



Bulletin

Entomological Society of Canada
Soci t  d'entomologie du Canada

Volume 43
Number / num ro 3



September / septembre 2011



Published quarterly by the
Entomological Society of Canada

Publication trimestrielle par la
Soci t  d'entomologie du Canada



Up front / Avant-propos	101
Important information / Information importante	
What has changed with Canada's system for importing arthropods and why? / Qu'est qui a changé avec le système d'importation des arthropodes au Canada et pourquoi?	104
Changes to The Canadian Entomologist / Changements à The Canadian Entomologist.....	118
Meeting announcements / Réunions futures.....	121
Moth balls / Boules à mites.....	122
Joint Annual Meeting / Réunion annuelle conjointe.....	124
The student wing / L'aile étudiante	126
ESC 2011 award winners / Gagnants des prix SEC 2011.....	129
People in the news / Gens qui font les manchettes.....	135
Special features/ Articles spéciaux:	
Titanic testicles in tettigoniids add weight to the male mating rate hypothesis.....	136
Status of entomology in Canada: crisis or opportunity.....	141
Book reviews / Critiques de livres	148
In memory / En souvenir de	158
Society business / Affaires de la Société.....	160
Announcements / Annonces	163
Officers of affiliated Societies / Dirigeants des Sociétés associées	166
The last word / Le dernier mot	168
Governing board / Conseil d'administration	inside back cover

Images

Sur le dos: Une mouche à toison, *Stenopogon inquinatus* Loew (Diptera : Asilidae), photographiée dans la vallée de l'Okanagan en Colombie-Britannique. Un des plus gros asilidés canadiens, sa distribution s'étend sur presque tout l'ouest de la Colombie-Britannique où il est commun dans les forêts sèches et les prairies. Photo : W. Strong

Sous le titre: Accouplement de téléphores fauves, *Rhagonycha fulva* (Scopoli) (Coleoptera : Cantharidae), dans un pré près de Delémont, en Suisse. Ce coléoptère prédateur européen a été introduit récemment en Amérique du Nord où il est maintenant répandu. Photo : A. Leroux

1 Une espèce européenne de *Plebejus* Kluk (Lepidoptera : Lycaenidae), très semblable à l'espèce néarctique *Plebejus melissa* (Edwards). Jerisberghof, Suisse. Photo : A. Leroux

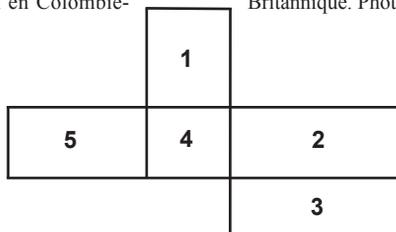
2 Œufs de *Leptoglossus occidentalis* Heidemann (Hemiptera : Coreidae), un important ravageur des graines de conifères en Amérique du Nord et des pignons de pins comestibles en Europe. Vernon, Colombie-Britannique. Photo : W. Strong

3 Une nymphe de criquet des pâtures, probablement une espèce de *Chorthippus* Fieber (Orthoptera : Acrididae), dans une pâture de montagne près de Soyhières, en Suisse. Photo: A. Leroux

4 Lars Andreassen préparant des leurres pour ses pièges à *Aleochara bipustulata* (L.) (Coleoptera : Staphylinidae), un agent potentiel de lutte biologique contre *Delia radicum* (L.) (Diptera : Anthomyiidae). Zurich, Suisse. Photo: A. Leroux

5 Une nymphe de punaise réduviidée (Heteroptera : Reduviidae), photographiée dans l'ouest du Massachusetts. Photo: B. Roitberg

Couverture arrière: Une guêpe platygastroïde, *Gryon pennsylvanicum* (Ashmead) (Hymenoptera : Scelionidae), pondant dans des œufs de la punaise américaine, *Leptoglossus occidentalis* Heidemann (Hemiptera : Coreidae) dans la vallée de l'Okanagan en Colombie-Britannique. Photo: W. Strong





'The Times They Are a-Changin'

The 1964 Bob Dylan song, about the social and political upheaval of the 1960's civil rights movement, is also about adaptation and renewal. As the world around us changes, we must recognize that there are new challenges to be met and we must continually adapt. It is therefore essential for new folks with new ideas to get involved so the ESC remains vibrant and relevant.

As the JAM approaches, we near the time when the Executive Council and Governing Board change. This year we also see change in our Trustees. We must say goodbye to Robb Bennett as *TCE* Editor-in-Chief and also to Annabelle Firlej as ESC Secretary. Over the last 5 years, Robb, le Grand Fromage, has made a real difference to the ESC's primary mechanism for communicating entomological science to the Canadian entomological community. He has been there to guide us authors through the process at every step of the way: to make sure our papers are the best they can be, to give us the good news that they are ac-

'The Times They Are a-Changin'

La chanson de Bob Dylan de 1964, parlant du bouleversement social et politique du mouvement de droits civiques des années 1960, parle également d'adaptation et de renouvellement. Alors que le monde change autour de nous, nous devons reconnaître qu'il y a de nouveaux défis à relever et que nous devons continuellement nous adapter. Il est donc essentiel pour les nouveaux collègues ayant de nouvelles idées de s'impliquer dans la SEC afin qu'elle demeure dynamique et pertinente.

Alors que la réunion conjointe annuelle approche, des changements dans le conseil exécutif et dans le conseil d'administration approchent également. Cette année, nous allons également voir des changements dans nos fiduciaires. Nous devons dire au revoir à Robb Bennett en tant que rédacteur en chef du *TCE* ainsi qu'à Annabelle Firlej en tant que secrétaire de la SEC. Durant les cinq dernières années, Robb, le grand Manitou, a fait une grande différence dans le mécanisme primaire de communication de la SEC pour la science entomologique au sein de la communauté entomologique canadienne. Il a été là pour guider les auteurs à chacune des étapes du processus : pour s'assurer que nos articles étaient à leur meilleur, pour nous donner les bonnes nouvelles lorsqu'ils étaient acceptés pour publication, et pour s'assurer qu'ils étaient lisibles pour une vaste audience. Bien que ça ne fasse que 3 ans, Annabelle a travaillé dur en coulisses afin de maintenir le conseil exécutif et le conseil d'administration sur la bonne voie. Elle a été très efficace en communication et en conseils pour la SEC. À Annabelle et Robb, j'offre mes sincères remerciements pour leur service extraordinaire à la SEC.

Je suis très heureux d'annoncer que nous avons signé un contrat avec les Presses de l'Université Cambridge afin de publier *The*

cepted for publication, and to make sure they are readable to a wide audience. Though it has been only 3 years, Annabelle has been hard at work behind the scenes to keep the Executive Council and the Governing Board on the right path. She has been an excellent communicator and advisor to the ESC. To both Annabelle and Robb, I extend sincere thanks for their extraordinary service to the ESC.

I am very pleased to announce that we have signed a contract with Cambridge University Press to publish *The Canadian Entomologist* for the next 7 years. The incoming Editor-in-Chief, Chris Buddle, has been working with Robb and the Publications Committee to ensure a smooth transition to our new publisher (see Chris' message under Important information). I also wish to welcome the new Editorial Board. Thanks also to Kevin Floate (ESC Publications Chair) for his leadership during the negotiations and to Scott Brooks (ESC Treasurer) for scrutinizing the documents at each step.

I am also pleased to welcome Alec McClay as the new ESC Secretary. Alec received his PhD from the University of Cambridge. He has over 30 years' experience in the use of insects and mites for classical biological control of invasive alien weeds (selection of target weeds and biocontrol agents, overseas exploration, biological studies, regulatory requirements, field evaluation and implementation). He has collaborated extensively with researchers and weed management staff in Canada and internationally. Alec has a broad understanding of the ecology of both deliberate and accidental introductions of alien species into new environments, and the effects of climate on insect development and distribution. He has extensive experience in literature reviewing and synthesis, and frequently reviews manuscripts for international journals, as well as petitions for the release of new weed biological control agents through the USDA Technical Advisory Group and the Canadian Biological Control Review Committee. Alec served as Secretary for the Entomological Society of Alberta from 1986 to 1988 and 1996 to 1998.

Canadian Entomologist pour les 7 prochaines années. Le nouveau rédacteur en chef, Chris Buddle, a travaillé avec Robb et le comité des publications afin d'assurer une transition en douceur vers notre nouvel éditeur (voir le message de Chris sous Informations importantes). Je veux également souhaiter la bienvenue au nouveau bureau de la rédaction. Merci également à Kevin Floate (président du comité des publications de la SEC) pour son leadership durant les négociations et à Scott Brooks (trésorier de la SEC) pour avoir minutieusement scruté tous les documents à chacune des étapes.

Je suis également heureux d'accueillir Alec McClay en tant que nouveau secrétaire de la SEC. Alec a obtenu son doctorat à l'Université Cambridge. Il a plus de 30 ans d'expérience dans l'utilisation des insectes et des acariens pour la lutte biologique classique des mauvaises herbes introduites envahissantes (sélection de mauvaises herbes cibles et d'agents de lutte biologique, exploration outre-mer, études biologiques, exigences réglementaires, évaluation sur le terrain et implantation). Il a beaucoup collaboré avec des chercheurs et des employés de gestion des mauvaises herbes au Canada et à travers le monde. Alec a une vaste compréhension de l'écologie autant des introductions délibérées qu'accidentelles d'espèces exotiques dans des nouveaux environnements, et des effets du climat sur le développement et la distribution des insectes. Il a une vaste expérience dans la revue de littérature et la synthèse, et révisé fréquemment des articles pour des revues internationales, ainsi que des pétitions pour le lâcher de nouveaux agents de lutte biologiques de mauvaises herbes via le « Technical Advisory Group » du ministère de l'agriculture des États-Unis et du Comité de révision de la lutte biologique au Canada (« Canadian Biological Control Review Committee »). Alec a été secrétaire de la Société d'entomologie d'Alberta de 1986 à 1988 et de 1996 à 1998.

Notre webmestre Rick West a fait un excellent travail en relevant les nombreux défis de cette dernière année! Il est prêt à passer le

Webmaster Rick West has done an exceptional job in handling the many challenges during this past year! He is ready to pass the 'hotkey' ... "it is time for fresh blood". If you are interested please let me or Michel Cusson know.

The 2011 JAM is near and I hope you will be in Halifax! The theme of this year's meeting is "Beauty and Impact" and the Local Organizing Committee has worked hard to facilitate all types of communication at this meeting. The Westin Nova Scotian Hotel is an excellent venue to support our scientific and social sessions. The program includes some renowned plenary speakers, a wide variety of symposia, contributed oral and poster presentations, and as always there will be excellent student presentations. Dan Quiring's Heritage Lecture on "The history of forest entomology in Atlantic Canada" is something not to be missed.

Finally, I want to thank my fellow Executive Council members, the ESC Governing Board, ESC Trustees, our Office Manager Derna Lisi, and ESC members for their support and collaboration during this past year. It has been a pleasure!

clavier... « it is time for fresh blood » (il temps d'avoir du sang neuf). Si vous êtes intéressés, merci d'informer soit moi, soit Michel Cusson.

La réunion conjointe annuelle de 2011 approche, et j'espère que vous serez à Halifax! Le thème de cette année est « Beauté et Impact » et le comité organisateur local a travaillé fort afin de faciliter tous les types de communication à cette réunion. L'hôtel Westin Nova Scotian est un excellent endroit pour soutenir nos sessions scientifiques et sociales. Le programme inclut quelques conférenciers invités de renom, une grande variété de symposiums, des présentations orales et par affiches et, comme toujours, il y aura d'excellentes présentations d'étudiants. L'allocution du patrimoine de Dan Quiring sur « L'histoire de l'entomologie forestière dans le Canada atlantique » est à ne pas manquer.

Finalement, je voudrais remercier tous mes collègues membres du conseil exécutif, du conseil d'administration, les fiduciaires de la SEC, notre directrice de bureau Derna Lisi et les membres de la SEC pour leur soutien et leur collaboration durant la dernière année. Ce fut un réel plaisir!



M. Larrivée

Saperda puncticollis, Cerambycidae

Important information / Information importante

What has changed with Canada's system for importing arthropods and why?

Rose De Clerck-Floate (Rosemarie.DeClerck-Floate@agr.gc.ca), Tanya Fielding (Tanya.Fielding@inspection.gc.ca), and Peter Mason (Peter.Mason@agr.gc.ca)

In May 2010, the Canadian Food Inspection Agency (CFIA) began implementing Canada's revised importation process for arthropods and other living organisms (e.g., microorganisms and nematodes). Changes to this process included:

- a new electronic [application form](#);
- policy changes regarding which arthropods could be imported with a plant protection import permit (e.g., [Policy Decision Regarding the Importation of Live Insects for Feed/Bait or as Pets](#));
- an updated import permit application review process; and
- the implementation of the new "[Containment Standards for Facilities Handling Plant Pests](#)" on 1 November 2010.

For those working with imported arthropods, these changes led to frustration and confusion regarding the application process for a plant protection import permit. This was evident at the Entomological Society of Canada's (ESC) Joint Annual Meeting in Vancouver in November 2010. The ESC Science Policy and Education Committee recognized the importance of the situation and initiated action to find a solution. To better understand the issues surrounding the changes to the import requirements for living arthropods, the ESC membership was surveyed in January 2011 regarding their experiences. Of the 14 responses to the survey, 10 expressed negative repercussions to their entomological activities, and 4 replied that they had no problems or applauded the changes.

From the ESC survey, it is apparent that completing the electronic application form is the step that is causing the greatest frustrations and taking the longest amount of time. One of the problems is that the information required (by law) is not clearly identified on the form (e.g., the facility name, civic address and room number where arthropods are to be held). The CFIA is currently revising their application form to increase its clarity and efficiency. For example, in addition to including fields for applicants to provide the facility name, civic address and room number where the arthropods will be held, the revised application form will include fields for facilities previously certified at a specific containment standard to self-identify. Furthermore, the revised application form will contain more detailed guidance for importers on how to fill out the individual sections of the form.

The CFIA is fully aware of the frustrations felt by applicants and is taking steps to consult further with client entomologists on improving the application process. The pressure on their side is the urgent need to stop plant pests at our borders, as emphasized in both Chapter 4 of the December 2008 Auditor General's report ("*Managing Risks to Canada's Plant Resources —Canadian Food Inspection Agency*") as well as in a review of the *Plant Protection Act* (1990) and *Plant Protection Regulations* (1995), for which the CFIA holds responsibility. Recommendations included increased pest risk mitigation through the importation process, including greater scrutiny of permit applications. Furthermore, the CFIA is no longer to issue or amend import permits for live arthropods that are not regulated under the *Plant Protection Act*.

The ESC survey results have been useful in identifying specific issues in the application process and have helped us in beginning a dialogue with the CFIA on these issues. As a first step, the CFIA has formed separate advisory/working groups between itself and the Canadian Association of Zoos and Aquariums, the U-15 Research Group (representing affected Canadian

universities) and, most recently, the Research Branch of Agriculture and Agri-Food Canada (AAFC). All working groups have entomologist representation, and collectively, progress will be made in streamlining the newly implemented permit application process for the sake of entomological activities in Canada. Specifically, the results of the ESC survey will feed into the AAFC-CFIA working group.

One of the suggestions made to CFIA was to better communicate the new importation process, including its requirements and expected timelines. This collaborative article is but one vehicle for communication. Following is a list of questions and answers which we hope will help guide entomologists through this period of change.

Q1. What is and isn't regulated under the *Plant Protection Act*?

A1. The purpose of the *Plant Protection Act* is “to protect plant life and the agricultural and forestry sectors of the Canadian economy by preventing the importation, exportation and spread of pests and by controlling or eradicating pests in Canada”. [Section 3](#) of this Act defined a pest as “anything that is injurious or potentially injurious, whether directly or indirectly, to plants or to products or by-products of plants, and includes any plant prescribed as a pest”. Examples of living organisms that would fall outside the mandate of the *Plant Protection Act* are:

Entomophagous or “insect-eating” living organisms (these may be regulated by Environment Canada under the *Canadian Environmental Protection Act*; in the case of approved entomophagous biological control agents, their import may also be regulated by the Pest Management Regulatory Agency under the *Pest Control Products Act*)

Human pathogens (regulated by the Public Health Agency of Canada under the *Human Pathogens and Toxins Act* and *Human Pathogens Importation Regulations*)

Animal pests or pathogens (regulated by the CFIA under the *Health of Animals Act*)

When a living organism is a plant pest as well as a human and/or animal pathogen, the regulatory oversight of their importation defaults to the more stringent authority (i.e., *Human Pathogens and Toxins Act* → *Health of Animals Act* → *Plant Protection Act*).

Q2. Who is eligible to apply for a plant protection import permit?

A2. In accordance with [Section 30](#) of the *Plant Protection Regulations*, a “person may apply for a permit if the person:

(a) is a Canadian citizen or permanent resident, as those terms are defined in subsection 2(1) of the *Immigration Act*;

(b) is authorized under the laws of Canada to reside in Canada for a period of six months or more and will have the possession, care or control of the thing to be imported; or

(c) in the case of a corporation with a place of business in Canada, is an agent or officer of the corporation who resides in Canada.”

In the case of colleges and universities, only a faculty member or department head can apply for a permit to import on behalf of the institution. This does not include emeritus personnel.

The CFIA may ask an applicant to provide documentation which supports their eligibility to apply for and hold a plant protection import permit. Examples of such documentation include a legible copy of their passport or permanent residency card issued by Citizenship and Immigration Canada (front and back). Social insurance numbers or copies of a birth certificate or citizenship card are not acceptable forms of supporting documentation as these are personal documents which cannot be confirmed or verified by the CFIA. Where the importer is a business or corporation, the CFIA may also request supporting documentation to confirm that the contact person listed on the application is authorized by the importer to act as an agent of the business or corporation.

Q3. What is a pest risk assessment and when is one required?

A3. [Section 32](#) of the *Plant Protection Regulations* requires that the Minister of Agriculture and Agri-Food issue a plant protection import permit based on a pest risk assessment. The requirement for a pest risk assessment is generally triggered when an importer applies for a plant protection import permit for a new commodity (i.e., one which has never been imported into Canada) or one for a familiar commodity from a new origin (i.e., the commodity has never been imported from that origin).

A pest risk assessment for an exotic arthropod considers the likelihood that the organism proposed for importation can or will become established in the Canadian environment, and if so, the potential magnitude of the impacts which may occur, particularly with regard to risks to the agricultural and forestry sectors (i.e., it assesses the potential for the organism to be a plant pest of concern). The time required to complete a pest risk assessment is dependent on a number of factors, which include the availability of information and the number of requests in the queue. Consequently, the time required for a pest risk assessment can vary anywhere from several weeks up to 2 years.

A pest risk assessment is followed by a risk management phase which identifies potential mitigation measures and determines appropriate import conditions and requirements to minimize any risks identified in the pest risk assessment. Where the risk is assessed as being high and/or unmanageable, the importation of the plant product or organism is prohibited (please see Question 6 for information on import exemptions for prohibited material).

A pest risk assessment may also determine that the importation of an organism falls outside the mandate of the *Plant Protection Act*. However, importers should be aware that this does not preclude the importation of their organism from being regulated under another federal or provincial act or regulation. It is the responsibility of the importer to ensure that their imported shipment meets all applicable import requirements.

Q4. Why is a separate pest risk assessment required for closely-related living organisms (i.e., in same genus)?

A4. Some closely-related organisms can have different feeding or reproductive behaviours that result in a significant difference in the threat they pose from a plant protection perspective. A good example of this in the world of insects is the genus *Drosophila* (vinegar flies) which includes the cosmopolitan *D. melanogaster*, extensively used for research in the studies of biology and genetics and which usually completes its life cycle in rotting or fermenting fruit. However, the same genus also contains the newly introduced *D. suzukii* which is causing serious damage to fruit orchards on the west coast of North America. Consequently, a separate pest risk assessment is required for each genus/species combination.

Q5. Who is responsible for conducting pest risk assessments?

A5. The CFIA's Plant Health Risk Assessment Unit is responsible for conducting pest risk assessments for living organisms, including arthropods.

Q6. Are there any exemptions for researchers wishing to work with prohibited material?

A6. [Section 43](#) of the *Plant Protection Regulations* allows for the importation of prohibited products or organisms — such as live plant pests of concern — for special purposes; more specifically for the purpose of research, exhibition, education and/or industrial processing. Such importations are subject to containment measures and oversight to ensure that none of the imported material is accidentally released into the Canadian environment. Section 43 does not allow the importation of prohibited material for any other purpose.

The pest risk assessment developed for a prohibited arthropod as well as the subsequent risk management phase will establish the appropriate containment standard (i.e., containment measures) under the new [Containment Standards for Facilities Handling Plant Pests](#) required to safely handle the prohibited organism in question. (See Question 3 for further information on pest risk assessments and Question 10 for further information on facility certification under the CFIA's new containment standards.)

Q7. What steps are involved in the review of an application for a plant protection import permit for arthropods?

A7. The attached flow chart provides an overview of the steps in the CFIA's application review process for all commodities.

The review process is initiated by an importer submitting an application for a plant protection import permit to the Plant Health Permit Office. The Permit Office will review the application to ensure that it is complete, and, where required, will request missing or additional information from the applicant.

Once a complete application is in hand, the Permit Office or relevant commodity section(s) will determine whether or not a pest risk assessment is required for the commodity (or commodities) listed in the application. (Note: In some cases, a pest risk assessment for a commodity may have already been developed. See Question 3 for further information on pest risk assessments.) Where a pest risk assessment is required, the applicant is informed in writing by the Permit Office. An applicant must then submit a revised application form, along with the applicable fee of \$250/species, if they wish to proceed with initiating a pest risk assessment. This fee is applied in accordance with [Part 12](#) of the *CFIA Fees Notice* ("Plant Protection Fees").

The importation into Canada of arthropods determined to be plant pests of concern is prohibited under the *Plant Protection Act*. For such organisms, their importation is only permitted with an import permit issued pursuant to Section 43 of the *Plant Protection Regulations* for one of the following end uses: research, education, exhibition or industrial processing (see Question 6 for further information on this import exemption).

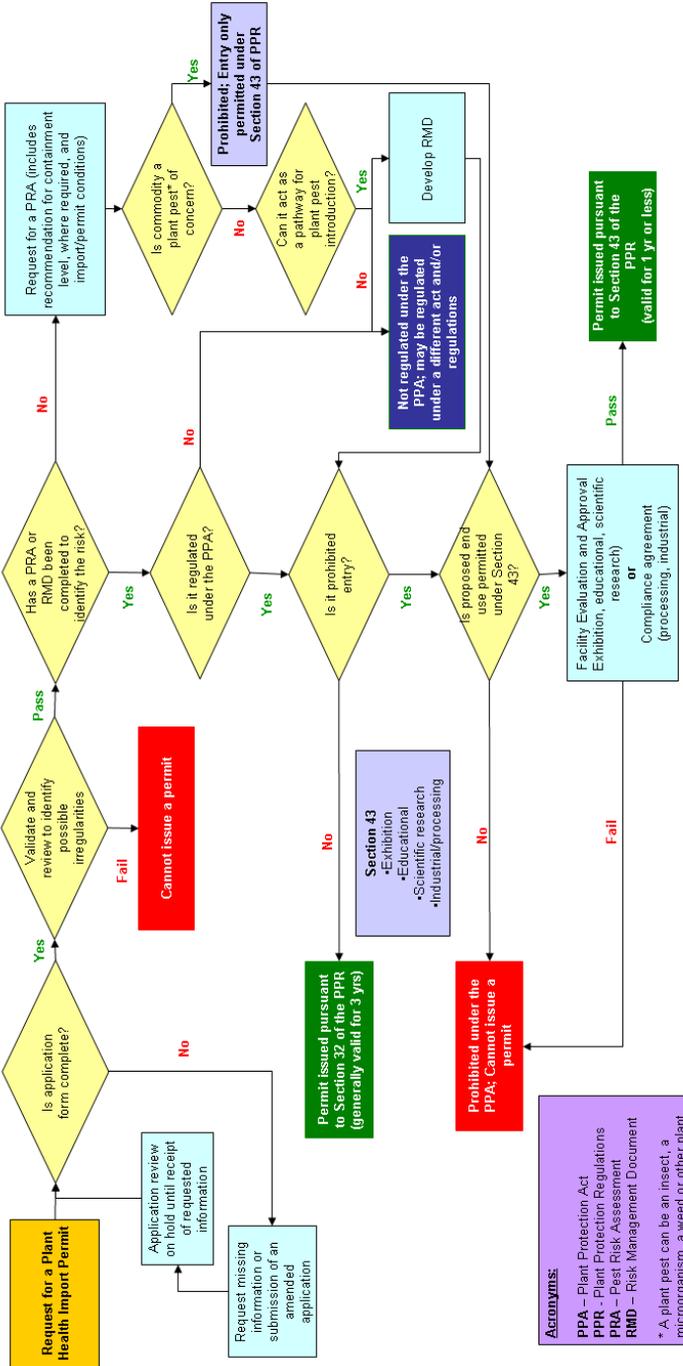
Facilities wishing to import a prohibited arthropod must be certified as meeting the required containment standard for that arthropod under the new [Containment Standards for Facilities Handling Plant Pests](#) prior to a permit being issued. (Further information on this certification process is available in Question 10.) Once a facility is certified, a permit is issued and may be valid for up to one year.

