefulness and relevance to entomologists in a variety of sub-disciplines?

Huber, D.P.W. (1), C. Pitt (1), J.A. Robert (1), T.R. Bonnett (1), J.D. Fraser (1), C.I. Keeling (2), J. Bohlmann (2)

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

TUESDAY, NOV 8 AT 11:00

SUBMITTED ORAL

Overwintering and developmental protein expression in mountain pine beetle larvae

We surveyed expressed proteins in overwintering mountain pine beetle, *Dendroctonus ponderosae* (Coleoptera: Curculionidae), larvae throughout autumn and spring. We detected 1508 proteins in early- and late-instar larvae, 506 of which showed significant seasonal shifts in prevalence. These proteomics data, along with related transcriptomic data specific to glycerol biosynthetic pathways, are a new and substantial glimpse into bark beetle overwintering and development.

Hurlburt, D.

ATK Subcommittee, Committee on the Status of Endangered Wildlife in Canada (COSEWIC), Ottawa, ON, and Annapolis Royal, NS
SUNDAY, NOV 6 AT 15:00

PLENARY

Aboriginal Traditional Knowledge in the Assessment of Insect Species at Risk in Canada

Aboriginal Traditional Knowledge (ATK) is a body of knowledge specific to each indigenous group that evolves as it is passed across generations. It includes elements of ecology, religion, aesthetics, economics and social values and is expressed orally, artistically and in cultural practices. COSEWIC, an arm's length advisory body to the Canadian public and the federal Environment Minister, is required by legislation to use the best available ATK in its assessments of species, including insects and other Arthropods. It does not consider the social or economic implications or values in its assessments. COSEWIC status reports primarily only include information that relates to the criteria it uses to determine risk of extinction; however ATK, especially that pertaining to insects, does not readily conform to the approach. I will illustrate a variety of forms of insect ATK that exist across Canada and the considerations for use of that knowledge by COSEWIC.

Hyde, D.A.

NatureServe Canada
TUESDAY, NOV 8 AT 11:30

INVITED SYMPOSIUM

Demand driven biodiversity data towards expanded investments in data publication and development in Canada

Canada's biodiversity data are limited spatially and taxonomically, and its investments lag behind other countries. Recent surveys reveal Canada lacks the data needed to manage its biodiversity effectively, particularly for non-charismatic species. To address emerging challenges, the presentation identifies a new strategy that engages citizens, promotes an aggressive policy of getting data into the hands of those who need it, and requires key biodiversity data holders to cooperate to succeed.

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

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

WEDNESDAY, NOV 9 AT 9:00

INVITED SYMPOSIA

Spatial genetic correlations among species in the mountain pine beetle system

Mountain pine outbreaks are the consequence of interactions among beetles, host pine trees, and pathogenic fungi. Predicting future outbreak risk requires an understanding of the genetic correlations among these species and how species' movement is affected by spatial context. We present the results from a landscape genetics analysis to identify genetic correlations among species and to describe the influence of spatial heterogeneity on gene flow and dispersal at different spatial scales.

Johns, R. (1), K. Ozaki (2), H. Tobita (2)

(1) Atlantic Forestry Centre, Canadian Forest Service, Fredericton, NB; (2) Hokkaido Forest Products Research Institute, Sapporo, Japan

TUESDAY, NOV 8 AT 13:30

SUBMITTED ORAL

Dietary mixing of needles from dimorphic shoots in larch enhances the performance of a specialist sawfly

Herbivorous insects mix resources in their diet to balance nutrients, dilute ingested toxins, accommodate changing nutritional needs associated with juvenile development, and avoid natural enemies. We investigated the mechanisms driving dietary mixing of 'shoot' and 'tuft' foliage in Japanese larch by larvae of the larch sawfly. All instars mixed foliage to some extent, however, only early instars performed better on a mixed diet; late instars performed best on tufted foliage. We discuss these results in the context of hypotheses commonly used to explain the adaptive value of dietary mixing on multiple plant species by generalist herbivores.

Kevan, P. G.

University of Guelph, ON
MONDAY, NOV 7 AT 14:30

INVITED SYMPOSIA

Insect behaviour on flowers: why it matters in pollination.

Many kinds of insects forage for various rewards on flowers. Their behaviours differ between taxa and according to the rewards they seek. Foraging across landscapes varies from the highly oriented, as in central place foraging, to haphazard. Foraging on patches of flowers varies from floral specialization and/or floral constancy as in monolecty and oligolecty to quite indiscriminate and general as in polylecty.

Once a forager is in a patch of flowers, it may work in a systematic and energy efficient fashion, as do bees, or obtain what it needs from a few floral visits and then become vagrant until hunger strikes next. The same range of foraging behaviours applies to flower visitors once they are on a particular flower.

Moreover, flower visitors may take on specific behaviours while feeding, or if they are territorial, seeking mates at flowers, obtaining shelter, or basking for warmth. The range of foraging behaviours has implications for pollination and the sexual reproductive strategies of the plants.

Kher, S .V. (1), L.M. Dosedall (1), 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
MONDAY, NOV 7 AT 13:15

PRESIDENT'S PRIZE - ORAL

Biology of the cereal leaf beetle, *Oulema melanopus* (Coleoptera: Chrysomelidae) on different cereal hosts and exploration of antibiotic characters in exotic wheat germplasm

The biology of the cereal leaf beetle, *Oulema melanopus*, was studied on live plants and excised leaf tissues of winter wheat (*Triticum aestivum* L.), oats (*Avena sativa* L.), rye (*Secale cereale* L.), triticale (× *Triticosecale* Wittmack) and sweet corn (*Zea mays* L.). We recorded larval survival, developmental time for each instar, total developmental time and pupal weights on each host. Furthermore, we selected six exotic wheat germplasms to test their putative antibiosis effects on *O. melanopus* survival.

Klein, B.A.

Guest Lectureship for Innovation in Teaching, Department of Biology, University of Konstanz, Konstanz, Germany
SUNDAY, NOV 6 AT 16:00

PLENARY

Insect esthetics and the importance of imagery in entomology

Images hold the power to inspire and to educate, and entomology has a long history of depicting insects in effective and exquisite ways. Images in entomology are important, at times necessary vehicles for describing features, interpreting data sets, or communicating concepts. Nevertheless, images are vanishing from at least one category of scientific publication that often features insect science: animal behavior. If images breathe life into scientific publications by educating and inspiring, then entomologists have a duty to keep this visual legacy alive. Join me for a visual presentation of the power and import of insect imagery in popular culture, art, education, and the science of studying insects.

Klymko, J.

TUESDAY, NOV 8 AT 10:45

Invited Symposia

The Maritimes Butterfly Atlas – a citizen science case study

Launched in 2010, the Maritimes Butterfly Atlas is a 5-year citizen science project documenting butterfly occurrence in the three Maritime provinces in an effort to improve understanding of the numbers, distribution, and status of butterfly species in the region. Following an intensive advertising campaign, 2010 saw 93 volunteers submit 2,463 records. Nearly 200 records were of provincially rare species, and two represented new provincial records.

Knee, W.

Carleton University, Ottawa, ON
WEDNESDAY, NOV 9 AT 11:00

INVITED SYMPOSIA

Cryptic species complex revealed in widespread generalist mite species associated with carrion-feeding beetles

Uroobovella nova is one of the most prevalent and abundant associates of carrion-feeding *Nicrophorus* beetles worldwide. Morphological, mitochondrial and nuclear markers were used to reveal that this widespread generalist species is not a single species, but is instead multiple species with narrow host preferences. The evolution and diversification of associated mites is assessed in context of the ecology and evolutionary history of their *Nicrophorus* hosts.

Knysch, K.M., D.J. Giberson, M.R. Van den Heuvel
Department of Biology, University of Prince Edward Island, Charlottetown, PE
TUESDAY, NOV 8 AT 13:15

SUBMITTED ORAL

Spring water arthropods: Crenophiles at the edge of agricultural fields

Springs are areas of focused groundwater discharge and generally relatively constant in temperature, which for PEI is about 7°C. Monitoring of spring benthic macroinvertebrates has been suggested as a means to detect groundwater contamination, but these springs have a unique cool temperature-adapted faunal assemblage that has not been well studied. The aim of this study is to determine the influence of agricultural inputs on spring invertebrate communities in eastern Prince Edward Island, through comparison of arthropod species composition and abundance patterns from spring sites originating in areas under agricultural production and those that remain forested.

Kulkarni, S. (1), L.M. Dossall (1), C. Willenborg (1), K.N. Harker (2), J. Spence (3)
(1)Department of Agricultural, Food and Nutritional Science, University of Alberta, Edmonton, AB; (2) Agriculture and Agri-Food Canada, Lethbridge, AB; (3)Department of Renewable Resources, University of Alberta, Edmonton, AB
MONDAY, NOV 7 AT 15:30

PRESIDENT'S PRIZE - POSTER

The effect of weed management practices on the distribution and abundance of ground beetles (Coleoptera: Carabidae) with special reference on granivorous species

The role of ground beetles (Coleoptera: Carabidae) as arthropod predators and bio-indicators is well recognized in agroecosystems. However, their role in granivory has been inadequately studied. This research investigated the abundance and diversity of carabids in agro-ecosystems in Alberta, Canada with a focus on granivorous species. We studied effects of crop rotational regime, herbicide treatments, seeding rates and weed seed densities on carabid abundance and species richness.

Labrie, G., J. De Almeida, R. Bernard, O. Lalonde, J.É. Guérin
Centre de recherche sur les grains Inc. (CÉROM)
TUESDAY, NOV 8 AT 14:00

SUBMITTED ORAL

Development and impacts of *Tipula paludosa* Meigen (Diptera: Tipulidae) on forage and field crops

The European crane fly is causing important damages in forage and field crops in Quebec province since 2008. The objective was to evaluate the performance of this pest in laboratory on 17 forage and field crops. Preliminary results demonstrated that sweet pearl millet, wheat, forage crops and flax were the most consumed by larvae, while soybean and corn were the less consumed. Sowing date and crop's choices in the rotation will be very important in the integrated pest management strategy.

Lamb, R.J. (1), P.A. MacKay (1), D. Wool (2)
(1) Department of Entomology, University of Manitoba, Winnipeg, MB; (2) Department of Zoology, Tel Aviv University, Tel Aviv, Israel
TUESDAY, NOV 8 AT 14:45

SUBMITTED ORAL

Population stability of a tree-galling aphid, *Baizongia pistaciae*, at three spatial scales

The population stability of *Baizongia pistaciae* (Hemiptera: Aphididae) on its primary host tree over 17 - 20 years was analyzed. Population variability declined with increasing population scale, because abundance was not synchronized among populations. Persistence decreased as abundance decreased and not as population variability increased. Population variability was independent of abundance. Although protected within galls on long-lived trees, the population variability of *B. pistaciae* was similar to that of other native but free-living aphid species on ephemeral herbaceous hosts, and lower than for introduced aphid species. Population variability was similar among populations, suggesting this parameter is characteristic of the species.

Legault, S. (1), J. Blais (2), C. Hébert (3), R. Berthiaume (4), J. Brodeur (1)

(1) Institut de recherche en biologie végétale, Département de sciences biologiques, Université de Montréal, Montréal, QC; (2) Département de Phytologie, Université Laval, Québec, QC; (3) Faculté de foresterie et géomatique, Département des sciences du bois et de la forêt, Université Laval, Québec, QC; (4) Natural Resources Canada, Canadian Forest Service, Laurentian Forestry Centre, Québec, QC

TUESDAY, NOV 8 AT 10:45

SUBMITTED ORAL

The atypical seasonal ecology of *Telenomus coloradensis* (Hymenoptera: Scelionidae): a matter of host availability and parasitoid activity

We studied the seasonal ecology of the egg parasitoid *Telenomus coloradensis*, a native biocontrol agent of the hemlock looper (Lepidoptera: Geometridae). The parasitoid showed an atypical thermal response by being active early in the season at very low temperature. This opens a window of opportunity for the parasitoid when host eggs remain dormant in early stages of development. Furthermore, lab experiments showed that host suitability varies inversely with embryonic development.

Leggett, F., **K. Floate**, P. Coghlin

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

TUESDAY, NOV 8 AT 15:00

SUBMITTED POSTER

Detection and distribution of Wolbachia bacteria in insect hosts determined using confocal microscopy

After treatment with antibiotics, infections of Wolbachia bacteria no longer were detected in two species of wasps (Pteromalidae) using standard PCR methods. Mating studies, however, indicated that low level infections remained present in one of the species. The presence of bacteria in eggs of this species was subsequently verified using confocal microscopy.

