

# THE ESO Newsletter

December 2007

Volume 12, Issue 2

## ESO President's Message:

It was wonderful to see such a great turn out for the ESO Annual Meeting in Sault Ste Marie. As usual, we were treated to a variety of interesting talks and our graduate and undergraduate students performed at their usual high standards.

As I gazed out the window on the drive back to Guelph, the changing landscape as we made our way south, and the multitude of colours in the trees around me, gave me pause to think about diversity – ecological diversity, biodiversity, and indeed diversity within our very society. The ESO is an inclusive organization open to all entomologists regardless of taxon of interest, research focus, or indeed faith, race or any of the other qualities with which we define ourselves.

It was thus with some concern that I reflected upon the inclusion of a Christian grace at the ESO Banquet, an event that I know has caused consternation among those of us who do not have a religious faith or who are adherents of other religions. I have heard from some of you, whose reactions have ranged from mild discomfort to great upset. I have also spoken with those involved and know that the decision to include grace was made by a small group of people at the last moment and thus without opportunity for reflection on the possible repercussions of doing so. They certainly did not intend to offend nor to exclude anyone. As President of the ESO, I would like to sincerely apologize to the ESO membership as a whole for the inclusion of grace at

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the banquet. This was an unusual occurrence and does not reflect the usual practices nor guiding principles of the ESO. This event has stimulated discussion about the appropriateness of including any religious activity in the business of a scientific society, and whether formal guidelines should be developed by the society. As usual, the comments and opinions of the membership on this issue, or any other, are welcomed.

As I said at our banquet, I have always found the ESO to be a very collegial community of entomologists, a wonderful venue for students to hone their craft, and to make connections that will likely be important to you throughout your scientific careers. Thus, it is important to me to enhance student involvement in the ESO, both by increasing the number of opportunities for students to be involved and by looking at ways in which the role and experience of the student representative on the ESO Board can be optimized. Some ideas that are being tossed around include increasing the term of the student rep so that experience gained in the first year could be applied to a second year in the position, having an optional second year in the student rep position and/or the creation of an additional student rep position that would allow overlap between successive student representatives. The ESO Board needs to hear from students in particular on this issue, so I invite you all to share your ideas and opinions with myself and with Jen Perry (jperry@zoo.utoronto.ca), your 2007-08 student representative to the Board.

I look forward to gathering together again next year at the Joint Annual Meeting of the Entomological Societies of Canada and Ontario, which will be held in Ottawa, 18-22 October 2008. There are plenty of opportunities to get involved ahead of time or to help at the event itself, and I encourage you to contact our Conference Chair, John Huber (huberjh@agr.gc.ca) to offer your services.

I will close by taking the opportunity to wish everyone a happy holiday and all the best in the New Year!

Yours entomologically,

*Rebecca*

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### Dr. Aylward (Al) Downe Memorial Fund

To honour the memory of Dr. Aylward E R Downe, Queen's Biology is seeking donations to The Al Downe Memorial Fund sufficient to host an annual lectureship in Dr. Downe's name.

Al Downe exemplified a career of excellence in research, teaching and administration. He received his PhD in Biology (Entomology) from Queen's under the supervision of Dr A.S. West. Professionally, Al was a keen entomologist, first serving as a Research Officer and Entomologist in the Veterinary and Medical Entomology Unit of Canada Agriculture from 1954-1961. Upon moving to Kansas State University (1961-1964) as a researcher and teacher in Medical Entomology, during which he published a single authored manuscript in the prestigious journal "Science" on the serology of mosquito species. Al continued his research on blood feeding insects at the University of Saskatchewan, Regina campus (1964-1967) and then finally back at Queen's University in 1967. Al served as Acting Head (1975-1977) then Head of Biology (1977-1980).

Al was known as a great storyteller and that, in turn, made him a truly engaging lecturer. He was nominated for the prestigious Queen's Alumni teaching award, and in 1991 and 1993 he was selected by the Biology Student Council to win awards for "Excellence in Teaching in the Department of Biology". He taught undergraduate courses in Entomology, Environmental Physiology, Physiology and Behavior of Blood Feeding Insects, Biology of Invertebrates. Al mentored 42 graduate students and served as committee members for an additional 52.

