

Boreus

Newsletter of the Entomological Society of British Columbia



June 2008
Volume 28 (1)



Grasshopper, Ponderosa pine forests outside Kamloops, August 2007



longhorn beetles, August 2007 Penticton area



Taylor's checkerspot frass pile, Denman Island, BC. July 2007

Table of Contents

The Executive	2
Publications of the ESBC.....	3
Message from the President.....	5
ESBC 2008 Elections.....	7
Upcoming Meetings and Events	12
Announcement 2008 Entomology Society of British Columbia <i>Annual General Meeting</i> October 3, 2008	12
Announcement Entomology Society of BC and Stanley Park Ecological Society invite you to a free public symposium.....	14
Program Outline and Speakers:.....	14
Parking, transit and access:.....	15
Nearby accommodation:	15
Dinner (the evening before) October 3, 2008:	15
Box lunch is \$10/person:	15
Posters and displays:	15
Further information and questions about the symposium:	15
ESBC Website Link.....	16
Random Photos from the field.....	16
Executive Profiles.....	17
Announcement Joint Annual Meeting of Entomological Society of Canada and Entomological Society of Ontario	18
In Memory: Dr. Edward Becker 1923 - 2008.....	37



The Executive

The Entomological Society of British Columbia is a scientific Society founded in 1902 for the advancement of entomological knowledge in the province.

Entomological Society of BC Executive

<i>President</i>	John McLean University of British Columbia, Vancouver
<i>President-Elect</i>	Sheila Fitzpatrick, Agriculture Canada, Agassiz
<i>Past-President</i>	Richard Ring, University of Victoria, Victoria
<i>Secretary / Treasurer</i>	Lorraine Maclauchlan BC Ministry of Forests, 515 Columbia Street, Kamloops, BC, Canada V2C 2T7
<i>Editorial Committee (Journal)</i>	Hugh Barclay (Editor), Canadian Forest Service, Victoria Geoff Scudder, University of British Columbia, Vancouver Lorraine Maclauchlan, BC Ministry of Forests, Kamloops Joan Cossentine, Agriculture Canada, Agassiz
<i>Editor (Boreus)</i>	Jennifer Heron, BC Ministry of Environment, Vancouver
<i>Directors</i>	Jim Corrigan (1st), Agriculture Canada, Vernon Rob McGregor (1st), Douglas College, New Westminster Naomi DeLury, (2nd), Agriculture Canada, Agassiz Dezene Huber (2nd), Univ. of Northern BC, Prince George Mike Smirle (2nd), Agriculture Canada, Summerland
<i>Honorary Auditor</i>	Richard Ring, University of Victoria, Victoria
<i>Regional Director of National Society</i>	Bill Riel, Canadian Forest Service, Victoria
<i>Web Page Editor</i>	Bill Riel, Canadian Forest Service, Victoria
<i>Web page</i>	http://www.sfu.ca/biology/esbc/



Publications of the ESBC

Journal of the Entomological Society of British Columbia

The *Journal of the Entomological Society of BC* is published annually. Papers for the *Journal* need not have been presented at meetings of the Society, nor is it mandatory, although preferable, that authors be members of the Society. The chief condition for publication is that the paper has some regional origin, interest or application. Line drawings or photographs as candidates for the cover are also accepted. Contributions should conform to the standards outlined in the Journal and the Website (<http://www.sfu.ca/biology/esbc/>), and should be sent to the Editor, Dr. Hugh Barclay, Canadian Forest Service, Pacific Forestry Centre, 506 West Burnside Road, Victoria, British Columbia, Canada V8Z 1M5 Email: HBarclay@pfc.cfs.nrcan.gc.ca

The deadline for submissions to be included in the 2008 issue is **September 1, 2008**.

Boreus

Boreus, the Newsletter of the Society is published in June and December. It contains entomological news, comments, reports, reviews and notices of meetings and other events. While emphasizing the Society's affairs, *Boreus* provides members with a forum for their views and news of British Columbia entomology, as well as informal articles, notes regarding research projects, photographs and anything else that may be of interest to entomologists. Please send correspondence concerning *Boreus* to the Editor, Jennifer Heron, BC Ministry of Environment, UBC Campus, 315-2202 Main Mall, Vancouver, BC V6T 1Z4; tel 604-222-6759; fax 604-660-1849; E-mail Jennifer.Heron@gov.bc.ca.

The deadline for submissions to be included in the December 2008 issue is **November 15, 2008**.



Membership of the Entomological Society of BC is available to anyone interested in entomology. Annual dues are Can\$20.00 (regular member) or Can\$10.00 (student member). Members receive the *Journal*, *Boreus* and *Occasional Papers* (the latter published intermittently).

Inquiries concerning membership and back issues should be sent to the Secretary/Treasurer, Dr. Lorraine Maclauchlan, BC Ministry of Forests, 515 Columbia Street, Kamloops, BC, Canada V2C 2T7; tel 250 828-4179; fax 250 828-4154; e-mail Lorraine.Maclauchlan@gov.bc.ca

Cover Sketch: *Boreus elegans* (Mecoptera: Boreidae); one of the more conspicuous snow scorpionflies in BC. Larvae and flightless adults live in, and feed on, moss and clubmoss. Adults appear in the fall and are active on snow on warm winter days. Credit Robert A. Cannings and Ward Strong.

Cover Photographs: taken in Burns Bog July/August 2007. Jennifer Heron.

Photograph Permission: photographs included within this publication remain the sole property of the photographer. Please contact the photographer for permission to use their photograph for other purposes. Contact information is written at the end of this newsletter.



Some of your ESBC Executive, left to right: Mike Smirle, Sheila Fitzpatrick, Bill Riel, John McLean, Dezine Huber, Richard Ring, Jim Corrigan, Rob McGregor, Lorraine Maclauchlan. Photo Lorraine Maclauchlan.



ESBC Society Business

Message from the President

Greetings on behalf of your ESBC Executive Committee. We had a spring executive meeting in April and all seems to be in order. There was one major subcommittee meeting on Library matters and we are advancing with our planning for this year's AGM and Symposium.



John with a semiochemical-baited trap recently set out along Merilees Trail near Prospect Point.
Photo Agnus Li.

We have continued to make progress with the Library (see the report) and we now have ready access to our **ESBC Serials Collection**, which has been accumulated over the last century, by way of the **Natural Resources Canada database Metafore2.ca**. Metafore2 is a great resource for accessing NRCan literature and we are very fortunate to have been added to their database. My thanks to Vince Nealis, Richard Ring, Robb Bennett, Hugh Barclay and Gregg Smith for their helpful comments at a Library Committee Meeting in February. Web Editor, Bill Riel, has updated the web site in the Publications area to guide you through the accession process.

Plans for this year's [ESBC] Annual Meeting on October 3rd are being developed. Our venue this year will be the Auditorium at the West End Community Centre on Denman Street in Vancouver. There is ample parking under the WECC. There will be prizes for the best Masters student and PhD student presentations as usual. In addition there will be President's prizes for the two best student posters submitted to the AGM without restriction to student status. See elsewhere for reminders regarding the AGM and travel scholarships.

The Symposium this year, "Biological Diversity in Stanley Park", will be held jointly with the Stanley Park Ecology Society on Saturday October 4th and will be open to the public. There have been several insect surveys carried out in the last two summers following the widespread winter storm damage of the winter of 2006/2007. As you know Stanley Park hosts several million visitors a year and there is a lot of interest in the biological aspects of the park. Dr. Geoff Scudder will present an opening address on insect biological diversity in Canada. Dr Jon Sweeney from the Atlantic Forestry Centre will review the experiences with invasive species in Point Pleasant Park in Halifax over the last decade where coarse woody debris was not managed after storms in the area. Dr Lee Humble from the Pacific Forestry Centre will review the history of



forest insect outbreaks and control efforts in Stanley Park. Robyn Worcester will give an overview of the challenges in maintaining small vertebrate habitats, Peter Woods will give a naturalist's view featuring the excellent insect photography he has assembled in Stanley Park over the years, and Vancouver Parks and Recreation Board Manager Jim Lowden will give a brief overview of the challenges he faced in developing the restoration plan. We are hoping to arrange a bus tour of the park at lunch time with a stop at one of the blow down areas near the Rose Garden where I am operating semiochemical-baited traps – see article elsewhere for details of the study. We will also have a brief stop near Prospect Point where we see the road realignment and the most severely impacted blow down area which has now been salvage logged and replanted.