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

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

MONDAY, NOV 7 AT 9:15

PRESIDENT'S PRIZE - ORAL

Effect of low temperatures on emergence, fecundity, longevity and host-feeding in *Trichogramma brassicae* (Hymenoptera: Trichogrammatidae)

Sub-optimal temperatures during parasitoid development can affect adult fitness. Experiments examined the impact of different low temperature regimes with gradual acclimation (5°C, 10°C or 13°C) on immature *T. brassicae*. Different fitness traits and host-feeding behaviours were evaluated. Acclimation of immatures reduced adult fitness costs and there were no differences in host-feeding behaviours. That behaviour may not reflect the loss in energy reserve.

Lindo, Z. (1), A. Gonzalez (2)

(1) Department of Biology, University of Western Ontario, London, ON; (2) Department of Biology, McGill University, Montréal, QC

TUESDAY, NOV 8 AT 13:45

SUBMITTED ORAL

Community disassembly and trophic contraction of forest floor microarthropod community under environmental change

The interactive effects of alterations in climate and habitat openness were explored in a forest floor microarthropod community. The effect of drought had a significant and overwhelming effect on microarthropod abundance, richness and body-size distribution, which lead to a trophic contraction of the community. Increased temperature under ambient moisture conditions increased species richness, while habitat openness mitigated biodiversity loss in the dominant group (Oribatida).

Loboda, S., C. Buddle, K. Sims

McGill University, Montreal, QC

MONDAY, NOV 7 AT 9:30

PRESIDENT'S PRIZE - ORAL

A temporal comparison of a high arctic spider community (Araneae) at Lake Hazen, Nunavut

The spider community of the Hazen Lake area (N 81°40' - 81°55') was surveyed using pitfall traps in 1966. As part of the Northern Biodiversity Program, this region's spider fauna was re-examined forty years later using the same sampling method. The spider community showed some changes between the two sampling periods. Species composition, species richness and abundance changed for most of the thirteen species originally found in 1966, and no new species were found.

Lowery, D.T.

AAFC-PARC, Summerland BC

TUESDAY, NOV 8 AT 8:40

INVITED SYMPOSIUM

Managing cutworm pests of grapes: from the ground up

Feeding by larvae of several cutworm species in early spring results in considerable damage to the buds of grapevines in south central British Columbia. Secondary buds that develop as a result of damage to the primary buds are often not fruitful and delayed ripening reduces the quality of the fruit at harvest. Damage levels can vary considerably within and between vineyards and from year to year at the same location. Growers, therefore, often apply broad-spectrum insecticides as a preventative measure. To better explain the variable nature of the cutworm infestations, we have investigated the direct and indirect effects of vineyard soils on the biology of these climbing cutworm pests of grapes.

Lumley, L., F. Sperling

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

TUESDAY, NOV 8 AT 15:00

SUBMITTED POSTER

Life-history traits maintain the genomic integrity of sympatric species of the spruce budworm (*Choristoneura fumiferana*) group on an isolated forest island

Identification of species collected from islands can be challenging due to potential for local divergence. We sought to determine how many species of the spruce budworm complex reside in Cypress Hills, an isolated forest island. We integrated data on behaviour, ecology, morphology, mtDNA, and SSRs, comparing Cypress Hills to other regions of North America. We identified *C. fumiferana*, *C. occidentalis*, *C. lambertiana* and hybrids in Cypress Hills. Adult flight phenology and pheromone attraction were identified as key life-history traits involved in maintaining species integrity.

Lumley, L., M. Cusson

Natural Resources Canada, Canadian Forest Service, Laurentian Forestry Centre, Quebec, QC

TUESDAY, NOV 8 AT 15:00

SUBMITTED POSTER

Scanning the genome for ecotype-specific markers, and linking them to gene function in the hemlock looper (*Lambdina fiscellaria*)

Lambdina fiscellaria is a serious forest pest of coniferous trees in Canada. Two geographic ecotypes are fixed to undergo different numbers of larval stadia and differ in propensity to outbreak. We scanned for ecotype-specific SNPs in ESTs and tested them for individuals collected from five localities representing the ecotypes. It was possible to completely differentiate the most southern and northern populations, to reduce the number of markers required for identification, and to associate gene function to the markers.

MacEachern, M.C., N.S. Boyd, G.C. Cutler

Nova Scotia Agricultural College, Truro, NS

MONDAY, NOV 7 AT 9:30

PRESIDENT'S PRIZE - ORAL

Prospects for spreading dogbane management with the dogbane leaf beetle

Dogbane leaf beetle (*Chrysochus auratus* Fab.) consumes spreading dogbane (*Apocynum androsaemifolium* L.), an important weed in lowbush blueberry fields. The lifecycle and population dynamics of the beetle in Nova Scotia are presented, as well as results from no-choice host specificity experiments. Damage to spreading dogbane was examined in cage tests. These data will be used to evaluate the potential of *C. auratus* as a biological control agent of spreading dogbane.

MacIvor, J.S.

York University, Toronto, ON

MONDAY, NOV 7 AT 11:00

INVITED SYMPOSIA

Revaluing the urban matrix with cavity-nesting bees

In novel, urban landscapes, solitary bees are surprisingly abundant. Many species are highly mobile and forage in habitats fragmented by a matrix of unrewarding or impervious surfaces. Monitoring cavity-nesting bees (that nest in small pre-existing holes) may provide a model to examine the resiliency of urban pollination services. Using nestboxes, this study will elucidate the landscape matrix effects limiting urban bee diversity and foraging, to better connect bees to city planning and design.

MacKay, C. (1), K. Hillier (1), J. Sweeney (2)

(1) Biology Department, Acadia University, Wolfville, NS; (2) Natural Resources Canada, Canadian Forest Service, Fredericton, NB

MONDAY, NOV 7 AT 15:30

PRESIDENT'S PRIZE - POSTER

Investigation of the olfactory physiology of the invasive brown spruce longhorn beetle (BSLB), *Tetropium fuscum* (Fabr.) (Coleoptera: Cerambycidae)

The brown spruce longhorn beetle, *Tetropium fuscum* (Fabr.) (Coleoptera: Cerambycidae), is an invasive species native to Europe that has become established in Nova Scotia. Electron microscopy was used to examine sensillar ultrastructure and physiological testing was carried out on native *T. cinnamopterum* as a surrogate to determine its response to biologically relevant stimuli. Data gathered may be useful for improving current pheromone- and host volatile-based mitigation initiatives.

MacKenzie, K. (1), D. Moreau (2)

(1) Pacific Agri-Food Research Centre, AAFC, Summerland, BC; (2) Atlantic Food and Horticulture Research Centre, AAFC, Kentville, NS

TUESDAY, NOV 8 AT 10:30

INVITED SYMPOSIA

Rooting out weevil damage in strawberry

Cryptic and nocturnal, root weevil adults can be located through trapping and night sweeping. The larvae which damage roots of many plants can only be counted through destructive sampling. Thus, interactions between larvae and their hosts, in this case – strawberry - are very difficult to uncover. We will discuss research that examined root weevil feeding on strawberry including cultivar tolerance and threshold studies.

MacQuarrie, C.J.K., J Fidgen

Natural Resources Canada, Canadian Forest Service, Great Lakes Forestry Centre, Sault Ste Marie, ON

TUESDAY, NOV 8 AT 15:00

SUBMITTED POSTER

Estimating presence and intensity of jack pine budworm defoliation using boosted regression trees

We developed models to predict the presence and intensity of jack pine budworm defoliation using boosted regression trees with abiotic and biotic predictors. Jack pine flowers were a good predictor of the intensity of defoliation but not a good predictor of the likelihood that defoliation may or may not occur within a stand. This is significant because flowers are well known to be a predictor of the success of larvae. Our results suggest that this may not be true at all ecological scales.

Maghodia, A.B. (1), C.Y. Olivier (1), B. Galka (1), L.E. Peixoto (2), S. Perlman (2)

(1) Saskatoon Research Centre, Agriculture and Agri-Food Canada, Saskatoon, SK; (2) Department of Biology, University of Victoria, Victoria, BC

TUESDAY, NOV 8 AT 15:00

SUBMITTED POSTER

Detection and characterization of *Arsenophonus* in leafhoppers across Canada

The genus *Arsenophonus* (Gammaproteobacteria: Enterobacteriaceae) is an emerging clade of inherited symbionts of arthropods. A number of *Arsenophonus* strains that infect phloem-feeding insects have also been recently shown to cause diseases in plants. In this study, we screened 43 species of leafhoppers (Hemiptera: Cicadellidae) for the presence of *Arsenophonus*. We found that infections are widespread, with 13 species testing positive. By sequencing three single-copy genes, we also found that multiple leafhopper species harbour identical *Arsenophonus* strains, suggesting that horizontal transmission is common, perhaps via shared host plants

Maghodia, A.B. (1), C.Y. Olivier (1), B. Galka (1), L.E. Peixoto (2), S.J. Perlman (2)

(1)Saskatoon Research Centre, Agriculture & Agri-Food Canada, Saskatoon, SK; (2) Department of Biology, University of Victoria, Victoria, BC

TUESDAY, NOV 8 AT 15:00

SUBMITTED POSTER

Detection and Characterization of *Arsenophonus*, a widespread inherited bacterial endosymbiont of leafhoppers across Canada

Arsenophonus is a widespread yet little studied clade of bacterial symbionts of arthropods that includes sex-ratio distorters, mutualists, and plant pathogens. We screened 43 species of leafhopper from 5 provinces and found that *Arsenophonus* infections are abundant in this group, with 13 species testing positive, including ~60% of individuals of *Macrosteles quadrilineatus*, the major vector of aster yellows disease. Different leafhopper species harbour identical *Arsenophonus* strains, suggesting that horizontal transmission is common, perhaps via shared host plants.

Maguire, D.Y., C.M. Buddle, E.M. Bennett

Department of Natural Resource Sciences, McGill University, Montreal, QC

MONDAY, NOV 7 AT 9:30

PRESIDENT'S PRIZE - ORAL

The effects of landscape composition on the regulation of insect herbivory

Forest fragmentation affects many ecosystem processes within remnant forest patches, and this has implications for the benefits that society derives from ecosystems. Much of southern Quebec is characterized by highly fragmented forest landscapes. In this region, sugar maple production is an economically valuable industry which can be significantly affected by insect herbivory. We quantified how forest patch composition in this landscape influences regulation of this ecosystem process in both understory and canopy sugar maple trees.

Majka, C.G.

Research Associate, Nova Scotia Museum, Halifax, NS

TUESDAY, NOV 8 AT 13:00

INVITED SYMPOSIA

Will Biodiversity Research Become Extinct in the 21st Century?

Despite escalating estimates of biodiversity, resources devoted to advance this knowledge have been in decline. The shortfall of investment in training, research, and collections management has led to a "taxonomic impediment" at a time when rates of extinction appear to be rising dramatically. There is a lack of public and political understanding of the importance of biodiversity research. This has resulted in an "extinction" of financial resources. How can this be remedied?

Marshall, S.A.

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

MONDAY, NOV 7 AT 9:30

INVITED SYMPOSIA

Identifying the OTHER pollinators

Several fly families occur regularly on flowers, and can be very important pollinators. Syrphidae and Calliphoridae in particular are often extremely abundant flower visitors, although other flies can be common at flowers and in some systems other families (such as Muscidae, Anthomyiidae, Mycetophilidae or Certopogonidae) are recognized as the major pollinators. Nonetheless, flies are sometimes neglected in pollinator studies because of the relative difficulty of identifying them. In part thanks to support from the CANPOLIN program, we have been trying to address obstacles to fly identification through the development of revisions, reviews and open access, user-friendly photographic keys. In this talk I will overview some of the results of ongoing and recently completed work on Syrphidae, Calliphoridae and other groups, and argue that the Canadian Journal of Arthropod Identification provides a cost-effective approach that could soon make it possible for anyone to quickly identify most flower-visiting insects in Canada.

Martel, V. (1), F. Schlyter (2), R. Ignell (2), P. Anderson (2)

(1) Natural Resources Canada, Canadian Forest Service, Laurentian Forestry Centre, Quebec City, QC; (2) Swedish University of Agricultural Sciences (SLU), Insect Chemical Ecology, Ethology and Evolution (ICE3), Alnarp, Sweden

WEDNESDAY, NOV 9 AT 9:45

SUBMITTED ORAL

Not only thirsty for blood: Mosquitoes feeding on a caterpillar

Even without killing their prey, enemies can have important impacts on them. We investigated the impact of a mosquito *Aedes aegypti*, on its unusual invertebrate host, *Spodoptera littoralis*. Larvae developing in presence of mosquitoes showed a slower development and reached a smaller pupal weight. In addition, larvae leave the plant more in presence of mosquitoes. Ecological impacts such as higher risks of food depletion and longer exposure to natural enemies are likely to be costly consequences.