Al's excellence in research was demonstrated through the publication of 89 research papers, with a primary focus on "reproduction in blood-feeding insects and insect neurobiology". Al was selected as a Fellow of the Entomological Society of Canada in 1983. He co-authored a successfully funded "Networks of Centres of Excellence" grant, creating the Queen's Biology-based "Insect Biotech Canada" (1990-1995). Although this organization no longer exists, an annual "Insect Biotech Conference" based on the Network continues to this day.

Please give generously to establish this worthwhile annual entomology lectureship in Dr. Downe's memory. To donate please contact Corrine Rawana 1-800-267-7837 ext. 75501.

## The Hine's Emerald Dragonfly

The only dragonfly protected by the U.S. Endangered Species Act, and one of North America's rarest, is the Hine's Emerald (*Somatochlora hineana*).



U.S. Fish & Wildlife Service

Prior to this year, the Hine's Emerald was only known in small areas in the United States, specifically in Wisconsin, Michigan, Missouri and Illinois. It was once found in Ohio and Indiana but seems to have disappeared from those states.

This summer, a population of Hine's Emeralds was discovered in the Minesing Wetlands in Simcoe County, Ontario, west of the City of Barrie.

The Hine's Emerald is a relatively large dragonfly with brilliant green eyes, and prominent yellow spots on the sides of the thorax. They occur only in spring-fed wetlands overlaying dolomite bedrock. Such sites occur on the Bruce Peninsula and Manitoulin Island. Locations that have been previously surveyed for Hine's Emerald in Ontario.

On June 20, 2007, Chris Evans of Midhurst, Ontario was looking for dragonflies along the roadside adjacent to the Minesing Wetlands when he caught a dragonfly he initially assumed was the Clamp-tipped Emerald (*Somatochlora tenebrosa*), a species known to occur in Ontario that is very similar to the Hine's Emerald.

Chris took photos and sent them to Colin Jones of the Natural Heritage Information Centre (NHIC), Ontario Ministry of Natural Resources. It was then realized that the individual was actually a Hine's Emerald.

On June 27, Colin Jones, along with Mike Oldham and Wasyl Bakowsky, biologists at the NHIC, and Mike's son Robert, visited the Minesing Wetlands and located several more Hine's Emeralds.

Since then, Colin Jones, Chris Evans and Bob Bowles have been working together to gather as much information as possible on the habitat of this rare dragonfly in the Minesing Wetlands. This information will be compiled into a scientific note and will be submitted for consideration to one of several possible entomological journals.

The Minesing Wetlands is a vast wetland of international significance spanning an area of over 6,000 hectares (15,000 acres). Minesing contains a complex of different wetland types including fens, marshes, swamps and bogs, each supporting a number of sensitive flora and fauna, some of which are rare or endangered. The Hine's Emerald is yet another rare species of the Minesing Wetlands and an indication of the extreme value of these wetlands to the conservation of Ontario's biodiversity!

Many thanks to Don Davis of TEA for forwarding this interesting find from Colin James!



## 2007 ELECTION RESULTS

The ESO is proud to welcome our new board members. The successful candidates were:

President-Elect	— Cynthia Scott-Dupree
Student Representative	— Jen Perry
2008-2010 Directors	— Hume Douglas and Kathleen Ryan

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## DEPARTING BOARD MEMBERS



As we welcome our newly-elected board members, it's also time to say good bye and thank you to our departing members. These individuals have offered both dedication and service to the ESO. On behalf of ESO, we would like to thank our out-going Past President, John Huber, Directors, Hannah Fraser and Margaret Pickles (2005-2007) and Student Representative, Aynsley Thielman (2007).