After lunch we will have a Scientific Café where after some brief introductory remarks on invasive weeds (Jill Peers), vertebrate issues (Robyn Worcester and Bill McIntosh), freshwater insects and other aquatic fauna (Karen Needham and Rex Kenner), routine insect surveys (Troy Kimoto) we will break up into discussion groups where everyone will be invited to share their concerns and opinions on flip charts which will be brought back to a reporting session for all to share. This is a new level of participation – yes, its experimental and I encourage you to come and contribute in a more public forum where we can see how our insects fit into the food webs of life that are found in a public park and help formulate some ideas that would be useful for those who have to manage these publicly cherished areas. If you have managed to read this far and you have any suggestions, do send me an email at john.mclean@ubc.ca.

Happy summer collecting and fruitful research.

Respectfully submitted,
John McLean
President, ESBC



ESBC 2008 Elections

The ESBC Executive consists of the President; Past-President; President-Elect; Secretary-Treasurer; five Directors, each Director serves a two-year term; editors of the Journal, *Boreus* and the webpage; Regional Director to the Entomological Society of Canada; and a Graduate Student Representative.

This year's elections are for *President-Elect*, three *Director* positions and the *Graduate Student Representative*. Directors serve a term of two years.

Please fill out your ballot (enclosed in this mail out) and mail back to:

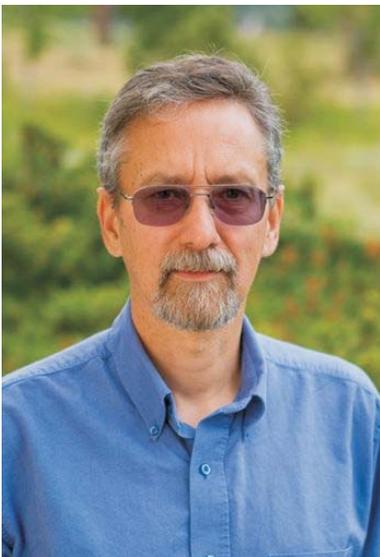
Lorraine Maclauchlan,
ESBC Secretary/Treasurer,
BC Ministry of Forests,
515 Columbia Street,
Kamloops, BC, Canada V2C 2T7

by the specified date and according to the directions on the ballot.

Candidates for President-Elect 2008 - 2009

One candidate

Tom Lowery



I obtained my undergraduate degree in Zoology (1980) and Masters in Entomology (1985) from the University of Guelph. Following a one-year stint at the Agriculture Canada station in Fredericton, New Brunswick, I was hired by the Ontario Ministry of Agriculture and Food to conduct research on turnip mosaic virus and develop an IPM program for crucifer crops. I left that position to pursue a PhD at UBC in the Department of Plant Science under the supervision of Dr. Murray Isman. After graduating in 1992, I obtained postdoctoral fellowships at the AAFC Research Centres at Summerland and Vineland. We returned to BC in 1996, and since 2001 I have been hired by AAFC-PARC, Summerland, to conduct research on plum pox virus and to develop an Integrated Pest Management program for grape pests with an emphasis on improved sustainability. My general areas of interest include epidemiology and management of insect-borne plant diseases, grape IPM, and the biology, toxicology and management of aphids and other Homoptera. I have been a long time member of several entomological societies and served one term as a Director of the ESBC.



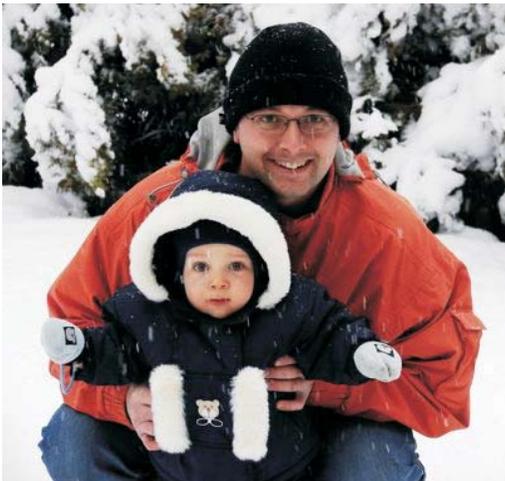
ESBC 2008 Elections

Candidates for Director 2008 - 2010

Three positions are open for the Director 2008 - 2010.

Three candidates are running for three positions. Candidates are Dezene Huber, Alida Jaanmat and Leo Rankin.

Dezene Huber



I completed a B.Sc. in Zoology at the University of Calgary and then carried on to complete an NSERC-funded Ph.D. under the direction of Dr. John Borden at Simon Fraser University. The topic of my Ph.D. research was the effects of nonhost angiosperm volatiles on aggregation of five species of British Columbia bark beetles. After my time at SFU, I worked for two years as an NSERC postdoctoral fellow with Dr. Joerg Bohlmann at the University of British Columbia. My research there was on the methyl jasmonate induced chemical defenses of Douglas-fir as well as on forest tent caterpillar herbivory-induced volatiles emissions from poplar. After two years at UBC I began work at the University of California, Davis in Dr. Steven Seybold's (USDA Forest Service) lab. Much of my work there entailed discovery - and research into expression patterns of - cytochromes P450 in the California fivespined ips. I also collaborated with Dr. Seybold and other USDA researchers on various chemical ecology projects related to the foraging and aggregation behavior of other bark beetles. In 2005 I began my current position as Canada Research Chair in Forest Entomology and Chemical Ecology & Assistant Professor in the Ecosystem Science and Management Program at the University of Northern British Columbia. The research in my lab - which currently houses five excellent graduate students as well as several eager undergraduates - revolves around various molecular, physiological, and ecological aspects of interactions between trees and forest insects. I have enjoyed my work as an ESBC director for the past two years, and would enjoy working in that position for a further two years.



ESBC 2008 Elections Candidates for Director 2008 - 2010 cont.

Three positions are open for the Director 2008 - 2010.
Three candidates are running for three positions. Candidates are
Dezene Huber, Alida Jaanmat and Leo Rankin.

Alida Jaanmat



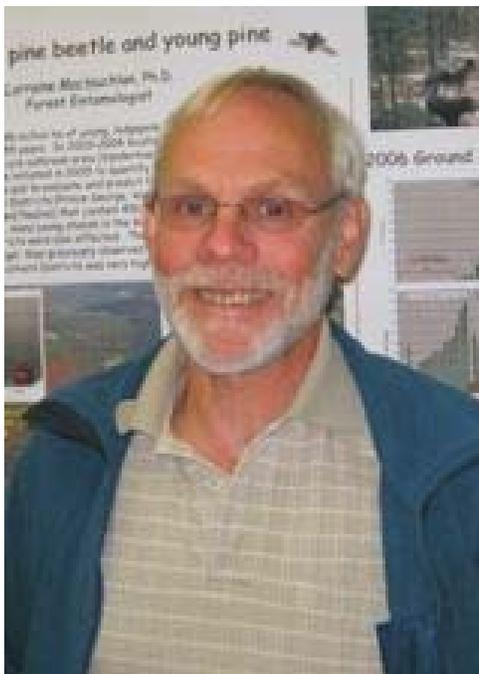
I first became interested in pursuing entomology during my undergraduate degree at Simon Fraser University (SFU). As a co-op student, I had the opportunity to work as a crop scout for Coast-Agri, Abbotsford, an entomology research technician at the Ministry of Agriculture, Cloverdale, and as a forestry research technician at the Red Rock research station near Prince George. Because of these experiences, I decided to pursue the Master's of Pest Management (MPM) program at SFU. During my MPM, I studied the impacts of *Varroa* mite parasitism on honeybee colonies under the supervision of Dr. Mark Winston. After finishing my thesis, I worked as the research and technical assistant for the BC Greenhouse Growers Association on issues related to pest management. Following which, I worked as a research assistant at the Agrotechnological Research Institute in the Netherlands on the use of essential oils and controlled atmosphere for the fumigation of cutflowers. I then decided to pursue a PhD at the University of British Columbia where I studied the evolution of resistance to *Bacillus thuringiensis* (Bt) in greenhouse cabbage looper populations under the supervision of Dr. Judith Myers. I returned to SFU for post-doctoral studies under Dr. Elizabeth Elle's supervision where I studied the ecological costs of spittlebug herbivory on *Collinsia parviflora* in Garry Oak ecosystems. Currently, I am part of the biology faculty at the University of the Fraser Valley where I am conducting projects on the role of the insect immune system in the resistance of cabbage loopers to Bt, the biological control of green peach aphids in greenhouses and the classical biocontrol of purple loosestrife. I am keen on expanding my involvement with the Entomological Society of British Columbia as a director if elected.



