Proceedings of the 67th Annual Meeting of the Acadian Entomological Society

June 10-12, 2007

St. Mary's University

Halifax, Nova Scotia

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Agenda of the 67th Annual Meeting of the

Acadian Entomological Society

June 10-12, 2007

St. Mary's University, Halifax, Nova Scotia

Sunday, June 10, 2007

1:00 – 4:00	Field Collecting Trip, McNabs Island, Halifax Tour Leaders: Jon Sweeney and Jeff Ogden (Note: Meet at 12:30 at Fisherman's Cove, Eastern Passage to catch boat)
7:00 – 10:00	*Registration & Reception* Sobey Lounge, 4th floor, Sobey's Building, St. Mary's University

Monday, June 11, 2007 – Morning

Room 265, Sobey's Building, St. Mary's University

8:00 – 9:00 *Registration, Front Desk, Sobey's Building*

9:00 - 9:05 Welcome: Kenna MacKenzie, President, AES
Doug Strongman, Chair, St. Mary's University

9:05 – 12:15 **Faunistics Symposium: The arthropod fauna of the Acadian region: lessons from dusty old bugs and new species**
Moderator: Dave McCorquodale

9:05 – 9:15 Arthropods of the Acadian region
David McCorquodale, Cape Breton University

9:15 – 9:45 Aquatic insect biodiversity studies in the Maritimes: why do we still know so little about these groups?
Donna Giberson, University of Prince Edward Island

9:45 – 10:15 Learning about insects of forensic importance
Douglas Strongman, Saint Mary's University and Chantelle Cormier, Cape Breton University

10:15 – 10:45 Refreshment Break

10:45 – 11:15 Maritime beetles: new insights from field and cabinet expeditions
Christopher Majka, Nova Scotia Museum of Natural History

11:15 – 11:55 Keynote Address: The opportunities and challenges with using structured inventories of Arachnids to increase faunistic knowledge in Acadia
Christopher Buddle, McGill University

11:55 – 12:15 Summary and discussion
David McCorquodale, Cape Breton University

Associated Poster:
Acquiring a baseline of knowledge for a taxon: the ADIP and MDDS examples (Odonata), Paul Brunelle

12:15 - 1:30 **Lunch, Loyola Dining Room**

Monday, June 11, 2007 – Afternoon: Student Presentations

Moderator: Suzanne Blatt

***** indicates this is a student presentation

1:30 – 1:45 Kathryn Dau-Schmidt* and Donna Giberson - The Mosquitoes of the PEI National Park

1:45 – 2:00 Sean LeMoine*, Soren Bondrup-Nielson and Kenna MacKenzie - Vegetation structure and invertebrate diversity in agriculture: a look at ground beetles (Family: Carabidae) in hayfields

2:00 – 2:15 Geoff Williams*, Aaron Shafer, Richard Rogers, Dave Shutler and Donald Stewart - A recently-introduced and potentially virulent parasite to honey bees in Canada

2:15 – 2:30 Melissa Reekie*, Kenna MacKenzie and Beata Lees - Is Cranberry Tipworm (Diptera, Cecidomyiidae, Dasineura oxycoccana) a New Pest of Lowbush Blueberry?

2:30 – 2:45 Jody Nelson*, Joanna MacKenzie and Andrew Hammermeister - Biology and Novel Approaches to the Management of Wireworm *Agriotes* spp. (Coleoptera: Elateridae) in Nova Scotia

2:45 – 3:00 Hui Zhou - Looking for a Job while Learning from Weevils to Others

3:00 – 3:15 Pest Updates

3:15 – 4:00 **Poster Session and Refreshment Break**

Christy Finlayson* and Andrei Alyokhin - Occurrence of Native and Non-Native Lady Beetles (Coleoptera: Coccinellidae): Do Numbers in Anthropogenic and Ancestral Habitats Differ?

Taro Saito* and Susan Bjornson - Horizontal transmission of a microsporidium from the convergent lady beetle *Hippodamia convergens* Guerin-Meneville (Coleoptera: Coccinellidae) to three coccinellid species of Nova Scotia

Jean-Philippe Michaud* and Gaétan Moreau - Assembly rules for insects of carrion and their applications to forensic science

Tina Rousselle*, Jean-Pierre Privé, Anita Leblanc - Evaluation of the effects of reflective groundcovers on ground beetle diversity and abundance

Dick Rogers – Honey bee health in crisis: assessing colonies and predicting survival

Monday, June 11, 2007 – Evening

5:30 - 6:00 *Brewery Tour*
Alexander Keith's NS Brewery, 1496 Lower Water Street, Halifax

6:30 *Banquet (cash bar) at Red Stag Tavern*
1496 Lower Water Street, Halifax
*Presentation of Student Awards

Tuesday, June 12, 2007 – Morning: Contributed Papers

Room 265, Sobey's Building, St. Mary's University

Moderator: Peggy Dixon

9:15 – 9:30 Christine Noronha - Carabid species diversity and movement in rotational fields in PEI

9:30 – 9:45 Shelley Adamo - Lipid metabolism and immunity: the consequences of intertwined physiological systems

9:45 – 10:00 Andrei Alyokhin and Gary Sewell - Competition among three species of potato-colonizing aphids

10:00 – 10:15 Jon Sweeney, Peter Silk, Jerzy Gutowski, Jessica Price and Ed Kettela - Pheromones for attraction and mate recognition in the brown spruce longhorn beetle

10:15 – 10:30 Gaétan Moreau - The simplification of forest structure and its impact on bottom-up and top-down forces acting on insect herbivores

10:30 – 11:00 **Refreshment Break**

11:00 – 11:30 AES Business Meeting

11:30 – 12:30 **Lunch, Loyola Dining Room**

2007 Acadian Entomological Society 66th Annual Meeting Abstracts

Faunistics Symposium: The arthropod fauna of the Acadian region: lessons from dusty old bugs and new species

Arthropods of the Acadian region

David McCorquodale

Cape Breton University

No abstract submitted.

