



Bulletin

Entomological Society of Canada
Société d'entomologie du Canada

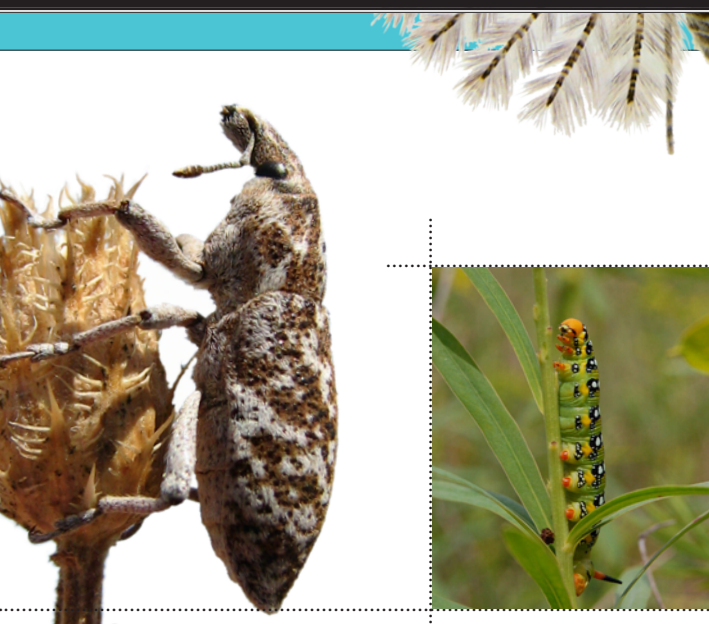
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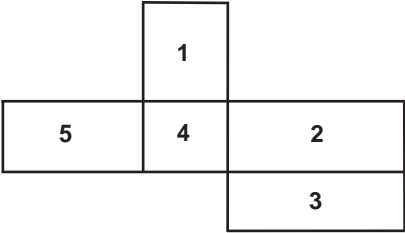
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Images

- Sur le dos:** *Cyphocleonus achates* (Fahraeus) (Coleoptera: Curculionidae) est un charançon des racines introduit au Canada pour le contrôle biologique d’espèces exotiques de centaurées. Photo: B. Van Hezewijk
- Sous le titre:** *Alucita adriendenisi* (Landry & Landry) (Lepidoptera: Alucitidae), retrouvé dans presque tout le Canada, a été nommé en l’honneur d’Adrien Denis qui a assisté Carl Atwood, le père de Margaret Atwood, dans ses travaux entomologiques et a laissé une impression importante à la famille Atwood. Photo: J. Dombroskie
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- 4** Récolte de parasitoïdes du charançon de la graine de chou, *Ceutorhynchus obstrictus* (Marshall) (Coleoptera: Curculionidae), dans des champs de canola (*Brassica* sp.). Photo: T. Haye
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- Couverture arrière:** Une saperde du pommier, *Saperda candida* (Fabricius) (Coleoptera: Cerambycidae) près de Peterborough en Ontario. Les individus de cette espèce varient sur la prédominance de bandes claires (comme ce spécimen) ou foncées. Photo: J. Fitzsimmons





I think my column in this issue of the *Bulletin* should be entitled: “Goodbyes, Hellos, Thank yous and How Tos”! The first order of business is to say “goodbye” and “thank you” to Kevin Floate for the time and effort he has put in as editor of the *Bulletin*. Kevin has served as editor for three years and the final issue under his stewardship was the December 2009 issue. From his very first issue, Kevin’s passion for entomology and entomological pursuits has shaped the content and production of the *Bulletin*. Kevin has encouraged all ESC members to share their interests, pursuits and “way-cool” bug trivia with other members in the pages of the *Bulletin*. Kevin’s enthusiasm along with his extraordinary organizational skills and the help of the assistant *Bulletin* editor, Fred Beaulieu, make him a hard act to follow! However, I think his replacement is up to the task and I would like to say “hello” to our new *Bulletin* editor, Cedric Gillott. As many of you know, Cedric was the recipient of the ESC’s Gold Medal for outstanding achievement in Canadian entomology in 2007. You are probably also familiar with his textbook “Entomology” the third edition of which was published in 2005. I guess you could say that Cedric shares Kevin’s enthusiasm for entomology! Some of Cedric’s former students (not

Je pense que ma chronique de ce numéro du *Bulletin* devrait s’intituler: “Au revoir, bonjour, merci et comment » ! Le premier point est de dire « au revoir » et « merci » à Kevin Floate pour le temps et l’investissement qu’il a mis en tant que rédacteur du *Bulletin*. Kevin a servi en tant que rédacteur durant trois ans, et le dernier numéro sous son commandement était celui de décembre 2009. Depuis son tout premier numéro, la passion de Kevin pour l’entomologie et les activités entomologiques ont modelé le contenu et la production du *Bulletin*. Kevin a encouragé tous les membres de la SEC à partager leurs intérêts, activités et anecdotes avec les autres membres dans les pages du *Bulletin*. L’enthousiasme de Kevin ainsi que son sens extraordinaire de l’organisation et l’aide du rédacteur adjoint du *Bulletin*, Fred Beaulieu, ont placé la marche haute! Cependant, je pense que son remplaçant est à la hauteur, et je voudrais dire « bonjour » à notre nouveau rédacteur du *Bulletin*, Cedric Gillott. Comme beaucoup d’entre vous le savez, Cedric a reçu la Médaille d’or de la SEC pour sa contribution exceptionnelle à l’entomologie canadienne en 2007. Vous êtes probablement également familier avec son livre « Entomology », dont la troisième édition a été publiée en 2005. Je pense que l’on peut dire que Cedric partage l’enthousiasme de Kevin pour l’entomologie! Certains des anciens étudiants de Cedric (en ne nommant personne) m’ont informé qu’il est également enthousiaste face à la grammaire... Alors je suis certaine qu’il fera un rédacteur fantastique! Cedric a beaucoup d’idées afin d’améliorer le *Bulletin* dans les prochains numéros. Il continuera à recevoir l’excellente assistance de Fred Beaulieu, à qui je voudrais également dire un gros « merci ».

Le rédacteur en chef de *The Canadian Entomologist*, Robb Bennett, a informé le conseil d’administration de la SEC qu’il nous dira bientôt « au revoir ». Robb prévoit quitter son poste à la fin de la réunion conjointe annuelle en octobre 2011. Je suis sûre que

mentioning any names) have informed me that he is also enthusiastic about grammar...so I am sure he will be a fantastic editor! Cedric has lots of great ideas for strengthening the *Bulletin* to keep an eye out for in future issues. He will continue to receive the excellent assistance of Fred Beaulieu to whom I would also like to issue a big “thank you”.

The editor-in-chief of *The Canadian Entomologist*, Robb Bennett, has informed the ESC governing board that he will soon be saying “goodbye”. Robb plans to resign from his post at the end of the JAM in October 2011. I am sure you will all agree that Robb has managed the editorship of our journal through some difficult times and has come out on the other side with some major improvements to the journal. Robb has been instrumental in the coordination of converting the journal to digital print production that will result in considerable cost savings to the society. Robb has worked hard to reinstate the CP Alexander invited review series and coverage of topical and even controversial issues in this series will certainly increase readership and citation of *The Canadian Entomologist*. Robb has also been brainstorming with the editorial board to find ways to increase submissions to the journal from ESC members. The most recent initiative is a “page charge waiver” for ESC members to be applied to 6 published pages per year. Check out this latest benefit of your ESC membership at <http://www.esc-sec.ca/canent/colourwaiver-tce.pdf>. Although Robb will not be officially saying “goodbye” until October 2011, he deserves many “thank yous” for his continued efforts at compiling a high quality broad-based entomological journal. If any of you are interested (or know of someone who could be convinced) in taking on this challenging and rewarding position starting in 2011, please let me know.

There are many more “thank yous” that need to be handed out to the many people currently serving our society but I would like to finish my column in this issue with a few “how tos”. Members have recently asked me “how to” access the digital back issues of *The*

vous serez d’accord pour dire que Robb a su mener la rédaction de notre journal au travers de certains temps plus difficiles, et est parvenu de l’autre côté avec des améliorations majeures pour le journal. Robb a aidé à la coordination de la conversion du journal vers la production numérique qui résultera en des économies considérables pour la Société. Robb a travaillé fort afin de réinstauré les revues invitées CP Alexander et la couverture de sujets parfois controversés dans cette série va certainement augmenter le nombre de lecteurs et les citations de *The Canadian Entomologist*. Robb a également brassé des idées avec le bureau de la rédaction afin de trouver des façons d’augmenter le nombre d’inscriptions au journal par les membres de la SEC. Sa plus récente initiative a été l’exemption de frais de publication pour la publication de 6 pages publiées par an pour les membres de la SEC. Consultez ce dernier avantage à votre adhésion à la SEC à <http://www.esc-sec.ca/canent/colourwaiver-tce-fr.pdf>. Quoique Robb ne nous dise pas officiellement « au revoir » avant octobre 2011, il mérite de nombreux « merci » pour ses efforts continus pour maintenir un journal entomologique de haute qualité. Si vous êtes intéressés (ou connaissez quelqu’un qui pourrait être convaincu) à prendre la relève pour cette position débutant en 2011, veuillez me contacter.

Il y a de nombreux autres “merci” qui doivent être adressés aux nombreuses personnes servant présentement notre société, mais je voudrais terminer ma chronique pour ce numéro avec quelques « comment ». Les membres m’ont récemment demandé « comment » accéder aux numéros antérieurs numérisés de *The Canadian Entomologist*. L’accès aux numéros antérieurs se fait via le site Internet de la SEC, en cliquant sur l’onglet revue. Sous la version en ligne, en cliquant, vous serez redirigé vers le site Internet des presses scientifiques du CNRC. Votre nom d’utilisateur et mot de passe de la SEC vous donneront accès à tous les numéros antérieurs à partir de 1868! D’ici la fin janvier 2010, les membres de la SEC seront excités d’apprendre « comment »

Canadian Entomologist. Access to the back issues is obtained by going to the ESC website and clicking on the journal tab. Under online access click here and you will be redirected to the NRC Press website. Your ESC username and password will get you access to all the back issues dating back to 1868! By the end of January 2010, ESC members will be excited to learn “how to” renew their membership on line. New web pages are currently being tested and a note will be placed on the ESC main page when the testing period is over. More changes to the web page will include the ability to submit conference registration online as well as add to the common names database. “Thank you” to our web master Rick West and chair of the web content committee Michel Cusson who have been heavily involved in the direction of these changes.

renouveler leur adhésion en ligne. De nouvelles pages Internet sont présentement testées et une note sera placée sur la page d’accueil de la SEC quand la période d’essai sera terminée. D’autres changements seront apportés à la page Internet, notamment afin de permettre de s’inscrire en ligne aux conférences, ainsi que d’ajouter des noms communs d’insectes à la base de données. « Merci » à notre webmestre, Rick West, et au président du comité du contenu Internet, Michel Cusson, qui se sont abondamment investis dans la direction de ces changements.



Steve Marshall

A periodical cicada (*Magicicada* sp.)

Moth balls / Boules à mites

Andrew Bennett



To Key or Not to Key?

I have to admit that there is something deeply satisfying about looking at an animal or plant and knowing precisely what it is and (in many cases), something about what it does. There's nothing strange about this. I see it in my young children as they gleefully distinguish lions and tigers and bears (oh my)... It's part of our human condition – a remnant of our evolution that allowed our ancestors to survive by distinguishing the nutritious from the poisonous; the harmless from the dangerous. With the advent of modern taxonomy, diagnosing new taxa from all previously described related taxa became a mandatory requirement of all valid taxonomic descriptions. And whereas in isolated taxa, this may be accomplished by means of a simple diagnostic sentence or paragraph, in more speciose taxa, the best way

to demonstrate that a species is new is to provide an identification key that clearly illustrates the unique set of characters of the new species in relation to its congeners.

I spend a lot of my time reading, writing and reviewing identification keys. Perhaps because I work on a very speciose, taxonomically difficult group, I am more exposed and therefore more sensitive than most to “challenging” keys. It's not always the fault of the taxonomist that a key is not effective at distinguishing the constituent taxa. For some taxa, there simply aren't morphological characters to distinguish species. In truth, for some taxa, there aren't even molecular characters! But not all bad keys have to be bad. Some keys are simply poorly conceived, with bad character choices, ambiguous character descriptions and poor or non-existent accompanying illustrations.

So now I come to the purpose of this issue's column which is to try to expose some of the shortcomings I have experienced in my taxonomic travels through the Land of Bad Keys. Some of these examples may be exaggerated or (dare I say) even imaginary, but others I have to deal with on a daily basis. For instance:

The overlap

Key to one (or two) species that should (or should not) be recognized as distinct

- | | | |
|----|---|----------------|
| 1. | Head 1.3 to 1.5 times as wide as long | Species A |
| — | Head 1.5 to 1.7 times as wide as long | Near species A |

I find this kind of couplet all the time in the literature of my group. Almost always, the specimen in my hand ends up measuring 1.5 times as wide as long. Notice that curiously, there are no other supporting characters. Kind of makes you wonder if the taxonomy behind the couplet is sound,

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doesn't it? Inevitably, this kind of beauty begins to appear in the middle to end of a 150 couplet key, never near the beginning where you can just give up quickly and write "sp." behind the generic name on your det. label.

Baby steps?

Here is a test for non- (or bad) taxonomists. When devising a dichotomous key, which is preferable: to have couplets that divide the remaining taxa to be keyed exactly in half, or to split off one taxon at a time in every couplet? Assuming that all characters are equal in terms of diagnostics, the answer is certainly for each couplet to divide the remaining taxa in half. To verify this numerically, if you have six species to key and use the two methods, the equal division method keys out all six species in an average of 2.7 steps, whereas the latter method requires an average of 3.3 steps. This disparity begins to make a huge difference to the amount of time required to key taxa when one has many specimens to identify and also when the number of taxa in a key is large. Baby steps are good in many pursuits, but keying bugs is not one of them!

Unsavoury character choice

Sometimes taxonomists make poor choices regarding characters to include in their keys. For instance, some characters are often hidden (e.g., on the back of the head) or require difficult, time-consuming specimen preparation (e.g., internal musculature), whereas some demand techniques of observation better left to the birds...

Key to the garden strawberry and its pests

1. Strawberry to sub-strawberry flavour
 ***Fragaria x ananassa* Duchesne** (common garden strawberry)
 — Not even slightly reminiscent of strawberry flavour **2**
2(1). Elytra present ***Anthonomus signatus* Say** (strawberry clipper weevil)
 — Elytra absent (hemi-elytra present)
 ***Lygus lineolaris* (Palisot de Beauvois)** (tarnished plant bug)

Of course, in the preceding key, the evaluation of Couplet 1 may have dire consequences for the ensuing evaluation of Couplet 2 (at least if the specimen is consumed in its entirety). This leads to the next category of bad characters:

Completely unobservable characters

At least in the previous example, the reader had a chance to identify their tarnished plant bug (assuming they only nibbled a leg or two). Some characters are only theoretically of use but, in practice, simply cannot be evaluated. For example:

Key to three dinosaurs you probably know...

