

Bulletin

Entomological Society of Canada
Société d'entomologie du Canada

Volume 38
Number / numero 1



March / mars 2006

Published quarterly by the
Entomological Society of Canada

Publication trimestrielle par la
Société d'entomologie du Canada



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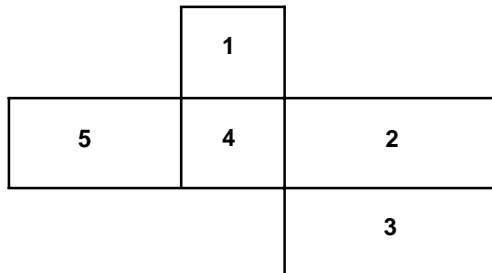
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Using information technology to improve the ESC

For most of us, the bulk of our communication with colleagues outside of our offices or labs is carried out via the Internet. Internet use is often the most efficient and cheapest way to obtain and send information. The strategic review that we carried out last year made several recommendations to improve our society through better use of information technology. More specifically, we attempted to identify ways that we could exploit information technology more effectively to further the objectives of ESC, reduce costs of communication, and forestall revenue losses that may occur as a result of changing technology.

We have just completed the first of several actions designed to achieve these goals. From now on, all submissions to *The Canadian Entomologist* and reviews of submissions will be carried out electronically, a process that will greatly speed the review process for authors and result in less mailing costs for our society. Some authors may not have access to the Internet, and so the journal will still accept paper manuscript submissions via the postal service in exceptional circumstances. However, as is now stated in the instructions to authors on the ESC web site, paper submissions may experience a longer review process.

For the last several years, all authors submitting papers to *The Canadian Entomologist* were required to submit both paper and electronic ver-

L'utilisation de l'Internet afin d'améliorer la SEC

De plus en plus, la majorité de nos communications avec nos collègues sont effectuées à l'aide de l'Internet. Souvent, celle-ci constitue le mode de communication le plus efficace et rentable. La revue stratégique que nous avons publié l'année passée a recommandé diverses façons d'améliorer le rendement de notre société en utilisant l'Internet. Plus spécifiquement, nous avons essayé d'identifier des moyens permettant l'utilisation de l'Internet afin de mieux atteindre les objectifs de la SEC, de réduire les coûts de communication et d'éviter les pertes de revenus potentiels associées aux changements dans l'utilisation de la technologie.

Nous venons de compléter la première de plusieurs actions mises en place pour atteindre ces objectifs. Dès maintenant, toutes les soumissions à *The Canadian Entomologist* ainsi que toutes les revues, seront faites électroniquement. Ce procédé accélérera le déroulement du processus d'acceptation des articles tout en réduisant les frais de poste. Les auteurs qui n'ont pas accès à l'Internet pourront encore soumettre leurs articles par la poste seulement lors de circonstances exceptionnelles. Toutefois, comme cela est expliqué dans la section "Instructions aux auteurs" de notre site web, la durée du processus d'acceptation de l'article soumis par la poste pourrait être plus long.

Depuis quelques années, tous les auteurs soumettant leurs articles à *The Canadian Entomologist* devaient soumettre une copie électronique de même qu'une copie par la poste. Par conséquent, le changement ne devrait en aucun cas augmenter le travail des auteurs. Nous avons, en plus, réduit "les instructions aux auteurs" ce qui devrait amener une réduction du nombre d'heures requis afin de compléter la mise en page des articles. Par exemple, les auteurs n'ont maintenant qu'à soumettre au rédacteur en chef par le biais de l'Internet, leurs articles dans un fichier Word, WordPerfect ou pdf.

Ces changements sont principalement le résultat

sions. Thus the new change should not result in any extra work for authors. On the contrary, we have shortened the "Instructions to authors" for *The Canadian Entomologist*, a change that will make formatting manuscripts for the journal easier for authors. For example, authors are now simply requested to submit their manuscripts in Word, WordPerfect, or pdf format to the Editor-in-Chief via email.

These changes result primarily from the work of an ad-hoc committee (Paul Fields, David Gray, Bob Lamb, Ward Strong and myself) as well as the Editor-in-Chief and Divisional Editors. A new ad-hoc committee, chaired by Michel Cusson, will continue to research ways to improve our society through the use of information technology. I hope that you will take advantage of the decreased effort that is now required to submit manuscripts to *The Canadian Entomologist* and send any constructive advice concerning how we can better use information technology to Michel or myself.

du travail du comité ad-hoc (Paul Fields, David Gray, Bob Lamb, Ward Strong ainsi que moi-même) en collaboration avec notre rédacteur en chef et de nos éditeurs de sections. Un nouveau comité ad-hoc mené par Michel Cusson, va continuer de rechercher des moyens permettant d'améliorer le fonctionnement de notre société grâce à l'utilisation de la technologie informatique. J'espère que vous prendrez avantages des améliorations apportées pour la soumission de vos articles au *The Canadian Entomologist*. Tous commentaires constructifs, visant à améliorer l'utilisation de la technologie informatique au sein de notre société, peuvent être envoyés à Michel ou à moi-même.

Moth balls / Boules à mites

By Andrew Bennett

DNA barcoding: The mini-series

For those of you who may have enjoyed Moth Balls previously (the column, not the chemical pellets), you should really thank the concept of DNA barcoding. Why? I believe that the original idea for the column (sprouting fungus-fruiting-body-like from the fertile mind of Paul Fields) was to get somebody to describe the pros and cons of DNA barcoding for the Society. For the past two years, I have skillfully avoided this task. Why? Could it be that I was slavishly researching the topic? (Not that I recall). Could it be that I was waiting for somebody else to write an insightful, thought-provoking article on the subject (perhaps for "Tricks of the Trade")? Possibly, and hopefully my brief comments below will inspire, or should I say, incite this. No, I think the main reason I haven't written



about DNA barcoding before now is because I was waiting for a moment of inspiration to find at least a smidgen of humour in the subject. Unfortunately with the associated millions of dollars in funding, multi-national collaborations, not to mention high profile publications and professional rivalries, humour seems hard to come by. If only there could be a scandal or two, we might have the makings of a plot for a TV miniseries... Until this happens, the following commentary must suffice.

To cite the Barcode of Life website (<http://www.barcodeoflife.org/rationale.php>), DNA barcoding is: "An approach that employs a small

fragment of DNA, a portion of a single gene, to provide a unique identifier - a "DNA barcode" - for each living species on Earth". Does it work? Read the following opinions and you be the judge.

Pro DNA barcoding: In the future, anybody will be able to identify the vast majority of the species on the planet by taking a small part of a specimen and inputting it into a DNA barcoding machine. DNA barcoding is quicker and cheaper than morphology-based taxonomy and in some ways is better because it can be used with all life stages or parts of the body (e.g. larvae, blood etc). This technique will democratize the ability to identify organisms (all people in all countries) which will enhance and complement initiatives such as biodiversity surveys and the control of invasive pests and diseases. Whereas exhaustive morphological studies and sequencing of large parts of the genome may be ideal goals for understanding the biodiversity of the planet, the lack of expertise in many groups coupled with the current rate of extinction, DNA barcoding offers the best hope to document the world's species before most of them vanish forever. It will also inject much-needed funds that previously were not awarded to the field of taxonomy (competing for these funds with so-called "big science" projects in physics, medicine and genomics).

Con DNA barcoding: DNA barcoding is an oversimplification. Whereas this gene region has been shown to work as an identification tool within some groups of organisms, it certainly does not work for all groups. Sound morphological studies are the foundation of taxonomy, supplemented as required by new technologies including DNA sequencing, but not limited to one 650 base pair fragment of the cytochrome c oxidase subunit I of the mitochondrion. The amount of money being allocated to sequence this one small region is detrimental to systematics in general because it will almost certainly decrease funding for mor-

phological studies (despite claims to the contrary by the proponents of barcoding). Even if funding does not decrease, in poorly known groups such as most invertebrates, fungi and micro-organisms (the majority of the diversity on the planet), sequencing the bar-coding region is mostly without merit until such time that a significant proportion of the diversity is surveyed, named and described morphologically. Any claim that DNA barcoding is cheaper and quicker than morphology-based taxonomy is false because the method is completely reliant on morphology to place its results in context.

So which viewpoint should you believe? Each is compelling. What is clear is that this technique is being used right now (even as you read this). For those working on reasonably well-studied groups like butterflies, you are likely to see potential benefits from DNA barcoding sooner than in other groups. For those people who work on poorly known groups, I would not recommend sitting back and grumbling about the millions being invested in DNA barcoding. It is happening, whether you like it or not. It is imperative that morphological taxonomists contact researchers doing barcoding and offer expertise to help choose the taxa to be barcoded and to put results in context. In return, barcoders must invest some of their funding for morphological studies in poorly known groups. It is in both groups' interest to work together. If this does not happen, the legacy of DNA barcoding may be one of missed opportunities.

Join me next issue when *Moth Balls* once again attempts to extract the essence of current topics in entomology.

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By Peter Kevan

Entomology: A celebration of Little Wonders

How does a plant gynoecologist qualify for an entomological Gold Medal? Yes, I can be considered a plant gynoecologist - "Spread those petals!" That also makes me a plant androecologist. Most flowers are boystrous, and girlstrous. At the same time they are flamboyant and flamgirlant advertisements for sex. The "naughty bits" may be hanging out for all to see, or demurely hidden within the corolla.

That's all very well, be lewd, but for sexual consummation, the union of male and female parts is needed. How do plants copulate? They use our "Little Wonders". Yes, insects, especially are plants' winged penises. And, the plant world is full of penis envy: "Mine is bigger than yours!"; "Mine stay longer than yours!"; "It's not how big it is, it's how you use it!"

Indeed, the jolly fun of plant procreation has given me a career of insect study in Botany and Ecology. *Flagrante delicto, coitus interruptus plantarum*, is how to collect pollinators. Who could ask for more?

I want to tell you about the "more". Plants may brag about their sexual prowess, but what about their sexual agents? How do insects experience flowers? That's Entomology and the subject of my thoughts in this address.

Flowers are bowers for insectan pleasure. At least, that's what I maintain, at the risk of being



dubbed anthropomorphic. Insects, when they visit flowers, are not altruistic matchmakers. They demand recompense. What do they get? Mostly food. Nectar is sweet, but much more than that, it is an elixir. Sugar for energy, amino acids for building the body beautiful, minerals as electrolytes, water for thirst. We can understand Shakespeare's implication when he wrote "Where the bee sucks, there suck I; In a cowslip's bell I lie; ...". Nectar is like Gatorade®. Pollen is nutritious. It's as nutritious as steak and eggs. Bees "bake" bread with it, and feed it to their young. Not only honeybees, but almost all bees. Those myriad bees that nest alone in the ground, or in twigs, or in beetle bore holes, they lay their eggs on carefully prepared and shaped bee-breadloaves within carefully prepared, constructed and waterproofed cells of mud, leaves, waxes, or self-made polyester. Some beetles and flies eat pollen, digest it, and turn the protein into eggs. Some special flowers provide special oils for special bees. Stranger still are flowers that provide gums for bees' nest building. Males of orchid bees take orchid scents to woo mates. Some beetles dine of floral parts. Thank a weevil for soap! Yes, it contains palm oil. Oil palms are pollinated by weevils with life histories intimately bound to the male inflorescences.

In evolution, what came first - nectar or pollen - as the recompense for pollination? A decade or so ago the answer would have been "probably pollen". Now, it seems that flies sought nectar from the flowers of the earliest Angiosperms, 160 million years, or more, ago. Not only that, those smallish flowers probably produced heat, as do

Peter G. Kevan FRES, recipient of the 2005 ESC Gold Medal, became interested in insects through the encouragement of his grandfather, D. K. Kevan, and amateur coleopterist in Scotland, and his father, well known in Canada and internationally for his interest in the Grasshoppers and soil ecology. Peter's main interests are in pollination from both zoological and botanical viewpoints, applied ecology, and conservation. He is presently Professor at the University of Guelph. E-mail: pkevan@uoguelph.ca, www.uoguelph.ca/~pkevan.

their extant relatives today.

"Hot flowers", you say. Yes, sexually hot and physically hot. And, scientifically hot!

As a student with Professor Brian Hocking at the University of Alberta, I learned a great deal about hot flowers. He published on them. He inspired me. I owe him many thanks for his generosity with ideas, his patience, and his encouragement in thinking "outside the box". I don't think I appreciated his mentorship as much then, as I do today.

Brian was interested in how insects interacted with flowers. He considered insect vision, the sense of smell in insects, foraging and flight energetics (his own doctorate study), and general anthecology. I followed his leads.

Did you know that a honeybee, and probably any bee, can't see the flower of a Prairie Rose, or any other rose for that matter, unless it is about 10 - 20 cm close? Did you know that the petals of a Prairie Rose, or any other rose, smell differently from the "naughty bits". (I mention the Prairie Rose because it is the Provincial Floral Emblem for Alberta.) Scent and vision interplay in attraction and orientation. Both sensory modalities are complex, but those complexities are cracking apart as senses are understood, and as floral attractants are analysed.

Flowers, those flamgirlant sexual advertisements for reward seeking sex-slaves, offer banquet tables adorned with colours. Some, like ultraviolet, we can not see with our human, and inferior, system of colour vision. The tables emit sensory delights of smells, fascinating shapes, variety of size of plates, and a smorgasbord of tasty comestibles. The tables may be found by insects quite easily, but obtaining the rewards can be problematic. How does an insect find its way into a delphinium flower? It must learn! Insects learn and remember. My friend and colleague, Terence Laverty, taken from us too soon, studied how with his elegant and simple experiments. Some insects, notably honeybees and stingless bees, have intricate ways of communicating with each other to convey what they have learned about where flowers are. Karl von Frisch earned his Nobel Prize for his studies on that.

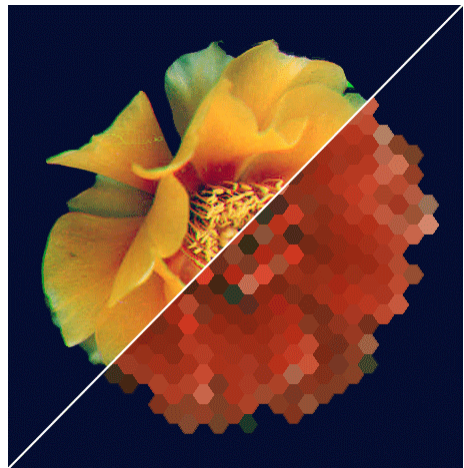
By training bees, as did von Frisch, I have

discovered marvellous things. How they see colours. What colours are more important than others to them. (Green is the most important: it is used for colour appreciation, but is also the main modality for detection of edges, shapes, symmetry, contrast, and motion.) With colleagues, I have learned how shapes and sizes are perceived. Bees use micro-Braille through their feelers at microscopic levels to distinguish surfaces.

Life's Little Wonders, indeed! But, what happens when, as individuals, they come together in nature, or when we try to coerce them to our own ends.

Asking those questions has not been easy. I am still using data from the High Arctic as gathered for my doctorate research under Brian Hocking. Linked to that is another interesting story. It comes from my work in New Brunswick on the adverse effects of insecticides on native bee assemblages (70 or so species) that service the pollination needs of lowbush blueberries.

The blueberry growers lost crops because pollinating bees were poisoned. They lost about 0.7 million kg per year for about five years. My surveys in the 1970s were unpopular, to say the least, with the insecticide spray programme aimed at protecting trees from the ravages of spruce



E. Gushul

Figure 1. View of a flower as bee might see it.

budworm. My surveys were popular with blueberry growers, who sued the spray operators. That was my first encounter with litigation, and a learning experience.

To cut to the chase - my results stimulated more studies over broader geographic and ecological ranges. The eventual upshot, a national change to much reduced pesticide use in Canadian forestry.

I am now very much involved in sustainability and conservation in pollination, and using pollinators in novel ways.

On the practical take, let me relate a quick story. Dan Esikowitch came from Tel Aviv University to my laboratory for his sabbatical leave. He had the idea of studying pollination in field milkweed in Canada to compare with his findings at home. We knew that milkweeds secrete nectar from the "very naughtiest of bits", the stigmatic receptive surface (is that the G-spot of the flower?). We also knew that the nectar was the magic juice in which the pollen would germinate. We extracted nectar from milkweed flowers that had opened in the field and from flowers that had opened in the lab. In Petri dishes, lab-opened flowers' nectar had the magic property - pollen germinated in it. From the field - the nectar inhibited pollen germination. What was going on?