Mason, P.G. (1), T. Haye (2), D.R. Gillespie (3), L.M. Dossdall (4), U. Kuhlmann (2), A.B. Broadbent (5), G.A.P. Gibson (1)

(1)Agriculture and Agri-Food Canada, Research Centre, Ottawa, ON; (2)CABI Europe-Switzerland, Delémont, Switzerland; (3)Agriculture and Agri-Food Canada, Research Centre, Agassiz, BC; (4)Department of Agricultural, Food and Nutritional Science, University of Alberta, 4-10 Agriculture-Forestry Centre, Edmonton, AB; (5)Agriculture and Agri-Food Canada, Research Centre, London, ON

TUESDAY, NOV 8 AT 14:45

SUBMITTED ORAL

Parasitoid Communities of Cabbage Seedpod Weevil: Are Native Species Enough?

Invasive alien species are highly successful in establishing populations that thrive in regions where they have not previously occurred. The 'enemy release hypothesis' is among the arguments used to explain this success. Will native species given enough time adapt to invaders and regulate their populations? Is classical biological control warranted? Furthermore, how many natural enemy species are enough? The cabbage seedpod weevil provides a good case study to explore these questions.

Mason, P.G. (1), A. Brauner (1), M. Appleby (2), J-F. Landry (1), J.H. Miall (1), M. Paibomesai (3), W.H. Jenner (4,6), R. Weiss (5), O. Olfert (5), U. Kuhlmann (4), N. Cappuccino (6)

(1) Agriculture and Agri-Food Canada, Research Centre, Ottawa, ON; (2) Ontario Ministry of Agriculture, Food and Rural Affairs, Brighton, ON; (3) Ontario Ministry of Agriculture, Food and Rural Affairs, Guelph, ON; (4) CABI Europe - Switzerland, Delémont, Switzerland; (5) Agriculture and Agri-Food Canada, Saskatoon, SK; (6) Department of Biology, Carleton University, Ottawa, ON

TUESDAY, NOV 8 AT 13:30

SUBMITTED ORAL

How does your garlic grow? The leek moth invasion in Canada

Leek moth has invaded North America. Initially reported from the Ottawa area, this invasive alien pest is slowly expanding its range in the east and devastating *Allium* spp. crops along the way. Three generations occur and each takes 445 degree-days to complete. We predict it will expand its range throughout eastern North America. Biologically based management will include a combination of pheromone trap monitoring, estimating development time, the use of physical barriers, and natural enemies.

McClay, A.S.

McClay Ecoscience, Sherwood Park, AB

TUESDAY, NOV 8 AT 8:30

SUBMITTED ORAL

Biological control of scentless chamomile in Canada – taking stock after almost twenty years

Scentless chamomile (*Tripleurospermum perforatum*) is an annual weed native to Europe. Three European biological control agents have been released against it in Canada, of which two, the gall midge *Rhopalomyia tripleurospermi* and the seed weevil *Omphalopion hookerorum*, have dispersed widely and are sometimes abundant. I will review the history of the project, discuss the biology and effects of these agents, and suggest ways of gaining a better understanding of their impact in the field.

McGregor, R., J. Bannerman

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

TUESDAY, NOV 8 AT 8:45

SUBMITTED ORAL

Evaluation of the impact of *Praon unicum* and *Aphidius matricariae* (Hymenoptera: Aphidiidae) on populations of *Myzus persicae* (Homoptera: Aphididae) on greenhouse peppers

Inundative releases of parasitoids are routinely made for aphid control on greenhouse-grown peppers in British Columbia. Despite this, effective biological control of aphids remains a challenge. We are currently evaluating a new parasitoid, *Praon unicum* (Hymenoptera: Aphidiidae), for aphid management. Here, we present results of a greenhouse cage experiment where we quantify aphid suppression by, and interactions between, *P. unicum* and another commonly-used parasitoid, *Aphidius matricariae*.

McGregor, R., C. Hemsworth

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

TUESDAY, NOV 8 AT 15:00

SUBMITTED POSTER

Olfactory responses of *Micromus variegatus* (Neuroptera: Hemerobiidae) to pepper leaves infested with *Myzus persicae* and *Aulacorthum solani* (Homoptera: Aphididae)

Myzus persicae and *Aulacorthum solani* (Homoptera: Aphididae) are primary pests of greenhouse-grown peppers in British Columbia. *Micromus variegatus* (Neuroptera: Hemerobiidae) is a predator that is being evaluated for biological control of aphids in greenhouses. Here, we present results of y-tube olfactometer assays of the responses of adult *M. variegatus* to the odours of pepper leaves infested with *M. persicae* and *A. solani*.

McNeil, J. N. (1), J. Delisle (2), B. Roitberg (3)

(1) Department of Biology, The University of Western Ontario, London, ON; (2) Ressources naturelles Canada, Service canadien des forêts, Centre de foresterie des Laurentides, Succ. Sainte-Foy, QC; (3) Evolutionary and Behavioural Ecology Research Group, Simon Fraser University, Burnaby, BC

MONDAY, NOV 6 AT 11:00

INVITED SYMPOSIA

Should one pity the poor migrant? The case of the sunflower moth (SFM), *Homoeosoma electellum*

How might an insect herbivore evolve to maximize resource exploitation and minimize mating failures when their resources are ephemeral? We examined the effect of delayed mating/oviposition on female reproductive success in the SFM, a species where the onset of sexual maturation, oviposition and migration are modulated by the availability of host plant pollen. We then developed a theoretical model elucidating the evolutionary stable, phenotypically flexible reproductive and movement decisions.

Melathopoulos, A.P. (1), S.F. Pernal (2), M.M. Guarna (3), L.J. Foster (4)

(1) Interdisciplinary PhD Program, Dalhousie University, Halifax, NS; (2) Agriculture and Agri-Food Canada, Beaverlodge, AB; (3) Centre for High-Throughput Biology, University of British Columbia, Vancouver, BC

TUESDAY, NOV 8 AT 15:00

SUBMITTED POSTER

Variability and correlations among traits associated with VaRROA MITE resistance in a Canadian breeding population

We measured the growth rate of the honey bee parasite *Varroa destructor* among uniformly infested commercial colonies across two generations and related it to previously-identified honey bee mite resistance traits. A number of traits were found to be correlated and heritable and this may generate new options for bee breeders to assay putative breeding colonies for resistance.

Minaei, S., A. Zayed

York University, Toronto, ON

WEDNESDAY, NOV 9 AT 11:00

SUBMITTED ORAL

Molecular evolution and its genomic correlates in the honeybee

The honeybee's genome provides us with the tools to study the genomic correlates of molecular evolution in social insects. Two unique features of the honeybee's genome, when compared to other insects, are: extremely low GC content and high recombination rates. We sequenced 21 randomly chosen honeybee genes and estimated several measures of genetic diversity. We plan to examine the joint effects of GC content and recombination rates on the honeybee's molecular evolution.

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

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

MONDAY, NOV 7 AT 9:45

PRESIDENT'S PRIZE - ORAL

Host choice by an oligophageous candidate weed biological control agent in native range communities

Sufficient host specificity is critical for minimizing risk in biocontrol; however, oligophages may be useful agents when several congeners invade. Here, a new challenge becomes predicting which species will be controlled. We surveyed host use of a candidate weed biocontrol agent (a gall wasp) in its native range. Despite occurrences on multiple host species, when suitable species co-occurred we found that host use was significantly non-random, with only the most abundant species utilized.

Mohan, M. (1, 2), C.D. Scott-Dupree (2), G.C. Cutler (1)

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

MONDAY, NOV 7 AT 9:45

PRESIDENT'S PRIZE - ORAL

Molecular, individual and population-level chemical hormesis in green peach aphids

Hormesis is a biphasic toxicological response displaying low-dose stimulation and high-dose inhibition. We found that green peach aphid reproduction increased 20-30% when exposed to sublethal concentrations of imidacloprid, and that up to five-fold up-regulation of several genes occurred at peak hormetic concentrations, as determined by real-time PCR. Further work will utilize whole plants in a greenhouse to study population effects in *M. persicae* when exposed to sublethal doses of imidacloprid.

Moreau, D.L. (1), T. Hueppelsheuser (2), H. Fraser (3), P. Fisher (3), J. Broatch (4), L. Urbain (4), J.-P. Legare (4), K.L. Foster (1).

(1) Agriculture and Agri-Food Canada, Atlantic Food and Horticulture Research Centre, Kentville, NS; (2) British Columbia Ministry of Agriculture, Agri-Food Protection Branch, Abbotsford, BC; (3) Ontario Ministry of Agriculture, Food & Rural Affairs, Vineland, ON; (4) Ministry of Agriculture, Fisheries and Food, QC

TUESDAY, NOV 8 AT 9:45

SUBMITTED ORAL

Monitoring efforts and detection of the invasive pest, Spotted wing drosophila (*Drosophila suzukii*) across Canada: Risk for blueberry?

Spotted wing drosophila (SWD) is considered a new invasive pest in Canada, having been first detected in British Columbia in 2009 and in Ontario in the fall of 2010. This pest is considered a serious threat to most temperate fresh fruits that includes economically important crops such as blueberries, cherries, raspberries and grapes. Climate analysis conducted by the Canadian Food Inspection Agency, showed that British Columbia, Ontario, and Nova Scotia are all at high risk for establishment of this pest. Regional surveys in 2011 did not detect SWD in Alberta, Saskatchewan or Quebec, despite captures in Quebec in 2010. Spotted wing drosophila was confirmed in Nova Scotia with captures in late summer 2011.

Moreau, D.L. (1), D.B. Strongman (2), D.J. Hebb (1), K.L. Foster (1)

(1) Agriculture and Agri-Food Canada, Atlantic Food and Horticulture Research Centre, Kentville, NS; (2) Biology Department, Saint Mary's University, Halifax, NS

TUESDAY, NOV 8 AT 15:00

SUBMITTED POSTER

Monitoring insects and their symbionts in the Thomas Brook watershed

Within the Thomas Brook watershed, the stream and riparian zones are impacted at a number of points by human residential and agricultural activities. Attempts to mediate this human impact are underway and improvements in the health of the system are being measured by comparison of the insect and microbial communities in the headwaters of the watershed with sites located further downstream that are directly affected. The influence of riparian zone health on insect diversity and effects of water quality on the microbial (fungi and bacteria) communities that are part of the resident flora associated with the insects is being monitored.

Moreau, G. (1), J.-P. Michaud (2, 1)

(1) Université de Moncton, Moncton, NB; (2) Royal Canadian Mounted Police, High River, AB

WEDNESDAY, NOV 9 AT 8:30

INVITED SYMPOSIA

Death and succession planning: can we trust insects to do it right?

Connell and Slatyer's facilitation model, believed by many to be an accurate explanation of the main causal mechanism behind heterotrophic succession, has been liberally carried over to heterotrophic systems without having benefited from empirical support in decomposition ecology. I will examine the ecological and evolutionary implications of this model and present a first test of the model in a heterotrophic context using carrion-related insects of forensic importance.

Mori, B.A., M.L. Evenden

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

MONDAY, NOV 7 AT 13:30

PRESIDENT'S PRIZE - ORAL

Demonstration of pheromone-mediated communication disruption for *Coleophora deauratella* (Lepidoptera: Coleophoridae)

The red clover casebearer (RCC) is an invasive seed predator of red clover, *Trifolium pratense*, in Canada. Lack of insecticidal control options makes RCC an ideal candidate for pheromone-mediated communication disruption. We tested pheromone rope dispensers (Shin-Etsu, Japan) and puffers (Suterra, USA) containing a 10:1 ratio of Z-7-dodecenyl acetate and Z-5-dodecenyl acetate in small plot studies. We further assessed the mechanisms of communication disruption through comparison of treatment with attractive and unattractive pheromone blends. The importance of pheromone release rate and dispenser distribution was also assessed.

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

Department of Entomology, University of Manitoba, Winnipeg, MB

TUESDAY, NOV 8 AT 13:45

SUBMITTED ORAL

Effect of *Lygus lineolaris* on navy beans

More than 80% of the of the plant bugs attacking navy beans in Manitoba are *Lygus lineolaris*, and their effects on yield quality and quantity were studied in field cages and the laboratory. At flowering and pod formation, *L. lineolaris* nymphs and adults caused significant loss in seed yield weight, primarily due to abortion of plant reproductive structures. At pod maturation, losses of yield weight were not significant, but seed quality and grade was reduced by direct injury to the seed coat.