- | | | |
|-------|--|--|
| 1. | Hind leg predominantly puce | <i>Tyrannosaurus rex</i> Osborn |
| — | Hind leg predominantly amaranthine | 2 |
| 2(1). | Multisyllabic alarm call | <i>Triceratops horridus</i> Marsh |
| — | Monosyllabic alarm call | <i>Styracosaurus albertensis</i> Lambe |

In the key above, there are at least two problems with Couplet 1. First, nobody has any valid idea what colour the hind leg of *T. rex* might have been (despite many artists' renditions). Second, what the hell is puce? This question (which will be answered later) segues nicely to the next annoying habit that many taxonomists introduce into both keys and species descriptions:

Use of obscure terms when clearly understood terms are available

Key to bugs drawn by my six year old son

- 1. Fore coxa spadiceous. Mesonotum slightly pavonated medially. Apex of abdomen porraceous with a hint of gridelin (at least laterally in males) **Awesomely-jawed cockroach crusher**
- Fore coxa cinerious. Mesonotum completely icteritious. Apex of abdomen ianthine to solferino **2**
- 2(1). Dorsal aspect of pronotum incarnadine. Fore wing puccoon except for smaragdine spots ventrolaterally. Hind coxa fulvo-ferruginous **Breakfast for awesomely-jawed cockroach crusher**
- Dorsal aspect of pronotum aeneous. Fore wing strongly miniaceous dorsally with bands of mazarine ventrally. Hind coxa stramineous **Afternoon snack for awesomely-jawed cockroach crusher**

Apart from taxonomists, only Latin/Greek scholars and lipstick designers might know that the above key deals entirely with colours! What’s wrong with good old orange and red, I ask? (By the way; in the previous key, puce is brownish purple).

Of course, all of the previous bad keys were based on bad character decisions by taxonomists. There is another entire class of futility caused not by errors of judgement, but by errors of bone-headedness. For instance:

Key to a chain of events in the life of a mathematically challenged taxonomist

- 1. Realization: “I know this. Let’s key it out in the first couplet” **Aha Menke**
- Not as above **3**
- 2(1). What has unfortunately occurred in Couplet 1 **Lapsus Pacheco**
- Not as above **5**
- 4(3). What has unfortunately happened again in Couplet 2 **Oops Agassiz**
- What would occur if this individual began publishing on your taxon **Disaster Agassiz**

But then again, it could be worse...

A key to taxonomist’s Hell

- 1. Small. Black. Non-descript **2**
- Very small. Very black. Very non-descript **3**
- 2(1). Wings reduced. Sparsely punctate. Sparsely setose **1**
- Wings absent. Impunctate. Lacking setae **1**
- 3(1). Wings reduced. Sparsely punctate. Sparsely setose **1**
- Wings absent. Impunctate. Lacking setae **1**

At this point I could (or perhaps should) discuss all the new advances that are making construction of identification keys easier and more effective than in the past (e.g., digital image stacking software; multi-entry, interactive computer-based identification keys; and, verification of morphology with DNA). But that’s not my style. I prefer to leave you in taxonomist’s Hell, so you get a glimpse of what my life is like when somebody asks me to identify a *Glypta* or *Mesochorus* ichneumonid specimen (among others).

Join me next time as *Moth Balls* discusses more key issues in entomology.



Dear Buggy,

What's so important about order of authors on papers? I hear my lab mates talking about first-author this and second-author that. I figure if you've worked hard and contributed to the paper it doesn't matter where you are in the list. I admit I'm pretty new at all this article-authorship thing, but is this something I should be worried about?

Signed 'Out of Order in Okotoks'

Excellent question OOO! [Looks like Buggy needs to fire the guy who comes up with these clever names, they're getting sillier with every column.]

The question of who should appear where in the list of authors is one that comes up quite a bit. The answer though, like many aspects of the publication process, is quite complex.

Most people will tell you that it is the first author and the last author who hold the coveted positions on a paper. Generally, the person who did the most work has their name first on the paper. The last author position is (for graduate students at least) often the person who runs the lab where the work was done. That's the simple answer.

In reality, most papers have more than one author; thus, it can be quite challenging to decide which name goes where when it comes time to submit the paper. There are actually two issues here: who deserves to be on a paper, and where should their name appear.

Say you have a lab mate who you go for beer with every once in a while to discuss your project. Over the course of a few months, you hash out your study design. Later on, when you're writing up the successful research from this project, your lab-mate asks to be on the paper. Does he deserve to be, just for helping you think out the project?

Imagine a different scenario. What about the situation where your research is built upon the work of another student in the lab. You share data back and forth in order to help explain each other's findings. Do you both deserve to be on each other's papers? If so, who goes first?

What about the situation where your supervisor insists that their colleague appears on your paper. Perhaps it's one of your committee members and you don't feel they've done much for your project. What then?

These are scenarios that come up all the time in research. Truth be told, just about everyone eventually winds up in an argument over authorship; however, many graduate students (and even a few non-graduate students) are often naive to the issues that arise over authorship.

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Dear Buggy is always looking for suggestions or guest contributors. Have an idea? Send it to cjkmacquarrie@gmail.com or post in the Facebook student group.

So why does it even matter? For starters, authorship counts in getting and keeping a job; the farther you progress in a research career, the number of publications and, more importantly, the number of first author publications will influence your likelihood of getting a job and being promoted. For many graduate students, especially those that aspire to academia or government research, it's therefore important to think about where you will appear in the list of the publications you contribute to. For the most part, you should expect to appear as first author on all your thesis work. But, just as importantly, you want to avoid the potential conflicts that go along with having many collaborators.

One solution is to be up-front about your intentions and address the issue early. You may find yourself in a project with a large number of collaborators all contributing equally to a large research project. In this case it would be productive to sit down early on in the project and sketch out the list of potential publications and who will appear on which. This list will be fluid and change as the project matures, but the exercise will help you get a feel for how your collaborators and potential co-authors approach authorship. More importantly, it will give you an idea as to the amount of contribution that is expected of you for any papers you won't be first author on.

In a smaller research project you may find yourself in the situation of relying upon a colleague for help (e.g., with your analysis, or access to special equipment). If this help becomes significant or important to your research, you should ask them what their expectations for authorship are. Some might demur, especially if your work is very different from their own, while others might expect authorship for a very small amount of help.

Eventually, you'll likely be faced with someone requesting authorship. This is a little more troublesome and can require a good deal of tact and diplomacy to come to a resolution where everyone is happy.

In truth, there are no hard and fast rules for dealing with whose names appear on a paper. But, it can help to have some general criteria you can use to judge whether someone deserves authorship on a paper. Here are a few of the criteria that I like:

- Was there a significant contribution to the design of the experiment or the analysis of the data?
- Did they make a significant contribution to the writing of the paper and the interpretation of the results?
- Did they make another intellectual contribution to the work (e.g., offered a critical interpretation, or were a sounding board for the research)?
- Did the person help with the technical aspects of the work?
- Did they provide resources to do the work (space, field sites, equipment)?
- Did they give or obtain funds that paid for at least some of the research?

You may agree or disagree with my criteria, and you may have your own. I think the real challenge though in this discussion is how you apply these criteria. You might be happy to have your co-authors do just one of these things; somebody else might want their potential co-authors to meet all these demands (good luck!). Regardless, your co-authors (if they're any good at all!) will appreciate it if you can state what you expect their contributions to be.

Now that you've decided who gets to be on the paper, how do you decide the order? Well, that's a bit trickier, and here again there are no rules. I've seen authors listed alphabetically, I've heard of papers where the authors drew straws, and some groups will apply a list of criteria and arrange the authors in order of their contribution. In reality, the decision will be up to you. Generally though, the deeper in the author list that your name appears, the less your contribution will be perceived to be. However, while that sentiment is still true in many disciplines and a common belief among scientists, the times they are a changing.

In recent years some journals have adopted a policy of allowing authors to specify what the contribution of each author was. This rather revolutionary idea has allowed both authors and readers to see the contribution of each person whose name appears on the paper. In journals where this is the policy, you'll now find a footnote that provides this information. In truth, if you find this to be an acceptable policy, there is no reason that you can't do this on your own papers, regardless of where you send them. If enough journals see that authors want this feature, I suspect more will come around to allowing their authors the latitude to include this information.

So OOO, I hope that helps. As always, concentrate on the content of your papers. That's the most important part. Arguments over authorship are inevitable, but they are always second to making sure the science is right. Good luck!

Buggy

Note: Buggy was responsible for the writing of this column; OOO provided the question; G. Lenfiddich provided the inspiration.

Meeting announcements / Réunions futures

Butterfly Conservation's 6th International Symposium: "The 2010 target and beyond for Lepidoptera"

Reading, UK, 26-28 March 2010

www.butterfly-conservation.org/symposium

19th International Plant Resistance to Insects Workshop

Charleston, South Carolina, USA, 28-31 March 2010

<http://entweb.clemson.edu/scesweb/ipri/>

Joint IOBC – Nearctic and Neotropic Regional Sections Conference

Niagara Falls, Ontario, 11-13 May 2010

http://www.iobcnrs.com/event_5-11-10.htm

6th International Wolbachia Conference

Asilomar, California, USA, 9-14 June 2010

<http://www.wolbachia.sols.uq.edu.au/news.cfm?action=newsitem&id=204>

34th Annual Meeting of the American Arachnological Society

Greenville, North Carolina, USA, 11-15 June 2010

http://www.americanarachnology.org/AAS_Meetings/index.html

54th Livestock Insect Workers Conference

Knoxville, Tennessee, USA, 27-30 June 2010

International Organisation for Biological and Integrated Control of Noxious Animals and Plants (IOBC) (Western Palaearctic Regional Section): "Land-scape management for functional biodiversity"

Cambridge, UK, 29 June – 1 July 2010

<http://www.iobc-wprs.org/pub/index.html>

6th International Conference on the Biology of Butterflies

University of Alberta, Edmonton, Alberta, 29 June – 2 July 2010

<http://www.biology.ualberta.ca/biobutterfly2010>

7^e conférence internationale francophone d'entomologie

Louvain-la-Neuve, Belgique, 5-10 July 2010

<http://www.biodiv.be/events/7eme-conference-internationale-francophone>

43rd Annual Meeting of the Society for Invertebrate Pathology

Trabzon, Turkey, 11-15 July 2010

www.sip2010.org

International Conference on Invertebrate Reproduction and Development

Prague, Czech Republic, 16-20 August 2010

<http://icird.bc.cas.cz/>

IXth European Congress of Entomology

Budapest, Hungary, 22-27 August, 2010

<http://www.ece2010.org/>

XIIIth International Congress of Acarology

Recife, Brazil, 23-27 August 2010

<http://www.cenargen.embrapa.br/ica13/index.php>

Biological Control for Nature

Northampton, Massachusetts, USA, 3-7 October 2010

<http://biocontrolfornature.ucr.edu/>

Joint Annual Meeting of the Entomological Societies of Canada and British Columbia

Vancouver, British Columbia, 31 October – 4 November 2010

http://www.sfu.ca/biology/esbc/JAM/jam_announce.html

58th Annual Meeting of the Entomological Society of America

San Diego, California, 12-15 December 2010

<http://www.entsoc.org/am/fm/2010/index.htm>



Max Larrivée

A Hummingbird Clearwing, *Hemaris thysbe* (Sphingidae)



Hello Entomology Students! It's hard to believe that a year has passed since I became the Student Representative for the Entomological Society of Canada. It has been a very rewarding experience so far and I am looking forward to my final year as the Student Rep for the ESC. If you have any questions or concerns about the ESC and entomology training in Canada, please let me know so I can bring them to the Society's attention at the governing board meetings. As my term as Student Rep for the ESC will finish at the next Joint Annual Meeting, we will be looking for a new student to take over this summer. If

you have any questions about the Student Rep or Student Affairs Committee member positions, please send me an e-mail (athielman@brocku.ca). The term for Student Representative is usually 2 years with the option to stay on for a third year if desired. The term of appointment for members of the Student Affairs Committee is 1 year but can also be renewed on a yearly basis. So, be sure to watch the website and check out the next issue of the *Bulletin* for more information about these positions and future events.

Directory of Entomology Education in Canada

The Student Affairs Committee has been hard at work updating the Directory of Entomology Education in Canada (2005) which is posted on the Student Affairs pages of the ESC website. There seem to be many changes required, most that stem from an initial lack of response by some institutions to the questionnaire sent out by the Student Affairs Committee in 2005. The greatest challenge our committee has faced has been finding people at each institution in Canada that offers entomology-related programs who would be willing to help provide the information we are seeking. So, if you have a couple of minutes, check out the Directory and see if your school is among those listed. If your school is not there, or if the information is out of date, please let me know (athielman@brocku.ca). I would really appreciate all the help we can get to make the Directory as up-to-date and comprehensive as possible.

ESC Facebook Group

The "Entomology Job and Training Opportunities" link (Student Affairs section of ESC website) regularly posts links to entomology-related job and academic opportunities. However, our current system requires a URL address or similar link to the particular posting, which means that some of the postings that come to my attention don't make it onto the ESC website. In these cases, I try to post them on the ESC Student Member Facebook Group Page. Facebook has made recent changes to the way the Group pages appear, making them more like personal Facebook pages. It has been great to see activity on the ESC Student Facebook page increased over the last few months. It is a great way for entomology students from all over the world to keep in touch, post questions about grad school, see what other students are doing these days, etc. If you have a Facebook page and are not already a member, I encourage you visit the site, join the Group and start posting!

Student Profiles

I would also like to remind students that there is a link in the Student Affairs to a page called Student Profiles, a site that allows students to have their own webpage on the ESC website. If you would like to add your profile to the list, please contact the site administrator, Kimberley Rondeau (kimberly.rondeau@ualberta.ca). If you already have a Profile page, perhaps it's been some time since you last sent your information in to Kim – have another look and send her all your updates as soon as you get a chance.

Whether you're still analysing last year's data or already planning your next field season, I wish you all the best with your research and theses in the coming months. Don't forget to check the Student Affairs section of the ESC website for news, updates, and other items of interest to entomology students.

Aynsley

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Thesis Roundup

I have only received a few Thesis Roundup submissions since last time:

Hunting, Wes. MSc, 2009. *A taxonomic revision of the Cymindis (Pinacodera) limbata species group (Coleoptera: Carabidae: Lebiini), with notes about evolutionary considerations.*
Supervisors: George E. Ball and Felix A. H. Sperling. University of Alberta.

Tansey, James. PhD, 2009. *Mechanisms of cabbage seedpod weevil, Ceutorhynchus obstrictus, resistance associated with novel germplasm derived from Sinapis alba x Brassica napus.*
Supervisors: Lloyd M. Dosdall and Andrew Keddle. University of Alberta.

Hummel, J.D. PhD, 2009. *Insect and agronomic responses in canola and wheat intercrops.*
Supervisor: Lloyd M. Dosdall. University of Alberta.

If you or someone you know has recently defended their thesis, please send the following information to me at athielman@brocku.ca:

Name, Degree, Date Defended. Title of thesis. Supervisor(s). Institution.

If the student would like to have their e-mail address printed with their degree information, please have them e-mail me directly for permission to publish their e-mail address. Or, fill out the Thesis Roundup Submission Form (next page) and mail it to me at the address on the form.