Faunistics Symposium: The arthropod fauna of the Acadian region: lessons from dusty old bugs and new species

Aquatic insect biodiversity studies in the Maritimes: why do we still know so little about these groups?

Donna Giberson

University of Prince Edward Island, Biology Department, Charlottetown, PEI C1A 4P3

There has been a wealth of concentrated aquatic insect sampling over the past decades in Atlantic Canada, yet we know surprisingly little about the species composition and status of aquatic insects in our region. "EPT" taxa (Ephemeroptera, Plecoptera, Trichoptera) might be expected to be the best known of the aquatic insects, since they are the major focus of mandated biomonitoring studies for a variety of anthropogenic disturbances. However, most biomonitoring studies are based on family- or genus-level identification, due to perceived costs or statistical "noise" associated with species-level identification, and to lack of larval keys or expertise. This is an interesting case where considerable funds have been spent on justifying why samples should not be identified to species, rather than developing resources for species identifications. Consequently, most of our information about species composition of aquatic insects comes from collecting trips by specialists from other regions, often dating back many decades, and a few recent habitat-specific studies. This has left us with an incomplete species list for most taxa, and little or no information about habitat requirements and species status information. An important exception to this pattern is the Odonata, which has been well studied at the species level throughout the Acadian region. In this review, I will focus on the Ephemeroptera and the Odonata, with examples from other aquatic taxa, to contrast the types of information gathering methods that have led to this pattern, and to suggest ways that we can address aquatic insect biodiversity issues in the future.

Faunistics Symposium: The arthropod fauna of the Acadian region: lessons from dusty old bugs and new species

Learning about insects of forensic importance

Douglas Strongman[1] and Chantelle Cormier[2]

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Forensic entomology is the application of entomological knowledge to criminal investigations. It is most commonly used to determine the minimum postmortem interval (PMI) of a corpse, but this type of evidence has also been used to determine if a body has been moved, if there was drug use prior to death, the location of wounds obscured by decomposition or if the victim is still living, whether they have suffered neglect at the hands of their caretakers. The recent increase in using insect data as evidence is due to its accuracy in determining PMI after 72 hours postmortem, when other physiological methods are no longer as reliable. There are two techniques to determine PMI; the first studies the development and age of the blowfly larvae (Diptera: Calliphoridae) collected from a corpse, while the second studies the successional wave of insects associated with a corpse. The accuracy of a PMI calculation greatly depends on established information concerning local carrion insects collected during an investigation. Many variables such as geographic location, season, climate, type of exposure and local carrion insect populations will affect the interpretation of the entomological evidence. In Canada, information of this kind is primarily available for regions in Western Canada, with less information for other provinces or biogeoclimatic regions. Locally, in Nova Scotia, three studies have collected data on forensically significant insects. The presentation in this symposium will summarize the brief history of carrion insect research in Canada, present some of the details on carrion insects based on work done by one of us (CC) and will identify some important needs for future research in the region which will be critical for the forensic application of the data.

Faunistics Symposium: The arthropod fauna of the Acadian region: lessons from dusty old bugs and new species

Maritime beetles: new insights from field and cabinet expeditions

Christopher Majka

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In the past decade a large number of studies of Coleoptera have been undertaken in the Maritime Provinces. These have significantly expanded our knowledge of the beetle fauna of the region. These studies have focused on various areas including; a) adventive species; b) native species; c) newly described species and systematic revisions; d) saproxylic faunas; e) forest-floor communities; f) beetles in agricultural contexts; g) island faunas; h) postglacial history; i) surveys of family groups; and j) beetles of specialized habitats (i.e. bee nests, owl nests, beach drift communities, etc.).

These research projects have involved both contemporary studies employing a variety of methodologies, as well as the examination of voucher specimens preserved in a large number of regional collections. These historical collections have proved to be very valuable in terms of understanding changes in the composition of the region's fauna as well as establishing early timelines for the presence of adventive species in the region. As a consequence there are now 895 species of beetles known from Prince Edward Island, an increase of 562 species from the 342 that were known in 1991. In Nova Scotia the provincial fauna is now known to consist of at least 2,332 species, an increase of 1,018 from the 1,314 that were known in 1991. In New Brunswick there has also been a sizeable increase in the known provincial beetle fauna.

As a result of these many studies an understanding of the composition of the region's fauna is beginning to emerge. There is further evidence of the importance of Atlantic Canada as a conduit and springboard of many introduced species. The region is also home to a sizeable number of rare and unusual native species, some of whose populations in the region which are significantly disjunct from the balance of their geographical ranges. A sizeable proportion (~ 30%) of saproxylic species are apparently rare, perhaps as a result of the long history of forest management practices in the region. Despite these significant strides, much remains to be learned about the region's beetle fauna. It is imperative to continue studies that will shed further light on this group and on the changing environmental circumstances which may be affecting them.

