

Bulletin

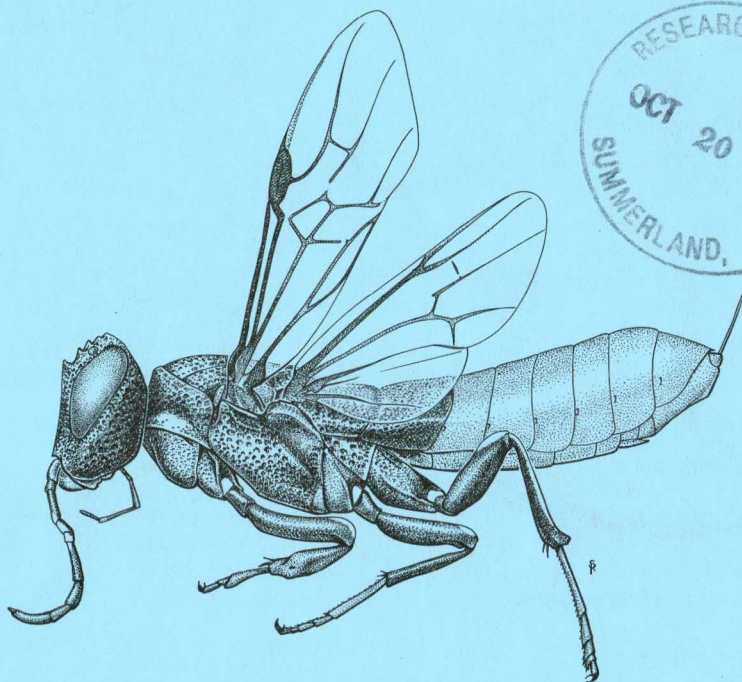
Entomological Society
of Canada

Société d'Entomologie
du Canada

Volume 31

No. 3

Sept/sept 1999



Entomological Society of Canada
Société d'Entomologie du Canada

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des matières sur la couverture-arrière

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Web Page for the ESC: <http://www.biology.ualberta.ca/esc.hp/homepage.htm>

E-mail: entsoc.can@sympatico.ca

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.

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

*Illustrated on the front cover is a *Orussus occidentalis* (Cresson) (Hymenoptera: Orussidae). These rare and unusually sculptured Hymenoptera are a link between phytophagous sawflies and the thin-waisted Apocrita. They are the only parasitic Symphyta known. The family is ancient and well represented as fossils. [Habitus illustration by Susan Rigby, Ottawa, Ontario, courtesy of H. Goulet and J. Huber.]*

*La page couverture illustre l'adulte de *Orussus occidentalis* (Cresson) (Hymenoptera: Orussidae). Ces hyménoptères rares aux ornements inusités constituent un lien entre les mouches à scie polyphages et les Apocrites à taille fine. Ce sont les seuls Symphites parasitiques connus. Cette famille est ancienne et est bien représentée dans les fossiles. [L'illustration par Susan Rigby, Ottawa, Ontario, une courtoisie de H. Goulet and J. Huber..]*

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

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.

SOCIETY BUSINESS/AFFAIRES DE LA SOCIÉTÉ

49th Annual General Meeting

The Annual General Meeting of the Entomological Society of Canada will be held at the *Radisson Hotel* in Saskatoon on September 28, 1999.

La réunion annuelle générale de la Société d'entomologie du Canada aura lieu au *Radisson Hotel* à Saskatoon, le 28 septembre 1999.

Governing Board Meeting

The Annual Meeting of the Governing Board will be held at the *Radisson Hotel* in Saskatoon on September 25, 1999.

La réunion annuelle du conseil d'administration se tiendra au *Radisson Hotel* à Saskatoon, le 25 septembre 1999.

Matters for consideration at any of the above meetings should be sent to the secretary at the address below:

Veillez faire part au secrétaire de tout sujet pouvant faire l'objet de discussion à l'une ou l'autre de ses réunions en communiquant à l'address suivante:

Dr. Rick West
Box 515, Portugal Cove
Newfoundland A0A 3K0
phone and fax: 709-895-2734
email: reely.west@roadrunner.nf.net

The *Canadian Entomologist* and back orders of the *Memoirs* are available from the Ottawa Office and may be purchased by Mastercard or VISA as well as by cheque or money order.