Where a pest risk assessment determines that the *Plant Protection Act* does not apply to the organism in question, a letter is sent to the applicant to inform them that the organism they wish to import is not regulated under the *Plant Protection Act* and, therefore, a plant protection import permit cannot be issued. The letter will also inform the applicant that their organism may be regulated under another federal act or regulation.

Q8. In general, how long does it take to review an application for a plant protection import permit?

A8. Applications for a plant protection import permit are reviewed and processed on a first come, first serve basis. Therefore, during peak or busier periods, the review and processing of an application may be longer than when an application is submitted during slower periods of the year. Between November to April, the Plant Health Permit Office can receive anywhere from 50 to 100 applications per day. Furthermore, where a request for clarification or additional information is sent to an applicant, the review of the application is suspended until the requested information is provided to the Permit Office. Moreover, the time required for the review and

Plant Health and Biosecurity Directorate – Process for Issuing Plant Protection Import Permits



processing of an application may also be dependent on a number of other factors, including:
 The time taken by the applicant to provide the Permit Office with the requested missing information or clarification

Whether or not the application must be reviewed by one or more commodity specialists

Whether or not a pest risk assessment is required

The time required to certify a facility at the required containment standard

Given all of these factors and to avoid unnecessary delays, importers are strongly recommended to apply for a plant protection import permit well in advance of either the expiry date of their current import permit and/or the expected date of their shipment(s) arriving at the Canadian border.

Importers should be aware that the submission of an application does not automatically guarantee that a plant protection import permit will be issued. The decision to issue a permit is only made once all of the required information and supporting documentation has been received and reviewed. Consequently, importers should have their import permit in hand before their shipment arrives at the Canadian border. Given that some import conditions or requirements must be fulfilled prior to the shipment leaving the country of export (e.g., treatment at origin), the CFIA strongly recommends that importers have their import permit in hand before their shipment leaves the country of export. Permits cannot be issued for a shipment once it has arrived at the Canadian border.

Q9. Who is responsible for certifying facilities under the new [Containment Standards for Facilities Handling Plant Pests](#)?

A9. The CFIA's Office of Biohazard Containment and Safety (OBCS) is responsible for certifying facilities under these new containment standards.

Q10. What steps are involved in getting a facility certified under these new containment standards and how long does the certification process take?

A10. The requirement for a facility to be certified under the *Containment Standards for Facilities Handling Plant Pests* is triggered when the facility has submitted an application for a plant protection import permit for a living plant pest of concern which is required to be kept in containment (i.e., has not been approved for environmental release).

The steps involved in the certification process depend on the plant pest containment (PPC) standard required to safely contain the organism in question. There are two different scenarios for certification/verification of containment facilities.

For organisms requiring the lower level containment standards, PPC-1 and PPC-2, the importer will be requested to complete a self-certification checklist and submit it to the Plant Health Permit Office. The checklists are reviewed by Biosafety Specialists from the CFIA's Office of Biohazard Containment and Safety (OBCS). The turn-around time for review is 2±1 weeks. Once the facility is deemed compliant based on the review of the completed checklist, a Compliance Letter is issued to the facility and is valid for a period of 2 years. PPC-1 and PPC-2 facilities may be subject to a follow up inspection by a CFIA inspector. The import permit is issued based on a facility's ability to meet the containment level specified for the organism(s) named on the permit.

For the higher level containment standards, PPC-2A and PPC-3, the process is robust and well defined. (For further details on the requirements of this process as well as Frequently Asked Questions, please click [here](#).) In contrast to the checklists required for PPC-1 and PPC-2, the complete certification submission for these higher level standards consists of three components:

As-Built Drawings

Biosafety Manual

Performance and Verification Test Reports.

The review time for each complete component is 3±1 weeks. A report will be generated by Biosafety Specialists and request for outstanding information will be made. A final component of the certification process is an on-site inspection by CFIA inspectors from the OBCS. Once the OBCS has verified that the facility meets all physical and operational containment requirements, a letter will be sent to confirm certification. Certification of a facility at the PPC-2A standard is valid for a period of 2 years and can be maintained via bi-annual recertification. Certification of a facility at the PPC-3 standard is valid for 1 year and can be maintained via annual recertification. If a facility is not granted certification, or certification is revoked for any reason, the deficiency or deficiencies must be corrected before the facility can be certified or re-certified.

Applicants should note that the timelines indicated above for the certification of a facility are based on an applicant/facility providing the checklist or other required documents in a timely fashion to the OBCS. Delays in providing the required information will result in a longer timeline for the certification of a facility.

Q11. Are there different permits required for arthropods that are shipped versus those that are hand-carried into Canada? If yes, are there different permit applications and application review processes involved?

A11. A plant protection import permit for an arthropod being hand carried into Canada (i.e., entering Canada via the traveler stream) is the same as an import permit for an arthropod being shipped to Canada using a courier service. However, in the absence of a link between the import permit and the person transporting the shipment, such a shipment will be refused entry at the border. To avoid unnecessary border issues, applicants are strongly advised to indicate this intent (and the name of the person transporting the shipment) to the Plant Health Permit Office on their application so that it may be reflected on the import permit. An additional import condition will be added to the permit which states that the person traveling with the shipment is authorized to transport the living organism(s) named on the permit to the Canadian destination listed on the permit.

Please note that documentation substantiating the identity of the traveler (e.g., a passport) may be requested when clearing customs/crossing the border.

Qu'est-ce qui a changé avec le système d'importation des arthropodes au Canada et pourquoi?

Rose De Clerck-Floate (Rosemarie.DeClerck-Floate@agr.gc.ca), Tanya Fielding (Tanya.Fielding@inspection.gc.ca), et Peter Mason (Peter.Mason@agr.gc.ca)

En mai 2010, l'Agence canadienne d'inspection des aliments (ACIA) a débuté l'implantation de procédures modifiées d'importation des arthropodes et autres organismes vivants (e.g. micro-organismes et nématodes) au Canada. Les changements à ces procédures incluent :

Un nouveau [formulaire](#) de demande électronique;

Des changements de politiques concernant les arthropodes qui peuvent être importés avec un permis d'importation de la protection des végétaux (e.g. [Décision stratégique relative à l'importation d'insectes vivants aux fins d'utilisation comme aliments du bétail, comme appâts ou comme animaux domestiques](#));

Une procédure de révision des demandes de permis d'importation mise à jour; et

L'implantation de nouvelles « [Normes sur le confinement des installations manipulant des](#)

[phytoravageurs](#) » depuis le 1^{er} novembre 2010.

Pour ceux qui travaillent avec des arthropodes importés, ces changements ont amené des frustrations et de la confusion concernant la procédure de demande pour un permis d'importation de la protection des végétaux. Ces frustrations étaient évidentes à la réunion conjointe annuelle de la Société d'entomologie du Canada (SEC) à Vancouver en novembre 2010. Le comité des politiques scientifiques et de l'éducation de la SEC a reconnu l'importance de la situation et a initié des actions afin de trouver une solution. Afin de mieux comprendre les problèmes autour des changements des exigences pour l'importation des arthropodes vivants, les membres de la SEC ont été questionnés en janvier 2011 concernant leur expérience. Des 14 réponses au questionnaire, 10 répondants ont rapporté des répercussions négatives sur leurs activités entomologiques et 4 ont répondu qu'ils n'avaient eu aucun problème, ou ont félicité les changements.

Il est devenu évident suite à ce questionnaire que remplir le formulaire de demande électronique est l'étape qui cause le plus de frustration et qui dure le plus longtemps. Un des problèmes est que les informations requises (selon la loi) ne sont pas clairement identifiées sur le formulaire (e.g. le nom de l'installation, l'adresse civique et le numéro de la salle où les arthropodes seront conservés). L'ACIA révisé présentement son formulaire de demande afin de le rendre plus clair et plus efficace. Par exemple, en plus d'inclure des champs pour que les demandeurs fournissent le nom de l'installation, l'adresse civique et le numéro de la pièce où les arthropodes seront conservés, le nouveau formulaire d'application inclura des champs pour les installations précédemment certifiées à un niveau de confinement spécifique. En outre, le formulaire de demande révisé contiendra plus de détails afin de guider les importateurs sur la façon de remplir les sections individuelles du formulaire.

L'ACIA est pleinement consciente des frustrations ressenties par les demandeurs et prend des mesures afin de consulter les clients entomologistes pour améliorer les procédures de demande. La pression de leur côté est l'urgent besoin de freiner les ravageurs à nos frontières, tel que mis en évidence dans le chapitre 4 du rapport de la vérificatrice générale du Canada (« Les ressources végétales du Canada : la gestion des risques – Agence canadienne d'inspection des aliments ») ainsi que dans une révision de la *Loi sur la protection des végétaux* (1990) et du *Règlement sur la protection des végétaux* (1995) pour lesquels l'ACIA possède la responsabilité.

Les recommandations incluent une augmentation des mesures d'atténuation des risques via la procédure d'importation, incluant un examen plus minutieux des demandes de permis. En outre, l'ACIA n'émet plus ou n'amende plus de permis d'importations pour des arthropodes vivants qui ne sont pas réglementés par la *Loi sur la protection des végétaux*. Les résultats du questionnaire de la SEC ont été utiles afin d'identifier les problèmes spécifiques dans la procédure de demande et nous a aidé à entamer un dialogue avec l'ACIA sur ces questions. La première étape de l'ACIA a été de former des groupes de travail/consultatifs séparés entre elle-même et l'Association canadienne des zoos et des aquariums, le groupe de recherche U-15 (représentant les universités canadiennes affectées) et, plus récemment, la branche de recherche d'Agriculture et agroalimentaire Canada (AAC). Tous les groupes de travail ont une représentation d'entomologistes et, collectivement, des progrès seront accomplis en rationalisant la procédure nouvellement implantée de demande de permis pour le bien des activités entomologiques au Canada. Plus spécifiquement, les résultats du questionnaire de la SEC ont nourris les groupes de travail d'AAC/ACIA.

Une des suggestions faite à l'ACIA était de mieux communiquer les nouvelles procédures d'importation, incluant les exigences et les délais attendus. Cet article de collaboration est un des moyens de communication. Voici des questions et réponses qui guideront les entomologistes durant cette période de changement.

Q1. Qu'est-ce qui est réglementé par la loi sur la protection des végétaux et qu'est-ce qui ne l'est pas?

R1. L'objet de la [Loi sur la protection des végétaux](#) est « d'assurer la protection de la vie végétale et des secteurs agricole et forestier de l'économie canadienne en empêchant l'importation, l'exportation et la propagation de parasites au Canada et en y assurant la défense contre ceux-ci ou leur élimination ». L'[article 3](#) de cette loi définit un parasite comme « toute chose nuisible – directement ou non – ou susceptible de l'être, aux végétaux, à leurs produits ou à leurs sous-produits ». Des exemples d'organismes vivants qui sont en dehors du mandat de la *Loi sur la protection des végétaux* sont :

Des entomophages, ou mangeurs d'insectes vivants (ceux-ci peuvent être réglementés par Environnement Canada en vertu de la [Loi canadienne sur la protection de l'environnement](#); dans le cas d'agents de lutte biologique entomophages approuvés, leur importation peut aussi être réglementée par l'Agence de réglementation de la lutte antiparasitaire en vertu de la [Loi sur les produits antiparasitaires](#))

Des pathogènes humains (réglementés par l'Agence de la santé publique du Canada en vertu de la [Loi sur les agents pathogènes humains et les toxines](#) et du [Règlement sur l'importation des agents anthropopathogènes](#))

Des parasites ou pathogènes animaux (réglementés par l'ACIA en vertu de la [Loi sur la santé des animaux](#))

Quand un organisme vivant est un parasite de plante ainsi qu'un pathogène humain et/ou animal, la supervision de leur importation incombe à l'autorité la plus stricte (i.e. *Loi sur les agents pathogènes humains et les toxines* → *Loi sur la santé des animaux* → *Loi sur la protection des végétaux*).

Q2. Qui est éligible pour demander un permis d'importation de la protection des végétaux?

R2. Selon l'[article 30](#) du *Règlement sur la protection des végétaux*, « peut demander un permis la personne qui, selon le cas :

est un citoyen canadien ou un résident permanent, au sens du paragraphe 2(1) de la *Loi sur l'immigration*;

est autorisée, en vertu des lois du Canada, à résider au Canada pendant une période de six mois ou plus et aura la possession, la responsabilité ou la charge des soins de la chose à importer;

dans le cas d'une personne morale ayant un établissement au Canada, son mandataire ou un de ses dirigeants qui résident au Canada. »

Dans le cas des universités ou collèges, seul un professeur ou un chef de département peut demander un permis d'importation au nom de l'établissement. Ceci n'inclut pas le personnel émérite.

L'ACIA peut demander à un demandeur de fournir la documentation prouvant son éligibilité à demander et détenir un permis d'importation de la protection des végétaux. Des exemples d'une telle documentation incluent une copie lisible du passeport ou de la carte de résidence permanente émise par Citoyenneté et immigration Canada (recto et verso). Le numéro d'assurance sociale ou une copie du certificat de naissance ou de la carte de citoyenneté ne sont pas des documents acceptables puisqu'ils sont personnels et ne peuvent pas être vérifiés par l'ACIA. Lorsque l'importateur est une compagnie ou une corporation, l'ACIA peut aussi demander de la documentation prouvant que la personne contact mentionnée est autorisée par l'importateur à agir en tant qu'agent de la compagnie ou de la corporation.

Q3. Qu'est-ce qu'une analyse des risques phytosanitaires et quand est-ce requis?

R3. L'[article 32](#) du *Règlement sur la protection des végétaux* requiert que le ministre d'Agriculture et agroalimentaire Canada émette un permis d'importation de la protection des végétaux selon une analyse des risques phytosanitaires. L'exigence d'avoir une analyse des risques phytosanitaires est généralement déclenchée lorsque l'importateur demande un permis d'importation de la protection des végétaux pour une nouvelle marchandise (i.e., une marchandise qui n'a jamais été importée au Canada) ou pour une marchandise familière d'une nouvelle origine (i.e. une marchandise qui n'a jamais été importée de cette origine).

Une analyse des risques phytosanitaire pour un arthropode exotique évalue la probabilité que l'organisme proposé pour l'importation puisse ou va s'établir dans l'environnement canadien, et si c'est le cas, l'importance potentielle des impacts qui peuvent en découler, particulièrement concernant les risques pour les secteurs agricole et forestier (i.e. elle évalue le potentiel qu'un organisme soit un phytoravageur préoccupant). Le temps requis pour compléter une analyse des risques phytosanitaires dépend d'un certain nombre de facteurs, incluant la disponibilité de l'information et le nombre de demandes en ligne. En conséquence, le temps requis pour une analyse des risques phytosanitaire se situe quelque part entre quelques semaines et 2 ans.

Une analyse des risques phytosanitaires est suivie d'une phase de gestion du risque qui identifie les mesures d'atténuation potentielles et détermine les conditions et les exigences d'importation appropriées afin de minimiser tout risque identifié dans l'analyse des risques phytosanitaires. Lorsque le risque est évalué comme élevé et/ou ingérable, l'importation du produit ou de l'organisme est interdit (voir Question 6 pour des informations sur les exemptions d'importation pour le matériel interdit).

Une analyse des risques phytosanitaires peut également déterminer que l'importation d'un organisme tombe en dehors du mandat de la *Loi sur la protection des végétaux*. Cependant, les importateurs doivent être conscients que cela n'empêche pas que l'importation de leurs organismes puisse être réglementée par une autre loi ou un autre règlement fédéral ou provincial. Il est de la responsabilité de l'importateur de s'assurer que l'envoi importé rencontre toutes les exigences d'importation applicables.

Q4. Pourquoi une analyse des risques phytosanitaires séparée est-elle requise pour des arthropodes exotiques apparentés (i.e. du même genre)?

R4. Certains organismes apparentés peuvent avoir différents comportements de nutrition ou de reproduction qui résultent en des différences importantes dans la menace qu'ils représentent du point de vue de la protection des plantes. Un bon exemple de ceci dans le monde des insectes est le genre *Drosophila* (mouches à fruits) qui inclut l'espèce cosmopolite *D. melanogaster*, largement utilisée en recherche pour des études en biologie et en génétique et qui complète son cycle de vie dans des fruits en décomposition ou en fermentation. Cependant, le même genre contient également l'espèce nouvellement introduite *D. suzukii* qui cause de sérieux dommages dans les vergers de fruits de la côte ouest de l'Amérique du Nord. En conséquence, une analyse des risques phytosanitaires séparée est requise pour chaque combinaison genre/espèce.

Q5. Qui est responsable de conduire les analyses des risques phytosanitaires?

R5. Le module Évaluation des risques phytosanitaires de l'ACIA est responsable de conduire l'analyse des risques phytosanitaires pour les organismes vivants, incluant les arthropodes.

Q6. Y a-t-il des exemptions pour les chercheurs qui veulent travailler avec du matériel interdit?

R6. L'[article 43](#) du *Règlement sur la protection des végétaux* permet l'importation des produits ou organismes interdits – tels que des phytoravageurs vivants préoccupants – à des fins particulières, plus particulièrement à des fins de recherche, exposition, éducation et/ou transformation industrielle. Ces importations sont sujettes à des mesures de confinement et une supervision afin d'assurer qu'aucun matériel importé n'est accidentellement relâché dans l'environnement canadien. L'article 43 ne permet pas l'importation de matériel interdit pour tout autre usage.

L'analyse des risques phytosanitaires développée pour un arthropode interdit ainsi que la phase subséquente de gestion du risque établira les exigences de confinement appropriées (i.e. les mesures de confinement) en vertu des nouvelles [Normes sur le confinement des installations manipulant des phytoravageurs](#) afin de manipuler de façon sécuritaire l'organisme interdit en question. (Voir Question 3 pour plus d'information sur les analyses des risques phytosanitaires et Question 10 pour plus d'information sur la certification des installations selon les nouvelles normes de confinement de l'ACIA.)

Q7. Quelles sont les étapes impliquées dans le processus de révision d'une demande de permis d'importation de la protection des végétaux pour des arthropodes vivants?

R7. Le schéma joint fournit un aperçu des étapes des nouvelles procédures de demande de l'ACIA pour toutes les marchandises.

Le processus de révision est initié par la soumission d'une demande de permis d'importation au Bureau des permis d'importation par un importateur. Le bureau des permis révisera la demande afin de s'assurer qu'elle est complète et, lorsque nécessaire, demandera des informations manquantes ou additionnelles au demandeur.

Une fois que la demande est complète, le bureau des permis ou la section appropriée pour les marchandises déterminera si une analyse des risques phytosanitaires est requise pour la marchandise (ou les marchandises) mentionnée dans la demande. (Note : Dans certains cas, une analyse des risques phytosanitaires pour une marchandise peut avoir déjà été réalisée. Voir Question 3 pour plus d'information sur les analyses des risques phytosanitaires.) Lorsqu'une analyse des risques phytosanitaires est nécessaire, le demandeur en est informé par écrit par le Bureau des permis. Le demandeur doit alors soumettre un formulaire de demande révisé, ainsi que les frais applicables de 250\$/espèce, s'il veut initier une analyse de risques phytosanitaires. Ces frais s'appliquent en vertu de la partie 12 de l'avis sur les prix de l'ACIA (« Prix applicables à la protection des végétaux »).

L'importation au Canada d'arthropodes considérés comme phytoravageurs préoccupants est interdite en vertu de la *Loi sur la protection des végétaux*. Pour de tels organismes, l'importation est seulement permise avec un permis émis en vertu de l'article 43 du *Règlement sur la protection des végétaux* pour une des fins suivantes : recherche, éducation, exposition ou transformation industrielle (voir Question 6 pour plus d'information sur les exemptions d'importation).

Les installations souhaitant importer un arthropode interdit doivent être certifiées comme rencontrant les exigences de confinements pour cet arthropode selon les nouvelles [Normes sur le confinement des installations manipulant des phytoravageurs](#) avant qu'un permis ne soit émis. (Plus d'informations sur les procédures de certifications sont disponibles à la Question 10.) Une fois qu'une installation est certifiée, un permis est émis et peut être valide pour une période allant jusqu'à un an.

Lorsqu'une analyse de risques phytosanitaires détermine que la *Loi sur la protection des végétaux* ne s'applique pas à l'organisme en question, une lettre est envoyée au demandeur afin de l'informer que l'organisme qu'il souhaite importer n'est pas réglementé en vertu de la *Loi sur la protection des végétaux* et qu'un permis d'importation de la protection des végétaux ne peut donc pas être émis. La lettre informera également le demandeur que l'organisme en question

peut être réglementé en vertu d'une autre loi ou d'un autre règlement fédéral.

Q8. En général, quels sont les délais de révision d'une demande de permis d'importation de la protection des végétaux?

R8. Les demandes pour un permis d'importation de la protection des végétaux sont révisées et traitées selon la règle du premier arrivé, premier servi. Ainsi, durant des périodes de pointe ou des périodes plus occupées, la révision et le traitement d'une demande peut être plus longue que lorsqu'une demande est soumise durant une période plus tranquille de l'année. Entre novembre et avril, le bureau des permis peut recevoir entre 50 et 100 demandes par jours. De plus, lorsqu'une requête pour des informations additionnelles est envoyée au demandeur, la révision de l'application est suspendue jusqu'à ce que l'information demandée soit fournie au bureau des permis. Le temps requis pour réviser et traiter une demande peut également dépendre de certains autres facteurs, incluant :

- Le temps pris par le demandeur pour fournir au Bureau des permis les informations ou clarifications requises;

- Si la demande doit être révisée par un ou plusieurs spécialistes des marchandises;

- Si une analyse des risques phytosanitaires est requise;

- Le temps requis pour certifier une installation au niveau de confinement requis.

À cause de tous ces facteurs et pour éviter des délais non nécessaires, il est fortement recommandé que les importateurs demandent un permis d'importation de la protection des végétaux bien en avance soit de la date d'expiration de leur permis actuel, soit de la date attendue du colis aux frontières canadiennes.

Les importateurs doivent être conscients que la soumission d'une demande ne garantit pas nécessairement qu'un permis d'importation de la protection des végétaux sera émis. La décision d'émettre un permis n'est prise qu'une fois toutes les informations et tous les documents requis reçus et révisés. En conséquence, les importateurs doivent avoir leur permis d'importation en main avant que l'envoi n'arrive aux frontières canadiennes. Puisque certaines conditions et exigences d'importation doivent être remplies avant que l'envoi ne quitte le pays d'importation (e.g. traitement à l'origine), l'ACIA recommande fortement aux importateurs d'avoir leur permis d'importation en main avant que l'envoi ne quitte le pays d'exportation. Les permis ne peuvent être émis pour un envoi après son arrivée aux frontières canadiennes.

Q9. Qui est responsable de certifier les installations selon les nouvelles [Normes sur le confinement des installations manipulant des phytoravageurs](#) ?

R9. Le Bureau de confinement des biorisques et sécurité de l'ACIA est responsable de certifier les installations en vertu de ces nouvelles normes de confinement.