**Joint meeting of the Entomological Societies of  
Canada and Ontario**

**Réunion conjointe des Sociétés entomologiques du  
Canada et d'Ontario**

October 18–22, 2008  
Crowne Plaza Hotel, Ottawa, Ontario

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*IDEAs: Integrating Diverse Entomological Approaches*

**Plenary Session**

- Dr. Dan Janzen, University of Pennsylvania
- Dr. Maydianne Andrade, University of Toronto
- Dr. John Heraty, University of California, Riverside

**Heritage Lecture**

- Dr. Stewart Peck, Carleton University

**Scientific Program**

Co-chairs

- Dr. Jeff Skevington ([skevingtonj@agr.gc.ca](mailto:skevingtonj@agr.gc.ca))
- Dr. Gary Umphrey ([umphrey@uoguelph.ca](mailto:umphrey@uoguelph.ca))

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Please send titles of talks or symposia suggestions directly to the scientific program co-chairs. A web page will be set up through the Entomological Society of Ontario for further information at (<http://www.entsocont.com/>).

## Call for Titles of Talks, Posters & Symposia for the Ottawa ESO-ESC 2008 JAM

Please send your proposed titles for talks and posters as soon as possible to Jeff Skevington or Gary Umphrey (addresses below). Students, please indicate if your talk is for the President's prize competition. Professors, please encourage your students to submit a talk.

We would like to receive titles by 31 January 2008 to help with planning. You will be able to amend your title up to the deadline for abstract submission (31 August 2008). Abstract submission will begin 1 February 2008. Details will be sent to those who have submitted preliminary titles. Titles and abstracts will be published in the official language they are received in. Please do not send abstracts to Jeff and Gary. We would like to get up to 100 talks and 80 posters.

If you would like to coordinate a special symposium, please contact Jeff Skevington ([skevingtonj@agr.gc.ca](mailto:skevingtonj@agr.gc.ca)) or Gary Umphrey ([umphrey@uoguelph.ca](mailto:umphrey@uoguelph.ca)) before **31 January 2008**.

1. Graduate Student symposium  
(Chris Borkent - [chris.borkent@mail.mcgill.ca](mailto:chris.borkent@mail.mcgill.ca))
2. Invasive Species symposium  
(Hume Douglas - [douglash@inspection.ca](mailto:douglash@inspection.ca))
3. 60th Anniversary of CABI – Canada:  
Biocontrol symposium  
(Peter Mason - [masonp@agr.gc.ca](mailto:masonp@agr.gc.ca))
4. Digital Entomology symposium  
(biodiversity informatics)  
(David Shorthouse - [dps1@ualberta.ca](mailto:dps1@ualberta.ca))
5. Biological Survey of Canada symposium  
(Andrew Smith - [asmith@mus-nature.ca](mailto:asmith@mus-nature.ca))



## The European Common Blue, *Polyommatus icarus*: new alien butterfly to Canada and North America



Photo Courtesy of Peter Hall

Ara Sarafian wasn't sure what blue butterfly he was observing in old fields and ditches around where he works at Mirabel Airport north of Montreal, Quebec. An amateur entomologist, he thought it might be a Northern Blue *Lycaeides idas* or possibly a Karner Blue *Lycaeides melissa samuelis*, but neither has ever been recorded in this area and it seemed different from both. After sending images in June, 2007, to the Canadian National Collection of Insects in Ottawa, Don Lafontaine identified it as *Polyommatus icarus*, known in England as the Common Blue, and one of the most widespread of European butterflies.

In light of its origin as a European species and the possible confusion of calling it just the Common Blue here in North America, it has been decided to call it the European Common Blue. This is in keeping with the precedent set by calling the invasive Essex Skipper *Thymelicus lineola*, the European Skipper in North America.