The web address for the Linnaean Games is www.biology.ualberta.ca/esc.hp/frenlin.htm

Please send all correspondence concerning the Bulletin to:

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The deadline for submissions to be included in the next issue (Vol. 31(4)) is **November 1, 1999**
La date limite pour recevoir vos contributions pour le prochain numéro (Vol. 31(4)) est le **1 novembre 1999**

1999

Call for Nominations

Achievement Awards Committee

Gold Medal for Outstanding Achievement in Canadian Entomology and The C. Gordon Hewitt Award

Members of the Society are invited to nominate individuals whom they regard as eligible for these awards (for the year **2000**). Nominations should be sent in an envelope marked "Confidential" to the following address:

**Achievement Awards Committee
Entomological Society of Canada
393 Winston Avenue
Ottawa, Ontario
K2A 1Y8**

and should comprise: (1) the name and address of the nominee(s); (2) a statement of relevant achievements; and (3) the name of the nominator and at least one seconder. To be considered by the Achievement Awards Committee, nominations must bear a postmark no later than **December 31 1999**.

The following conditions govern these awards:

1. Outstanding contributions should be judged on the basis of
 - (a) superior research accomplishment either as a single contribution or as a series of associated endeavours and which may be either in entomology or a related field where the results obtained are of great consequence;
 - or
 - (b) dedicated and fruitful service in the fields of Society affairs, research, administration or education.
2. No more than one of each award shall be granted per year but, where circumstances warrant, more than one individual may be mentioned in a single award.
3. Recipients need not be members of the Society providing their contribution is judged to have a major impact on entomology in Canada.
4. The award may be granted on different occasions to the same recipient but for different contributions to entomology in Canada.
5. Nominees for the C. Gordon Hewitt Award must be less than 40 years of age throughout the calendar year in which the award is both announced and awarded.

Comité des décorations

Médaille d'Or pour Contributions Exceptionnelles à l'Entomologie Canadienne et Prix C. Gordon Hewitt

La Société invite les membres à lui faire parvenir les noms des personnes qu'ils considèrent éligibles à ces deux prix. Veuillez envoyer vos nominations (pour l'année 2000) au:

**Comité des décorations
La Société d'entomologie du Canada
393 Winston Avenue
Ottawa, Ontario
K2A 1Y8**

dans une enveloppe portant la mention "Confidentiel". La nomination doit contenir: (1) le nom ainsi que l'adresse du (ou des) candidat(s) désigné(s); (2) un compte rendu des réalisations pertinentes; et (3) le nom du parrain et celui d'au moins une deuxième personne appuyant la mise en nomination. Pour être acceptées par le Comité, les nominations devront porter un sceau postal d'au plus tard le 31 décembre 1999.

Les conditions suivantes régissent le choix des récipiendaires de ces prix:

1. Les contributions exceptionnelles devraient être jugées dans le contexte

(a) d'un accomplissement hors pair en recherche, soit comme résultat d'une seule contribution ou d'une série d'efforts reliés et ayant abouti à des résultats de grande valeur. Cette recherche aura été réalisé en entomologie ou tout autre domaine connexe.

ou

(b) de service dévoué et fructueux au profit de la Société, de l'administration de recherche, ou de l'éducation.

2. Chaque prix ne sera décerné qu'une seule fois par année. Cependant, lorsque les circonstances le justifient, plusieurs personnes peuvent collectivement devenir récipiendaires d'un prix.

3. Les récipiendaires ne doivent pas nécessairement être membres de la Société pour autant que l'on juge que leur contribution à eu un impact majeur sur l'entomologie au Canada.

4. Chaque prix peut être décerné plus d'une fois au même récipiendaire mais pour différentes contributions à l'entomologie au Canada.

5. Le candidat désigné pour le prix C. Gordon Hewitt doit être agé de moins de 40 ans pour toute la durée de l'année au cours de laquelle le prix est annoncé et décerné.