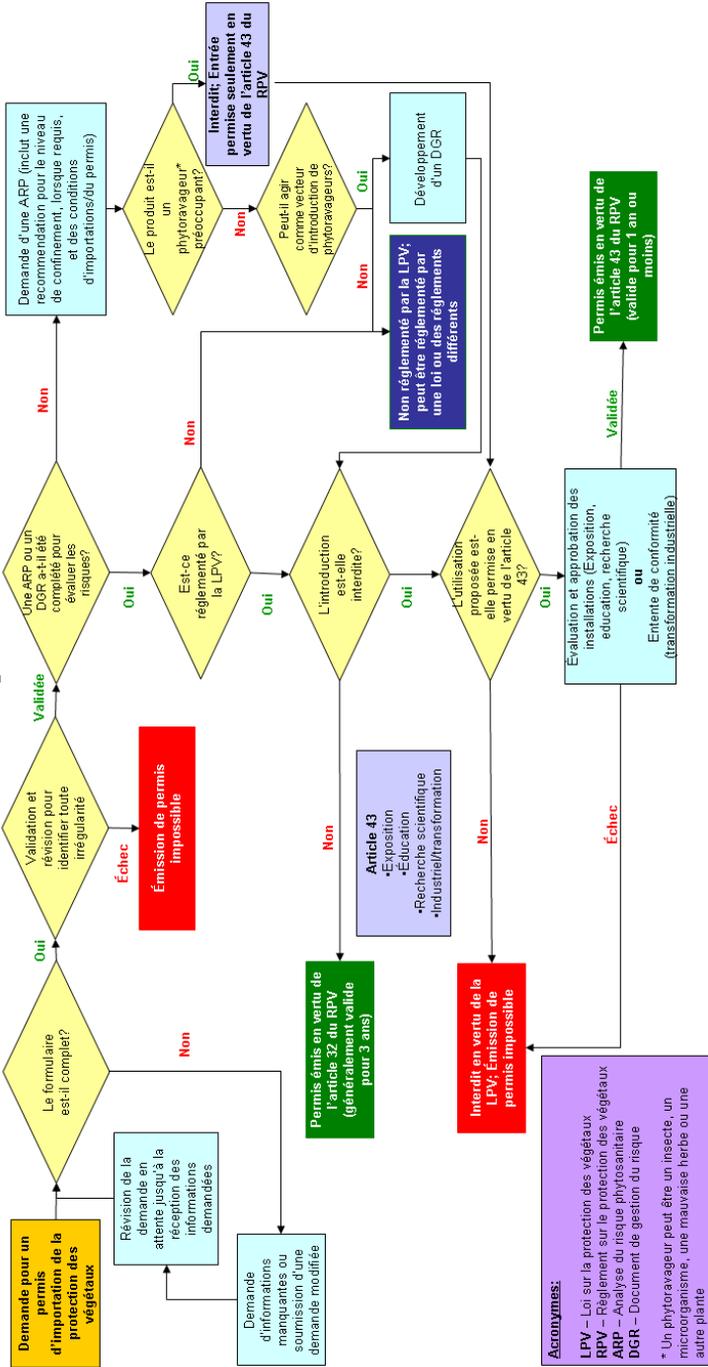
Q10. Quelles sont les étapes impliquées dans l'obtention d'une certification d'une installation selon ces nouvelles normes de confinement et combien de temps la certification prend-elle?

R10. L'exigence qu'une installation soit certifiée selon les *Normes sur le confinement des installations manipulant des phytoravageurs* est déclenchée lorsque l'installation a soumis une demande pour un permis d'importation de la protection des végétaux pour un phytoravageur vivant préoccupant qui doit être gardé en confinement (i.e. qui n'a pas été approuvé pour être relâché dans l'environnement).

Les étapes impliquées dans la procédure de certification dépendent du niveau de confinement des phytoravageurs nécessaire pour contenir de façon sécuritaire l'organisme en question. Il y a deux différents scénarios pour la certification/vérification des installations de confinement.

Pour les organismes nécessitant un niveau de confinement bas, PPC-1 et PPC-2, l'importateur

Direction de la protection des végétaux et de la biosécurité – Procédure pour l'émission de permis d'importation de la protection des végétaux



devra compléter une liste d'auto-évaluation et la soumettre au Bureau des permis. Les listes sont révisées par des spécialistes en biosécurité du Bureau de confinement des biorisques et sécurité de l'ACIA. Le temps requis pour une révision est de 2±1 semaines. Une fois que l'installation remplit les conditions selon la révision de la liste, une lettre d'accréditation est envoyée à l'installation et est valide pour une période de 2 ans. Les installations PPC-1 et PPC-2 peuvent être sujettes à une inspection de suivi par un inspecteur de l'ACIA. Le permis d'importation est émis selon les capacités de l'installation à rencontrer le niveau de confinement spécifié pour l'organisme mentionné sur le permis.

Pour des niveaux de confinement plus élevés, PPC-2A et PPC-3, le processus est robuste et bien défini. (Pour plus de détails sur les exigences de ce processus ainsi qu'une foire aux questions, veuillez cliquer [ici](#).) Contrairement à la liste d'auto-évaluation requise pour les niveaux PPC-1 et PPC-2, la soumission d'une demande de certification complète pour ces niveaux plus élevés possède trois composantes :

Schémas de l'installation;

Manuel de biosécurité;

Rapports d'essais de performance et de vérification.

Le temps de révision pour chaque composante complète est de 3±1 semaines. Un rapport sera généré par les spécialistes en biosécurité et des demandes d'informations seront faites. La composante finale du processus de certification est une inspection sur place par les inspecteurs du bureau de confinement des biorisques et de sécurité de l'ACIA. Une fois que le bureau a vérifié que l'installation rencontre toutes les exigences physiques et opérationnelles de confinement, une lettre sera envoyée pour confirmer la certification. La certification d'une installation aux exigences PPC-2A est valide pour une période de 2 ans et peut être maintenue par une re-certification biannuelle. La certification d'une installation aux exigences PPC-3 est valide pour un an et peut être maintenue par une re-certification annuelle. Si une installation ne reçoit pas la certification, ou si la certification est révoquée pour quelque raison que ce soit, les lacunes devront être comblées avant que l'installation puisse être certifiée ou re-certifiée.

Les demandeurs devraient noter que les délais indiqués plus haut pour la certification d'une installation sont basés sur l'hypothèse que le demandeur / l'installation fournisse la liste d'auto-évaluation ou les autres documents requis dans des délais raisonnables au bureau de confinement des biorisques et de sécurité. Des délais dans l'envoi des informations requises résulteront en des délais plus longs pour la certification d'une installation.

Q11. Y a-t-il différents permis requis pour des arthropodes qui sont envoyés versus des arthropodes amenés au Canada? Si oui, est-ce que les procédures de demande diffèrent?

R11. Un permis d'importation de la protection des végétaux pour un arthropode amené au Canada (i.e. entrant au Canada avec le voyageur) est le même que pour un permis d'importation d'un arthropode envoyé au Canada par un service de courrier. Cependant, en absence d'un lien entre le permis d'importation et la personne transportant le colis, un tel colis sera refusé aux frontières. Afin d'éviter des problèmes non nécessaires à la frontière, il est fortement recommandé aux demandeurs d'indiquer cette intention (et le nom de la personne qui transportera le colis) au bureau des permis sur leur demande afin que ce soit indiqué sur le permis. Une condition additionnelle sera ajoutée au permis qui mentionnera que la personne voyageant avec le colis est autorisée à transporter l'organisme vivant mentionné sur le permis à la destination canadienne mentionnée sur le permis.

Veuillez noter que la documentation prouvant l'identité du voyageur (e.g. un passeport) peut être demandée lors du passage aux douanes à la frontière.

Changes to *The Canadian Entomologist*

Chris Buddle (chris.buddle@mcgill.ca)

Over the next 4 to 6 months, *The Canadian Entomologist* (*TCE*) will be entering another important phase in its impressive 143-year history. I want to bring you up to speed on some key developments with the journal so the upcoming changes do not take anyone by surprise, and we can get through these transitions seamlessly.

There are a number of changes to the Editorial Board, and the structure of the editorial process. On 1 October 2011, I will take over from Robb Bennett as Editor-in-Chief. Robb has done a tremendous job with *TCE* and there are big shoes to fill. He will be missed, and his care and dedication are qualities that I will try to exemplify.

I plan to adjust the process by which manuscripts are handled to decrease turn-around times. This will include adjustments to the Editorial Board, and I plan to eliminate the step of "Division Editor" from the review process. The current three-tier review system will be replaced by a two-tier system. The Divisions will remain as a way to organize papers in *TCE*, but that level of editorial input will be dissolved.

Cambridge University Press (CUP) will be taking over as our publisher, starting officially in January 2012. The Publications Committee and the Executive Council of the Entomological Society of Canada have worked behind the scenes for many months to ensure the new contract with CUP will be beneficial for *TCE* and our Society. We are excited about working with CUP in the future: they will be initiating an aggressive marketing campaign for *TCE*, and we hope this will increase our profile internationally and allow us to continue to attract high quality research papers. Perhaps the most significant change from an author's perspective is that page charges for authors will be eliminated, and CUP will be publishing colour figures free of charge to authors. Again, we expect this will increase submissions to *TCE*.

The manuscript submission and review process for *TCE* will be handled entirely by the on-line system ScholarOne Manuscripts beginning in September 2011. Many of you are probably already familiar with the program: it is used extensively by many scientific journals. It is user-friendly: it allows authors to seamlessly submit papers to the journal, and facilitates very effective tracking of manuscripts once they are uploaded to the system. With ScholarOne Manuscripts, the Editorial Board is able to assign reviewers quickly, and automatic e-mails will be sent out to help remind reviewers and editors that deadlines are approaching (or are past!). ScholarOne also sets up a database of users for *TCE* so that potential reviewers can be identified easily, based on areas of expertise. Reviewers similarly enter their comments about a paper on-line, and use a 'tick box' system to assign their ranking of an article.

Using ScholarOne Manuscripts will take some adjustment for all of us, and will require some initial work to reap the full benefits. For example, it does take a little time to submit a manuscript with an on-line system, and users will have to be assigned a username and password, and fill out a few particulars (e-mail addresses, areas of expertise, etc). It will also take some time to adjust to the idea that parts of the *TCE* editorial process will be automated. You can be assured, however, that we will continue to treat all manuscripts with personal attention and care! I ask for your patience with this process, and I am confident that once you are familiar with ScholarOne, you will find it simple to use, effective, and will help get your papers reviewed quickly and professionally!

The publication process for *TCE* will also be moving away from an "issue-based" strategy. This means that papers accepted for publication will be available on-line as something called

"First View": this is quite common with other journals, and means that papers will be available for viewing well in advance of the printed issues, and authors can download their paper potentially many months before the journal issue is printed.

Finally, I am excited to announce that *TCE*'s final issue of 2011 and the first two issues of 2012 will be a cohesive and important set of papers honouring Diptera systematics in Ottawa (1937-1989), and the Manual of Nearctic Diptera. This Diptera Festschrift has attracted the best scientists, globally, working in the area of Diptera Systematics. Robb Bennett, members of the Diptera Unit at the Canadian National Collection of Insects, and Division Editor Bradley Sinclair, have worked tirelessly on this Festschrift, and the Editorial Board hopes that you find the papers stimulating, and engaging.

In summary, there are a lot of exciting changes coming for *TCE*, and these will all be happening in the near future. I ask for your continued support, and patience, during this phase of the journal's history. I am confident the changes will be beneficial for *TCE* and the Society, and that we will continue to produce a world-class entomology journal.

Changements à *The Canadian Entomologist*

Chris Buddle (chris.buddle@mcgill.ca)

Durant les 4 à 6 prochains mois, *The Canadian Entomologist (TCE)* entrera dans une autre phase importante de ses 143 impressionnantes années d'histoire. Je voudrais vous informer des principaux développements du journal afin que les changements à venir ne prennent personne par surprise, et que nous puissions passer par ces transitions tout en douceur.

Il y a un nombre de changements au bureau de la rédaction et à la structure du processus éditorial. Le 1^{er} octobre 2011, je prendrai le relais de Robb Bennett comme rédacteur en chef. Robb a fait un travail incroyable avec le *TCE* et la marche sera haute. Il nous manquera, et ses attentions et son dévouement sont des qualités que j'essaierai de prendre en exemple.

Je prévois ajuster la procédure par laquelle les articles sont traités afin de diminuer les délais. Ceci inclura des ajustements au bureau de la rédaction et je prévois éliminer l'étape « Division Editor » (directeur scientifique d'une division) du processus de révision. Le système actuel à trois niveaux sera remplacé par un système à deux niveaux. Les divisions demeureront une façon d'organiser les articles dans le *TCE*, mais l'apport éditorial à ce niveau sera dissout.

Les Presses de l'Université Cambridge (CUP) prendront le relais en tant qu'éditeurs, commençant officiellement en janvier 2012. Le comité des publications et le conseil exécutif de la Société d'entomologie du Canada a travaillé en coulisses durant plusieurs mois afin d'assurer que le nouveau contrat avec les CUP sera avantageux pour le *TCE* et pour notre Société. Nous sommes excités de travailler avec les CUP à l'avenir : ils débiteront une campagne publicitaire agressive pour le *TCE*, et nous espérons que cela augmentera notre profil international et nous permettra de continuer à attirer des articles de recherche de haute qualité. Peut-être que le changement le plus important du point de vue des auteurs est que les frais de publication pour les auteurs seront éliminés, et les CUP publieront des images en couleur sans frais pour les auteurs. Une fois de plus, nous espérons que ceci augmentera les soumissions au *TCE*.

Les procédures de soumission et de révision des articles au *TCE* seront complètement gérées par le système en ligne ScholarOne Manuscripts à partir de septembre 2011. La plupart d'entre vous sont probablement familier avec ce système : il est largement utilisé par de nombreuses revues scientifiques. Il est très facile à utiliser : il permet aux auteurs de soumettre facilement des articles à la revue, et facilite grandement le suivi des articles une fois qu'ils sont téléchargés

dans le système. Avec ScholarOne Manuscripts, le comité éditorial sera capable d'assigner des réviseurs rapidement, et des courriels de réponse automatiques seront envoyés afin de rappeler aux réviseurs et éditeurs que les dates limites approchent (ou sont passées !). ScholarOne Manuscripts tient également une base de données avec les utilisateurs du *TCE* alors des réviseurs potentiels peuvent être identifiés facilement sur la base de leur domaine d'expertise. De la même façon, les réviseurs entrent leurs commentaires sur l'article en ligne, et utilisent un système de cases à cocher afin d'assigner leur évaluation sur un article.

Utiliser ScholarOne Manuscripts demandera quelques ajustements pour nous tous, et demandera un travail initial afin de profiter des avantages. Par exemple, il faudra un peu de temps afin de soumettre un article en ligne, et les utilisateurs devront obtenir un nom d'utilisateur et un mot de passe et remplir quelques informations (adresse courriel, domaine d'expertise, etc.). Il faudra également du temps afin de s'ajuster à l'idée qu'une partie du travail éditorial du *TCE* sera automatique. Vous pouvez être assurés cependant que nous continuerons de traiter tous les articles avec une attention particulière et personnelle ! Je vous demande d'être patient avec ce processus, et je suis confiant qu'une fois que vous serez familier avec ScholarOne, vous trouverez ce système simple à utiliser, efficace, et qu'il aidera vos articles à être révisés rapidement et professionnellement !

Le processus de publication de *TCE* s'éloignera aussi d'une stratégie par numéro. Cela signifie que les articles acceptés pour publication seront disponibles en ligne en tant que « First View » : ceci est très commun dans les autres revues, et signifie que les articles seront disponibles pour consultation bien avant l'impression, et les auteurs peuvent télécharger leur article potentiellement plusieurs mois avec que le numéro imprimé ne sorte.

Finalement, je suis excité d'annoncer que le numéro final du *TCE* de 2011 et les deux premiers numéros de 2012 seront un ensemble important et cohérent d'articles honorant la systématique des Diptères à Ottawa (1937-1989) et le *Manual of Nearctic Diptera*. Cette « festschrift » (mot allemand désignant un recueil d'articles) sur les diptères a su attirer les meilleurs scientifiques travaillant dans le domaine de la systématique des diptères. Robb Bennett, membre de l'unité des diptères à la collection nationale canadienne d'insectes, et le directeur scientifique de division Bradley Sinclair ont travaillé sans relâche sur cette « festschrift » et le bureau de la rédaction espère que vous trouverez les articles stimulants et engageants.

Pour résumer, il y a de nombreux changements excitants à venir pour le *TCE*, et ils arriveront dans un futur proche. Je demande votre soutien continu et votre patience durant cette phase de l'histoire de la revue. Je suis confiant que les changements seront bénéfiques pour le *TCE* et la Société, et que nous continuerons à produire une revue entomologique de niveau international.



VIIth International Conference on Arthropods: Chemical, Physiological, Biotechnological and Environmental Aspects. (Stefan Kopeć Memorial Conference)

Białka Tatrzańska near Zakopane, Poland, 18-23 September 2011

<http://VIIarthropods.stud.wchuwr.pl>

Sixth International Symposium on Molecular Insect Science

NH Grand Krasnapolsky, Amsterdam, The Netherlands, 2-5 October 2011

www.molecularinsectscience.com/index.html

Joint Annual Meeting of the Entomological Society of Canada and the Acadian Entomological Society

Halifax, Nova Scotia, 6-9 November 2011

www.acadianes.ca/jam2011

59th Annual Meeting of the Entomological Society of America

Reno-Sparks Convention Center, Reno, Nevada, 13-16 November 2011

<http://www.entsoc.org/entomology2011>

International Congress of Entomology

Daegu, South Korea, 19-25 August 2012

<http://www.ice2012.org/>

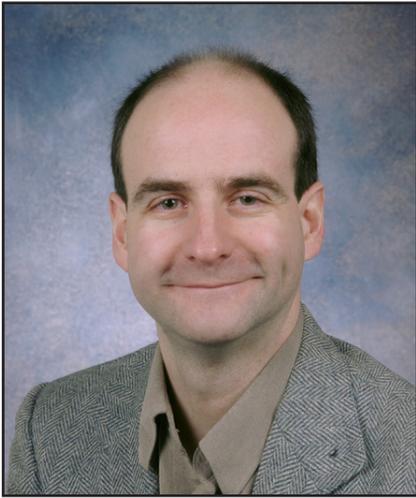
Joint Annual Meeting of the Entomological Societies of Canada and Alberta

Edmonton, Alberta, 4-7 November 2012

ECE X (Tenth European Congress of Entomology)

York, UK, 3-8 August 2014

www.ece2014.com



Ento-Marketing 101: Some-what *Phthirus*, but mostly *Pediculus*

Did you ever wish that the rest of the world appreciated insects the way you do? For example, does it make you mad when people insist on using chemicals to kill insects that aren't harming them in any way? If so, then close your eyes... (OK, maybe just imagine closing your eyes, because actually closing your eyes will make it a little difficult to continue reading.) Now think of a world where all insects are loved; where all people celebrate the fact that our world and the world of insects are inextricably intertwined. OK. Now snap out of it and consider the new marketing possibilities in such a world, and

how a smart entomologist such as yourself could benefit immensely...

For example, we wouldn't have to be so squeamish about insects in our food. Perhaps you could play a role in developing new products for our supermarket shelves such as:

1. *Helicoverpa* brand corn chips (now with added protein).
2. *Pieris* and friends fun nutritious salad snacks for kids. Each package comes with one of four adorable pets! Collect (or eat) them all!
3. *Bolium* brand extra crunchy bread sticks. If you want the crunchiest, Try *Bolium*!

But why stop at food? Beauty products and services deserve an infusion of ento-inspiration as well. How about:

1. *Demodex* extra-strength mascara remover (cleans right down to the follicles)!
2. *Culex* spa and weight loss clinic. Guaranteed weight loss with our patented culicid weight removal regimen.
3. *Nepa* home acupuncture systems. Easy to apply water scorpions remain affixed with the latest "raptorial-leg attachment system". Safe for use on almost all pressure points of the body.

For families and kids, you could help ensure that insects play an integral part in the newest toys and games:

1. *Camponotus* versus *Solenopsis* ant chess set. Guaranteed to provide seconds of gruesome game play. (Not recommended for use in wooden houses or areas where fire ants are yet to be established).
2. Entomological Jeopardy: Home Edition. (I'll take Thoracic Apodemes for \$1000, Alex).
3. My Little *Pulex*. What more needs to (or should) be said?

Moth balls has already covered ento-fashion (*Bull. Ent. Soc. Canada* 39(3): 100-102), but

Andrew Bennett is a research scientist with Agriculture and Agri-Food Canada in Ottawa working on the taxonomy of Ichneumonidae. He received his PhD at the University of Toronto. Contact details: e-mail: andrew.bennett@agr.gc.ca, tel.: (613) 759-1900.

there are so many links between entomology and fashion, I can't help but mention a few more of the most obvious:

1. Imported Australian funnel web spider silk sleepwear. Tonight, you can be the one who *Atrax* attention. Spiders (usually) not included.

2. Bee Beards are back! Popular in the 1970s prior to the invasion of killer bees to the USA, the covering of the face with live bees is making a comeback due to the more lethargic nature of swarms affected by colony collapse disorder (CCD). (And people said there was no “up-side” to CCD.) Available in goatee, Van Dyck or full-facial “Santa-style”. Chicks dig a “killer” bee beard!

3. Think having lice is uncool? Are you *Phthirus*? Don't be *Pediculus*! In an entomologically-informed world and through the wonders of genetically modified organisms, GMO lice will soon be the latest, must-have fashion accessory! Light up the dance floor and impress your friends with multi-spectrum, glow-in-the-dark head and body lice!

And now, if you will excuse me, I have to go and re-charge my head lice for the big dance tonight.



M.P. Mignault

Earwig (Dermaptera)

Joint Annual Meeting / Réunion annuelle conjointe

THE JOINT ANNUAL MEETING OF THE ENTOMOLOGICAL SOCIETY OF CANADA AND THE ACADIAN ENTOMOLOGICAL SOCIETY

The Westin Nova Scotian Hotel, Halifax, Nova Scotia
Sunday 6 November – Wednesday 9 November 2011

The Acadian Entomological Society invites you to the 2011 Joint Annual Meeting of the Entomological Society of Canada and the Acadian Entomological Society to be held at the Westin Nova Scotian Hotel Halifax, Nova Scotia, from 6 November to 9 November 2011.

Room rates are \$149 per night plus taxes (extra \$30 for a Harborview room).

The deadline to reserve rooms is 5 October 2011.

Link through the 2011 JAM website to reserve: <http://www.acadianes.ca/2011jam/>

1181 Hollis Street
Halifax, NS, B3H 2P6
902-412-1000

<http://www.thewestinnovascotian.com/>

Program Highlights

Our meeting theme is **Beauty and Impact** – “Beauty” speaks to the aesthetic appeal of insects and the fascinating aspects of their behavior/ecology, while “Impact” covers the influence that insects have on society as pests, impact on all other fields of research, beneficial impact for humans and nature, along with the impacts humans have on insects.

*Plenary symposium theme: **Beauty and Impact: Perspectives in seeing the insect world.***

Symposia:

Forestry Entomology in Canada - Future outlooks
Graduate Student Symposium
Pollination
Canadian Forum for Biological Control
Evolution and Assembly of Insect Communities
Insect pests of *Vaccinium* spp.
Unearthing Underground Entities
Biological Survey of Canada
Female Mating Failures in Insects

Heritage lecture: Dan Quiring “*The history of forest entomology in Atlantic Canada*”

Student paper and poster competitions

Regular poster and presented papers sessions

Deadlines:

15 August: Title/abstract submissions
1 September: Early registration fees
5 October: Hotel room reservation. It is advisable to book your room early!

For More Information:

Check the AES webpage (www.acadianes.ca/2011jam/) for updated information on symposia and the call for papers. On-line registration and abstract submission will be available soon.

RÉUNION CONJOINTE ANNUELLE DE LA SOCIÉTÉ D'ENTOMOLOGIE DU CANADA ET DE LA SOCIÉTÉ D'ENTOMOLOGIE ACADIENNE

Hôtel The Westin Nova Scotian, Halifax, Nouvelle-Écosse

Dimanche 6 novembre – mercredi 9 novembre 2011

La Société d'entomologie acadienne vous invite à la réunion conjointe annuelle 2011 de la Société d'entomologie du Canada et de la Société d'entomologie acadienne qui se tiendra à l'hôtel Westin Nova Scotian à Halifax, en Nouvelle-Écosse, du 6 au 9 novembre 2011.

Le tarif des chambres est de \$149 plus taxes par nuit (30\$ supplémentaire pour une chambre avec vue sur le port).

La date limite pour réserver une chambre est le 5 octobre 2011. Passez par le site Internet de la réunion pour réserver : <http://www.acadianes.ca/2011jam/indexf.html>.

1181 Hollis Street

Halifax, NS, B3H 2P6

902-412-1000

<http://www.thewestinnovascotian.com/>

Aperçu du programme

Le thème de la réunion est **Beauté et impact** – “Beauté” fait appel à l'esthétique des insectes et aux aspects fascinants de leur comportement et leur écologie, alors que “Impact” couvre l'influence des insectes sur la société en tant que ravageurs, impact sur tous les autres domaines de recherche, impact bénéfique pour les humains et la nature, ainsi que les impacts des humains sur les insectes.

Thème de la session plénière: **Beauté et Impact: Perspectives dans la vision du monde des insectes.**

Symposiums :

L'entomologie forestière au Canada

– les perspectives futures

Déterrer les entités souterraines

Défaillance des accouplements chez
les femelles

Symposium des étudiants gradués

Commission biologique du Canada

Les insectes ravageurs de *Vaccinium* spp.