Faunistics Symposium: The arthropod fauna of the Acadian region: lessons from dusty old bugs and new species

The opportunities and challenges with using structured inventories of Arachnids to increase faunistic knowledge in the Acadian region

Chris Buddle

Dept. Natural Resource Sciences, McGill University, 21,111 Lakeshore Rd, Ste Anne de Bellevue, QC H9X3V9

The spider fauna of the Acadian region has been relatively well studied due to good focused collections in the past; over 400 species are known from Nova Scotia, 363 from Newfoundland, 378 from New Brunswick, but merely 36 species are known from PEI, and estimates for Maine are lacking. However, records are not readily accessible making databasing a key priority for future Arachnological studies in the region. Structured inventories of spiders represent an opportunity to target key regions or habitats, as this approach is cost-effective and spider taxonomy is accessible and can be taught to non-specialists. A case study, from beech-maple forests in Quebec, is used to illustrate the value of such an inventory, with focus on collecting data with ecologists and taxonomists as end-users, and using taxon sampling curves to produce accurate diversity estimates. The value of long-term inventories is also discussed in light of invasive species, including the spider *Linyphia triangularis* which has the potential to disrupt spider assemblages in the Acadian region.

Faunistics Symposium: The arthropod fauna of the Acadian region: lessons from dusty old bugs and new species

Poster: Acquiring a baseline of knowledge for a taxon: the ADIP and MDDS examples (Odonata)

Paul Brunelle

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No abstract submitted.

Oral Presentations

***** indicates this is a student presentation

Lipid metabolism and immunity: the consequences of intertwined physiological systems

Shelley A. Adamo

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During intense activity, many insects use an exchangeable apolipoprotein, apolipophorin III, for lipid transport. However, under resting conditions, apolipophorin III acts as an immune surveillance molecule. My lab has found that intense activity (e.g. flight) in crickets (*Gryllus texensis*) leads to transient immunosuppression. For approximately one hour after flight, crickets are more susceptible to the Gram-negative bacterium *Serratia marcescens*. During flight, hemolymph lipid levels increase, and the apolipophorin III concentration decreases. Decreasing apolipophorin III levels by injecting adipokinetic hormone also leads to immunosuppression. Reducing the decrease in apolipophorin III during flight by preloading crickets with trehalose reduces flight-induced immunosuppression. Injections of purified apolipophorin III also reduced flight-induced immunosuppression. These results suggest that when apolipophorin III is 'borrowed' for lipid transport, immune surveillance declines, resulting in an increased susceptibility to bacterial infection.

Competition among three species of potato-colonizing aphids

Andrei Alyokhin and Gary Sewell

University of Maine, Orono

Potato aphid (*Macrosiphum euphorbiae* (Thomas)), green peach aphid (*Myzus persicae* (Sulzer)), and buckthorn aphid (*Aphis nasturtii* Kaltenbach) are polyphagous species that colonize potato plants (*Solanum tuberosum* L.) in Northeastern U.S. and Canada. We investigated effects of inter- and intra-specific competition among these species on their longevity and fecundity in laboratory cages. Buckthorn aphid had a shorter life expectancy and produced fewer nymphs compared with the other two species. Competing with the other two species also interfered with its reproduction. Potato aphid had shorter life expectancy than green peach aphid when confined with conspecifics, but the difference disappeared when the three species were held together. Green peach aphid produced fewer nymphs when held separately from the other species. Overall, it appears that inter-specific competition is more important for the buckthorn aphid, while intra-specific competition may be more important for the other two species. Different spatial distribution on potato plants may help these three species co-exist with each other.

The Mosquitoes of the PEI National Park

Kathryn Dau-Schmidt* and Donna Giberson

Department of Biology, 550 University Ave., University of Prince Edward Island, Charlottetown, PE C1A 4P3

At the start of this decade pressure was being applied to the PEI National Park to treat the salt marshes in the Brackley Beach area. These salt marshes were being blamed for the mosquito problems experienced by people with properties adjacent to the Park. A survey of biting adult mosquitoes was carried out in 2003 and a survey of larval mosquitoes, as well as biting adults, was carried out in 2004 in order to get a better understanding of which mosquito species were present in the Brackley Beach area and which species were biting people. Of the total larvae collected in the 2004 survey 10% were fresh water species and 90% were salt water species. However, of the biting adults collected in both surveys, 70-72% were freshwater species and 28-30% were salt water species. The species most frequently collected as a larva was the salt water species *Oc. cantator* making up 87% of the total larvae collected. The species most frequently collected as a biting adult was the fresh water species *Oc. stimulans* making up 40% and 35% of the total biting adults collected in 2003 and 2004 respectively. *Oc. cantator* was the second most frequently collected species making up 26% and 27% of the total biting adults collected in 2003 and 2004 respectively.