Pollinators carried the pollen in packages called pollinia. They drank nectar from the flowers. What we discovered was that the pollinators infected the flowers with yeast. It was a yeast infection like no other - with contraceptive properties! We had discovered a plant venereal disease.

Another plant STD (sexually transmitted disease to be more politically correct than my earlier terminology) is grey mould. Grey mould rots your strawberries. John Sutton, my office neighbour at the University of Guelph, and I plotted to use the flying penises of strawberry and of raspberry to deliver to the flowers another fungus that was antagonistic to grey mould. Would it work? It did, in spades! The rate of rot dropped to levels obtained by sprays of fungicide. Now, a team of entomologists, plant and insect pathologists, and pollination ecologists uses honeybees and bumblebees to disperse biocontrol agents to crops in greenhouses (tomatoes and peppers) against plant pathogens, and plant bugs, thrips, aphids, and



Hisa Taki

It's not how big it is - it's what you do with it. A tiny bee buzz pollinates a large solanaceous flower in Brazil .

white fly. Does the technology work? Indeed!

We have a double whammy - better pollination with higher quality and more crop plus biocontrol of pests. We are even trying to turn pests beneficial. Fungus gnats can transmit biocontrol agents that inhibit the growth of the very pathogens they carry. Little Wonders at Work!

Greenhouses and field crops present simple ecosystems. In returning to my roots in natural ecosystems, I am convinced that it is not just more pollinators that matter, but more kinds of pollinators.

The three basics of ecology are Diversity, Abundance, and Activity. Those conjoin in pollination to assure ecosystemic productivity and sustainability in agriculture, and in nature. A few community ecologists working in pollination systems are finding that results from our studies apply to the fast growing subject of "biocomplexity" through diversity, ecosystem function and stability. Members of my team at the University of Guelph, with friends and colleagues in Mexico, Brazil, Israel, USA, and UK are discovering that greater diversity and size of pollinator forces better serve communities of plants with more complex sets of interactions than does simply flooding smaller areas with a few pollinator types. Those ideas seem to apply not just to natural areas but

also in agricultural systems as seemingly simple as greenhouses to the complexities of plantation cropping.

For the reasons introduced above, and others, pollination is regarded internationally as an important area for conservation. The Rio Convention on Biological Diversity has embraced the concern, spear-headed from Brazil. Now there are initiatives around the globe promoting the crucial importance of pollination for the sustenance of life on earth. Little pollination, few fruits and seeds, wildlife food shortages, human food and fibre security at risk, natural community regeneration adversely affected.

Just a glimpse of my major studies and interests. Life's Little Wonders have filled my time in ways that I would never have imagined. My personal curiosity about life on earth and how it is all inter-related has been satisfied, not fully, of course. I have travelled and worked from the High Arctic and high alpine, to tropical rainforests in South-east Asia, Africa, and the Americas, and places in between. My personal curiosity about how the Little Wonders perceive their world has got me to "thinking like a bug". I don't see flowers the same way as before, anymore. I have gained immense personal satisfaction from sharing discoveries with friends and colleagues in so many disciplines, not just Biology, Ecology, Botany, and Entomology. Using my ideas and findings to address practical and environmental problems has

been no less exciting. I have sought new ways to expand the generality of knowledge to utility in issues of sustained, cleaner, and more efficient agricultural productivity, notably into crop protection by biocontrol. Pollination is one form of biocontrol! Pest biocontrol is another. They have been combined. Ultimately, my quest to understand the basis for Ecology through interactions of Diversity, Abundance, and Activity is being satisfied through studies of one of nature's major and critical mutualisms - Pollination.

I need to thank people, and I do. My Grandfather was a coleopterist and naturalist. He showed me, a small boy, my first stinkhorn fungus in Pennycuik Woods in Scotland. His sense of humour and temper may have rubbed off. My Father, a grasshopperist and soil zoologist: I have so much to thank him for, I can not say. He is a Gold Medalist too. His was also presented in Alberta, in 1981. My Mother has always been so encouraging; insects in the house, Norma the newt, and life in the English countryside until I was 14. I thank Anthony Downes for asking me eclectic questions, and expecting similarly eclectic answers. I have mentioned Brian Hocking who helped immeasurably with eclecticism. Randolph Menzel gave me opportunity to study at the Institut für Neurobiologie in Berlin. That rekindled my interest in how insects perceive flowers. I thank Joe Shorthouse for such a long friendship, and co-authoring our first scientific paper. Rob Roughley and I have a "dog and pony" show called Arctic & Boreal Entomology. What fun! I thank Bruce Hemming for calling me a "chronic generalist". That was in about 1968! He, with Dan Johnson, another gifted grasshopperist and all round insectologist, were instrumental in my being nominated for this award. Thank you both! The list goes on in my mind, so I must apologize for omitting so many others, Entomologists, Botanists, Ecologists, in Canada and around the world. In finishing, though, I thank all my wonderful students over the years (they started a collection for a one-way ticket for me to visit Mars), my colleagues, friends, and kindred spirits. Thank you ESC, and The Little Wonders.

So much more to learn! Think outside the box! Thank you all for your support!



Victoria MaePhail

Polistes on *Caltha* (marsh marigold)

Biodiversity databases: Getting the data in, out, and shared

By David Shorthouse

There is a rapidly growing, global movement to encourage open access to scientific data, publications and reports. This notion began in Budapest through the Budapest Open Access Initiative in December 2001 (see <http://www.soros.org/openaccess/index.shtml>). Examples of agencies that have since adopted this policy are the World Summit on the Information Society (WSIS), the UN Convention on Biological Diversity, the Organization for Economic Cooperation and Development (OECD), the Conservation Commons, and the Global Biodiversity Information Facility (GBIF). The American Museum of Natural History recently opened the door to permit free access to all its publications via their library website. Other American institutions are following suit. It is only a matter of time before this notion of open-access is adopted by Canadian research councils. Provided powerhouse publishing firms don't kill this movement, publicly funded Canadian research will be acces-

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sible on the Internet, will be stored in a permanent location online, and will be accessible free of direct costs to all potential users. The advantages of opening the doors far outweigh any disadvantages. Good, well-collected and well-described data are used most often, are cited most frequently, and ultimately lead to advancement in the scientific community. Choosing not to adopt the open-access policy will bury academic works because freely accessible journals will become the preferred forum.

Biodiversity databases and collection records are no exception to this eventual open-access policy. Here is where the advantages are truly awesome. Imagine being able to determine at the click of your mouse, the point source introduction of non-native species, the suite of large-scale environmental conditions that best explain a species' distribution, and what may happen to these distributions should environmental conditions change. This is not science fiction. These sorts of tools and other interesting applications are currently under development by GBIF grant-holders. Some existing tools such as Pablo Goloboff's Endemism Algorithm (Szumik and Goloboff 2004) and DesktopGarp (Scachetti-Pereira 2002), a Genetic Algorithm for Rule Set Production based on David Stockwell's work (Stockwell and Noble 1992), can be tweaked for web-based outputs. Public access to primary collection data and the application of these algorithms and tools can lead to more informed resource management, the establishment of appropriate protected areas, and other vital and publicly-charged activities.

Coordinating collections data and presenting these on rich, user-interactive websites need not be an arduous or expensive task. There are also immense and untapped pools of data in the closets and basements of amateur collectors and it would be foolish not to integrate these data into biological surveys or to make them available and searchable. Including amateur collectors has immeasurable value, not to mention the exponential swell of enthusiasm they generate when it is clear their efforts can make a significant contribution to assessments of global warming, species introductions, or to the number of specimens available for use in conducting taxonomic revisions. En-

Tom Murray



Figure 1. Habitus of FAM: ARANEIDAE, *Araniella displicata* (Hentz, 1847), the six-spotted orb weaver.

couraging private collectors to remotely upload their digital records greatly eases an institution's specimen acquisition procedure and establishes very strong ties to its community of collectors.

I am of the mind that delivery and presentation of taxonomic, natural history, biogeography and biodiversity data ought to cost nothing. Museums and institutions are strapped for funds that ought to be spent on supplies and pure research to feed the content and quality of presentation systems. Here, I aim to provide some technical guidelines and suggestions for how one may develop inexpensive on-line biodiversity databases and to illustrate what can be done with these data. It is time to embrace open-access and make use of available tools.

The only cost associated with digital delivery of biodiversity data should be computer hardware. There is a plethora of open-source software from operating systems to peer-reviewed document management systems (e.g. Simon Fraser University's own Open Journal Systems, <http://pkp.sfu.ca/>, which also includes an RSS feed plug-in). There is absolutely no need to spend a dime on costly software products, high-end databases, or buy into peer-review content management systems.

Well-developed and automated installations of open-source packages that include a Linux oper-

ating system, the Apache web page server, the MySQL database, and PHP web page delivery (so-called LAMP project) are leading the way to low-cost, public delivery of information. These distributions can be downloaded from a number of Linux enthusiast web sites and installed on an inexpensive PC in a matter of minutes. One such example is the Debian operating system and its community of software developers (<http://www.debian.org>). Installing the LAMP project from a Debian distribution is accomplished by plugging the machine into the network for Internet access, installing the base operating system from CD (available off the Debian website), then installing the packages for LAMP as they are downloaded. This latter installation is as simple as typing a set of strings at the Linux command prompt. (You can e-mail me for more detailed instructions.)

The alternative to Linux or at least a means to practice using Apache and MySQL is to make use of the tools and downloads available by GBIF for Windows users. The GBIF Data Repository Tool includes everything needed to become a data provider from database to web server in one download and installation file. One could download this package (available at <http://www.gbif.org/serv/gbif-tools>) and install it on a Windows XP machine. As a word of caution however, Windows XP machines are limited to 10 concurrent connections. In other words, a desktop operating system would not make a very good server.

In addition to the operating system and back-end database, there is an exceptionally powerful and free application that permits real-time generation of collection maps. MapServer (<http://mapserver.gis.umn.edu/>) is a low-overhead, web server plug-in that is capable of handling a wide array of standard map file types and to re-project them on-the-fly. It also permits connections to a backend database allowing point location data to be layered on top of these re-projected maps. The widely used Berkeley Mapper makes use of the MapServer plug-in. For an example of its capabilities, you are invited to examine the species description page for *Araniella displicata* (Hentz, 1847) in the Nearctic Spider Database, directly

accessible at http://canadianarachnology.dyndns.org/data/canada_spiders/15326.htm. This spider is a diminutive orbweaver (Figure 1) in the Family Araneidae, commonly called the six-spotted orbweaver. It has a Holarctic distribution and has been collected throughout North America at least since the early 1900's (Figure 2). In addition to plotting collection locales on freely available ArcView shapefiles, MapServer can be configured to colour-code these localities by a range of dates. This has significant implications because one can deduce the point source introduction of a non-native species or examine its dynamic range through

space and time without having to rely on expensive applications like ArcView or its web-based counterpart, ArcIMS. The caveat, of course, is ensuring there are an ample number of georeferenced records in the database.

Getting the data into a backend database is by far the greatest challenge for a biodiversity information facility. Again, technology is not the hurdle here. There are some truly amazing things one can do with open-source Java application servers or even a Microsoft Access client database. These can be designed to permit data uploads from the contributor's end directly to their own table in the backend database. In fact, I make use of a Micro-

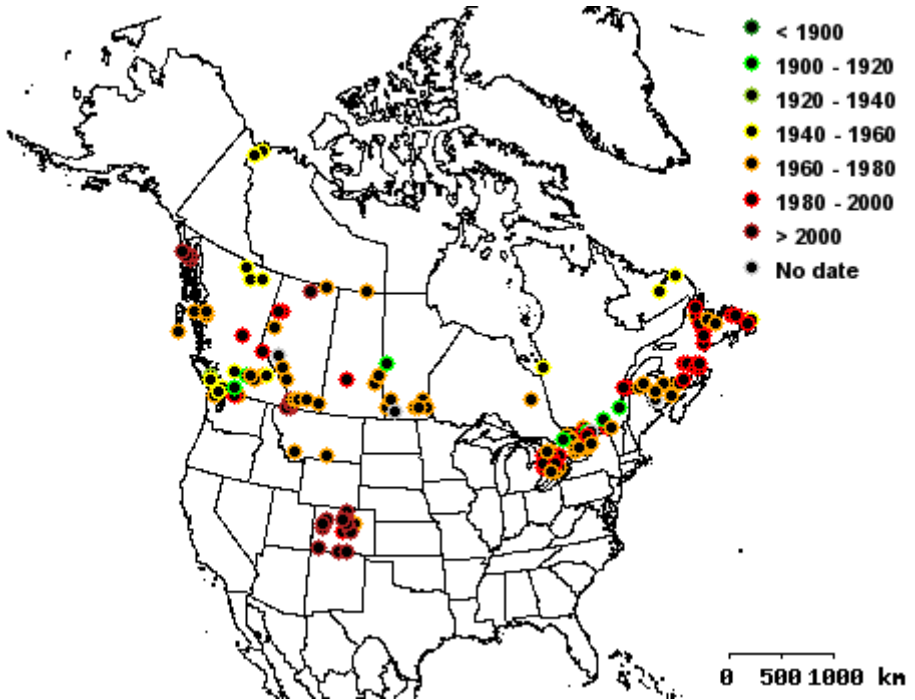


Figure 2. Collection locality map of FAM: ARANEIDAE, *Araniella displicata* (Hentz, 1847). Locales are colour-coded by 20-year increments in collection dates. Many records represented here were provided by the Canadian National Collection of Insects, Arachnids and Nematodes via Pierre Paquin and Nadine Dup r r  and by the Denver Museum of Nature and Science via Joey Slowik and Paula Cushing. John Hancock also contributed a significant number of records.

soft Access template for contributors to the Ne-arctic Spider Database. Each contributor, whether they are an amateur collector or a curator at an institution, has a personally requested, owned and operated table in the backend. They may upload, change, or delete their records as they see fit and the work schedule is entirely their own. I provide functions in this template to assist with spelling and nomenclature recognition, thus ensuring the data will be recognizable by the peripheral taxonomic tables I maintain. More high-end data sharing from server to server can be accomplished over HTTP with XML via SOAP, RPC, or DIGIR, or direct, clustered linkages via JDBC, OLEDB, or other connection protocols. The challenge for large-scale, communal biodiversity databases is not the technological scaffold and its intricate lattice-work of confusing languages and code. It is politics and personalities. As counter-productive as it may seem for a lead organization, all the credit for the database must be placed squarely on each and every individual contributor. An amorphous, communal effort has far greater appeal and longevity than does a multi-facility conglomerate. In my humble opinion, mega-projects and mega-grants risk suffocating the spirit of open-access. Here then is where funds for large-scale projects would be most effectively spent: persistent and positive communication and dogged determination to accommodate each and every contributor.

Technologies that unlock the historically inaccessible species occurrence data in museums and private collections are advancing at break-neck speed. Whole operating systems, backend databases, mapping applications, and species distribution algorithms are free for the taking thanks to the time and effort open-source software engineers devote to their projects. The kinds of tools biodiversity data managers can now take advantage of would astound the casual collector. However, biodiversity data-mining projects must adopt the spirit of open-access and must not lose sight of the true scaffold for their projects when they aspire to uncover trends in species associations or distributions. The collector, the alpha taxonomist, and the systematist know how to count the rivets.

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À la recherche d'un nouveau Rédacteur en chef de *The Canadian Entomologist*

La Société d'entomologie du Canada est à la recherche d'un nouveau rédacteur ou rédactrice en chef pour *The Canadian Entomologist*. Le titulaire du poste est responsable de l'ensemble du journal; de sa publication ainsi que de son intégrité éditoriale et scientifique. Cette année, les tâches reliées au poste ont changé considérablement, depuis la nomination de trois rédacteurs, chefs de secteur, dont la responsabilité comprend le contenu et la qualité scientifique du domaine attiré. Le rédacteur en chef est nommé par le conseil d'administration, est un fiduciaire de la société, et un membre *ex officio* du comité de publication. Elle ou il est encouragé à assister à l'assemblée générale annuelle et aux réunions conseil d'administration. Présentement, le rédacteur reçoit de honoraires de 500 \$/an et peut recevoir des fonds pour assister à l'AGA.