NEWS OF ORGANIZATIONS

Biological Survey of Canada (Terrestrial Arthropods)

The Scientific Committee met in Ottawa on 15-16 April 1999. A more detailed account of the meeting is included in the Newsletter of the Biological Survey (Terrestrial Arthropods) 18(2), 1999.

Scientific Projects

Family keys

Dr. G. Scudder reported that many of the plates for the keys to the apterygotes and exopterygotes are now done. It is hoped that by next year the plates will be complete and keys will be near final form.

Grasslands

The Committee discussed the grasslands project at length, decided on a general strategy to move this important project forward, including core scientific and other potential products on a range of time scales, and established a larger subcommittee to steer it.

Arctic Invertebrate Biology

Dr. Richard Ring noted that the main initiative has been the encouragement of communication and collaboration, which continues largely due to the production of Arctic Insect News. A symposium on insect and plant cold hardiness is planned for the year 2000 in Victoria.

Seasonal adaptations

Dr. Hugh Danks reviewed activities under this project, including papers about trehalose and about life cycles of polar arthropods. The International Japanese-Czech New Year Seminar in Entomology on Seasonal Adaptation in Insects and Mites, held in Japan, was highly relevant for this project. Dr. Danks presented a lecture there and also held discussions at Kochi University. An article on life cycles had been sent to *Antennae*, the bulletin of the Société d'entomologie du Québec.

Insects of Keewatin

Dr. Doug Currie explained the great biogeographical interest of the Keewatin region and the fact that a large area between the Mackenzie River and Hudson Bay has been neglected faunistically. Terrestrial as well as aquatic insects will be studied by travelling 600 km along the Horton river over a three-week period in August 2000. Dr. Currie welcomes further interest in this expedition, for which 4 of about 6 places are already taken.

Other scientific priorities

Arthropod fauna of soils

Dr. Valerie Behan-Pelletier commented on the 1999 acarology summer program at Ohio State University and the Soil Ecology Conference. A report is being prepared on biodiversity in Canadian agricultural soils for the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA). Dr. Behan-Pelletier continues to collaborate with colleagues in studying canopies of western hemlock and of amabilis fir where oribatid mites are the dominant arthropods. Field work for a project entitled "Identifying ecosystem controls on soil biodiversity" begins soon in the Konza tall-grass prairie in Kansas.

Old-growth forests

Dr. Scudder had considered the possibility of a symposium on old-growth forests, but it was deemed premature. When progress is more advanced a symposium to compare objectives and results will be developed. Drs. Scudder and Ring reported on specific studies and developments in old-growth forests in Canada.

Insects of Newfoundland

Dr. David Larson noted that study of the fauna in Newfoundland has been going on for a number of years, assembling representative collections, cataloguing literature information, and condensing other information on the Newfoundland fauna. No one is currently in a position to spearhead the project, but in the meantime it will be continued on an ad hoc basis.

Damaged ecosystems

Dr. Joe Shorthouse noted that this project continues to study biodiversity on tailings in lands owned by Inco and Falconbridge. Relevant papers are in press.

Dissemination of biodiversity information on Survey web site; and project on faunal analysis and gaps in expertise

Dr. Bob Anderson introduced a subcommittee report dealing with technical and cost issues related to a potentially larger BSC platform, potentially increasing the Survey's profile by making substantive faunal content available on the web page, potential expansion of components, format, and linkages with the faunal analysis project of the Survey. The Survey will explore the possibility of bringing in an intern to help redesign the web site and deal with technical issues. With regard to the faunal analysis, relatively complete contributions have been received for some orders. Dr. Huber and Dr. Anderson will continue to solicit further content.

Survey publicity

Dr. Shorthouse is developing slide material relevant to the Survey. He requested that other members send him photographs, slides or electronic images of themselves at their institutes or working in the field.

Funding for biodiversity projects

Dr. Terry Wheeler has continued to collect information on sources of funding for biodiversity projects. The information, as well as an introduction with advice on grant writing, will eventually be posted on the Survey's web site.