Vegetation structure and invertebrate diversity in agriculture: a look at ground beetles (Family: Carabidae) in hayfields

Sean LeMoine[1, 2]*, Soren Bondrup-Nielsen[1], and Kenna MacKenzie[2]

[1]Biology Department, Acadia University, 24 University Ave., Wolfville, NS, B4P 2R6, [2]Atlantic Food and Horticulture Research Centre, Agriculture and Agri.-Food Canada, 32 Main St., Kentville, NS, B4N 1J5

Realization of the negative impact industrialized agriculture imposes on global biodiversity has resulted in increased research on species diversity in agro-ecosystems. However, such research focused on invertebrates and vegetation frequently has looked at invertebrate and vegetation diversity without accounting for the influence of vegetation structure. Although structure has repeatedly been shown to play an important role for other organisms such as birds and small mammals, only recently has it been shown to contribute on an important level to invertebrate diversity. As part of a larger study in Annapolis County, Nova Scotia, the influence of hayfield vegetation on ground beetles (Family: Carabidae) was examined at a small scale (within and between fields) in 2006. Ground beetle diversity was compared to both vegetation structure and plant species diversity. Results will be discussed.

The simplification of forest structure and its impact on bottom-up and top-down forces acting on insect herbivores

Gaétan Moreau

Département de Biologie, Université de Moncton, Moncton, NB, E1A 3E9

The simplification of stand conditions caused by plantation, short rotation coppice, selection cutting and thinning could affect the relative strength of both bottom-up and top-down forces acting on herbivore populations, potentially increasing the severity of insect outbreaks. The trophic webs of *Neodiprion abietis* (Harris), a sawfly defoliator of thinned forests of Atlantic Canada and *Phratora vulgatissima* (L.), a beetle defoliator of short rotation coppice plantations of Sweden were studied to examine these effects. Independent estimates of trophic forces were generated through the use of cloned saplings and non proximate methods. Results indicated that in both systems, treatments that simplify stand conditions altered the balance between bottom-up and top-down forces. Moreover, nonadditive (compensatory and synergistic) mortality between bottom-up and top-down forces was detected in both studies. This exemplifies that treatments that simplify forest conditions can (1) influence ecosystem function, (2) have a substantial impact on the balance between bottom-up and top-down forces acting on populations from this ecosystem, and (3) reduce the capacity of ecosystems to suppress herbivores. It is suggested that nonadditive effects between bottom-up and top-down forces may be common, offering an explanation through which the contrasting evidences previously presented by proponents of the bottom-up and top-down views can be understood.

Biology and Novel Approaches to the Management of Wireworm *Agriotes* spp. (Coleoptera: Elateridae) in Nova Scotia

Jody Nelson*, Joanna MacKenzie, and Dr. Andrew Hammermeister

Organic Agriculture Centre of Canada, Nova Scotia Agricultural College, P.O. Box 550, Truro, NS B2N 5E3

Eastern Canada is faced with the persistent threat of European wireworms, namely *Agriotes lineatus*, *A. obscurus*, and *A. sputator*. The destructive larvae of these species persist in the soil for several years, feeding on the roots of host plants and causing significant reductions in the yield and quality of economically important crops. Wireworm control through the use of insecticides, many of which are now deregistered, has proven difficult, as most damage occurs after insecticides have lost effectiveness. Alternative methods of wireworm control, particularly organic practices, are therefore desired. Here, cultural management strategies, targeted at both the larval wireworm and adult click beetle will be examined.

Wireworms may be managed through the use of a push-pull-immobilize strategy, where feeding deterrents, trap crops, and destruction of wireworms are employed. To examine the effectiveness of this strategy, a series of laboratory and field trials will be performed. Laboratory trials will involve determinations of crop and variety preferences, the effectiveness of organic deterrents, and the examination of potential soil applied controls. Field trials will be established to examine the impact of crop rotations on wireworm infestations.

Deterring the deposition of eggs is an alternative method of reducing wireworm populations on agricultural land. A field experiment will be conducted to determine the crop preference of adult click beetles. Deterrence of egg deposition may be based on food preferences or habitat selection. It is hoped that the findings of these studies will lead to organic cultural management methods for wireworm control, such as the use of less desirable crops in a rotation.

Carabid species diversity and movement in rotational fields in PEI

Christine Noronha

Agriculture and Agri-Food Canada, Charlottetown, PE C1A 4N6

The influence of the hedgerow and adjacent crop type on the diversity and movement of Carabid beetle species over a three year crop rotation cycle, was studied at Harrington farms in PEI. Five transects were established within three fields. Using the edge of the hedgerow as the starting point, each transect was divided into six 5 x 1m sections (1m into the hedgerow and 1, 3, 10, 30, and 60 m into the adjacent crop field). Two pitfall traps in each section were used to collect beetles every two weeks. Beetle diversity was monitored for three years in the same field; two years in the rotation crop and the third year in the main crop (potatoes). Rotation crops were either, barley, clover, or soybeans. A total of 46 Carabids species were identified. Results showed a higher diversity of species at the 1m distance in the field. The lowest diversity was found within the hedgerow into all three years and crops. The abundance of the nine most dominant species at each distance varied with the crop. As expected some species were more dominant early in the season while others at the end of the season. Certain species were lower in numbers in the potato crop when compared to the clover and barley crops. Two introduced species *Harpauls rufipes* and *Pterostichus melanarius* dominated the catch in all three years.