Il s'agit d'un des postes les plus importants au sein de la Société d'entomologie du Canada. Si vous désirez servir la Société dans ce poste déterminant, veuillez communiquer, avant le 1 juin 2006, avec :

Dan Quiring

Président, Société d'entomologie du Canada

Courriel : quiring@unb.ca

Téléphone : (506) 453-4922

Barrenlands entomology: A survival guide

By Doug Currie

The barrenlands of Canada are by far the largest wilderness area in North America. With only a dozen or so communities scattered across a land area more than twice the size of Alberta, this treeless landscape presents a formidable challenge for anyone contemplating entomological research. The vastness of the region, in combination with lack of road access from the south, requires that visitors either fly into one of the few communities serviced by regularly scheduled flights, or charter an aircraft equipped with pontoons or tundra tires. The high cost of access alone is enough to discourage most entomologists from visiting Arctic Canada; yet, this is just one of several obstacles facing scientists from the south. The barrenlands remain among the most inadequately studied areas in all of North America, but the rewards are great for anyone willing to meet the challenges. Here are a few things to keep in mind before making the decision to head north.

Permits

Start early! Any scientific research project in the barrenlands requires one or more permits - even if the project simply entails collecting insects. The permitting process can take several months so it is imperative to get started well in advance of the field season. Be prepared to contend with many difficult and unfamiliar questions

Doug Currie has been a regular visitor to the arctic since his 700 km expedition along the Horton River, NWT, in 2000. His main area of interest is biting flies, especially black flies. Doug is Curator of Entomology in the Department of Natural History, Royal Ontario Museum; he is also an Associate Professor in the Department of Zoology, University of Toronto. E-mail: dcurrie@zoo.utoronto.ca



Figure 1. Inuit guides at Baker Lake, Nunavut

on the application forms like "projected amount of grey water generated" and "mitigation of environmental impacts". In Nunavut, be prepared to have a summary of your proposal translated into Inuktitut. Permits for the Northwest Territories are available from the Aurora Institute in Inuvik (<http://www.nwtresearch.com>); those for Nunavut are available from the Nunavut Research Institute (<http://pooka.nunanet.com/~research/reslicensing.htm>). It is important to bear in mind that you will not necessarily be dealing only with personnel from those particular institutions. Community consultation is an integral part of the permitting process, so you will be required to consult with Hunter and Trapper Associations (among other stakeholders) from each land claim area you plan to visit. In some instances your research is approved without question; in others you may be required to provide clarification on particular points. On one occasion our permit was almost rejected because we neglected to hire a local guide - despite the fact our research was conducted hundreds of kilometers from the nearest community. Our application was rehabilitated only after we agreed to hire a particular charter

company to pick us up at the end of our trip. The moral of the story? Don't making definitive plans until you're aware of any conditions that might apply to your proposed research.

Logistics

Any trip to the barrenlands demands meticulous planning. Many of the supplies and services that we take for granted in southern Canada are not available in northern communities. Accordingly, it is necessary to assemble virtually everything you need before departure. Among the most vexing problems is the transport of dangerous goods, such as ethanol, cyanide, ethyl acetate, and glacial acetic acid, to name a few. Such staples of entomological research are banned from commercial airlines, requiring that they be specially couriered to one of the communities serviced by regularly scheduled flights. Fortunately, chartered aircraft are not as stringent in their restrictions, so it is possible for critical (though "dangerous") chemicals to accompany you into the heart of the barrens.

Unless you have considerable experience with backcountry travel, consider hiring a licensed guide to outfit your expedition. They take care of logistics and provide all the food and equipment (tents, cooking gear, safety equipment, satellite phone, etc.) needed for daily life on the tundra.

Emancipated from the need to worry about day-to-day survival, you will be freed to devote more of your time to research. Of course, this option is most feasible if outfitting costs - along with those of the chartered aircraft - are shared among several people. Most companies that specialize in arctic travel are willing to design a custom trip for scientists. However, be specific about your requirements and ask for estimates from more than one outfitter to ensure that you're getting good value. A good outfitter can make the difference between a successful or a miserable experience.

Getting around

Consult any map of the barrenlands and you will be struck by the almost complete absence of roads. Unless you're endowed with an especially large research grant, or are content to spend all your time at a single locality, you will need to find a cost-effective means to cover as much territory as possible. One option that has proven especially effective is river travel. A number of outfitting companies offer guided canoe tours along the major barrenlands rivers, any of which provides access to hundreds of kilometers of remote territory. All that is needed is two chartered flights: one dropping you off at an upstream point, and



Doug Currie

Figure 2. Donna Giberson and Peter Adler in front of their gear in Yellowknife, NWT.



Doug Currie

Figure 3. Tim Gfeller and Lisa Purcell paddling on the Thelon River in July 2002.

another retrieving you from a predetermined downstream point. If the costs of a chartered aircraft are too prohibitive for your budget, then you might consider hiring a motorboat at a lakeside community such as Baker Lake. Travel is possible either to lakeshore sites, or up major tributaries such as the Thelon River. Local guides are eager to cater to visitors' needs, whether they be sports fishers or scientists; and you will also benefit from their hospitality knowledge of the local flora and fauna. Yet another option is the use of a four-wheeled drive All Terrain Vehicle (ATV). This mode of transportation has gained recent popularity in barrenground communities, though not without consequences for the surrounding tundra. Nonetheless, ATVs and their bloated tires are well adapted for covering large distances over inhospitable terrain.

Why study barrenground insects?

Northern mainland Canada remains one of the truly great wilderness areas left on earth. With only about 12,000 permanent residents scattered across a huge geographical area, the barren-grounds have remained virtually untouched since the retreat of the last glaciation. However, recent studies indicate that the Arctic is warming twice as fast as the rest of the planet. At the current rate

of warming, the North Pole could be ice-free by the year 2100. Even now, the Inuit are beginning to encounter new and unfamiliar species as their ranges are extended northward. Perhaps the most spectacular example is the recent discovery of a yellow jacket wasp (*Vespula intermedia*) near the village of Arctic Bay, Baffin Island. Whether this represents a freak occurrence, or is an early sign of global warming, remains to be seen. What's clear is that baseline data are needed to more effectively track the inevitable changes in insect distribution.



Doug Currie

Figure 4. Donna Giberson driving an ATV near Arviat, Nunavut, in July 2003.

By Carolyn Parsons

Although I have only been working in the field of entomology for about five years, the interesting things I have had to do for the sake of insect study are already adding up. The two insects that I have had the opportunity to get up close and personal with so far in my career are the cabbage maggot (*Delia radicum*) and the elm spanworm (*Ennomos subsignaria*). These two insects have required me to spend many hours on hands and (padded) knees at soil level as well as looking up to the tops of trees, from one directional extreme to another!

The cabbage maggot is an economically important dipteran pest that feeds on the roots of brassica crops. My PhD thesis explores the effect of within field diversification (undersowing/intercropping) on the egg-laying behaviour of *D. radicum* and as a result there were many early



Heidi Fry

Figure 2. This accumulation of frass, larvae and leaves didn't happen overnight; nonetheless it may be one of the reasons there are so few convertibles in St. John's...



Heidi Fry

Figure 1. Observing moth behaviour...what a pain in the neck.

mornings spent collecting eggs from the base of cauliflower plants. Nothing like a morning of modified yoga positions in the field during egg collection to deal with a tired back and sore knees!

The elm spanworm is a moth species whose population has reached epidemic proportions in the city of St. John's over the past 4-5 years. Talk about life imitating art...the abundant larvae have really made life in the city during mid-late July like something out of a horror movie. My experience with this insect has been through personal confrontations in my own backyard to assisting a fellow graduate student Heidi Fry (studying with Dan Quiring at University of New Brunswick) with her data collection. Collecting with Heidi has involved pole pruning tops of trees with larvae and frass falling down like rain as well as a 'moth marathon' which involved observing moth behaviour in the field during a 24 hour period (a story on its own, perhaps Heidi will tell that one!).

Although the field work for my thesis is complete and I am spending most of my days at the computer writing my thesis or curating the insect collection at Agriculture and Agri-Food Canada, St. John's, I am secretly crossing my fingers that my post-doc will require sampling at eye level!

The student wing / L'aile étudiante

Mike Borkent



Chris Borkent

Happy New Year everyone from your new co-chairs, Greg Smith and Chris Borkent! The first thing we want to do is thank Tonya Mousseau for her enthusiastic role as chair of the Student Affairs Committee over the last four years. She has done a great job, and we hope to maintain her high standards in serving the student community.



Jessica Smith

Greg Smith

For those of you that we have not met let us introduce ourselves. Greg (gregsmith@telus.net) is a Master's student at the University of Northern British Columbia (UNBC) studying the interactions between a secondary bark beetle and endemic mountain pine beetles with Staffan Lindgren at UNBC and Allan Carroll of the Pacific Forestry Centre, Canadian Forest Service in Victoria. Chris (cborkent@primus.ca) is currently a research contractor with the Royal BC Museum. He is about to begin his PhD on the systematics and biogeography of Fungus gnats (Mycetophilidae: Diptera) with Terry Wheeler at the Lyman Museum, McGill University.

We are both excited about co-chairing the student committee this year, and look forward to interacting with you over the next 12 months. If there is anything you would like to see discussed or presented in *The student wing*, or if you have information on student activities in your area that you want to bring to a larger audience, please drop either Chris or Greg a line, or contact the member of the Student Affairs Committee in your area (see <http://esc-sec.org/students.htm>).

This year at the ESC/SEQ JAM in Montreal, there will be a graduate student symposium. The major change this year is that chosen presenters will have their registration fees covered through the generous sponsorship of the Lyman Museum, and its director, Terry Wheeler. We encourage all students that have just finished up their theses, or are in their final year of studies, to submit abstracts. For more info on this please see pages 20-21.

We have once again included a list of compatriots who have successfully defended their ideas and views. If you know of anyone who defended in the past year that has not been mentioned so far, please let us know so that we can include them in the next *Bulletin*. Don't hesitate to email if you have any ideas or questions about anything student related. We will do our best to answer all of your questions, and will take to heart any suggestions about involving students in the Society.

We wish you all the best in your research, and look forward to hearing from you!

Bourse étudiante de voyage pour assister à la réunion annuelle de la SEC

Une ou plusieurs bourses de 500\$ chacune seront offertes pour aider les étudiant(e)s, membres de la Société, à assister à la réunion annuelle de 2006 à Montréal. Pour être admissible, les étudiant(e)s doivent faire une présentation orale ou une affiche lors de la réunion annuelle. Les bourses seront accordées aux étudiant(e)s en rai-

son des seuls critères de réussite académique. **Date limite : la même que celle de soumission d'un résumé** (i.e. juillet ; vérifier le *Bulletin* ou le site Internet de la Société pour plus d'information, <http://esc-sec.org>). Note : les récipiendaires seront avisés en septembre 2006 ce qui leur donnera amplement le temps de planifier leur voyage.

Consulter <http://esc-sec.org/students.htm> pour plus de détails ou contacter Rose De Clerck-Floate à Floate@agr.gc.ca

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Thesis roundup / Un foisonnement de thèses

- Belter, Danica L.; dbelter@ualberta.ca, MSc January 2006. *Effects of plant species and herbivory on rhizosphere assemblages*. Supervisor: Heather Proctor, University of Alberta.
- Broberg, Cynthia L.; cbroberg@sfu.ca, PhD December 2005. *Antixenotic and Antibiotic Resistance of Hybrid Poplars to the Poplar-and-Willow Borer*, *Cryptorhynchus lapathi* (L.) (Coleoptera: Curculionidae). Supervisor: John Borden, Simon Fraser University.
- Caron, Valerie; PhD. *Ecological interactions between the cabbage looper, a parasitoid, host plants and Bacillus thuringiensis*. Supervisors: Judy Myers and Dave Gillespie, University of British Columbia.
- Cervantes, Veronica; MSc December 2005. *Population ecology of Trichoplusia ni in vegetable greenhouses and the potential of Autographa californica nucleopolyhedrovirus for their control*. Supervisor: Judy Myers, University of British Columbia.
- Chin, Krista; MSc December 2005. *Within peatland spatial structuring and the influence of the matrix of between peatland movement on the dragonfly, Leucorrhinia hudsonica in western Newfoundland*. Supervisor: Phil Taylor, Acadia University.
- Glasgow, Margaret A.; mglasgow@ualberta.ca, MSc January 2006. *The effects of forest fragmentation on generalist predation of forest tent caterpillars (Malacosoma disstria) in Alberta*. Supervisor: Jens Roland, University of Alberta.
- Griesdale, Peggy Liu; MSc September 2005. *The relationship of grazing to orthopteran diversity in the intermontane grasslands of the South Okanagan, BC*. Supervisor: Geoff Scudder, University of British Columbia.
- Hawkins-Bowman, Amy; umhawkin@cc.umanitoba.ca, MSc November 2005. *The effect of tillage and seeding rate on infestations of cabbage root maggots, Delia radicum (L.) (Diptera: Anthomyiidae) in canola, Brassica napus (L.), in Manitoba*. Supervisor: Neil Holliday, University of Manitoba.
- Henneberry, Natalie; MScF December 2005. *Aspects of the pathology and transmission of Neodiprion abietis nucleopolyhedrovirus*. Supervisors: Chris Lucarotti and Dan Quiring, University of New Brunswick.
- Hoover, Shelley; sehoover@sfu.ca, PhD October 2005. *Regulation of worker reproduction in the honey bee (Apis mellifera L.)*. Supervisor: Mark Winston, Simon Fraser University.
- Leighton, Bruce J.; leighton@sfu.ca, MPM April 2005. *The use of blood-fed mosquitoes as diagnostic tools for the detection and monitoring of infectious disease in wildlife*. Supervisor: Bernard Roitberg, Simon Fraser University.
- Miresmailli, Saber; MSc January 2006. *Assessing the efficacy and persistence of a rosemary oil-based acaricide/insecticide for use on greenhouse tomato*. Supervisor: Murray Isman, University of British Columbia.
- Morandin, Lora; lmorandi@sfu.ca, PhD November 2005. *Wild bees and agroecosystems*. Supervisor: Mark Winston, Simon Fraser University.
- Morrison, Andrew; e0yj@unb.ca MScF March 2005. *Influence of the host plant on preference and performance of a gall midge, Harmandia tremulae (Winnertz), on trembling aspen*. Supervisor: Dan Quiring, University of New Brunswick.
- Neal, Scott J.; MSc September 2005. *A functional and comparative analysis of heat-induced gene expression in Drosophila*. Supervisor: T. Westwood, University of Toronto.
- Rakochoy, Patience; patienceraakochoy@shaw.ca, MSc December 2005. *Lodgepole pine stand dynamics as a result of mountain pine beetle in the central interior of British Columbia*. Supervisor: Chris Hawkins, University of Northern British Columbia.
- Wilkerson, Stacey; staceyw@uvic.ca, MSc August 2005. *Community structure of canopy microarthropods associated with Abies amabilis in a montane variable retention stand, Vancouver Island, Canada*. Supervisors: Brad Anholt and Richard Ring, University of Victoria.

Seeking Graduate Students

University of Alberta

I am seeking one or two qualified students interested in pursuing graduate studies in insect behavior and chemical ecology at either the MSc or PhD level. The Department of Biological Sciences at the University of Alberta has a large graduate program (>200 students), and substantial strength in entomology and ecology. Applications will be accepted until positions are filled.

Our research examines factors influencing mate finding in several moth mating systems in managed and natural landscapes. Projects could include both basic behavior and the application of semiochemicals to Integrated Pest Management. Suitable applicants are eligible for teaching and research assistantships (minimum \$17 700 per year). Operating funds are provided in part by existing support (NSERC). Students would also be expected to pursue additional sources of funding. If interested, please contact me at:

Maya Evenden

Telephone: (780) 492-1873

Email: mevenden@ualberta.ca

www.biology.ualberta.ca/faculty/maya_evenden/

University of Victoria

I am seeking graduate students who are interested in insect evolutionary ecology and/or host-parasite interactions. I use a number of approaches (including experimental, molecular, and phylogenetic methods), in the lab and the field, to study the evolution and ecology of associations between insects and their symbionts.