Namayandeh, A. (1), K.M. Somers (2), P.J. Dillon (1)

(1) Trent University, ON; (2) Dorset Environmental Complex

MONDAY, NOV 7 AT 10:30

PRESIDENT'S PRIZE - ORAL

Substituting space for time: Effects of change in temperature along landscape gradients on community of benthic invertebrates in boreal shield's headwater streams of Ontario, Canada

This study seeks to understand whether changes in climate over time can be evaluated by looking at surrogate changes in climate along spatial gradients in elevation or altitude. Study uses spatial and temporal stream data sets (i.e. water temperature) to infer changes over time coinciding with regional-scale warming or cooling events. Similar changes in elevation series will be used as confirmation that elevation gradients could be used to predict changes in benthic communities of streams.

Namayandeh, A. (1), K.M. Somers (2), P.J. Dillon (1), D.V. Beresford

(1) Trent University, ON; (2) Dorset Environmental Complex

MONDAY, NOV 7 AT 15:30

PRESIDENT'S PRIZE - POSTER

Precambrian Shield headwater streams larvae Chironomidae (Diptera:Chironomidae) of Ontario, Canada

A diagnosis based on a field study of Precambrian Shield headwater streams from April through to August of 2009-2010 was constructed. Diagnosis represents the Chironomidae found in 1st order headwater streams.

Namin, H.H., B. Sharanowski, M. Iranpour

Department of Entomology, University of Manitoba, Winnipeg, MB

MONDAY, NOV 7 AT 14:00

SUBMITTED ORAL

DNA fingerprinting of black-legged *Aedes/Ochlerotatus* species (Diptera: Culicidae) occurring in Canada

Twenty seven black-legged *Aedes/Ochlerotatus* species are currently distributed in Canada. Accurate identification of these species is extremely difficult as key morphological characters are often destroyed through common collection and preservation techniques. Moreover, the members of *A. communis* complex cannot be identified morphologically in the adult stage. Molecular methods such as RFLP analysis using mitochondrial DNA may be used as a powerful tool for the identification of species in all developmental stages, as well as for seriously damaged specimens. We present a preliminary identification key based on DNA fingerprinting for several members of the black-legged *Aedes* species occurring in Canada, particularly in Manitoba.

Nanayakkara, U.N. (1), Y. Pelletier (1), M.G. Giguère

(1) Potato Research Centre, AAFC, Fredericton, NB

WEDNESDAY, NOV 9 AT 9:15

SUBMITTED ORAL

Development of a method for evaluation of acquisition potential of Potato Virus Y (PVY) by different aphid species

Aphids transmit Potato Virus Y (PVY) in a non-persistent manner and many casual visitors to potato fields can acquire and transmit the virus with varying efficiency. We have developed a simple, reliable and rapid assay to determine acquisition potential of PVY by different aphid species. Acquisition access was given to aphids in a satchel containing a preparation of partially purified virions, helper component and 15% sucrose. Presence of PVY was detected using RT-PCR in individual stylets and bodies. Acquisition rate based on single stylets varied between 10-38% in the species evaluated.

Nealis, V.G.

Natural Resources Canada-Canadian Forest Service Pacific Forestry Centre, Victoria, BC
TUESDAY, NOV 8 AT 11:30

SUBMITTED ORAL

The phenological window for western spruce budworm

Experimental cohorts of western spruce budworm were used to measure seasonal decline in the adequacy of their Douglas-fir host at several field sites and years in British Columbia. Host adequacy was expressed at budworm fitness; the product of survival and fecundity. Fitness declined four-fold over the season and was greatest in coastal and higher-elevation interior sites. These patterns provide insight into the adaptive significance of budworms' curious phenology.

Nmor, J.C. (1,3), T. Sunahara (1), K. Goto (2), K. Futami (1), G. Dida (4), G. Sonye (5), U. Fillinger (6), N. Minakawa (1,7)*

(1) Department of Vector Ecology and Environment, Institute of Tropical Medicine Nagasaki University, Nagasaki, Japan; (2) Department of Eco-epidemiology, Institute of Tropical Medicine Nagasaki University, Nagasaki, Japan; (3) Department of Animal and Environmental Biology, Delta State University, Abraka, Nigeria; (4) School of Public Health, Maseno University, Maseno, Kenya; (5) Spring of Hopes, Mbita, Kenya; (6) Durham University, School of Biological and Biomedical Sciences, Durham, UK; (7) Institute of Tropical Medicine (NEKKEN) and the Global Centre of Excellence Program, Nagasaki University, Nagasaki, Japan

MONDAY, NOV 7 AT 10:45

PRESIDENT'S PRIZE - ORAL

Predicting breeding sites of malaria vectors in Western Kenya using topographic derivatives of Digital Elevation Model

We aimed to employ topographic variables to predict malaria vector breeding sites. Using mosquito larval habitats data conducted in Western Kenya during 2006 and randomly generated points, we obtained multivariate logistic regression model that predicts presence of breeding sites from topographic indices derived from a DEM. The model showed moderate accuracy (AUC > 0.75) both in the main study area and in the adjacent area which breeding site data was not used in model development. Our methods could help strategize malaria control.

Noronha C. (1), B. Beaton (2), S. Mellish (2)

(1) Crops and Livestock Research Centre, AAFC, Charlottetown, PE; (2) PEI Department of Agriculture, PE
TUESDAY, NOV 8 AT 13:15

SUBMITTED ORAL

The distribution of click beetles belonging to the genus *Agriotes* in PEI

The increase in wireworm damage to vegetable crops across Prince Edward Island has resulted in considerable economic loss to farmers. A spike in wireworm populations and increasing reports of damage from virgin areas is cause for concern. In 2009, a survey was conducted to determine the distribution of the three *Agriotes* species responsible for the majority of damage. Seventy six pheromone traps, for *A. obscurus*, *A. lineatus* and *A. sputator* were set-up in fields across the island. This presentation will provide information on the distribution and abundance of the three *Agriotes* species on PEI.

O'Connell D.M. (1), S.D. Wratten (1), M.A. Gillespie (2)

(1) Bio-Protection Research Centre, Lincoln University, Lincoln, New Zealand; (2) Institute of Integrative and Comparative Biology, University of Leeds, Leeds, UK
WEDNESDAY, NOV 9 AT 8:45

SUBMITTED ORAL

Floral resource provision in biological control: the effect on multi-trophic interactions in brassicas

The addition of floral resources to agroecosystems to improve biological control may enhance the fitness of third trophic level, but also provide a resource that benefits the second trophic level. We manipulated insect communities by providing a floral resource to investigate if nectar availability mediated a trophic cascade effect. We conclude that the likelihood of a trophic cascade occurring, mediated by the provision of floral resource remains unclear under field cage conditions.

O'Connell, D.M. (1), W.G. Lee (2), A. Monks (2), K.J.M. Dickinson (3)

(1) Bio-Protection Research Centre, Lincoln University, Lincoln, New Zealand; (2) Landcare Research, Dunedin, New Zealand; (3) Department of Botany, University of Otago, Dunedin, New Zealand

TUESDAY, NOV 8 AT 14:00

SUBMITTED ORAL

Foliar domatia affect mite assemblages on the shrub *Coprosma lucida* (Rubiaceae)

Habitat structure is an important factor influencing population dynamics and trophic organisation of terrestrial invertebrates. Leaf domatia, small indentations on the underside of leaves, are often inhabited by potentially beneficial mites and may mediate trophic relationships. We investigated the relationship between domatia availability and foliar mite assemblages in contrasting habitats. We found that foliar mite assemblages in native vegetation on experimental shrubs are influenced by domatia availability, resident foliar mites, and local mite assemblages.

Olivier, C. (1), B. Galka (1), A. Pearce (1), G. Séguin-Swartz (1), R. Gugel

(1) Agriculture and Agri-Food Canada, Saskatoon, SK

TUESDAY, NOV 8 AT 15:00

SUBMITTED POSTER

Aster yellows phytoplasma strains infecting plants of *Camelina sativa* (L.) Crantz in Saskatchewan

The oilseed *Camelina sativa* (L.) Crantz has recently gained economic importance in the Canadian agricultural sector. *Camelina sativa* is resistant to some of the common pests and diseases of Brassica oilseeds, but is susceptible to aster yellows disease (AY). AY is caused by the phytoplasma species 'Candidatus Phytoplasma asteris', which is transmitted mainly by leafhoppers. Plants and leafhoppers were sampled in camelina fields located near Saskatoon and phytoplasma infected plants and insects were identified using PCR tests and virtual RFLP. The biodiversity of the AY strains will be discussed.

Olivier, C. (1), B. Galka (1), C. Vincent (2), J. Saguez (2), L. Stobbs (3)

(1) Agriculture and Agri-Food Canada, Saskatoon, SK; (2) Agriculture and Agri-Food Canada, Saint-Jean-sur-Richelieu, QC; (3) Agriculture and Agri-Food Canada, Vineland, ON

WEDNESDAY, NOV 9 AT 9:00

SUBMITTED ORAL

Biodiversity of Aster Yellow phytoplasma strains in *Macrosteles quadrilineatus* in Canada, based on the 16Sr gene sequencing

Aster Yellow diseases (AY) are caused by different strains of the phytoplasma species 'Candidatus Phytoplasma asteris', a phloem-limited pathogen, mainly transmitted by leafhoppers. In Canada, the aster leafhopper *Macrosteles quadrilineatus* Forbes is the main AY vector. Populations of aster leafhoppers were sampled in vineyards, cereals, canola and vegetable crops in different provinces of Canada. Phytoplasma strains were identified using PCR tests with primers based on 16S ribosomal DNA. Known strains of Aster Yellow phytoplasma were detected in many specimens and one new strain was identified.

Orlofske, J.M. (1), D.J. Baird (2)

(1) Canadian Rivers Institute, Department of Biology, University of New Brunswick, Fredericton, NB; (2) Environment Canada, Canadian Rivers Institute, Department of Biology, University of New Brunswick, Fredericton, NB

MONDAY, NOV 7 AT 15:30

PRESIDENT'S PRIZE - POSTER

Aquatic insect community trait and taxonomic composition in mesoscale flow habitats

Understanding how aquatic insects respond to flow is essential for developing biomonitoring metrics. Alteration of flow conditions influences mesoscale habitats, affecting community dynamics. We investigate taxonomic and trait patterns at the mesoscale for 4 aquatic insects orders. Benthic samples and physical habitat data were collected from 3 streams in the Miramichi River watershed, NB. We observed variation in community structure among flow habitats, which may indicate hydrologic conditions.

Otani, J.K. (1), C. Yoder (2)

(1) Agriculture and Agri-Food Canada, Beaverlodge Research Farm, Beaverlodge, AB; (2) Agriculture and Rural Development, Spirit River, AB

TUESDAY, NOV 8 AT 13:00

SUBMITTED ORAL

Pest status of the Red clover casebearer (Lepidoptera: Coleophoridae: *Coleophora deauratella*) in clover seed production in the Peace River region

Infestations of Red clover casebearer (*Coleophora deauratella* Lienig) have been so serious since 2005 in the Peace River region that seed production recommendations now include only first-year seed crops then rotating to a new crop. The establishment of this exotic pest species has abruptly changed production practices in the Peace River region. An update on the biology and studies examining control options for clover seed production related to *C. deauratella* will be described.

Packer, L., C.S. Sheffield
Department of Biology, York University, Toronto, ON
TUESDAY, NOV 8 AT 13:45

INVITED SYMPOSIA

COSEWIC and biodiversity surveys

We outline COSEWIC's criteria for listing species as at risk with examples and outline how different taxonomic groups often have very different kinds of data. A recently developed tool for assessing future potential decline – the “threats calculator” will often require additional information for effective use. The role of insect survey work in recent successes and failures at COSEWIC will be discussed. We present a survey of bee biodiversity and show how they may influence COSEWIC decisions.

Packer, L., C.S. Sheffield
Department of Biology, York University, Toronto, ON
MONDAY, NOV 7 AT 10:30

INVITED SYMPOSIA

Bee Biodiversity

Almost 20,000 bee species are known worldwide, with approximately 800 in Canada. The number known from our country is increasing as a result of intensive sampling, much of it the result of CANPOLIN activities. Bee diversity follows the standard latitudinal gradient in species richness with the added pattern of increased diversity in arid and semi-arid regions. In this talk we will provide an overview of the taxonomic, ecological and behavioural diversity of the bees of Canada.