Is Cranberry Tipworm (Diptera, Cecidomyiidae, *Dasineura oxycoccana*) a New Pest of Lowbush Blueberry?

Melissa Reekie *[1,2], Kenna MacKenzie[2] and Beata Lees[2]

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In 2005, investigations of extreme yield reductions and unusual growth over the past five to six years in lowbush blueberry fields in Yarmouth County, Nova Scotia led to the discovery of *Dasineura oxycoccana*, commonly known as cranberry tipworm (CTW). While a pest of cranberry and highbush blueberry, this is the first record of CTW in lowbush blueberry. The biology of CTW and the degree of infestation and damage in four suspect blueberry fields in Yarmouth Country, Nova Scotia was evaluated in 2006. Temperature, precipitation and daylength from the weather station of Environment Canada at Kejimkujik Park were used to assess the effect of environmental conditions of CTW dynamics. Three different methods were used to assess population density of CTW: bud dissection, sticky board traps and insect sweeps. Of these three methods, bud dissection was the most sensitive measure of CTW presence. Temperature, precipitation and daylength were correlated with time of pupation. A significant number of buds died at all four field sites and there was no difference among sites in the extent of damage. Analysis of fluctuations in larval instar numbers from week to week suggests there were three generations of CTW present in fields in the 2006 growing season. The number of insects per growing bud differed significantly among fields and peak damage occurred before peak CTW populations suggesting that CTW was not the primary cause of the extensive damage observed in these fields. However, changing weather conditions due to global warming may lead to more serious future infestations.

Pheromones for attraction and mate recognition in the brown spruce longhorn beetle

Jon Sweeney[1], Peter Silk[1], Jerzy Gutowski[2], Jessica Price[1], and Ed Kettela[1]

[1]Natural Resources Canada, Canadian Forest Service, Atlantic Forestry Centre, Fredericton, NB, E3B 5P7; [2] Forest Research Institute, Department of Natural Forests, 17-230 Białowieża, Poland

We are investigating the use of pheromones by the brown spruce longhorn beetle, *Tetropium fuscum* (F.) and related species, with the objective of developing improved tools for survey and control. In volatile collections from adult beetles, (E)-6,10-dimethyl-5,9-undecadien-2-ol (geranyl acetol), termed here fuscol, was emitted by male *Tetropium fuscum* (F.) and male *Tetropium cinnamopterum* Kirby. In field experiments in 2006, traps baited with synthetic fuscol alone were not significantly attractive, but the combination of fuscol plus host volatiles (a synthetic blend of monoterpenes plus ethanol) attracted significantly more male and female *T. fuscum* and female *T. cinnamopterum* than did host volatiles alone. Field experiments are being repeated in 2007 in Halifax and Poland. In separate bioassays we have evidence suggesting that long chain hydrocarbons on the cuticle of female *Tetropium* spp. act as contact pheromones for species/mate recognition and induce copulatory behavior in conspecific males.

A recently-introduced and potentially virulent parasite to honey bees in Canada

Geoffrey R. Williams *[1], Aaron B. A. Shafer[1], Richard E. L. Rogers[2], Dave Shutler[1], and Donald T. Stewart[1]

[1]Department of Biology, Acadia University, Wolfville, NS B4P 2R6; [2]Wildwood Labs Inc., 53 Blossom Drive, Kentville, NS B4N 3Z1

Nosema ceranae is an emerging microsporidian parasite of European honey bees, *Apis mellifera*, but its distribution is not well known. Six *Nosema*-positive samples (determined from light microscopy of spores) of adult worker bees from the three Maritime Provinces (two each from Nova Scotia, New Brunswick, and Prince Edward Island) were tested to determine *Nosema* species using previously developed PCR primers of the 16S rRNA gene. We detected for the first time *N. ceranae* in Canada. Widespread transportation of bees for commerce has likely resulted in this parasite becoming globally ubiquitous.

Looking for a Job while Learning from Weevils to Others

Zhou, Hui

202, 36 Montgomery CT, Halifax, NS B3M 4M8

Looking for a job, generally speaking, is tough and sometimes challenging and even torturous. This is even more so to find a position in entomology. However, some day you might think that it could be enjoyable and lead to self-encouragement and self-improvement.

In this presentation, I like to share my deep feelings and true stories, after completing my Masters working with root weevils, how I encountered rat surgeries in my first job in Canada; how much I learned from such words as Alzheimer's, Al Qaeda/Hezbollah, black soldier flies and bio-intensive IPM; why I re-read the best selling book in 1960s, Silent Spring, while I was looking for job.

I am still looking for job, however, I feel differently about it.

Key words: Looking for job, Learning, Self-improvement

Poster Presentations

***** indicates this is a student presentation

Occurrence of Native and Non-Native Lady Beetles (Coleoptera: Coccinellidae): Do Numbers in Anthropogenic and Ancestral Habitats Differ?