Pollinisation

Forum canadien pour la lutte biologique

Évolution et assemblage des communautés
d'insectes

Allocution du patrimoine : Dan Quiring

*“L'histoire de l'entomologie forestière au
Canada atlantique”*

*Compétition étudiante : présentations et af-
fiches*

*Sessions d'affiches et de présentations ré-
gulières*

Dates limites:

15 août – pour la soumission des titres/résumés

1 septembre – pour le tarif d'inscriptions
hâtives

5 octobre – pour la réservation d'une cham-
bre. Nous vous conseillons de réserver le plus
tôt possible !

Pour plus d'information

Consultez le site Internet de la Société
d'entomologie acadienne (www.acadianes.ca/2011jam/indexf.html) pour les dernières
mises à jour sur les symposiums et les appels
à soumission. Les inscriptions et la soumission
de résumés peuvent se faire en ligne.

The student wing / L'aile étudiante

Chandra Moffat



Hello ESC Students! So much for a summer of not doing field work – I just couldn't help myself and spent a great month in the field! If you were doing fieldwork this summer, I hope the bugs were not too bad (they were pretty bad here in British Columbia!) and you got all the data you needed. If you were stuck in the lab running experiments or in the office analyzing data or writing, I hope you got out and soaked up some summer sun! I hope you are all checking the ESC website for updates and job postings and the ESC Student Facebook page for other great info! Sometimes job announcements that don't make it onto the ESC website are posted on the ESC Student Facebook page, so be sure to check both regularly if you are looking for employment (don't forget to clear your web browser on your computer to make sure you're getting the most recent update).

JAM 2011

The Joint Annual Meeting of the Entomological Society of Canada and the Acadian Entomological Society is coming up quickly, and I for one am excited! The Student Affairs Committee (SAC) is working hard to organize some great events.

Need to share a hotel room at JAM 2011? The SAC is running a roommate matching service. Students interested in being matched with a roommate should email jam2011roommates@gmail.com.

Bonjour étudiants de la SEC! Voilà pour un été sans travail de terrain – je n'ai pas pu m'empêcher de passer un mois sur le terrain! Si vous faisiez du travail de terrain cet été, j'espère que les bibittes n'étaient pas trop dérangeantes (elles l'étaient ici en Colombie-Britannique!) et que vous avez obtenu toutes les données dont vous aviez besoin. Si vous étiez coincés dans le labo à faire des expériences ou dans le bureau à analyser des données ou à rédiger, j'espère que vous êtes sortis et que vous avez pris un bain de soleil! J'espère que vous vérifiez tous le site Internet de la SEC pour des mises à jour et des offres d'emploi et la page Facebook du groupe des étudiants de la SEC pour d'autres informations intéressantes! Certaines offres d'emploi qui n'apparaissent pas sur le site de la SEC sont parfois affichées sur la page Facebook des étudiants de la SEC, alors assurez-vous de consulter les deux régulièrement si vous cherchez un emploi (n'oubliez pas d'actualiser votre navigateur afin d'être certains d'avoir la plus récente mise à jour).

Réunion conjointe annuelle 2011

La réunion conjointe annuelle de la Société d'entomologie du Canada et de la Société d'entomologie acadienne arrive à grands pas, et j'ai hâte! Le comité des affaires étudiantes travaille fort afin d'organiser des événements intéressants.

Besoin de partager une chambre à la réunion conjointe annuelle 2011? Le comité des affaires étudiantes offre un service d'appariement pour le partage de chambres. Les étudiants intéressés à trouver quelqu'un pour partager une chambre peuvent écrire à jam2011roommates@gmail.com.

Cocktail étudiant et quiz entomologique

Appel à questions pour le quiz! Puisque notre connaissance des insectes est probablement aussi diverse que les organismes que nous étudions, le comité des affaires étudiantes aimerait que vous soumettiez vos questions pour le quiz entomologique!

Student Mixer and Insect Trivia Contest

Call for Trivia Questions! Since our knowledge of insects is likely as diverse as the organisms we study, the SAC would love you all to submit questions for the Insect Trivia Contest! Questions can be submitted by email to students@esc-sec.ca.

The SAC will be hosting the Student Mixer and Insect Trivia Contest once again. The Student Mixer is a great opportunity to come out and meet your fellow students and let loose (without worry that your current or future supervisor may be watching), so make sure you look for the details of the Student Mixer and Insect Trivia contest in the meeting program!

Graduate Student Symposium

The Graduate Student Symposium (GSS) Committee (Chandra Moffat, Julia Mlynarek, and David McCorquodale) is busy organizing what promises to be an interesting and informative session, with talks by some of the ESC's most promising graduate students. The GSS Committee would like to thank everyone who submitted abstracts this year. The students and talks selected for the Symposium are given below.

Silent Auction

The SAC is again organizing a Silent Auction to be held during the Meeting. All funds raised through the Silent Auction are donated to the ESC Student Scholarships and Awards fund. If you or someone you know is cleaning out the office and looking to get rid of entomology related books or other items (trinkets, artwork, jewellery, field gear, T-shirts, etc.), the Silent Auction would love to have them. Please bring them along with you to the meeting and drop them off at the Silent Auction tables. For large or heavy items, or if you would like to ship your donations in advance (please note, shipping charges will not be reimbursed), please send them to:

Attention: Kevin Reeh, Nova Scotia Agricultural College, Department of Environmental Sciences, 21 Cox Road, Truro, Nova Scotia, B2N 5E3.

Les questions peuvent être soumises par courriel à students@esc-sec.ca.

Le comité des affaires étudiantes organisera le cocktail étudiant et le quiz entomologique une fois de plus. Le cocktail étudiant est une excellente opportunité de venir rencontrer vos collègues étudiants et vous relâcher (sans crainte que votre directeur actuel ou futur vous voit !), alors consultez les détails du cocktail étudiant et du quiz entomologique dans le programme de la réunion !

Symposium des étudiants gradués

Le comité du symposium des étudiants gradués (Chandra Moffat, Julia Mlynarek, et David McCorquodale) est occupé à organiser ce qui promet d'être une session intéressante et informative, avec des présentations de quelques-uns des étudiants les plus prometteurs de la SEC. Le comité du symposium des étudiants gradués aimerait remercier tous les étudiants qui ont soumis un résumé cette année. Les étudiants et les présentations sélectionnées pour le symposium sont indiqués plus bas.

Enchères silencieuses

Le comité des affaires étudiantes organise cette année encore des enchères silencieuses durant la réunion. Tous les fonds amassés lors des enchères silencieuses seront donnés au Fonds des prix et bourses étudiants de la SEC. Si vous ou quelqu'un que vous connaissez fait du ménage dans son bureau et cherche à se débarrasser de livres ou objets en lien avec l'entomologie (pièces d'art, bijoux, accessoires de terrain, t-shirts, etc.), les enchères silencieuses adoreraient les avoir. Merci de les amener avec vous lors de la réunion et de les déposer à la table des actions silencieuse. Pour des objets plus gros ou lourds, ou si vous voulez envoyer vos dons en avance (veuillez noter que les frais de port ne seront pas remboursés), merci de les envoyer à :

Attention: Kevin Reeh, Nova Scotia Agricultural College, Department of Environmental Sciences, 21 Cox Road, Truro, Nova Scotia, B2N 5E3.

Les enchères silencieuses sont une excel-

The Silent Auction is a great opportunity to find really neat books and things at excellent prices and to show your support for student members of the ESC. So, be sure to come by and browse the Silent Auction tables - you never know what you might find!

That is all I have for now, I hope to see many of you in Halifax!

~Chandra
students@esc-sec.ca

lente opportunité pour trouver des livres et des objets à d'excellents prix et de montrer votre soutien aux membres étudiants de la SEC. Alors venez faire un tour et fouiner sur les tables des enchères silencieuses – vous ne savez pas ce que vous pourrez y trouver !

Voilà tout ce que j'ai pour le moment, j'espère vous voir nombreux à Halifax !

~Chandra
students@esc-sec.ca

Thesis Roundup

As always, we like to know when a student defends their thesis. If you have (or anyone you know of has) defended a thesis recently, please send me your/their name, degree and date achieved, thesis title, supervisor's name, university and email address to students@esc-sec.ca.

Foisonnement de thèses

Comme toujours, nous aimerions savoir quand un étudiant soutient sa thèse. Si vous (ou quelqu'un que vous connaissez) avez soutenu votre thèse récemment, merci d'envoyer les noms, diplôme, date d'obtention, titre de thèse, nom du directeur, université et adresse courriel à students@esc-sec.ca.

Dergousoff, Shaun. PhD, 2011. *Comparison of the bacteria within ticks from allopatric and sympatric populations of *Dermacentor andersoni* and *Dermacentor variabilis* near their northern distributional limits in Canada*. Supervisor: Neil Chilton. University of Saskatchewan.

Graduate Student Symposium: Too many aphids, too few butterflies, and the patterns in between

After careful deliberation, the GSS Committee selected the following students and talks for the Symposium:

Symposium des étudiants gradués: Trop de pucerons, pas assez de papillons, et les patrons intermédiaires

Après de dures délibérations, le comité du symposium des étudiants gradués a sélectionné les étudiants et présentations suivants pour le symposium :

Colin Curry (University of New Brunswick). **Relative patterns of larval biodiversity in Trichoptera and Odonata: the role of dispersal ability in freshwater insect biodiversity assessment.**

Simon Daoust (Université de Montréal). **Different landscape parameters are perceived at different spatial scales: insights from a tri-trophic system within agricultural lands.**

Chaminda De Silva Weeraddana (Nova Scotia Agricultural College). **Potential use of *Ascophyllum nodosum* (L.) Le Jol. extracts for the management of green peach aphid, *Myzus persicae*.**

Susan Horton (Saint Mary's University). **Identifying the locations, movement and habitat of the European fire ant, *Myrmica rubra*: an invasive species in the urban/suburban environment of Halifax, Nova Scotia.**

Lauren Pinault (Brock University). **Distribution and habitat associations of *Anopheles* spp. (Diptera: Culicidae) in highland Ecuador - What does this mean for malaria?**

Christa Rigney (University of Winnipeg). **Determination of Dakota skipper (*Hesperia dactyle*) critical habitat in Manitoba: characterization of vegetation.**



Médaille d'or

Murray B. Isman

Le récipiendaire 2011 de la Médaille d'or de la Société d'entomologie du Canada pour une contribution exceptionnelle en entomologie est Professeur Murray B. Isman. Chercheur accompli, Professeur Isman a fait plusieurs découvertes fondamentales en écologie chimique des insectes et a apporté des contributions importantes sur la chimie et le mode d'action des pesticides botaniques. Professeur à la Faculté « Land and Food Systems » à l'Université de Colombie-Britannique (UBC) depuis 1988 et présentement doyen de cette faculté, Professeur Isman a complété un baccalauréat en zoologie à l'UBC en 1975 et une maîtrise dans le même établissement en 1977, où il a étudié la séquestration des cardénolides chez les punaises *Oncopeltus fasciatus*. Il a ensuite déménagé pour faire un doctorat à l'Université de Californie (UC)-Davis, où il a travaillé sur le rôle des composés phénoliques des plantes sur la biologie des insectes se nourrissant de tomates. En 1983, après un post-doctorat de 2 ans sur les inhibiteurs de croissance des insectes dans les plantes désertiques à l'UC-Irvine, il a accepté un poste de professeur adjoint à l'UBC au département des sciences des plantes. Il est devenu professeur en 1994.

Si Professeur Isman est une autorité aussi respectée dans sa discipline à travers le monde, c'est parce qu'il a habilement réussi à apporter des contributions importantes autant dans les branches fondamentales qu'appliquées de sa discipline, collaborant avec des partenaires académiques et industriels. Lui et son équipe ont par exemple démontré que l'activité biologique des insecticides à base de neem dépend largement de la présence du constituant principal, l'azadirachtine, alors que des composants mineurs ne jouent qu'un rôle mineur dans son efficacité. De la même façon, il a montré que les composants mineurs des huiles essentielles peuvent avoir

Gold Medal Award

Murray B. Isman

The 2011 recipient of the Entomological Society of Canada Gold Medal Award for outstanding achievement in entomology is Professor Murray B. Isman. An accomplished scholar, Professor Isman has made many fundamental discoveries in the field of insect chemical ecology and important contributions to the chemistry and mode of action of botanical pesticides.

A tenured professor in the Faculty of Land and Food Systems at the University of British Columbia (UBC) since 1988, and currently Dean of that Faculty, Professor Isman completed a BSc in zoology at UBC in 1975 and an MSc at the same institution in 1977, where he studied the sequestration of cardenolides in milkweed bugs. He then moved on to do a PhD at the University of California (UC)-Davis, where he worked on the role of phenolic plant compounds on the biology of tomato-feeding insects. In 1983, after two years of postdoctoral work on insect growth inhibitors in desert plants at UC-Irvine, he accepted a position as Assistant Professor at UBC in the Department of Plant Science. He became a full professor in 1994.

If Professor Isman is such a respected authority in his discipline throughout the world, it is, in part, because he has skillfully man-

aged to make important contributions to both the fundamental and applied branches of his discipline, collaborating with both academic and industrial partners. For example, he and his team have demonstrated that the biological activity of neem-based insecticides depends largely on the presence of the principal constituent, azadirachtin, while minor components play little role in efficacy. Conversely, he has shown that minor constituents of essential oils can have an important synergistic insecticidal effect. His research has also shown that natural mixtures of constituents found in botanical insecticides can delay or prevent habituation to feeding deterrents. His work on botanicals has been instrumental in the development of essential-oil-based insecticides marketed by EcoSMART Technologies Inc., relevant for industrial, agricultural and consumer markets, now available in over 10,000 retail outlets in the USA and sold in 11 other countries.

Professor Isman has had a remarkably productive career. Having received over \$4 million of extramural funding, he has more than 180 publications, including three that have been cited over 200 times, according to the ISI Science Citation Index, and has co-edited two books. Over the past 27 years, he has been involved in the teaching of nine separate courses and has served as external examiner for doctoral theses in several countries around the world. He has also been a devoted mentor, playing a role in the training of 24 graduate students, 12 postdoctorals and 14 visiting scholars.

Professor Isman's outstanding career has been recognized by previous awards, including the Society's C. Gordon Hewitt Award in 1991, the Bronze Medal from the International Society of Chemical Ecology in 1997, and his appointment as a Distinguished Scholar in the Peter Wall Institute for Advanced Studies at UBC in 2004.

With respect to his contributions to the affairs of scientific societies, Prof. Isman has served as President of the International Society of Chemical Ecology, the Phytochemical Society of North America and the Entomological Society of British Columbia, and has been a member of various Entomological Society of Canada committees.

un effet insecticide synergique important. Ses recherches ont également montré que des mélanges naturels de composés trouvés dans des insecticides botaniques peuvent retarder ou prévenir l'habituation aux anti-appétants. Ses travaux en botanique ont été précieux dans le développement d'insecticides à base d'huile essentielle mis en marché par EcoSMART Technologies Inc., insecticides importants pour les marchés industriels, agricoles et de consommation, maintenant disponible dans plus de 10 000 détaillants aux É.U. et vendus dans plus de 11 pays.

Professeur Isman a eu une carrière incroyablement productive. Ayant reçu plus de 4 millions de dollars de financement extramural, il a plus de 180 publications, incluant 3 qui ont été citées plus de 200 fois selon le ISI Science Citation Index, et a co-édité 2 livres. Durant les 27 dernières années, il a été impliqué dans l'enseignement de 9 cours distincts et a servi d'examineur externe pour des thèses de doctorat dans de nombreux pays. Il a également été un mentor dévoué, jouant un rôle dans la formation de 24 étudiants gradués, 12 postdoctoraux et 14 professeurs invités.

La formidable carrière du Professeur Isman a été reconnue par différents prix, incluant le prix C. Gordon Hewitt de la SEC en 1991, la Médaille de bronze de la Société internationale d'écologie chimique (ISCE) en 1997, et sa nomination en tant que Professeur distingué (« Distinguished Scholar ») à l'Institut Peter Wall pour les études avancées de l'UBC en 2004.

Pour ce qui est de sa contribution dans les affaires des sociétés scientifiques, Professeur Isman a servi en tant que Président de la Société internationale d'écologie chimique (ISCE), la Société phytochimique d'Amérique du Nord et la Société d'entomologie de Colombie-Britannique, et il a été membre de différents comités de la Société d'entomologie du Canada.



Prix C. Gordon Hewitt

Kirk Hillier

Le récipiendaire 2011 du prix C. Gordon Hewitt est Dr Neil Kirk Hillier. Professeur agrégé au département de biologie de l'Université Acadia, Dr Hillier est devenu une figure importante dans la recherche sur les phéromones d'insectes au Canada. Portant sur un vaste domaine, ses recherches couvrent autant des aspects fondamentaux qu'appliqués, et elles incorporent des éléments d'écologie chimique, agriculture, comportement et neurosciences. Ses contributions les plus importantes concernent le traitement olfactif des phéromones d'insectes et le contrôle génétique de la perception des phéromones.

En 1998, Dr Hillier a terminé un baccalauréat en biologie à l'Université Memorial, où il a également entrepris un doctorat sur l'utilisation des substances sémiocchimiques dans la gestion des ravageurs avec Prof. Dave Larson et Dr Peggy Dixon (Agriculture et agroalimentaire Canada). Il a gradué en 2002 et entrepris un postdoctorat dans le laboratoire de Prof. Neil Vickers à l'Université de l'Utah. Il y a d'abord étudié les parades sexuelles chez les papillons, mais s'est éventuellement tourné vers une formation en neurophysiologie de l'insecte et est devenu un expert dans les enregistrements sensoriels des antennes des insectes. Il a été recruté comme professeur adjoint par Acadia en 2007, et a été promu professeur agrégé en 2010. Il a également été chercheur invité au Theodor Boveri Institut et au Max Planck Institut für Chemische Ökologie, tous deux situés en Allemagne, respectivement en 2006 et 2007. Le programme de recherches de Dr Hillier vise à obtenir une meilleure compréhension du traitement de l'olfaction chez les insectes et de la relation entre les odeurs et le comportement des insectes. Plus particulièrement, ses recherches s'appliquent à la cartographie des neurones récepteurs olfactifs, à l'identification de sensilles mâles sensibles aux phéromones non-décrites précédemment et à la modifica-

C. Gordon Hewitt Award

N. Kirk Hillier

The 2011 recipient of the C. Gordon Hewitt Award is Dr Neil Kirk Hillier. An Associate Professor in the Department of Biology at Acadia University, Dr Hillier has become a prominent figure in insect pheromone research in Canada. Broad in scope, his research has both basic and applied components, and incorporates elements of chemical ecology, agriculture, behaviour and neuroscience. His most significant contributions pertain to olfactory processing of insect pheromones and the genetic control of pheromone perception.

In 1998, Dr Hillier completed a BSc degree in biology at Memorial University, and undertook a PhD in the same institution, where he studied the use of semiochemicals for pest monitoring with Professor Dave Larson and Dr Peggy Dixon (Agriculture and Agri-Food Canada). He graduated in 2002 and undertook a postdoctoral fellowship in the laboratory of Professor Neil Vickers, at the University of Utah. There, he initially studied courtship in moths, but eventually sought training in insect neurophysiology and became a leading expert in sensory recordings made from insect antennae. He was recruited as Assistant Professor by Acadia in 2007 and promoted to Associate Professor in 2010. He was also Visiting Scientist at the Theodor Boveri Institut and the Max Planck Institut für Chemische Ökologie, both

in Germany, in 2006 and 2007, respectively.

Dr Hillier's research program aims at acquiring a better understanding of insect olfactory processing and the relationship between odours and insect behaviour. More specifically, his research is concerned with mapping of olfactory receptor neurons, identification of previously undescribed male pheromone-sensitive sensilla and modification of insects using interspecific tissue transplants. Dr Hillier has also developed a regional network of collaborators with whom he works on applied aspects of entomology, including the chemical ecology and management of lowbush blueberry and vineyard pests.

Dr Hillier has already had remarkable success in obtaining research grants. Upon accepting his position at Acadia, he was successful in securing a \$349,000 Canadian Foundation for Innovation grant, which he used to develop a neurophysiology facility known as the Chemical Analysis and Bioimaging Laboratory. Dr Hillier has also been successful in obtaining funding from various other sources, including a recent \$6.9M collaborative grant from the Atlantic Canada Opportunity Agency, awarded for applied work on the use of pheromones for insect pest management.

Dr Hillier has authored or co-authored 12 peer-reviewed papers, including one in the prestigious Proceedings of the National Academy of Sciences, and has several others in preparation as well as some in non-refereed publications. Known for his outstanding communication skills, he has given numerous invited lectures and over 24 conference presentations. He has contributed to the teaching of six courses at Acadia, where he has also supervised 35 graduate, honours and summer students. In 2009, he was awarded an Acadia Student Union Teaching Recognition Award.

Finally, Dr Hillier has provided dedicated service to the ESC, which he joined in 2000. Since 2004, he has been an active and valued member of the Marketing Committee and has chaired this committee since 2007. In addition, he has been a member of the AES since 1999 and is Co-chair of this year's ESC-AES Joint Annual Meeting.

tion des insectes en utilisant des transplants de tissus interspécifiques. Dr Hillier a également développé un réseau régional de collaborateurs avec qui il travaille sur des aspects appliqués de l'entomologie, incluant l'écologie chimique et la gestion de ravageurs du bleuet à feuilles dentelées et des vignes.

Dr Hillier a déjà eu un succès incroyable dans l'obtention de subventions de recherche. Depuis le début de son poste à Acadia, il a réussi à obtenir une subvention de 349 000\$ de la Fondation canadienne pour l'innovation qu'il a utilisé pour développer une installation de neurophysiologie connue comme le laboratoire d'analyse chimique et de bioimagerie. Dr Hillier a également réussi à obtenir des financements de différentes autres sources, incluant une subvention collaborative récente de 6.9 M\$ de l'Agence de promotion économique du Canada atlantique, accordée pour des travaux appliqués sur l'utilisation de phéromones pour la gestion des insectes ravageurs.

Dr Hillier a écrit ou coécrit 12 articles avec comité de révision, incluant 1 dans la prestigieuse revue *Proceedings of the National Academy of Sciences*, et en a plusieurs autres en préparation, ainsi que des articles sans comité de révision. Connu pour ses incroyables talents en communication, il a donné de nombreuses conférences invitées et plus de 24 présentations dans des congrès. Il a contribué à l'enseignement de 6 cours à Acadia, où il a également supervisé 35 étudiants diplômés, de premier cycle et d'été. En 2009, il a reçu un le prix *Acadia Student Union Teaching Recognition Award* pour ses enseignements. Finalement, Dr Hillier s'est impliqué de façon dédiée à la SEC qu'il a jointe en 2000. Depuis 2004, il est un membre actif et important du comité du marketing et il préside ce comité depuis 2007. De plus, il est membre de la SEA depuis 1999 et co-organise la réunion conjointe annuelle SEC-SEA de cette année.



Bert and John Carr Award

Zoë Lindo

In 2010, the ESC saw the creation of a new award, the Carr Award, which is named in honour of Bert and John Carr, who left a legacy of entomological knowledge resulting from the collection and taxonomy of several hundred thousand North American beetle specimens. This award has been made possible by the Carrs' desire to see an interest in science and nature carried through to the next generation. This is a cash award (\$500) in support of research activities by individuals who study insect faunistics, or the natural history and taxonomy of Canada's insect fauna. Although preference is given to applications by amateurs, applications by students and others are also considered.

The first recipient of the Carr award is Dr Zoë Lindo who, at the time of submitting her application, was a postdoctoral fellow at McGill University. Dr Lindo received her BSc in ecology and MSc in soil ecology from the University of Calgary where she became interested in soil microarthropods and, in particular, oribatid mites (Acari: Oribatida). In 2004, Dr Lindo returned to her home town of Victoria, to complete her PhD in community ecology at the University of Victoria (2008), where she explored the biodiverse mite communities in temperate rainforest canopy systems. From 2008 to 2011, Dr Lindo was a postdoctoral fellow at McGill University, working on sub-

Prix Bert et John Carr

Zoë Lindo

En 2010, la SEC a vu la création d'un nouveau prix, le prix Carr, nommé en l'honneur de Bert et John Carr qui ont laissé un héritage de connaissances entomologiques provenant de la collecte et de la taxonomie de plusieurs centaines de milliers de spécimens de coléoptères d'Amérique du nord. Ce prix voit le jour grâce au désir de Bert et John Carr de voir leur intérêt dans les sciences et la nature être transmis aux prochaines générations. Il s'agit d'un prix en argent (500\$) afin de soutenir les activités de recherche par des individus qui étudient la faunistique des insectes, ou l'histoire naturelle et la taxonomie de la faune d'insectes au Canada. Bien que la préférence soit donnée aux amateurs, les demandes d'étudiants et autres sont aussi considérées.