Mr. Sarafian had been seeing the butterflies in the area since 2005. A number of butterfly specialists, including Ross Layberry, Chris Schmidt, Diane Lepage, Louis Handfield and Peter Hall, as well as Mr. Sarafian, conducted searches around and out from the Mirabel Airport in 2007 and, by October, the alien butterfly had been seen regularly in a triangular

..... Continued on Page 9

## 2007 PRESIDENT'S PRIZE WINNERS FOR ORAL PRESENTATION



### WELCOME TO THE NEIGHBOURHOOD: WHAT IT MEANS FOR NATIVE CATERpillARS WHEN THE GYPSY MOTH MOVES IN FOR GOOD

Laura Timms and Sandy Smith

Research on the detection and management of the gypsy moth has been extensive; however, very few studies have addressed the ecological implications of its introduction into North American forests. With a wide host range and a large assemblage of natural enemies, the gypsy moth has broad potential to both indirectly and directly affect native species. Gypsy moth and native caterpillars were reared from areas in Ontario where the gypsy moth had either been recorded at outbreak levels or had never been observed. Parasitoid species composition and abundance were assessed to understand how the presence of gypsy moth indirectly affects the natural mortality of native caterpillars.

### PHYLOGEOGRAPHY, POST-GLACIAL HISTORY AND CRYPTIC SPECIATION IN THE BLACK FLY, *Prosimulium travisi* Stone (Diptera: Simuliidae)

Julio Rivera and Douglas C. Currie

Climatic oscillations during the Quaternary Period greatly impacted the distribution of organisms in North America. In order to infer distributional patterns of black flies in western North America, we investigated phylogeographic structure within a widespread Cordilleran species, *Prosimulium travisi*. Three hundred and thirty individuals were collected from 56 populations distributed throughout the entire range of the species. Phylogeographical structure was analyzed using a 624bp section of the COI gene. Results suggest that populations of *P. travisi* were confined to two different refugial areas during the Wisconsinan Glaciation: one in the north (Beringia) and one in the south (i.e., south of the Cordilleran Ice Sheet). Following deglaciation, these founding populations dispersed southward and northward, respectively, and are now sympatric in the area straddling the 49th parallel. Geographically isolated populations from Colorado were found to represent a separate (but cryptic) species, suggesting the influence of an earlier glacial cycle.



### Honourable Mention

### THE FRUIT FLIES OF ONTARIO (Diptera: Tephritidae); AN INTEGRATION OF MORPHOLOGICAL AND MOLECULAR IDENTIFICATION

Morgan D. Jackson, Stephen A. Marshall and Robert Hanner

## 2007 PRESIDENT'S PRIZE WINNER FOR POSTER PRESENTATION

### SIZE DOESN'T MATTER: DIETARY INFLUENCE ON MATE SELECTION BY THE LARGE MILWEED BUG, *Oncopeltus fasciatus*

J. Scott MacIvor, Gard Otis and Jonathon G. Schmidt

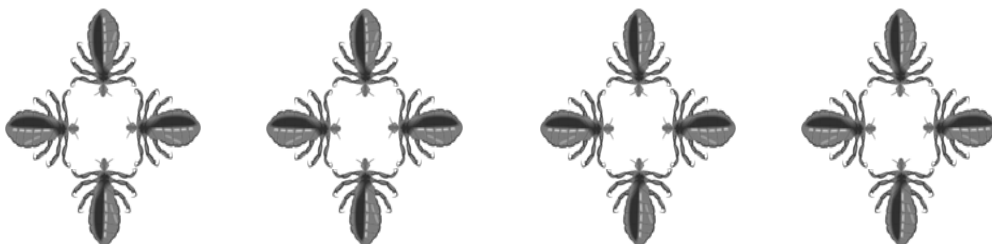
Our study investigated two factors that could affect mate discrimination in the large milkweed bug: adult body size and diet. The bugs sequester toxic cardenolides and other compounds from milkweed (*Asclepias syriaca*) seeds, their natural food source. The laboratory strain we studied can also feed on sunflower seeds (*Helianthus annuus*), resulting in toxin-free bugs. We maintained two subpopulations of *O. fasciatus* for several generations on either milkweed seeds or sunflower seeds. When we placed a virgin female in a container with two males (one from each diet-subpopulation), they exhibited a strong mating preference for males fed on milkweed seeds. In contrast, males exhibited no preference when presented a choice between females of the two subpopulations. Body size did not affect mating success in any of the trials. During courtship, males grasp the female with their metathoracic legs and rub their abdomen laterally against the female. Our results provide evidence of female mate discrimination based on male diet and not size. Females have the opportunity to assess male chemistry and to preferentially mate with males with sequestered milkweed compounds (i.e., cardenolides), thereby enhancing their fitness.