Christy Finlayson* and Andrei Alyokhin

Department of Biological Sciences, 5722 Deering Hall Room 202, The University of Maine, Orono, ME 04469-5722

In a number of studies, non-native lady beetles have been shown to replace native lady beetles in agricultural habitats. Little is known, however, about lady beetle species composition outside of agricultural habitats. Evans (2004) suggested that native species have retreated to ancestral habitats in response to the arrival of non-native lady beetles. To test this hypothesis, a survey of lady beetles was conducted in 2004 and 2005 in different habitats in Maine. From May to October, lady beetles were sampled in a variety of anthropogenic and ancestral habitats. A total of 3487 and 2903 lady beetles were collected in 2004 and 2005, respectively. Non-native lady beetles were found in a variety of habitats, including the ones that would have presumably served as a refuge for native species if the native species had retreated. Native species were found in very low numbers in all of the habitats surveyed, but their proportion was higher in anthropogenic habitats when compared with ancestral habitats. *Hippodamia tredecimpunctata* and *Coccinella transversoguttata*, the two native species that were once dominant here, made up only 1.09% and 0.07% of the total lady beetles collected, respectively. In this survey, we failed to detect evidence that native lady beetles have retreated to ancestral habitats in response to the arrival of non-native lady beetles.

Assembly rules for insects of carrion and their applications to forensic science

Jean-Philippe Michaud* and Gaétan Moreau

Département de Biologie, Université de Moncton, Moncton, NB, E1A 3E9

It is well known that insect succession on carrion is not random and is specific to a biogeoclimatic zone. However, to the best of our knowledge, it has never been demonstrated that insect colonisation of carrion is in line with Diamond's assembly rules. To test this hypothesis and document the decomposition process of human carcasses in New Brunswick, a preliminary study was conducted using domestic pigs (*Sus scrofa*) as models. The results of this preliminary study indicate that some of the targeted species have nonrandom colonisation tendencies, being influenced by heat accumulation, and/or the season (fall or summer). For instance, *Lucilia illustris* (Diptera: Calliphoridae) had the characteristics of a pioneer species for both the summer and the fall, while *Necrophila americana* (Coleoptera: Silphidae) was a mid-sequence coloniser of summer only. *Necrodes surinamensis* (Coleoptera: Silphidae) colonised late in the sequence but its occurrence was rare in the fall. *Ontholestes cingulatus* (Coleoptera: Staphylinidae) did not exhibit a distinct pattern of colonisation. The possible benefits for forensic entomology of an increased consideration of ecological principles are discussed.

Honey bee health in crisis: assessing colonies and predicting survival

Dick Rogers

Wildwood Labs Inc., 53 Blossom Drive, Kentville, NS B4N 3Z1

Separation of plant protection product (PPP) effects on bees from infectious and non-infectious disorder effects requires comprehensive full colony assessments, and evaluation of the impact of single and multiple factors. A Colony Condition Assessment and Survival Prediction Analysis (CCA/SPA) approach has been used with apparent success in several locations in Canada and the US since 2003. Thresholds and interaction considerations used by CCA/SPA help sort out the potential implications of multiple stressors. When colonies die from Multiple and Various Causative Agents Syndrome (MVCAS) the cause is often considered mysterious and this leads to various allegations of what caused the losses. CCA/SPA can determine the most likely causes, and survival prediction takes the mystery out of why bees are dying. Brood success measurement is also a useful tool for determine PPP and environmental effects on bees. Using a brood overlap matrix and very precise brood age classification it is possible to accurately determine and directly compare brood develop times and success rates for control and test colonies. Time of brood replacement can also be determined from the matrix.

Evaluation of the effects of reflective groundcovers on ground beetle diversity and abundance

Tina Rousselle*[1], Jean-Pierre Privé[2], Anita Leblanc[2] and Gaétan Moreau[1]

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Reflective groundcovers rolled out between rows can improve light distribution within crops, as well as fruit production. However, groundcovers act as a barrier that could influence the movement and survival of insects within the agroecosystem, with potential impacts on expected gains from the use of groundcovers. Indeed, previous studies have shown that plant gains from other treatments that improve light availability can sometimes be offset by an increase in herbivore density. As an integral part of studies on Extenday Reflective Groundcovers on raspberry crops, an experiment was conducted to examine the effects of groundcovers on ground beetles (Coleoptera: Carabidae), used here as bioindicators of higher trophic organisms. Two sites, one commercial and one experimental, were selected and treatments were replicated within sites. Beetles were sampled using pitfall traps emptied every 2-3 days from June to September. The preliminary results suggest that groundcovers altered the seasonal fluctuations in density of ground beetles, as well as their diversity. It appears that groundcovers may have been used as a refuge by certain species of ground beetles such as *Pterostichus melanarius*, especially in area where beetle density is low.

Horizontal transmission of a microsporidium from the convergent lady beetle *Hippodamia convergens* Guerin-Meneville (Coleoptera: Coccinellidae) to three coccinellid species of Nova Scotia

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Convergent lady beetles, *Hippodamia convergens* Guérin-Méneville, are collected annually from their overwintering sites in California for aphid control throughout North America. A microsporidian pathogen was found in *H. convergens* adults that were purchased from a commercial insectary. Egg cannibalism and egg predation were examined as a means of horizontal transmission of the microsporidium among *H. convergens* larvae and three coccinellid species from Nova Scotia: *Coccinella septempunctata*, *C. trifasciata perplexa*, and *Harmonia axyridis*. The microsporidium was transmitted with 100% efficiency when first-instar larvae fed on microsporidia-infected eggs. Mean spore counts from smear preparations of infected beetles suggest that the infection was as heavy in *C. trifasciata perplexa* (a native coccinellid) as it was in *H. convergens* (the natural host) but lighter in the introduced species *C. septempunctata* and *H. axyridis*. For all of the species examined, larval development was significantly longer for microsporidia-infected individuals than for their uninfected cohorts. The microsporidium had no effect on larval mortality. The results suggest that uninfected field-collected beetles should be used to rear individuals for release in biological control programs. However, this is unlikely to happen because *H. convergens* are relatively easy and inexpensive to collect from their overwintering sites for redistribution.