ESBC 2008 Elections Candidates for Director 2008 - 2010 cont.

Three positions are open for the Director 2008 - 2010.
Three candidates are running for three positions. Candidates are
Dezene Huber, Alida Jaanmat and Leo Rankin.

Leo Rankin



I completed my undergrad at the University of Victoria in 1982 in Zoology. In 1985 I returned to school in the Masters of Pest Management program at Simon Fraser University. My focus was forest entomology. I graduated in 1988 after finishing my Masters, which focused on competition between *Ips pini* and mountain pine beetle. I won a competition for a position as Forest Entomologist for the B.C. Forest Service in the Cariboo Forest Region, which began in June 1988. In 2001 the Cariboo Forest Region was eliminated and combined with the Kamloops and Nelson Regions to form the Southern Interior Forest Region. My work is focused on bark beetle and defoliator detection, monitoring and control. I am based in Williams Lake. My work was mainly focused on containment of mountain pine beetle until it expanded to population levels, which forced submission to its overwhelming numbers and a shift into a salvage harvest strategy. Now management efforts target Douglas-fir and spruce beetle. With respect to defoliators, western spruce budworm is the chief damaging agent. Last year in the Cariboo, the Forest Health program treated over 36,000 hectares with Btk to control budworm population expansion and damage.



2008 ESBC Elections

Candidates for Graduate Student Representative

One candidate is running for the Graduate Student Representative.

Melanie Hart



After finishing my undergraduate degrees in the sciences and arts at the University of Victoria, I enjoyed a brief stint at Pherotech International. After this work experience in the field of pest monitoring and control, I joined Gerhard Gries' Insect Communication Ecology Lab at Simon Fraser University. For my master of science, I studied acoustic communication in the peach twig borer. Currently, I'm working on my PhD with Gerhard Gries, studying acoustic signaling in three species of moths. Professionally, I volunteered with the PPMABC for three years, am currently active with Bully Buddies (a non-profit organization for rescuing bully dog breeds), and am the TSSU (the teaching and support staff union) steward for biological sciences. In regards to awards and recognition, I hold an NSERC graduate research award, have been the subject of media attention for my research, have won teaching awards at the departmental and faculty levels, and have received numerous scholarships and acknowledgements of my work, including the Lindbergh Grant, a world-wide competition in memory of Charles Lindbergh, that seeks to fund research exemplifying a commitment to the combination of technology and sound environmental practices.



Upcoming Meetings and Events

Announcement

2008 Entomology Society of British Columbia *Annual General Meeting* October 3, 2008



This year's AGM will be held within the Auditorium at the **West End Community Centre**, 870 Denman Street, downtown Vancouver on Friday, October 3, 2009.

The AGM will include oral presentations and posters by members and students.

For more information about the ESBC AGM contact:

John McLean,
ESBC President
University of BC
Faculty of Forestry,
Tel: 604-822-
Fax: 250-721-7120
Email:
John.Mclean@ubc.ca

When:

Presentations and AGM --- Friday 3 October 2008.

Time:

9:30 am – 5:00 pm (lunch included in registration fee).

Cost:

\$20 per day; \$10 for students and amateur entomologists

The details of these sessions are forthcoming, and progress will be posted on the Entomological Society of BC website (<http://www.sfu.ca/biology/esbc/>). If you would like to be added to a reminder email list, please send an email to Jennifer Heron (Jennifer.Heron@gov.bc.ca).

Members, students and other interested parties are encouraged to submit abstracts for oral or poster presentations for the AGM. Prizes will be awarded for best student oral presentations (MSc and PhD) and best student poster presentation. Titles and abstracts (50 words or less) for oral and poster presentations should be submitted to Rob McGregor at mgregorr@douglas.bc.ca by Wednesday September 3rd.

Winners of the annual *MSc and PhD Graduate Student Travel Scholarships* will be announced at the AGM. These awards consist of \$500 each to attend conferences other than the ESBC AGM. See the Funding Opportunities section of this newsletter for more detail.



ESBC 11th Annual Graduate Student Scholarships

The Entomological Society of British Columbia announces the ninth annual Graduate Student Scholarship competition. Two \$500.00 Scholarships (one M.Sc., one Ph.D.) are awarded each year at the Annual General Meeting. Scholarships are to be used to defray research paper or poster presentation related costs (including travel) incurred by graduate students for participation in conferences other than the ESBC AGM.

For consideration, applicants must be:

- Graduate students and ESBC members in good standing, and **must submit a Word file containing:**
 - name and locality of conference to be attended,
 - title and abstract of research to be presented, and
 - current CV.

Abstract should be double spaced, 12 font, and a **maximum** of 200-250 words (based on processor electronic word count). Applications will be judged on the basis of scientific importance, quality of the application, and qualifications of the applicant. Applications from M.Sc. and Ph.D. students will be judged in separate categories; a singleton application in either category will be judged with applications in the other.

Deadline for receipt of applications for 2008 Scholarships is **30 September 2008**.

This year's scholarships will be awarded during the ESBC Annual General Meeting, October 3, 2008.

Send applications to:

Lorraine Maclauchlan, Secretary/Treasurer, ESBC
BC Ministry of Forests & Range
515 Columbia Street
Kamloops, B.C. V2C 2T7
or by e-mail to: Lorraine.Maclauchlan@gov.bc.ca



Announcement
 Entomology Society of BC and
 Stanley Park Ecological Society invite you
 to a free public symposium

Biodiversity in Stanley Park

Saturday, October 4, 2008 9am – 3:30pm
 Auditorium, West End Community Centre

870 Denman St., Vancouver, BC V6G 2L8 www.westendcc.ca
 Phone: 604-257-8333 (only for directions and services; contact ESBC for symposium details)

Program Outline and Speakers:

Morning Sessions: 9 am – 11:45 am, with a half hour coffee break

- Dr. Geoff Scudder, University of British Columbia - insect biological diversity in Canada.
- Dr Jon Sweeney, Atlantic Forestry Centre - invasive species and coarse woody debris management over the last decade, in Point Pleasant Park, Halifax
- Dr Lee Humble, Pacific Forestry Centre - history of forest insect outbreaks and control efforts in Stanley Park.
- Robyn Worcester - challenges in maintaining small vertebrate habitats in Stanley Park
- Peter Woods - a naturalist's view featuring insect photography in Stanley Park
- Jim Lowden, Manager, Vancouver Parks and Recreation Board - a brief overview of the challenges faced in developing a restoration plan for Stanley Park following the 2006 winter storms.

Lunch Bus Tour (tentative) of select blowdown areas in Stanley Park 12 noon – 1:30 pm

- We are hoping to arrange a bus tour of Stanley Park with one stop at the blow down areas near the Rose Garden to show some insect trapping and a brief stop near Prospect Point to view the road realignment and the most severely impacted blow down area. Details are forthcoming. Box lunches will be available for \$10/each to take on the tour.

Afternoon program 1:45 pm – 3 pm Scientific Café

- After some brief introductory remarks on invasive weeds (Jill Peers), vertebrate issues (Robyn Worcester & Bill McIntosh), freshwater insects and other aquatic fauna (Karen Needham & Rex Kenner), and routine insect surveys (Troy Kimoto) we will break up into discussion groups for a Scientific Café. Everyone will share their concerns and opinions on flip charts which will be brought back to a reporting session. The Scientific Café will allow all to contribute in a more



public forum where we can see how our insects fit into the food webs of life that are found in a public park and help formulate some ideas that would be useful for park management.

Parking, transit and access:

Buses run from the Burrard Skytrain Station.

Pay parking is available under the West End Community Centre.

