# Abstracts, Oral Presentations

**Host preference in Hairy Chinch Bug (*Blissus leucopterus hirtus*)**

Robyn Auld
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*Blissus leucopterus hirtus* (hairy chinch bug) is a destructive turfgrass pest commonly found in Central and Eastern Canada. The host preference of this insect within Newfoundland has not yet been characterized, but is of considerable interest for comparison of host preference across the insect's range. Furthermore, the factors that govern host preference for this bug within the turf environment are currently not well understood. Single tiller and tuft host choice tests were conducted on hairy chinch bug using 12 grass varieties found within Newfoundland. Single tiller tests showed preference by the bug for Timothy and Tall Fescue, with no difference in preference between endophyte and non-endophyte enhanced grasses. Tuft tests, conducted in an area exposed to sunlight, appear to have been influenced by orientation of the tuft to the sun.

**The Aquatic Insects of Newfoundland**

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The island of Newfoundland has a depauperate aquatic insect fauna compared to the Maritime Provinces and Maine, despite their northern parts and southern Newfoundland being the same latitude. The current aquatic insect fauna colonized Newfoundland after the last glaciation which ended around 10,000 YBP. The paper characterizes the fauna, with a briefly overview of the taxa present and comparing the richness among certain groups and their ecological traits to the nearby mainland faunas. What this overview shows is in general the fauna is dominated by widely distributed taxa whose range include northern latitudes, although not all such taxa have established populations on the Island. On the other hand the insect communities have a trait composition similar to elsewhere. One interesting aspect of the aquatic insect fauna, compared to the terrestrial fauna, is an almost complete lack of species linked to human introductions.

**The History of Entomology in Newfoundland: Entomological observations from an early naturalist in Newfoundland and observations 175 years later**

Barry Hicks
College of the North Atlantic, 4 Pike's Lane, Carbonear, NL

The famous British naturalist, Philip Henry Gosse, lived in Carbonear, Newfoundland, between 1827-1835. By making carefully detailed, coloured hand drawings of the insects that he encountered in the area, he made one of the earliest records of insects in Newfoundland. This talk will take us back in time to see what life was like in Newfoundland for this young naturalist and will view some of his amazing drawings. To conclude, I will discuss observations in the same area 175 years later.

# Abstracts, Oral Presentations

**The impact of native bees on Lowbush Blueberry (*Vaccininum angustifolium*) pollination in managed and un-managed plots in Eastern Newfoundland**

Barry Hicks
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While blueberry producers in Newfoundland depend on native bees to pollinate their fields, very little is known about the native bee fauna here. Diversity and abundance of bees was measured by yellow bowl trapping in 2 habitats (managed and un-managed) on the Avalon Peninsula during 2006-2007 and pollination was determined using fruit-set. The results showed that bees in the un-managed plots pollinated blueberry flowers as good as, or better than, bees in managed plots. This occurred even though the un-managed plots had significantly reduced diversity and abundance of bees. The number of flowers in the managed plots was considerably higher than in the natural plots. While there were higher abundances of bees on the managed plots it is possible that there was insufficient number of bees to pollinate the flowers adequately. The bees mostly nest in the ground, and thus soil moisture may affect the developing larvae. Soil moisture and fruit-set were negative correlated. Soil moisture may have negatively impacted the bee abundances which in turn reduced pollination. Excess moisture can result in fungal growth in the bee cells causing higher mortality.

**Comparative insect olfaction: mixture detection, processing and output**

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Insect behaviour is strongly linked to neurophysiology, such that reliable relationships may be inferred from a combined behavioral-neurophysiological research approach. In particular, the olfactory system provides a model for a simple neural network which is easily accessed and manipulated to investigate signal integration, synergy and inhibition of neural signals. Knowledge of host odor processing and insect behaviour can be used to investigate olfactory preference by insects, and to address long-standing ecological theories on host choice, chemical legacy, and mechanisms of odor memory. How are different mixtures of odorants encoded within the insect brain and what degree of variation is evident in physiology, coding and morphology between divergent species? Phylogeny (evolutionary lineage) and habitat (plant preference) are expected to influence representation of odours within the brains of different species, however how are these factors balanced, and what dictates behavioural choice: peripheral sensitivity, antennal lobe processing or higher order behavioural controls?