Peach, D.A.H. (1,3), P.K. Abram (2), **T. Haye** (3), P.G. Mason (4), N. Cappuccino (2), G. Boivin (5), U. Kuhlmann (3)

(1) Department of Environmental Science, 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

TUESDAY, NOV 8 AT 15:00

SUBMITTED POSTER

Is more really merrier? Superparasitism of swede midge (*Contarinia nasturtii*) by *Synopeas myles*

Superparasitism, unless certain conditions are met, is not typically an optimal fitness strategy for solitary endoparasitoid females. We examined the effect of different degrees of superparasitism on the fitness of *Synopeas myles* (Hymenoptera: Platygasteridae) offspring, measured as differences in survival rate, development time, and size. The results of this investigation may help to explain why superparasitism by this species is relatively common in the field.

Peixoto, L.E. (1), A.B. Maghodia (2), C.Y. Olivier (2), B. Galka (2), S.J. Perlman (1)

(1) Department of Biology, University of Victoria, Victoria, BC; (2) Saskatoon Research Centre, Agriculture and Agri-Food Canada, Saskatoon, SK

MONDAY, NOV 7 AT 16:15

SUBMITTED ORAL

Characterization of *Arsenophonus*, a widespread inherited bacterial endosymbiont of leafhoppers across Canada

Arsenophonus is a widespread yet little studied clade of bacterial symbionts of arthropods that includes male-killers, mutualists, and plant pathogens. We show that *Arsenophonus* is pervasive in leafhoppers, with 13 out of 43 species testing positive, including ~60% of individuals of *Macrostelus quadrilineatus*, the major vector of aster yellows disease. Similar symbiont strains infect different host species, suggesting that horizontal transmission is common. We will also present results of lab experiments measuring vertical, sexual and plant-mediated symbiont transmission

Pelletier, Y.

Potato Research Centre Agriculture and Agri-Food Canada, Fredericton, NB
WEDNESDAY, NOV 9 AT 8:45

SUBMITTED ORAL

The role of host-plant selection behaviour in PVY transmission by aphids

Potato virus Y (PVY) is transmitted to potato by aphids that do not use it as a host. Since PVY is a non-persistent virus, the host selection behaviour of aphid vectors may influence the transmission success. Ethological and electronic penetration graph observations of the aphids on potato and their host plant are used to evaluate the potential of PVY transmission by those aphids.

Pinault, L.L., F.F. Hunter

Brock University, Biological Sciences, St. Catharines, ON
TUESDAY, NOV 8 AT 10:30

INVITED SYMPOSIA

Distribution and habitat associations of *Anopheles* spp. (Diptera: Culicidae) in highland Ecuador - what does this mean for malaria?

Malaria has recently occurred in highland Bolivia, suggesting the resurgence of malaria vectors (Culicidae: *Anopheles* spp.) in the Andes. New distribution maps from collections in Ecuador show more widespread occurrence of multiple malaria vectors than in historical maps. Habitat associations (abiotic and biotic parameters and human land uses) are summarized. Using habitat association data, a GIS model will predict the impact of climate change on future anopheline distributions in Ecuador.

Pohl, G.R., C. Jaeger

Natural Resources Canada, Canadian Forest Service, Edmonton, AB
TUESDAY, NOV 8 AT 11:15

SUBMITTED ORAL

Biology of *Paraclemensia acerifoliella* leafcutter moths on *Amelanchier* in Alberta (Lepidoptera: Incurvariidae)

The Incurvariid moth species *Paraclemensia acerifoliella* has recently been discovered in Alberta, feeding upon wild and cultivated saskatoon trees (*Amelanchier alnifolia*; Rosaceae). This is the first report of the Lepidoptera family Incurvariidae in the province, as well as the first report of saskatoon as a host for *Paraclemensia*. We compare leafcutter biology on saskatoon trees, to the species' biology on maple in eastern Canada.

Quezada Garcia, R., E. Bauce.

Département des Sciences du Bois et de la Forêt, Université Laval, Québec, QC
Monday, Nov 7 at 9:45

President's Prize - Oral

Heritability of life-history and metric traits of spruce budworm *Choristoneura fumiferana* (Clem.) under laboratory conditions

The spruce budworm is one of the most important outbreak insect defoliator species in the boreal forest of North America. Severe defoliation by budworm can cause significant changes in the concentration of foliar nutrients. This variation could affect budworm fitness and act as a form of natural selection thus affecting the local decline of an outbreak. The purpose of this study was to determine the heritability of life-history and metric traits. Preliminary results indicate that fecundity and egg fertility have an important additive variance and are more critical factors than weight. These components could be considered when studying the population dynamics of this pest.

Quiring, D.

Population Ecology Group, Faculty of Forestry and Environmental Management, University of New Brunswick, Fredericton, NB
TUESDAY, NOV 8 AT 16:00

HERITAGE LECTURE

History of Forest Entomology Research in Atlantic Canada

Research in forest entomology has a rich tradition in Atlantic Canada, and especially in New Brunswick, where the first Atlantic federal forest entomology research lab was established in 1911. From its humble beginnings, forest entomological research expanded throughout the region and produced classical studies in several disciplines, including population dynamics and biological control. I will examine research in forest entomology from 1910 to 1985.

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

Department of Environmental Sciences, Nova Scotia Agricultural College, Truro, NS
MONDAY, NOV 7 AT 13:45

PRESIDENT'S PRIZE - ORAL

Biovectoring: Effects of dispenser design on foraging behaviour and disease management

Bees can effectively vector biocontrol agents in greenhouses and some small-acreage crops. However, less is known about the effects of this technique on the bees, or the viability of this tactic for other crops. Experiments examined the dispersal of *Clonostachys rosea*, a fungal antagonist, by *Bombus impatiens* in lowbush blueberry. Two dispensers were examined for their effects on bee foraging, ability to load bees with *C. rosea*, and for exposed blossoms to resist infection by *Botrytis cinerea*.

Régnière, J. (1), J. Delisle (1), D. Pureswaran (1), R. Trudel (2)

(1) Natural Resources Canada, Canadian Forest Service, Laurentian Forestry Centre, Québec, QC; (2) Société de protection des forêts contre les insectes et les maladies (SOPFIM), Québec, QC

MONDAY, NOV 7 AT 9:15

INVITED SYMPOSIA

Mating success, an important process in spruce budworm (SBW) population dynamics and management

SBW population dynamics are viewed as a density-dependent stochastic process, where fluctuation of natural enemy impact generates the rise and fall pattern of outbreaks, and changes in apparent fecundity are a pattern-less perturbation source. Recent observations are casting doubt of this interpretation. SBW mating success is related to male density, a strong Allee effect that points to moth migration in triggering outbreaks and the use of mating disruption as a tool for population management.

Renkema, J.M. (1), D.H. Lynch (2), G.C. Cutler (3), K. MacKenzie (4), S.J. Walde (1)

(1) Biology Department, Dalhousie University, Halifax, NS; (2) Department of Plant and Animal Science, Nova Scotia Agricultural College, Truro, NS; (3) Department of Environmental Sciences, Nova Scotia Agricultural College, Truro, NS; (4) Agriculture and Agri-Food Canada, Kentville, NS

TUESDAY, NOV 8 AT 11:00

INVITED SYMPOSIA

Predation by *Pterostichus melanarius* (Illiger) (Coleoptera: Carabidae) on immature *Rhagoletis mendax* Curran (Diptera: Tephritidae) in semi-field and field conditions

When blueberry maggots pupate in the ground, they may be susceptible to predators. Increasing the density of a ground beetle in mesocosms did not significantly reduce maggots in field-collected compost or soil. In compost with no alternative prey, beetles reduced maggots by 35%. There were fewer maggots in soil but not in compost field-plots where predators and alternative prey were abundant. Despite attracting predators, alternative food in compost appears to interfere with predation on maggots

Renkema, J.M.

Department of Biology, Dalhousie University, Halifax, NS

TUESDAY, NOV 8 AT 9:15

INVITED SYMPOSIA

Mulch and weed effects on blueberry maggot (Diptera: Tephritidae) dynamics and highbush blueberry productivity

Mulching and weeding in highbush blueberries may affect pests as well as plant growth. More blueberry maggot flies were captured on traps in bushes that were unweeded or mulched with compost than in those that were weeded or pine needle mulched or unmulched. There were more maggot-infested blueberries in composted than unmulched bushes in the year mulch was applied but not two years later. Compost mulch promoted bush growth and could be used to increase yields without compromising maggot control.

Rhinds, M., J. Sweeney, W. MacKinnon, K. Porter, P. Silk

Natural Resources Canada, Canadian Forest Service, Atlantic Centre, Fredericton, NB

MONDAY, NOV 7 AT 8:30

INVITED SYMPOSIA

Mating failures: How did I get there?

We document broad scale variation in female mating success for two closely related longhorn beetles that share a similar ecological niche, the invasive *Tetropium fuscum* and the native *T. cinnamopterum*, testing for the hypothesis that low female mating failure in sparse populations toward the edge of the distribution range restricts the spread of biological invasions.

Rigney, C., A.R. Westwood

(1) University of Winnipeg, Department of Biology, Winnipeg, MB

TUESDAY, NOV 8 AT 9:30

INVITED SYMPOSIA

Determination of Dakota skipper (*Hesperia dacotae*) critical habitat in Manitoba: characterization of vegetation

The Dakota skipper, *Hesperia dacotae*, is a threatened butterfly restricted to fragmented prairies in Manitoba. Currently there is limited data on the life history and habitat requirements in Canada to implement effective conservation measures. I seek to better understand key biological and physical habitat requirements to develop a preferred site profile. Vegetation and nectar flower surveys were conducted in 2010. Analysis of the vegetation abundance and diversity was used to develop critical habitat profiles to determine optimal Dakota skipper habitat.

Rivera, J.

Department of Ecology and Evolutionary Biology, University of Toronto, Toronto, ON

MONDAY, NOV 7 AT 10:30

PRESIDENT'S PRIZE - ORAL

The functional diversity of the Mantodean oothecae and their usefulness as a novel character system for praying mantid taxonomy and systematics (Insecta: Mantodea)

Praying mantids, cockroaches and termites constitute the monophyletic superorder Dictyoptera. As most Dictyoptera, mantids form oothecae, a protein-based structure that provides mechanical support and protection to the eggs. Oothecae are laid among the vegetation and multiple selective pressures have led to the evolution of complex structural modifications and cryptic attributes to escape predation. Such morphological diversity exhibited by mantid oothecae is unique among the Dictyoptera and has been seldom documented. We present novel data obtained from the analyses of over 40 Neotropical mantid genera and highlight the usefulness of the ootheca as a character for taxonomic and phylogenetic studies.

Roscoe, L.E. (1), D.B. Lyons (2), S.M. Smith (1)

(1) Faculty of Forestry, University of Toronto, Toronto, ON; (2) Natural Resources Canada, Canadian Forest Service – Great Lakes Forestry Center, Sault Ste. Marie, ON

MONDAY, NOV 7 AT 8:30

PRESIDENT'S PRIZE - ORAL

Host-habitat location using semiochemicals by *Phasgonophora sulcata* Westwood (Hymenoptera: Chalcididae), a native parasitoid of *Agrius planipennis* Fairmaire (Coleoptera: Burpestidae)

Augmentation using native parasitoids may be an effective tool for managing Emerald Ash Borer (EAB) (*Agrius planipennis*) in North America. One species, *Phasgonophora sulcata*, has been reared from EAB-infested trees in several Ontario sites. We studied the roles of host-plant synomones and host kairomones in EAB host-habitat location by *P. sulcata*. Y-tube olfactometer tests indicated that female wasps chose (3Z)-hexenol, a *Fraxinus* spp green-leaf volatile, and (3Z)-lactone, an EAB contact sex pheromone, significantly more than a control volatile. Our results suggest that these volatiles may be important for host-habitat location, and may be useful in surveys of *P. sulcata* populations.

Royauté, R. (1,2), C. Buddle (1), C. Vincent (2)

(1) McGill University, Department of Natural Resource Sciences, Ste Anne de Bellevue, QC; (2) Agriculture and AgriFood Canada, Horticulture Research and Development Centre, Saint-Jean-sur-Richelieu, QC

MONDAY, NOV 7 AT 11:00

PRESIDENT'S PRIZE - ORAL

Repeatability of behavioural syndromes across life-stages in the jumping spider *Eris militaris* (Araneae: Salticidae)

The question regarding the consistency of behavioural syndromes across life stages is currently unresolved. To address this question, spiders of the species *Eris militaris* were collected in an insecticide-free and an insecticide-treated orchard. We tested the correlations between activity, aggression, boldness and voracity for all life-stages. We found evidence for a shift in behavioural syndrome between the immature and penultimate stages tested in the insecticide-free orchard. We will also report results on the repeatability of these correlations for individuals tested both at the penultimates and adult stages.