Steve Perlman

email: stevep@uvic.ca

Telephone: (250) 721-6319

<http://web.uvic.ca/biology/People/perlman/perlman.htm>

University of Northern British Columbia

A Master's student position is available May 2006 in the Ecosystem Science and Management Program at the University of Northern British Columbia. The research project involves investigating how spatial patterns of salvage harvesting affect Warren root collar weevil pressure in regenerating stands. In coming years, the province of British Columbia will have expansive areas of regeneration following the current mountain pine beetle outbreak (8.5 million ha). Warren root collar weevil (*Hylobius warreni*) concentrating in and migrating from residual stands is a growing threat to post-salvage regeneration.

Suitable candidates will have a BSc in forestry or biology or similar degree at a recognized, post-secondary institution. The ideal candidate will be a team player with experience in field research settings and an interest in spatial ecology. The project will be supervised by Brian Aukema (Canadian Forest Service at UNBC; <http://web.unbc.ca/~aukema>) and Staffan Lindgren (UNBC; <http://web.unbc.ca/~lindgren>) and Michael Gillingham (UNBC; <http://web.unbc.ca/~michael>). Support is available for two years minimum. Applicants will also have opportunities to obtain support and teaching experience through teaching assistantships available within the Ecosystem Science and Management Program. Aside from university resources, the student will receive research support from Canadian Forest Service staff.

Interested applicants should send a CV, statement of interest, and names of 2 references to Brian Aukema (baukema@nrcan.gc.ca) as soon as possible.

The University of Northern British Columbia is situated in scenic Prince George, British Columbia, Canada. UNBC provides wonderful opportunities to students interested in forest research, such as its unsurpassed access to a variety of forest ecosystems, its maintenance of two dedicated research forests within two hours of the campus, and the diverse expertise of its faculty members in a wide range of topics in forest ecosystem research.

Entomological Society of Canada Graduate Student Symposium 2006:

Call for submissions

A Graduate Student Symposium will take place this year in Montréal, Québec, during the Joint Annual Meeting of the Entomological Society of Canada and the Société d'entomologie du Québec, 18-22 November 2006.

The principal goal of the symposium is to give a higher profile to graduating students as they move to the next stage in their careers by providing them a longer time slot to talk about their research.

To be eligible, students must have either defended their thesis in the past year or be planning to defend within one year of the meeting. The degree may be either MSc or PhD.

Students from all disciplines are encouraged to submit an abstract. Ideally, the symposium will follow the general theme of the meeting, "Diversity"; however, depending on the submissions a different focus may be selected.

- four to six presentations will be selected depending on the amount of time allotted to the symposium.

- **Those selected will have their conference registration fees paid** through a generous donation made by the Lyman Museum, McDonald College, McGill University.

- presentations will be approx 25 minutes in length with an additional 5 minutes for questions (30 minutes total).

- papers that are included in the Graduate Student Symposium will not be eligible for the President's Prize, however speakers may also submit a paper on a more specific topic to the President's Prize competition. See also point 3 below.

If you are eligible and want to be considered for the symposium please submit the following information by 15 June 2006:

1. An **expanded abstract** (200-300 words) describing your proposed presentation and how it relates to the theme of the meeting "Diversity".

2. A **letter (or email) of support** from your principal supervisor that confirms the anticipated or actual date of graduation, and comments on your proposed presentation.

3. Also include a **standard abstract** (70 words) and title. If not selected for the Graduate Student Symposium, your presentation will automatically be included in the President's Prize Competition.

Students who have been selected to speak will be contacted by 31 July 2006. When notified they will receive a list of the other speakers, email addresses and a copy of all initial abstracts to identify points for discussion in the talks and elimination of potential overlap.

Expanded abstracts of chosen speakers will be published in the December issue of the *Bulletin of the Entomological Society of Canada*.

Submission for the graduate student symposium should be sent in Word or Rich Text format to:

Chris Borkent: email: cborkent@primus.ca

or

Greg Smith: email: gregsmith@telus.net

Student Conference Travel Awards

One or more awards of \$500 each to be awarded as financial assistance for travel by student members of ESC to the 2006 annual meeting in Montreal. To be eligible, students must present a paper or poster at the annual meeting. Applications will be judged on academic merit. **Deadline: same as deadline for abstracts to annual meeting** (i.e., July; watch for more information in the *Bulletin* or on the ESC website, <http://esc-sec.org>). Note: winners will be notified by September 2006 so travel plans can be made.

See <http://esc-sec.org/students.htm> for complete award details, or contact Rose De Clerck-Floate at Floate@agr.gc.ca

Symposium des étudiants gradués de la Société d'Entomologie du Canada 2006:

Invitation générale

Un Symposium des étudiants gradués est organisé à l'occasion de la réunion annuelle conjointe de la Société d'Entomologie du Canada et de la Société d'Entomologie du Québec qui aura lieu à Montréal, Québec, du 18 au 22 novembre 2006.

Le but principal de ce symposium est de mettre en lumière les travaux de recherche des étudiants gradués alors qu'ils passent à la prochaine étape de leur carrière en leur fournissant une période plus longue afin de présenter leurs recherches.

Pour être admissibles, les étudiants doivent avoir soutenu leur thèse au cours de la dernière année, ou planifier de le faire dans l'année suivant la réunion. Les étudiants à la maîtrise et au doctorat sont admissibles.

Les étudiants de toutes les disciplines sont encouragés à soumettre un résumé. Idéalement, le Symposium devrait correspondre au thème général de la réunion, soit "Diversité". Toutefois, selon les sujets proposés, il sera possible de lui donner une orientation différente.

- 4 à 6 présentations seront sélectionnées en fonction du temps alloué pour le Symposium.

- Les frais d'inscription de la réunion des étudiants dont la présentation aura été sélectionnée seront payés grâce à un don généreux du musée Lyman du campus MacDonald de l'Université McGill.

- Les présentations seront approximativement de 25 minutes avec une période de questions additionnelle de 5 minutes pour un total de 30 minutes.

- Les présentations incluses dans le Symposium des étudiants gradués ne seront pas admissibles au Prix du président. Cependant, les conférenciers peuvent également soumettre un résumé sur un sujet plus précis afin de participer au Prix du président. Voir le point 3 plus bas.

Si vous êtes admissible et souhaitez être con-

sidéré pour le Symposium, veuillez nous faire parvenir les informations suivantes au plus tard le 15 juin 2006:

1. Un **résumé détaillé** (200-300 mots) décrivant la présentation proposée et faisant le lien entre le sujet de l'exposé et le thème de la réunion "Diversité".

2. Une **lettre (ou courrier électronique) d'appui** de votre directeur de thèse confirmant votre date prévue ou réelle de graduation, et commentant la présentation proposée.

3. Inclure également un **résumé régulier** (70 mots) et un titre. Si votre présentation n'est pas retenue pour le Symposium des étudiants gradués, votre présentation sera automatiquement incluse pour le Prix du président.

Les étudiants dont l'exposé sera sélectionné seront contactés au plus tard le 31 juillet 2006. Ils recevront alors la liste des autres conférenciers du Symposium avec leur adresse électronique ainsi qu'une copie de leur résumé initial afin de se préparer aux discussions et d'éviter les chevauchements éventuels.

Les résumés détaillés des conférenciers seront publiés dans le numéro de décembre du *Bulletin de la Société d'Entomologie du Canada*.

Les soumissions pour le Symposium des étudiants gradués doivent être envoyées en format Word ou Rich Text à:

Chris Borkent: cborkent@primus.ca

ou

Greg Smith: gregsmith@telus.net

Job Opening

The Okanagan Kootenay Sterile Insect Release (SIR) Program is seeking to hire an entomologist. Contact Cara McCurrach, 1-800-363-6684, Email: cmccurrach@oksir.org, Website: www.oksir.org for information.

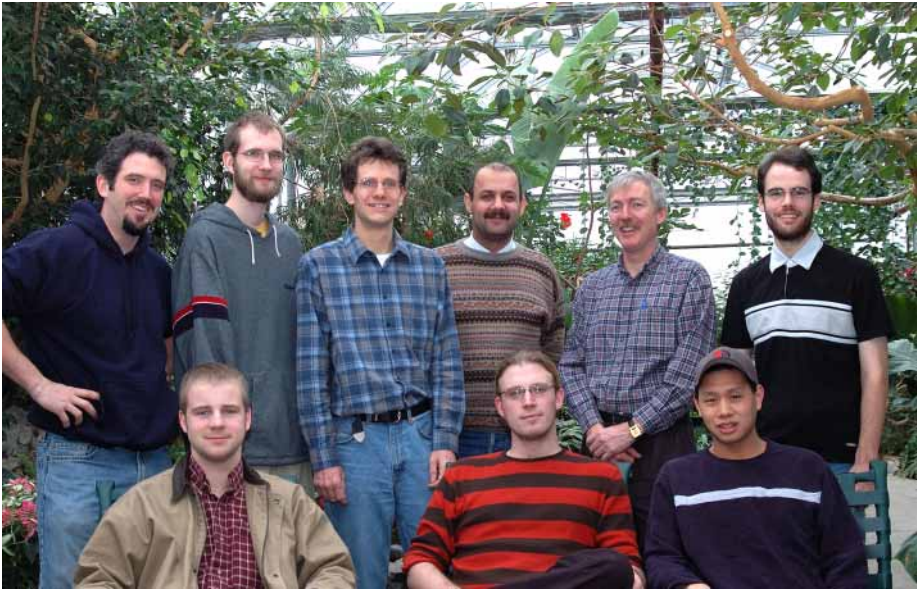
The University of Guelph Insect Systematics Laboratory

Most of the work in the insect systematics laboratory is somehow linked to our superb reference collection of almost two million specimens. Faunal surveys, like our recent projects on tallgrass prairies, bogs, and several parks and protected areas, use the collection as an identification resource and also build up the collection through the deposition of survey material. The collection was also used extensively in verifying names for Steve Marshall's new book, *Insects: Their natural history and diversity*. Most of the theses written by students in the insect systematics laboratory have been centered on thorough revisions of various groups of insects, usually acalyprate Diptera. Those projects, too, are dependent on the collection for study specimens, and contribute in turn to the development of the collection by increasing the

size and curatorial level of the collection for the taxa under study. The collection is bursting at the seams and due for a major renovation and expansion for which we received funding from The Canada Foundation for Innovation through the "Biodiversity Institute of Ontario" proposal. With luck, we will actually be able to use that money to expand the collection sometime soon. In addition to the collection, our lab is well equipped with several state-of-the-art microscopes and excellent systems for digital microphotography. Our greatest asset, however, is a tremendous team of enthusiastic people, partly represented in the photo below and described in a bit more detail below.

Steve Marshall, Professor and Director of the Insect Collection

I have been on faculty here since 1982, and I have been actively involved with the University of Guelph Insect Collection since the early 1970s. I work primarily on the systematics of acalyprate Diptera, but I maintain an active interest in the faunistics of various insect groups. More about



Back row, left to right: Steven Paiero, Joel Kits, Matthias Buck, Mehrdad Parchami-Araghi, Steve Marshall, Matthew Bergeron. Seated, left to right: John Klymko, Owen Lonsdale, Dave K.B. Cheung. Not in picture: Evelyn Dell, Rosemary Dell, Stephen MacIntyre.

my activities, and the activities of other members of the University of Guelph Insect Systematics Laboratory, can be found at the University of Guelph Insect Collection web site (<http://www.uoguelph.ca/~samarsha/>).

Matthias Buck, Curator of the Insect Collection

I came from the University of Ulm, Germany in 1997 to undertake a post-doctorate at the Guelph Insect Systematics Lab working on a revision of the New World *Leptocera* (s. str.) (Diptera: Sphaeroceridae). Since 1999 I have been Curator of the Guelph Insect Collection, and I have continued my research into Diptera systematics and diversity of Ontario aculeate Hymenoptera. Recent research highlights have been the discovery of a new Neotropical family of flies, senior authorship on the key to fly families of the upcoming *Manual of Central American Diptera*, and a new checklist of Ontario spheciform wasps that has increased the number of species recorded from the province by 70%.

Steven Paiero, Technical assistant/lab manager

I have been involved with the University of Guelph Insect Collection since doing an undergraduate thesis on Auchenorrhyncha, after which I did my MSc on the insects of Ojibway Prairie (a tallgrass park in southern Ontario). Since wrapping up my MSc, I have continued in the Insect Systematics lab, working on various contracts for the Ontario Ministry of Natural Resources (Orthoptera of Ontario, Hemiptera of Ontario) and doing general curatorial work in the UGC.

Owen Lonsdale, PhD candidate

I am currently revising most of the family Clusiidae, a family of small, thin yellow to black flies in the Acalypratae. My work includes a traditional morphological approach, but I have been supplementing my work with molecular data. I have also recently contributed chapters to the *Manual of Costa Rican Diptera*, as well as pages to the Tree of Life website (<http://www.tolweb.org>) for the Clusiidae, Somatiidae and Acartophthalmidae.



Steve Marshall

Sobarocephala setipes

Mehrdad Parchami-Araghi

I came from Iran to undertake a doctorate in Diptera systematics in the University of Guelph Insect Systematics Laboratory, and recently defended my thesis on the systematics of the sphaerocerid genus *Spelobia*. I am currently preparing the results of this research for publication while doing some other projects dealing with Calliphoridae and Tachinidae.

John Klymko, MSc candidate

The main focus of my research is a revisionary treatment of the New World *Curtonotum* (Diptera: Curtonotidae). With 21 species recognized in the New World, *Curtonotum* is a relatively small and poorly known genus. No revisionary work has been done on the group since the 1930s, so there is great potential for the discovery of new species, and a great need to update the existing literature.

Joel Kits, MSc Candidate

I am studying the systematics of the Neotropical sphaerocerid genus *Archiborborus*. Although the majority of described species in the genus are found in Chile and Argentina, there is a considerable diversity, mostly undescribed, found in Central America and northern South America, and this is where I will be focusing my research. I am working on a species level revision and phylogeny based primarily on morphological characters,



Steve Marshall

Curtonotum helvum (Curtonotidae)

as well as reviewing the relationships of the Archiborborini within the Sphaeroceridae.

Dave K.B. Cheung, Undergraduate student, lab webmaster, technical assistant

I became a part of the team during the summer of 2003. Since then I have devoted most of my time to photography and developing digital products including webpages, posters and digital keys. Most recently I have been working on Mecoptera of Ontario which will be available through the BSc E-journal. My interest lies in the application of digital technology to further traditional taxonomy.

Stephen MacIntyre, Undergraduate student

Stephen is currently working on an undergraduate thesis dealing with the Chrysopidae of Ontario. He began working as a laboratory assistant in the Insect Systematics Laboratory at the beginning of 2006, and plans to continue on in entomology with graduate studies.

Evelyn and Rosemary Dell

We are undergraduate thesis students currently finishing a revision of the genus *Ptilosphen* initiated in 2005. This project followed an interest in Micropezidae developed during the Field Entomology course, and has led to the redefinition and revision of the micropezid genus, *Ptilosphen* including several new species and a new generic synonym.

Bio-Blitz 2006

In collaboration with the Newfoundland and Labrador Department of Environment and Conservation and Parks Canada, the Biological Survey of Canada will hold its 6th annual Bio-Blitz in Gros Morne National Park, Newfoundland, 5-10 July 2006. This will be the first Bio-Blitz held in eastern Canada (previous events were held in Alberta and Manitoba).

Gros Morne National Park has a high diversity of habitats and plant and animal life. Major plant community types include coastal scrub (tuckermoor), lowland bogs, riverine thickets, balsam fir and black spruce forests, heath barrens, sedge meadows, tundra, serpentine barrens, and intertidal salt marshes. The park is home to over 700 species of flowering plants, 400 species of bryophytes and 400 species of lichens. This remarkable diversity is due to the wide range of habitats provided by bedrock types, soil development, exposure, altitude range, and proximity to the ocean. On the hills, conditions are cooler, windier, and moister than on the lowlands. Hiking from the seashore up onto the Long Range Mountains is a bit like traveling into the past, to a time when Newfoundland was covered with Arctic plants and animals. From seashore to highland tundra there are many unusual niches in the park for you to explore and sample! Rare species are usually found in rare habitats, and Gros Morne National Park, like the rest of the Great Northern Peninsula, has no shortage of either. The entomological fauna of the park has not been well collected. You are invited to join in this unique opportunity to collect in one of Canada's most scenic and biologically diverse locations. In addition, opportunities will be provided for participants to collect in other interesting and rare habitats on the west coast of Newfoundland. Stay tuned to the BSC website for updates <http://www.biology.ualberta.ca/bsc/bschome.htm> or contact David Langor (780-435-7330; dlangor@nrcan.gc.ca).