### Honourable Mention

### EVIDENCE FOR SIGNALLING VIA NUPTIAL GIFTS IN A LADYBIRD BEETLE, *Adalia bipunctata* (Coleoptera: Coccinellidae)

Jennifer C. Perry and Locke Rowe



# 2007 ESO TRAVEL AWARD WINNERS

## EVIDENCE FOR SIGNALLING VIA NUPTIAL GIFTS IN A LADYBIRD BEETLE, *Adalia bipunctata* (Coleoptera: Coccinellidae)

Jennifer C. Perry and Locke Rowe



We hypothesize that nuptial gifts derived from seminal proteins will induce similar changes in females as caused by ejaculate proteins: increased oviposition and decreased lifespan and mating receptivity. We tested this hypothesis in *Adalia bipunctata* a species in which females consume a spermatophore after mating. We examined the short-term reproductive and re-mating response to spermatophore feeding and the effect of continued spermatophore feeding on longevity, re-mating and fecundity. To examine how spermatophore feeding affects short term reproduction, we crossed the spermatophore feeding treatment with a diet manipulation. Eating a spermatophore caused females to oviposit more quickly than if prevented from eating a spermatophore. This effect did not

depend on diet, suggesting a signalling function. Eating a spermatophore also decreased re-mating receptivity. The ingestion of multiple spermatophores had no effect on longevity, lifetime reproductive success or lifetime re-mating. Overall, the results imply that spermatophores have a signalling function but provide little nutritional value or long-term fitness effects.

## NESTMATE RECOGNITION IN THE LARGE CARPENTER BEE, *Xylocopa virginica*

Marianne Peso and Miriam H. Richards

Kin recognition allows an individual to help potential relatives and avoid inbreeding. Living in aggregations, the large carpenter bee, *Xylocopa virginica*, has daily opportunities to encounter conspecifics and react to them appropriately. Male *Xylocopa* defend territories and can benefit from avoiding fights with potentially related nestmates and passing up copulation with female nestmates. With nestmate recognition, female *Xylocopa* can preferentially help their female nestmates (likely sisters) and reject mating attempts by nestmate males (likely brothers). The aim of this study was to determine whether pairs of male-male nestmates, female-female nestmates and male-female nestmates behave differently than their non-nestmate counterparts, suggesting the ability to



discriminate nestmates from non-nestmates. Behaviour was measured in terms of frequency, latency and total time spent. Results indicate *X. virginica* can distinguish between nestmates and non-nestmates of either sex but this behavioral variation takes on different forms depending on the sex of bees in a pair.



area with an east to west distance of 27 km and a north to south distance of 17 km with Mirabel Airport in the south-central part of the triangle. Some of the sites had dozens of the butterfly in flight.

The most likely explanation for the European Common Blue's appearance around the airport was that it arrived in one of its stages, either two or more immatures or a gravid female, in cargo at the airport and subsequently escaped and was able to successfully reproduce.



Photo Courtesy of Peter Hall

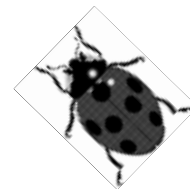
In its widespread European locations, it feeds regularly as a larva on a variety of legume plants, particularly Common Bird's-foot-trefoil, *Lotus corniculatus*. Many of the major clover and trefoil favourite larval food plants in Europe are found commonly as alien invasives along many roadsides in North America. The potential sites for the butterfly are easy to find as all it takes is perusal of roadside patches of the conspicuously yellow Common Bird's-foot-trefoil which blooms into October. Larvae were also found and reared on the trefoil. It appears that there could be as many as three or four generations as butterflies were seen flying from June and then well into October.

It will be very informative to track this new species over time and watch its spread. When the European Skipper first showed up in London, Ontario (~1910), there were very few butterfly specialists around to track its expanding distribution. Now it is one of the most common butterflies in North America feeding on Timothy Grass, *Phleum pratense*, associated with hay fields and other grasses. Today, there are many more butterfly enthusiasts who can lend a monitoring hand with the European Common Blue.