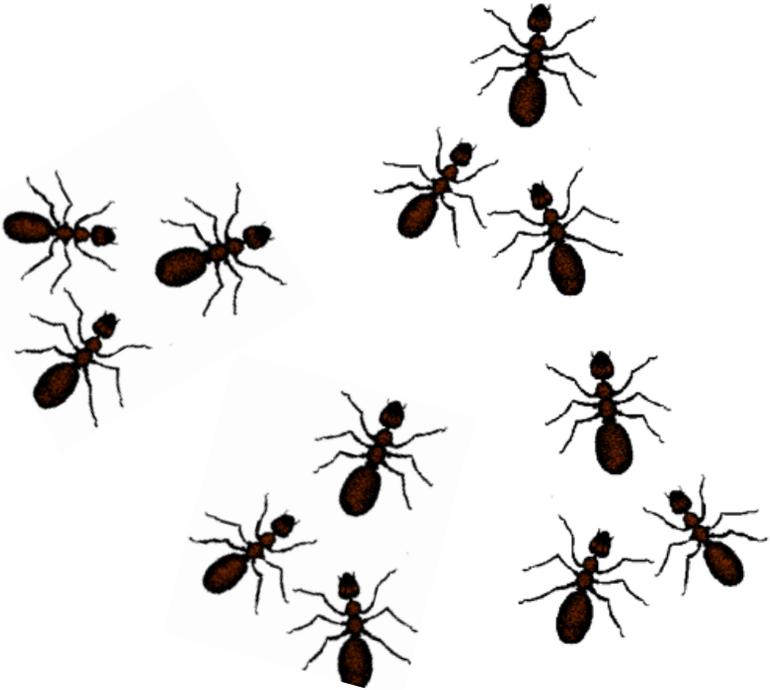
Le premier récipiendaire du prix Carr est Dr Zoë Lindo qui, au moment de la demande, était chercheure postdoctorale à l'Université McGill. Dr Lindo a obtenu son baccalauréat en écologie et sa maîtrise en écologie du sol de l'Université de Calgary où elle s'est intéressée aux microarthropodes du sol et, plus particulièrement, des acariens oribates (Acari : Oribatida). En 2004, Dr Lindo est retournée dans sa ville natale Victoria afin de compléter un doctorat en écologie des communautés à l'Université de Victoria (2008) où elle a exploré la biodiversité des communautés d'arthropodes dans les canopées des forêts tempérées humides. De 2008 à 2011, Dr Lindo a fait un post-doctorat à l'Université McGill sur les communautés de mousses et microarthropodes subarctiques et leur réponse aux changements climatiques et à la fragmentation des habitats. En septembre 2011, Dr Lindo deviendra professeure adjointe à l'Université Western Ontario à London.

Dr Lindo se décrit comme une scientifique de la biodiversité, un terme adopté afin d'inclure la diversité des domaines de recherche de l'écologie des communautés, l'écologie du sol,

arctic moss-microarthropod communities and their response to climate change and habitat fragmentation. In September 2011, Dr Lindo will become an Assistant Professor at the University of Western Ontario in London.

Dr Lindo describes herself as a biodiversity scientist, a term adopted to encompass the breadth of research in the areas of community ecology, soil ecology, acarology, and taxonomy/systematics. Support from the Carr Award will allow her to compile a comprehensive list of oribatid mite species for British Columbia, contribute to the E-fauna of BC webpages, and write a manuscript for *The Canadian Entomologist*. To date, this project includes an estimated 314 species for British Columbia, of which an estimated 109 species are currently undescribed.

l'acarologie et la taxonomie/systématique. Le soutien du prix Carr lui permettra de compiler une liste exhaustive des espèces d'acariens oribates de Colombie-Britannique, de contribuer à la page « E-fauna of BC » et d'écrire un article pour *The Canadian Entomologist*. A ce jour, le projet inclut une estimation de 314 espèces de Colombie-Britannique, incluant environ 109 espèces non décrites.



Dave Gillespie – 2011 Winner of AAFC Gold Harvest Award

Over his 30-year career as a research scientist with AAFC's Research Branch, Dave Gillespie's research on the natural enemies of insects and mites has contributed directly to the discovery and widespread use of many of these species for biological control in domestic and international greenhouse operations.

For the first 20 years of his career, Dave worked with the Canadian greenhouse vegetable industry to find biological control agents to manage pest insects, thus substantially reducing the use of pesticides in greenhouse vegetable production. His early research on the responses of greenhouse insects to colour led to use of colour traps for monitoring greenhouse pests.

Dave's unique way of offering his research findings to the greenhouse industry at large, such as beneficial insect production companies and greenhouse crop managers, has resulted in his sustained contributions being used around the world.

He is currently the principal investigator for a national AAFC peer-reviewed project on the biological control of the cabbage seedpod weevil in Canada. Under Dave's leadership, this collaborative project advances the interests of canola producers to find biological control solutions to major pest problems.



Jodi Aylard, Assistant Deputy Minister Research Branch AAFC; Andrea Lyon, Associate Deputy Minister AAFC; Dave Gillespie; John Knubley Deputy Minister AAFC

Titanic testicles in tettigoniids add weight to the male mating rate hypothesis

Karim Vahed

In absolute terms, the record holder for the largest testicles in the animal kingdom is the right whale (*Eubalaena* spp), with gonads that weigh in at a combined mass of approximately 1000 kg (the weight of about 12 grown men) (Frasier et al. 2007). Right whales, however, are very large. Which species, then, has the largest testes as a percentage of male body mass? In the right whale, the testes make up about 1% of the male's body mass. This is still respectable when compared with humans, in which testes are a mere fraction of a percentage of male body mass (approximately only 0.05%, Diamond 1986). This does not compare very favourably with the largest testes relative to male body weight recorded in mammals so far, which are found in Rafinesque's big eared bat (*Corynorhinus rafinesquii*) and which constitute an impressive 8.4% of male body weight (Pitnick et al. 2006). Fish can top this record: the grey mullet (*Mugil cephalus*) sports internal testes that represent 12% of male body mass (Stockley et al. 1997), while deep-sea angler fish (sub-order Ceratoidei) could probably out-do all the competition. Having found a mate, the male becomes parasitic on the female and much of his body begins to degenerate, apart from the testes (Pietsch 2005) (I consider this to be cheating, however). Among birds, the relatively largest testes are found in the Alpine accentor (*Prunella collaris*) (7.7% of male body mass, Nakamura 1990). Reptile record holders include tiger snakes (*Notechis* spp) (5.1% of male body mass, Olsen & Masden 1998), while a Japanese tree frog (*Rhacophorus arboreus*) (testes 5% of male body mass) tops the frog testes charts (Kusano et al. 1991). Among insects, the largest testes recorded up to now, at 10.6% of male body mass, belonged to a species of fruit fly (*Drosophila bifurca*, Pitnick 1996). This record, however, has now been beaten: we have recently found that the tuberous bushcricket (*Platycleis affinis*) produces testes that are, on average, 13.8% of male body mass (and up to around 16% of male body mass, Vahed et al. 2011) (Fig. 1). This, in fact, appears to make the tuberous bushcricket the overall record holder for the largest combined testicle mass relative to male body mass in the animal kingdom (deep-sea angler fish excluded), although there is a relative scarcity of testis mass data for many animal taxa. A further point of caution is that comparing testis mass using percentages could be misleading. Evidence suggests that in some taxa, such as mammals, there is a negative allometric relationship between body



Fig. 1. A male tuberous bushcricket (*Platycleis affinis*) together with his testes, which represent an average of 13.8% of male body mass.

Karim Vahed (k.vahed@derby.ac.uk) is a Reader in Behavioural Ecology and Senior Lecturer in Zoology at the University of Derby, U.K, where he teaches Behavioural Ecology, Animal Behaviour, Entomology, Invertebrate Biology and Ecology. He studies sexual selection and sexual conflict and is particularly interested in crickets and bushcrickets.

mass and relative investment in testis mass (MacLeod and MacLeod 2009): smaller species tend to have relatively larger testes than do larger species. Nevertheless, it is clear that tuberous bushcrickets do have unusually large testes.

What evolutionary forces could lie behind the production of such titanic testicles? An almost universal evolutionary rule appears to be that variation in the relative size of the testes is linked to female mating behaviour: testes tend to be relatively larger in species in which females are more polyandrous (mate with more males). This has been demonstrated in a wide range of taxa, including fish, amphibians, birds, mammals and insects, including butterflies, bruchid beetles and *Drosophila* species (reviewed in Fromhage et al. 2008; Katvala et al. 2008). Females of most of the above testes record holders are unusually polyandrous compared to related species. At least two hypotheses could account for this pattern: the sperm competition hypothesis on the one hand and the male mating rate hypothesis (otherwise known as the “sperm depletion” hypothesis) on the other (Møller 1991). Of these, the sperm competition hypothesis has won broad acceptance over the last few decades (reviewed in Birkhead & Møller 1998; Simmons 2001), while the male mating rate hypothesis has tended to be either dismissed or overlooked. In the case of the sperm competition hypothesis, it is assumed that larger testes produce more sperm per ejaculate and thereby provide males with an advantage in numerical sperm competition (competition between sperm from two or more males for the fertilisation of the female’s eggs) (Parker 1998). Sperm competition will be most intense in species in which females mate with multiple males. The male that has produced the most sperm in the lottery of fertilisation is often assumed to be at an advantage, hence selection is predicted to favour larger testes in species in which females mate multiply (Parker 1998). An increase in the extent of multiple mating in females, however, will not only increase the level of sperm competition, but, all else being equal, will also entail an increase in the number of sexually available females in the population at any given time and hence of mating opportunities available for the male (Parker & Ball 2005; Fromhage et al. 2008). It is therefore possible that larger testes have evolved in more polyandrous species simply because they allow an increase in the rate of ejaculate production and thereby enable the male to engage in a greater number of successive copulations, rather than the advantage they confer in terms of numerical sperm competition.

What sort of data can allow us to distinguish between these two hypotheses for the evolution of large testes? The sperm competition hypothesis predicts that males of species in which females are more polyandrous should have larger testes which produce more sperm per ejaculate, hence there should be a positive relationship across species between testis mass and sperm number per ejaculate (Parker 1998). The mating rate hypothesis, on the other hand, predicts that while males of such species will have larger testes, they will not necessarily produce more sperm per ejaculate. In fact males might even produce less sperm per ejaculate in order to conserve sperm for future mating opportunities (Parker & Ball 2005; Fromhage et al. 2008).

In order to test these hypotheses for the evolution of testis size, we obtained values of testis mass for 21 species of bushcricket (otherwise known as katydids; Orthoptera: Tettigoniidae), along with data on sperm number, ejaculate volume, male body mass and the lifetime degree of multiple mating in females (Vahed et al. 2011, see also Vahed 2006). There were many advantages of using bushcrickets for a study such as this, compared to vertebrates. For one thing, male bushcrickets transfer their sperm in a spermatophore, which remains partly external to the female. It is therefore very easy to remove the ejaculate shortly after it has been transferred in order to gain data on sperm number per ejaculate and the mass of the ampulla of the spermatophore (which equates to ejaculate volume). By contrast, in vertebrates, ejaculates are much more difficult to obtain, other than by artificial means such as manual ejaculate stripping in studies of fish and birds (Møller 1988; Stockley et al. 1997), which could lead to over-estimates of

the number of sperm per ejaculate. Another big advantage of studying bushcrickets is that in certain sub-families, each time the female mates, a separate ejaculate pouch, or spermatodose, is formed within the female's sperm storage organ (spermatheca) (see Vahed 2003, 2006). The number of times a female has mated can therefore be assessed simply by dissecting out the spermatheca and counting the spermatodoses. We analysed the relationships between testis mass and the other variables across the bushcricket species by fitting phylogenetic generalised least-squares models (Martins & Hansen 1997), which enabled us to control for the effects of common ancestry. The effect of differences in male body mass between species was taken into account by including male body mass as a candidate predictor variable in the models.



S. Taylor

Fig. 2. A male *Gampsocleis glabra* together with his testes, which represent 1% of his body mass.

As with previous comparative studies of testis size, we found that the testes were proportionately larger in species in which females mated with more males: female tuberous bushcrickets will mate with an average of about 11 different males (and up to 23 males) in the space of their 2-month adult life (Vahed 2006). The next largest testes after *Platycleis* and closely related genera were found in the Alpine bushcricket, *Anonconotus ghilianii* (a mean of 8% of male body mass). Males of this species are unusual in that they are able to obtain copulations by force (Vahed & Carron 2008) and, perhaps as a consequence, females have a very high lifetime degree of polyandry, mating an average of 25 times. These figures contrast with the low level of polyandry,

ranging from a mean of around two to three copulations, and relatively small testes, representing only 1% of male body mass, in species such as *Ephippiger ephippiger* and *Gampsocleis glabra* (Fig 2). Unlike virtually all previous studies (e.g. Møller 1988, 1989; Stockley et al. 1997, but see Pitnick 1996), however, we found that species with larger testes, such as *P. affinis*, did not produce more sperm: there was no significant relationship across species between testis size and sperm number (Vahed et al. 2011) or between sperm number and the degree of polyandry (Vahed 2006). In fact, the trend was for species with larger testes to produce less sperm per ejaculate. For example, the sperm count for *P. affinis* (largest testes) was about three times smaller than that for *G. glabra* (small testes), even though males of both species were of similar body mass. Furthermore, ejaculate volume was significantly smaller in species with larger testes (Vahed et al. 2011) and in more polyandrous species (Vahed 2006; Vahed et al. 2011).

These results therefore support the mating rate hypothesis rather than the sperm competition hypothesis and indicate that extra large testes in bushcrickets probably allow males to allocate their sperm to a greater number of females, or to put it another way, males don't put all their eggs (or rather sperm!) in one basket. While sperm competition is undoubtedly a powerful selective force in shaping testes size (Birkhead and Møller 1998; Simmons 2001), it is clearly not the only factor at play. How applicable our findings are to other taxa is unclear at present. Further comparative studies of testis size in insects and other non-vertebrates are needed to redress the taxonomic biases of previous studies and will undoubtedly lead to valuable insights into the selective pressures favouring the evolution of titanic testicles.

Acknowledgements

I thank D. Parker for discussion and C. Gillott for inviting me to write this article.

References

- Birkhead, T.R., and Møller, A.P. (eds.) 1998. Sperm Competition and Sexual Selection. Academic Press, London.
- Diamond, J.M. 1986. Variation in human testis size. *Nature* **320**: 488–489.
- Frasier, T.R. Hamilton, P.K., Brown, M.W., Conger, L.A., Knowlton, A.R., Marx, M. K., Slay, C.K., Krause, S.D. and White, B.N. 2007. Patterns of male reproductive success in a highly promiscuous whale species: the endangered North Atlantic right whale. *Molecular Ecology*, **16**: 5277–5293.
- Fromhage, L., McNamara, J.H. and Houston, A.I. 2008. Sperm allocation strategies and female resistance: a unifying perspective. *American Naturalist* **172**: 25-33.
- Katvala, M., Roenn, J.L. and Arnqvist, G. 2008. Correlated evolution between male ejaculate allocation and female remating behaviour in seed beetles (Bruchidae). *Journal of Evolutionary Biology* **21**: 471-479.
- Kusano, T., Toda, M and Fukuyama, K. 1991. Testes size and breeding systems in Japanese anurans with special reference to large testes in the treefrog *Rhacophorus arboreus* (Amphibia: Rhacophoridae). *Behavioural Ecology and Sociobiology* **29**: 27–31.
- Macleod, C.D. and Macleod, R. 2009. The relationship between body mass and relative investment in testes mass in amniotes and other vertebrates. *Oikos* **118**: 903-916.
- Martins, E.P. & Hansen, T.F. 1997. Phylogenies and the comparative method: a general approach to incorporating phylogenetic information into the analysis of interspecific data. *American Naturalist* **149**: 646–667.
- Møller, A.P. 1988. Testis size, ejaculate quality, and sperm competition in birds. *Biological Journal of the Linnean Society* **33**: 273–383.
- Møller, A.P. 1989. Ejaculate quality, testes size and sperm production in mammals. *Functional Ecology* **3**: 91-96.
- Møller, A.P. 1991. Sperm competition, sperm depletion, paternal care and relative testis size in birds. *American Naturalist* **137**: 882-906.
- Nakamura, M. 1990. Cloacal protuberance and copulatory behavior of the Alpine accentor (*Prunella collaris*). *The Auk* **107**: 284–295.
- Olsen, M. and Masden, T. 1998. Sexual selection and sperm competition in reptiles. In *Sperm Competition and Sexual Selection*. Edited by T. R. Birkhead and A. P. Møller. Academic Press, London. pp 503–577.
- Parker, G.A. 1998. Sperm competition and the evolution of ejaculates: towards a theory base. In *Sperm Competition and Sexual Selection*. Edited by T. R. Birkhead and A. P. Møller. Academic Press, London. pp 3-54.
- Parker, G.A., and Ball, M.A. 2005. Sperm competition, mating rate and the evolution of testis and ejaculate sizes: a population model. *Biology Letters* **1**: 235-238.
- Pietsch, T.W. 2005. Dimorphism, parasitism, and sex revisited: modes of reproduction among deep-sea ceratoid anglerfishes (Teleostei: Lophiiformes). *Ichthyological Research* **52**: 207–236.
- Pitnick, S. 1996. Investment in testes and the cost of making long sperm in *Drosophila*. *American Naturalist* **148**: 57-80.
- Pitnick, S., Jones, K.E. and Wilkinson, G.S. 2006. Mating system and brain size in bats. *Proceedings of the Royal Society, Series B* **273**: 719–724.
- Simmons, L.W. 2001. *Sperm Competition and its Evolutionary Consequences in the Insects*.

Princeton University Press, Oxford, UK.

- Stockley, P., Gage, M.J.G., Parker, G.A. and Møller, A.P. 1997. Sperm competition in fishes: the evolution of testis size and ejaculate characteristics. *The American Naturalist* **149**: 933–954.
- Vahed, K. 2003. Structure of spermatodocytes in shield-back bushcrickets (Tettigoniidae, Tettigoniinae). *Journal of Morphology* **257**: 45-52.
- Vahed, K. 2006. Larger ejaculate volumes are associated with a lower degree of polyandry across bushcricket taxa. *Proceedings of the Royal Society, Series B* **273**: 2387-2394.
- Vahed, K., and Carron, G. 2008. Comparison of forced mating behaviour in four taxa of *Anonconotus*, the Alpine bushcricket. *Journal of Zoology* **276**: 313-321.
- Vahed, K., Parker, D.J. and Gilbert, J.D.J. 2011. Larger testes are associated with a higher level of polyandry, but a smaller ejaculate volume, across bushcricket species (Tettigoniinae). *Biology Letters* **7**: 261–264.



S. Marshall

True Katydid (*Pterophylla camellifolia*) from *Insects: Their natural history and diversity*. 2006. S. Marshall.

Status of entomology in Canada: crisis or opportunity?

Christopher M. Buddle, Crystal Ernst, Meggy Hervieux, Sarah Loboda, Alyssa MacLeod, Timothy Maloney, Cinthya Leyva Mancilla, Raphaël Royauté, and Anna M. Solecki

Entomologists in Canada have long been concerned about their discipline in terms of employment opportunities, recognition of entomology in the broader field of biology, training and research at Universities, and lack of sufficient funding (Madder et al. 1984; Cusson and Therrien 1989). Many of these concerns are warranted, especially given the disappearance of Departments of Entomology in Canada in the last 20 years (e.g., University of Alberta, McGill University); currently, the University of Manitoba has the only remaining Department of Entomology in the nation. Despite this, Canada is still recognized for its excellence in entomology. It is a fertile training ground for entomologists and many universities and government institutions continue to employ scientists with expertise on arthropods.

We are a group of entomologists and students of entomology with concerns about career options. Canadian students are receiving advanced training in entomology, but are worried there are few options for future employment. What are the job prospects for entomologists? Are more students being trained than the job market can sustain? With these questions in mind, the goal of the present study is to establish the status of entomology in Canada including training, employment, and funding opportunities.

The importance of entomology

Insects and other arthropods affect the social, economic, environmental and physical well-being of Canadians (e.g., Brues 1947; Byrd and Kuchner 2000; Dimarcq 2003; Murphy 2007; Kluge 2008; Kurz et al. 2008; Yemshanov et al. 2009). The prominence of entomological subjects in the media (e.g., Harrel 2008; Holland 2009) is contributing to awareness and understanding in the general public. Given the significance of insects to society, it seems clear that sustained research in the field is of the utmost importance. This fact has not escaped the attention of certain governmental agencies and organizations, which have given insects much consideration. For instance, Agriculture and Agri-Food Canada is maintaining the Canadian National Collection of Insects, Arachnids and Nematodes to support agricultural research as part of its research systematics program (Skevington 2010). As well, the Biological Survey of Canada, a not-for-profit organization, has many ongoing projects focusing on arthropod diversity, such as Arthropods of Canadian Grasslands and Terrestrial arthropods of Newfoundland and Labrador (Biological Survey of Canada 2010). Yet is this importance reflected in the funding and employment conditions for entomologists across Canada?

Survey methods

To obtain data about the status of entomology in Canada, we invited professional and student entomologists to complete our on-line survey, which was available in both English and French (the survey questions can be viewed at <http://insectecology.mcgill.ca/Survey.pdf>). For the purpose of this study, we defined an entomologist as an individual trained in some aspect of entomology that studies and/or rears and/or conducts experiments with insects or other closely related

Chris Buddle (chris.buddle@mcgill.ca) is an Associate Professor of Insect Ecology at McGill University. This paper is a result of a research project undertaken by students in a graduate class (Forest Entomology) at McGill; all co-authors were students in the Department of Natural Resource Sciences at McGill when the paper was written.

arthropods as a significant component of his or her current employment. We compiled a list of 498 professional academic and public-sector entomologists in Canada using a listserv provided by the Biological Survey of Canada and general web searches of academic and governmental institutions. Entomologists from the private sector were not targeted in our search or survey. Although the private sector plays an important role in the discipline, it was beyond the scope of the current project to be included in the survey. Targeted individuals were notified about the survey via e-mail and invited to pass on the survey to their graduate students and colleagues. We also posted the link to the survey on the Biological Survey of Canada’s e-mail listserv and the Entomological Society of Canada website. Data were collected for 1 month after which time the survey was disabled.

Entomological training

When entomology professionals and students were asked how they would best describe where their interests in entomology started, 48% and 51%, respectively, responded that their interest developed from exposure to the subject in a formal education system. These responses emphasize the role played by academic training in developing the curiosity of future entomologists. For the purpose of this study, we have focused on training offered by universities at the undergraduate and graduate level.

A list of Canadian universities was obtained from the University of Waterloo website (<http://uwaterloo.ca/canu/index/php>). We compiled a list of entomology courses currently listed on Canadian universities’ websites (summarized in Table 1). Universities whose courses were not readily accessible on-line were excluded from the results. Only courses whose titles included at least one of the terms “entomology”, “arthropod” or “insect”, or whose course descriptions indicated a primary focus in entomology (e.g., pollination) were included in the search. Past lists of Canadian entomology courses were available for the 1962-63 and 2004-05 academic years (Beckel 1964; Thielman 2010); the courses listed in these publications which met the search criteria listed above are included in Table 1 for comparative purposes. Some universities that

Table 1: Number of entomology-based graduate and undergraduate courses offered at Canadian universities, listed by province, for 1962-63 (Beckel 1964), 2004-05 (Thielman 2010) and 2009-10.

Province	# Undergraduate Courses			# Graduate Courses		
	1964	2005	2010	1964	2005	2010
Alberta	6	4	17	4	0	6
British Columbia	4	11	11	3	13	9
Manitoba	7	8	14	5	7	7
New Brunswick	6	4	8	0	3	1
Newfoundland	0	2	1	0	2	3
Nova Scotia	0	5	9	0	1	2
Ontario	13	18	39	19	8	18
Prince Edward Island	0	1	1	0	0	0
Quebec	11	21	29	10	7	13
Saskatchewan	1	7	6	3	3	1

we included in our study were not present in the 1964 and 2005 reviews.

In the 2009-2010 academic year, 46% of Canadian universities surveyed offered at least one course in entomology. A total of 195 university entomology courses were offered across Canada, of which 135 were undergraduate courses and 60 were graduate courses. The majority of all courses were offered in Ontario (29%) and Quebec (22%). The number of courses offered across Canada has more than doubled since the 1962-1963 academic year, with several provinces, especially in the Maritimes, now offering training where none existed half a century ago.