Workshop on biodiversity monitoring sponsored by EMAN

The Survey had organized a workshop, sponsored by EMAN, to determine which groups of organisms would be best to use for biodiversity monitoring at all EMAN sites. A representative group of biologists met in Ottawa in February 1999. The submitted report of the workshop will be posted in due course on the EMAN web site. A definitive list of what must be monitored is not recommended in the report, because especially for insects many more expert discussions would be required.

Geographic data standards for specimen labels

Dr. Wheeler reported on the feasibility of establishing standards for specimen data labels. The Survey agreed to produce a brief that synthesizes such information; a draft will be reviewed at the next Committee meeting.

Other priorities

The Committee reviewed information about other topics of interest, including information concerning various Survey projects that are no longer fully active, invasions and reductions in the Canadian insect fauna, endangered species, scientific representation on biodiversity forums, and a potential brief on biodiversity.

Liaison and exchange of information

Canadian Museum of Nature

Dr. Anderson, on behalf of Dr. Mark Graham, reported that the Museum will have some operating challenges in the next year, as the owner of the new Natural Heritage Building will be working to bring

the building up to correct seismic specifications. There will be some disruptions, although insurance will cover expenses required to correct the building as well as losses of productivity. The CMN continues as a partner in the Canadian Biodiversity Information Initiative, as it develops the butterfly module of the Biota of Canada project (<http://www.nature.ca/CanBII>). The CMN continues to provide logistic and financial support for 35 ongoing research activities being carried out by 14 research scientists under four main projects: collection management and conservation research, issues in biodiversity, rare elements and paleobiological studies (see <http://www.nature.ca>). The CMN continues to develop the Federal Biosystematics Partnership (FBP). The CMN seat on the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) now also represents the FBP. The CMN has ceased publication of Global Biodiversity as a result of fiscal realities and other internal priorities such as the opening of new public galleries.

ECORC, Agriculture and Agri-Food Canada

Dr. Jean-Marc Deschines, Director, ECORC, explained that the Biological Resources Program has been reorganized to create three sections, including one dealing with systematic entomology and one with biodiversity and bioinformatics. Dr. Deschines reassured the Committee that sufficient resources will continue to be devoted to maintain and curate the collections. He confirmed Agriculture's involvement with the Federal Biosystematics Partnership. Dr. Deschines reported on recent ECORC participation in an OECD meeting of the Global Biodiversity Information Facility. He also described a proposal for a Biota of Canada information network (a final decision is awaited on that proposal). Cooperative research agreements continue with EMAN for assessments of species diversity. There is also a proposal to develop a data base of insects in Canadian national parks. Staffing priorities are currently being reviewed in conjunction with program priorities.

Entomological Society of Canada

Dr. Hugh Danks, on behalf of Dr. Linda Gilkeson, reported that the final items in the Society's strategic review have been completed. For example, a 3-year contract with the NRC Research Press for production of *The Canadian Entomologist* has now been signed. The Society is in a good financial position for the future. Because the midterm meeting of the Society Executive is scheduled for April 17 other developments could not yet be reported, although discussions related to the joint Annual Meeting with the Entomological Society of America and the Société d'entomologie du Québec in the year 2000 are a major issue.

Canadian Forest Service

Dr. Ben Moody, Scientific Advisor, Pest Management, reported that the Canadian Forest Service has been examining the biosystematics of exotic pests such as the Asian longhorn beetle. A joint workshop with the Canadian Food Inspection Agency in October considered such economic pests, identifying needs to deal with exotics, including the need for biosystematics. The CFS Biosystematics Working Group has prepared a draft report listing existing expertise, gaps and needs for the future. CFS recently signed a MOU with the Canadian Food Inspection Agency; the CFS will conduct research especially on environmentally safer fumigants. Regulations requiring inspection of shipments from China and Hong Kong have been put in place.

Parks Canada

Mr. Jean Poitevin, Applied Research Coordinator, Parks Canada reported on activities in Canadian Parks related to database gathering and information building. Parks is in the process of setting up national lists of animals and plants, which would be placed eventually on the Parks Canada web site. The next step would be to put more emphasis on arthropods for the State of the Parks report due in 2001. A small project with Agriculture and Agri-Food Canada will organize the data on insects collected in past contracts into digital format so that it can be shared and its value demonstrated.