Peter Hall  
halljp@rogers.com



Photo Courtesy of Peter Hall



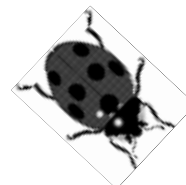
## TEST YOUR KNOWLEDGE

1. The Greek word for "two wing" refers to which insect order?
2. A simple eye in insects is called \_\_\_\_\_?
3. A typical honey bee hive, at its peak, has how many workers?
4. An insect which gives birth to live young, is said to be \_\_\_\_\_?
5. Before they became "phthiraptera", which two orders contained lice?
6. How can you tell the difference between male and female earwigs?
7. The insect activity \_\_\_\_\_, is the rubbing of two surfaces to produce a noise?

### Answers:

1. diptera 2. ocellus (pl. ocelli) 3. 50-60,000 4. viviparous 5. anoplura & mallophaga 6. cerci 7. stridulation

Source: [www.mstate.edu/Entomology/4-H/LINNAEAN.html](http://www.mstate.edu/Entomology/4-H/LINNAEAN.html)





## 144th ANNUAL MEETING OF THE ENTOMOLOGICAL SOCIETY OF ONTARIO

**Sault Ste. Marie, Ontario  
October 26-27, 2007**

The 144th Annual Meeting of the ESO was held in Sault Ste. Marie, Ontario on 26-27 October. The theme of this year's meeting was "Entomology at the border: bridging the gap". Saturday morning's plenary session was opened by Dr. Tony Hopkin, Director of the Great Lakes Forestry Centre—NRCan. Attendees were treated to three engaging presentations during this session. Dr. Jenny Cory, from Algoma University College, presented a talk titled "Insect pathogen ecology—developing the link between entomology and molecular biology". Following Dr. Cory's presentation, Dr. Robert Haack, with the US Forest Service, discussed recently established exotic bark- and wood-boring insects. To finish the session, Dr. Dean Thompson, from NRCan, presented a talk titled "Bridging the discipline gap between chemistry and entomology".

The afternoon session, devoted primarily to President Prize Competition presentations offered attendees a great opportunity to learn about current entomological research. All ten students who presented did a fantastic job! The session finished off with presentations by Dr. Matthias Buck and Dr. Peter Hallett.

The meeting was capped off at the banquet by good food, good conversations, the passing of the gavel and cockroach, and a fantastic after-dinner speech titled "For the love of a rose" by Dr. Joe Shorthouse.

This meeting would not have been possible without the hard work of the meeting organizing committee including:

- ◆ Chairperson and Finance: Blair Helson
- ◆ Local Arrangements: Kevin Barber
- ◆ Scientific Program: Barry Lyons
- ◆ Registration: Kathryn Nystrom and Isabelle Ochoa
- ◆ Technical Services: Carl Nystrom



Pictured above, Blair Helson (left), past-president passes on the ESO gavel and cockroach to president Rebecca Hallett (right).

## NRCan Staff Engage Students in Designing the 144th Annual Meeting of ESO Logo

Earlier this year, Grade 5 students from St. Mary's French Immersion Catholic School in Sault Ste. Marie Ontario were asked to design a logo that would be used on the program and related publications for the annual general meeting of the Entomological Society of Ontario (ESO) this coming fall. It was decided to have a local student design the logo to help raise awareness among the students, teachers and parents about the Society, entomology, and NRCan. A contest proved to be the perfect means of achieving this goal.

"Children's imaginations and artistic abilities are a great resource," says Isabelle Ochoa, Entomology Technical Assistant at the Great Lakes Forestry Centre (GLFC). "I was grateful to have Mme DeGuire's support and her students' enthusiasm for this venture." Mme DeGuire is the Grade 5 teacher at St. Mary's



Isabelle Ochoa (GLFC) presents Daniella first prize in the logo design contest.