Royer, L. (1), J. Delisle (2)

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

TUESDAY, NOV 8 AT 11:45

SUBMITTED ORAL

Ontogenic variations in response of hemlock looper (HL) to physical stimuli

The response of HL larvae to physical stimuli was studied in the laboratory. All larval developmental stages (I to IV) exhibited positive phototaxis and negative geotaxis, but the magnitude of these responses declined with age. Pre-pupal wandering larvae were geopositive and unresponsive to light. However, they preferentially selected darkened and rough sites to pupate. Results will be discussed in relation to the intra-tree distribution and foraging behaviour of HL.

Saguez, J. (1,2), J. Attoumbré (2), P. Giordanengo (2), S. Baltora-Rosset (2)

(1) Agriculture and Agri-Food Canada, Saint-Jean-sur-Richelieu, QC; (2) Université de Picardie Jules Verne, Amiens, France

TUESDAY, NOV 8 AT 15:00

SUBMITTED POSTER

Flax lignans and neolignans : potential biopesticides against *Myzus persicae*

The aphid *Myzus persicae* is one of the most polyphagous aphids but only few specimens were observed on flax. Lignans and neolignans have been described as antifeedant compounds, growth inhibitors and also to interfere with enzymatic systems. We evaluated the biological effects of four compounds (SECO, SDG, ASH and DCG) isolated from flax, delivered to *M. persicae* via artificial diet at different concentrations. SECO, SDG, ASH and DCG induced differential aphicidal effects but increased mortality and altered daily fecundity, intrinsic rate of increase and population doubling time were observed. These effects could explain the low aphid populations observed on flax.

Saguez, J., N. Bostanian, C. Vincent

Agriculture and Agri-Food Canada, CRDH, Saint-Jean-sur-Richelieu, QC

TUESDAY, NOV 8 AT 15:00

SUBMITTED POSTER

Toxicological assays for leafhoppers associated with vineyards

Although leafhoppers are increasingly important pests of vineyards in Canada, little is known about the effects of insecticides on them. In this study, we estimated the lethal concentrations (LC50 and LC95) of acetamiprid (Assail) and bifenthrin (Capture) insecticides on nymphs and adults of *Erythroneura vitis* (Harris) and *E. ziczac* Walsh. The leafhoppers were reared in Petri dishes containing grapevine leaves treated with different concentrations of the insecticides. Leafhopper mortality was daily checked. The LC50 and LC95 for nymphs and adults of both species were much lower than the recommended field label rates.

Saindon, J.P., B.J. Sinclair

University of Western Ontario, London, ON

WEDNESDAY, NOV 9 AT 10:45

SUBMITTED ORAL

How much gene flow is required to impede adaptation? An artificial selection *Drosophila* model

Gene flow can limit a species' range from expanding; however, an empirical estimate of the amount of gene flow required for this has not been experimentally investigated. I use laboratory populations of *Drosophila melanogaster* under selection and quantify adaptation in populations subject to a gradient of migration. Results indicate that slight additions of gene flow initially depress population fitness, although as the amount of gene flow increases, adaptation to the stressor also increases.

Schaefer, P. (1), D.C. Currie (1,2)

(1)Ecology and Evolutionary Biology, University of Toronto, Toronto, ON; (2)Royal Ontario Museum, Toronto, ON

MONDAY, NOV 7 AT 15:30

PRESIDENT'S PRIZE - POSTER

Diversity and evolution of biting flies in northern Canada – Preliminary data from the Northern Biodiversity Program (NBP)

The NBP is an integrative research initiative with the goal of understanding diversity patterns of northern arthropods. Northern regions have been markedly influenced by glacial cycles, and are currently experiencing an unprecedented rate of warming. Our research aims to better understand the diversity and phylogeography of selected families of northern biting flies (Simuliidae, Culicidae and Tabanidae). DNA barcoding will help resolve species-boundaries and reveals phylogeographical patterns.

Scott, I.M. (1), Y. Pelletier (2), K. Kramp (3), J.T. Arnason (4), T. Durst (5), S.R. Sims (6)

(1) Southern Crop Protection and Food Research Centre, Agriculture and Agri-Food Canada, London, ON; (2) Potato Research Centre, Agriculture and Agri-Food Canada, Fredericton, NB; (3) BioSciences, Loyalist College, Belleville, ON; (4) Centre for Advanced Research in Environmental Genomics, Ottawa-Carleton Institute of Biology, University of Ottawa, Ottawa, ON; (5) Chemistry Department, University of Ottawa, Ottawa, ON; (6) BASF, St. Louis, MO, USA

TUESDAY, NOV 8 AT 15:00

SUBMITTED POSTER

A Novel Insecticide Synergist from Dill Oil

Natural products are the basis for insecticide synergists, for example Piperonyl Butoxide (PBO), derived from safrole. However, a replacement for PBO is required due to current health and safety concerns. Dillapiol, the main constituent in dill *Anethum sowa* (Apiaceae) oil and *Piper aduncum* (Piperaceae) is an effective cytochrome P450 inhibitor. Laboratory and field trials with pyrethrum (Py) extracts combined with dillapiol were effective against both insecticide-susceptible (SS) and –resistant (RS) Colorado potato beetle (CPB) *Leptinotarsa decemlineata* (Say). The Py efficacy was increased 2.2-fold with the SS strain and 9.1-fold with the RS strains using the Py+dillapiol combination.

Scott, I.M., D.C. MacArthur, J.H. Tolman

Southern Crop Protection and Food Research Centre, Agriculture and Agri-Food Canada London, ON

TUESDAY, NOV 8 AT 15:00

SUBMITTED POSTER

Survey for neonicotinoid-resistance and cross-resistance to anthranilic diamides in Colorado potato beetle populations in Canadian potato fields, 2008 – 2011

Neonicotinoid insecticides are registered in Canada to control Colorado potato beetle (CPB), *Leptinotarsa decemlineata* (Say). Over the past 4 years AAFC has surveyed neonicotinoid resistance/tolerance in CPB populations and measured possible cross resistance to the anthranilic diamides, chlorantraniliprole and cyantraniliprole. The proportion of populations considered resistant to imidacloprid has decreased from 45% in 2008 to 10% in 2010, while the proportion susceptible to thiamethoxam and clothianidin has increased from 66 % to > 80%. Although an initial positive correlation between tolerance to neonicotinoids and chlorantraniliprole has become smaller, the correlation between tolerance to neonicotinoids and cyantraniliprole has become more positive.

Seehausen, L. (1), J. Régnière (2), R. Berthiaume (1), É. Bauce (1)

(1) Faculté de foresterie, de géographie et de géomatique, Université Laval, Québec, QC; (2) Natural Resources Canada, Canadian Forest Service, Laurentian Forestry Centre, Québec, QC

MONDAY, NOV 7 AT 10:30

PRESIDENT'S PRIZE - ORAL

Influence of partial cutting on parasitism of the spruce budworm and the hemlock looper

We investigated the influence of partial cutting on parasitism of the spruce budworm (*Choristoneura fumiferana*) and the hemlock looper (*Lambdina fuscicollis*). Laboratory reared larvae of the spruce budworm and pupae of both species were exposed in twelve four hectare stands within a thinning density gradient of 0%, 25% and 40% to determine the parasitism rate. One year after thinning, hemlock looper pupae were significantly less parasitized in the 40% thinned stands than in the other treatments.

Semmler, S.J. (1), A.C. Worley (1), A.R. Westwood (2)

(1) Department of Biological Sciences, University of Manitoba, Winnipeg, MB; (2) Department of Biology, University of Winnipeg, Winnipeg, MB

MONDAY, NOV 7 AT 14:00

PRESIDENT'S PRIZE ORAL

Effects of fire on community diversity and plant-pollinator interactions in the tall grass prairie

Fires are important for the maintenance of tall grass prairie vegetation. However, the effects of fire on plant-insect interactions are poorly known. I am constructing pollination networks to assess community structure in habitats of different burn ages. Results indicate that recently burned sites offer a greater density of floral resources for insects, increasing observed interactions. Interestingly, the abundance of a flowering plant species is not always correlated with insect preference.

Sharanowski, B.

University of Manitoba, Department of Entomology, Winnipeg, MB

TUESDAY, NOV 8 AT 11:00

INVITED SYMPOSIA

Biodiversity for everyone: perspectives on accessibility

Whether out of fear, passion, economics, or simple curiosity, Canadians are interested in insects. Are we missing an opportunity to demonstrate the relevance of our field and share our passion for insects and other arthropods? I would argue that taxonomists are currently the primary generators and users of Canadian biodiversity information. Can we improve on how we collect and disseminate biodiversity data so that it can be utilized by researchers, teachers, students, producers, agronomists, and the general public? This presentation will emphasize modern biodiversity informatics that enhance the relevance of our data. Examples of exceptional open-access biodiversity datasets will be highlighted to demonstrate the practical use of biodiversity metadata. Additionally, possible strategies on a national effort will be discussed to promote discourse on how the Biodiversity Survey of Canada can remain relevant in the face of constantly changing technology.

Sheffield, C.S. (1), M. Chagnon (2), C. Cutler (3), V. Fournier (4), J. Moisan-De Serres (4), M. Wilkes (5), J. Gibbs (6)

(1) York University, Toronto, ON; (2) Université du Québec à Montréal, Montréal, QC; (3) Nova Scotia Agricultural College, Truro, NS; (4) Université Laval, Québec, QC; (5) Memorial University, St. John's, NL; (6) Cornell University, Ithaca, NY, USA

TUESDAY, NOV 8 AT 9:00

INVITED SYMPOSIA

The bee pollinators of lowbush blueberry

Lowbush blueberry (*Vaccinium angustifolium*) is one of the most important berry crops in eastern North America. Native to this region, this deciduous shrub has up to 100 bee species that visit its flowers, and many indigenous bees make important contributions as pollinators. A brief review of the taxonomy, diversity and biology of these bees will be presented. In addition, a discussion of their relative importance as pollinators, and suggestions on what can be done to increase their numbers will be presented.

Sheffield, C.S. (1), J-M. Perron (2)

(1) Department of Biology, York University, Toronto, ON; (2) Faculté des sciences et de génie, Université Laval, Ville de Québec, QC

MONDAY, NOV 7 AT 8:30

INVITED SYMPOSIA

Léon Provancher's Contributions to Canadian Melittology

Between 1882-1896 (those after 1892 published posthumously), Léon Provancher listed over 175 bee species from North America, describing 64 new species, 24 of which are still valid. The taxonomy of Provancher's bees is reviewed. In addition, Provancher's comprehensive work on the bee fauna of Quebec (and Ontario) accounted for over 40% of the species known from that region at the time; 120 of the species in the region were described after 1900. His work provides one of the earliest sets of data for bees in Canada, and in this context it is discussed as a major contribution and baseline for the status of bees in Canada.

Shelton, A.M.

Department of Entomology, Cornell University/NYSAES, Geneva, NY, USA

SUNDAY, NOV 6 AT 14:30

PLENARY

The impact of pest insects on humans and our environment, and management tactics for the 21st century

By most measures of evolutionary success, insects are unmatched in their numbers, diversity of adaptation, biomass and ecological impact. Although approximately one million species have been identified, many more millions are yet to be discovered and identified. We may view insects in many different ways: for their beauty, their evolutionary complexity, the important role they play in the ecology of natural systems, the insights they provide for general biology and human behavior, or their interactions with humans as pests. Only a small percentage of insects are considered pest species, but their impact can be profound. Insects can damage or destroy crops and valuable plants by feeding on various parts or by transmitting pathogens. They can annoy or injure humans and other animals by disseminating diseases, causing annoyance, applying venoms or living on or in their bodies. Insects can destroy the value of possessions including homes, stored foods, clothing, furniture and buildings. How we deal with insects and related arthropods when they are pests can have tremendous impacts on our health and that of the environment in which we live. While a fundamental knowledge of the biology and ecology of insect and related arthropod pests remains the foundation for their management, new technologies have been developed that can play a major role in more sustainable management programs. As the great entomologist Tom Eisner once said, "Bugs are not going to inherit the earth. They own it now. So we might as well make peace with the landlord." How we go about doing that will have important ramifications for humans and the environment in which we live.