Environment Canada / Ecological Monitoring and Assessment Network

Dr. Peter Hall explained that he is working part time with EMAN on partnerships within the fed-

eral government and other organizations with respect to environmental monitoring projects, development of environmental monitoring methods, and publicizing the results of monitoring efforts in Canada. He reported that the national EMAN meeting, held in January 1999 in Victoria, was attended by approximately 400 people from diverse backgrounds. He noted that the need to get an environmental monitoring message across to the public and to the senior levels of government in order to maintain support came up again and again throughout the meeting. The Biological Survey had displayed a poster at the meeting. The next EMAN national meeting will be in Toronto, January 2000.

Canada/MAB and the Biodiversity Science Board of Canada

Dr. Patricia Roberts-Pichette informed the Committee about developments related to the DIVERSITAS International Biological Observation Year (IBOY). She also reported on news from the Biodiversity Science Board, including draft reports on a number of topics. Dr. Roberts-Pichette noted that Canadian memberships in international activities are declining. For example, Canadian memberships in the International Institute for Applied Systems Analysis and the International Union of Biological Sciences and the Pacific Science Association have been discontinued.

Parasitology module, Canadian Society of Zoologists

Dr. David Marcogliese noted the Canadian Museum of Nature's continuing intellectual support for the parasitology module. The stickleback project continues to receive new data. The final draft of the protocols for sampling for parasites of freshwater fish has been completed. The Canadian Society of Zoologists has formed a standing committee on biodiversity. The 1999 annual meeting of the CSZ includes a symposium on host-parasite interactions in a changing climate. Dr. Marcogliese noted some international issues and also noted web sites and publications of interest (e.g. <http://www.gov.ns.ca/legi/legc/>; and <http://www.redpath-museum.mcgill.ca/>).

Secretariat activities

Ongoing operations of the Biological Survey secretariat were reviewed, including coordination, research and other roles, and travels to entomological centres by Dr. Danks on behalf of the Survey to exchange information about relevant work and to present seminars and lectures.

Other items

Regional developments

Information from different regions of Canada was summarized. For example, in British Columbia, Dr. Scudder has retired from UBC, but no replacement has been hired and courses have been cancelled. The disposition of the UBC collections is still unknown. Two new NSERC industrial chairs have been established at the University of Victoria.

In the prairies, construction work for a building expansion at the Lethbridge research centre will begin in the fall. An active program on forest biodiversity continues at the University of Alberta. Dr. Felix Sperling will take up a position in systematic entomology there in July 1999.

In Ontario, a new biodiversity gallery is scheduled to open soon at the Royal Ontario Museum and will include a substantial insect component. An Ontario-wide Odonata survey is being set up.

In Quebec, the White Admiral Butterfly was voted as the insect emblem of Quebec although among entomologists the Ebony Jewelwing damselfly was favoured. The May issue of Québec Science magazine will have a supplement about entomology in Quebec. A tour of insect biodiversity is now on the Schoolnet web site [http://www.schoolnet.ca/collections/biodiversity/about_insects_what.html]. McGill University has received substantial funds to upgrade facilities for long-term ecological monitoring and research at its field stations. A variety of insect studies and surveys are in progress in the province.

In Newfoundland and the Maritimes, there are now relatively few active entomologists. The

Newfoundland insectarium will open officially in October 1999. A previous annual entomology field trip on Brunette Island, north of St. Pierre and Miquelon, has led to a paper in press about the collection made there. Pending legislation in PEI will require buffer zones along watercourses to protect riparian habitat, and will favour the stream and pond biota.

With respect to the Arctic, a tundra ecosystem monitoring network of the International Tundra Experiment (ITEX) will include an entomology component. NSERC has formed a task force dealing with problems in research in the north and recently sent out a questionnaire about the current state of affairs. The United States National Science Foundation has increased funding for arctic research.

Other matters

The Committee also considered recent Survey publications especially newsletters, the annual report to the Canadian Museum of Nature and liaison with foreign organizations. The annual general meeting of Biological Survey Foundation members took place, including information about very favourable reviews of the book *Insects of the Yukon*.