Nearby accommodation:

- **Best Western Sands by the Sea Downtown Hotel**, 1755 Davie Street, Vancouver
Phone: 604.682.1831/fax: 604.682.3546 or Toll Free: 1.800.663.940
<http://www.bestwesternsandshotelvancouver.com/>
- **Sunset Inn & Suites**, 1111 Burnaby St., Vancouver,
Tel: 604.688.2474 <http://www.sunsetinn.com/contact.php>
- **The Sylvia Hotel** 1154 Gilford St. Room Reservations call +1 604.681.9321
<http://www.sylviahotel.com/index.htm>
- There are many others within the vicinity.

Dinner (the evening before) October 3, 2008:

For those of you attending the ESBC Annual General Meeting held the day before, we have organized an informal dinner at the **Bayside Lounge and Restaurant** located in the Best Western Sands By the Sea Downtown Hotel, 1755 Davie Street at 7pm on Friday, October 3, 2008. We will reserve space for the group. Entrées cost from \$11.95 – \$21.95, and the menu includes burgers to steaks and vegetarian options.

Box lunch is \$10/person:

On date of symposium, order the box lunch in the morning upon arrival

Posters and displays:

Do you have a poster or display that is themed with the symposium topic? If you are a non-profit or society group wishing to promote educational topics related to the symposium, please put forth your request. The ESBC executive reserves the right to refuse a poster or display request and acceptance of your request will be at the discretion of the ESBC executive.

Further information and questions about the symposium:

Contact John McLean, ESBC President, phone: 604-822-3360, Fax: 604-822-9102 or email at john.mclean@ubc.ca.

Symposium speakers are requested to submit a 200-400 word abstract of their talk for publication in the *Journal of the Entomological Society of British Columbia*. They are also invited to publish a scientific note or full paper on the topic of their presentation, although the submission would be peer-reviewed and processed as a regular manuscript submission.



ESBC Website Link

Change your ESBC website bookmark, the new link is
<http://www.sfu.ca/biology/esbc/>

Random Photos from the field



BC Entomologists at a meeting in Boulder, Colorado, April 2008



Executive Profiles

Rob McGregor

Director

Summer plans at the Institute of Urban Ecology, Douglas College

This summer, we will be continuing work on several insect-related projects at the Institute of Urban Ecology.



Photo Rob McGregor

Since 2001, we have been sampling ground beetles near Hoy Creek in Coquitlam, BC. This program will be expanded to new sites this summer. We are interested in how urban habitat fragments of varying size and history of disturbance support and maintain insect communities.

Our Urban Bug Gardens project will continue at the community gardens at Colony Farm Regional Park. This project is evaluating the potential of native and ornamental flowering plants to attract predatory insects (like syrphids) for conservation biological control. Below is one of our bug garden test plots and a syrphid adult on sweet alyssum (*Lobularia maritima*).



In collaboration with Dave Gillespie at Agriculture & Agri-Food Canada, further collections will be made of parasitoids of tomato psyllid (*Bactericera cockerelli*). Tomato psyllid is serious pest of greenhouse tomatoes and peppers, and currently there is no biological-control product available. We collected psyllid parasitoids in 2007 (*Tamarixia* sp.) but did not establish a rearing colony. Further attempts to collect and establish psyllid parasitoids will be made in the summer of 2008.



Photographs by Jennifer Lewis, Institute of Urban Ecology, Douglas College, New Westminster



Announcement

Joint Annual Meeting of

The Entomological Society of Canada and The Entomological Society of Ontario

Réunion conjointe des Sociétés entomologiques du
Canada et d'Ontario

October 19 - 22, 2008

Crown Plaza Hotel, Ottawa, Ontario

Theme: *IDEAs: Integrating Diverse Entomological Approaches*

Plenary Session

- Dr. Maydianne Andrade, University of Toronto (Ecology)
- Dr. Dan Janzen, University of Pennsylvania (Behaviour/Physiology)
- Dr. John Heraty, University of California, Riverside (Systematics)

Heritage Lecture

- Dr. Stewart Peck, Carleton University

Scientific Program Co-chairs:

- Dr. Jeff Skevington, Agriculture Canada
- Dr. Gary Umphrey, University of Guelph

Special Symposia – title and organizer

- Graduate Student: contact Chris Borkent chris.borkent@mail.mcgill.ca
- Invasive Species: contact Vasily Grebennikov grebennikovv@inspection.gc.ca and Hume Douglas douglash@inspection.gc.ca
- 60th Anniversary of CABI - Canada's Collaboration in Biological Control: Biocontrol: Peter Mason masonp@agr.gc.ca
- Digital Entomology (Biodiversity Informatics): David Shorthouse dps1@ualberta.ca
- Biological Survey of Canada: Andrew Smith asmith@mus-nature.ca
- Canadian Insect Collections - their role in support of national and international biodiversity research: Steve Marshall samarsha@uoguelph.ca
- Insect Pests of Grapevine: Christel Olivier olivierc@agr.gc.ca and Charles Vincent vincentch@agr.gc.ca



NOTICE of Silent Auction

- bring your old bug trinkets!



Entomological gear piled onto a skidder for ease of delivery, Bute Inlet, July 2007

The Student Affairs Committee of the Entomological Society of Canada plans to hold a silent auction at the 58th Joint Annual Meeting in Ottawa. The Committee is in search of **entomology-related items that patrons are willing to donate for silent auction**. Here is an opportunity to downsize your entomological library, find a home for those collecting materials that you haven't used in years, or recycle useful entomological material in general. Proceeds will go towards ESC student scholarships. Contact Chris Borkent to donate your items chris.borkent@mail.mcgill.ca

Entomological
Society of Canada
Annual General
Meeting Information
cont.

Deadline for JESC-ON AGM Oral Presentation and Poster Submissions

Deadlines for oral presentation/poster is August 31, 2008

Deadline for Presidents Prize presentation/poster is August 31, 2008

Presentations (including the Abstract) may be given in either official language. See website for submission guidelines

<http://www.canacoll.org/JAM2008/html/submissions.html>

President's Prize Eligibility Criteria:

President's Prize Candidates:

- currently enrolled in a degree program or has graduated from a degree program since the last annual meeting
- registered at the meeting and has designated the President's Prize category at the time of abstract submission
- the principal researcher of the paper or poster



Deadline for AGM early registration is August 31st

Registration Type	Early before 15 August 2008	Late after 15 August 2008
Regular members	\$265	\$365
Students and retired members	\$100	\$160
Students non-member	\$140	\$200
Non-members	\$365	\$465
One-day registration		
Regular members	\$100	\$100
Students and retired members	\$75	\$75
Non-members	\$150	\$150
Companion Activities		
Guest ticket for the banquet	\$60	\$60
Canadian Museum of Civilization tour	\$20	\$20

Accommodation: Participants are encouraged to stay at the Crowne Plaza Hotel to be close to the meeting location and to help keep our meeting costs down. The local organizing committee has negotiated an excellent guestroom rate: \$120 per night plus taxes. This conference rate is for one or two adults with one or two beds requested. Each additional adult in the room (to a maximum of four adults per room) is an additional \$15 plus taxes per adult. When making reservations, please identify yourself with the booking code: "ESC"

To reserve a room, simply contact the hotel directly. You may make your reservation via any of the following five options:

Phone: 1-800-2CROWNE (1-800-227-6963)
 Phone (local): 613-237-3600 - reservations or ext.6200
 Fax: 613-688-6821
 e-Mail: cpreservations@chiphospitality.com
 Internet: www.crowneottawa.ca

Deadline for room reservations at the advertised conference rate is September 15, 2008. We have booked 150 rooms at this rate. We cannot guarantee rooms or rates, so please book as soon as you can.



Upcoming meetings and conferences

Year 2008

1. Entomological Society of Canada and Entomological Society of Ontario Joint Annual General Meeting, October 19 – 22, 2008. Crowne Plaza Hotel, Ottawa, Ontario. <http://www.canacoll.org/JAM2008/>
2. **Entomological Society of America** Annual Meeting will be held on December 7-11, 2008, at the Charlotte Convention Center in Charlotte, North Carolina. *Contact: [ESA Annual Meeting](#)*, 10001 Derekwood Lane, Suite 100, Lanham, MD 20706, phone 301-731-4535, fax 301-731-4538
3. **Australian Entomological Society**
39th Annual General Meeting and Scientific Conference 2008
Orange Agricultural Institute, Orange, New South Wales
28th September - 1st October 2008
<http://www.agric.nsw.gov.au/Hort/ascu/myrmecia/events.htm>

Year 2009

1. **The 72nd Annual Purdue Pest Management Conference** will be held January 7-11 in West Lafayette, Indiana. Contact Susan Umberger at 800-359-2968 or sumberger@purdue.edu.