The Gerhard Gries lab: Simon Fraser University

The Gries lab studies mechanisms of insect/spider communication and host selection. We elucidate sonic, semiochemical, and bacterial communication signals, and investigate how these signals may have evolved in response to community composition, scarceness of larval resources, and physical parameters of the habitat. We also develop acquired knowledge for sophisticated control of pest insects.

Most of our current study objects (hobo spiders; house flies; *Drosophila* fruit flies; mosquitoes; twig and tree borer moths; lymantriid moths; earwigs; *Cimex*, *Boisea*, and *Leptoglossus* bugs; cecidomyiid midges; cockroaches; braconid wasps; silverfish and firebrats; etc.) have major economic or ecological implications. We work on them under the premise that their biology and communication ecology is as intriguing as that of any other insect.

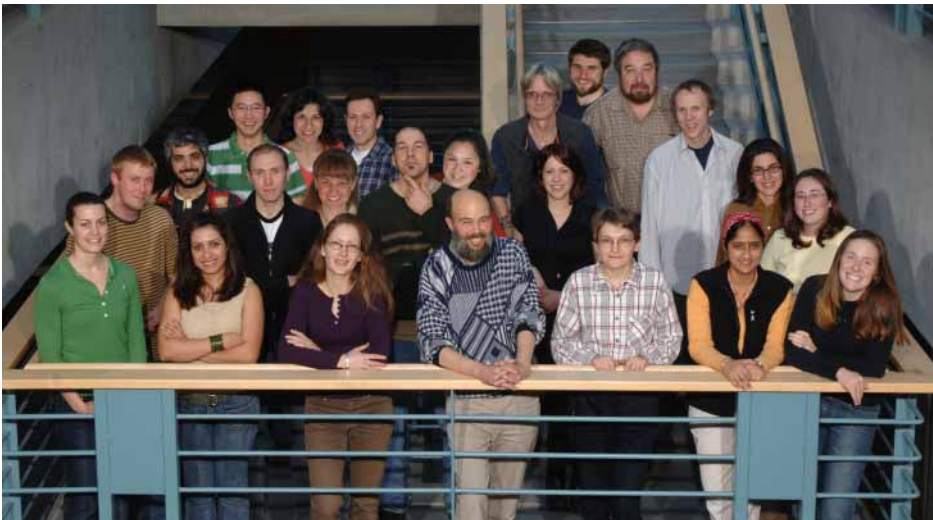
Once a week, we have a lab meeting, where we

present recent results and discuss their meanings, review talks for professional or scientific meetings, or simply brainstorm about what to do next in any given project.

Findings of our research can be developed for earth-friendly control of insects in urban, agricultural, and forest settings. This is why we attract funding from Industrial Sponsors. In June 2004, our lab obtained an NSERC-Industrial Research Chair (IRC) in Insect Communication Ecology, with Phero Tech Inc., SC Johnson Canada, and Global Forest as (industrial) sponsors. This NSERC-IRC is a triple-win because: (1) it provides a perfect training and research environment for many graduate and undergraduate students, and pushes the frontiers of science; (2) it provides society with earth-friendly solutions for insect problems; and (3) it generates new products and technologies for the industrial sponsors.

Kelly Ablard, PhD Candidate

Kelly obtained her MSc from Britain, where her research focused on the scent marking behavior of slender lorises (primates) in response to



Greg Ehlers (LUDC-SFU)

Current lab members (left to right): Kelsie Thu, Eric Siljander, Zaid Jumean, Nooshin Karimifar, Kevin Lam, Cory Campbell, Pilar Cepeda, Kelly Ablard, Samantha Vibert, Thomas Cowan, Joseph Schwarz, Shannon Derksen, Gerhard Gries, Stephen Takács, Rosanna Wijenberg, Nathan Woodbury, Regine Gries, Grigori Khaskin, Iisak Andreller, Gagandeep Hehar, Adela Danci, Eloise Rowland, Melanie Hart.



Parasitoid *Mastrus ridibundus* parasitizing prepupal codling moth, *Cydia pomonella*

predators. Her plan is to become a primate conservation biologist whose research will integrate chemical ecology, bioacoustic communication, and genetics. Her interesting project "The behavioral and chemical ecology of mate-marking in parasitic wasps" will result in consummate research skills that may be applied to conservation efforts, and alike may be the impetus behind further research in insect communication ecology.

Isak Andreller, NSERC-USRA

Isak stood out as a critical and excellent thinker in my large undergraduate class "BISC 204 - Introduction to Ecology". I am very pleased that he is now a recipient of an NSERC - Undergraduate Student Research Award (USRA), and that he will work on stimuli that mediate cone-foraging behavior in western conifer seed bugs, *Leptoglossus occidentalis* (Hemiptera: Coreidae).

Cory Campbell, MPM Candidate

Should you despise the pain and itch of mosquito bites, look forward to Cory's research results. Working with *Aedes aegypti* (Diptera: Culicidae), Cory investigates natural sources of mosquito repellents and the active ingredients therein. He lives up to the philosophy of "happy insects make happy researchers" by allowing his mosquitoes to feed on his own blood.

Pilar Cepeda, Insect Rearing Technician

Pilar is our fast-footed and meticulous insect-rearing technician. Her work helps students with

their time-intensive rearing of experimental insects.

Thomas Cowan, MPM Candidate

Thomas ("Tom") is on leave from his day-time position as Provincial Officer of the Ontario Ministry of the Environment, to start a day- and night-time position in our lab. Because he is determined to complete his research on Indian meal moth in just 2 years, he will be burning the candle from both ends!

Adela Danci, MSc Candidate (Prospective PhD student, summer 2006)

Adela has come to us from Romania. She is the perfect match for her research topic "Intra- and interspecific communication in three species of parasitic wasps (Hymenoptera: Braconidae)". She will defend her thesis in April 2006, and continue as a PhD student in our lab to study intertrophic communication between primary and secondary parasitoids.

Shannon Derksen, MPM Candidate

Shannon follows the lead of many other MPM graduates from our lab. She has a job (Canadian Food Inspection Agency) even before finishing her Masters' degree. Currently, she completes the final revision of her thesis, *Semiochemically-mediated oviposition by female peachtree borers*, *Synanthedon exitiosa* (Lepidoptera: Sesiidae), for defense in April 2006. Shannon is also the proud mom of a 2-year-old daughter.

Gerhard Gries

I have been fascinated by the natural world every since I was a small kid who spent days and nights (much to the worries of my dear mom) in the forest. When I came to Canada from my native Germany to work in John Borden's lab as a postdoctoral fellow, I was enchanted by the natural beauty of British Columbia, and truly felt like Alice in Wonderland.

My career path was influenced by the professor of wildlife biology with whom I wanted to undertake graduate studies. When he told me that he would give me a topic and then see me at my defense, I turned to insects instead. This proved

to be a wise decision because now I can keep and pursue both of my hobbies, doing research and enjoying wildlife.

My research is currently focused on the communication ecology of lymantriid moths. In collaboration with my long-standing collaborator and good friend Paul Schaefer (United States Department of Agriculture, Delaware), we study lymantriid communities on the islands of Hokkaido, Honshu, Okinawa and Taiwan, and investigate how the community composition affects the communication signal, and time of signaling, of the same species in different communities.

Regine Gries, Research Associate

Regine is married to the other Gries in the lab. They share the workplace, and thus never have a good reason to go home. A day's conversation may end with "the proposed structure for the roach pheromone did not pan out" and commence with "I dreamt up a new idea for this darn pheromone." Regine is the analytical chemist and electrophysiologist in the lab. She maintains all of our analytical tools and toys, and often runs many of them in parallel. She also puts the lid on spending, making sure that annual budgets remain in place for more than a month. Finally, Regine is very receptive to ideas. For example: in 1991, when a Canada Immigration Officer suggested "that she wouldn't have to come back every 6 months for renewal of her work permit if only that fellow Gerhard Gries she stayed with mar-

ried her", she really liked that idea, and insisted that I followed through with it. After 18 years of marriage, I am still glad I did.

Melanie Hart, MSc Candidate (Prospective PhD student, summer 2006)

Melanie ("Mel") studies the role of bioacoustic sexual communication signals in peach twig borer moths, *Anarsia lineatella* (Lepidoptera: Gelechiidae). She is also a regular instigator and "master of ceremony" for social events in and around the lab. As an early bird, she brews a fresh pot of coffee in the morning before most of us get in. Luckily, she has agreed to continue on as a PhD student after her MSc thesis defense in March, so we can continue to enjoy her intriguing line of research, and the coffee service.

Gagandeep Hehar, MPM Candidate

Gagandeep has joined us from India. Each spring, together with her husband Gagandeep (it is the same first name!), she amasses some 20,000 European earwigs, *Forficula auricularia* (Dermaptera: Forficulidae), from the field and asks them complex questions in olfactometer bioassays. Her research has proceeded well, and she expects "straight answers" from her earwigs this summer.

Zaid Jumean, PhD Candidate

The worm in the apple spoils the satisfying crunch of a newly harvested apple, but is stage front and center of Zaid's research. Zaid has identified the complex aggregation pheromone codling moth larvae produce when they spin up cocoons for pupation. Moreover, Zaid has set out to test if larval aggregations are part of the codling moth's reproductive strategy. His research is poised to improve codling moth management in apple orchards and private backyards. Zaid is also an award-winning teaching assistant, and the co-professor in all my insect biology classes. In 2005, he has taken recycling in our lab to new heights. He has reused the same paper towel 72 times before discarding it!

Nooshin Karimifar, MPM Candidate

German cockroaches, *Blattella germanica* (Dic-



Joseph Schwarz

Regine Gries taking EAG recordings with male gypsy moth, *Lymantria dispar*.



Mark Gardiner

Ovipositing house flies, *Musca domestica*.

tyoptera: Blattellidae), can eat all kinds of food but may prefer to dine à la carte. Nooshin, who joined us from Kerman (Iran), studies the attractiveness of various food sources to German cockroaches, with the intent to compile a semiochemical cocktail that even the most spoiled and well-fed cockroach cannot resist.

Grigori Khaskin, Research Associate

Grigori is our long-standing synthetic chemist. He came to us from the Ukraine where he obtained his PhD degree. Grigori produces all those new pheromones and semiochemicals we test in our bioassays. He is very sociable, except when he uses benzoquinones (the stinky sock odor) as a synthetic intermediate. In his spare minutes, he looks for jokes on the Internet, and freely shares the good ones with the lab.

Kevin Lam, MSc Candidate (and Candidate for transfer to PhD program)

Kevin claims, and has data to back it up, that he can actually see the communication signals his house fly study objects deploy during oviposition. He also holds the lab's record for most experiments (509!) conducted for a single manu-

script (currently in review). In this busy but well-managed schedule, he finds time to run a successful tutoring company. In preparation for his thesis defense (or for other reasons), he has become a student of martial arts, soon to obtain his black belt in Taekwondo.

Eloise Rowland (Prospective Graduate Student, fall 2006)

Eloise is one of those rare students who will already have publications in peer-reviewed journals under her belt when she enters Graduate Studies. As an undergraduate student, she has learned the ropes in insect chemical communication ecology, and as a graduate student she will study bioacoustic communication in lymantriid moths. Eloise then intends to apply all her skills and expertise to the study of primates, a group of vertebrates she is truly intrigued with. Eloise will obviously become a "Joan of All Trades".

Joseph Schwarz, MSc Candidate

When he is not out "shutter-bugging" in the back woodland swamps of Jersey, Joseph adjusts focus, and explores the aggregation behavior (Where? When? Why? How?) in the boxelder bug, *Boisea rubrolineatus* (Heteroptera: Rhopaidae), here in BC. Joseph has so many research leads and ideas in this project that they could last him a lifetime.

Eric Siljander, MPM Candidate

"Good night, sleep tight and don't let the bed bugs bite" may become wishful thinking. Bed bugs, *Cimex lectularius* (Hemiptera: Cimicidae), are enjoying a global resurgence. Eric will do something about this. He investigates the bed bugs' pheromonal communication, hoping to put acquired knowledge to use in bedbug control programs. As a hockey enthusiast and skillful player of Finnish descent, Eric celebrated twice when Canada and Finland took the gold and bronze medal, respectively, at the last world junior championship.

Stephen Takács, Research Associate

Stephen ("Steve") has obtained both his MPM and PhD degree from our laboratory. He is one of

those individuals too good to let go. Steve is our sound and computer specialist. He develops all that sophisticated software for sound acquisition and analysis. Steve is also a superb artist whose wildlife drawings decorate many homes and offices.

Kelsie Thu, NSERC-USRA

The Latin philosophy "*mens sana in corpore sano*" (a sound mind in a sound body) applies to Kelsie. As a member of SFU's basketball team she is a superb athlete, and she is also an outstanding young scholar. As a recipient of an NSERC-Undergraduate Student Research Award (USRA), Kelsie will study, together with Kevin Lam, microbial interactions that affect oviposition decisions by female house flies, *Musca domestica* (Diptera: Muscidae).

Samantha Vibert, PhD Candidate

Samantha ("Sam") is from Switzerland. She is the only student in the lab working on a spider (rather than an insect). She is "inspidered" by the behavioral and chemical communication ecology of the hobo spider, *Tegenaria agrestis* (Aranea: Agelenidae). Her "movie" on the hobo's courtship behavior has won two awards at two meetings, and has dazzled the minds of ecologists about the complexity and intricacy of spider communication. To unravel all those signals will be an academic and technical feast.

Rosanna Wijenberg, NSERC-USRA (Prospective Graduate student, fall 2006)

Rosanna ("Rosie") has completed her honors degree on bioacoustic communication in German cockroaches, *Blattella germanica* (Diptera: Blattellidae), in our lab, and will continue her work this fall as an MPM student. Without a doubt, Rosie is one of the most "apparent" students in the lab. Her ephemeral hair colors reflect all those of the rainbow, and her research results have already led to 2 U.S. provisional patent applications.

Nathan Woodbury, MPM Candidate

Nathan is the winner of the lottery for number of languages spoken in our lab (16). That he used his prize money to buy equipment is reflective of his drive and determination in his project. Nathan studies pheromonal communication of firebrats, *Thermobia domestica*, and silverfish, *Lepisma saccharina* (Thysanura: Lepismatidae). Although these insects are ancient communicators, Nathan applies most modern approaches to unravel their communication signals.



Charlene Wood

Zaid Jumean - Field testing of synthetic larval aggregation pheromone of codling moth, *Cydia pomonella*.

Acknowledgements

I thank Sharon Oliver and Renée Picard for word processing.

Congrès conjoint de la Société d'entomologie du Canada et de la Société d'entomologie du Québec

18 au 22 novembre 2006

l'Hôtel Holiday Inn Midtown, Montréal, Québec

Le thème de la réunion : Diversité.

L'équipe de l'organisation :

Responsable principal et relations avec l'hôtel : Charles Vincent, vincentch@agr.gc.ca

Programme scientifique et décorations : Terry Wheeler, wheeler@nrs.mcgill.ca

Correspondance scientifique, résumés et équipements audio-visuel : Chris Buddle, chris.buddle@nrs.mcgill.ca

Trésorerie, suivi des finances et administration : Michel Cusson, cusson@cfl.forestry.ca

Levée de fonds : Jacques Brodeur, jacques.brodeur@plg.ulaval.ca

Webmestre : Thierry Poiré, poiret@inspection.gc.ca

Arrangements locaux, photographies et programme connexe : Pierre Lemoyne, lemoynep@agr.gc.ca

Coordination du banquet : Johanne Landry, johanne_landry@ville.montreal.qc.ca

Des informations seront disponibles prochainement sur les sites de la Société d'entomologie du Québec : <http://www.seq.qc.ca/> et de la Société d'entomologie du Canada, <http://www.esc-sec.org/>

Joint annual meeting of the Entomological Society of Canada and Entomological Society of Quebec

18-22 November 2006

Holiday Inn Midtown Hotel, Montreal, Quebec

Meeting theme: Diversity

The organisational team:

General chair and hotel related matters: Charles Vincent, vincentch@agr.gc.ca

Scientific program and awards: Terry Wheeler, wheeler@nrs.mcgill.ca

Scientific correspondence, abstracts and audio-visuals: Chris Buddle, chris.buddle@nrs.mcgill.ca

Treasurer, finance tracking and administration: Michel Cusson, cusson@cfl.forestry.ca

Fund raising: Jacques Brodeur, jacques.brodeur@plg.ulaval.ca

Webmaster: Thierry Poiré, poiret@inspection.gc.ca

Local arrangements, photographs & side program: Pierre Lemoyne, lemoynep@agr.gc.ca

Coordination-banquet: Johanne Landry, johanne_landry@ville.montreal.qc.ca

Information will be soon available on the Entomological Society of Quebec website: <http://www.seq.qc.ca/>, as well as the Entomological Society of Canada website <http://www.esc-sec.org/>

Meeting announcements / Réunions futures

International Symposium: Integrated Pest Management in Oilseed Rape

University of Göttingen, Göttingen, Germany, 3-5 April 2006

<http://www.symposium-ipm-oilseed-rape.de>

La Société de protection des plantes du Québec

La protection des plantes en agriculture biologique, relevons le défi!