Thesis Roundup submission form

Name: _____

E-mail address: _____

Degree: _____

Date: _____

Title: _____

Supervisor(s): _____

Institution: _____

Formulaire de soumission – Foisonnement de thèses

Nom: _____

Courriel: _____

Diplôme: _____

Date: _____

Titre: _____

Directeur(s): _____

Institution: _____

Please send to/Envoyer à:

Aynsley Thielman,
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St. Catharines, ON, Canada
L2S 3A1

Bonjour étudiants en entomologie! Il est difficile de croire qu'une année s'est écoulée depuis que je suis devenue la représentante étudiante de la Société d'entomologie du Canada. Ce fut une expérience vraiment enrichissante jusqu'à maintenant, et j'ai hâte à ma dernière année en tant que représentante étudiante de la SEC. Si vous avez des questions ou des inquiétudes au sujet de la SEC et de la formation en entomologie au Canada, veuillez me contacter afin que je mentionne le sujet aux réunions du conseil d'administration. Mon mandat en tant que représentante de la SEC se terminera à la fin de la prochaine réunion conjointe annuelle, alors je serai à la recherche d'un nouvel étudiant qui prendra ma place cet été. Si vous avez des questions au sujet du poste de représentant étudiant ou du comité des affaires étudiantes, veuillez me contacter à athielman@brocku.ca. Le mandat de représentant étudiant est généralement de deux ans avec une option de rester pour une troisième année. Le mandat de membre du comité des affaires étudiants est de un an, mais peut également être renouvelé sur une base annuelle. Alors, n'oubliez pas de consulter le site Internet et de regarder le prochain numéro du *Bulletin* pour plus d'information sur ces postes et sur les événements futurs.

Répertoire des formations entomologiques au Canada

Le comité des affaires étudiantes a travaillé fort afin de mettre à jour le répertoire des formations entomologiques au Canada (2005), affiché sur la page des affaires étudiantes du site Internet de la SEC. Il semble y avoir de nombreux changements requis, la plupart provenant d'une absence de réponse de certaines institutions au questionnaire envoyé par le comité des affaires étudiantes en 2005. Le plus grand défi de notre comité a été de trouver des gens dans chaque institution canadienne offrant des programmes liés à l'entomologie qui seraient prêts à nous aider à trouver l'information recherchée. Alors, si vous avez quelques minutes, consultez le répertoire (disponible sur le site Internet de la SEC) et regarder si votre école est dans la liste du document. Si elle n'y est pas, ou si les informations sont incorrectes, veuillez me le faire savoir (athielman@brocku.ca). J'apprécierais vraiment toute l'aide que nous pourrions obtenir afin de rendre le répertoire aussi à jour et compréhensible que possible.

Le groupe SEC sur Facebook

Le lien "Opportunités d'emplois/recherche" (section des affaires étudiantes du site Internet de la SEC) affiche régulièrement des liens vers des emplois liés à l'entomologie et des opportunités académiques. Cependant, notre système actuel nécessite une adresse URL ou un lien similaire vers la page spécifique, ce qui implique que certaines opportunités que je reçois ne peuvent être affichées sur le site. Dans ces cas, j'essaie de les afficher sur la page du groupe des étudiants de la SEC de Facebook. Facebook a fait de récents changements sur la façon dont les pages de groupes s'affichent, les rendant plus similaires aux pages personnelles de Facebook. J'ai été contente de voir que l'activité sur la page Facebook des étudiants de la SEC a augmenté dans les derniers mois. Il s'agit d'une bonne façon pour les étudiants en entomologie du monde entier de rester en contact, d'afficher des questions sur les institutions, de voir ce que les autres étudiants font, etc. Si vous avez une page Facebook et n'êtes pas encore membre du groupe, je vous encourage à visiter le site, à joindre le groupe et à commencer à afficher!

Profiles étudiants

Je voudrais également rappeler aux étudiants qu'il y a un lien sur la page des affaires étudiantes vers une page nommée Profils étudiants, un site qui permet aux étudiants d'avoir leur propre page Internet sur le site de la SEC. Si vous voulez ajouter votre profil à la liste, veuillez contacter l'administratrice de cette page, Kimberley Rondeau à kimberly.rondeau@ualberta.ca. Si vous avez déjà une page de profil, il y a peut-être un moment que vous ne l'avez mis à jour en envoyant des informations à Kim – jetez-y un œil et envoyez lui toutes les mises à jour dès que vous en aurez l'occasion.

Que vous soyez en train d'analyser vos données de l'an dernier ou que vous planifiez votre prochaine saison de terrain, je vous souhaite tout ce qu'il y a de meilleurs dans vos recherches et votre thèse pour les mois à venir. N'oubliez pas de consulter la page des affaires étudiantes du site Internet de la SEC pour des nouvelles, mises à jour et autres items d'intérêts pour les étudiants en entomologie.

Aynsley

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Foisonnement de thèses

Je n'ai reçu que quelques soumissions pour le foisonnement de thèses depuis la dernière fois:

- Hunting, Wes.** MSc, 2009. *A taxonomic revision of the Cymindis (Pinacodera) limbata species group (Coleoptera: Carabidae: Lebiini), with notes about evolutionary considerations.*
Directeurs: George E. Ball and Felix A. H. Sperling. University of Alberta.
- Tansey, James.** PhD, 2009. *Mechanisms of cabbage seedpod weevil, Ceutorhynchus obstrictus, resistance associated with novel germplasm derived from Sinapis alba x Brassica napus.*
Directeurs: Lloyd M. Dosdall and Andrew Keddie. University of Alberta.
- Hummel, J.D.** PhD, 2009. *Insect and agronomic responses in canola and wheat intercrops.*
Directeur: Lloyd M. Dosdall. University of Alberta.

Si vous, ou quelqu'un que vous connaissez a récemment soutenu sa thèse, veuillez m'envoyer l'information à athielman@brocku.ca:

Nom, diplôme, date de la soutenance. Titre de la thèse. Directeur(s). Institution.

Si l'étudiant désire voir son courriel affiché avec les informations du diplôme, il doit m'écrire directement afin de m'en donner la permission. Vous pouvez également remplir le formulaire de soumission de Foisonnement de thèses (page 13) et me l'envoyer par la poste à l'adresse indiquée sur le formulaire.

Joint Annual Meeting / Réunion annuelle conjointe

THE JOINT ANNUAL MEETING OF THE ENTOMOLOGICAL SOCIETY OF CANADA AND THE ENTOMOLOGICAL SOCIETY OF BRITISH COLUMBIA

Coast Plaza Hotel, Vancouver, British Columbia
Sunday 31 October – Wednesday 3 November 2010

The Entomological Society of British Columbia invites you to the 2010 Joint Annual Meeting of the Entomological Societies of Canada and British Columbia to be held at the Coast Plaza Hotel and Suites in Vancouver, British Columbia, from October 31st to November 3rd, 2010.

The room rates are \$149 per night plus taxes; each additional adult is \$25. *The deadline to reserve rooms is 30 Sept. 2010.*

The Coast Plaza Hotel and Suites
1763 Comox Street, Vancouver BC V6G1P6
604-688-7711

http://www.coasthotels.com/hotels/canada/bc/vancouver/coast_plaza/overview

Program Highlights

Our meeting theme is **Communication** – in the widest sense: at the level of insect to insect, insect to entomologist, and entomologist to society.

Plenary symposium theme: Science Communication: What we can learn from Arthropods.

Proposed symposia:*

- Mountain pine beetle system genomics
- Dealing with invasive insects
- Insect community ecology
- Mark Winston research retrospective
- Invertebrate conservation
- Arachnology
- Graduate Student Symposium

Heritage lecture

Student paper and poster competitions

Regular poster and presented papers sessions

* Check ESBC webpage for updated information on symposia and important deadline dates.

Committee Representatives & Contact Information

Meeting Chair:	Bill Riel	bill.riel@nrcan-rncan.gc.ca
Science Program:	Ward Strong	ward.strong@gov.bc.ca
Local Arrangements:	Sheila Fitzpatrick	sheila.fitzpatrick@agr.gc.ca
Treasurer:	Lorraine Maclauchlan	lorraine.maclauchlan@gov.bc.ca
Registration:	Markus Clodius	markus.clodius@agr.gc.ca

P.S. Wear your favorite bug costume to our Opening Reception on Halloween night!

For more information, see: http://www.sfu.ca/biology/esbc/JAM/jam_announce.html

LA RÉUNION ANNUELLE CONJOINTE DE LA SOCIÉTÉ D'ENTOMOLOGIE DU CANADA ET DE LA SOCIÉTÉ D'ENTOMOLOGIE DE LA COLOMBIE-BRITANNIQUE

Hôtel Coast Plaza, Vancouver, Colombie-Britannique
Dimanche 31 octobre – mercredi 3 novembre 2010

La Société d'entomologie de la Colombie-Britannique vous invite à la réunion conjointe annuelle de 2010 des sociétés d'entomologie du Canada et de la Colombie-Britannique qui se tiendra à l'hôtel Coast Plaza Hotel and Suites à Vancouver, Colombie-Britannique, du 31 octobre au 3 novembre 2010.

Le tarif des chambres est de 149\$ plus taxes par nuit; 25\$ pour chaque adulte additionnel. *La date limite pour réserver les chambres est le 30 sept. 2010.*

Hôtel Coast Plaza and Suites
1763 Comox Street, Vancouver BC V6G1P6
604-688-7711

http://www.coasthotels.com/hotels/canada/bc/vancouver/coast_plaza/overview

Aperçu du programme

Le thème de la réunion est **Communication**, au sens large: au niveau insecte – insecte, insecte – entomologiste et entomologiste – société.

Thème de la session plénière: Communication en science: Que pouvons-nous apprendre des arthropodes.

Symposia proposés:*

- Génomique du dendroctone du pin
- Gérer les insectes invasifs
- Écologie des communautés d'insectes
- Rétrospective de Mark Winston
- Conservation des invertébrés
- Arachnologie
- Symposium des étudiants gradués

Allocation du patrimoine

Compétition étudiante: présentation et affiches

Sessions d'affiches et de présentations régulières

* Consultez le site Internet de la SECB pour les dernières informations sur les symposia et les dates importantes.

Représentants du comité et contacts

Président de la réunion:	Bill Riel	bill.riel@nrcan-rncan.gc.ca
Programme scientifique:	Ward Strong	ward.strong@gov.bc.ca
Arrangements locaux:	Sheila Fitzpatrick	sheila.fitzpatrick@agr.gc.ca
Trésorière:	Lorraine Maclauchlan	lorraine.maclauchlan@gov.bc.ca
Inscriptions:	Markus Clodius	markus.clodius@agr.gc.ca

P.S. Portez votre costume d'insecte favori pour notre réception d'ouverture le soir de l'Halloween!

Pour plus d'information, visitez: http://www.sfu.ca/biology/esbc/JAM/jam_announce.html

Transfer of the Pine Sawfly Baculovirus to Canada from Europe – a Personal Retrospective

G. R. Wyatt

The European pine sawfly, *Neodiprion sertifer* (Geoffr.), a defoliator of 2-needle pines including red pine and Scots pine, first appeared in North America about 1925 and in Ontario about 1936 (Lyons 1964). However, a specific polyhedral disease virus (baculovirus), important in the natural control of this insect in Europe, did not accompany it, and the pine sawfly became a serious pest in pine plantations in Canada and the United States. In 1949, the virus was brought from Europe to Ontario, and it has since spread through North American populations of *N. sertifer* and contributes substantially to natural control of this species (Rose 1999). A precedent exists in the control of the European spruce sawfly, *Gilpinia hercyniae*, by an introduced baculovirus, although in this case the importation of the virus was accidental (Bird 1955; Bird and Burk 1961).

How did the pine sawfly virus get to North America? Bird and Whalen (1953) state, “In 1949 virus-killed larvae collected in Sweden by Forsslund were sent to the Laboratory of Insect Pathology [Sault Ste. Marie, Ontario] by G.R. Wyatt of this laboratory...”, and this is cited in subsequent literature (Lyons 1964; Tinsley 1979), but no further particulars have been published. As the person named, I feel that it may be of interest, after 60 years, to place on record a brief account of this successful example of the importation of a pathogen for control of a pest species.

In the fall of 1947, after working as a student with the Forest Insect unit of the Canadian Department of Agriculture (as it was then) in British Columbia, and having completed a year of graduate work in entomology at the University of California that included insect pathology with E.A. Steinhaus, I was sent on transfer of research to Cambridge, England, where I stayed for three years. One aim of this mission was to locate in Europe and send to Canada pathogens that might be of use in the control of introduced forest defoliators. I was also able to work toward a PhD at the University of Cambridge under the supervision of Dr K.M. Smith, an authority on viruses, in preparation for a position in the new Laboratory of Insect Pathology at Sault Ste. Marie, Ontario. For this favorable arrangement I thank the vision of Mr J.J. de Gryse, then Chief of Forest Insect Investigations in Ottawa. In the Cambridge lab, I was influenced by a young biochemist, Roy Markham, who held the then radical view that nucleic acids were the key to virus replication, and was developing techniques for quantitative microanalysis of nucleic acids. After adapting the techniques for DNA, I looked at a set of insect viruses and obtained base composition data (Wyatt 1952) that contributed to Watson and Crick's (1953) base-paired structure for DNA.

To contribute to the practical aim of my sojourn in Cambridge, my attention focussed on the pine sawfly, *N. sertifer*, for which there were records of mortality due to disease in outbreaks in continental Europe and in England. In 1948, I contacted Mr H.S. Hanson, Forest Entomologist at the Alice Holt Forest Research Station, Farnham, Surrey, and in July he sent me some larvae from an infestation in Yorkshire that appeared to have been controlled by disease. With the microscope, I found polyhedral bodies in them, but it was too late in the season to obtain healthy larvae for infectivity tests or amplification of the virus. I sent some of this material to Canada. In May 1949,

G.R. (Jerry) Wyatt (meandj@kos.net) is a professor emeritus of biology at Queen's University in Kingston, Ontario. He dabbled with DNA before Watson and Crick, then for many years he researched and wrote on various aspects of the biochemistry and molecular biology of insects, and now he is enjoying retirement.

travelling by train and bicycle, I visited pine plantations in Norfolk, collected enough healthy sawfly larvae to use in tests of infectivity, and was able to demonstrate virus in this material.

I also contacted Dr K.-H. Forsslund at the State Forest Experiment Station, Stockholm, who had reported that a virus disease was important in the control of an infestation of *N. sertifer* in Sweden (Forsslund 1945). In 1948, he wrote that during the past two years this insect had been scarce in Sweden, but in June, 1949, he reported an infestation in central Sweden that was infected with the disease, from which he sent me specimens. These showed abundant typical polyhedra and were infective on the larvae collected in Norfolk. I sent some of this material to Dr K. Graham in the lab at Sault Ste. Marie, and he passed them to Dr F.T. Bird, who was working with sawflies.

Bird confirmed the virulence of the sample (Bird and Whalen 1953), disseminated the virus in southern Ontario (Bird 1953) and sent infective material to the United States (Bird 1955), where it was found to be highly effective in pine sawfly control in New Jersey and Illinois (Dowden and Girth, 1953). From these centres, by natural and artificial dispersal (Mohamed et al. 1983), the virus has become widespread in North America. I have found no record of any subsequent importation from Europe. Aerial spraying of dilute suspensions of crude polyhedra over an infestation in Ontario was found to produce complete mortality (Cunningham et al. 1975), and from 1983 to 1991, preparations were distributed by the U.S. Department of Agriculture Forest Service as a microbial pesticide under the name Neocheck-s. Recently, its genome has been sequenced (Garcia-Maruniak et al. 2004).