Shorthouse, D.P., D. Mozzherin, D. J. Patterson

Marine Biological Laboratory, Woods Hole, MA, USA

TUESDAY, NOV 8 AT 13:15

INVITED SYMPOSIA

Names are the key to the big new biology: a bottom-up solution to creating a macroscope

The BSC can make a profound impact on public engagement, policy-driven decisions and informatics projects with a lightweight, socio-technical solution to publish peer-reviewed, contextualized checklists in a new journal. Authors submit open access checklists in familiar narrative format and attach a standards-based supplement. Tools are available to produce, explore, mix, match, or merge lists with taxonomic robustness. Spatiotemporal search across all lists produces dynamic species inventories.

Sim, K.A. (1), S. Loboda (1), C.M. Buddle (1), T.A. Wheeler (1)

(1) Department of Natural Resource Sciences, Macdonald Campus, McGill University, Ste-Anne-de-Bellevue, QC
MONDAY, NOV 7 AT 15:30 PRESIDENT'S PRIZE - POSTER

Molecular and morphological variation in the Arctic wolf spider *Pardosa glacialis* (Araneae, Lycosidae)

Juvenile wolf spiders disperse aerially by ballooning on silk threads. The dispersal distance is influenced by habitat structure, which can lead to variation in metapopulation size and changes in genetic variation across the species range. This research examines the genetic diversity of wolf spiders in the Arctic using mtDNA gene regions. Collections were made in 2010 and 2011 at 12 sites across Canada, ranging from the northern boreal to the high Arctic. Preliminary results on the genetic variation observed in selected species will be used to elucidate patterns in gene flow between populations.

Smallwood, B., J.D. Shorthouse

Laurentian University, Sudbury, ON

MONDAY, NOV 7 AT 11:15

PRESIDENT'S PRIZE - ORAL

What makes cynipid gall wasps on roses so different from other herbivores?

Roses are host to most guilds of herbivores including cynipid gall-wasps of the genus *Diplolepis*. The ability to manipulate plant tissues to produce a gall make *Diplolepis* more specialized than other herbivores. To compensate for a sedentary lifestyle encased within plant tissues, *Diplolepis* stimulate plant cells that are unique to cynipid galls and serve as their sole source of food. Results of histological examination of galls are used to highlight this intricate insect-plant relationship.

Smith, M.A.H. (1), **P.A. MacKay** (2), R.J. Lamb (2)

(1) Agriculture & Agri-Food Canada, Winnipeg, MB; (2) Department of Entomology, University of Manitoba, Winnipeg, MB

TUESDAY, NOV 8 AT 10:30

SUBMITTED ORAL

Temperature modulation of photoperiodism and genetic variability in the response to the end of the season in the aphid, *Acyrtosiphon pisum*

The timing of the transition from asexual to sexual reproduction was studied in the field over five years for two control clones and many wild genotypes of *Acyrtosiphon pisum* (Hemiptera: Aphididae). Some of the wild genotypes were recent immigrants from south or north of the field site. Most wild genotypes and both control clones, which had different lab-measured critical photoperiods, responded at approximately the same time to natural changes in day length and temperature. Temperature modulation of the photoperiodic response allowed most immigrant genotypes to respond appropriately to local day length and temperature at the end of the season.

Sperling, F.A.H. (1), D.B. McCorquodale (2), D. Giberson (3)

(1) University of Alberta, Edmonton, AB; (2) Cape Breton University, Sydney, NS; (3) University of Prince Edward Island, Charlottetown, PE

TUESDAY, NOV 8 AT 8:30

INVITED SYMPOSIA

How to complete a biological survey of Canada

This symposium presents an opportunity to develop better linkages among the Biological Survey of Canada, Entomological Society of Canada, and other biodiversity-oriented associations or institutes. We ask - how can the biodiversity community in Canada move forward more effectively? What role can and should the BSC play? Broader policy and organizational issues, as well as technical aspects like data management and diagnostic methods, can all interact within the larger matrix of a Canada-wide effort that provides support for both citizen science and professional research.

Stanton, D., L. Dosedall, R.C. Yang

Department of Agriculture, Life and Environmental Science, University of Alberta, Edmonton, AB

MONDAY, NOV 7 AT 14:45

PRESIDENT'S PRIZE - ORAL

Understanding host preference in root maggots (*Delia* spp.) (Diptera: Anthomyiidae) in *Brassica napus*

Estimated yield loss in Canadian canola crops (*Brassica napus*) from infestation of root maggots (*Delia* spp.) is substantial; thus resistant cultivars are desirable. Evaluation of resistance mechanisms in interspecific crosses between *B. napus* and *Sinapis alba* in a mixed refuge were undertaken. Infestations within mixtures with various ratios of resistant and susceptible genotypes were evaluated. The use of host selection criteria covariates revealed a lack of differences in susceptibility.

Stephens, D.T., A.R. Davis

Department of Biology, University of Saskatchewan, Saskatoon, SK

MONDAY, NOV 7 AT 15:45

PRESIDENT'S PRIZE - ORAL

Flower visitors as potential pollinators of a population of *Vaccinium myrtilloides* and *V. vitis-idaea* (Ericaceae) in central Saskatchewan

V. myrtilloides and *V. vitis-idaea* are widely distributed in Canada, yet little is known about their pollinators. The flowers possess poricidal anthers, suggesting that they are buzz pollinated, but also possess nectaries and thus attract nectar gatherers. To rank the contributions of the insect visitors as pollinators the technique of allowing single insect visitation to bagged, "virgin" flowers was employed. Field results of insect visitors as well as insect pollinators will be presented.

Strongman, D. (1), K. MacKenzie (2)

(1) Saint Mary's University, Halifax, NS; (2) Pacific Agri-Food Research Centre, Summerland, BC

TUESDAY, NOV 8 AT 9:40

INVITED SYMPOSIA

Danger lurking in the soil: fungal pathogens of the sawfly *Neopareophora litura* (Klug) in lowbush blueberry

Lowbush blueberry is a host for a variety of defoliating insect pests. Sawfly larvae are a pest species periodically defoliating blueberries and insect densities can become high, at least locally. As with most insects, increased population density can result in dramatic population declines due to natural controls such as parasitoids and microbial control agents. This presentation will show the effects of fungal pathogens on sawfly pupae in the soil in a low bush blueberry plot where there was a rapid population crash brought on primarily by a fungal pathogen, *Paecilomyces farinosus*.

Suthisut, D. (1,3), P. Fields (2), A. Chandrapatya (3)

(1) Postharvest and Product Processing Research and Development Office, Department of Agriculture, Bangkok, Thailand; (2) Cereal Research Centre, Agriculture & Agri-Food Canada, Winnipeg, MB; (3) Department of Entomology, Faculty of Agriculture, Kasetsart University, Bangkok, Thailand

TUESDAY, NOV 8 AT 9:45

SUBMITTED ORAL

Contact toxicity of essential oils from three Thai plants (ginger family) and their major components against two stored-product insects

The contact toxicity of essential oils from rhizomes of *Alpinia conchigera*, *Zingiber zerumbet*, *Curcuma zedoaria*; their major compounds; and synthetic essential oils was measured. *Sitophilus zeamais* was more sensitive to *C. zedoaria* oils (LD50: 18 µL/L) than *Z. zerumbet* (21 µL/L) or *A. conchigera* (24 µL/L). The LD50 of synthetic *A. conchigera* and *Z. zerumbet* oils were similar to those of the extracted essential oils, whereas synthetic *C. zedoaria* oils were less toxic than extracted *C. zedoaria* oils. *Sitophilus zeamais* and *T. castaneum* were sensitive to terpinen-4-ol and isoborneol.

Sweeney, J., P. Silk, E. Kettela, M. Rhinds, W. MacKay

Natural Resources Canada, Canadian Forest Service, Fredericton, NB

MONDAY, NOV 7 AT 14:30

INVITED SYMPOSIA

Pheromone-mediated mating suppression of an exotic longhorn beetle

The brown spruce longhorn beetle, *Tetropium fuscum* (F.), is a quarantine pest established in Nova Scotia since at least 1990. We present results of field trials testing aerial applications of fuscumol (the beetle's aggregation pheromone) in Hercon flakes for mating disruption and population suppression of *T. fuscum* as a means to slow its spread in North America. Pheromone treatments significantly reduced *T. fuscum* mating success in both 2009 and 2010, but reduced infestation in 2009 only.

Taylor-Pindar, A.N., L. Packer

Department of Biology, York University, Toronto, ON

MONDAY, NOV 7 AT 14:00

INVITED SYMPOSIA

The impact of fire on bee communities in oak savannah habitat, Southern Ontario

Even though fire has been re-introduced to oak savannah habitat in Southern Ontario, the effects on pollinators, particularly bees, have not been studied. Our primary objective is to test experimentally the hypothesis that fire increases bee diversity and diversity is greater shortly after fire than many years after. We examine how bee communities re-colonize a habitat after a fire, assess whether fire is a positive or negative disturbance to bee communities and whether it impacts different guilds, or species within a guild, in different ways. Preliminary results show bee diversity increased post-fire, but bee guilds do not respond the same way to fire.

Timms, L.L., C.M. Buddle, T.A. Wheeler

Department of Natural Resource Sciences, McGill University, Ste-Anne-de-Bellevue, QC
TUESDAY, NOV 8 AT 14:30

SUBMITTED ORAL

Extending our understanding of the mid-latitude peak in diversity of Ichneumonidae

Peak diversity of the Ichneumonidae occurs at higher latitudes than most other taxa. Many hypotheses have been put forward to explain this phenomenon, both abiotic (e.g. climatic variability, temperature, precipitation) and biotic (e.g. resource fragmentation, chemical defense). Although the pattern is well documented, tests of these explanatory hypotheses are rare and have used data from a limited geographic area. We assess explanations of the latitudinal gradient of ichneumonid diversity in a novel fashion, using newly collected data from high latitudes in northern Canada as well as compiled data from a large number of other Malaise trap studies across the northern hemisphere.

Veiga, N., L. Packer

Department of Biology, York University, Toronto, ON
MONDAY, NOV 7 AT 16:00

PRESIDENT'S PRIZE - ORAL

Wild bee diversity responses to large-scale burns in Argentina

Little is known about the effect of fire on bees. Studies show that bees respond to fire though it is unknown how bees respond or re-colonize immediately after a large-scale burn. Bees captured in Argentina were categorized into guilds in order to explain community composition pre and post-burn. This study shows bees respond positively to fire with increased diversity within traps post-burn based on community composition and increased species variability farthest from burn edges.

Veilleux, J., N.J. Holliday

Department of Entomology, University of Manitoba, Winnipeg, MB
MONDAY, NOV 7 AT 10:45

PRESIDENT'S PRIZE - ORAL

Bionomics of the banded elm bark beetle, *Scolytus schevyrewi*, in Saskatchewan and Manitoba and implications for Dutch elm disease management

If the alien invasive *S. schevyrewi* were to vector Dutch elm disease (DED) on the Prairies, its arrival could compromise programs protecting urban American elms from DED. Sticky trap and trap log data from 2009 and 2010, show that *S. schevyrewi* was multivoltine, with adults trapped most frequently in late summer, and that mature larvae survived winter. Siberian elm was the preferred brood host and is seldom infected with DED, so the probability of DED transmission by *S. schevyrewi* may be small.

Veilleux, J. (1), J. Leferink (2), N.J. Holliday (1)

(1) Department of Entomology, University of Manitoba, Winnipeg, MB; (2) Manitoba Conservation – Forestry Branch, Winnipeg, MB

MONDAY, NOV 7 AT 11:00

PRESIDENT'S PRIZE - ORAL

Does rapid removal of infected trees reduce Dutch elm disease infection rates: a real world study

From 2004–10 in 7 pairs of Manitoba communities, American elm trees newly displaying symptoms of Dutch elm disease (DED) were removed within 6 weeks of symptom detection in one member of the pair; in the other, removal was at the standard time of fall or winter. The average annual prevalence of DED in rapid removal communities was $1.5 \pm 0.2\%$ — significantly lower than the $3.1 \pm 0.4\%$ with fall/winter removal. In a decade in such communities, rapid removal could reduce elm losses by \$600,000/km².