The theme for this year's Conference is *Entomology at the Border: Bridging the Gap*, and as the end of the school year drew near, staff at the GLFC voted for their favourite logo. The votes were close, but first place went to a student named Daniella who incorporated this year's theme into her symmetrically designed sketch. For her winning design, Isabelle Ochoa presented Daniella with several great prizes, including a pen donated by GLFC Director General Ted Van Lunen.

Nicole Leed, from Communications Branch, and Rachel Fillion from the Insect Identification lab, handed out second and third-place prizes to students Anna and Victoria, which included NRCan Frisbees, pencils and pens. Isabelle also personally donated prizes for the students, including treats, as it was the last day of school. Both Nicole and Rachel had attended St. Mary's when they were younger, so it was interesting and fun to have them there to present the prizes. Having former students of the elementary school helped the kids understand the wide variety of career possibilities that are available to them in entomology, which is a branch of biology that focuses on the study of insects. Entomologists add to the understanding of nature and to the enhancement of food, health, and living standards. There are many insects that affect trees and shrubs in our forests, and if an insect is damaging a tree, you need to know what the insect is in order to treat the tree and solve the problem.

Each student who participated received activity booklets on ecology as well as NRCan pencils and highlighters to thank them for their efforts. As well, a book titled *Trees in Canada* was donated to the school library. The book will help students in their learning about entomological host species.

Nicole Leed  
GLFC



# Insect Rearing – Tool for Detection of Non-indigenous Wood Boring Insects

T. Kimoto<sup>1</sup>, L.M. Humble<sup>2</sup>, E. Bullas-Appleton<sup>3</sup>

<sup>1</sup>Canadian Food Inspection Agency, Plant Health Surveillance Unit, Burnaby, BC.

<sup>2</sup>Natural Resources Canada, Canadian Forest Service - Pacific Forestry Centre, Victoria, BC.

<sup>3</sup>Canadian Food Inspection Agency, Plant Health Surveillance Unit

## Introduction

Non-indigenous insects such as the emerald ash borer (*Agrilus planipennis*) and Asian longhorned beetle (*Anoplophora glabripennis*) have recently become established in Canada. These insects were probably introduced through wood packaging material associated with imported commodities. Since 1998, the Canadian Food Inspection Agency (CFIA) has used traps baited with semiochemicals to detect non-indigenous wood boring insects at high risk sites in urban areas. Although these chemicals can attract a variety of insects, they were primarily developed to target coniferophagous bark and ambrosia beetles. As such, insects that are not attracted to these chemicals will unlikely be detected using this method.

In 2005, staff from the Canadian Forest Service (CFS) and CFIA formed a committee to recommend alternative methods to detect established populations of non-indigenous wood boring insects by the CFIA. Rearing insects from logs was recommended as any species that develop under the bark or in the wood can be recovered from the attacked host rather than only those that respond to the specific lure in a trap. In 2006, the CFIA in partnership with the CFS, City of Surrey, City of Toronto, City of Montréal and Halifax Regional Municipality (HRM) initiated this survey as a pilot project.

## Insect Rearing Facility

Steel marine transport containers were modified into climate-controlled rearing facilities (Fig. 1). Layout of the rearing facilities was designed by Lee Humble. Within each facility there are 2 types of rearing systems: ceiling racks (Fig. 2) and sonotubes (Fig. 3).



Fig. 1. Insect rearing facility modified from a 40 ft marine transport container.



Fig. 2. Logs suspended from the ceiling rack.



Fig. 3. Rearing tubes beneath mesh cages.

Logs are suspended from 2 sets of ceiling racks that occur on both sides of a central aisle. Mesh sleeve cages are placed around each log and emerging insects are collected in a plastic bottle attached to the bottom of each sleeve. Logs up to 40 cm in diameter and 1 m in length can be placed in the sleeve cages (Humble, unpublished). In addition to the ceiling racks, there are 5 wooden dollies in each facility that hold 6 sonotubes modified to collect insects. The sonotubes were designed by Peter de Groot and Jon Sweeney (CFS) and are able to hold logs 7 inches in diameter and 24 inches long. In total there is room for 147 logs (117 mesh sleeves and 30 sonotubes) in each facility.