While the particulars of how this virus came to cross the Atlantic may be unimportant, I feel that they are worth recording because they represent a government-sponsored project that may initially have seemed diffuse, but which acquired focus and had a valuable outcome, at relatively little expense. After re-reading my correspondence saved from 1948 and 1949, I want also to say how impressed I am at the helpfulness of the scientists and amateur entomologists whom I contacted, who willingly sent information and material without recompense. This correspondence has been archived in the Great Lakes Forestry Centre, Sault Ste. Marie, Ontario.



Steve Marshall

Larvae of the European pine sawfly, *Neodiprion sertifer*

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Jerry examining red pine

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Introduced Alberta Spiders

Robin Leech

Since the early 1970s, at least 16 species of spiders in 10 families have either been recorded previously in Alberta, or are being recorded in this paper for the first time as introduced. Most of these introductions represent spider species that do not exist naturally in Alberta; but some are ones that do exist naturally, that is, are precinctive to Alberta, but only in the most southeastern part, but not in Edmonton where they were collected. A *precinctive* species, genus, family or group is one that is confined to the geographic area under discussion (Sharp 1900; Frank & McCoy 1990).

Spider species have been brought in unintentionally by commerce (equipment, materials, crushed rock, fruits and vegetables) and even in packed clothing in suitcases by unsuspecting holidayers visiting or returning from the U.S.A., Mexico, Europe, Asia and other Canadian provinces.

Not considered for discussion here are tarantulas and other arachnids brought in for pet shops and museums. Theraphosids that are considered have come in fruits from tropical countries. To date, there have not been formal records kept of spider species introduced to Alberta, or most other arthropod groups, for that matter. Interest has been mostly in the pest species of agriculture and forestry, and in those that are disease-bearing (e.g., West Nile Virus) to humans, pets, and crops.

The following spider families and species of spiders have been introduced to Alberta, and this paper constitutes the first formal record for several of the families and species. Family names and genus-specific-epithet combinations follow Ubick et al. (2005) and Platnick (2009).

SPIDER FAMILY	SCIENTIFIC NAME	DATA
AGELENIDAE (Funnelweb Spiders)	(?) <i>Hololena</i> or (?) <i>Novalena</i> sp.	September 2009. Two immatures on grapes from California
	<i>Tegenaria agrestis</i> (Walckenaer, 1802) (Fig. 1, female)	Hobo Spider; not a necrotic biter; first Alberta records, summer 1999 (Leech in Veitch 1999)
	<i>Tegenaria domestica</i> (Clerck, 1757)	Worldwide in homes
	<i>Tegenaria duellica</i> Simon, 1875 (Fig. 2, male and female)	Giant House Spider; first recorded in Alberta in 1993 (Leech 1993)
AMPHINECTIDAE	<i>Metaltella simoni</i> (Keyserling, 1878) (Fig. 3, female)	First Alberta record Aug. 1991 (Leech and Steiner 1992); first introduced to North America in 1944 (Leech 1971)
CTENIDAE (Wandering Spiders)	<i>Cupiennius chiapanensis</i> Soriano, 2006	For years called <i>C. salei</i> (Keyserling, 1877) in error
	<i>Cupiennius coccineus</i> F.O. P.-Camb., 1901	Both species on Central American fruits, especially bananas; introduced in late 1960s
MITURGIDAE	<i>Cheiracanthium inclusum</i> (Hentz, 1847) (Fig. 4, female)	First record May 1993 (Leech & Brown 1994); a very painful biter

Robin Leech (releech@telus.net) is a Research Associate at the Royal Alberta Museum, Edmonton, Alberta.

Special features

PHOLCIDAE	<i>Pholcus phalangioides</i> (Fueslin, 1775)	First record March 2000 in Edmonton (Leech 2000); harmless
SALTICIDAE (Jumping Spiders)	<i>Salticus scenicus</i> (Clerck, 1757) (Fig 5, probably female)	Established for many years in Alberta; may be replacing precinctive <i>Phlo-dromus</i> spp.
SICARIIDAE	<i>Loxosceles blanda</i> Gertsch & Ennik, 1983 (Fig 6, male)	Live male, Calgary, Sept. 2007; first Alberta record for the family; bites cause hideous necrotic lesions
SPARASSIDAE (Giant Crab Spiders)	<i>Heteropoda venatoria</i> (Linnaeus, 1767) (Fig. 7, male)	Cosmopolitan; coming to Alberta since fresh bananas have been imported
THERIDIIDAE (Comb-footed Spiders)	<i>Latrodectus geometricus</i> C.L.Koch, 1841 (Fig. 8, male and female)	Geometric Button Spider; bite is poi-sonous
	<i>Latrodectus hesperus</i> Chamb.& Ivie, 1935	Western Black Widow Spider; bite is poisonous
	<i>Latrodectus mactans</i> (Fabricius, 1775)	Southern Black Widow Spider; bite is poisonous
THERAPHOSIDAE (Tarantulas)	Several unidentified genera and species. <i>Brachypelma smithi</i> (F.O.Pickard-Camb., 1897) (Fig. 9, female)	Not problem spiders; brought in by produce-importing (especially fruits) companies; also by pet shops and museums



Robin Leech

Fig. 1. *Tegenaria agrestis* female



Greg Pohl

Fig. 2. *Tegenaria duellica* pair



Lenny Vincent

Fig. 3. *Metaltella simoni* female



Terry Thormin

Fig. 4. *Cheiracanthium inclusum* female



Ken Cramer

Fig. 6. *Loxosceles blanda*



Robert Bercha

Fig. 5. *Salticus scenicus*



Don Buckle

Fig. 7. *Heteropoda venatoria* male



Lenny Vincent

Fig. 8. *Latrodectus geometricus* pair



Robin Leech

Fig. 9. *Brachypelma smithi* female

Why should we be concerned about introduced spider fauna to Alberta, or any introduced biota for that matter? We should be concerned because in some cases they are poisonous. In other cases, they may become established (e.g., *Salictus scenicus*) and kill off precinctive species by competing with them. Once established, they may become abundant to the degree that they affect or replace precinctive species, and even alter ecosystem function. And non-spiders may cause economic problems as agriculture pests, forest pests, or they may spread viral or other diseases to humans and pets.

I suggest that we need to establish a single-source data bank/check list for all the Alberta fauna, and especially for the introduced fauna. There is an Alberta Lepidoptera Check List, and there are Canadian check lists for Hemiptera (incl. Homoptera) and Coleoptera. The single-source data bank/check list might best be started with Alberta, and when and if the other Prairie Provinces see that this is something useful, they might join us. British Columbia is much further ahead of Alberta in this regard (Klinkenberg 2009) (see www.efauna.bc.ca). This huge website covers terrestrial, freshwater aquatic and marine flora and fauna.

Acknowledgements

My thanks are to Don Buckle, Robb Bennett, Rick Vetter, Lenny Vincent, Robert Bercha, Mariana Marton, Norman Platnick, Greg Pohl, Gerald Hilchie, Bruce Heming, Kevin Floate, Cedric Gilloft and Lorie Taylor for helpful comments and/or pictures. I thank Dr Ken Cramer, University of Windsor, Windsor, Ontario, for permission to use the image of *Loxosceles blanda*.

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Working with the smoky-winged beetle bandit

Philip Careless and Stephen A. Marshall

Picture a German Shepherd sniffing for drugs at the airport... now replace the dog with the native wasp *Cerceris fumipennis* (Fig.1), the drugs with invasive wood-boring beetles, and the airport with a forest, woodlot or tree-lined city street. Sniffing out alien beetles with native wasps has proven to be an effective approach to biosurveillance, and an elegant reminder that native insects are sophisticated organisms often capable of outperforming our best technology. Most entomologists are familiar with the concept of biological control, by which pest species are brought under control using a parasitic or predaceous species. Biosurveillance is a similar strategy of turning an organism's behaviour to our benefit, in this case using a crabronid wasp to monitor or survey for the introduced buprestid *Agrilus planipennis* (the Emerald Ash Borer or "EAB").

With well over half a million km² of quarantine zones across thirteen states and two provinces, the infestation of destructive EAB continues to spread (USDA 2010). Originally from eastern Asia, the EAB was first detected in North America in 2002. Since then, despite hundreds of millions of dollars spent on research and control, it has had an increasingly devastating impact on the health of eastern North America's native ash (*Fraxinus* spp.) trees. Infestations of this beetle ultimately lead to the death of the host tree and in most parts of Essex County (Ontario) and southern Michigan the once-dominant large ash trees are all but gone. While the loss of native ash trees would transform the face of eastern North American forests (akin to the loss of American Chestnuts or Elm), and result in the loss of upwards of \$25 billion to the forest industry (USDA 2007), the primary ecological and economic risk is to urban forests. After the decline of elms, ash species (particularly Green Ash, *Fraxinus pennsylvanica*) have become the dominant trees planted in our urban environments. Cleanup costs associated with the removal of dead ash on municipal land in North American cities (and these do not include replacement costs or costs incurred on private land) are already estimated at \$60 billion (USDA 2007). This is a devastating toll for municipalities, and both Canadian and American agencies responsible for the management of introduced pest insects are under great pressure to find and control this difficult-to-detect beetle.

Successful management of the beetle demands effective early detection tools because once trees show signs of dieback there is little that can be done to save them. Such surveillance tools must be able to locate beetles in seem-



Philip Careless

Figure 1. Predominantly black, a single yellow/cream coloured band across the abdomen, smoky blue/brown wings and 'Michelin Man' appearance of the abdomen are conspicuous field marks of *Cerceris fumipennis*.

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ingly healthy-looking forests – a bit like looking for a shiny green needle in a giant green haystack. Traditional surveillance tools such as sticky traps and pheromone traps have proven relatively ineffective because of the EAB's elusive behaviour, so the discovery of a native wasp preadapted to harvest adult Buprestidae, including EAB, represented an important breakthrough in EAB surveillance.

Discovery

This project had its birth during an entomological weekend in Ontario's Rondeau Provincial Park when Steve Marshall's youngest son (Stephen, then 8 years old) drew his father's attention to an aggregation of large black and yellow wasps carrying an assortment of metallic wood-boring beetles to burrows that looked superficially like ant mounds. That first led to a bit of fun 'stealing' prey from the wasps just to see what kind of beetles they were bringing in, and then to the idea that this fortuitous observation might have some application in collecting and surveying Buprestidae. Guelph entomologist Steven Paiero later joined the other two Steves to "steal" a collection of beetles from the returning wasps that included a diversity of Buprestidae, with genera and species new to Canada (Marshall et al. 2005). The wasps were *Cerceris fumipennis*, a native, ground-nesting, solitary wasp long recorded from the eastern United States, but only recently reported from Canada (Buck 2004). *Cerceris* nests are clustered together in loose aggregations, a neighbourhood or informal colony, and those initial observations of the colony at Rondeau led to the idea that the wasps could be used to survey an area's local buprestid diversity and at the same time provide a cost-effective monitoring tool for EAB (Marshall et al. 2005).

Thanks largely to the support of Bruce Gill at the Canadian Food Inspection Agency (CFIA), the CFIA was receptive to the idea of using *Cerceris fumipennis* as a biomonitoring tool and agreed to provide funding for an MSc student to research the idea. As one of the many keen young entomologists working and volunteering in the University of Guelph Insect Systematics Laboratory, one of us (Careless) had the good fortune of being partnered with *Cerceris fumipennis* to assess its value as an EAB survey tool.

Assessment

We were delighted to discover that many of the wasp's natural attributes fit our ideal for an accessible and reliable biosurveillance tool for the following reasons:

- a) Physically Accessible – Colonies thrive in disturbed areas, apparently preferring the hard-packed sandy soil of sites such as ball diamonds;
- b) Temporally Accessible – Colonies are active during appropriate time periods, and the flight season of the wasp overlaps with the latter two thirds of the EAB's flight season in Ontario. *Cerceris fumipennis* in Canada are single-brooded and emerge from new burrows each year around July first; and
- c) Behaviorally Accessible – Wasps are easily and safely handled. Although they possess an impressive sting used to subdue and paralyze prey, in our experience they never sting in defense of the nest or when handled (Fig. 2).



Philip Careless

Figure 2. Pink-Pink, a female *Cerceris fumipennis* after receiving its individual markings.

Perhaps more importantly, the wasps tolerate being repeatedly robbed of buprestid prey, continuing to forage and provision their nests with buprestid beetles even after being relieved of hard-earned prey. The adult wasps don't eat the beetles but, like many solitary wasps, store the paralyzed insect prey underground in cells (jelly bean-sized chambers) as food for the wasp's larvae. An egg is laid on the last beetle placed into the cell and access to the cell is then backfilled by the female. As the adult female works on the subsequent cell, the egg hatches and the wasp grub consumes the living beetles. Paralysis of the beetle through a sting by the female wasp can be seen as a form of food preservation, as killing the beetles prior to placement in the cell would leave them susceptible to rotting before the larva has had time to feed.

Refinement

Further observations and trials showed how naturally well-suited our wasp was for its new role as a biosurveillance tool. A colony of 30 wasps could collect as many as 93 buprestids per day, spanning a broad spectrum of native and introduced species. The wasp's current eastern North American prey list boasts 97 species, including 7 species unknown from Canada prior to being "stolen" from *Cerceris* females. Colonies within EAB-infested areas readily provision their nests with EAB, which sometimes make up as much as 60% of the daily catch.

After two field seasons, we concluded that naturally-established colonies of *C. fumipennis* could be used as an effective and efficient survey tool for monitoring both native Buprestidae and EAB (Careless et al. 2009). While the wasp is not specific enough in its prey choice to control EAB populations, it is sensitive enough to detect low density populations of EAB (hence the term "biosurveillance", rather than "biocontrol"). During comparison trials in 2008 and 2009, *C. fumipennis* out-competed the conventional EAB prism-trap (commonly used to survey for EAB in the United States) with respect to detection rate (finding EAB at a site) and capture rate (speed of detection and quantity of EAB collected). But, that said, the evolution from a novel

dinner party story to a valuable ally in the search for invasive buprestids like the EAB depended on the wasp colony's mobility. It was important to show the wasps can be moved where and when needed, surveying forests well beyond the reach of the local, naturally established colonies.

Now, after much experimentation and manipulation of variables that affect the female wasp's fidelity to a mobile nest, we can deploy mobile wasp colonies to wherever a swift and sensitive monitoring tool is required. Our vessel of choice is a 6" diameter PVC sewer tube (tube-nest) which, when punched into the ground and extracted with its soil core, can harvest one female wasp along with her burrow. At night, while the female wasps are resting in their harvested nests, each tube-nest can be transported to a new



Philip Careless

Figure 3. A female *Cerceris fumipennis* is seen here returning to her nest with prey, one large, paralyzed female Emerald Ash Borer and a second smaller male (unparalyzed but still in copula). The blue plastic tab and golf tee prevent the wasp from entering her nest until the buprestid catch has been identified by her human colleague.

survey location. The next morning the female wasps emerge from their burrows, perform an orientation flight (memorizing the new landmarks that will guide them to and from their tube-nests), and then begin foraging for buprestid beetles. The wasp's human companion simply sits by the tube-nests and checks the identity of each prey item being brought to the nest. The wasp's access to her nest is slowed by a simple plastic collar placed over her burrow exit with a hole only large enough for the wasp to pass through provided she has no prey (Fig 3). Once the prey has been visually identified, the collar is then shifted to one side allowing the female wasp to pass into her nest with prey.