Opportunities exist for students to receive specialized entomology training in Canada at both the graduate and undergraduate level, but what opportunities are available for students who have completed their training? Many students are optimistic about finding employment in their chosen field (52%), but the remainder are uncertain or even pessimistic. Over half of student respondents (55%) are uncertain whether there is sufficient demand for entomologists to provide employment for new graduates.

Portrait of entomologists in Canada

The results of our survey reveal the demography of Canadian entomologists working in the public and academic sectors. Most professional respondents have an average age of 50, are male (78%) and have obtained a PhD or have post-doctoral training. They are largely employed by universities (44%) or the federal government (39%) and mainly apply their expertise in the sub-fields of ecology, systematics, applied biological pest control, forest entomology, and plant-insect interactions (in that order). Our student respondents were predominantly female (57%) and were pursuing a master's-level degree. Their average age was 28. Most entomologists are found in Ontario (35%), followed by Alberta (17%) and Quebec (15%).

Seventeen percent of our respondents are planning to retire by 2015, and 65% by 2030. It appears there will likely be a peak in retirements of entomology workers between 2020 and 2025 as this is when 40% of our respondents are planning to retire.

Career prospects

In April, 2010, we searched on-line for entomology employment opportunities in Canada, using the following key words: “insect”, “arthropod”, “spider”, “entomology”, “acarology”, “arachnology”, and/or “pest”. We searched the Entomological Society of Canada and regional entomological societies' websites, and three other job search websites: www.jobs.gc.ca, www.careerbeacon.com, and www.workopolis.com. We also included 2-year-old archived employment offers from McGill University's Career Planning Service. We only took into account offers that included entomology as a significant proportion of the work, according to our definition of an entomologist. A total of 30 offers of employment were found in Canada between 2008 and 2010 (Table 2). Forty percent of all positions were located in Quebec and 30% in Ontario; the remainder were distributed among six provinces. Most of the positions were temporary. This situation is not new as 17% of our professional respondents were temporarily employed for 5 years or more prior to their current employment.

Fifty percent of the offers required a PhD. Seventy percent of the positions were in the public and academic sectors, while 30% were from the private sector. With only 30 offers over 2 years, employment opportunities in entomology appear to be rare. This may be a concern for current students wishing to find employment in their field of study. Over 55% of the professionals who responded to our survey indicated that no entomology positions have been offered recently at their place of employment. Moreover, the majority of professionals think that the rate of replacement of vacated entomology positions is too slow, both nationwide and at their place of work. Low rates of replacement and few employment opportunities clearly do not coincide with the availability of trained workers, given the number of entomology students.

Table 2. Summary of entomology-related employment opportunities offered in Canada from 2008-2010, based on an internet search.

Job category	# of positions	Job duration	Requirement level of education	Province(s)
Public programs	4	2-3 months	BSc	QC
Curation	1	permanent	MSc or PhD	ON
Database management	2	3-24 months	BSc or MSc	QC
Postdoctoral fellow	4	24-36 months	PhD	AB, ON, QC, SK
Research and Development	2	(not available)	Bsc, MSc or PhD	ON, SK
Research scientist	8	18 months to permanent	Bsc, MSc or PhD	NB, ON, QC
Technical assistant	4	3 months	BSc	BC, ON, QC
University	4	permanent	PhD	BC, MN, NS, ON.

The job postings uncovered in the internet search were primarily entomology-focused. Many professionals commented that it is important to teach students about careers outside academia and how to market their skills in broader areas of application (e.g., biology, ecology, genetics) as opposed to only “entomology”. In addition, respondents’ replies revealed the importance of developing non-research skills, including administrative, supervisory and teaching roles. Yet even if one focuses on entomology-specific employment, it is encouraging to see that as many as 60% of the academic respondents indicated that at least half of their past students currently have jobs in entomology.

While entomology job opportunities might be few, finding employment may simply be a matter of broadening the search parameters. Our search was not exhaustive; parameters were narrow and the private sector was not targeted. In addition, in the year and a half prior to our project’s data collection, the country had been experiencing an economic crisis (Annis 2009). It is reassuring to know that despite financial difficulties, there are still job opportunities in the field of entomology.

Funding for entomological research

Only 8% of respondents think that there is adequate funding for entomological research nationally. Seventy-six percent are of the opinion that funding is inadequate and the remaining 16% are uncertain. However, when polled about funding levels at their own workplace, 60% indicate that it is sufficient to high. It appears, therefore, that there is an overarching concern among entomologists about national availability of funds, but, for our respondents, the funding situation may not be as dire as feared. These general trends were consistent among sectors.

Funding levels for research can be measured in part by grants administered to academic researchers via federal agencies. The Natural Sciences and Engineering Research Council (NSERC) Individual Discovery Grants (DGs) Program supports ongoing programs of academic research

Table 3. Summary of information on federal Discovery Grants awarded for the competition years between 1995-1999 and 2005-2009, generated from on-line search of NSERC Awards Search Engine.

Subject Area	# Projects Funded		Total Funds Awarded (\$1,000,000)		Average Funding/Project (\$1000)	
	1995-1999	2005-2009	1995-1999	2005-2009	1995-1999	2005-2009
All	9634	11637	254.8	349.9	26.5	30.1
“Evolution and Ecology” sub-category only	492	675	13.4	19.6	27.2	29.0
Entomology	65	188	1.9	5.9	30.4	31.6
“Evolution and Ecology” sub-category only	32	68	0.79	1.9	24.7	27.2

and represents the largest pool of federal funding available to researchers (NSERC 2008). In order to ascertain recent funding levels for entomological research, we searched the on-line NSERC Awards Search Engine (NSERC 2010) (Table 3). A list of all DGs awarded in the past 5 competition years (2005-2009) was generated. We then compiled a list of all DGs whose title and/or summary contained one or more of the following search terms: “insect”, “arthropod”, “spider”, “entomology”, “acarology”, “arachnology”, and/or “pest”. Of those, subsets awarded in the research subject Evolution and Ecology were extracted from the main searches. In order to assess how funding levels have changed over time, we conducted the same searches for the oldest available on-line data (1995-1999).

A perfunctory scan of the search results showed that not all projects included in the lists were relevant to the intended search (e.g., the entomology search terms also yielded some engineering and robotics projects). We did not screen the list of projects for relevance after it was generated; therefore, the number of projects classified as entomology-based, given our search parameters, is almost certainly an overestimate. The projects most pertinent to actual entomological work generally fall under the Evolution and Ecology research area.

Of all DGs awarded from 1995-1999, less than 1% were for entomology projects. From 2005 to 2009 the proportion of entomology DGs awarded increased to just under 2%. In this 15-year period, there was nearly a three-fold increase in the number of DGs awarded to entomology research. While entomology funding per-project is higher than average when searching in all research areas, these data are unreliable due to the number of irrelevant results (e.g., robotics projects). In the Evolution and Ecology subset, per-project funding awarded was less than the average research project, although the total number of funded entomology projects has more than doubled in the last 15 years.

Based on these data, funding in the field of entomology appears to be close to the overall average. As well, since most respondents thought funding is sufficient in their workplace, the financial situation in the field of entomology may not be as critical as some may think.

Conclusions

The number of entomology courses offered in Canada has approximately doubled since 1963. Canadian universities and colleges are now offering courses in entomology where none existed nearly 45 years ago. However, given that even currently employed entomologists are performing

tasks that are not strictly entomological, it would be wise for students in entomology to broaden their search parameters when looking for employment. Despite few strictly entomological employment opportunities, academics report that a good proportion of students are finding jobs in entomology after graduating. Finding permanent employment in entomology may require patience; if the employment histories of current entomologists are any indication, more than 80% of new entomologists will find permanent employment in under 5 years. Because of the age structure of current entomologists and their retirement plans, there will likely be many job openings between 2020 and 2025. Although some view circumstances surrounding current entomology employment as not ideal (e.g., lower-than-average project funding), our evidence does not indicate that the field of entomology in Canada is undergoing a full-blown crisis.

Acknowledgements

The authors wish to thank the many professionals and students who volunteered to participate in our survey, and who provided insightful comments. This project was reviewed and approved in accordance with the requirements of the McGill University Policy on the Ethical Conduct of Research Involving Human Subjects and with the Tri-Council Policy Statement: Ethical Conduct For Research Involving Humans, certificate # 935-0310.

References

- Annis, R. 2009. Economic crisis slams Canada [online]. Available from <http://www.global-research.ca/index.php?context=va&aid=12945> [accessed 26 April 2010].
- Beckel, W.E. 1964. Entomology in the university curriculum in Canada. *The Canadian Entomologist* **96**: 250-258.
- Brues, C.T. 1947. *Insects and human welfare; an account of the more important relations of insects to the health of man, to agriculture, and to forestry*. Harvard University Press, Cambridge, Mass.
- Byrd, J.S., and Castner, J.L., eds. 2001. *Forensic Entomology: the Utility of Arthropods in Legal Investigations*. CRC Press, Boca Raton.
- Biological Survey of Canada. 2010. Biological Survey of Canada [online]. Available from <http://www.biology.ualberta.ca/bsc/bschome.htm> [accessed 21 April 2010].
- Cusson, M., and Therrien, P. 1989. Étude de la situation de l'emploi en entomologie en Québec. Report produced for La Société d'entomologie du Québec.
- Dimarq, J.L., and Hunneyball, I. 2003. Pharma-entomology: when bugs become drugs. *Drug Discovery Today* **8**: 107-110.
- Harrel, E. 2008. Mystery insect found in London [online]. Available from <http://www.time.com/time/health/article/0,8599,1822936,00.html>. [accessed 21 April 2010].
- Holland, N. 2009. The economic value of honeybees [online]. Available from <http://news.bbc.co.uk/2/hi/business/8015136.stm> [accessed 21 April 2010].
- Kluge, J.A., Rabotyagova, O., Leisk, G.G., and Kaplan, D.L. 2008. Spider silks and their applications. *Trends in Biotechnology* **26**: 244-251.
- Kurz, W.A., Dymond, C.C., Stinson, G., Rampley, G. J., Neilson, E.T., Carroll, A.L., Ebata, T., and Safranyik, L. 2008. Mountain pine beetle and forest carbon feedback to climate change. *Nature* **452**: 987-990.
- Madder, D.J., Kinoshita, G.B., MacDonald, R.S., and Smith, S.M. 1984. Human resources in entomology in Canada: current status (1983) and future projections. Supplement to the *Bulletin of the Entomological Society of Canada* **16(2)**: 12 pp.
- Murphy, G. 2007. Biocontrol now more mainstream [online]. Available from <http://www.greenhousecanada.com/content/view/1067/> [accessed 10 April 2010].
- NSERC (Natural Sciences and Engineering Research Council). 2008. Facts and Figures

- 2008-2009 [online]. Available from http://www.nserc-crsng.gc.ca/_doc/FactsFigures-TableauxDetailles/2007-2008Figures_e.pdf [accessed 10 April 2010].
- NSERC (Natural Sciences and Engineering Research Council). 2010. NSERC Awards Search Engine [online]. Available from <http://www.outil.ost.uqam.ca/CRSNG/Outil.aspx?Langue=Anglais> [accessed 1 March 2010].
- Skevington, J.H. 2010. Canadian National Collection of Insects, Arachnids and Nematodes [online]. Available from <http://www.canacoll.org/> [accessed 22 April 2010].
- Thielman, A. (Ed.) 2010. Directory of Entomological Education in Canada. Edition 6. November 2010. <http://www.esc-sec.ca/directed.html>
- Yemshanov, D., McKenny, D.W., de Groot, P., Haugen, D., Sidders, D., and Joss, B. 2009. A bioeconomic approach to assess the impact of an alien invasive insect on timber supply and harvesting: a case study with *Sirex noctilio* in eastern Canada. Canadian Journal of Forest Research **39**: 154-168.



**ATELIER JEAN
PAQUET INC.**

MATÉRIEL ENTOMOLOGIQUE
ENTOMOLOGICAL SUPPLIES

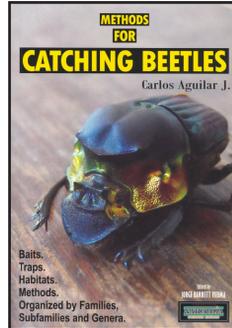
Courriel: jeanpaquet@webnet.qc.ca

www.atelierjeanpaquet.com

(paid advertisement/ publicité payée)

Methods for catching beetles. Aguilar Julio, C. 2010. Naturalia Scientific Collection, Montevideo, Uruguay. 303 pp. ISBN 978-9974-98-133-1. US\$76 plus shipping. Available from www.naturalia-editions.com. 14.8 x 21 cm. Softcover.

Before seeing a copy of this book I had received several unsolicited email messages from the publisher highlighting the great contents of this new publication. From what I could see from the ads, the cover looked professional and the contents offered lots of potential. I thought I could definitely learn a lot about new ways to sample my beloved beetles from a book like this. When I was asked to provide a review of the book for the Bulletin, I enthusiastically jumped at the occasion to get my hands on a copy, but unfortunately my enthusiasm quickly dissipated...



First, I should mention that the author describes himself as a “volunteer officer” at the National Museum of Natural History of Paraguay. While his biological/entomological experience in South America may be extensive, his qualifications as an authoritative author of scientific works are obviously lacking. Early in the book (Prologue, page 10), the author recounts the famous story about when J.B.S. Haldane was asked by a distinguished theologian about what he could infer about the nature of the Creator from the study of His creation, he had replied “An inordinate fondness for beetles”. After reading through the first few pages of *Methods for catching beetles*, I regrettably had the impression that the author had “An inordinate fondness for inconsistencies and spelling mistakes”. Although some of the shortcomings in this book can undoubtedly be attributed to the fact that English is not the author’s first language, such mistakes should have been pointed out and corrected by the editor of the book Jorge Barrett Viedma.

The main contents of the book are organized as follows: Chapter 1: Collection plan, Chapter 2: Environments, Chapter 3: Sampling methods and traps, Chapter 4: Where do they live... and Chapter 5: Killing, temporary storage, preservation, labelling, formulas, rearing. Chapter 1 is brief (pages 17-20) and contains tips about how to plan a collecting trip. It includes information such as making sure that road and topographic maps are consulted prior to the expedition and that the day is divided in sections that would maximize the chances of capturing the taxon of interest. It also includes a list of meteorological websites, some of which are more useful than others. Chapter 2 (pages 21 to 88) includes a description of the world’s major “environments” (e.g., deserts, forests, caves) and a discussion of how to find beetles in specific microhabitats (e.g., salt lakes, tree holes, flowers) within each environment.

Chapter 3 (pages 89 to 150) includes a description of the main methods (both active and passive) used for collecting and rearing beetles. The headings used range broadly from “Night collection” to “Traps with fruit” and everything in between. From what I can see, the trapping methods are adequately described and some people will find bits of useful information. A small number of sections within Chapter 3 were provided by contributors and seem to have been included as submitted (e.g., the section “Beetles associated with vertebrates” by Stewart Peck on pages 127-128).

Chapter 4 (pages 151 to 248) includes data on the distribution and biology of the major groups of Coleoptera with tips on how to look for particular taxa (families, subfamilies, genera) based on knowledge of their biology. The chapter starts with a section called “Taxonomic list of the beetles (sic) families” on pages 151 to 153. Without explanations, the author also includes

Chapter 5 (pages 249 to 303) includes information on the collection, preservation, and rearing of beetles. It also includes a list of meteorological websites, some of which are more useful than others. Chapter 5 (pages 249 to 303) includes information on the collection, preservation, and rearing of beetles. It also includes a list of meteorological websites, some of which are more useful than others.

Chapter 5 (pages 249 to 303) includes information on the collection, preservation, and rearing of beetles. It also includes a list of meteorological websites, some of which are more useful than others.

subfamilies and genera in this list, as well as alternative spellings of some family names. One example is the listing of both “Lymexylidae” and “Limexilonidae” under the “Superfamily Lymexyloniodea”. In this case the correct spelling of the only family in this group is Lymexylidae and the correct spelling of the superfamily name is Lymexyloidea, not Lymexyloniodea. The treatment of some sections in this chapter was provided by experts (e.g., Michael Ulyshen for the family Silphidae).

Chapter 5 (pages 249 to 259) provides information about the materials needed to kill, preserve and label specimens. It also contains information about what a basic “collection kit” should include such as aspirators and tweezers. Three more small sections make up the rest of the contents of the book: a “Glossary” (pages 260 to 263), a list of “Useful books for study” (page 264), and lastly the “References” (pages 264 to 303). There is no Index in the book, which is another failing. The last section of the book is peppered with distracting formatting and other inconsistencies such as references in the wrong order, spellings of authors’ names that differ from those given in citations in the text, authors’ first names sometimes given in full, sometimes abbreviated, accents missing for some authors’ names, and some references ordered using the first name of the first author instead of their surname.

The quality of the more than 150 photographs and illustrations (most of which are in black and white except for the 16 color plates in the centre of the book) is variable. Although the pictures of the various habitats discussed are often of good quality, others are of very poor quality and should not have been included in this era of high quality digital photography. The trapping methods are often illustrated with line drawings, some of which were drawn by the author while others were pulled directly from the BioQuip website. The pixelation in the line drawings is sometimes so coarse that it is impossible to read the descriptive labels pointing to various parts of the traps.

Pages 6 to 9 include sections such as Contributors (photographs and affiliations of 10 coleopterists who have obviously provided some of the data for the book), Reviewers (a list of 29 coleopterists with their affiliations), Translators (a list of 7 people all unknown to me) and Picture Contributors (a list of 16 individuals or websites). Judging from the large number of people involved in the project, some of which are well known and respected coleopterists, it is difficult to figure out how such a low quality end product was published, or is it...? Perhaps the downfall of the project was that the book’s author (and/or the editor) did not feel adequately qualified to make any changes to the data received from those well known coleopterists and decided instead to copy and paste their offerings without making the changes necessary to ensure consistent formatting for all parts of the publication. Needless to say, this book turned out to be a huge disappointment for me. It certainly contains valuable information but is probably not worth the US\$76 plus shipping needed to acquire a copy.

Patrice Bouchard

Canadian National Collection of Insects, Arachnids and Nematodes

Agriculture and Agri-Food Canada

Ottawa

Checklist of the Beetles of Maine, USA. Majka, C.G., Chandler, D.S., and Donahue, C.P. 2011. Empty Mirrors Press, Halifax, Nova Scotia. 328pp. ISBN 978-0-9695104-4-4. Can\$50.00. Softcover.

This ambitious project lists, with documentation, more than 2,800 species of Coleoptera from Maine. It builds on the list of about 1200 species by Dearborn and Donahue (1993) and the list of families of Bourque et al. (2005) that included an estimate of 2,180 species. The increase in number of species through the past 20 years gives an indication of the effort invested in this project.

For northeastern North America there is a solid foundation of taxonomy and basic biology for beetles (e.g., Downie and Arnett 1996, Arnett and Thomas 2000, Arnett et al. 2002). This book on Maine beetles builds on these basics to fine tune our understanding of geographic distributions. The focus is on Maine, but it also includes state and province lists for northern New England and adjacent Canada. Cogent arguments have been made that checklists such as this are essential for progress in systematics, ecology, conservation, and forest management (e.g., Sikes 2003, 2004, Sikes and Webster 2005). A baseline such as this checklist can be used to document changes in the fauna that may be due to changes in forestry and agriculture, or the arrival and spread of adventive species. Checklists should also reduce clutter by expunging erroneous records because of either changing taxonomy or misidentifications (Sikes 2003).

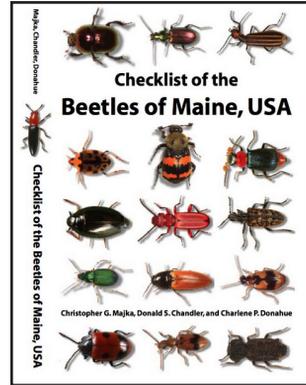
Three introductory chapters precede the checklist of beetles. The three introductory chapters highlight the pluses of this work. The first focuses on the history of beetle exploration in Maine, from the work of Randall, a Harvard student in the 1830s, through 40 years of publications documenting beetles in Maine by Frost, to current workers.

The second chapter reviews earlier compilations of the beetles of Maine and considers how complete the current work is. The fauna of Maine is compared with that in nearby states and provinces. Based on relative proportions of various families, geographic area and latitude, it is estimated that more than 20% of the beetles, about 600 species, that occur in Maine are still undocumented. That is sobering, considering this list is more than twice the length of one produced less than 20 years ago and that this effort provides data to support 417 additions to the state list.

The third introductory chapter is extremely valuable. The main collections examined are listed. All except a handful of new records are from the University of New Hampshire (UNHC is the acronym used elsewhere in the book, although both DENH and UNHC are used in this chapter), Maine Forest Service, and the collection of David Bourque and Dana Michaud. The breadth of the literature review is also explained.

The bulk of the book is a list of 2,871 species in 96 families of beetles. Each family section includes notes on systematic authority (largely Arnett and Thomas 2000, Arnett et al. 2002), basic ecology, prevalence of non-native species, major sources of information and a photograph. This is followed by a list of all species including the source for including each species. New records for Maine (n=417) include label data. Fifty eight species are removed from the state list and for each the rationale is explained.

This is an important addition to our understanding of beetle distribution in northeastern North America. It complements the excellent checklist and updates from Rhode Island (Sikes 2004, Sikes and Webster 2005). The value of checklists and other compilations is enhanced by completeness and minimal errors. For example, although Downie and Arnett (1996) is valuable



as a compilation of taxonomic resources for northeastern beetles, the state level distributions included are rarely used because of numerous errors. After my initial perusal of this checklist revealed several minor errors, I systematically read three pages to gauge the prevalence of errors. On these three pages (59, 159 and 259), I found eight errors ranging from incorrectly spelled genera (*Ascoidea* spp. instead of *Ascoides* spp., *Desmogaster* instead of *Desmatogaster*) to missing letters to misplaced parentheses. Most would not cause a serious problem, but they were annoying. Assuming 2 minor errors per page across 328 pages, it seems there are too many.

For one family, Cerambycidae, I checked the occurrence of the 163 species in neighbouring jurisdictions. First I noticed very few records from Rhode Island, despite an expectation there would be more than 90% overlap and knowing there was an excellent recent checklist (Sikes 2004). In fact only four species were listed for Rhode Island, despite more than a dozen being listed by Sikes and Webster (2005) as additions to the checklist. For Nova Scotia, New Brunswick and Prince Edward Island, there were several omissions. Curiously, some newly recorded species were included (e.g., *Leptura oblitterata deleta* from New Brunswick, *Microgoes oculus* from New Brunswick and Nova Scotia) while others were not (e.g., *Acmaeops discoideus* from Nova Scotia and *Anthophylax attenuatus* from Prince Edward Island) (see Webster et al. 2009). My recommendation is to use cautiously the distributional information from other states and provinces.

The *Checklist of the Beetles of Maine* is a valuable resource for beetle faunistics in northeastern North America. Along with Sikes (2004), it should be a model. However, future checklists should strive for many fewer typographical errors and omissions to improve the reliability and usefulness of the list.

References

- Arnett, R.H., Jr., and Thomas, M.C. (eds.). 2000. American Beetles. Volume 1. Archostemata, Myxophaga, Adephaga, Polyphaga: Staphyliniformia. CRC Press, Boca Raton. xvi + 443 pp.
- Arnett, R.H., Jr., Thomas, M.C., Skelley, P.E., and Frank, J.H. (eds.). 2002. American Beetles. Volume 2. Polyphaga: Scarabaeoidea through Curculionioidea. CRC Press, Boca Raton. xiv + 861 pp.
- Dearborn, R.G., and Donahue, C.P. 1993. An annotated list of insects collected and recorded by the Maine Forest Service: Order Coleoptera, Beetles. Maine Forest Service, Technical Report 32. Augusta, Maine. 101 pp.
- Downie, N.M., and Arnett, R.H., Jr. 1996. The Beetles of Northeastern North America. Volumes I & II. The Sandhill Crane Press, Gainesville. 1721 pp.
- Sikes, D.S. 2003. The beetle fauna of the state of Rhode Island, USA (Coleoptera): 657 new state records. *Zootaxa* **340**: 1–38.
- Sikes, D.S. 2004. The Beetle Fauna of Rhode Island: An Annotated Checklist. The Biota of Rhode Island, Volume 3. Rhode Island Natural History Survey, Kingston, Rhode Island. vi + 296 pp.
- Sikes, D.S., and Webster, R.P. 2005. Bioinventory of Rhode Island Coleoptera: 45 new records. *Coleopterists Bulletin* **59**: 311-327.
- Webster, R.P., McCorquodale, D.B., and Majka, C.G. 2009. New records of Cerambycidae (Coleoptera) for New Brunswick, Nova Scotia and Prince Edward Island, Canada. *ZooKeys* **22**: 285-308.