Watt, G.A. (1), S. Smith, R.A. Fleming

(1) University of Toronto, Faculty of Forestry
MONDAY, NOV 7 AT 11:15

PRESIDENT'S PRIZE - ORAL

Changes in boreal mixedwood forest structure due to continuous Spruce Budworm attack

The recent quantification of Spruce Budworm's (*Choristoneura fumiferana*) synergy with wildfire united the greatest biotic and abiotic disturbance factors essential to the diversity, stability, the beauty, of the boreal forest ecosystem. The driving factors behind their interaction are yet known, but analysis of 10 boreal mixedwood stands in zones of continuous and progressively longer spruce budworm attack suggests the changes imposed on vertical forest structure are contributors.

Wheeler, T.A. (1), A.M. Solecki (1), J. Wang (2)

(1) McGill University, Montreal, QC; (2) China Agricultural University, Beijing, China

MONDAY, NOV 6 AT 13:45

SUBMITTED ORAL

Chloropidae (Diptera) of Churchill: morphology, DNA barcodes and ecology

Chloropid flies are abundant and diverse worldwide, but previous records from the arctic and subarctic are sparse. Focused collecting effort has increased the known diversity at Churchill, Manitoba from a handful of species to more than 50. Morphological characters and DNA barcodes correspond in delimiting most, but not all species. Ecological diversity of chloropids in the region is higher than previously documented.

Wilkes, M.A. (1), L. Hermanutz (1), G.C. Cutler (2)

(1) Department of Biology, Memorial University of Newfoundland, St. John's, NL; (2) Department of Environmental Sciences, Nova Scotia Agricultural College, Truro, NS

MONDAY, NOV 7 AT 15:30

PRESIDENT'S PRIZE - ORAL

Relying on "free bees"? Lowbush blueberry crop pollination in the absence of commercial pollinators

Assessing the contribution of native bees to crop pollination is increasingly challenging due to the widespread use of non-native commercial pollinators. Newfoundland's lowbush blueberry industry uniquely meets pollination needs via naturally-occurring native bees in the absence of commercial pollinators. I examine whether the island's managed berry fields mirror nearby wild patches in terms of 1) pollinator communities, 2) floral composition & availability, and 3) rates of berry production.

Wogin, M.J. (1), D.R. Gillespie (2), T. Haye (4), B.D. Roitberg (3)

(1) Simon Fraser University, Burnaby, BC; (2) Agriculture and Agri-Food Canada, Agassiz, BC; CABI Europe - Switzerland, Delemont, Switzerland

MONDAY, NOV 7 AT 14:00

INVITED SYMPOSIA

The stabilizing effect of virginity in solitary parasitoids producing female-biased sex-ratios

Mated female parasitic wasps can alter their offspring sex ratios. Virgin females, however, are restricted to produce only male offspring. We propose that an increasing female bias in a population can lead to increased virginity. Using a theoretical approach, we examine the effects of plastic sex ratios on parasitoid-host dynamics. We show that an increasing female bias can destabilize dynamics and have varying effects on host suppression. Virginity caused by a lack of males, however, can stabilize population dynamics and prevent runaway female bias in a parasitoid population.

Zayed, A.

Department of Biology, York University, Toronto, ON

MONDAY, NOV 7 AT 13:00

INVITED SYMPOSIA

A review on the effects of diploid male production and mating failures in the Hymenoptera

In some hymenoptera, sex is determined by genotype at an autosomal locus; heterozygosity and hemizygosity result in the production of normal diploid females and haploid males respectively. However, diploid males can be produced from fertilized eggs if they have a homozygous genotype at the sex determination locus. Diploid male production can be viewed as a partial or complete mating failure in ants, bees and wasps with complementary sex determination. I will review how the production of diploid males can have substantial fitness implications for this important group of insects.

Zayed, A.

Department of Biology, York University, Toronto, ON

MONDAY, NOV 7 AT 11:30

INVITED SYMPOSIA

The population genetics of the honey bee, *Apis mellifera*

The honey bee *Apis mellifera* has emerged as model organism for understanding the genetic basis of social behaviour, and in turn, how social behaviour affects molecular evolution. I will discuss the prevalence of positive selection on the honey bee's genome, the major factors affecting genome evolution in the bee, as well as the prospects for charting the bee's genotype to phenotype map.

Zhang, M.Y. (1), M.W. Gates (2), J.D. Shorthouse (1)

(1) Laurentian University, Sudbury, ON; (2) Systematic Entomology Laboratory, National Museum of Natural History, Washington, DC, USA

MONDAY, NOV 7 AT 10:45

PRESIDENT'S PRIZE - ORAL

Total evidence approach reveals cryptic species among Eurytomidae (Hymenoptera: Chalcidoidea) associated with galls of *Diplolepis* (Hymenoptera: Cynipidae) on roses in Canada

Eurytomids are a widespread group of parasitic wasps that are taxonomically challenging due to their small size and morphological conservatism. The biology of the 16 Nearctic species of eurytomids associated with rose galls and their distribution was previously unknown. Using a combination of mtDNA COI, adult morphology and host records, cryptic species with deep divergence and polymorphism were revealed. The validity of previously described species is discussed in light of this new information.



Female brown spruce longhorn beetle with ovipositor extended. Photo credit : Jon Sweeney

JAM 2011 Welcome Reception Entertainment

Mahers Bahers



Frank Maher (4-stop accordion) of The Battery in St. John's is a legendary figure in Newfoundland noted for his incredible musicianship and significant contributions to the development and preservation of traditional music. He has received Lifetime Achievement Awards from festival organizers in Newfoundland and Ontario and is an ECMA Stompin' Tom Connors Award Winner. Joining Frank are his good friends Jean Hewson (guitar), Christina Smith (fiddle) and Rick West (bodhran) who enjoy playing tunes extracted from the deep dark recesses of Frank's brain, exchanging witticisms and spending their time together. Evolved from Saturday sessions at the infamous Ship Inn in the late 90's, MAHERS BAHERS has performed at numerous festivals from St. John's to Vancouver revelling in the playing of Newfoundland singles, jigs and reels with great pace, passion and humour. Their CD, *MAHERVELOUS!*, received excellent

press and garnered two Canadian Folk Music Award nominations in 2005. The Canadian and Acadian Entomological Societies are pleased and honoured to present Mahers Bahers in concert at the Welcome Reception of JAM 2011.

Frank Maher (accordéon diatonique) de The Battery à St-Jean est une figure légendaire à Terre-Neuve pour ses contributions importantes au développement et à la préservation de la musique traditionnelle. Il a reçu des prix « Lifetime Achievement Awards » d'organiseurs de festivals à Terre-Neuve et en Ontario, et a gagné un prix Stompin' Tom Connors de l'ECMA. Se joignent à Frank ses bons amis Jean Hewson (guitare), Christina Smith (violon) et Rick West (bodhran) qui aiment jouer des morceaux extraits des sombres recoins du cerveau de Frank, échangeant des boutades et passant leur temps ensemble. Issu des sessions du samedi au Infamous Ship Inn à la fin des années 90, MAHERS BAHERS a performé lors de nombreux festivals de St-Jean à Vancouver, se délectant en jouant des giges et reels de Terre-Neuve avec rythme, passion et humour. Leur album, *MAHERVELOUS !* a reçu d'excellentes critiques et a recueilli deux nominations pour les Prix de musique folk canadienne en 2005. Les sociétés d'entomologie canadienne et acadienne sont heureuses et honorées de présenter les Mahers Bahers en concert à la réception de bienvenue de la réunion conjointe annuelle 2011.

Check out www.seeitnow.ca/mahersbahers

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Local AES Rep (and T-shirts): Carolyn Parsons

Logo Design: Janet Coombs/Rick West

The 2011 JAM Logo



The 2011 JAM Logo was conceptualized by Janet Coombes and is based on the yin-yang symbol which reflects the intertwined duality of all things in nature. Photographs kindly provided by Jim des Rivières (Io moth), Calvin Cutler (honey bees) and Ed Kettela (spruce budworm defoliation) were used by Rick West to create the logo.



Automeris io (Fabricius).
Photo: Jim des Rivières

Jim des Rivières' stunning photos of moths in the Ottawa Valley area were on display at the Canadian Museum of Nature for several months and a 3-year travelling exhibition is planned. A visit to moths.ca is a must!



Apis mellifera L.
Photo: Calvin Cutler

Calvin Cutler was looking at a honey bee experiment his son, Chris, was conducting, and he took a few shots, being an interested, retired science teacher!



Choristeneura fumiferana L. defoliation in the Cape Breton Highlands, 1977.
Photo: Ed Kettela

Ed Kettela is a project manager with the Canadian Forest Service in Fredericton. He has spent a long career developing integrated control strategies against forest insect pests.

Logo de la réunion conjointe annuelle



Le logo de la réunion 2011, conçu par Janet Coombes, représente le symbole yin-yang illustrant la dualité omniprésente dans la nature. Rick West a réalisé ce logo en utilisant les photos fournies par Jim des Rivières (*Automeris io*), Calvin Cutler (abeilles) et Ed Kettela (défoliation par la tordeuse des bourgeons de l'épinette).



Automeris io (Fabricius).
Photo: Jim des Rivières



Apis mellifera L.
Photo: Calvin Cutler



Défoliation par
Choristeneura fumiferana
L. au Cap Breton, 1977.
Photo: Ed Kettela

Jim des Rivières a exposé des photos saisissantes de papillons de nuit de la vallée d'Ottawa au musée canadien de la nature et planifie une exposition itinérante de 3 ans. Une visite sur moths.ca s'impose!

Calvin Cutler observait l'expérience que son fils Chris réalisait avec des abeilles et n'a pas pu s'empêcher de les photographier, étant un enseignant des sciences à la retraite!

Ed Kettela est un gestionnaire de projets au centre du Service Canadien des forêts à Fredericton. Il a dédié sa longue carrière au développement de stratégies de lutte intégrée contre les insectes ravageurs des forêts.

NOTES

WHERE TO EAT...

<u>Restaurant</u>	<u>Address</u>	<u>Phone</u>	<u>Distance</u>
elements on hollis	1181 Hollis Street	(902) 496-7960	15m NW
Tomavino's Cellar Ristorante	5173 South Street	(902) 425-7111	61m W
Taj Mahal Restaurant	5175 South Street	(902) 492-8251	68m W
The New ThaiChin	5175 South Street	(902) 492-8424	68m W
Castello Cafe	5151 Terminal Rd	(902) 422-5602	111m NE
Henry House	1222 Barrington Street	(902) 423-5660	126m W
Shiraz Restaurant Home Of Persian Food	1240 Hollis Street	(902) 404-3300	129m NW
Cafe Chianti	1241 Barrington Street	(902) 423-7471	156m NW
Talay Thai Restaurant	1261 Barrington Street	(902) 404-3700	195m NW
South End Diner	1128 Barrington Street	(902) 492-0271	208m SW
Bearly's House Of Blues & Ribs	1269 Barrington St	(902) 423-2526	219m NW
Hamachi House	5190 Morris Street	(902) 425-7711	240m NW
The Wired Monk Coffee Bistro	5147 Morris Street	(902) 422-2219	243m N
Stories Fine Dining	5184 Morris Street	(902) 444-4400	245m NW
Gingergrass Thai & Vietnamese Restaurant	1284 Barrington Street	(902) 425-8555	250m NW
Morris East Restaurant	5212 Morris Street	(902) 444-7663	267m NW
Tim Hortons	1047 Barrington Street	(902) 425-9268	364m S
The Bicycle Thief	1475 Lower Water Street	(902) 425-7993	390m N
Red Stag Tavern	1496 Lower Water Street	(902) 422-0275	393m N
Rani's Curry & Roti Shop	5280 Green Street	(902) 404-3440	394m SW
Da Maurizio	1496 Lower Water Street	(902) 423-0859	397m N
Ristorante A Mano	1477 Lower Water St	(902) 423-6266	413m N
Jessy's Pizza	1014 Barrington Street	(902) 492-3333	427m S
Tarboosh Lebanese Cuisine	5566 Fenwick Street	(902) 405-4000	438m SW
Boneheads BBQ - Kickin' Southern Smokehouse	1014 Barrington Street	(902) 407-4100	440m S
Darrell's Restaurant	5576 Fenwick Street	(902) 492-2344	464m SW
Rum Runners Rum Cake Factory	1479 Lower Water St	(902) 421-6079	481m N
Niche Lounge Supperclub	1505 Barrington Street	(902) 423-6632	535m NW
CUT Steakhouse + Urban Grill	5120 Salter Street	(902) 429-5120	574m N
E-pin Grill House	1533 Barrington Street	(902) 431-3839	594m NW
MIX Fresh Kitchen	5171 Salter Street	(902) 429-9571	595m NW
Chives Canadian Bistro	1537 Barrington Street	(902) 420-9626	619m NW

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