Entomology Internet Resources

**Source: Center for Insect Science Education and Outreach:
The University of Arizona.**

<http://insected.arizona.edu/www.htm>

Entomology on the World Wide Web <http://entowww.tamu.edu/entoweb/> (list and gateway to many entomological sites geared towards teachers)

Entomology Index of Internet Resources - Web Sites Iowa State University <http://www.ent.iastate.edu/list/> (huge list and gateway to the majority of entomology resources on the internet - very comprehensive, great links - connects to almost all other major entomological sites)

Entomology on the WWW <http://www.colostate.edu/Depts/Entomology/> (list and gateway to many entomological sites on the internet. Not as colorful or complete as Iowa State)

Fon's Bug World <http://www.sirius.com/~fonzilla/insect.htm> (many links to other entomological sites and to insect pictures - the homepage is strange but information and pictures are worth the stop)

Iowa State University <http://www.public.iastate.edu/~entomology/> (main features pertain to the Entomology Dept.'s programs, but there is a link to the use of insects as food that includes recipes)

University of Kentucky - Entomology Youth Facts

<http://www.uky.edu/Agriculture/Entomology/ythfacts/entyouth.htm> (a site designed for teachers, 4-H'ers and anyone interested in insects that has great information and ideas on insects)

University of Illinois at Urbana-Champaign <http://www.life.uiuc.edu/Entomology/home.html> (insect drawings and links to other entomology related resources and information)

Web Lift to any Taxon of Organism <http://www.ucmp.berkeley.edu/help/taxaform.html> (web lift to information on any organism by scientific name and common name)

More Specific URLs by Species Group

Ants: Myrmecology <http://members.aol.com/dinarda/ant/index.html> (information on ants, references, and links)

Entomology on the Internet <http://members.aol.com/dinarda/ant/ento.htm> (a good site for colorful information on entomology with an emphasis on ants and contains great links and pictures)

Ant Exhibition: Living with Ants http://133.25.20.32/Harvard/ANT_MC2.html (a tour through the Harvard University Museum of Natural History including pictures and detailed descriptions of the life history of ants)

Ant Lions and Lacewings The Antlion Pit - a doodlebug anthology www.antlionpit.com (everything you would want to know about antlions including culture, art, mythology, and more)

Neuroweb <http://entowww.tamu.edu/research/nruopterida/neuroweb.html> (information on the order Neuroptera and links to other sites)

Bees Gears - Bee Information <http://gears.tucson.ars.ag.gov/> (contains information on current research at the Carl Haden Bee Research Center and a variety of information and pictures on many species of bees)

Beekeeping <http://weber.u.washington.edu/~jlks/bee.html> (information on keeping bees from the University of Washington)

Beetles Glowworms <http://www.rfhsm.ac.uk:81/golly/glowworm.html> (pictures and description of firefly larvae and adults)

Butterflies: Monarch Watch <http://www.MonarchWatch.org> (a network of students, teachers, and researchers interested in investigating and monitoring the annual migration of Monarch butterflies. E-mail: monarch@falcon.cc.ukans.edu)

Butterflies of the United States <http://www.npsc.nbs.gov/resource/distr/lepid/bflyusa/bflyusa.htm> (information and distribution maps of American butterflies)

The Butterfly Web Site <http://mgfx.com/butterfly> (information on butterflies and butterfly gardening)

Crickets and Grasshoppers The Orthopterists Society http://www.viceroy.eeb.uconn/OS_Homepage (information on the society and Orthoptera, great links to more entomology on the www)

Cockroaches Cockroach World <http://www.nj.com/yucky/roaches/index.html> (a fun site with a wide range of information on cockroaches)



Hissers/Blattodea Culture Group <http://www.ex.ac.uk/~gilramel/roach.html> (general information, rearing instructions, pictures and links to other roach sites)

Dragonflies British Dragonfly Society <http://www.rfhsm.ac.uk:81/golly/bds.html> (information on dragonflies and links to many organizations and clubs)

Dragonflies <http://www.ex.ac.uk/~gilramel/odonata.html> (information on dragonflies and damselflies and links to other related sites on the web)

Flies <http://www.ex.ac.uk/~gilramel/diptera.html> (great information on all of the major fly families with many links to other sites with more information)

Mantids Mantid Home Page <http://ns9000.furman.edu/~dksargen/PM.htm> (great pictures of mantids, rearing information, good leads for general information, and insect stories and facts)

Mosquitos New Jersey Mosquitoes <http://www.rci.rutgers.edu/~insects/njmos.htm> (wonderful section on mosquito biology and sections on diseases vectored by mosquitoes)

Insects as Food Fun Insect Ideas <http://www.uky.edu/Agriculture/Entomology/ythfacts/bugfood1.htm> (creative cooking to simulate eating insects i.e. using raisins or nuts in food)

Dr. Frog's Recipe Page <http://frog.simplenet.com/froggy/recipes.shtml> (cultural foods from around the world that use insects)

Insect Recipes <http://www.ent.iastate.edu/Misc/insectasfood.html> (collection of insect recipes)

Archi McPhee Edibles <http://www.mcphee.com/edibles/index.html> (a fun site with insect candies and other interesting things sold through the McPhee catalog)

More Insect Recipes <http://www.uky.edu/Agriculture/Entomology/ythfacts/bugfood2.htm> (more insect recipes)

General Insect Information

Book of Insect Records <http://gnv.ifas.ufl.edu/~tjw/recbk.htm> (detailed facts on insect feats and records)

Creepy Crawlies Bibliography <http://www.eduplace.com/rdg/itl/1/creepy/index.html> (a bibliography of entomology books for a variety of ages compiled by H. Mifflin)

Cultural Entomology Digest <http://www.insects.org> (a collection of current projects and educational materials with lots of articles on insects in human culture including a bibliography)

Entomation <http://members.aol.com/entomation/entomation.html> (entomation clip art for the computer)

Insect Drawings <http://www.life.uiuc.edu/Entomology/insectgifs.html> (excellent pictures and drawings of insects that were used as teaching tools at the University of Illinois Department of entomology 50-60 years ago, historical and great for teaching about insects)

Popular Classics in Entomology <http://www.Colostate.edu/Depts/Entomology/readings.html> (a bibliography of nontechnical books on the natural history of insects and the personal experiences of the entomologists who work on them)

Young Entomologists' Society, Inc. <http://insects.ummz.lsa.umich.edu/YES/YES.html> (includes information about the club as well as interesting ideas and links to other sites). Address: 1915 Peggy Place, Lansing MI 48910-2553; Phone/fax: 517-887-0499 E-mail: YESbugs@aol.com

Other Arthropods American Tarantula Society Home Page <http://concentric.net/~Dmartin/ats/index.shtml> (information on ATS and basic care for tarantulas)

Scorpion du jour http://wrbu.si.edu/www/stockwell/du_jour/scorpion_du_jourt.html (information and pictures of scorpions; scorpion-enthusiast mailing list)

Sonoran Arthropod Studies Institute <http://www.azstarnet.com/~sasi/> (information on SASI and arthropods of the Sonoran Desert detailed with lots of pictures and a nature trail)



Random insect photos from the field



Leptoglossus occidentalis Heidemann [Hemiptera: Coreidae], the Western conifer seed bug, found on cones of western white pine, *Pinus monticola*. Date: May 15, 2008. Location: Bailey Road Seed Orchards, Vernon BC. Photographer: Penny Major.



Jim Corrigan at Kilpoola Lake, June 2006. Photo J.Heron



Retirements

Dave Raworth Retires



Dave Raworth retires from Agriculture and Agri-Food Canada after 35 years of research. He plans to complete publications that are in review, and continue on a research project with Neil Gilbert in England. In addition, Dave will be doing house repairs and gardening at his home in Victoria, walking the dog 'Bella' at the beach, biking, studying yoga, experimenting with two art forms - oil paints and sculpture - and generally enjoying a few of the many interesting things on planet earth.