ACADIAN ENTOMOLOGICAL SOCIETY
67TH ANNUAL BUSINESS MEETING

MINUTES

Tuesday, June 12, 2007
St. Mary's University, Halifax, NS

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1. Call to Order: The 67th Acadian Entomological Society Annual Business Meeting was called to order by President, Kenna MacKenzie at 11:10 am on Tuesday, June 12, 2007. Approximately 20 members were present

2. Approval of 2006: Correction of mistake on last paragraph of last page - "winters" was changed to "winners". Moved by Jon Sweeney and seconded by Christine Noronha. Passed.

3. Business arising from the minutes:

a. AES investments: information about the GICs from the last minutes has been passed to Don Ostaff, and Suzie Blatt is award of the issue. Investments need to be dealt with. ACTION: Treasurer

b. Proceedings from 1999: Kenna has reported that we're still looking for the 1999 proceedings so we can send a copy to a library in Germany that has requested it. She asked people to look for it again. The other volumes have been sent.

c. Thanks to webmaster and journal editor: Kenna reported that she was supposed to send thanks to Rick West and Don Ostaff to make sure they know we appreciate their services; she thinks she did so, but will do so again to make sure ACTION: Kenna

d. South Okanagan Reserve: Kenna reported that the letter of support for the reserve hadn't been sent. This wasn't done because Paul Fields, 2nd VP of ESC had been told to hold off writing the support letter for ESC after contacting Geoff Scudder because of some issues in BC. Kenna will write a letter if Geoff indicates that it is advisable to do so.

4. Approval of Agenda:
Two items, Sponsored Student Prizes and Checklist of Maritime Insects, were added to agenda under new business.

5. President's Report:
Kenna thanked the organizers of this meeting including Doug Strongman, Susan Bjornson, Dave McCorquodale and Suzie Blatt. Jon Sweeney and Jeff Ogden did a great job leading the field tour to McNabs Island. About 20 people participated and it was a great time for all. We had six sponsors for the meeting. St. Mary's University was very generous giving $200 from the Faculty of Science, $100 from the Biology Department and a 50% discount on rooms. NSERC Atlantic donated $200, Wildwood Labs $100 and AgraPoint International $100. Photocopying and other supplies from Agriculture and Agri-Food Canada were used. AES is very grateful for their support.
Kenna thanked the judges (Christine Noronha, Sonia Gaul, Donna Giberson, and Shelley Adamo) of the student competitions, and acknowledged the awardees – Melissa Reekie for best oral presentation, Sean LeMoine runner-up in oral presentation and Taro Saito for best poster presentation.

Kenna thanked the executive members. Suzie Blatt for all her work on the executive over the past two years – she keep things organized with frequent reminders and assistance. As well, Michelle Larson (VP) and Dick Rogers (Member-at-Large) also were very active throughout the year even though they couldn't attend this meeting.
Kenna also thanked our web master, Rick West for keeping her on track and for the great job he does, and Don Ostaff for moving forward with the Journal. Kenna's closing remarks were about the friendly nature of our meeting, and wishing good luck to the next executive.

5. Treasurer's report: See attached. Suzie produced a report which was lost when Kenna misplaced her memory stick. Kenna reported that our bank account was still healthy.

6. Journal Editor's Report: Don Ostaff sent a report for the Journal; he's feeling more confident about things now since more papers have been submitted than last year, and it seems to be taking off. He will be improving the looks and format of the journal, and is contacting sources to see about indexing the journal, and it will be in CABI and Entomology abstracts, and he is contacting others. The librarian at the Forestry Centre is helping out. Jon pointed out that Don is close to retirement, but he thought that Don may stay on with the journal. Kenna acknowledged the associate editors as well.

7. New Business:

a. Sponsorship of student awards: Dick Rogers, Wildwood Labs, has offered to support one of the student prizes at the meeting each year. Kenna wanted to know if the membership felt this was a good idea. There was some discussion on this, with Jon Sweeney asking if it would be just for a particular type of paper, and Kenna assured him that it would still be a general prize. Kenna indicated that she'd be willing to go forward to try to find other sponsors as well. Peggy Dixon moved, Jon Sweeney seconded that we accept this proposal, and that ask Kenna to go seek sponsorship of our student awards. Carried. ACTION: Kenna

b. Maritime Insects: Donna Giberson presented the idea that we try to get a baseline "Checklist of maritime insects" issue of the journal together to come out of the faunistics symposium. This would be actual journal articles. Kenna suggested that Dave spearhead some sort of article or process that this could happen. There was some discussion, and the response was positive that this is a very necessary first step, and should go ahead. ACTION: Dave McCorquodale

c. AES organization: Kenna gave a rundown on the traditional organization of the society, with a rotation every two years between our five jurisdictions within the society. Kenna passed out information dating back to 1915 (no meetings reported from 1926-1949) on executives and places of the meetings. She explained that the bank account was moved each time the executive changed except for last time when the accounts were kept in the NB bank branch and electronic banking was used. This rotation has been somewhat difficult in recent times and no continuity remained on the executive every second year. It can be hard to get to some locations (and expensive) and it may be a bit of a hardship on some small entomological communities to organize two meetings in a row.