Stephen Marshall

Figure 4. Stephen Marshall Jr. and Philip Careless monitoring a *Cerceris fumipennis* colony on Walpole Island First Nation, near Sarnia, Ontario.

The Future

With the assistance of CFIA's Bruce Gill, Tory Kimoto and Erin Bullas-Appleton, as well as the United States Forest Service's Dick Reardon and the United States Department of Agriculture's Vic Mastro, interest and utilization of *C. fumipennis* has now spilled out from Steve Marshall's lab to a broad *Cerceris fumipennis* working group in Canada and the United States (having in excess of 100 university and government researchers, students, state, provincial and municipal forest managers, naturalists and woodlot owners). This working group now operates in 22 provinces and states, training WaspWatcher volunteers, monitoring a network of 289 eastern North American colonies, inspecting almost 3500 buprestid specimens in 2009 alone, and beginning research into various aspects of *C. fumipennis* biology (degree-day modeling, colony transplantation, studying buprestid cuticular compounds using antennograms, measuring yearly fluctuation in colony size, captive rearing, manipulating emergence dates, quantifying foraging range, etc.) (Fig. 4).

Ultimately we hope to galvanize a network of researchers and volunteers to act as the infrastructure for future biosurveillance/first detector projects. For those of you interested in learning more about *C. fumipennis*, studying your local species, or volunteering as a WaspWatcher, please visit www.cerceris.info. Entomologists on the west coast might want to keep an eye out for *C. fumipennis*' western counterpart, *C. californica*; those of you in the New World tropics might find it useful to take a close look at *C. dilatata* or *C. cerverae*.

The famous French army surgeon turned passionate entomologist, J. Henri Fabre, became addicted to the world of insects upon crossing paths with the European buprestid-hunting species of *Cerceris*. Many who have seen *C. fumipennis* operate in the field would agree with Fabre when, in his book *The Hunting Wasps* (Fabre 1915), he writes that *Cerceris bupresticida* wasps, "fling wide the gates of a new world wherein our intellectual powers are henceforth to be employed."

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Steve Marshall

Anthidium oblongatum (Megachilidae), recently introduced in northeastern North America.

People in the news / Gens qui font les manchettes

Peter Kevan, FRSC

Congratulations to Peter Kevan, ESC Gold Medal recipient in 2006, on his recent induction as a Fellow of the Royal Society of Canada. Peter's citation noted that his pioneering ecological, zoological, and botanical contributions were both extensive and interdisciplinary. He has elucidated unsuspectedly tight pollination relations between Arctic insects and plants. His studies on floral colours have linked botany to insect colour vision. For greenhouse and field crops, his cross-cutting research on pollinators for vectoring biocontrol agents has illustrated his rigorous, practical lateral thinking. Peter is a renowned plant gynecologist and a world leader in pollination conservation. He has served on the US-NAS panel "Status of Pollinators in North America", is leader of the Strategic Network "NSERC-CANPOLIN", and is Chair of the International Commission for Bee-Plant Relationships. His international, Arctic-to-tropical interests embrace ecosystem function and stress, sustainability, conservation, terrain disruption and soil ecology, habitat fragmentation, pesticides, and urban ecology.

Peter recently retired from the University of Guelph but will continue as Professor Emeritus and Scientific Director of CANPOLIN.



Martin Schwalbe

Peter Kevan, browsing one of his books on pollination biology.

Ruby Larson, FAIC – Scientist and Mentor

In this time of greying professionals and the realization of the need for succession planning within organizations, the role of mentoring and coaching is gaining in discussion and practice. The Gender Equality Mainstreaming (GEM) Committee of the Agricultural Institute of Canada (AIC) has recently learned more about one member of AIC who began coaching and mentoring in the late 1950s and 1960s and, as a result, helped many young people in Lethbridge, Alberta, at that time to appreciate the potential for careers in science and agriculture. Of the 400 Fellows of the Agricultural Institute of Canada (FAIC), Dr Ruby I. Larson was the third woman to become an FAIC (1977).

Dr Larson's community contributions to mentoring young people involved being a founding member of the Lethbridge Science Fair and initiating and operating the Lethbridge Science Club out of the basement in her home for over 20 years. Dr Larson demonstrated her commitment to science education by devoting her basement to establishing a lab with work benches, providing relevant books (in biology, mathematics, chemistry, and physics), setting up dissecting microscopes and inviting interested neighbourhood youth to this dedicated space. The club operated as an organization with a president, secretary and treasurer; the members had to give a presentation to be allowed to join the group. The membership cost was very minimal – about \$4 per year – which Dr Larson matched so the youth could order what they wanted from science catalogues.

Dr Ruby Larson was born in Hatfield, Saskatchewan, where she studied to become a teacher, earning her BA and MA degrees from the University of Saskatchewan. As a teacher, she knew what children needed, how to present material in an engaging interactive way, and the role of self-discovery as a learning strategy. The original group of 12 boys began exploring their interest in science while in Grades 7 and 8 in school, and continued as members of the Science Club



Ruby Larson (in white suit) with members of her Junior Science Club. How many of these members do readers recognize as future well-known entomologists?

until Grade 12. The group was highly motivated and became successful in their professional careers, graduating 3 PhD entomologists, 2 medical doctors, 1 civil engineer, 1 Rhodes Scholar in architecture, 1 teacher and 1 school principal. After the original group left for university, Dr Larson began to encourage girls as well.

Dr Larson was very instrumental in the development of the Lethbridge Regional Science Fair in 1963 along with several other staff at Agriculture and Agri-food Canada's (AAFC) Lethbridge Research Centre. With support from fellow scientists and technicians, the Lethbridge youth were provided access to field-based research sites, allowed to examine the insect collections, and invited on field trips. Many AAFC staff volunteered as judges at the Science Fair. The fair was initially sponsored by the AIC.

Dr Larson represented Lethbridge at national meetings related to the Canada Wide Science Fair and attended many science fairs across Canada. The first winner of the Fair in Lethbridge was Joe Shorthouse while Ken Richards was the winner of the second fair (both became PhDs in entomology). Ken was the first to represent Lethbridge at a Canada Wide Science Fair in Montreal in 1964 with Dr Larson as the chaperone. Dr Richards and his colleagues at the Saskatoon Research Centre of AAFC currently support youth in the local Saskatoon science fair.

Dr Larson participated in a range of activities that are important to the health and growth of a profession and that have been valued. Dr Larson is a charter member and honorary member of the Entomological Society of Alberta and encouraged amateur entomology. In 1997, the Entomological Society of Canada honored her with the Criddle Award and the Entomological Society of Alberta presented her with the Carr Award. In 1977, she was awarded an honorary Doctor of Science from the University of Lethbridge (the same year that she was awarded the FAIC).

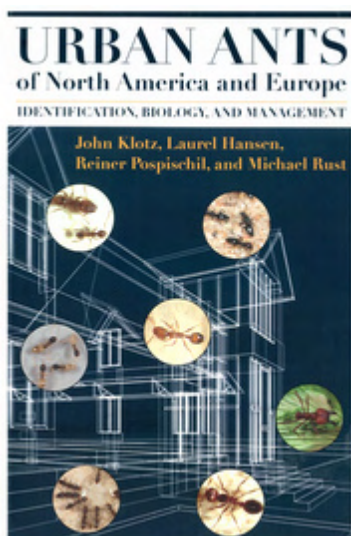
Dr Larson's agricultural career began at the Swift Current research Station in 1946. In 1948 she was transferred to the present-day AAFC's Lethbridge Research Centre. During this time, Dr Larson completed her PhD in cytogenetics at the University of Missouri in 1952, which continued as her focus at Lethbridge until she retired in 1979. Dr Larson's contributions extended beyond her prairie roots. Her research team identified specific chromosomes containing genes which controlled wheat's resistance to common root rot.

Dr Larson's legacy to youth lives on in the form of academic support. A \$500 Scholarship has been established at The University of Lethbridge entitled the Dr Ruby I. Larson Biological Research Aptitude Scholarship. The award will be presented annually to a fourth year biology student demonstrating the greatest potential for biological research. In addition, the University of Lethbridge awards in Dr Larson's name include the Dr Ruby I. Larson French Language Scholarship and the Dr Ruby I. Larson Scholarship in Education.

Dr Larson also made global connections by financially supporting students in international locations. She visited these students, attended their high school graduation, and shared letters from them with the Lethbridge youth.

She truly has lived the philosophy "think globally, act locally". Sources indicate that Dr Larson is living in Stony Plain, Alberta. We thank her for her many contributions to the profession.

The above is a slightly amended version of an article that appeared in the June 2009 Agricultural Institute of Canada Monthly Report. The accompanying photograph, which shows Ruby and her Saturday morning Junior Science Club, includes on the back row (from left to second from right) those members who went on to become professional entomologists: Joe Shorthouse, Dave Larson, and Ken Richards. For more information on Ruby, read Dave Larson's Heritage Lecture (2005), published in the [Bulletin, vol. 37 \(4\)](#), pages 186-195.



Urban ants of North America and Europe: Identification, biology and management.

Klotz, J., Hansen, L., Pospischil, R., and Rust, M. 2008. Comstock Publishing Associates, A Division of Cornell University Press, Ithaca and London, 196 pp., 4 colour plates, numerous black and white photos and line drawings, ISBN 978-0-8014-7473-6 (paperback), \$30.95 - 33.95 Can. (online)

By anyone's standards, ants are among the most successful life forms on this planet. Their social organization and symbiotic relationships with other organisms have allowed them to become a dominant force in many ecosystems. While not a particularly species-rich taxon, their numbers are impressive, easily matching human beings in overall biomass. Their only weakness is their need for relatively warm environments, so as we move

northward their dominance wanes, and they are virtually absent above the tree-line. It is not surprising, then, that some ants like the cozy confines of human structures, and that they are eminently successful in that environment as well.

"*Urban Ants of North America and Europe*" is basically organized into four parts: An introductory chapter on the ecology of pest ants; a series of six chapters describing specific groups or species of ants in various subfamilies; two chapters dealing with ant stings and bites and pest management, respectively; and finally appendices, references and an index. At the front of the book are four colour plates with photographs of numerous species. The colour photographs are of varied quality, with some excellent and some fairly bland. The book is further illustrated by black and white photographs, and the keys are very well illustrated with excellent line drawings placed in direct association with couplets of the key which they support. I have not attempted to use the keys, but the illustrations appear better and easier to use than those in keys I have encountered in the past.

The initial chapter is fairly general, as one might expect from a handbook of this nature, but it adequately provides an introduction to ant ecology, and it includes a key to the subfamilies. Each subfamily-specific chapter is subdivided into an introductory section describing the characteristics of the subfamily, along with a key to the genera. Each important genus or species is then described in turn, with each section organized in subsections providing identifying characteristics, distribution, biology and habits, control, and where needed a specific key to the genus.

Chapter 8 on "Adverse reactions to stings and bites" is a brief account of general symptoms, followed by sections on specific subfamilies. This is an interesting chapter, which recounts a number of case studies. I am not sure that it is all that valuable as a reference guide to stings and bites *per se*, but it gives a good, general overview of the potential problems that may be associated with ant stings and bites. The real gem of the book, in my opinion, is the final chapter on management. Unlike what one might expect, this chapter describes general management approaches in the context of ant behaviour. I think the authors have done an excellent job of conveying to the reader the importance of understanding ant ecology and behaviour, as well as species- and habitat-specific knowledge for successful implementation of control strategies. This

chapter should be particularly valuable as a guide for how one might approach the development of effective management strategies of pestiferous ants.

"*Urban Ants of North America and Europe*" is a book dedicated to 'pest' ant species in urban environments. The book is aimed at a general interest audience, but is primarily designed to be a resource book for pest management operators. I believe the book has succeeded in this regard, with well illustrated keys, which should be useful. The choice of species described seems reasonable for the most part, although in some cases I am unsure as to the motivation of the authors. For example, only two species of the genus *Myrmica* are described, the invasive European species *M. rubra*, and the native, widespread *M. brevispinosa*. It would seem that additional species could be warranted for this genus, but then I tend to view ants in a more general ecological context, so perhaps this is a reasonable choice.

My initial reaction to the inclusion of European species was quite negative. I felt as if the book was a North American book with some European species thrown in for good measure, and comments on the European experience seemed to be tacked onto a largely North American-focused description. As I read through the book I warmed to the idea, and in the end I became convinced that the authors made the right choice. I was particularly impressed by the approach of the final chapter, which makes this book worth its quite modest price tag.

In summary, I feel that this book is well worth its price, and would be an excellent addition to the bookshelf of any person interested in entomology, whether as a lay person or professional.

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Manual of Central American Diptera – Volume 1. Brown, B.V., Borkent, A., Cummings, J.M., Wood, D.M., Woodley, N.E., Zumbado, M.A. (Eds). 2009. NRC Research Press, Ottawa. xi + 714 pp. incl. 12 color plates. ISBN 978-0-660-19833-0. \$94.95 USD. Available from National Research Council, Canada, www.nrc-cnrc.gc.ca

Finally, the long-awaited Manual of Central American Diptera (MCAD) Volume 1 has arrived. The production has been over 10 years in the making, which is not unreasonable considering the magnitude of the job. However, some 4 years ago, I started pestering various colleagues for draft versions of their respective chapters, so it has seemed like forever to me.

The MCAD is modeled after the Manual of Nearctic Diptera (MND), thus inviting a comparison with its iconic predecessor. MCAD is a multi-authored tome (45 authors in Volume

1) including a handful of the original MND authors. The present volume has a fresher, modern look and feel. It is also striking to behold, as the cover is graced with a color photo (by Steve Marshall, of course) of a showy, tropical stratiomyid fly that elicits a “Wow!” from every first-time viewer. The size and heft of the volume are similar to those of the MND, but the paper is a cleaner, whiter, semi-glossy style that yields crisp, clear text and brilliant drawings and half-tones. For all its good looks, however, the binding is questionable – I don’t think it is going to last (more on this below).

The content is another matter. I will go so far as to say that the MCAD is the most significant Diptera publication of its decade. It surely will endure and be consulted for decades to come just as the MND has served us so well for nearly 30 years. The MCAD provides the first comprehensive entree into the vast Diptera fauna occurring in the New World tropics, perhaps the richest in the world. The minimum geographic coverage for individual families of Diptera includes the primarily tropical regions of Mexico south to the Panama-Colombia border, and broader coverage into the greater Neotropics is provided for many families.

The Introduction provides a numerical accounting of the known Diptera faunas of the various biogeographical regions of the world, and speculation on the relative numerical importance of the various families in Central America. This chapter also describes the important mass-capture techniques whose deployment in recent decades has swelled our collections, sometimes to overwhelming numbers, and produced a wealth of material to study.