Dave's areas of expertise include: biology, life history, and population dynamics of aphids and mites on small fruit crops; improvement of aphid and spider mite control on

small fruit and greenhouse crops; development and improvement of mass-reared biological controls; development of integrated pest management programs on small fruit crops; and improvement of natural biological controls by altering cultural practices. In recent years Dave's current projects have included aphids and field transmission of blueberry scorch virus; forecast pests & develop decision support systems; assess status of pests & their natural enemies; assess adoption, efficacy & impact of Best Management Practices and Integrated Pest Management.



Dave has been involved with the Entomological Society of British Columbia for many years. As the ESBC journal Editor-in-Chief, Dave led the production of the centennial issue of the publication. Most recently, Dave served as ESBC President from 2004 – 05. Dave is also been a mentor to countless students and professionals throughout the years, helping with advice and information on their respective entomological topics.



New ESBC Journal Editor

Hugh Barclay is taking over as Editor-in-Chief of the Journal of the ESBC. Hugh was the editor of the Bulletin of the Entomological Society of Canada for several years. Hugh will be retiring within a couple of months, and looks forward to devoting some of his time and energy to the JESBC.

Ward Strong has been the ESBC Journal Editor-in-Chief since 2002, taking over from Dave Raworth after the centennial issue was completed. The journal editor position demands countless hours of review, coordination and work. Ward will be happy to act as his "transition consultant" for the first year or so and welcomes Hugh to his new role. Ward is planning on immersing himself in his current research in Vernon, and work on getting some of his on research published.

Bugs and Beers

“Bugs and Beers” continue with great fun! This is meant to be an informal setting for amateurs, enthusiasts, and professionals to meet and talk bugs. Come out and meet other entomologists!

Saturday, August 16, 2008 2 pm	Pot-luck BYOB BBQ at Ward Strong’s Home, Vernon Please RSVP Ward through email at Ward.Strong@gov.bc.ca , and he will also provide directions to his home. Ward lives on the lake, so bring your bathing suit, snorkel and flippers and we can survey the aquatic fauna too!
Monday, September 15, 2008 6 pm	Spinnaker’s Brew Pub 308 Catherine Street, Victoria Telephone 1-877-838-2739 http://www.spinnakers.com/brewpub/index.htm
Friday, October 3, 2008 6:30 pm	The Bayside Lounge and Restaurant Located in the Best Western Sands By the Sea Downtown Hotel, 1755 Davie Street, Vancouver Phone: (604) 682-1831 Coincides with the ESBC AGM October 3 and ESBC Symposium Oct 4 http://www.bestwesternsandshotelvancouver.com/contact.html
Friday, November 14, 2008 6:30 pm	The Whip Gallery Restaurant 209 East 6th Ave @ Main St, Vancouver Telephone: 604 874 4689 www.thewhiprestaurant.com
Friday, December 12, 2008 6:30 pm	Foggy Dew Irish Pub 405 North Road, Coquitlam Telephone 604-937-5808 www.foggydewirishpub.com



Efauna Update

June 2008 update:

As usual, lots happening on E-Fauna BC (efauna.bc.ca). We are now working on editing and debugging, and development of new atlas pages. This will be an ongoing process as we work with experts to develop or obtain information where we can.

Our species checklist page is expanding, and today we added a new checklist for the **Corals of British Columbia** to the E-Fauna BC checklist page. This is thanks to the work of Glen Jamieson, and is based on his recently published paper on the corals of BC.

See

<http://www.geog.ubc.ca/biodiversity/efauna/documents/CoralsofBCJamieson2008.pdf>

We hope to add info now on sponges and other marine creatures, on invasive species, and to add to our search capabilities and overall access to species information. One of the next additions that will be made public will be the butterfly links prepared by Rosemary Taylor. Rosemary has developed a database linking butterflies on E-Fauna BC with their food plants on E-Flora BC.

We are lucky to have many new photographers signed in with us, so are seeing the photo galleries expand. Recent highlights include some great shots of cougars, many marine creatures and some terrific bird photos by several photographers. It well worth a browse through the photo galleries.

Stay tuned for more!
Brian Klinkenberg

E-fauna image credit to David Blevins <http://www.blevinsphoto.com/>



Notes from the Field

Summer 2008 in Stanley Park

Submitted by John McLean, UBC Faculty of Forestry

With the windfalls largely cleared away, we have the opportunity to set out our traps again in Stanley Park. A large area of windfall south of Beaver Lake has six semiochemical-baited traps set out to assess ambrosia beetles, bark beetles and wood borers in the area. Another set of similarly baited traps have also been set out along Merilees Trail near Prospect Point which was the most seriously impacted area in the winter of 2006/07. We have set out pit fall traps at each trapping location as well. We sorted last year's catches to order/family where possible and if you have any interest to looking at some of these samples please contact me (john.mclean@ubc.ca).



Agnes Li with one of the pit fall traps she has set out near Prospect Point. Photo John McLean.



Submitted articles:

Mass Amputation at the Royal BC Museum: Sampling B.C.'s Geometrid Moths for DNA Barcoding

Written by Jeremy R. deWaard,

University of British Columbia, Department of Forest Sciences, Vancouver, BC V6T 1Z4
Royal British Columbia Museum, Entomology, 675 Belleville Street, Victoria, BC V8W 9W2

DNA barcoding has emerged in recent years, promising rapid, objective, and accurate species-level identifications using a standardized DNA fragment (Hebert *et al.* 2003a). Proof of principle studies since its inception have demonstrated the efficacy of sequence variation in a 648 base pair segment of the cytochrome oxidase 1 (COI) gene to differentiate species in a wide range of animals (e.g. Hebert *et al.* 2003b) and in distant sectors of life (e.g. Saunders 2005, Seifert *et al.* 2007). While its effectiveness in Lepidoptera has been explored previously (Hebert *et al.* 2003a, Hebert *et al.*, *in prep*), the entire fauna of a region, particularly in a hyper-diverse family, has not been investigated. The Geometridae of BC provide an intriguing test group to this end, with approximately 345 species in BC alone. Moreover, it presents a group that would benefit greatly from a species-identification tool, due to its taxonomically challenging species groups, many of which can only be disentangled by labour-intensive genitalic dissections. In addition, a large proportion of the species are important defoliators, including several native pests such as the fall cankerworm (*Alsophila pometaria*) and invasive pests such as the winter moth (*Operophtera brumata*), making their reliable diagnosis imperative.

To establish and evaluate a DNA barcode library for BC's geometrid moths, I utilized the extensive geometrid collection of the Royal British Columbia Museum (RBCM). In several visits to the collection, 753 specimens of geometrid moths were selected and analyzed. Between 1 and 8 specimens were sampled for each species, with an effort made to cover the geographic range of each species. All specimens selected were databased, digitally photographed, and sampled for DNA analysis by removing a single leg. The tissue samples were analyzed at the Biodiversity Institute of Ontario in Guelph, ON following standard protocols (deWaard *et al.*, *in press*). The data, images and resultant sequences were uploaded to the Barcode of Life Database (BOLD; www.barcodinglife.org). By comparing the new barcode sequences with the BOLD reference database, the identifications of the RBCM specimens could be confirmed, determined, or flagged as potentially incorrect. The latter two cases were checked using the dichotomous keys of McGuffin (e.g. 1987) and Bolte (1990) and corrected as necessary. Species groups that require genitalic



dissections for species delimitation have been left as originally identified; dissections are underway but were not completed for this report.