Rick West first brought up the idea of changing the way we do things, and Kenna agreed it might be time to modernize our organization. Kenna suggested a new model that might include elected officers, with regional reps from each jurisdiction. The bank account will stay in the same place each year, and we

should have more continuity with our treasurer. Also we can plan a joint meeting with the Maine society, for example every five years. Rick West had previously checked the constitution and bylaws, and reported that such a change is in accordance with them. So, changes can be made by a vote by the membership. Andrei indicated as well that we didn't need to be held to a 5-yr rotation with Maine, either, but could look at just finding the best place.

Kenna wondered about setting up a committee to look into this. Donna G. put out the idea that we could vote on it now, since it is such a good idea. Some discussion ensued about the potential problems of getting people to volunteer to do a meeting, but Donna felt that it would not be that difficult if a committee was struck to bring bids for meetings to a meeting in advance. Donna suggested that we aim for a committee that will work on structure, but that we can approve in principle now.

Donna Giberson moved that we adopt a new organization where we hold general elections to elect the executive for the society, and that a committee be struck to organize nominations for the executive. She also moved that we strike a committee to organize locations for annual meetings, with a goal of having the meeting location set up 2 years in advance. Andrei Alyokhin seconded; passed.

Donna reminded Kenna (after Peggy's report from ESC) that we have unfinished business re: the motions

ACTION: Kenna (as past pres) will put together a committee on organizational structure/executive and Donna will put together a committee on meeting locations.

b. Time and place for next year, and transition executive:
Peggy reported that they are looking at St John's; it is a little further, but there should be enough to offer that people will come. She reported that the party is already planned, so bring your instruments.
Peggy asked about timing; she proposed about the same time as this year

c. Kenna reported that the next joint meeting with ESC is 2011, and proposed a meeting in Halifax. Doug pointed out that we would need to do this at least two, and preferably three years, ahead.

d. Peggy brought greetings from the ESC and reported briefly on the society. Her main points were the updates to the website and a process to submit articles to ESC on line. Other than that she just reminded us of the JAM in Saskatoon.

e. Elections for the executive:
- Peggy nominated Carolyn Parsons as president
- Donna nominated Peggy as VP
- Peggy nominated Janet Coombes as Secretary-Treasurer
- Peggy nominated Rick West as Member at large

Kenna called for other nominations; hearing none, she called for the question; Carried

Jon moved adjournment at 12:05

Financial Statement - Acadian Entomological Society
(as of June 12, 2007)

Balance Forward		$ 9,853.95
Revenue		$ 1,905.06
2006 Membership Dues	$ 377.33	
Registration - 67th AES Meeting (June 2007)	$ 1,526.28	
Miscellaneous - bank interest	$ 1.45	
Expenses		$ 1,291.75
Honorarium for Webmaster (Rick West)	$ 200.00	
Speakers for ESC/AES Annual Meeting	$ 1,000.00	
Gifts/awards during ESC/AES	$ 200.00	
Bank Charges	$ 19.75	
PAYG fees	$ 52.00	
BALANCE		$ 10,467.26

ACADIAN ENTOMOLOGICAL SOCIETY

Publisher of

THE JOURNAL OF THE ACADIAN ENTOMOLOGICAL SOCIETY

Editor's Report

67th Annual Meeting of the Acadian Entomological Society

St. Mary's University, Halifax, Nova Scotia

This year has been a very exciting year for the Journal of the Acadian Entomological Society. To date we have had 4 manuscripts submitted for review. The galleys for one manuscript have been sent to the authors for proofing. Two manuscripts have been reviewed and returned to the authors, the decision on one 'Accepted with Minor Revision'; the other was 'Accepted with Major Revision'. The fourth manuscript has been resubmitted and is undergoing a second review following the decision by the reviewers to 'Accept with Major Revision with a Second Review'.

I have spent the last few months becoming familiar with the desktop publishing software InDesign in order to produce a good looking product for our Journal. It has been a challenge but with the help of a colleague I believe we have come up with a nice format. Now that we have a template for the articles, publishing on our website will be timelier.

Through our librarian at AFC we have contacted a number of sources for the indexing of our Journal. To date we have received confirmation from the following:

1) CABI – CAB Abstracts and Global Health
2) Entomology Abstracts

We have yet to receive a response from Google Scholar, AGRICOLA, Biological Abstracts, and Current Contents Connect. Our Librarian will be following up with the appropriate contact.

The articles submitted to date have undergone very thorough reviews from all the reviewers we have contacted, ensuring a high quality product. I would like to extend a heartfelt thanks to all those who have reviewed manuscripts and especially to my Associate Editors (Steve Woods, Yvan Pelletier, Graham Thurston and Reggie Webster) who have made my job easier.

I would strongly encourage you to consider the Journal of the Acadian Entomological Society for publication of your data.

Sincerely,

Don Ostaff
Editor
Phone: (506) 452-3579; e-mail: dostaff@nrcan.gc.ca