**Vacuuming as a Treatment for Chinch Bug Infested Lawns**

Nancy Hudson
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Vacuum suction effectively removes chinch bugs from grass, which is great news for those seeking alternatives to chemical pesticides. However, problems with equipment must be resolved before vacuuming, as a non-chemical pesticide treatment can be adopted by the lawn care industry. The extent of both urban lawn-scape and chinch bug habitation warrant the quest for perfecting this technology. Throughout history, vacuums have proven useful for all sorts functions and with each purpose came an evolution of design. Well if "what's old is new again" then it is time to resurrect vacuums and put a modern technological spin on them.

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# Abstracts, Oral Presentations

**Colony longevity and predation in a native aphid on a woodland wildflower: some data**

Bob Lamb and Pat MacKay
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Populations of the aphid *Uroleucon rudbeckiae* (Fitch) on its host *Rudbeckia laciniata* are persistent, but individual colonies are short lived. In four populations in Riding Mountain National Park, 90% of colonies survived less than 14 days. In a population in a Winnipeg garden, average colony longevity was similar but individual colonies have been observed to last as long as two months. Nevertheless, colonies rarely, if ever, lasted the whole season. Predation of aphids was heavy and hypothesized as the cause of low longevity. The role of predation in colony longevity was tested by comparing control colonies with colonies where predators were removed. Colonies where predators were removed increased more rapidly and reached a higher peak, but still collapsed at about the same time as control colonies. Some predators could not be reliably removed. Predation probably determines colony longevity, but a definitive test of the hypothesis has not yet been completed.

**Colony longevity and predation in a native aphid on a woodland wildflower: the perpetrators**

Pat MacKay and Bob Lamb
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Predation pressure on colonies of *Uroleucon rudbeckiae* on *Rudbeckia laciniata* is high. Predators include at least 20 species of invertebrates and several vertebrates including a number of species of songbirds. Data will be presented on the frequency of occurrence or prevalence of the commonly seen predators, along with a photographic record of these. The most common and possibly most important insect predators are in the Diptera, including several species in the Syrphidae and one in the Cecidomyiidae. The Hymenoptera are represented by a number of parasitoid wasps in the family Braconidae and a number of predatory wasps, probably in the family Crabronidae. Possibly of lesser importance are the Neuroptera, with at least one species in each of the Chrysopidae and the Hemerobiidae. Occasionally present, but uncommon, are several species of Coleoptera in the family Coccinellidae. Within the arachnids, two species of mites and several species of spiders have been recorded predating aphids, with the spiders probably being important predators.

**Intra-and interspecific interactions between carrion insects at carcasses**

Gaétan Moreau, Jessy Phillips, Jean-Philippe Michaud
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The repeated sampling of dipteral larvae is commonly used in forensic entomology to document community composition at carcasses along the decomposition process. In this study, we investigated how different sampling intensities would affect the decomposition process, species abundance, species behaviour, and the composition of carrion insect communities.

# Abstracts, Oral Presentations

**Influence of temperature and tree growth rate on incidence of gouting by the balsam woolly adelgid.**

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The balsam woolly adelgid, *Adelges picea*, was introduced into Canada from Europe early in the last century and now occurs on both coasts. Feeding by the adelgid renders trees unsuitable for lumber, due to uneven shrinkage causing warping and splitting, and pulp is of inferior quality to that of non-attacked trees. Chronic crown attack by the adelgid can slowly kill a tree over 10 to 20 years. Surveys were carried out in stands in Newfoundland and New Brunswick to determine the influence of overwintering temperature and shoot size on the incidence of gouting by balsam woolly adelgid. I tested the hypothesis that the incidence of gouting, which is the occurrence of swollen tissue at the base of shoots, is parabolically related to shoot size. This prediction, which emanates from the optimal module size hypothesis developed for gall insects, assumes that gouting is similar to gall formation, and that female balsam woolly adelgids would not be able to survive on large shoots on fast-growing trees. Mean January temperature and shoot length explained more than 50% of annual variations in the incidence of gouting. Due to lower winter temperatures, temperature had a much stronger effect on the incidence of gouting in New Brunswick than Newfoundland. These data suggest that site quality and climatic zone can be used to develop a hazard rating for this insect.

**Vector-borne disease surveillance and research activities**

Dr. Laura Rogers, Veterinary Pathologist
Animal Health Division, Department of Natural Resources

Discussion will focus on investigations conducted in the past by the Animal Health Division of the NL Department of Natural Resources, that had some cross over with entomology. These include West Nile Virus, Lyme disease and some pending work on California serogroup viruses. Future collaboration possibilities will also be discussed.