Of the 753 specimens analyzed, a DNA barcode was successfully generated from 707 (93.9%). This represents 250 species, providing a mean sampling intensity of 2.8 sequences per species. Almost all specimens analyzed were over 10 years old, and barcode sequences were recovered from specimens up to 29 years old. The 46 specimens that were not successfully barcoded contained only four species not represented by another sequence (*Eumacaria latiferrugata*, *Eupithecia behrensata*, *Eupithecia olivacea*, and *Leucobrepbos brephoides*). In general, specimens within a species form monophyletic groups that are divergent from other species clusters, as for instance, in the subfamily Geometrinae (Figure 1A). The COI divergence is typically low (mean = 0.94, range = 0-14.94, SE = 0.08) while the divergence between species of the same genus is relatively high (mean = 8.07, range = 0-15.62, SE = 0.069). However, this is not always the case – 36 of the 250 species could not be discriminated by DNA barcodes i.e. they either shared identical barcodes or had inter-mixed sequences with closely related species. An example of this is in the genus *Caripeta*. *C. divisata* and *angustiorata* can be distinguished from *aequaliaria*, but the former two can not be differentiated from one another (Figure 1B). The morphological identifications of these 2 species are unequivocal; given that the two share similar ranges and the adults fly at the same time (McGuffin 1987), this may suggest that they hybridize or continue to interbreed to some degree. Due to these 36 ‘misbehaving’ species, the overall barcode success rate of 85.6% is nearly ten percent lower than previous estimates of the efficacy of barcodes in Lepidoptera (Hebert et al. 2003a, Hebert et al., *in prep*). This is may be due to several reasons, including some biological (e.g. increased taxonomic sampling should lead to a higher proportion of closely allied taxa, where a higher incidence of incomplete lineage sorting and introgression is expected), but it is probable that the success rate will increase when the pending genitalic dissections and final confirmations/corrections are complete.

By comparing the new barcode sequences with the BOLD reference database, the identification of specimens were confirmed (653), corrected (41) or determined (13). While the validity in extrapolating this to the entire RBCM Geometridae collection is debatable (since only specimens <30 years old were analyzed), this might suggest that roughly 6% of the specimens are misidentified. Again, this number is likely to change when all the necessary dissections are complete, allowing further confirmation and correction to the assigned identifications. Of the determinations provided by barcoding, 2 resulted in new species for the RBCM collection (*Eupithecia lachrymosa* and *E. intricata*). Similarly, one of the corrections provided a new species for the collection—and for Canada (*Lampropteryx suffumata*; deWaard et al., *in prep*).



These examples nicely highlight the utility of DNA barcoding for assisting faunal inventories, as well as its potential for invasive alien species detection.

In summary, this small study on the RBCM Geometridae collection demonstrates the reciprocal contributions that natural history collections and the DNA barcoding programme can provide one another. Collections receive ‘value-added’ to each specimen in the form of online images, DNA sequence data, archived DNA extractions and the onfirmation/correction/determination of species identification, all with negligible damage to specimens. The barcode programme on the other hand, receives access to endless authoritatively identified specimens for generating the barcode reference libraries, as well as access to the invaluable expertise and resources of the ‘collectionsphere’. In tandem, the two institutions are certain to make significant contributions, both in taxonomic discoveries and with the countless applications of the DNA barcoding tool.

Acknowledgements

The work described here was made possible by a NSERC/RBCM Systematics Research Graduate Supplement and I am indebted to R. Cannings, K. Sandal, and G. Hughes for welcoming me into their collectionsphere. An NSERC Canadian Graduate Scholarship, an NSERC Research Network Grant (to L. Humble), and a Forest Investment Account – Forest Science Program Student Grant provided additional financial support. A special thanks to G. Bandelier, R. Cannings, C. Copley, L. Humble, and J.-F. Landry and C. Schmidt for valuable assistance.

Literature Cited

- Bolte, K.B. (1990) Guide to the Geometridae of Canada (Lepidoptera). VI, subfamily Larentiinae, 1. Revision of the genus *Eupithecia*. No. 150.
- deWaard, J.R., Ivanova, N.V., Hajibabaei, M. and Hebert, P.D.N. Assembling DNA Barcodes: Analytical Protocols. In Methods in Molecular Biology: Environmental Genetics (Ed: Cristofre Martin; Humana Press Inc., Totowa, USA). In press.
- deWaard, J.R., Schmidt, B.C., Anweiler, G.G., and Humble, L.M. First Canadian records of *Lampropteryx suffumata* (Denis & Schiffermüller, 1775) (Geometridae: Larentiinae). In preparation.
- Hebert, P.D.N., Cywinska, A., Ball, S.L., and deWaard, J.R. (2003a) Biological identifications through DNA barcodes. Proceedings of the Royal Society of London B 270:313-321.
- Hebert, P.D.N., Ratnasingham, S., and deWaard, J.R. (2003b) Barcoding animal life: COI divergences among closely related species. Proceedings of the Royal Society of London B 270:S96-S99.
- Hebert, P.D.N., deWaard, J.R., and Landry, J.-F. DNA barcodes deliver: Species identifications and revelations for 1/1000 of the Animal Kingdom. In preparation.
- McGuffin, W.C. (1987) Guide to the Geometridae of Canada (Lepidoptera). II, subfamily Ennominae 4. No. 138.
- Saunders, G.W. (2005) Applying DNA barcoding to red macroalgae: a preliminary appraisal holds promise for future applications. Philosophical Transactions of the Royal Society of London, B, *Biological Sciences* 360: 1879-1888.
- Seifert, K.A., Sampson, R.A., deWaard, J.R., Houbacken, J.A., et al. (2007) Prospects for fungus identification using CO1 DNA barcodes, with *Penicillium* as a test case. *Proceedings of the National Academy of Sciences* 104:3901-3906.

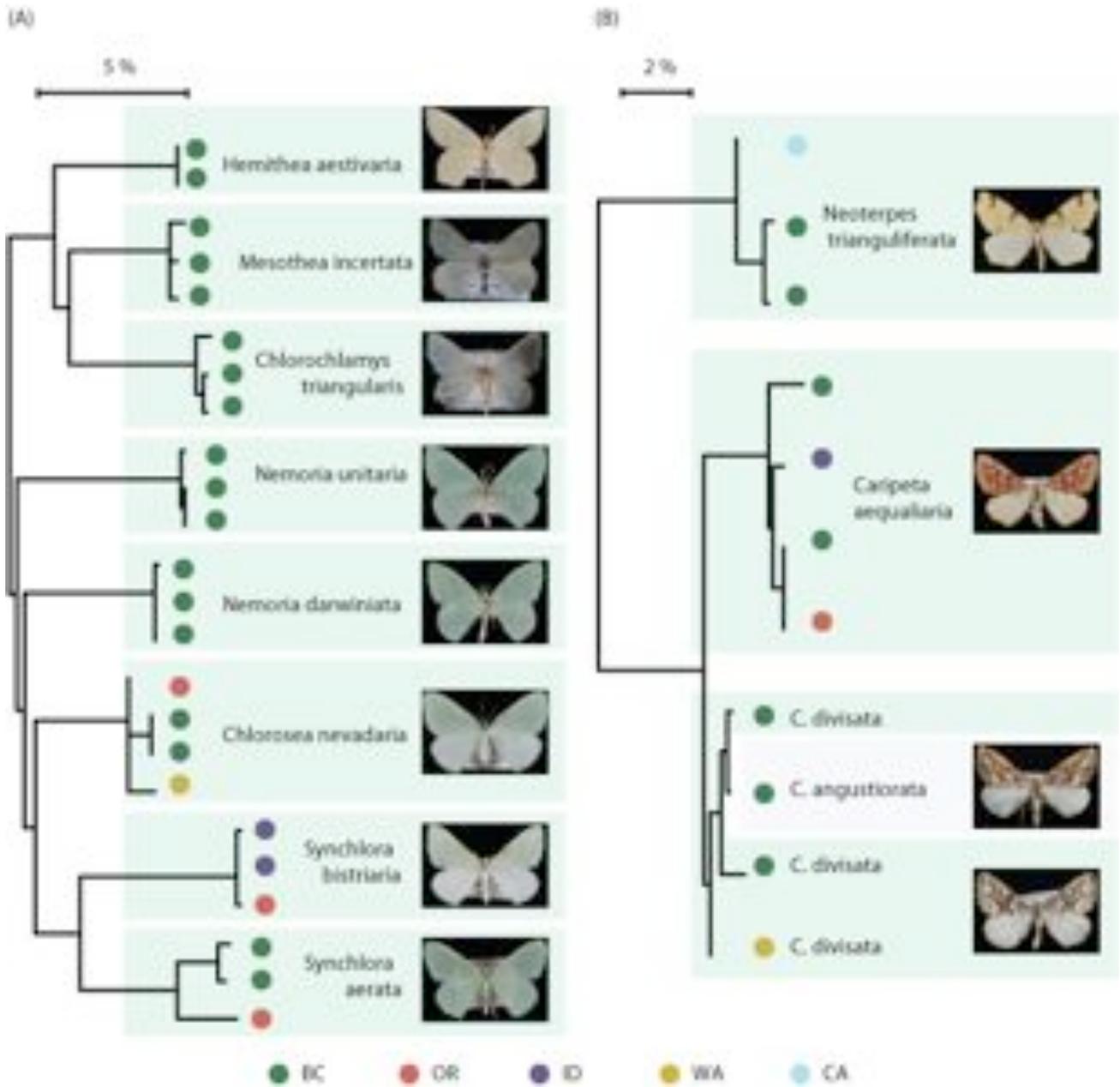


Figure 1. Neighbor-joining trees constructed with COI barcode sequence data for (A) the subfamily Geometrinae and (B) the genus *Caripeta* (with *Neoterpes* as outgroup).