David B. McCorquodale
Cape Breton University
Sydney, Nova Scotia

A Revision of the Genus Aulacigaster Macquart (Diptera: Aulacigastridae). Rung, A., and Mathis, W.N. 2011. Smithsonian Contributions to Zoology, Number 633. x + 132 pages, 220 figures, and 18 maps. Smithsonian Institution Scholarly Press, Washington. ISSN: 0081-0282 (print), 1943-6696 (online).

This book review will depart from most others of its kind by discussing two “unusual” topics close to my heart: flies and taxonomy. Taxonomy is fascinating because it is the field of science that allows us to explore life, examine its component parts (i.e., species) and discuss how they are interrelated by hypothesizing on evolutionary relationships (the “phylogeny”) and the appropriate boundaries for higher groupings such as genera and families. When these species and evolutionary hypotheses are presented to the World, it sets the stage for all subsequent organismal and ecological studies, which now have the biological units with which to work.

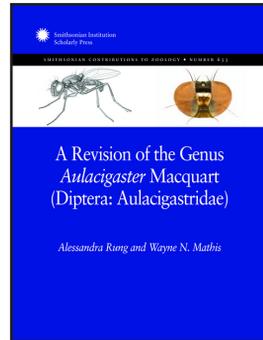
Flies are equally as fascinating to me because I am interested by the vast spectrum of life, and this insect order may be the most diverse and speciose form of life on the planet (we’re still waiting to find out who the “winner” of this diversity competition will be, but it’s clear which group I’d put my money on, and it isn’t beetles!). That, and flies are pretty cool.

Flies also present a particularly complex challenge to those interested in reconstructing the past, as the order has experienced several intense periods of radiation where dozens of families seem to have appeared all at once, giving them little time to develop characters (morphological and molecular) useful for reconstructing evolutionary relationships.

The Schizophora is one of these mega-diverse groups, containing over 80 families (nearly half of all in Diptera!) that appeared at the beginning of the Tertiary for which we have been able to find relatively few reliable sister-group relationships. Our family of interest here, the Aulacigastridae (and its putative sister-family Perisclididae), belongs to this nebulous group, which is why over the last ten years I have been reading the works of Alessandra Rung and Wayne Mathis, who are specialists in the family. This is a duo that, along with several others, have gradually and painstakingly been bringing order to this particular region of chaos, redefining family and generic limits, examining fossils and biogeography, and describing new genera and species.

The most recent contribution from Rung and Mathis is a complete revision of the genus *Aulacigaster*, possibly left to this point in time due to the effort needed to properly treat it. The genus remained monotypic (i.e., contained a single species) for over a century, concealing its true size, which we now know to total at least 55 species, 41 of which are newly described from the Afrotropical (2 spp.), Neotropical (37 spp.) and Oriental Regions (2 spp.). In this detailed monograph, each of these beautiful species is figured, mapped, keyed, described and contrasted to others in the genus, allowing for most with an entomology background to identify any species they may find anyplace in the World. Biology is also described for some species for which details are known, including those whose larvae develop in the accumulated water in the base of bromeliad leaves.

To begin with, one of my favourite aspects of this book is its striking overall appearance. As a result of the “facelift” the Smithsonian Institution Scholarly Press underwent in 2007, this



work has a stylish cover and layout, and includes large glossy pages that show off its numerous figures - there are 220 large, digitally-produced illustrations and photographs of the body, head, wing and genitalia, as well as some other structures useful for diagnosis, including some unusual male femoral “protrusions” and reflective head stripes. These figures leave little to the imagination, and make identification and diagnosis as simple as possible. There are also a number of useful colour plates towards the back of the book, which are unfortunately somewhat small and surrounded by under-utilized white space.

Secondly, aside from the ample figures, my favourite aspect of the book is its discussion of biogeography and evolutionary history, which can only truly be done effectively in the context of a full generic revision. This provides much more depth and information for the reader than a “typical” treatment would provide, and allows us to understand the genus better as a dynamic group of living organisms that has branched and evolved over time. It also allows us to more easily follow the revision itself, as descriptions are ordered according to species group and biogeographical region, making identification and species comparison more efficient. My only concern is that this section of the revision does not go far enough – while the monophyly and relationships of the species groups are well established through the use of representatives from each group, the authors stop short of a full phylogenetic analysis including all species and numerous outgroups. In a work this comprehensive, I would like to see how these species are related to each other and if common patterns of speciation occur across groups, particularly those six found exclusively in the Neotropics. The *Aulacigaster leucopeza* species group also provides an interesting opportunity for biogeographic analysis, as it is the only group that has extended outside of the Neotropics, occurring in all realms except for the Australasian Region.

Lastly, there is an informative history of the genus in the literature and a timeline of the changing boundaries of the Aulacigastridae, illustrating how our concepts similarly “evolve” over time due to the inclusion of new specimens, species and data sets, and how these challenge our ever-adapting taxonomic hypotheses.

At 132 pages, this is a truly thorough treatment of the genus, setting the stage for future studies in the Aulacigastridae and Schizophora, and setting the bar for standards in taxonomy. In light of these advances, I feel slightly more confident in the looming shadow of the so-called “taxonomic impediment”, which recedes in the light of even a couple of dedicated taxonomists. They show us that we can indeed succeed at understanding and documenting our planet’s diversity, armed only with a microscope and the opportunity to use it.

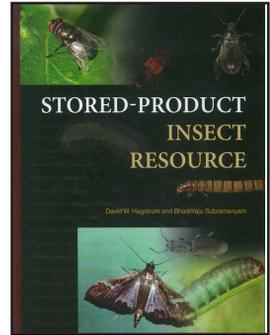
Owen Lonsdale
Agriculture and Agri-Food Canada
Ottawa

Stored-Product Insect Resource. Hagstrum D.W., and Subramanyam, B. 2009. AACC International Inc., St. Paul, Minnesota. 509 pp. ISBN 978-1-891127-66-3 (hard cover) US\$195. (Available from AACC International, <https://interactive.aaccnet.org/>)

There are two types of knowledge: one is knowing a fact and other is knowing where to find the fact. This book now allows you to know where to find the fact for stored-product entomology. If you work in stored-product entomology as a researcher or as a technical expert, you need this book. This is the first time such extensive information has been available in one publication. The book gives detailed information on over 1600 insects, 39 of their natural enemies, found in over 240 commodities, linked to over 2200 publications. However, no information on the many stored-product mites has been included, but perhaps will appear in a second edition.

The authors, Hagstrum and Subramanyam, are well known in the field of stored-product entomology. They have edited two books on stored products (Subramanyam and Hagstrum 1996, 2000), and they have written a text book (Hagstrum and Subramanyam 2006) for which this book is meant to serve as a companion document.

The book is divided into 11 chapters. The first chapter, Species List, is the longest and most important chapter, listing the 1663 insect species found in stored products and, for each, giving information on: ranking of seriousness of damage (damage potential), common name, list of identification keys, list of publications with photos or drawings, geographical distribution, commodities and facilities infested, natural enemies, and finally a list of publications on biology. Chapters 2 to 6 contain the same information as found in Chapter 1, but ordered in different ways. Chapter 2 is an alphabetical listing by family giving all the species. Chapter 3 provides a list of the keys, which insects they cover, and the stages that can be used in the key. This is particularly useful if you receive a sample to identify but it only contains larvae or eggs. Chapter 4 is an alphabetical listing of commodities and insects that are associated with each commodity. Chapter 5 lists the insects by damage potential. The authors use a new ranking for damage potential based on the number and diversity of scientific publications for a given species and previous ratings of damage potential. This new definition of damage potential allows for the inclusion of an additional 176 species, many of them predators and parasites of stored product insects. However, I believe it would have been better to use the previous damage ratings and not include predators and parasites. I found the new ranking rates somewhat arbitrary. Insects that can convert whole seed to powder (e.g., *Sitophilus oryzae* and *Rhyzopertha dominica*), are rated with the highest damage potential of five along with insects that are incapable of damaging whole seed (e.g., *Cryptolestes pusillus* and *Tribolium castaneum*). Yet very similar species such as *Cryptolestes ferrugineus* are given a new damage rating of four. Chapter 6 is an alphabetical list of insects by their common name. A welcome addition to this chapter would have been the common names in other languages such as Arabic, French, Hindu, Italian, Mandarin, Portuguese and Spanish. Chapter 7 is an alphabetical list of commodities listed by their scientific name and common name as the literature often only gives the common name of the commodity. Chapter 8 is list of the over 2200 references with annotations on the species and topics covered in the paper. Chapter 9 gives instructions on how to prepare insects for storage and identification. A few images in this chapter would have helped guide newcomers to entomology on the methods of pinning, and tools of the trade. Chapter 10 is list of books and book chapters. This is use-



ful to be separated from the massive list of papers from the primary literature. However, the authors have missed a few key books in this list, for example, Sinha and Watters (1985), Hill (2002) and Cotton (1963). The final chapter, Chapter 11, is an alphabetical listing by species giving the corresponding genus, which is particularly useful as the insects in Chapter 1 are listed alphabetically by genus.

In summary, this is a must-have reference for any person working in the area of stored product entomology. My one regret is that this is not available as an electronic database. With a database, you could type in a genus, species, commodity or author, and could then obtain the information listed in Chapter 1 with links to the other information. Perhaps the second edition will be electronic.

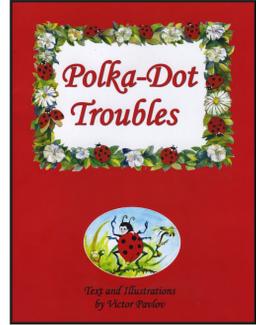
References

- Cotton, R.T. 1963. *Pests of Stored Grain and Grain Products*. Burgess Publishing Company, Minneapolis.
- Hagstrum, D.W., and Subramanyam, B. 2006. *Fundamentals of Stored-Product Entomology*. ACCC International, St. Paul.
- Hill, D.S. 2002. *Pests of Stored Foodstuffs and Their Control*. Kluwer Academic Publishers, Boston.
- Sinha, R.N., and Watters, F.L. 1985. *Insect Pests of Flour Mills, Grain Elevators, and Feed Mills and Their Control*. Research Branch, Agriculture Canada Publication 1776, Ottawa.
- Subramanyam, B., and Hagstrum, D.W. (Eds.). 1996. *Integrated Management of Insects in Stored Products*. Marcel Decker Inc., New York.
- Subramanyam, B., and Hagstrum, D.W. (Eds.). 2000. *Alternatives to Pesticides in Stored-product IPM*. Kluwer Academic Publishers, Boston.

Paul Fields
Agriculture and Agri-Food Canada
Cereal Research Centre
Winnipeg



Polka-Dot Troubles. Pavlov, V. 2011. Baico Publishing Inc., Ottawa. 15 pp. (www.baico.ca) ISBN 978-1-926945-17-0. Can\$14.95. Softback.



Polka-Dot Troubles is a children’s bedtime story book with an insect theme. Victor Pavlov is both author and illustrator, and the illustrations are the best part by far. Pavlov begins by explaining that the story was translated from long-lost notes in Bulgarian, which helps, since the text *feels* translated, and is written in a peculiar sort of semi-rhyming prose that my own 9-year-old said was “for little kids but with too many words for little kids, so the parents have to read it to them.” Like many children’s stories about animals, it is not really about animals at all, since the animals are hominoid, speak English, and in this instance all look like children wearing insect costumes with curly-toed elf shoes.

And what is the story? Well, a ladybird loses her spots in the rain, and turns to her insect friends for help. None of these can “draw” the spots for her, and so she is sad. She then asks who made Mrs Butterfly’s lovely “dress” and is told “Mother Nature.” With this realization in place, and as if in response, the ladybird’s spots reappear, and everyone joins in celebratory song. The ladybird exclaims “Mother Nature showed the world that I have grown... I feel as happy as a bride.” Then Mr Spider appears with a “green-aphids’ cake”, “the same as [the ladybird’s] mother used to bake.” Someone, presumably Mr Spider, then says “I am glad the gift wasn’t a toy. Since Mother Nature has granted your wish, the link to your youth is your Mother’s dish.” The punch line, then, is a broad sweeping endorsement of coming of age, the social order, and by extension, the order of nature and the authority of the Creator, in the metaphorical form of Mother Nature. I personally found it somewhere between surreal and anachronistic.

The last 3 pages of this 15-page book are presumably the reason it was submitted to the ESC for review. Page 11 gives amazing facts about ladybugs and Page 12 is devoted to ladybug anatomy. Both these treatments are accompanied by simplistic illustrations, nowhere near as well executed as the paintings in the rest of the book, and they are peppered with inaccuracies. Page 13 features a few selected species of ladybugs and was modified from Steve Marshall’s University of Guelph website, albeit in a somewhat distorted fashion. Thus, the educational component of the book is clearly an afterthought, tangentially related to the story itself. It could have been vastly better if the author had asked Dr. Marshall to vet the text, and taken the time to bring the illustrations up to the standard in the rest of the book.

In summary, this is a children’s fable with a natural history appendix, and although it has its charms, it would not be my first choice if I wanted my children to know more about the insect world. I suppose any awareness of insects is to be praised, but as a parent, aware of the cost of children’s books, and the rate at which they accumulate, I am acutely aware that there is a need to pick and choose, and that there are much better books about ladybugs already on the market.

John H. Acorn
University of Alberta
Edmonton

Books available for review

The ESC frequently receives unsolicited books for review. A list of these books is available online (<http://www.esc-sec.ca/bulletinbooks.html>) and is updated as new books are received.

If you wish to review one of these books, please send an email to the Chair of the Publications Committee (Kevin Floate, Kevin.Floate@agr.gc.ca). You should briefly indicate your qualifications to review the topic of the book, and be able to complete your review within 8 weeks.

Preference will be given to ESC members.

Guidelines

Book reviews should be approximately 800-1200 words in length. They should clearly identify the topic of the book and how well the book meets its stated objective. Weaknesses and strengths of the book should be described.

Formatting of the review should follow that of reviews in recent issues of the Bulletin. A scan of the book cover (jpeg or tiff format, about 500 kb) should be submitted with the review.

Livres disponibles pour critique

La SEC reçoit fréquemment des livres non demandés pour des critiques. Une liste de ces livres est disponible en ligne (<http://www.esc-sec.ca/fr/f-bulletinbooks.html>) et est mise à jour lorsque de nouveaux livres sont reçus. Si vous souhaitez critiquer un de ces livres, veuillez envoyer un message au président du comité des publications (Kevin Floate, Kevin.Floate@agr.gc.ca). Vous devez brièvement indiquer vos qualifications pour critiquer le sujet du livre, et être en mesure de terminer votre critique en 8 semaines.

La préférence est donnée aux membres de la SEC.

Lignes directrices

Les critiques de livre doivent compter entre 800 et 1200 mots. Elles doivent clairement identifier le sujet du livre et si le livre rencontre bien les objectifs énoncés. Les forces et faiblesses du livre devraient être décrites.

Le format des textes doit suivre celui des critiques des récents numéros du Bulletin. Une version numérisée de la couverture du livre (en format jpeg ou tiff, environ 500 kb) devra être soumise avec la critique.

Currently available for review/ Disponibles pour critique

- *Family-Group Names in Coleoptera (Insecta)*. 2011. Bouchard P., Bousquet, Y., Davies, A., Alonso-Zarazaga, M., Lawrence, J., Lyal, C., Newton, A., Reid, C., Schmitt, M., Slipinski, A., and Smith, A. Pensoft Publishing, 972 pp.
- *Empire of the Beetle: How Human Folly and a Tiny Bug Are Killing North America's Great Forests*. 2011. Nikiforuk, A. 2011. Greystone Books, 240 pp.
- *The Beekeeper's Handbook (4th ed.)*. 2011. Sammartaro, D., and Avitabile, A. Cornell University Press, 320 pp.
- *Insect Ecology. An Ecosystem Approach (3rd ed.)*. 2011. Schowalter, T.D. Academic Press, 633 pp.



Doug Eidt

1928-2011

a Bachelor of Science in Agriculture (BSA) at the Ontario Agricultural College in Guelph in 1950 and entered a 2-year program for the MSA degree the next autumn while also employed as a laboratory demonstrator. Doug married Betty Jean Reddon in the summer of 1951, completed his MSA (a University of Toronto degree) in 1952, and moved to Saskatoon to take a job as a Research Officer with the Federal Field Crop Insect Laboratory in Saskatoon. In 1955, Doug obtained the first PhD in Biology awarded by the University of Saskatchewan. Doug was transferred to the Canadian Forestry Service in Fredericton in 1956 where he was employed as a research scientist until his official retirement in 1989. In 1961 Doug accepted an 18-month tour of duty as a Forest Entomologist in Nigeria with the FAO, an experience he described as one of the most interesting and educational of his life.

During his career, Doug published 89 refereed scientific papers and 80 non-refereed scientific reports, most of which were concerned with the biology and management of forest insect pests. His research interests ranged from early work on taxonomy, morphology, and life history of forest insect pests, to extensive studies on the effects of insecticides on aquatic invertebrates, decomposition and nutrient cycling. A collaboration with Tony Little exploring the concept of controlling insect pests by inducing plant - insect asynchrony led to a 1968 publication in *Nature*. Doug was an Honorary Research Associate at the University of New Brunswick and served on several graduate student advisory and examination committees. Following his official retirement in 1989, Doug continued his research as a “one-third time” scientist, starting a new project developing the use of entomopathogenic nematodes for control of insects in forest nurseries and plantations. Even after Doug truly retired he maintained a passionate interest in the history of entomology, particularly in Atlantic Canada. Doug was always an active member of the Entomological Society of Canada, as well as the Acadian Entomological Society. In addition to serving on several committees (Fellowship, Achievement Awards, Science Policy, Publications, Heritage), Doug chaired the By-Laws Committee and the Common Names Committee, was Founding Editor of the *Bulletin* of the ESC from 1969-1975, Scientific Editor of *The Canadian Entomologist* and the *Memoirs* from 1978-1983, Director-at-Large from 1968-70, and President of the ESC in 1988-89. In recognition of his many years of dedicated service, Doug was made an Honorary Member of both the ESC and the Acadian Entomological Society. Doug was always moving and full of energy at work, in the field, and at home. He loved to see new country and explore less traveled ways. In addition to his passion for entomology, Doug enjoyed many other interests including gardening, stamp collecting, wood-working, singing in the church

Douglas Conrad Eidt passed away 10 July 2011 in Fredericton, New Brunswick, at the age of 83. Doug was born 2 July 1928 in Fergus, Ontario, and his family moved to Kentville, Nova Scotia, in 1930 where his father was employed as a researcher at the Dominion Experimental Farm. As a student, Doug worked after school and in summers at the Kentville Publishing Co., where he learned many aspects of the newspaper and job printing trade, skills that proved invaluable in later years. Doug graduated from Kings County Academy, Kentville, in 1945 and began his undergraduate degree at the Nova Scotia Agriculture College in Truro. He completed

choir, genealogy, and spending time at the family cottage on Oromocto Lake. He played water polo at lunch for many years and was also an avid cross country skier, clearing many kilometres of cross country ski trails annually. Doug acted as general contractor in the building his own passive solar house in 1979, before many now common items such as heat exchangers were available, and in 1980 it outperformed all others monitored by the National Research Council.

He is survived by his loving wife, Betty, five sons, twelve grandchildren, seven great grandchildren, three siblings, and several nieces and nephews. Doug felt one of his greatest achievements was balancing his professional life and love of family.

Jon Sweeney, Wayne Fairchild, and Graham Thurston,
Fredericton



B. Sand

Black witch, *Ascalapha odorata* Noctuidae, sheltering in the front porch of a Saskatoon home, July 2011.

Une papillon deuil, *Ascalapha odorata* Noctuidae, s'abritant sur le porche avant d'une maison à Saskatoon, juillet 2011.

Summary of items arising from the Executive Council Meeting, 14 June 2011

Annabelle Firlej, Secretary

Treasurer

The 2010 audit with Bouris, Wilson LLP took place on 7 March 2011 and a ballot was sent to the Governing Board to request their vote on the 2010 financial statements.

At this meeting, the Treasurer usually asks the Finance Committee to provide input on subscription rates and costs of reprints for the coming year (2012) in accordance with Standing Rules XX (3) and XII.6. However, because of the imminent shift to Cambridge University Press (CUP) and their involvement in determining future subscription rates and reprint costs, we need to change the Standing Rules. Accordingly, these changes will be made with other changes needed for *TCE* Editorial Board.

Headquarters Committee

Repair of the back porch roof of the Headquarters is an outstanding item that the Committee should deal with in Fall 2011.

Scientific Editor

Since October 2010, 62 manuscripts have been received for review. Of these, 37 were entered into review: 5 are currently under review, 20 are accepted, 3 are under revision and 9 were rejected. Publication of the *Festschrift* issues will permit *TCE* to accumulate a bank of acceptable manuscripts for publication.

The coordinator of the *Festschrift* issues (B. Sinclair) requested 100 free hard copies to offer to authors who contributed to these special *TCE* issues. The Treasurer asked CUP to provide the expected cost of a single issue of *TCE* in 2012 but did not receive a response. M. Evenden suggested that a hard copy of the issue containing the manuscript should be offered to first authors when their manuscript is published.

TCE Publisher

NRC Press re-vamped *TCE*. A 1-year contract has been signed with NRC Research Press.

CUP provided a draft contract to ESC representatives (K. Floate, P. Mason, S. Brooks and C. Buddle) who subsequently held a conference call with CUP on 15 April 2011. An agreement-in-principle was reached to sign a 7-year contract pending minor revisions of the draft contract. ESC initially expected to sign a contract with CUP in March based on information provided by CUP. Signing of the contract is now anticipated in June.

Editor - *Bulletin*

It was decided to switch printers for the June 2011 issue, using St. Joseph Printing rather than LMG, with an anticipated saving of about \$500 per issue (based on 48 pages, including cover), with no expected loss of quality. Society members who receive the hard-copy version will be solicited to determine whether any change in quality is noted.

Publications Committee

The Publications Committee has examined the need to add a disclaimer and a privacy statement to the ESC website similar to those of the ESA website (e.g., <http://www.entsoc.org/disclaimer>; <http://www.entsoc.org/membership/overview/privacy>). A document was drafted by Ward Strong from the Publications Committee with the Webmaster, R. West, and M. Cusson, Chair of the Web Content Committee. K. Floate reported that the Committee decided not to add a disclaimer and privacy statement to the ESC website, whereas M. Cusson sent the document

to the Secretary for approval by the Board. M. Cusson will contact K. Floate to decide on the fate of this document.

Nominations Committee

Candidates for new Board members were confirmed, and Rebecca Hallett has stepped down from the Nominations Committee in order to run for Second Vice-President. The Chair still needs to find a replacement for her on the Committee.

Achievement Awards Committee

The recipients of the Gold Medal (Dr M. Isman) and C. Gordon Hewitt Award (Dr K Hillier) were approved by the Board. Peter and Linda Payzant will share the Norman Criddle Award, and Dr Zoë Lindo will receive the Bert and John Carr Award. M. Evenden suggested that the Achievement Awards Committee chair send a letter each year to the Carr family to inform them about the recipient of the prize.

Heritage Committee

The Committee produced obituaries for recently deceased entomologists and also is preparing a second Appendix to the Index to Biography of Entomologists in Canadian Publications covering the period 2006-2010 to be published in September or December 2011 issue of the *Bulletin*.

Science Policy and Education Committee

The Education Programs (EP) Manager with the American Institute of Biological Sciences (AIBS) contacted the Committee on 28 March 2011 with regard to their strategic planning. The EP Manager was tasked with contacting AIBS member organizations to obtain feedback on the role of the AIBS in biology education. The ESC is the only Canadian society in their 90-member organization. The Chair will have an interview with the EP Manager within the next month about this issue.

The Committee has provided help to the Entomological Society of Alberta (ESA) and the Alberta Bird of Prey Centre to host an entomology display or event this summer for the public.

Because of restrictions on travel budgets for employees of federal departments and agencies, there is uncertainty on participation of some ESC members in the next ESC Joint Annual Meeting. The Committee will draft a letter to send out to federal government departments reminding them of the importance of federal employees to attend scientific meetings to maintain their professional contacts towards achieving their professional goals.

Student Affairs Committee

The Committee is very active in the organization of the 2011 Joint Annual Meeting of the ESC and the Acadian Entomological Society. The Board approved a change to the Standing Rules to include undergraduate students in the eligibility criteria for the student paper competition; this change should be voted on by the membership at the AGM.

Fund-raising Committee

The President is still waiting for a response from some regional societies on names of potential candidates for the Fund-Raising Committee. He will send a reminder to regional societies that have not responded.