**Agricultural insect pest compromise survival of endemic plants**

Squires, Susan
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Agro-ecosystems support an enormous biomass of non-native insects, but the potential of these insects to invade and degrade natural ecosystems is largely unknown. *Plutella xylostella* L. (diamondback moth) is a problematic global agricultural pest that is not native to North America. It feeds on members of the Brassicaceae family, including the endangered *Braya longii* (Fernald) (Long's braya) and threatened *B. fernaldii* (Abbe) (Fernald's braya) which are endemic to the limestone barrens of Newfoundland. The immigration of *P. xylostella* from overwintering sites in the United States to this rare natural ecosystem was monitored with pheromone traps between 2003 and 2005. After their mass immigration in early summer, females lay eggs on an average of 30% of the *B. longii* and 16% of the *B. fernaldii* population. Larval feeding reduces mean seed output by 60%, from 10.8 to 4.3 seeds/fruit, and damages 26% of leaves. There are residual and long-term effects as many dead braya had higher numbers of eggs, and subsequent leaf and fruit damage one, two and/or three years before they died. High summer air temperatures and low precipitation allowed this pest to become multivoltine, resulting in additive damage to braya individuals. Presently, insufficient attention is directed to the impacts of agricultural pests on native ecosystems and rare host plants; hence, there is an urgent need for the conservation and agricultural communities to cooperate in mitigating the impacts of these pests on native biodiversity.

# Abstracts - Posters

**Herbivore damage and saline stress tolerance in the Gulf of St. Lawrence Aster**

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The Gulf of St. Lawrence Aster, *Symphotricum laurentianum* (Fernald) Nesom (Asteraceae), is a rare annual halophyte endemic to the southern Gulf of St. Lawrence. Natively, it grows close to related species experiencing insect herbivore attack, making spill-over herbivory on this species likely. However, the impact of herbivore damage on plant fitness is unknown, as is the potential interaction of herbivore damage with costs of salinity tolerance. We used growth chamber experiments with simulated herbivory to examine interacting effects of salinity and leaf area removal on plant fitness. We subjected 300 individual plants to eight treatments, with two levels of simulated herbivory (leaf area removal) and four levels of salinity. We predicted that leaf area removal and salinity would have a synergistically negative effect on plant fitness. A negative effect of salinity on filled seed count was observed, however, there was no detectable effect of damage on filled seed count. Detectable but subtle differences in mean plant height were also observed between undamaged and damaged plants at 5 g/L (13% increase) and 10 g/L (9% decrease) salinity. These results may inform potential management strategies for this and other rare halophytic plants through the inclusion of the effects of insect herbivores. Keywords: salinity, herbivores, tolerance, rare plants Topical Presentations: stress tolerance

**Biology of the intertidal mite *Neomolgus littoralis* (L.) (Acarina: Bdellidae) in the lower Bay of Fundy**

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*Neomolgus littoralis* is a large, bright-red bdellid mite found on intertidal rock outcrops and algae in the eulittoral zone and littoral fringe along the east and west coasts of North America. The food habits, reproductive biology, and life history of this mite were examined in the Fundy Isles, Oak Bay and St. Andrews, New Brunswick, and in Eastport and Lubec, Maine during the summer of 2007. *N. littoralis* preyed on kelp flies, midges, and springtails, but also occasionally scavenged dead insects. When the tide was out, males deposited stalked spermatophores on rock surfaces during a process that lasted two to four minutes; these spermatophores were later picked up by females during the same intertidal period. Few larvae were observed; however, protonymphs, deutonymphs, tritonymphs and adults were present.

**What in the world?? A global perspective on *Delia* spp research**

Peggy L. Dixon[1], Carolyn Parsons[1,2], Janet Coombes[1], Julie Soroka[3]
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Root maggots (*Delia* spp (Diptera: Anthomyiidae)) have the potential to cause extensive damage and yield losses in canola and vegetable brassicas like broccoli, cabbage, cauliflower and rutabaga. The main species of concern are *Delia radicum*, the cabbage maggot, *Delia floralis*, the turnip maggot and, to a lesser extent, *Delia platura*, the seed corn maggot. Each of these flies has a cosmopolitan distribution and has been the subject of considerable research internationally. The purpose of our project was to find existing strategies for managing *Delia* spp. elsewhere in the world, which might be relevant to Canadian farmers. We conducted a worldwide literature review and personally interviewed scientists and extension officials in all countries where we could find contacts. A summary of findings is presented.