Victoriaville, Quebec, 15 -16 juin 2006

<http://www.sppq.qc.ca/congres.htm>

56th Annual Meeting of the Entomological Society of Canada

Montreal, Quebec, Canada, 18-22 November 2006

<http://www.esc-sec.org/agm.htm>

53rd Annual Meeting of the Entomological Society of America

Indianapolis, Indiana, USA, 10-14 December 2006

http://www.entsoc.org/annual_meeting/



Joe Shorthouse

This is what meetings are for (from left to right): George Ball (MSc supervisor of Larson), Gordon Pritchard (mentored by Ball and PhD supervisor of Larson), David Larson (2005 Heritage Lecture, PhD supervisor of Langor), David Langor (PhD co-supervisor of Buddle), Chris Buddle (PhD supervisor of Sackett) and Tara Sackett (PhD student of Buddle and by association of all). Taken at the ESC meeting in Canmore Alberta, November, 2005.

The NAPPO Phytosanitary Alert System:

Keeping you informed about plant pest threats to North America

The North American Plant Protection Organization (NAPPO), composed of the plant protection organizations of Canada, the United States and Mexico, was established in 1976 as a regional organization of the International Plant Protection Convention (IPPC). NAPPO's mission is to protect the plant resources of North America against the introduction of plant pests, while facilitating trade.

In the war against plant pest invaders it pays to know the enemy - those plant pests (i.e., insects, mites, fungi, nematodes, viruses, bacteria, phytoplasma, weeds, etc.) that threaten to cross our borders, colonize, spread, and cause serious economic and/or environmental damage. In an effort to keep member countries informed of the ever increasing threats posed by these exotic plant pest invaders, NAPPO developed the Phytosanitary Alert System, or PAS (<http://www.pestalert.org/main.cfm>).

First launched in April 2000, the PAS is a web-based notification system that provides a mechanism to share scientific intelligence about emerging plant pests that might pose a significant threat to North America agriculture, forestry or natural habitats. The intent of the PAS is to facilitate awareness, detection, prevention and management of exotic plant pest species within North America. Information posted on the PAS is useful not just to plant protection organizations, but also to academic institutions, industries, and other organizations or individuals with an interest in safeguarding our borders from plant pest invasions.

The PAS was designed and is maintained by a

For more information on NAPPO-PAS contact Ian A. MacLachy; (613) 228-6698, maclachy@inspection.gc.ca Plant Pathologist, Plant Health Risk Assessment, Canadian Food Inspection Agency 3851 Fallowfield Road, Ottawa, ON K2H 8P9.



K. Boile

The emerald ash borer, *Agrilus planipennis* Fairmaire (Buprestidae), an invasive beetle from Asia that threatens North American ash trees.

panel of experts from each of the federal plant protection organizations of the three NAPPO countries. Panel members gather, on a broad international scale, crucial intelligence about plant pests of importance to the NAPPO countries and disseminates that information through the website. Pest information may come from any one of a variety of sources, including records from port of entry interceptions, domestic plant pest surveys, the internet, published literature (journals, newsletters, popular press), etc. Readers/users of the PAS are also welcome to submit their own pest alerts for potential posting on the website.

In addition to posting pest alerts, the PAS also provides member countries with a mechanism to provide timely official notification (i.e. official pest reports) concerning any outbreaks of significant new plant pest finds within their country, or to provide updates on already regulated pests. These official pest reports are intended to comply with the FAO's IPPC Standard on Pest Reporting, endorsed by the Interim Commission on Phytosanitary Measures in March 2002 (see the International Standards for Phytosanitary Measures No. 17 on "Pest Reporting").

To stay informed about significant plant pest threats to North America and to keep up-to-date with official pest reports from the NAPPO member countries, members of the Entomological Society of Canada are encouraged to visit on a regular basis the NAPPO-PAS web site. Better yet, subscribe to the NAPPO-PAS (<http://www.pestalert.org/subscribe.cfm>) (its free!) so you can be automatically notified via email when new information is posted on the site. Keep informed, and help keep NAPPO countries free from exotic plant pest invaders!

Seeking new *Bulletin* Editor

The Entomological Society of Canada is looking to fill the position of *Bulletin* Editor. The main duties of the Editor are to solicit material to be published in the *Bulletin*, arrange the material, proof-read galleys, and to arrange printing and mailing of the *Bulletin*. This position provides an excellent opportunity to become fluent with desktop publishing, and allows the incumbent to become familiar with all aspects of the Society.

The *Bulletin* Editor is appointed by the Governing Board, is a Trustee of the Society and an *ex officio* member of the Publication Committee. He or she is encouraged to attend the Annual General Meeting and Governing Board Meetings. Currently, the Editor receives an honorarium of \$500/year and can be provided some funds to attend the AGM. If you are interested in serving the Society in this important position, please contact by 1 June 2006,

Dan Quiring

President, Entomological Society of Canada

Email: quiring@unb.ca

Telephone: (506) 453-4922

Seeking New Editor-in-Chief of *The Canadian Entomologist*

The Entomological Society of Canada is seeking a replacement Editor-in-Chief of *The Canadian Entomologist*. The Editor-in-Chief has overall responsibility for the scientific and editorial integrity of the journal, and is responsible for publication of *The Canadian Entomologist*. The duties of the Editor-in-Chief have changed dramatically with the appointment of three division editors, each responsible for the scientific calibre of the contents of their assigned division. The Editor-in-Chief is appointed by the Governing Board, is a Trustee of the Society and an *ex officio* member of the Publication Committee. He or she is encouraged to attend the Annual General Meeting and Governing Board Meetings. Currently, the Editor receives an honorarium of \$500/year and can be provided some funds to attend the AGM. This is one of the most important positions within the Entomological Society of Canada. If you are interested in serving in this critical position, please contact, by 1 June 2006,

Dan Quiring

President Entomological Society of Canada

Email: quiring@unb.ca

Telephone: (506) 453-4922

Recently deceased Compiled by Ed Becker

Joan Skidmore, wife of Bob Skidmore, #203-2090 Neepawa Ave., Ottawa ON K2A 3M1, died on 15 September 2005. She had been in and out of the hospital for several months. A memorial service was held in the Arboretum at the Central Experimental Farm on 24 September 2005.

Dick Davis, long time insect bionutritionist at the Saskatoon Research Station, died on 23 November 2005 in Peterborough ON at age 80. According to my records, he was living in Peterborough and only his daughter, Elyse Bruce, Unit 25-30 Alexander Ave., Peterborough ON K9J 6B4, knew Dick's address. She called me on 26 November and said that her father died in his sleep.

Killer corks contribute to Kevan Scholarship

Readers may remember Peter Kevan's description of the killer corks (*Bulletin*: 2005 37(3)144-145). Peter has been in touch with BioQuip about producing them commercially and BioQuip has generously agreed to contribute \$1.00 to the ESC's Kevan Scholarship for each set of collecting materials, that include the corks, sold. Please visit the BioQuip website for more information; www.bioquip.com.

Biological Survey of Canada: Terrestrial Arthropods

Survey Report

The Scientific Committee met in Canmore, Alberta, on November 5, 2005. Because of budget restrictions this was an abbreviated meeting, some members were not able to attend, and the range of topics discussed was curtailed. A more detailed account of the meeting appears in the *Newsletter of the Biological Survey of Canada (Terrestrial Arthropods)* 25(1), 2006, which is also on the BSC web site at <http://www.biology.ualberta.ca/bsc/english/newsletters.htm>

Scientific Projects

1. Grasslands

Most chapters for the book on ecology and interactions in grassland habitats have been submitted and editing continues.

2. BSC e-journal of Arthropod Identification

The BSC e-journal of arthropod identification continues to be developed with a target launch date in 2006.

3. Terrestrial arthropods of Newfoundland and Labrador

Work continues on a number of keys, some of which will soon be complete and will be submitted to the BSC e-journal. The 2006 BioBlitz is being planned for Gros Morne National Park and other sites on the west coast of Newfoundland. See page 24 for more details on the BioBlitz.

4. Forest arthropods

The 2005 BioBlitz, held in Waterton Lakes National Park in July, was very successful, attracting 30 participants. Waterton Lakes National Park will manage the database of specimen records. Issue number 2 of the Forest Arthropods newsletter will be published in March 2006. The project on Cerambycidae of Canada and Alaska and other initiatives are progressing.

5. Insects of the Arctic

Collecting was done in the Norman Wells and Rankin Inlet areas and in eastern Siberia in the summer of 2005 as well as some pitfall trapping in the Yukon. Residues will be available from some of these collections.

6. Seasonal adaptations

A number of papers on this topic have been published or are in press and Hugh Danks of the Secretariat attended relevant meetings in Denmark and in Japan.

7. Invasions and reductions

A one-day symposium on the impacts of exotic arthropods on native biota is planned to precede the Joint Annual Meeting in Montreal in November 2006. Work continues to catalogue all non-native arthropods of Canada. A web database will be available in due course. Information on coccinellids in the context of invasive species continues to be assembled, and information from individual regions is becoming available in published form.

Other scientific priorities

1. Survey web site

The number of visitors to the BSC web site continues to increase. Routine maintenance and updates continue to be done. The site is being redesigned and reorganized, and revised pages will be posted in due course.

2. Survey publicity

Two flags with the BSC logo were made available for publicity purposes, as at the BioBlitz held at Waterton National Park.

3. Arthropods and fire

The symposium on arthropods and fire at the ESC meeting went well. The feasibility of producing a synthetic publication that includes papers from the conference is being investigated.

4. Arthropods of the Gulf of St. Lawrence Islands

Fieldwork on the Magdalen Islands and other sites is being planned in the early stages of this project.

5. Databasing

There is general agreement that the Darwin Core set of fields should be adopted and made congruent with GBIF standards. Some other news about databases was discussed. The BSC's database of important historic collecting localities continues to be compiled.

6. Other priorities

The Committee also considered potential work on endangered species, some potential future publications including a possible revision and expansion of the Survey's 1994 brief on planning a biodiversity study and recommended sampling techniques, and other topics.

Liaison and exchange of information

Because of the location and abbreviated nature of the meeting representatives from various agencies were not able to attend. However, a written report about activities at Agriculture and Agri-Food Canada included the following items.

Barry Grace is acting National Science Director for the Biodiversity Theme, to which all taxonomists working at the CNC belong. Two new research scientists (a phytophagous mite systematist and a plant nematode systematist) are expected to be hired by January 2006. Funding has been obtained to database entomology and other collections, initially focusing on invasive alien species. Don Bright, retired from the CNC, will move to Colorado, but will maintain a responsibility for providing bark beetle identifications. Jim Troubridge is the new collection manager at CNC. The CNC plans to acquire a new high-end imaging system soon. Production of new volumes in the Insects and Arachnids of Canada handbook series is continuing. Agriculture and Agri-Food Canada is one of the partners in the Barcoding of

Life project, based at the University of Guelph, including staff working on Lepidoptera.

Other items

1. Canadian Museum of Nature

Funds are restricted within the CMN, because of exhibit and other commitments, leading to the current abbreviated meeting without expenses for participants. Other BSC activities may also have to be deferred. The CMN organized an all-day workshop in Ottawa during October to discuss potential development of the BSC, attended by government representatives, members of the Alliance of Natural History Museums, and scientific society representatives.

2. Other matters

The Committee also considered briefly issues such as the BSC award through the ESC, membership of the Scientific Committee, and items of more general interest from regional information.

À la recherche d'un nouveau rédacteur du *Bulletin*

La société d'entomologie du Canada cherche à combler le poste de rédacteur du *Bulletin*. Les tâches comprennent, entre autres, la recherche de matériel neuf pour le *Bulletin*, la mise en page, la révision des épreuves, l'impression et l'envoi du *Bulletin*. Ce poste fournit une opportunité excellente d'apprendre à travailler dans le monde de l'édition, tout en devenant familier avec les diverses facettes de la Société.

Le rédacteur du *Bulletin* est nommé par le conseil d'administration, est un fiduciaire de la société, et un membre *ex officio* du comité de publication. Elle ou il est encouragé à assister à l'assemblée générale annuelle et aux réunions du conseil d'administration. Présentement, le rédacteur reçoit des honoraires de 500 \$/an et peut recevoir des fonds pour assister à l'AGA. Si vous désirez servir la Société dans ce poste déterminant, veuillez communiquer, avant le 1 juin 2006, avec : Dan Quiring, Président de la SEC

The Third Arctic and Boreal Entomology Course: 2005

By Michael Alperyn, Rob Roughley and Peter Kevan

The third Arctic and Boreal Entomology Course, was again held at the Churchill Northern Studies Centre (CNSC) in Churchill, MB from 25 July to 5 August 2005. The course was lead by Peter Kevan, Environmental Biology, University of Guelph and Rob Roughley, Department of Entomology, University of Manitoba. Teaching assistantship was provided by Corey Sheffield, Environmental Biology, University of Guelph, and Michael Alperyn, Department of Entomology, University of Manitoba.

This year students came from across North America to participate in the course (Figure 1). Each student had their own unique reason for taking the course but all were unified in their enthusiasm for learning about boreal and arctic entomology.

The staff at the CNSC again made our stay enjoyable and provided everything we needed to conduct our lessons safely and efficiently. The Centre is an excellent facility to foster scientific research and provides all of the necessary amenities including classrooms, laboratory space, com-

puter and internet access, vehicles, dormitories, and home-cooked meals. The CNSC kitchen staff kept us well fueled for those long hours of collecting and their culinary variety made us hungry with anticipation while we were still in the field.

Despite the sometimes chilly temperatures even in summer months Churchill is a hotspot for entomologists because it offers a wide range of habitats in close proximity. One can easily investigate tidal pools with a dip net, set a transect of pit fall traps in a boreal forest, swiftly sweep willow scrub, and eagerly check bottle traps from a fen, all before lunch. The course days were divided between field collecting during the day, and evening lectures after dinner. Lab hours were interspersed throughout the day and evening to allow students to take inventory of their collections and learn proper pinning and preservation techniques.

Collecting efforts were spurred on by the interests of the class. Since a few students showed interest in aquatic insects, a considerable time was spent (to the delight of Rob Roughley) collecting in standing and flowing waters. Habitats that were sampled included temporary and saline ponds, fens, bogs, and salt marshes along the Churchill River. Flowing water habitats sampled included Goose Creek, and the banks of the Churchill River. Terrestrial insects were also given their fair share of attention and were sampled from willow scrub, the krumholz, boreal forest-tundra transi-



Figure 1. Course participants: from left to right; Rachel Barbero, University of Guelph, Ont.; Jessica, Laurie, and Doug Post, Folsom, California; Carolyn Mallory, Iqualuit, Nunavut; Peter Kevan, University of Guelph, Ont.; Cory Sheffield, University of Guelph, Ont.; Dominique Collet, Sterling, Alaska; Michael Alperyn and Rob Roughley, University of Manitoba, Man.

tion zones, and tundra zones. Dominique Collet, from Sterling, Alaska was very interested in gall insects and transmitted his enthusiasm to students and staff alike to probe willow galls and rose galls looking for their parasites and parasitoids.