Biological Survey of Canada

The final version of the Memorandum of Understanding was approved by the Board and signed 23 March 2011. The Secretary will correspond with David Langor because Susan Goods is no longer associated with the BSC.

Commemorative stamp for 150th anniversary of ESC/ESO

The President attempted to contact G. Umphrey to see what happened with this proposal but

received no response. The President will contact the ESO to find out if they will go further with this project.

Appointment of ESC Secretary

Alec McClay, candidate for the Secretary position, joined the conference call to present himself to the Executive Council. Since the Board approved this candidate, the current Secretary will contact Alec to ensure a smooth transition.

ENTOMOLOGICAL SOCIETY OF CANADA		
Consolidated Statement Of Financial Position		
For The Year Ended December 31, 2010	2010	2009
Assets		
Current		
Cash (note 7)	\$ 239,957	\$ 214,453
Accounts receivable	1,745	10,655
Inventory (notes 3, 7)	3,588	5,843
Prepaid expenses	2,524	3,210
	<u>247,814</u>	<u>234,161</u>
Investments (notes 5, 7)	503,337	501,095
Digital archives (note 3)	55,000	55,000
Property, plant and equipment (notes 3, 6, 7)	149,702	154,273
	<u>\$ 955,853</u>	<u>\$ 944,529</u>
Liabilities and Net Assets		
Current		
Accounts payable and accrued liabilities (note 7)	\$ 29,638	\$ 12,000
Deferred revenue	68,861	84,860
	<u>98,499</u>	<u>96,860</u>
Unrestricted Net Assets		
General Fund	<u>378,583</u>	<u>377,081</u>
Restricted Net Assets (note 7)		
Endowment Fund	74,921	75,585
Building Fund	149,702	154,273
Scholarship Fund	245,576	229,880
Book Project Fund	8,572	10,850
	<u>478,771</u>	<u>470,588</u>
	<u>\$ 955,853</u>	<u>\$ 944,529</u>

The above statement is only an excerpt. To see the full set of audited financial statements please see <http://www.esc-sec.ca/> and click on MEMBERS' AREA

61st Annual General and Governing Board Meetings

The Annual General Meeting of the Entomological Society of Canada will be held at the Westin Nova Scotian Hotel, Halifax, Nova Scotia on Tuesday, 8 November 2011, from 17:00 to 17:45. The Governing Board Meeting will be held at the same location on Saturday, 5 November 2011 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.

61^{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 Westin Nova Scotian, Halifax, Nouvelle-Écosse, le mardi 8 novembre 2011 de 17:00 à 17:45. La réunion du conseil d'administration aura lieu au même endroit le samedi 5 novembre 2011 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.

Joint Annual Meeting of the Entomological Societies of Canada and Alberta, November 2012

Call for symposia: Are you interested in developing a symposium for inclusion in the 2012 JAM? The Joint Annual Meeting of the Entomological Societies of Canada and Alberta will be held in Edmonton, 4-7 November 2012. If you are interested, please contact the Scientific Program Co-chair, Felix Sperling (felix.sperling@ualberta.ca) by 30 September 2011. Symposia related to the meeting theme of "Insects and Biodiversity" are particularly encouraged.

Réunion conjointe annuelle des Sociétés d'entomologie du Canada et d'Alberta, novembre 2012

Appel à contribution pour les symposiums : Êtes-vous intéressé à développer un symposium pour la réunion conjointe de 2012 ? La réunion conjointe annuelle des Sociétés d'entomologie du Canada et d'Alberta se tiendra à Edmonton, du 4 au 7 novembre 2012. Si vous êtes intéressé, merci de contacter le co-président du programme scientifique, Felix Sperling (felix.sperling@ualberta.ca) avant le 30 septembre 2011. Les symposiums en lien avec le thème de la réunion, « Les insectes et la biodiversité », sont particulièrement encouragés.

Important new key

A Matrix Key to Families, Subfamilies and Tribes of Lepidoptera of Canada.

Canadian Journal of Arthropod Investigation #17 (19 July 2011). Jason J. Dombroskie (University of Alberta, dombrosk@ualberta.ca)

http://www.biology.ualberta.ca/bsc/ejournal/d_17/d_17.html

Despite being ecologically, economically, and scientifically important as well as a relatively well known group of insects, the order Lepidoptera can be difficult for non-experts to identify reliably. The matrix-based key presented here provides an easy and reliable way to identify the more difficult groups of adult Lepidoptera using a standard dissecting microscope. The key allows identification to the level of subfamily or tribe for most Canadian Lepidoptera, includes 222 taxa, and uses 73 characters with 266 character states. Taxon pages covering the diversity, diagnosis, and taxonomic references of each taxon accompany the identification key.

Note: Mac users will have to wait until the XID format works on Macs, but in the near term future there should be an Android version.

Positions available

Graduate Assistantships: Systematics of North American water mites (no previous mite experience necessary)

Two NSF-funded PhD positions are available to work on a systematic revision of North American water mites in the family Torrenticolidae with Dr Ashley Dowling at the University of Arkansas in the Department of Entomology. The project starts in January 2012 and is in collaboration with Dr Andrea Radwell (University of Arkansas) and Dr Ian Smith (Canadian National Collection).

Water mites (Acari: Hydrachnidiae) are among the most numerous, diverse, ecologically important – and unknown – groups of arthropods in freshwater ecosystems; however, there are very few water mite experts worldwide, and even fewer trained in modern systematics. The objective of this PEET project is to revise, monograph, and disseminate data on a North American water mite family, Torrenticolidae, while training two PhD students in water mite systematics using modern taxonomic and phylogenetic methods.

Research will include: 1) field collection in the North American Rocky Mountains, Yukon and Alaska, the Sierra Nevada Mountains in California, and Appalachian Mountain drainages in Georgia and Florida; 2) species descriptions focusing on a digital workflow and cybertaxonomic methods to speed up the time from discovery to dissemination of data; and 3) a full phylogenetic revision of Torrenticolidae based upon molecular and morphological data.

Previous experience with mites is not required for work on this project. We are primarily looking for students with a good background in biology and a strong interest in systematics and natural history. Students should be self motivated and possess a desire to become an expert in a group very few know much about.

For more information about the project or the graduate assistantships, please contact Ashley Dowling at [479-575-2482](tel:479-575-2482) or adowling@uark.edu. Information about the University of Arkansas can be obtained at <http://www.uark.edu> and the Department of Entomology at <http://entomology.uark.edu/>. The positions are fully funded and include student stipend, healthcare and tuition.

‘Fun, fun, fun’

(continued from page 168)

have also benefitted from the extra water, but because of their short generation time, temporary water sources that are found from year to year also make good breeding sites. The point I was trying to get across to the media was that although we were seeing lots of both mosquitoes and dragonflies, the former had arisen from eggs laid a few weeks ago, while the dragonflies had probably started life in 2007 or 2008.

Following one of the radio interviews that I gave, I received photographs of insects for identification. One such specimen, snapped in the front porch of a Saskatoon home, I had never seen before, but it looked a bit like a giant silkworm (remember, I’m no taxonomist!) so I sent the photo to an expert on Canadian Saturniidae. He was probably quite embarrassed to have to tell me that it was not a saturniid but a noctuid(!), specifically the black witch, *Ascalapha odorata* (page 159). This species, which has a wingspan reaching 15 cm or more, is normally found from Brazil north to the southern USA, so this specimen presumably had been blown to Saskatoon by a strong weather system. In Mexico and many Caribbean cultures, the black witch is believed to bring back luck should it get into a home, including death for any resident who is sick.

My third ‘fun’ entomological item for 2011 was the discovery of a string of lacewing (*Chrysopa* sp.) eggs, each laid at the tip of a silken stalk, while inspecting my cabbages for imported cabbageworm corpses following treatment with Bt. Though I had seen pictures of lacewings’ stalked eggs, I never dreamed that I would actually find them in my own garden!

So, entomologically speaking my summer has been a really fun experience. I hope yours has, too!

*In case readers are wondering, my Daddy didn’t even own a car, never mind a T’bird!

‘Fun, fun, fun’

(suite de la page 168)

la radio, j’ai reçu des photos d’insectes pour identification. Un des spécimens, photographié sur le balcon avant d’une maison de Saskatoon, m’était inconnu, mais il ressemblait à un ver à soie géant (souvenez-vous, je ne suis pas taxonomiste!) alors j’ai envoyé la photo à un expert de Saturniidae au Canada. Il était probablement plutôt embarrassé de devoir me dire qu’il ne s’agissait pas d’un saturnidé, mais bien d’un noctuidé (!), plus spécifiquement du papillon deuil *Ascalapha odorata* (page 159). Cette espèce, qui a une envergure de 15 cm ou plus, se trouve normalement du nord du Brésil au sud des États-Unis, alors ce spécimen a probablement été porté à Saskatoon par un système météo plutôt fort. Au Mexique et dans plusieurs cultures des Caraïbes, le papillon deuil porte malchance s’il s’introduit dans une maison, allant jusqu’à la mort de tout résident malade.

Ma troisième anecdote entomologique ‘fun’ pour 2011 est la découverte d’une masse d’œufs de chrysopes (*Chrysopa* sp.), chacun pondu au bout d’une tige de soie, alors que j’inspectais mes choux pour des cadavres de piérides de la rave après un traitement au Bt. Bien que j’aie déjà vu des photos d’œufs de chrysope, je n’avais jamais rêvé que j’en trouverais dans mon propre jardin!

Alors, entomologiquement parlant, mon été a été une expérience vraiment amusante! J’espère que le vôtre aussi!

*Au cas où les lecteurs se le demanderaient, mon papa n’a jamais possédé de voiture, alors encore moins une T-Bird!

Officers of affiliated Societies, 2010-2011 Dirigeants des Sociétés associées, 2010-2011

Entomological Society of British

Columbia

President Rob McGregor
President-Elect Ward Strong
Past President Tom Lowery
Treasurer Lorraine Maclauchlan
Editor (Journal) Hugh Barclay
Editors (Boreus) Jennifer Heron,
Jeremy deWaard

Webmaster Bill Riel
Secretary Leo Rankin
Ministry of Natural Resource Operations
200-640 Borland St, Williams Lake, BC V2G 4T1
Tel: (250) 398-4352
E-mail: Leo.Rankin@gov.bc.ca
<http://www.sfu.ca/biology/esbc/>

Entomological Society of Alberta

President Rob Longair
Vice-President Lloyd Dოსdall
Past President Greg Pohl
Treasurer Adam Blake
Editor (Proceedings) Meghan Evans
Webmaster Alec McClay
Secretary Ken Fry
Olds College
4500 - 50 Steet, Olds, AB T4H 1R6
Tel: (403) 556-8261
E-mail: esalberta@gmail.com
<http://www.biology.ualberta.ca/courses.hp/esa/esa.htm>

Entomological Society of

Saskatchewan

President Ruwandi Andrahennadi
President-Elect Jeff Boone
Past President Cedric Gillott
Treasurer Dwayne Hegedus
Newsletter Editor Brian Galka
Secretary Iain Phillips
Saskatchewan Watershed Authority
101-108 Research Drive, Saskatoon, SK, S7N 3R3
Tel: (306) 933-7474
Email: iain.phillips@swa.ca
<http://www.usask.ca/biology/ess/>

Entomological Society of Manitoba

President Taz Stuart
President-Elect Lisa Capar
Past President Marj Smith
Treasurer Ian Wise
Newsletter Editors Mahmood Iranpour
Patricia MacKay
Editor (Proceedings) Terry Galloway
Webmaster Rob Currie

Secretary David Ostermann
Manitoba Agriculture
204-545 University Cres., Winnipeg, MB R3T 5S6
Tel: (204) 945-3861, Fax: (204) 945-4327
E-mail: david.ostermann@agr.mb.ca
<http://home.cc.umanitoba.ca/esm/>

Entomological Society of Ontario

President Hannah Fraser
President-Elect Bruce Gill
Past President Gary Umphrey
Treasurer Shiyou Li
Editor (Journal) John Huber
Webmaster Morgan Jackson
Secretary Nicole McKenzie
Vista Centre
1830 Bank St. P.O. Box 83025
Ottawa, ON K1V 1A3
E-mail: nicole_mckenzie@hc-sc.gc.ca
<http://www.entsocont.ca>

Société d'entomologie du Québec

Président Bruno Fréchette
Vice-présidente Sophie Rochefort
Président sortant Guy Charpentier
Trésorière Maryse Barette
Rédactrice (Antennae) Christine Jean
Webmestre Thierry Poiré
Secrétaire Julie-Éléonore Maisonhaute
Université du Québec à Montréal
Département des sciences biologiques
C.P.8888, Succ. Centre Ville, Montréal (Qc) H3C 3P8
Tél: (514) 987-3000 ext. 4799
E-mail: secretariat@seq.qc.ca
<http://www.seq.qc.ca/>

Acadian Entomological Society

President Christine Noronha
Vice-President Donna Giberson
Past President Carolyn Parsons
Journal Editor Don Ostaff
Webmaster Rick West
Secretary/Treasurer Rob Johns
Atlantic Forestry Centre
P.O. Box 4000, 1350 Regent Street South
Fredericton, NB, E3B 5P7
Tel: (506) 452-3785
E-mail: Rob.Johns@NRCan-RNCan.gc.ca
<http://www.acadianes.org/index.html>

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: Julia Mlynarek

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

Published by the
Entomological Society of Canada
393 Winston Ave.
Ottawa, Ontario, Canada K2A 1Y8
www.esc-sec.ca/
entsoc.can@bellnet.ca

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.

Send correspondence to:
Cedric Gillott
Bulletin Editor
Department of Biology
University of Saskatchewan
112 Science Place, SK S7N 5E2
Telephone: (306) 966-4401
Fax: (306) 966-4461
E-mail: cedric.gillott@usask.ca

ISSN: 0071-0741
Customer Account No. 3975533
Publications Mail Agreement No. 40033986
Printed in Canada
Contents copyrighted 2011 by the Entomological Society of Canada

Submission deadline for the next issue: 31 October 2011



Bulletin de la Société d'entomologie du Canada

Rédacteur: Cedric Gillott
Rédactrice adjointe: Julia Mlynarek

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

Publié par la
Société d'entomologie du Canada
393 Winston Ave.
Ottawa, Ontario, Canada K2A 1Y8
www.esc-sec.ca/
entsoc.can@bellnet.ca

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.

Envoyer vos soumissions à:
Cedric Gillott
Rédacteur du *Bulletin*
Department of Biology
University of Saskatchewan
112 Science Place, SK S7N 5E2
Telephone: (306) 966-4401
Fax: (306) 966-4461
courriel : cedric.gillott@usask.ca

ISSN: 0071-0741
Numéro de client: 3975533
Numéro de convention: 40033986
Imprimé au Canada
Droits d'auteur 2011 Société d'entomologie du Canada

Date de tombée pour le prochain numéro: 31 octobre 2011



'Fun, fun, fun' (with apologies to the Beach Boys, 1964)*

Prairie summers may be short but they are great fun, especially for us entomologists. Among the numerous and diverse insects that show up with the arrival of decent weather, there are always a few 'special cases' worth noting, and this year has been no exception.

Without doubt, at least in the Saskatoon area, 2011 has been 'The Year of Dragonflies', with unparalleled numbers of the large darners (*Aeshna* spp.) and meadowhawks (*Sympetrum* spp.) on the wing throughout late June and July. Inevitably, this brought calls from the media, especially wanting to know whether this abundance was related to the also higher-than-normal mosquito population (that is, are there more dragonflies because there are more mosquitoes?). The answer I gave was a sort of 'Yes' and 'No'! 'No' because the number of (adult) dragonflies is not directly a result of there being more (adult) mosquitoes. But 'Yes', because the juvenile stages of both groups are aquatic, the odonate naiads feeding on mosquito larvae, and because there are many more permanent water bodies in the area, following a series of wet years. This type of habitat is essential for the large dragonflies, whose naiads require 3 or more years to mature, spending the intervening winters 'snuggled' in the mud at the bottom of the slough, lake, etc. Of course, mosquitoes

(continued on page 165)

'Fun, fun, fun' (avec mes excuses aux Beach Boys, 1964)*

Les étés dans les prairies sont peut-être courts, mais ils sont très amusants, particulièrement pour nous les entomologistes. Parmi les nombreux et divers insectes qui apparaissent avec l'arrivée de températures décentes, il y a toujours quelques cas spéciaux qui valent la peine d'être mentionnés, et cette année ne fait pas exception.

L'année 2011 a été, au moins pour la région de Saskatoon, l'année des libellules avec un nombre incomparable de grandes libellules du genre *Aeshna* et de sympétrum (*Sympetrum* spp.) en vol à la fin juin et en juillet. Ceci a inévitablement amené de nombreux appels des médias, particulièrement afin de savoir si cette abondance était liée à celle des moustiques (c'est-à-dire y a-t-il plus de libellules parce qu'il y a plus de moustiques?). La réponse que j'ai donnée était un genre de 'Oui' et 'Non'! 'Non' parce que le nombre de libellules (adultes) n'est pas une conséquence directe du grand nombre de moustiques (adultes). Mais 'oui' parce que les stades juvéniles des deux groupes sont aquatiques, que les nymphes de libellules se nourrissent de larves de moustiques et qu'il y a beaucoup plus d'étendues d'eau permanentes dans la région après une succession d'années pluvieuses. Ce type d'habitat est essentiel pour les grandes libellules, dont les nymphes ont besoin de 3 ans ou plus afin de se développer, et qui passent les hivers blotties dans la boue dans le fond des marécages, lacs, etc. Évidemment, les moustiques ont également bénéficié du supplément d'eau, mais parce que leur temps de génération est court, les étendues d'eau temporaires qui sont présentes d'années en années font également de bons sites de pontes. Le point que j'essayais de faire passer aux médias est que bien que nous voyons beaucoup de moustiques et de libellules, les premiers proviennent d'œufs pondus il y a quelques semaines alors que les libellules ont probablement débuté leur vie en 2007 ou 2008.

Après l'un des entretiens que j'ai donné à

(suite à la page 165)

Entomological Society of Canada, 2010-2011 Société d'entomologie du Canada, 2010-2011

Executive Council / Conseil exécutif

President / Président

Peter Mason
Agriculture and Agri-Food Canada
960 Carling Avenue, Ottawa, ON K1A 0C6
Tel: (613) 759-1908, Fax: (613) 759-1926
E-mail: peter.mason@agr.gc.ca

First Vice-President / Premier vice-président

Michel Cusson
Service canadien des forêts, Ressources naturelles Canada,
1055 rue du P.E.P.S., C.P. 10380, Succ. Sainte-Foy, Québec, QC G1V 4C7
Tel: (418) 648-3944, Fax: (418) 648-5849
E-mail: michel.cusson@RNCAN-NRCAN.gc.ca

Second Vice-President / Seconde vice-présidente

Rosemarie DeClerck-Floate
Agriculture and Agri-Food Canada
5403 - 1 Avenue South, PO Box 3000
Lethbridge, Alberta T1J 4B1
Tel: (403) 317-2270, Fax: (403) 382-3156
Email: Rosemarie.Declerck-Floate@agr.gc.ca

Past President / Présidente sortante

Maya Evenden
CW 405 Biological Sciences Centre
University of Alberta
Edmonton, AB T6G 2E9
Tel: (780) 492-1873, Fax: (780) 492-7150
E-mail: mevenden@ualberta.ca

Directors-at-Large / Conseillers

Michèle Roy (2011)
Felix Sperling (2012)
Brent Elliott (2013)

Regional Directors / Directeurs régionaux

Bill Riel (ESBC), Kevin Floate (ESA), Martin Erlandson (ESS), Terry Galloway (ESM), Hume Douglas (ESO), Geneviève Labrie (SEQ), Carolyn Parsons (AES)

Student Representative /

Représentante des étudiants

Chandra Moffatt
University of British Columbia
E-mail: chandra.moffat@gmail.com

Trustees / Fiduciaires

Treasurer / Trésorier

Scott Brooks
Entomological Society of Canada
393 Winston Ave. Ottawa, ON K2A 1Y8
Tel: (613) 694-2718 Fax: (613) 759-1927
Email: scott.brooks@agr.gc.ca

Secretary / Secrétaire

Annabelle Firlej
Institut de Recherche en Biologie Végétale
4101 Sherbrooke Est, Montréal, QC H1X 2B2
Tel: (450) 441-4654
E-mail: afirlej@yahoo.com

Bulletin Editor / Rédacteur du Bulletin

Cedric Gillott
Dept of Biology, University of Saskatchewan
112 Science Place, SK S7N 5E2
Tel: (306) 966-4401, Fax: (306) 966-4461
E-mail: cedric.gillott@usask.ca

Ass. Bulletin Editor / Rédactrice adj. du Bulletin

Julia Mlynarek
Carleton University, Biology Department
1125 Colonel By Drive, Ottawa, ON K2A 1Y8
Tel: (613) 520-2600 ext. 3872
E-mail: jmlynare@connect.carleton.ca

Webmaster / Webmestre

Rick West
31 Drover's Heights
Portugal Cove-St. Philips, NL A1M 3G6
Tel: (709) 895-2734
E-mail: reely.west@nl.rogers.com

The Canadian Entomologist

Editor-in-Chief / Rédacteur en chef

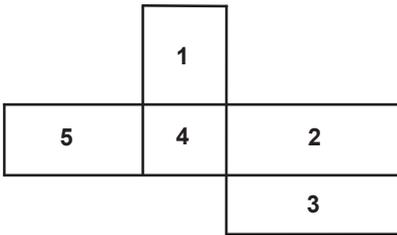
Robb Bennett
Tel: (250) 370-5015, Fax: (250) 652-4204
E-mail: rbennett@esc-sec.ca

Division Editors / Rédacteurs de division

Gilles Boiteau, E-mail: gilles.boiteau@agr.gc.ca
Chris Buddle, E-mail: chris.buddle@mcgill.ca
Yvan Pelletier, E-mail: yvan.pelletier@agr.gc.ca
Brad Sinclair, E-mail: bradley.sinclair@inspection.gc.ca
Jon Sweeney, E-mail: Jon.sweeney@RNCAN-RNCAN.gc.ca

Head Office / Siège social

Derna Lisi (Office manager)
Entomological Society of Canada
393 Winston Ave., Ottawa, ON K2A 1Y8
Tel: (613) 725-2619, Fax: (613) 725-9349
E-mail: entsoc.can@bellnet.ca, www.esc-sec.ca/



www.esc-sec.ca/

Return Undeliverable Canadian Address to:
 Entomological Society of Canada
 Société d'entomologie du Canada
 393 Winston Avenue
 Ottawa, Ontario, Canada K2A 1Y8
 E-mail: entsoc.can@bellnet.ca

Publications Mail Agreement No. 40033986
 Date of issue: September 2011

ISSN: 0071-0741

Images

On the spine: A robber fly, *Stenopogon inquinatus* Loew (Diptera: Asilidae), photographed in the Okanagan Valley of British Columbia. One of the largest Canadian asilids, it ranges over much of western North America where it is common in dry forests and grasslands. Photo: W. Strong

Beneath the title: Mating soldier beetles, *Rhagonycha fulva* (Scopoli) (Coleoptera: Cantharidae), in a meadow near Delémont, Switzerland. This predatory European beetle was recently introduced to North America where it is now widespread. Photo: A. Leroux

1 A European species of *Plebejus* Kluk (Lepidoptera: Lycaenidae), very similar to the Nearctic species *Plebejus melissa* (Edwards). Jerisberghof, Switzerland. Photo: A. Leroux

2 Eggs of *Leptoglossus occidentalis* Heidemann (Hemiptera: Coreidae), an important pest of North American conifer seeds and European edible pine nuts. Vernon, British Columbia. Photo: W. Strong

3 A meadow grasshopper nymph, probably a species of *Chorthippus* Fieber (Orthoptera: Acrididae), in a mountain pasture near Soyhières, Switzerland. Photo: A. Leroux

4 Lars Andreassen preparing trap lures for *Aleochara bipustulata* (L.) (Coleoptera: Staphylinidae), a potential biological control agent for *Delia radicum* (L.) (Diptera: Anthomyiidae). Zurich, Switzerland. Photo: A. Leroux

5 An assassin bug nymph (Heteroptera: Reduviidae), photographed in western Massachusetts. Photo: B. Roitberg

Back cover: A platygastroid wasp, *Gryon pennsylvanicum* (Ashmead) (Hymenoptera: Scelionidae), ovipositing in eggs of western conifer seed bug, *Leptoglossus occidentalis* Heidemann (Hemiptera: Coreidae) in the Okanagan Valley of British Columbia. Photo: W. Strong

Français à l'intérieur de la couverture avant.