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# Abstracts - Posters

**Suppression of *Ennomos subsignaria* (Lepidoptera: Geometridae) on *Acer pseudoplatanus* (Aceraceae) in an urban forest using bole-implanted acephate**

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Trees in an urban forest are highly valued because they have aesthetic appeal, provide shade, and improve air quality. During the past 5 years (2002-2006) in St. John's, Newfoundland and Labrador, the elm spanworm, *Ennomos subsignaria* (Hübner) (Lepidoptera: Geometridae), has reached outbreak densities. Each year hundreds of trees have been completely defoliated, and many more trees have been partially defoliated. Adding to this problem, the larvae, their silk strands, and their frass are a considerable nuisance to property owners in areas of high larval densities. In this study, we evaluated the efficacy of three doses of bole-implanted acephate (AceCap® 97) for reducing densities and associated defoliation of *E. subsignaria* on sycamore maple, *Acer pseudoplatanus* L. (Aceraceae). During the treatment year (2005), all three doses significantly reduced *E. subsignaria* density; treatments 1 and 2 significantly reduced defoliation compared with control trees. During the post-treatment year (2006), bole-implanted acephate did not affect *E. subsignaria* mortality or defoliation. Bole-implanted acephate is an effective and practical way of suppressing *E. subsignaria* densities and herbivory in an urban forest where the protection of high-value trees and the reduction of environmental contamination is of utmost importance.

**Vacuum Treatment Alternative to Chemical Pesticide for Chinch Bug Control**

Nancy Hudson[1] , Susan Knight[1] and Peggy Dixon
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The hairy chinch bug (*Blissus leucopterus hirtus* Montandon) is part of a complex of *Blissus* spp. which damage grasses across vast regions in Canada, the USA, and Mexico. Chinch bugs have caused severe economic losses and are costly to control. Damage is mitigated primary by the use of chemical pesticides. In recent years Canadian regulatory bodies and legislators have played a substantial role in diminishing the use of chemical pesticides through restrictions on products, and service areas. Consequently industry is encumbered by economic losses, reductions in market share, and a lack of viable alternatives. Preliminary results from studies in Newfoundland showed that vacuums were effective at reducing chinch bug populations in lawns; unfortunately the vacuum equipment proved incompatible with most lawn environments. An APV (Minuteman-Parker) debris removal vacuum was modified and tested on lawns in 2007. Hairy chinch bug (HCB) counts obtained before and after treatment were used to compare the effectiveness of vacuuming vs. chemical pesticide spray. Although the modified vacuum provided effective treatment results, it still lacked maneuverability. It is doubtful that industry will adopt vacuum technology as an alternative to chemical pesticide sprays unless issues of poor handling are resolved. Our vacuum treatment study will continue in 2008, concurrent with another study aimed at improving vacuum mobility in lawn environments.

Funding is provided by the Newfoundland and Labrador Agri-Adapt Council Inc., in partnership with the Nova Scotia Agri-Futures Council and the New Brunswick Agricultural Council, through the Advancing Canadian Agriculture and Agri-Food (ACAAF) Program; and administered by the NL Horticulture Producers Council. Technical support is provided by Dr. Peggy Dixon AAFC entomologist, Janet Coombes, AAFC entomology technician, and Andy Fisher, P.Eng., Faculty of Engineering Memorial University of Newfoundland; industry support is provided by Don Barry, Service Master Lawn Care.

# Abstracts - Posters

**Changes in the carabid beetle community in response to the use of reflective groundcovers in berry crops**

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Mulches or groundcovers made of reflective materials are a management tool used to enhance plant microclimate so as to favour crop production. However, groundcover is a physical barrier that may influence the movement and survival of insects within the agroecosystem. To document the effects of groundcovers on higher trophic organisms, carabid beetles were collected in raspberry plantations using a pitfall trap that were emptied every three days. A total of 8723 carabid beetles were collected in the raspberry plantations of two study sites over the experimental periods of 2006 and 2007. Species rarefaction, correspondence analysis and the analysis of temporal trends indicated that reflective groundcovers may increase the stability of the carabid beetle community.