Notes from far a field:

Dunes, Dragonflies and Dikdiks: a short trip to Namibia and South Africa

Written by Rob Cannings, Royal British Columbia Museum, Victoria, BC

In April and May 2007 I had the good fortune to make my first trip to southern Africa – a jaunt of three weeks to Namibia and South Africa with almost as much time (it seemed!) spent in planes and airports. The main purpose of the trip was to attend an international conference on dragonfly research in Swakopmund, Namibia. While there, I made a whirlwind tour of some of that spectacular country, traveling from the stark dunes of the coastal Namib Desert to the rich woodlands of the Okovanga River in the northeast. The last week was spent along about 600 kilometres of coastline at the southern tip of Africa, from Cape Town east to Tsitsikamma National Park. Not only did I try to learn some of the dragonflies in both these areas but I absorbed the sights and sounds of other exotic insects, of stunning landscapes and weird plants, of the wonderful birds, mammals and other inhabitants of the southern African environment.



Photo: Rob Cannings

I have been active in international dragonfly research and conservation over the past thirty years and have attended various meetings around the world. I was particularly excited by the Namibian meeting because, besides the wonderful venue, a major theme was one close to my heart -- Odonata conservation, especially inventory and species status ranking. It included a plenary seminar entitled “Global Dragonfly Assessment for Conservation” that was sponsored by the IUCN. I have had an interest in the International Union for the Conservation of Nature since 1980 when I attended my first IUCN (Odonata Subgroup) gathering in Kyoto. My membership on the Committee on Status of



Photo: Rob Cannings



Endangered Wildlife in Canada (COSEWIC) (Invertebrate Subcommittee) and the General Status Group (Odonata) of Environment Canada gave me some experience in Canada's activities in dragonfly conservation. These groups play a major role in determining the conservation status of dragonfly species nationally. Recently, national and provincial conservation ranks of dragonflies and damselflies were published in a new annotated checklist of the Odonata of Canada (Catling *et al.* 2005).



Urothemis edwardsii Photo: Dennis Paulson and Netta Smith. Contact Rob Cannings for photographer contact information.

The regular sessions of the meeting also focused, to some extent, on Odonata inventory and conservation. My contribution described the results of the decade-long Living Landscapes entomology project, an extensive survey of the dragonflies of British Columbia with special reference to species status, habitat requirements, and species of management concern. The involvements of local volunteers and inter-ministerial cooperation have been special characteristics of this research. Living Landscapes was a multidisciplinary Royal BC Museum project designed to involve the museum's staff, research and collections with residents of the various regions of the province. The dragonfly inventory was partnered with the BC Conservation Data Centre, an agency of the BC Ministry of the Environment that maintains databases of rare and endangered species and ecosystems in BC. The

conservation-oriented results of this project are documented in Ramsay and Cannings (2005). Conversations with my international colleagues about inventories and their differing complexities in different countries were fascinating and useful.

The meetings lasted from 16 to 20 April, 2007. While on the coast at Swakopmund I participated in several day trips to local spots of interest, including the huge sand dunes southeast of the town, the gravel plains where the strange *Welwitschia* plants thrived, and the lagoons of Walvis Bay, thick with waterbirds. There are few localities with fresh water nearby but we



Trithemis annulata Photo: Dennis Paulson and Netta Smith. Contact Rob Cannings for photographer contact information.



examined a few for dragonflies. Namibia has about 80 per cent the land mass of BC and has 126 dragonfly species compared to BC's 87, but this is still rather depauperate for a tropical/subtropical country. Most of the dragonfly species live in the far north where it is wettest, especially along the Okavango River.



Rob and Welwitschia plant in Namib Desert
Photo: John Simaika

The post-congress trip, 21-26 April, 2007 headed north and east. It was organized as an informal camping safari to three main sites: Etosha National Park, the Okavango River along the Angola and Botswana borders and Waterberg Plateau. Lots of memories there! Returning to Windhoek, the country's capital, I flew back to Cape Town. John Simaika, a former University of Victoria student who I supervised as an undergraduate honours student, is now working on a PhD at the University of Stellenbosch near Cape Town. He is studying endangered dragonflies and their management with Michael Samways, a prominent invertebrate conservation biologist. John accompanied me on the Namibian trip and, in South Africa from 27 April to 3 May, 2007, showed me various dragonfly and robber fly habitats along the southern coast.

References

- Catling, P.M., R.A. Cannings and P.M. Brunelle. 2005. An annotated checklist of the Odonata of Canada. *Bulletin of American Odonatology* 9(1): 1-20.
- Ramsay, L.R. and R.A. Cannings. 2005. Determining the status of British Columbia's dragonflies. In T.D. Hooper (Ed.) *Proceedings of the Species at Risk 2004 Pathways to Recovery Conference March 2-6, 2004, Victoria, British Columbia. Species at Risk 2004 Pathways to Recovery Conference Organizing Committee, Victoria, BC.* On Internet at: http://www.speciesatrisk2004.ca/pdf/ramsay_edited_final_feb_28.pdf



Gainsbok in Etosha National Park, Namibia, June 2007.
Photo Rob Cannings.



Do you have artistic talent? Do you have a good entomological joke? Send your ideas to the Boreus editor for the December 2008 issue

Entomological Humour

Berry Wijdeven is a Species At Risk Biologist for the BC Ministry of Environment in Queen Charlotte/Haida Gwaii. Berry has had his work published in McLeans, the National Post, Vancouver Sun and numerous other weekly publications. Among his artistic talents, he creates the weekly comic *Nature Calls*. Register for Berry's weekly email comics by sending him an email at Berry.Wijdeven@gov.bc.ca

nature calls



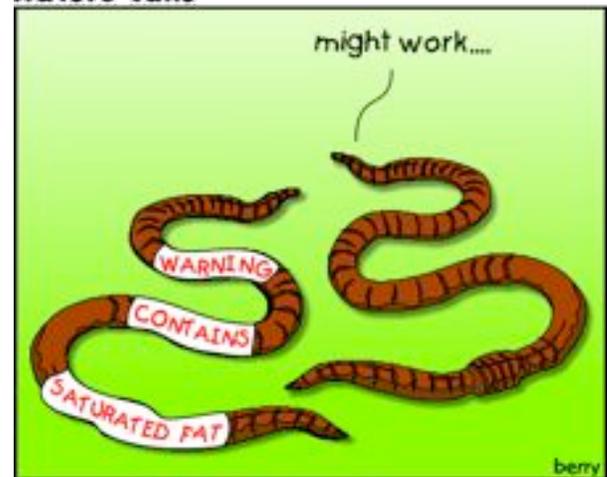
nature calls



nature calls



nature calls





In Memory

Dr. Edward Becker

1923 - 2008

Dr. Ed Becker passed away on May 13, 2008 at the age of 85. He was a well known and respected entomologist, attending every Entomological Society of Canada AGM over the past 49 years. He was a systematist on click beetles (Coleoptera: Elateridae) at the Canadian National Collection of Insects, Arachnids and Nematodes (CNC) in Ottawa. His passion for his work continued into retirement, as he came to work nearly every day for the past 28 years. A more complete obituary will be published in the December issue of *Boreus*.



Photographer Information for June 2008 Boreus Issue

Photographer

Rob Cannings
Jeremy deWaard
Jennifer Heron
John McLean
Agnes Li
John Simaika

Email

rcannings@royalbcmuseum.bc.ca
Jeremy.dewaard@gmail.com
Jennifer.Heron@gov.bc.ca
John.McLean@ubc.ca
agnesli@hotmail.com
simaikaj@telus.net