Chapter 2 covers adult morphology and terminology. It borrows heavily from the corresponding chapter in the MND. In fact, every one of the drawings is duplicated from the MND; why re-invent the wheel, after all? The organization of the equivalent chapters in the two books is different, however. In describing body parts, the MND follows a strictly logical sequence from head to toe, so to speak, while the MCAD follows body sequence only at the level of head (with subdivisions for eye, antenna, mouthparts), thorax (also subdivided), and abdomen (ditto), then defines all of the terms for associated body parts in a glossary (alphabetical) format. The MND format is better suited to discussion of function and homology, but to find the definition of some particular term often involves a trip to the index followed by diligent word searching on the referenced page. By contrast, it is very easy to find a morphological term and its meaning/discussion in the MCAD. Surprisingly, however, none of these terms is included in the MCAD index, which lists taxonomic names only. Readers with only rudimentary knowledge of fly body parts and their locations may have to flip through many pages to find what they want – but they likely will learn a lot on the way. The MCAD does not include a chapter on larval morphology, so MND Volume 1, Chapter 3 is still the go-to source for those details.

The subject matters of MCAD Chapter 3 (Natural History) and Chapter 4 (Economic Importance) are new to the series. The former chapter provides a summary of dipteran life stages, prominent behaviors such as swarming and lekking, adult and larval feeding niches, and other important aspects of their ecologies. The latter chapter touches on disease transmission and nuisance issues, where Diptera reign supreme among insect orders, as well as the beneficial roles of flies as decomposers, biological control agents, pollinators, forensic tools, and genetic laboratory workhorses.

An entire volume of MND was devoted to Diptera phylogeny. That Volume (3), published in 1989, serves as a platform for discussion in MCAD Chapter 5 of advances in the study of Diptera relationships in the intervening 2 decades. During this era, the whole brave new world of DNA sequence analysis has sprung up, in some cases clarifying relationships and in other cases obfuscating them. However, not only the molecularists have been busy during this time. Traditional morphologists have conducted excellent, broad-ranging studies of both adult and immature stages and contributed greatly to advancement of the field in recent years. This succinctly written chapter brings one up to date on our understanding of phylogenetic relationships from the level of suborder down to superfamily, explaining which hypotheses have stood the test of time and where problems still fester.

Chapters 6 and 7 provide keys to adults and larvae, respectively, of the Diptera families occurring in the region. Again, these chapters will look familiar to users of the MND, as many of the same excellent drawings are re-used here. In fact, many drawings look even better because of the different paper used. The logic of the keys follows closely on that of its predecessor making adjustments for tropical families missing from the Nearctic region and vice versa. The MCAD key to adult families is 22 couplets longer than that of the MND due in part to the multiplication of “fungus gnat” families, and the greater frequency at which couplets end in family XXidae “in part,” for example among the oestroid families (blow flies, flesh flies, and the like). The adult key is augmented by 12 pages of color plates with habitus photos of live flies representing 104 families. These photos are remarkable, because many readers most likely have never seen representatives of many of these families even as pinned specimens! The key to larvae is considered “tentative” by its authors. Overall, our knowledge of Diptera larvae is very poor (they are known for less than 3% of named species), and larvae of nine families in the region are entirely unknown.

Like the MND, the bulk of the book comprises individual chapters for each of the Diptera families occurring in the region. These chapters are where the great and immediate value of the book resides, as they provide a path to the names and everything else that follows in the scientific literature relating to the Diptera fauna of much of the tropical New World. Each of the family chapters includes seven sections: Diagnosis, Biology, Classification, Identification, Key to the genera, Synopsis of the fauna, and Literature cited. The family diagnoses are generally more compact than those given in the MND. The biological details, when known at all for flies in this region, are always fascinating. Brief histories and the current concepts of the classification of each family are provided along with their important citations. The identification section is a new feature, not seen in the MND. It highlights the problems peculiar to each family in arriving at an accurate identification, things ranging from the known existence of cryptic species complexes to the reliance on specific life stages to the necessity of preserving and preparing specimens in particular ways. The keys to genera of various families are qualified in numerous ways, for example, as applying to “Central America and the West Indies”, or restricted to certain subfamilies, or “males only” depending on the state of knowledge for each family; for Scatopsidae, there is a key to genera of the world. The keys are supported by excellent drawings and labeling, the hallmark of the MND. Many of those drawings are re-used here, but some chapters rely almost exclusively on other, outside sources, and many equally excellent drawings are entirely new. The synopses are another new and welcome feature. For each genus, the synopsis provides a brief overview of the numbers of described and undescribed species, distributions, biologies, and important citations. Just as in the MND, the range of families in Volume 1 includes Tipulidae to Dolichopodidae, 42 chapters all together. Some of the families you’ve probably never heard of, and you probably won’t know how to pronounce them either. Nor will you need to know Spanish to read this book. Only a handful of Spanish words appear in the volume, the common names of a few biting fly families in the chapter headers.

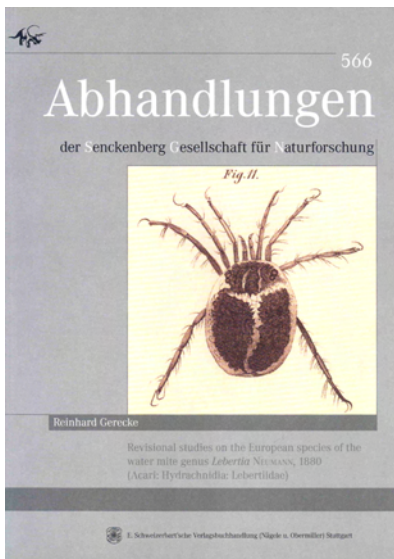
Now, back to the binding, possibly the one “fly in the ointment” of this undertaking. The MND has a buckram cover and sewn-through-the-fold binding. The MCAD has a board cover and pages are glued but not sewn. My MND Volume 1, purchased in 1981, has been rifled through hundreds of times per year during the past 28 years, yet would still be listed as “fine condition, front cover a little loose” by an experienced used book dealer. In contrast, I’ve now seen four brand new copies of MCAD Volume 1: two arrived with the front cover partially torn along the shoulder, two had incompletely trimmed pages (one rather badly so), and all four have crushed cover corners. This does not bode well for a book destined to be a major, heavily-consulted reference work, a book that will often find itself awkwardly propped on knees or cluttered bench top while the user rubbernecks between its pages and the microscope. Add in a few clumsy students, and ... looseleaf?

The book, of course, is of enormous practical use. It will be put to use immediately by anyone who has Neotropical material in their collections. Additionally, it will be hugely influential in attracting naturalists to the study of Diptera of the region, and equally influential in pushing forward the discovery of new material. It is routine to hear student and practiced entomologist alike say that they “just don’t do Diptera.” Admittedly, you need a good microscope, some patience, and a willingness to learn, but, given the MND and now the MCAD, there is simply no excuse for this sentiment.

I hope that the organizers are true to their word that updates to the MCAD will be made available at www.mcadiptera.net. For example (and I hope not to jinx it by asking), when will Volume 2 be available? These two volumes together will open the floodgates to further taxonomic work on the Diptera fauna of the Neotropics. I suspect that authors of Volume 1 are already annotating their chapters for revision. The MCAD initially was conceived as the “Manual of the Costa Rican Diptera,” and it relies heavily on material from the southern reaches of Central America. Thus, some elements of this geologically and biogeographically complex region probably are poorly represented in this work. By way of example, from a survey of tephritid “fruit flies” (a relatively “well-known” family) presently underway in the highlands of Guatemala, approximately one third of the collected taxa are undescribed species, some representing undescribed genera and/or calling into question the integrity of presently named genera. I expect an eventual flood of similar, new information that will greatly build upon and even transform the present work.

To the organizers and all authors, I say congratulations and thanks for a job well done. To dipterists and general entomologists, to all the insect museums and natural history libraries of the world, I say you need this book.

Gary J. Steck
Florida State Collection of Arthropods
Gainesville, Florida



Revisional studies on the European species of the water mite genus *Lebertia* Neumann, 1880 (Acari: Hydrachnidia; Lebertiidae). Gerecke, R. 2009. Abhandlungen der Senckenberg Gesellschaft für Naturforschung 566: 1-144.

The water mite genus *Lebertia* has a Holarctic distribution with a few outliers in Africa, India and Central America. *Lebertia* species occur in a wide variety of both flowing and standing freshwater habitats. Adults prey on insect larvae and pupae, mostly Chironomidae, and larvae are parasitic on chironomids. Members of this genus can occur in fairly large numbers and some species are able to tolerate a high degree of organic pollution, whereas others are very sensitive to decreases in oxygen availability. These features would suggest that *Lebertia* should be a relatively

well-studied taxon and that the natural history of the most common species should be understood. This, however, is not the case. Instead, we are quite ignorant of their ecology; indeed, the author of the reviewed book could find only one paper on the natural history of a *Lebertia* species. I posit that this is due to the, up to now, messy state of taxonomy of this genus. *Lebertia* is an inherently difficult taxon. The species lack the sexually dimorphic features associated with sperm transfer that are so helpful with many other water mite groups. Also, according to the author, individual mites continue to expand the amount of sclerotized integument as they age, so that descriptions based on a few older specimens may not apply to freshly eclosed adults. And finally, the author argues that the previous belief that *Lebertia* associated with springs and hyporheic waters lacked parasitic larvae and hence were poor dispersers resulted in rampant splitting of taxa based on geography. It was the goal of the author to clean up the mess of more than 100 years of poor taxonomy “...in order to clarify...nomenclature and build a sound foundation for future systematic, ecological and biogeographical research on members of this genus...”. Although the audience for this monograph will be small, it will be one very appreciative of the fine scholarship that went into this review of a widespread, species-rich, and morphologically frustrating genus. Reinhard Gerecke is one of the most meticulous mite systematists. In this work, which likely occupied the full 2 years of his Deutsche Forschungsgemeinschaft grant, he takes great pains to render what was one of the messiest genera into a tidy taxon with defined and justified boundaries at the genus, subgenus, and species levels for those taxa occurring in Europe.

In the 144 pages of this monograph, Gerecke reorganizes and justifies the subgenera of *Lebertia*, tidies the types (designating neo- and lectotypes when needed), elevates 4 subspecies to species, designates 21 taxa as *incertae sedis*, rejects 9 previous synonymies, proposes 42 new synonymies, provides information on ‘missing’ sexes for 7 species, and describes 9 new species (mostly from southern Europe). For each species he accepts, he provides illustrations of legs and palps at minimum, as well as distribution records and an exhaustive taxonomic history. As an illustration of the last, Gerecke found 21 synonyms for *Lebertia porosa* Thor! As well as these descriptions and diagnoses, Gerecke provides dichotomous keys to subgenera and to the accepted species, and a table that illustrates intraspecific variation in more than 50 morphometric characters in *Lebertia fimbriata* Thor. Although it is for only a single species, the table provides clues as to which characters are likely to be stable and which should be avoided for species-level diagnoses. In his descriptions Gerecke includes details about several characters that are rarely used in water mite taxonomy, including fine structure of the integument. He illustrates some of these with SEM, which do a good job of showing the surprising intrageneric diversity in integument sculpture.

The physical aspect of the monograph is also praiseworthy. The font and illustrations are crisp, the SEM detailed, the pages of good quality paper that is firmly but flexibly bound so that the book remains open at the selected page (important when using it at the microscope). The taxonomic index at the back is clearly organized and, for the several items that I checked, the page numbers listed are correct. There are a few things missing from this otherwise excellent monograph, however, the most surprising being maps of species distributions. Collection records are given as lists, but maps would make it much easier to see the extent of each species’ distribution. Under the heading “Distribution”, Gerecke typically lists numeric codes that I determined, after some effort, to refer to the Limnofauna Europaea geographic scheme (J. Illies ed.1978. Limnofauna. Europaea, 2nd edition. Gustav Fischer Verlag & Swets-Zeitlinger). Gerecke does not provide a map with these regions illustrated, so I had to search the internet and eventually found one (click on ‘European Fauna’ at <http://www.watermite.org/>). I was also a little disappointed that there was no attempt to construct a phylogeny of *Lebertia* species, though given the geographical restriction of the study this is understandable. My final small complaint involves the keys. The character states listed in the couplets frequently abut or overlap, or are clouded with such vague statements as “**generally** bearing one ventrodiscal

seta”, “numerous” setae vs setae “**reduced** in number” without any statement as to what values count as ‘reduced’ (emphasis mine). I think that if I were trying to identify a European specimen of *Lebertia* I might skip the key and go straight to the species descriptions. This is not entirely the fault of the author, as it seems that species of *Lebertia* are mainly distinguished by clusters of quantitatively different features rather than by the nested qualitative differences that are more suitable to a dichotomous key. Perhaps in the future someone will construct a matrix-based electronic key that would allow more rapid identification of *Lebertia* species.

I have personally avoided trying to identify *Lebertia* specimens to species, or to even sub-genera, because of the frustratingly vague taxonomy. While Gerecke’s admirable work will not be directly applicable to most North American taxa (only two of the species covered are considered to have a Holarctic distribution), it provides a model on which we can base our own delimitations for the several dozen species likely to occur on this continent (see http://www.naturewatch.ca/eman/reports/publications/99_montane/mites/mites06.html). If we are unable to raise a home-grown taxonomist willing to tackle this group, perhaps we can convince Reinhard Gerecke to take them on; compared to European *Lebertia*, they should be easy, given that we haven’t had a century of spurious synonymies to confuse matters.

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



Steve Marshall

A male *Dytiscus* sp. (Dytiscidae)

BACK ISSUES of the *The Canadian Entomologist* and the *Memoirs of the ESC*

Do you need back issues of *The Canadian Entomologist* and *Memoirs*? Just for the price of shipping you can receive paper copies of *The Canadian Entomologist* and *Memoirs* back issues. Hurry as this offer will only be available for three months after this advertisement after which the back issues will be sent to recycling.

To order copies, contact Derna Lisi, Office Manager, Entomological Society of Canada at entsoc.can@bellnet.ca.



The University of Manitoba Imaging Services

Robert E. Roughley (1950-2009)

The entomological community has lost one of its classic figures. Rob Roughley passed away suddenly at his home on 9 November 2009 at the age of 59. Rob was an authority on water beetles, especially the Dytiscidae. He completed his BSc (Agr) in Entomology in the Department of Environmental Biology at the University of Guelph in 1974. He was part of the cadre of young entomologists, inspired by Dave Pengelly, who emerged from Guelph at about that time. While an undergraduate student, Rob spent two summers at the Agriculture Canada Research Station in Harrow, Ontario, where he worked on insect pathology with Bob Jaques, and with Bill Elliott on aphids on vegetable crops. It was perhaps during the time he spent with Bill Elliott, and the following summer on Dave Pengelly's field crew to replenish the ravaged Natural History of Insects collection, that Rob became fascinated by taxonomy and systematics. Rob stayed on at Guelph to revise the genus *Hydaticus* (Dytiscidae) for his MSC (1976), which involved spending some of his

time working at the Canadian National Collection in Ottawa. Rob went to the University of Alberta for his PhD under the supervision of George Ball; his thesis research was a revision of the genus *Dytiscus*, using characters from adults and immature stages. In 1982, even before he defended his PhD thesis, he accepted a faculty position in the Department of Entomology at the University of Manitoba. For the next year, he worked day and night to complete his PhD thesis, which he defended in 1983.