## Methods

One rearing facility was placed in Surrey, Montréal and Dartmouth while 2 were placed in Toronto. In order to minimize costs, logs were originally targeted through each city's hazard tree removal program. Each city was given a map of high risk sites and was requested to contact the CFIA when trees were going to be removed from these areas. Prior to removal, CFIA, CFS and city staff assessed each tree. If the tree met specific criteria (e.g. signs of insect activity, symptoms of decline, recently dead or dying, etc.), it was selected for inclusion in this survey (Fig. 4).

When insect attack occurred throughout the tree, 1 log was taken from breast height and the other from the crown. If attack occurred in localized areas on the tree, 2 logs were removed from that area. When the tree was in decline and insect activity was not observed, 1



Fig. 4. Marking areas for collection on the target tree.

log was taken from breast height and the other was taken from the area of decline. Logs were transported to the facility where the cut ends were covered in paraffin wax to prevent rapid desiccation of the wood and bark (Fig. 5). Logs were then placed in sonotubes or suspended from the ceiling racks (Fig. 6).



Fig. 5. Applying paraffin wax to the cut end of a log.

All sonotubes and cages were marked with a unique tag that lists the tree species, collection date, location and collector names. Undiluted propylene glycol was poured into the collection bottles of the mesh cages and sonotubes to capture and preserve emerging insects.

Temperature and relative humidity was monitored by data loggers and an analog thermohygrometer. Every 2 weeks the facility was visited by CFIA staff to monitor



Fig. 6. Using a hydraulic lift to suspend a log from the ceiling rack.

the internal climate and collect emerged insects. Specimens were placed in 75% ethanol and forwarded to the CFIA entomology lab in Ottawa for identification.

## Results

Log collection was recently initiated this summer in Toronto, Montréal and HRM and will continue until each facility has been filled. Approximately 60 logs have been collected from 30 trees (16 species) in Toronto while only a few logs have been collected in Montréal and HRM. Therefore, no insects have been reared from these 3 cities.

In the City of Surrey, log collection began in August 2006. Approximately 80 logs have been collected. To date, ambrosia beetles, weevils, bark beetles, longhorn beetles and metallic wood borers have been reared from a variety of softwood and hardwood species. Although a few naturalized non-indigenous species have been collected, most of the reared insects are native. To date, there have not been any new records of introduced species.

## Acknowledgments

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## MEETINGS: Ontario

### Toronto Entomologists' Association Meetings:

All meetings are held in Room 006 of Northrop Frye Hall, 73 Queen's Park Crescent, University of Toronto (except where otherwise noted).

#### *PROVEN TECHNIQUES TO CAPTURE INSECT IMAGES*

Saturday, January 26, 2008 1:15 p.m.

*Presenter:* Kerry Jarvis

#### *ONTARIO BEEKEEPERS ASSOCIATION UPDATE*

Saturday, February 23, 2008 1:15 p.m.

*Presenter:* Doug McRory

#### *STUDENT SYMPOSIUM*

Saturday, March 29, 2008 1:15 p.m.

Location: Room 432, Ramsay Wright Zoological Building, University of Toronto. The address is 25 Harbord Street, and the building is at the southwest corner of St George and Harbord.

#### *THE DEMISE OF THE GREEN DRAKE MAYFLY: WHAT IT TELLS US ABOUT THE HEALTH OF SOUTHERN ONTARIO TROUT STREAMS*

Saturday April 26, 2008, 1:15 p.m.

*Presenter:* Henry Frania

## MEETINGS: Outside Ontario

### Eastern Branch ESA Annual Meeting

March 9-11, 2008

Syracuse/Liverpool, New York

### North Central Branch ESA Annual Meeting

March 24-27, 2008

Columbus, Ohio

### ESA Annual Meeting

November 16-19, 2008

Reno, Nevada

Theme: Metamorphosis - A new beginning

Website: [www.entsoc.org/am/fm/2008/index.htm](http://www.entsoc.org/am/fm/2008/index.htm)

### XXIII International Congress of Entomology,

July 6-12, 2008

International Conventional Centre, Durban, South Africa

<http://www.ice2008.org.za>



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