A wide variety of passive and active sampling techniques were demonstrated in the course. To collect aquatic insects, bottle traps and aquatic dip-net sampling were used. Sweep net sampling, aspirating insects (Figure 2), pitfall traps, fan traps (Figure 3), malaise traps, and flight interception traps were used to sample terrestrial insects. In the lab, students also employed Berlese funnels to extract insects from soil core samples taken from a variety of habitats.

The lectures provided students with an insight into entomology within the context of a boreal and arctic ecozone. Topics were divided into macro-scale and micro-scale effectors on insect diversity. Climate, geography and glaciations were discussed on how these phenomena have shaped and preserve the present day insect fauna of the boreal and arctic ecozones. Within these two ecozones, the terrestrial and aquatic habitats available for insects were discussed. Obviously, a course examining northern regions and insects would not be complete without considering cold hardiness. Therefore, particular attention was given to the physiological and developmental strategies that insects have employed to survive in cold climates.

Supplementary lectures were presented by Michael Alperyn (Factors affecting Dytiscidae community ecology as it relates to boreal and other ecozones), Corey Sheffield (Apidae diversity



Michael Alperyn

Figure 3. Rob Roughley sets up a fan trap in a forested area.

of the boreal and arctic ecozones) and Dominique Collet (Willow gall ecology of the arctic and boreal ecozones) providing students with a look at current research questions and pursuits.

Students were also required to design, implement and write a written report on an investigation of their choice. Student projects included an examination of terrestrial insect diversity from three zones in varying proximity from the Churchill river and an aquatic study that examined whether compass bearings had any effect on the aquatic insect diversity along pond margins.

Along with being immersed in the study of the six-legged variety, students also had a privileged opportunity to take in some of Churchill's more notorious wildlife including arctic foxes and hares, caribou, beluga whales, various birds and of course polar bears. There was also time to visit some of Churchill's other attractions, including local shops, restaurants, and museums.

This course will be given again this year from 7-19 August 2006 in Churchill Manitoba. Information on the course can be found on the web site of the University of the Arctic <http://www.uarctic.org/fieldschool/catalogue.asp> Please contact either Peter Kevan (pkevan@uoguelph.ca) or Rob Roughley (Rob_Roughley@umanitoba.ca) if you are interested in taking the course.



Laurie Post

Figure 2. Doug Post and Michael Alperyn aspirate shore bugs near the banks of the Churchill River.

Strategic Review of the Entomological Society of Canada - 2005

Bob Lamb, Past-President, Chair of the Strategic Review Committee

Summary

Recommendations are offered on Membership, Financial Sustainability and Implications of Electronic Communication:

- Regular membership of ESC has been in decline for at least 20 years, but minor changes in the membership process show promise for at least stabilizing regular membership.

- ESC net assets are increasing at about 5% per year, although declining institutional subscriptions for *The Canadian Entomologist* and increasing costs of publishing may eventually threaten financial stability. With a new 4-year contract for producing the *TCE* in place, time is available to take action if ESC finances become a problem.

- Changes in information technology offer many opportunities for helping ESC improve communication among its members and entomologists in general. The challenge will be to exploit this technology to enhance entomology in Canada, and at the same time reduce costs.

- Some members recognize a need for a basic rejuvenation of ESC, to assure that it continues to be a dynamic and positive force for Canadian entomology. Suggested changes included: taking a more active role in entomological activities such as the Annual Meeting and the Biological Survey of Canada; re-organizing the Board and Committees, to focus and stimulate the enthusiasm of volunteers.

Membership

Members provide funding for the activities of the Society through their dues, and the volunteers that organize and conduct the business of the ESC. For about 20 years, the membership of ESC has been in slow decline (Table 1), and may be approaching a level that will make it difficult to sus-

tain ESC activities. Because ESC is in a sound financial situation, and membership fees are low, the decline in membership is more important in relation to participation than in terms of lost revenue. Regular membership peaked at 918 in 1969, declined sharply after 1983, and continued to decline at about 3% per year, resulting in a 25% reduction in membership since 1995. The decline reversed briefly in 2000, probably as a result of new memberships taken out to reduce registration fees for the joint meeting with the Entomological Society of America. By 2002, these opportunistic members appear to have dropped out and the decline continued. The decline is primarily a result of a loss of Regular rather than Student or Emeritus members. The latter two categories fluctuate from year to year, but with no clear trend. ESC continues to be attractive to students and retired members, but ESC is having difficulty retaining Regular members.

At least five factors contribute to the decline in membership.

1. Many of us bemoan but accept that entomological employment in Canada is declining, and with it ESC membership. ESC, however, is unlikely to be able to influence entomological employment in the short term, and the efficacy of an intense lobbying effort is doubtful.

2. An abrupt membership decline followed an increase in past membership fees, implying that the size of membership fees can influence membership. Consistent with this view is the effort to lobby for employer subsidies towards membership in professional societies, particularly ESC, with the goal of increasing ESC membership. Student and Emeritus members, who pay much lower fees, are being retained by ESC. A substantial reduction in membership fees might increase membership at least slightly, but membership fees have been stable for about 15 years (since 1989), were never high compared to professional incomes, and have decreased substantially over time due to inflation.

3. Members drop out through inertia, simply because they are forgetful or find that available methods of payment do not encourage prompt renewal. The Office Manager currently sends out a membership renewal forms around the time of

the Annual Meeting, with a reminder in early February. Members may renew by cheque or credit card. An internet payment option might appeal to members but would cause a reduction in revenue as a result of transaction fees.

4. Some entomologists expect, but are not receiving, the level of membership services they believe should be offered. Therefore, enhancing services might increase membership. However, membership fees do not cover the cost to ESC of the services provided. For \$85 members receive both *The Canadian Entomologist* and the *Bulletin* as well as a reduced registration fee for the Annual Meeting, and access to the Members area of the Website.

5. Many volunteer organizations are suffering declines in membership as a result of societal changes that are poorly understood, and ESC is just another example. ESC cannot easily address the societal changes causing a decline in volunteerism, but can minimize volunteer burnout by eliminating non-essential work, and by assuring that the volunteer efforts of our members are meaningful and acknowledged.

Comparison of regional and national membership lists reveals that a relatively small proportion of the members of this regional society were also members of ESC. If simple inertia and a lack of

encouragement account for much of the decline in membership, regional societies likely represent a substantial number of potential members that might be attracted through an effective membership drive. A small-scale, targeted membership drive conducted by the President resulted in at least a 50% success rate, suggesting that the strategy might be effective. As of 15 September 2005, membership rose from 480 at the end of 2004 to 494, the first increase recorded in the past 10 years, except for that associated with the joint meeting with the Entomological Society of America in 2000. Regular and Emeritus memberships were stable, and Student members increased.

Membership might be sustained or even increased by minor improvements to the renewal process, and continued small-scale but targeted membership drives. Other approaches that might be adopted are increasing the differential charges for regular members and non-members at Annual Meetings. The disadvantage of raising the differential might be a reduction in attendance, although because the meetings remain popular and registration fees are not excessive compared with many meetings, attendance might not be affected. ESC might take on a much larger role at the Annual Meeting and so stimulate increased membership by members of regional societies. This approach

Table 1. Membership in ESC, 1995 to September 2005 (for 1962-1994 see Danks, H.V. 1994. *Bulletin ESC* Vol. 26(3): 110).

Year	Membership class			
	Regular	Student	Emeritus	Total
1995	450	99	61	610
1996	432	84	73	589
1997	404	79	70	553
1998	396	76	76	548
1999	382	72	72	526
2000	400	114	77	591
2001	386	98	82	566
2002	364	90	65	519
2003	357	87	74	518
2004	333	70	77	480
2005(Sept)	334	85	75	494

would give ESC a much higher profile in Canadian entomology, and thereby perhaps emphasize the need for regional entomologists to participate in ESC. It would allow effective use of differential fees to enhance membership, providing a clear membership benefit. Revenues to ESC might be substantially enhanced because annual meetings are regularly profitable. This approach might also affect the relationship between ESC and the larger regional societies, while at the same time depriving the smaller regional societies with an important source of revenue and focus for their entomological activities. Membership in ESC might be increased substantially by reducing or eliminating page charges for members publishing in *The Canadian Entomologist*. Reduced page charges would increase the popularity of *TCE*, particularly with university and international entomologists, and possibly thereby eventually increase library subscriptions. Furthermore, Canadian entomologists would find *TCE* more competitive with low-page-charge European and private journals. Disadvantages of this approach are: a loss of revenue of up to \$40 000/year because revenue from page charges would be unlikely to be matched by increased revenue from either memberships or library subscriptions; an increase in workloads for editors of *TCE* resulting from increased submissions of manuscripts; a possible reduction in the focus on Canadian entomology.

Even if ESC membership can be stabilized and even increased, Regular membership currently is one-quarter less than it was a decade ago. The reduced membership probably cannot sustain the same level of volunteer activity. By reducing non-essential committee activity, the efforts of remaining active volunteers can be targeted on the essential activities of the Society.

Possible changes to the duties of the Committees should recognize the changing workloads of the Committees, and be designed to minimize non-essential work for the volunteer committee members.

Financial Sustainability

Given apparent declines in membership and particularly institutional subscriptions to *The Ca-*

nadian Entomologist, the committee reviewed the financial situation with the objective of assessing whether ESC can sustain the core activities of the society: the Joint Annual Meeting, the *Bulletin*, the Website, *The Canadian Entomologist*, and the Scholarships and Awards Program. Over the past six years (1999-2004), the average net assets of ESC increased by between \$8000 and \$69 000 annually, for an average annual net increase of almost \$43 000, greater than 5% per year. The society's net capital assets reached \$930 000 as of 31 December 2004. At present, ESC is in an excellent financial situation. The question for the committee is whether finances will likely continue to be satisfactory in the near future.

The Joint Annual Meeting costs ESC a grant to the organizing society. A financial loss would be covered by ESC, and organizing societies usually have agreed to share any profit with ESC. Considering gains by the Scholarship Fund from these profits, grants provided to the organizing committees and an absence of losses, ESC is in a financially neutral or positive financial position as a result of the Joint Annual Meeting. The Annual Board Meeting and costs associated with honourees are considered overhead, typically \$3000 to \$7500, and excluded from consideration. Attendance at the Joint Annual Meeting fluctuates between 200 and 300, depending on location, but shows no sign of a decline, and participation by graduate students is excellent. The Joint Annual Meeting is likely to be financially sustainable over the near future.

The Bulletin does not generate revenue and is an essential membership service. The current *Bulletin* is of high quality, achieved while reducing the cost from \$19 900 in 2003 to \$9400 in 2004, a remarkable saving. A realistic estimate of ongoing costs is about \$15 000/year, or about 50% of membership dues for the current format. The sustainability of this expenditure would be threatened by escalating costs or declining membership, neither of which seems likely in the near future. The society is well-served by the current annual expenditure on the *Bulletin*, but the cost for this essential membership service is high in relation to membership dues.

The Website does not generate revenue and is

an essential membership service, which comes at a very minor cost. Many members of the public contact ESC as a result of encountering the Website. The Website is likely to become a more and more important for members and as a link between the public and ESC. ESC should seek ways to exploit the Website to enhance communication about entomology, and reduce costs of communication, even if this means increasing the costs of operating the Website.

The Canadian Entomologist is the single greatest source of revenue for ESC, and also results in the largest expenditure. Expenditures in 2003 and 2004 were \$149 700 and \$145 600, respectively. Excluding a contribution from membership fees but including all *TCE* related revenues, *TCE* generated net revenues of \$22 200 and \$33 463 in the two years, respectively. This calculation assumes that institutional subscriptions are for *TCE* (rather than *TCE* and the *Bulletin*, which are both distributed to subscribers). Therefore, institutional subscriptions provide a major source of revenue for the Society. Two factors threaten this revenue, increases in publishing costs and declining institutional subscriptions. ESC recently negotiated a new contract for copy editing and printing of *TCE* with NRC Research Press for 2006 through 2009. The cost increase will be about 12% or \$12 000 per year, reducing our net revenue to \$10 000 to \$20 000 per year for *TCE*. This cost increase was a year or two overdue, and expected. It should not result in a financial problem for ESC, and we have the benefit of assured printing costs for the near future. A potentially serious problem, however, is the continuous decline in institutional subscriptions, from 696 in 1996 to 490 in 2004. This decline is at the rate of about 3.3% per year, or a drop of about \$4000 in revenues per year. If this decline continues, we will move from a net gain on publishing *TCE* to a net loss within three or four years. Solutions include increasing subscriptions, an uncertain prospect at best, or increasing subscription charges. The latter is probably justified because *TCE* is less expensive per page than most entomological journals, and we have not captured the benefit to libraries of providing online access which cost *TCE* \$5080 in 2004. Increasing sub-

scription fees, however, might accelerate the decline in institutional subscriptions. The four-year contract with NRC Research Press and a positive financial situation for *TCE* assures that precipitous action is not warranted, and probably not desirable.

The Scholarships and Awards Program operates through a separately audited fund, generated by donations and return on investments. Awards to support travel of student members are paid from general ESC revenue. Over the past few years, donations to the Scholarship Fund have ranged from \$4710 to \$38 349, annually. The annual expenditures for awards are \$8000 or \$9000. In 2004, interest income on the fund was at a rate of 5.3%. With the fund having reached a level of nearly \$177 000 in 2004, the fund itself should generate close to \$9000 annually and cover the awards made at present. With ongoing donations expected, the fund appears to be fully sustainable, with an excess likely available in another year or two.

The core activities of ESC are financially sustainable for the near future. The only obvious concern is an ongoing decline in institutional subscriptions for *The Canadian Entomologist*. This decline should be monitored and if possible reversed, but does not pose a serious threat over the next two or three years at least.

Implications of Information Technology

The Entomological Society of Canada now uses information technology for much of the day to day communication among members. Communication among Executive members, Secretary, Treasurer, Office Manager and Board are almost exclusively by email. The Society operates a website with much current and past information available to its members and the general public. Our *Bulletin* and *The Canadian Entomologist* are available as digital versions through our Website. Digital "reprints" of papers published in *TCE* can be purchased and distributed to readers. Although we are heavily involved in using information technology to further the aims of Canadian entomologists, as befits the relatively high technical skills of our members, improvements are always possible. Furthermore, changes in technology are

amazingly rapid, sometimes feeling inexorable. Keeping up with technological developments that could help our Society function even more effectively is a challenge. Information technology is likely to be particularly important in speeding the production and reducing the cost of our entomological publications. Nevertheless, adapting to rapid changes in technology may come with costs and uncertainties: new technology means spending time learning the operating manuals instead of doing entomology; our members adapt to new technology at different rates, and may differentially benefit from technological change; the pace of technological change means that our traditional archival needs may not be met, or at best be uncertain. Making technological changes without also assuring that our entomological activities are facilitated by the changes would be folly.

This aspect of the review addresses three changes to our use of information technology that are possible now and might eventually benefit ESC activities: internet- or web-based review of submissions to *TCE*; production of *TCE* and *Bulletin* primarily as digital rather than primarily on paper; adopting the ESC Website as the focus for Society communication.

Internet-based review of submissions to *The Canadian Entomologist*. The current review of manuscripts submitted to *The Canadian Entomologist* consists of a mix of internet communications and transfer of paper documents between Author, Editors, Reviewers and NRC Research Press. Each time the postal system is used, the relatively time-consuming and costly processes of photocopying, completion of address labels, and postage are incurred. More importantly, delivery times for modern postal systems cause substantial delays, often a week to 10 days within Canada, and much longer internationally. Each paper manuscript may require five or more trips through the postal system. Publications delays are an important concern for authors and editors, and such delays are a significant drag on the relentless cycle of publishing issues of the journal. On the other hand, reviewers and editors often prefer to read and work on paper documents than on computer screens. Some computerized review systems rule out this traditional editing approach.

The balance between the benefits of editing on paper and the speed and efficiency of electronic review is a moving target depending on the editor involved.

ESC could purchase electronic review software for the *TCE*. This software costs about \$12 000 for the set-up year and then \$8000 per year subsequently, plus the learning time of the editorial group. ESC decided against this option in our recently negotiated contract with NRC Research Press, because of cost and uncertainties about the need or desirability of the system for *TCE*. ESC has members with the expertise to develop a system using a mix of email, website-based forms, and the postal system, that should speed the review process and ease the paperwork burden for editors. ESC should not expect the development of such a system to be the duty of the Editor-in-Chief, however. The Editor-in-Chief is already giving a great deal of time to editing duties. Entomological editing, which primarily means assessing the scientific value of submissions, is the key job of the Editor-in-Chief, not developing software fixes to ease paper flow. Furthermore, whatever information technology that is developed for use by the Editors must be compatible with their patterns of work; the technology must make their lives easier not more complicated.