Water beetles, especially Dytiscidae, formed the focus for Rob's research. He was a world authority in dytiscids and related groups, and his expertise was much in demand. His taxonomic advice was sought by curators, amateurs and consultants needing specimen identification, and he often visited museums and provided curatorial assistance in the areas he knew best. He worked particularly on the dytiscids of North America and the water beetle fauna of Middle America, and had a great deal of involvement with the Instituto Nacional de Biodiversidad (INBio), in Costa Rica. At INBio, he taught water beetle collecting techniques to parataxonomists, and was team leader for the aquatic Coleoptera group. Rob's combined efforts with David S. White on the chapter on aquatic Coleoptera in the fourth edition of *An Introduction to the Aquatic Insects of North America* (2008) is a lasting contribution to his discipline. Rob was involved with the scientific community in many areas of endeavour, particularly those dealing with conservation; he was an active participant in the Biological Survey of Canada, the Nature Conservancy of Canada, the Committee on the Status of Endangered Wildlife in Canada, CANPOLIN, and the International Union for the Conservation of Nature.

Rob was never shy about tackling less familiar areas of research, and he assumed supervision of graduate students in many areas beyond his own field of systematics. He supervised students who examined the integrated control of purple loosestrife, and others who worked on the bio-

diversity of spiders, carabids, bees, and flies, especially those associated with prairie grassland and subarctic habitats in Manitoba. He encouraged his students to work hard and gain a sense of pride in their own accomplishments as they saw their own expertise grow. His encouragement extended to undergraduate students as well. Rob had an unorthodox lecture style. He was always very relaxed, but you never knew what approach he might take. He sometimes delivered lectures in a classic sense, but he also explored an open-ended style, where students were expected to contribute substantially to the learning process. Rob enjoyed a high level of interaction in his lectures, and he delivered his lecture material from many different angles. In recognition of the success of this approach, he received a Students' Teacher Recognition Award at the University of Manitoba in 1995. For many years, he and Peter Kevan taught a course in boreal and arctic entomology, in Churchill, Manitoba, as part of the offerings of the University of the Arctic.

One of Rob's great loves was collecting insects, and he travelled the world in the pursuit of water beetles. His extended field trips with students or colleagues were legendary: they would start out from Winnipeg heading west, hit the coast, travel south, turn east, keep going until they hit the sea, and then wend their way back. Several visiting postdocs received their initiation to North America on just such trips. Rob travelled extensively in Europe, Asia, Australia, and Costa Rica, gaining taxonomic insights from the beetles he collected and the habitats he visited. It was perhaps these insights that were so valuable to his colleagues and for which his advice was so often sought.

Rob also carried a large portion of the load for extension calls in the Department of Entomology. These calls came on the telephone, through the mail, via e-mail or where an unannounced visitor would appear at the door with concerns or curiosity about some entomological dilemma. He met thousands of people this way, sharing his experience and enthusiasm with each and every one. At one time he was a popular voice on local radio for ask-the-bug-doctor programs. It was always a treat to tune in because you never knew what people would call in to ask, and you could never guess how Rob was going to respond. He served the agricultural extension service through his contacts with Manitoba Agriculture, Food and Rural Initiatives, to provide identification of known and new pest problems. In 2007, his record of dealing with over 12,000 extension calls during his career was recognized by his receipt of a University of Manitoba Annual Outreach Award.

Rob was an untiring supporter of collections and collection management in Canada, and when he assumed the curatorship of the entomological museum upon arrival in Winnipeg, the collection immediately began to expand. In 1983, the museum was given the official title, the J.B. Wallis Museum of Entomology, to commemorate the contributions and early development of the collection by J.B. Wallis. Rob presided over the small naming ceremony, and was clearly in his glory in dedicating the museum to the memory of a former water beetle specialist. From that time, the collection has grown from a modest 50,000–60,000 specimens to where it stands today, at an estimated 2,000,000 specimens. Over the years, as the collection grew and several collections in Winnipeg were orphaned and donated to the JBWM, space available to work efficiently shrank. In 2000, Rob was integral in obtaining Canadian Foundation for Innovation funding to expand the museum facilities and to implement one of the first bar-coded databases for entomological museums in Canada. The museum now has enough space to accommodate many years' contributions of specimens, and in the near future we expect to announce the new official name of our museum, the J.B. Wallis/R.E. Roughley Museum of Entomology, a fitting tribute to two water beetle specialists.

Rob had a big voice, a big personality and a big heart. There are few entomologists more generous with their time and expertise. He was endlessly supportive of students, and always provided the encouragement and enthusiasm for all things entomological that seemed to in-

spire so many of them. If you needed assistance, a reference, some specimens, an opinion, or an update on scores in the NHL games the night before, Rob was always there. He reveled in seeing some strange and unusual insect; he was always excited by whatever you had to share with him, even if it wasn't a beetle.

Rob has been an important component of the entomological community in Canada and he will be sorely missed. Rob is survived by his wife, Pearl, children Amy (Mike), grandsons Nicholas and Maxwell, Kate (Blake), Keegan, and stepsons Ryan and Chad.

Terry Galloway, Noel White, and Neil Holliday,
Winnipeg, MB

Society business / Affaires de la société

60th Annual General and Governing Board Meetings

The Annual General Meeting of the Entomological Society of Canada will be held at the Coast Plaza Hotel, Vancouver, British Columbia on Tuesday, 2 November 2010 from 17:00 to 17:45. The Governing Board Meeting will be held at the same location on Saturday, 30 October 2010 from 08:30 to 17:00. Matters for consideration at either of the above meetings should be sent to Annabelle Firlej, Secretary of the ESC.

Call for nominations: Second Vice-President, Director-at-Large

Nominations for the Second Vice-President and Director-at-Large must be signed by three active members of the Society and should be received by the Secretary of the Entomological Society of Canada, Annabelle Firlej, by 30 April 2010 (see inside back cover for contact details).

60^{ème} Assemblée générale annuelle et la réunion du conseil d'administration

L'assemblée générale annuelle de la Société d'entomologie du Canada aura lieu à l'Hôtel Coast Plaza, Vancouver, Colombie Britannique, le mardi 2 novembre 2010 de 17:00 à 17:45. La réunion du conseil d'administration aura lieu au même endroit le samedi 30 octobre 2010 de 08:30 à 17:00. Veuillez faire part à la secrétaire, Annabelle Firlej, de tout sujet pouvant faire l'objet de discussion lors de ces réunions.

Appel de nominations: Deuxième vice-président, Conseiller

Les nominations pour deuxième vice-président et conseiller doivent être signées par trois membres actifs de la Société et devront être reçues par la Secrétaire de la Société d'entomologie du Canada, Annabelle Firlej, avant le 30 avril 2010 (voir intérieur de la couverture arrière pour coordonnées détaillées).

Coleopterists Society

The 48th issue of Scarabs, the Coleopterists Society Newsletter, is now available for downloading. It can be found at the Society's webpage:

http://www.coleopsoc.org/default.asp?Action=Show_Resources&ID=Scarabs

and at University of Nebraska's Scarab Central:

<http://www-museum.unl.edu/research/entomology/Scarabs-Newsletter.htm>

Ant-agonizers in Action

Haley Catton

As anyone who has set up an experiment knows, there are a lot of ways things can go wrong. This seems particularly true when you are working outdoors, where so many things, known and unknown, are out of our control. I had a rather surprising and interesting experience last summer along this line that may get a knowing chuckle out of some of you.

I work with the root feeding weevil *Mogulones crucifer*, released in Canada to control the invasive plant houndstongue (*Cynoglossum officinale*). My research is centered around exploring population-level effects of the insect on its target weed and a native non-target plant. Studying this topic is a blast because it involves both helpful practical applications and interesting theoretical biological questions.

Two of my main questions are: 1) What determines a weevil's "choice" to stay on or leave a non-target plant?; and 2) How far will weevils travel to find their host plant? So, I designed a mark-release-recapture experiment using potted plants to be conducted on the grounds of the Lethbridge Research Centre in spring 2009. I would release colour-coded batches of insects on potted non-target plants and



Figure 1. A wood ant climbs and attacks a painted *Mogulones crucifer* weevil.

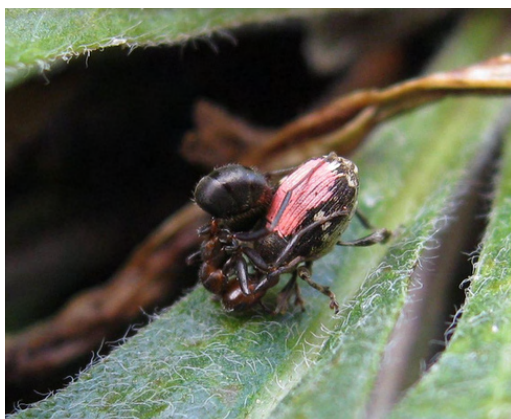


Figure 2. The ant continues to attack the weevil, presumably spraying formic acid on its victim.

track how many remained on the plants and how many left ("Should I stay or should I go?"). The areas where I would set up the experiment had to be (1) far from any 'wild' houndstongue and known *M. crucifer* release sites, (2) not mowed or disturbed during my 10-day experiment, and (3) away from pesticide spraying. Eventually, I chose to set up on field edges near unused and unmowed research fields. Perfect, I thought.

My student assistant and I spent many hours setting up the clusters of potted plants in suitable areas of the field edges. We also carefully hand-painted the elytra of about 4 000 weevils, and released

Haley Catton (hcatton@interchange.ubc.ca) is a PhD student studying weed biocontrol out of UBC Okanagan and Agriculture and Agri-Food Canada's Lethbridge Research Centre.

them in batches on clusters of potted plants. We were to return to the plants every day to water them, and every 2 days to count and return remaining well-dressed *M. crucifer*. For the most part, this was a pretty sound plan.

The problem was that in one of the areas, I did not notice a wood ant (*Formica* sp.) mound in the tall grass about 10 metres away from my potted plants. I had thought of a lot of ways this experiment could go wrong, but the effect of ants never crossed my mind. I did not even see the ants until the next day when it was too late – I went to water my plants and saw them covered in *Formica*! Where were the weevils? The few that were left were being harassed by aggressive wood ants who obviously did not want my cute little painted insects on their turf. I watched in shock as the ants attacked and harassed my weevils, effectively sabotaging this repetition of my experiment. I remember yelling “Nooooooo!! Stop that!!” to the ants before wising up and pulling out my camera.

The result is a series of photos of a 3-minute ant-on-weevil attack, some of the best shots I have ever taken. This particular ant was climbing on the weevil and shooting formic acid at its victim for over a minute (Figs. 1 & 2). When that was not effective, it and a friend tried to rip the legs off the weevil (Fig. 3). Finally, after 3 minutes, the ants gave up and the weevil emerged agitated but alive and with all body parts intact (Fig. 4). The weevil was simply too well-armoured for the ants.

Luckily for me, the ants destroyed only a small part of my experiment and I was still able to obtain a nice data set. What is the lesson here? When it comes to planning and conducting experiments, all you can do is the best you can, but experience helps. If and when things go wrong, make sure you take out your camera.



Figure 3. Two ants gang up on a weevil, with one using its mouthparts to try to break off one of the weevil's legs.



Hailey Catton

Figure 4. After the 3-minute attack, the weevil emerges victorious, and all in one piece!

Positions available

MSc Student Position in Wild Pollinator Ecology & Conservation

Co-Supervision: Dr Luise Hermanutz, Department of Biology, Memorial University, and Dr Chris Cutler, Department of Environmental Sciences, Nova Scotia Agricultural College

Location: Memorial University, St. John's, Newfoundland, Canada

Project: The island of Newfoundland offers a unique opportunity to study native pollinators under conditions found in few places in Canada – because of its isolation from the rest of North America, there is almost an absence of both non-native bumblebees and honey bees. This field-based project will attempt to clarify factors that affect wild bee diversity and abundance in lowbush blueberry habitats across the island. The MSc candidate will correlate native bee population dynamics with natural vegetation during and following bloom. Additional investigations will examine the prevalence and impact of imported, non-native bees on the wild bee fauna. This research will investigate the role of native pollinators in the development of an important indigenous fruit crop, and more basic issues of conservation biology and biodiversity surrounding wild bees and the pollination of native berries. The project is part of the NSERC Canadian Pollination Initiative (CANPOLIN) and thus will provide the successful candidate a unique opportunity to collaborate with a large, national team of scientists on issues surrounding pollinators and pollination in Canada.

Qualifications: Applicants must hold a BSc Honours degree in the biological sciences and have a first class GPA in the last two years of undergraduate study. Experience and knowledge in insect and plant ecology would be valuable assets. Strong written and oral communication skills are necessary to successfully complete this programme.

Stipend: \$17 500 per year for 2 years, contingent on funding. Canadian citizens and permanent residents will be encouraged to apply for a NSERC PGS scholarship valued at \$17 300, or any other applicable scholarship.

Start Date: May 2010

To Apply: For additional information on the research project and to submit the application, please contact: Dr Luise Hermanutz, Dept. of Biology, Memorial University, St. John's, NL, Canada A1B 3X9; e-mail: lhermanu@mun.ca.

Graduate Program Information: For further information on the MSc Program at Memorial University, see <http://www.mun.ca/biology> and/or contact the Biology Graduate Program Coordinator at graduate.biology@mun.ca or (709) 737-7498.

MSc/PhD Student Research Positions in Pollination Ecology and Plant Reproduction

We are seeking motivated and independent students to become part of an interdisciplinary team of federally funded researchers (NSERC-CANPOLIN) studying the consequences of pollinator decline in North America. Our central project concerns the pollination and reproductive biology of the plant genus *Vaccinium* (blueberries). Investigations include research and training in community ecology, population biology, and molecular ecology and involve a combination of field and laboratory approaches. Supervision could take place at one or more of the following Canadian universities: McGill University, University of New Brunswick, University of Ottawa. For further information, please check our websites:

Dr Linley Jesson: <http://v8nu74s71s3lg374r7ssn017uloss3c1vr3s.unbf.ca/~jesson/>

Dr Risa Sargent: <http://www.science.uottawa.ca/~rsargent/>

Dr Dan Schoen: <http://biology.mcgill.ca/faculty/schoen/>

or contact us by e-mail at: jesson@unb.ca; rsargent@uottawa.ca; or daniel.schoen@mcgill.ca.

Assistant/Associate Professor in Insect Systematics and Taxonomy

The Department of Entomology, Faculty of Agricultural and Food Sciences, University of Manitoba invites applications for a tenure track position at the rank of Assistant or Associate Professor, commencing 1 July 2010, or as soon as possible thereafter, to teach and conduct research in Insect Systematics and Taxonomy. The position will be weighted at approximately 45% teaching, 40% research and 15% service/outreach. Qualified applicants must possess: a PhD in taxonomy and systematics of insects or closely related arthropods; a record of independent research as demonstrated by scholarly publications; the potential for developing a strong externally funded research program in one or more areas of insect systematics or taxonomy; demonstrated ability or potential for excellence in undergraduate and graduate teaching; and excellent oral and written communication skills. The successful candidate will be required to teach undergraduate students in the area of insect systematics and taxonomy, as well as in general and economic entomology. Teaching assignments will balance the expertise of the successful candidate with the needs of the Department. The successful candidate will be expected to lead an active research program including supervision of graduate students in the area of insect systematics, biodiversity and related fields, and to secure external research funding. The successful candidate will become Curator of the J.B. Wallis Museum of Entomology, western Canada's largest entomological research museum, and will be expected to lead and collaborate in initiatives to further develop the Museum, including the current project to data-base the collection. The successful candidate will be expected to provide taxonomic and systematics expertise and advice to all graduate students and faculty in the Department of Entomology, and to participate in entomological extension activities of the Department of Entomology, including supervision of the "Bug Line" and responding to insect enquiries from the agricultural community and the general public.