***The Canadian Entomologist* and *Bulletin* - digital or paper publications?** Both *The Canadian Entomologist* and the *Bulletin* are available to members and institutional subscribers as paper bound journals as well as digitally. The paper-bound versions are expensive, with the *Bulletin* costing ESC about \$10 000 to \$15 000 per year to publish, down from about \$20 000 a couple of years ago. Large savings through further efficiencies seem unlikely. The costs are for printing and postage. Of course *TCE* is much more expensive to produce, because we also pay for technical editing, formatting, and digital access as well as printing and postage. With declining memberships and institutional, the funds available to support these publications is declining. Electronic publication could save many of the costs, and allow us to go on producing high quality publications, albeit virtual ones. Another important issue is the desire of many libraries to reduce their stor-

age of paper documents, and increasingly disperse information to their users by electronic means. Should ESC pursue all electronic publishing of its serial publications?

Many of our members would be very uncomfortable with this approach. The disadvantages are often discussed. Who wants to read a long document on a computer screen? How do we serve members who don't have modern computers and high speed internet access? Would a digital publication be ignored and sit unread, simply because a computer file is easy to pass by while a physical publication sits on a desk waiting to be opened? Can we sustain satisfactory scientific quality in a rapid-turn-around electronic publication? How would we collect revenue from our publications to support the costs? How do we protect our publications from indiscriminate distribution, with little return to ESC or authors? Perhaps most importantly, how do we guarantee archival security for a virtual publication?

Of course advantages are evident also, and answers can be provided for the questions above. One real advantage is that colour can be used with ease and at low cost in a digital publication. Other media - videos, sound, databases - become feasible parts of our publications. Another advantage is that only those who actually wish to read an article need to print a copy; no one needs to read on their computer screen if they don't want to. For those who don't have the necessary computer equipment, ESC could provide a printed version of papers of interest at cost, using a standard good quality laser printer in the ESC office. The scientific editing could continue as it does now, but the process of technical editing and page formatting is an important matter, that probably cannot be taken over by volunteers. ESC could go on selling memberships and electronic institutional subscriptions as it does now, but the lack of paper serials might affect the number of subscriptions or memberships. ESC probably could not protect our publications from unauthorized electronic distribution, no more than it can protect papers from being photocopied. Secure archival storage of electronic media is a very important issue that would require careful thought and attention to the technology. On the other hand, a

simple fix would be to print and bind a number of copies of each issue, perhaps 20, and distribute these free of charge to libraries around Canada and the world.

Recognizing that the issues raised by the prospect of electronic publishing are critical to the future of ESC, no decision should be made lightly. To that end, the Executive made the decision to negotiate a four-year contract with NRC Research Press, which will continue to give us both the paper and electronic version of *TCE* for that period. The time is available for considering the value and processes of electronic publishing at a time when the financial situation of ESC is robust.

Focussing ESC communication through the Society Website. The ESC website is an extremely cost-effective and useful way to distribute ESC documents and information. Use of this site by members and non-members is likely to increase as time passes. Certainly, improvements in and increased use of information technology by ESC will put an increased burden on the website. Currently, the website is operated by a single volunteer, who has looked after all aspects of the site since its inception as an independent website. The website was recently re-designed and updated. Continued development of the website will require ongoing input from many members of ESC, and likely require a greater financial investment.

Review Participants

The sub-committee chairs were: Membership - Charles Vincent, Past President; Finance - Peggy Dixon, Second-Vice-President; Information Technology - Dan Quiring, First-Vice-President. Much useful input came from Treasurer Pat Bouchard, Secretary Rick West, Office Manager Alexandra Devine, Membership Chair Jon Sweeney, *Bulletin* Editor Paul Fields, Publications Chair Allan Carroll, and Annual Meeting Committee Chair Terry Shore. The recommendations of the review were presented as motions at the November Board meeting and are part of the minutes of that meeting. This article provides a condensed version of the review that led to the recommendations.

Mites of Greenhouses: Identification, Biology and Control. Zhang, Z.-Q. 2003, CABI Publishing, Wallingford, UK and Cambridge, MA, USA. xii + 244 pp. ISBN 0-85199-590-X (hard cover) US\$80\$.

Presented in a readily accessible format, this timely book addresses the need for a compilation of available information on the diversity of mites that may be encountered in greenhouses. It provides illustrated identification keys, information on biology, and various options for control of harmful mites, including application of beneficial predatory mites.

The book is divided into three main parts. Part I introduces the reader first to greenhouses, the plants grown in them, and the mites that invade or are introduced into them, and then to a fuller general presentation of mites, the structures used to identify, describe and classify them, and to methods of collecting, rearing, preserving, and preparing them for study.

Part II includes separate chapters on spider mites, false spider mites, tarsonemids, eriophyids, acarids, and other pest mites, each chapter presenting an introduction, morphological attributes, life history and biology, illustrated keys to genera and species important in greenhouses, followed by available data for each species on distribution, host plants, living appearance and damage symptoms, diagnostic characters, life history, control and management, and references.

The same approach is used in part III on beneficial mites, with separate chapters on phytoseiids, laelapids, and other mesostigmatic and prostigmatic mites. The book ends with part IV, "Accessories", that includes a glossary, an appendix with mite information sources, and an index, each of which is useful. The appendix includes professional organizations, serial publications, directories, internet resources, collections, courses, and suppliers of natural enemies for biological control.

In introductory chapter 2, some lapses include omission of the Cheyletidae, a family of predatory mites with at least one species reported from greenhouses in Japan and USA (Ehara 1962, who also noted other greenhouse species not covered

by this book, *Tetranychus desertorum* Banks, *Brevipalpus californicus* (Banks), *Amblyseius orientalis* Ehara). The key to families of Prostigmata includes the Ereyetidae which is not treated further in the book, but excludes the Tydeidae, Anystidae and Penthaleidae which are considered elsewhere in the book, and it misrepresents the Cunaxidae with a figure of Bdellidae. The same key does not make clear that a capitate prodorsal sensillus is characteristic of only the adult female of Tarsonemidae and Siteroptidae, and that a sejugal furrow may be faint, rather than absent, among members of Tetranychidae. The most prevalent sex determining mechanism in the family Phytoseiidae, parahaploidy, is not mentioned in chapter 2. Reference to a paper by Wu (1986), for a more safe and efficient method of ringing slides, would be useful in chapter 3.

Among the chapters for each family of mites, biological information and illustrations are generally well presented and references well selected. Some over generalizations or otherwise misleading statements include not accounting for some species being thelytokous and others overwintering as eggs in section 4.3 on spider mites, and referring to tenuipalpids in chapter 5 as false spider mites because they do not produce silk webbing on plants, when an entire subfamily of spider mites is also characterized by not producing silk. The statement on pp. 48 and 70 that some *Schizotetranychus* and *Eotetranychus* species may have only one nymphal stage in males is questionable and needs citation of references. The entry for *Tetranychus turkestanii* on p. 68 does not comment on how its female differs from that of *T. urticae* and its male from that of *T. kanzawai*. In chapter 6, seta c2 is mis-labelled as c1 and seta sc1 is shown covered by the prodorsal shield (contrary to the diagnostic statement) in Fig. 6.3, and the dorsal sensory setal cluster is shown on the ventral surface of tibia I in Fig. 6.7. The entry in chapter 7 for *Epitrimerus alinae* cites Lindquist 1996 for further reading, but this should refer to Lindquist, Sabelis and Bruin (editors) 1996. In chapter 10, female phytoseiid mites are characterized by the sternal shield having three pairs of setae, but that of some species has only two pairs. In chapter 12, the section on Stigmaeidae errs in

stating that stigmæids have stigmata and overlooks long distance dispersal that in some cases is by phoresy on insects.

Some grammatical errors and mis-spellings are found throughout the book, but they rarely hinder intended meanings and do not detract from its overall presentation. A few entries in the glossary are imprecise, e.g., duplex setae, famulus, physogastry, podospermy (counter to which there is no entry for tocospermy), solenidion, spermatotreme, v setae (confused with sc setae), and mis-spelled entries for sporotheca and whorl.

Apart from the inaccuracies and omissions noted above, this book is an attractive, useful and well-bound compilation. It is recommended as a reference tool for managers of and workers in greenhouses as well as pest control agencies worldwide, even though some may wince at the price for a book of such modest size.

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- Ehara, S. 1962. Mites of greenhouse plants in Hokkaido, with a new species of Cheyletidae. *Annotationes zoologicae Japonenses* **35**: 106-111.
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- Wu, K.W. 1986. Review of the polyethylene bottle applicator technique for sealing microslide preparations of mites. *International Journal of Acarology* **12**: 87-89.

Evert Lindquist
Ottawa, Ontario

Alexandra Devine retiring

On 1 May 2006, Alexandra (Sandy) Devine, will retire as Office Manager of the Entomological Society of Canada after 20 years of sterling and exemplary service. Her experience, "institutional memory", hard work and devotion to the Society will be sorely missed. Sandy essentially ran the financial, membership and Headquarters operations for the Society on a day-to-day basis since her initial appointment in 1986. Over this time the needs and operations of the ESC changed dramatically and an ever-increasing variety of skills were required to address the challenging and diverse work load imposed upon her. Her success and long tenure are a testament to her ability to adapt and to plan and work independently to attain a variety of goals simultaneously. The positive attitude and dedication she brought to her job for 20 years was above and beyond the call of duty. Originally joining the Society under the reign of Ed Becker, Sandy patiently trained four other societal Treasurers during her tenure and all owe her a great debt, as does the Society. Sandy will be honoured by the Society this fall at the Joint Annual Meeting in Montreal.



Patrice Bouchard

Alexandra Devine will be retiring as Office Manager of the ESC after 20 years of exemplary service.

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Editor's note: Society Directors and Officers are reminded to check these lists, and submit corrections, including the names and positions of new officers.

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The *Bulletin of the Entomological Society of Canada*, published since 1969, presents quarterly entomological news, opportunities and information, details of Society business, matters of wider scientific importance and book reviews.

Published by the
Entomological Society of Canada
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The Entomological Society of Canada was founded in 1863 primarily to study, advance and promote entomology. It supports entomology through publications, meetings, advocacy and other activities.

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ISSN: 0071-0741
Customer Account No. 3975533
Publications Mail Agreement No. 40033986
Printed in Canada
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**Submission deadline for
the next issue: 30 April 2006**



**Bulletin
de la Société d'entomologie du
Canada**

Rédacteur : Paul Fields
Rédactrice adjointe : Marj Smith

Le *Bulletin de la Société d'entomologie du Canada*, publié depuis 1969, présente trimestriellement des informations entomologiques, des occasions, des renseignements sur les opérations de la Société, des dossiers scientifiques d'importance et des analyses d'ouvrages.

Publié par
Société d'entomologie du Canada
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La Société d'entomologie du Canada a été établie en 1863 principalement pour promouvoir l'étude et l'avancement de l'entomologie. Elle soutient l'entomologie par l'entremise de publications, de réunions et d'autres activités.

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ISSN: 0071-0741
Numéro de client : 3975533
Numéro de convention : 40033986
Imprimé au Canada
Droits d'auteur 2006 par la
Société d'entomologie du Canada

**Date de tombée pour le
prochain numéro :
30 avril 2006**

The Buzz / Bourdonnements

Marj Smith, Assitant Editor / Rédactrice adjointe



Paul Fields

Most entomologists I've met entered the profession from the love of insects. So I suppose I'm one of the few who started out as an entomophobe. While at the University of Waterloo in my final year of a BSc focussing on plant physiology and ecology, I decided to take Introduction to Entomology, thinking that if I understood these creatures a bit, maybe I'd be less fearful. Well, talk about "medicine that works"! The course's two professors, Stephen Smith and Herbert Fernando, were real teachers, with an infectious love of the animals they studied. We got to do neat things, like tie fly maggots in half and observe the results of their disrupted hormonal systems, and discover that there are insects under bark and in stream beds. Then, when Stephen Smith offered me an MSc project studying the yellow birch tingid, *Corythuca pallipes*, in Algonquin Park, I knew I was hooked.

Now, much later, I find myself in Winnipeg enjoying my work as an entomologist for Agriculture and Agri-Food Canada, studying the wheat midge and assisting the wheat breeders who are developing midge-resistant wheat varieties. In the meantime, I completed a PhD at University of Manitoba investigating photoperiodic responses and long-distance movements in pea aphid populations, and then I worked seasonally in Pat MacKay's lab doing research on pea aphid and cereal aphids.

Thanks to Paul Fields, I've been given another new opportunity, this time learning desktop publishing. Paul has done a fantastic job of revitalizing the *Bulletin*, and making it a forum for entomologists to share ideas and learn about each other.

La plupart des entomologistes que je connais se sont lancés en entomologie pour l'amour des insectes. Alors, je pense que je suis une des rares entomologistes qui a commencé sa carrière en entomologie comme entomophobe. Dans la dernière année de mon baccalauréat à University of Waterloo, j'ai suivi surtout les cours en physiologie des plantes et en écologie. J'ai décidé de suivre le cours, *Introduction à l'entomologie*, pensant que si je savais plus sur ses créateurs, peut-être que je serais moins peureuse. Eh bien le remède a fait effet. Les deux professeurs du cours, Stephen Smith et Herbert Fernando, étaient de vrais enseignants, avec un amour contagieux pour le sujet de leurs études, les insectes. Nous avons eu la chance de faire des choses super intéressantes, comme lier les asticots de mouches en deux et observer les résultats de leur systèmes hormonaux perturbés. Aussi, nous avons découvert qu'il y avait des insectes sous l'écorce des arbres et dans les ruisseaux. Alors, quand Steve Smith m'a offert un projet de maîtrise sur une tingid, *Corythuca pallipes* en parc Algonquin, je savais que j'avais la piqûre.

Maintenant, beaucoup plus tard, je me retrouve à Winnipeg, heureuse dans mon travail comme biologiste pour Agriculture et agroalimentaire Canada, où j'étudie le cécidomyie du blé et j'aide les sélectionneurs de blé à développer les variétés de blé résistants au cécidomyie du blé. Entre temps, j'ai complété mon doctorat à l'Université du Manitoba sur les réponses des pucerons de pois à la photopériode et à la migration à longue distance. Après cela, j'ai travaillé saisonnièrement pour Pat MacKay sur les pucerons des pois et les pucerons des céréales.

Grâce à Paul Fields, j'ai eu une autre opportunité, celle d'apprendre l'édition. Paul a fait un travail fantastique de revitaliser le *Bulletin*, en faisant un forum où les entomologistes peuvent partager leurs idées et mieux se connaître.

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Publications Mail Agreement No. 40033986
 Date of issue: March 2006

ISSN: 0071-0741

Images

On the spine: The spurge hawk-moth, *Hyles euphorbiae* (L.) (Sphingidae), a biological control agent introduced to North America during the 1960s, photo: P. MacKay.

Beneath the title: The boxelder bug, *Boisea trivittatus* (Say) (Rhopalidae), feeds on seeds of female boxelder trees, photo: B. Landry.

Photos on front cover:

1. The two-striped grasshopper, *Melanoplus bivittatus* (Say) (Acrididae), a major North American crop pest, completing its molt, photo: T. Wist.

2. Sampling for the soybean aphid, *Aphis glycines* Matsumura (Aphididae), photo: J. Brodeur.

3. *Stratiolaelaps scimitus* (Womersley) (Laelapidae), a predatory mite used as a biological control agent for thrips and fungus gnats in greenhouses, photo: D. Walter.

4. *Perillus bioculatus* (F.) (Pentatomidae), the twospotted stinkbug, a natural predator of the Colorado potato beetle, photo: S. Marshall.

5. The ponderosa pine seedworm, *Cydia piperana* (Kft.) (Tortricidae), an obligate seed feeder common on ponderosa pine, photo: L. van Akker.

Back cover: The assassin bug, *Zelus luridus* Stal (Reduviidae), feeding on a flower fly, *Ocyrtamus fascipennis* (Wiedemann) (Syrphidae), photo: S. Marshall.

Français à l'intérieur de la couverture avant