The Department of Entomology (<http://www.umanitoba.ca/afs/entomology/>) is part of the Faculty of Agricultural and Food Sciences, which is committed to an interdisciplinary systems-approach to both teaching and research. The Department of Entomology is a small unit; collegiality, as well as cooperative and effective interactions with colleagues, support staff and students, are essential to its effective operation. Development of good working relationships with other systematists at the University of Manitoba and elsewhere, and with extension entomologists in government and industry is expected. Salary will be commensurate with experience and qualifications.

The University is located in Winnipeg, the largest city in the province of Manitoba. The city has a rich cultural environment including symphony, opera, dance, theatre, and ethnic festivals. The region provides ample opportunities for outdoor recreation in all seasons. Learn more about Winnipeg at <http://www.winnipeg.ca>.

The University of Manitoba encourages applications from qualified women and men, including members of visible minorities, Aboriginal peoples and persons with disabilities. All qualified candidates are encouraged to apply; however, Canadians and permanent residents will be given priority.

Applications, including a curriculum vitae, short statement of teaching philosophy and research interests and the names and addresses (including phone, fax and e-mail addresses) of three referees should be sent to Dr M.L. Connor, Chair, Search Committee - SE, Department of Animal Science, Faculty of Agricultural and Food Sciences, University of Manitoba, Winnipeg, MB, R3T 2N2 Canada. Tel.: (204) 474-9219; Fax: (204) 474-7628; e-mail: mconnor@cc.umanitoba.ca. Specify position number 10948 in the application. Closing date for applications is 15 April 2009. The review of applications will continue until the position is filled. Application materials, including letters of reference, will be handled in accordance with the Freedom of Information

and Protection of Privacy Act (Manitoba). Please note that curricula vitae may be provided to participating members of the search process.

For more information on this opportunity, please visit www.umanitoba.ca/employment.

Course announcements

• **Pollination Biology Field Course**, Missouri Botanical Garden, St. Louis, Missouri, 19-30 April 2010. www.uoguelph.ca/canpolin

• **Arctic & Boreal Entomology Field Course 2010**, Churchill Northern Studies Centre, Churchill, Manitoba, 5-16 July 2010.

<http://www.uoguelph.ca/canpolin/Courses/ArcticBorealEnt2010.pdf>

• **Annual International Pollination Course**, Rio Grande do Sul, Brazil, 22 November - 4 December 2010.

Changes? Hopefully few.

(Continued from p. 52)

our *Bulletin* is in excellent shape, both literally and metaphorically, due in no small part to the sterling work of previous editors Paul Fields (2003-2006) and Kevin Floate (2007-2009). Between them, these individuals have developed a publication with both substance and structure. It provides a medium that keeps members up to date with their Society's activities (including strong student involvement), news of conferences, courses, new books, etc., as well as presenting fascinating stories of current research and entomological history through features such as Entomologists at Work, Lab Profile, Heritage Lecture, Gold Medal Address, and special articles. We also have some fun items, notably Moth Balls and Dear Buggy, to which may be added in the future cryptic entomological crosswords and a series on Entomologists at Play (if I can find any entomologists that have any spare time!).

My hope is that readers will not notice much difference between this (and future) issues and those that have gone before. If this is the case, it will indicate that I have got over my 'teething problems.' Of course, I shall be pleased

to receive any comments that you may have regarding the *Bulletin's* content, especially if you have new ideas, and ESPECIALLY if you are willing to write something for us!

Changements? Espérons peu.

(Suite de la page 52)

que Entomologistes au boulot, Profil de labo, Allocation du patrimoine, Allocation du médaillé d'or et des articles spéciaux. Nous avons également quelques chroniques amusantes, notamment Boules à mites et Cher Bibitte, auxquelles pourront être ajoutés dans le futur des mots croisés entomologiques et une chronique Entomologistes en coulisse (si je peux trouver des entomologistes qui ont des temps libres!).

Mon espoir est que les lecteurs ne verront pas la différence entre ce numéro (ainsi que les futurs) et ceux qui ont été publiés avant. Si c'est le cas, ça indiquera que j'aurai réussi à me faire les dents. Bien sûr, je serai heureux de recevoir tout commentaire que vous pourriez avoir concernant le contenu du *Bulletin*, spécialement si vous avez des nouvelles idées, et plus particulièrement si vous êtes motivés à écrire pour nous!

Annual Photo Contest

Seeking a Few Good Photos!

The Sixth Annual Photo Contest to select images for the 2011 covers of *The Canadian Entomologist* and the *Bulletin of the Entomological Society of Canada* is underway. The cover images are intended to represent the breadth of entomology covered by the Society's publications. Insects and non-insects in forestry, urban or agriculture; landscapes, field, laboratory or close-ups; or activities associated with physiology, behaviour, taxonomy or IPM are all desirable. A couple of 'Featured Insects' (for the spine and under the title) are also needed. If selected, your photo will grace the cover of both publications for the entire year. In addition, winning photos may be used on the ESC website.

Contest rules are as follows:

1. Photos can be submitted as an electronic file (preferred), a slide or a print (negative will be required if chosen). Digital images must have a resolution of at least 50 pixels/cm.
2. Entrants can submit more than one photo. A brief description (i.e. caption) should be provided with each photo submitted.
3. Photos must be taken by the entrant, or the entrant must own the copyright.
4. The copyright of the photo remains with the entrant, but use must be granted to the Entomological Society of Canada for inclusion on the cover of one volume (i.e. 6 issues) of *The Canadian Entomologist*, one volume (i.e. 4 issues) of the *Bulletin of the Entomological Society of Canada*, and on the ESC website.
5. The entrant must be a member in good standing of the Entomological Society of Canada.
6. The judging committee will be chosen by the Chair of the Publications Committee of ESC.
7. Photos are not restricted to insect "portraits". To represent the scope of entomological research we encourage photos of field plots, laboratory experiments, insect impacts, sampling equipment, non-insect arthropods, etc.
8. A selection of the entries may be exhibited and the winners announced at the Annual Meeting of the Entomological Society of Canada or in the *Bulletin*.
9. There is no cash award for the winners, but photographers will be acknowledged in each issue the photos are printed.
10. Submissions should be sent by **31 July 2010** to:

Peter de Groot,
Chair, ESC Publications Committee
Great Lakes Forestry Centre
Natural Resources Canada
1219 Queen Street East
Sault Ste. Marie, ON P6A 2E5
Tel: 705-541-5640 Fax: 705-541-5700
E-mail: pdegroot@nrcan.gc.ca

Concours annuel de photographie

À la recherche de quelques bons clichés!

La sixième édition du concours annuel de photographie visant à sélectionner des images pour les couvertures de *The Canadian Entomologist* et du *Bulletin de la Société d'entomologie du Canada* de 2011 est présentement en cours. Les images des couvertures doivent représenter l'étendue de l'entomologie couverte par les publications de la Société. Des photos représentant des insectes et d'autres arthropodes forestiers, urbains ou agricoles, des paysages, du travail de terrain ou de laboratoire, des gros plans, ainsi que des activités associées à la physiologie, au comportement, à la taxonomie ou à la lutte intégrée seraient souhaitées. Nous avons également besoin de quelques «insectes vedettes» (pour le dos et sous le titre). Si vos photographies sont sélectionnées, elles seront utilisées pour la couverture des deux publications pour l'année entière. En plus, les photos gagnantes pourront être utilisées dans le site Web de la SEC.

Les règlements du concours sont les suivants :

1. Les photos peuvent être soumises sous forme de fichiers électroniques (de préférence), de diapositives ou imprimées (le négatif sera requis si la photo est choisie). Les images numériques doivent avoir une résolution minimale de 50 pixels/cm.
2. Les concurrents peuvent soumettre plus d'une photo. Une brève description doit être fournie avec chaque photographie soumise.
3. Les photos doivent avoir été prises par le concurrent, ou ce dernier doit en posséder les droits d'auteur.
4. Les droits d'auteur de la photo appartiennent au concurrent, mais l'utilisation doit être accordée à la Société d'entomologie du Canada pour son utilisation sur la couverture d'un volume (i.e. 6 numéros) dans *The Canadian Entomologist* et un volume (i.e. 4 numéros) dans le *Bulletin de la Société d'entomologie du Canada*, ainsi que sur le site Web de la SEC.
5. Le concurrent doit être un membre en règle de la Société d'entomologie du Canada.
6. Le jury d'évaluation sera choisi par le président du Comité des publications de la SEC.
7. Les photos n'ont pas à être restreintes à des « portraits » d'insectes. Afin de représenter l'étendue des recherches en entomologie, nous encourageons les photographies de terrain, d'expériences de laboratoires, d'impacts des insectes, d'équipement d'échantillonnage, d'arthropodes autres qu'insectes, etc.
8. Une sélection des candidats sera exposée et les gagnants seront annoncés à la réunion annuelle de la Société d'entomologie du Canada, ou dans le *Bulletin*.
9. Il n'y a pas de récompense monétaire pour les gagnants, mais les photographes seront remerciés dans chacun des numéros où les photos apparaîtront.
10. Les soumissions doivent être envoyées avant le **31 juillet 2010** à :

Peter de Groot,
Président, Comité des publications de la SEC
Centre de foresterie des Grands Lacs
Ressources naturelles Canada
1219, rue Queen Est
Sault Ste-Marie, Ontario, P6A 2E5
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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.

Bulletin of the Entomological Society of Canada

Editor: Cedric Gillott

Assistant Editor: Fred Beaulieu

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.

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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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Bulletin de la Société d'entomologie du Canada

Rédacteur: Cedric Gillott

Rédacteur adjoint: Fred Beaulieu

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.

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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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**Date de tombée pour le prochain numéro:
30 avril 2010**

The last word / Le dernier mot

Cedric Gillott, Editor / Rédacteur



Changes? Hopefully few.

After 7 years and 28 issues, it is time to lay “The Buzz” to rest. The editor’s column has acquired a new title: The Last Word. This is not especially original, though may be slightly more appropriate than ‘buzz’ or ‘chirp’ (though not perhaps ‘drone’) for an author about to enter his eighth decade. It also has some personal significance as the elevation to my new position as Editor of the *Bulletin* was foreseen by my mother over 50 years ago! I recall with some embarrassment, being a somewhat unruly and certainly argumentative teenager, that she would often say “Cedric, you will have the last word!” (To which, of course, I always replied “Yes”).

It was with some trepidation that I agreed to become the *Bulletin*’s editor as I had long believed that the position would require expertise in desk-top publishing, laying out web pages, and other computer skills that are largely foreign to me. However, having been reassured that this was not the case, such skills residing in the bailiwick of our super Assistant Editor, Fred Beaulieu, I was convinced to step aboard. It took me very little time to appreciate that

(Continued on p. 47)

Changements? Espérons peu.

Après 7 ans et 28 numéros, il est temps de laisser les “Bourdonnements” reposer. La chronique du rédacteur a maintenant un nouveau nom: Le dernier mot. Ce n’est pas particulièrement original, quoique peut-être légèrement plus approprié que « bourdonnement » ou « gazouillis » pour un auteur sur le point d’entrer dans sa huitième décennie. Cette expression possède également une signification personnelle puisque l’obtention de mon nouveau poste en tant que rédacteur du *Bulletin* avait été prédite par ma mère il y a plus de 50 ans! Je me souviens avec embarras que, ayant été un adolescent indiscipliné et obstiné, ma mère disait souvent: « Cedric, tu auras le dernier mot! ». Ce à quoi je répondais bien sûr: « Oui ».

C’est avec une certaine appréhension que j’ai accepté de devenir le rédacteur du *Bulletin* puisque j’ai longtemps cru que ce poste requerrait une expertise dans la publication assistée par ordinateur, la mise en forme de sites Internet et autres habiletés qui me sont totalement étrangères. Cependant, étant rassuré que ce n’était pas le cas, ces habiletés étant de la juridiction de notre super rédacteur adjoint, Fred Beaulieu, j’ai été convaincu de monter à bord. Je n’ai eu besoin que de bien peu de temps pour me rendre compte que notre *Bulletin* est en très bonne forme, littéralement et métaphoriquement, grâce au travail des rédacteurs précédents, Paul Fields (2003-2006) et Kevin Floate (2007-2009). À eux deux, ces individus ont développé une publication possédant structure et substance. Le *Bulletin* fournit un médium qui maintient les membres à jour sur les activités de la Société (incluant une forte implication étudiante), les nouvelles de conférences, les cours, les nouveaux livres, etc., ainsi que de présenter des histoires fascinantes sur la recherche actuelle et l’histoire entomologique au travers des sections telles

(Suite à la page 47)

Entomological Society of Canada, 2009-2010

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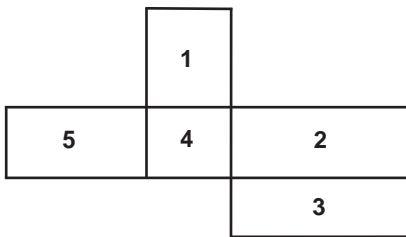
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Images

On the spine: *Cyphocleonus achates* (Fahraeus) (Coleoptera: Curculionidae) is a root feeding weevil introduced into Canada for the biological control of non-native species of knapweed (*Centaurea* spp.). Photo: B. Van Hezewijk

Beneath the title: *Alucita adriendenisi* (Landry & Landry) (Lepidoptera: Alucitidae), found across much of Canada, was named in honour of Adrien Denis who assisted Carl Atwood, the father of Margaret Atwood, in his entomological work and left a significant impression on the Atwood family. Photo: J. Dombroskie

- 1 Caterpillar of the spurge hawk-moth, *Hyles euphorbiae* (L.) (Lepidoptera: Sphingidae), on leafy spurge (*Euphorbia esula* L.), Spruce Woods Provincial Park, Manitoba. Photo: A. Leroux
 - 2 Mating flesh flies (Diptera: Sarcophagidae), Gatineau Park, Quebec. Photo: M. Larri  e
 - 3 *Piagetiella peralis* (Leidy) (Phthiraptera: Menoponidae), a parasite found in the pouch of American white pelican (*Pelecanus erythrorhynchus*). Photo: T. Galloway
 - 4 Collecting parasitoids of the cabbage seedpod weevil, *Ceutorhynchus obstrictus* (Marsham) (Coleoptera: Curculionidae), in Swiss canola (*Brassica* sp.) fields. Photo: T. Haye
 - 5 A highly ornamented soil mite from native grasslands in Alberta (Prostigmata: Stigmaeidae). Photo: H. Proctor
- Back cover:** A round-headed apple tree borer, *Saperda candida* (Fabricius) (Coleoptera: Cerambycidae) near Peterborough, Ontario. Individuals of this species vary in the predominance of light (as in this specimen) or dark stripes. Photo: J. Fitzsimmons

Fran  ais    l'int  rieur de la couverture avant