Hugh Danks
Canadian Museum of Nature
Ottawa

International Commission on Zoological Nomenclature

The International Code of Zoological Nomenclature

The new and extensively revised 4th Edition of the *International Code of Zoological Nomenclature* has now been published and is in effect from 1 January 2000. The price is £40 or \$65, but discounts are offered to individuals buying the Code for personal use or to institutes buying five or more copies. Full details of how to buy copies are given on the Commission's Website <http://www.iczn.org> or may be obtained by e-mailing iczn@nhm.ac.uk.

Applications published in the Bulletin of Zoological Nomenclature

The following Applications were published on 30 June 1999 in Vol. 56, Part 2 of the Bulletin of Zoological Nomenclature. Comment or advice on any of these applications is invited for publication in the Bulletin and should be sent to the Executive Secretary (I.C.Z.N.), c/o The Natural History Museum, Cromwell Road, London SW7 5BD, U.K. (e-mail: iczn@nhm.ac.uk).

Case 3052 *Sphaerius* Waltl, 1838 and SPHAERIUSIDAE Erichson, 1845 (Insecta, Coleoptera): proposed conservation by the partial revocation of Opinion 1331

M.A. Jäch, Naturhistorisches Museum, Burgring 7, A-1014 Wien, Austria (e-mail: manfred.jaech@nhm-wien.ac.at)

Abstract, The purpose of this application is to conserve the beetle family-group name SPHAERIUSIDAE Erichson, 1845 and the name of its type genus *Sphaerius* Waltl, 1838. The nominal genus *Sphaerius* was unnecessarily suppressed in Opinion 1331 (1985) despite the fact that it was never (and is still not) a homonym. The Commission is asked to rescind certain parts of Opinion 1331 and to correct errors of fact relating to a number of names placed on Official Lists.

Keywords. Nomenclature; taxonomy; Coleoptera; SPHAERIUSIDAE; *Sphaerius*; *Sphaerius acaroides*.

Case 3063 *Blennocampa* Hartig, 1837, *Cryptocampus* Hartig, 1837, *Taxonus* Hartig, 1837, *Ametastegia* A. Costa, 1882, *Endelomyia* Ashmead, 1898, *Monsoma* MacGillivray, 1908, *Gemmura* E.L.

Smith, 1968, BLENNOCAMPINI Konow, 1890 and CALIROINI Benson, 1938 (Insecta, Hymenoptera): proposed conservation by setting aside the type species designations by Gimmerthal (1847) and recognition of those by Rohwer (1911).

Stephan M. Blank and Andreas Taeger, Deutsches Entomologisches Institut, Schicklerstrasse 5, D-16225 Eberswalde, Germany (e-mail: blank@dei-eberswalde.de; taeger@dei-eberswalde.de)

Abstract. Gimmerthal (1847) proposed type species for the sawfly genera *Poecilostoma* Dahlbom, 1835, *Blennocampa* Hartig, 1837, *Cryptocampus* Hartig, 1837 and *Taxonus* Hartig, 1837 (family TENTHREDINIDAE). The designations of type species in Gimmerthal's publication have been overlooked by subsequent authors. The purpose of this application is to conserve the subsequent designations of type species by Rohwer (1911), thereby maintaining the current usage of the genus-group names *Blennocampa*, *Cryptocampus*, *Taxonus*, *Ametastegia* A. Costa, 1882, *Endelomyia* Ashmead, 1898, *Monosoma* MacGillivray, 1908 and *Gemmura* E.L. Smith, 1968, and the family-group names BLENNOCAMPINI Konow, 1890 and CALIROINI Benson, 1938.

Keywords. Nomenclature; taxonomy; Hymenoptera; TENTHREDINIDAE; BLENNOCAMPINAE; CALIROINI; sawflies; *Blennocampa*; *Cryptocampus*; *Taxonus*; *Ametastegia*; *Endelomyia*; *Monosoma*; *Gemmura*.

Case 3066 *Macrophya* Dohlbom, 1835 (Insecta, Hymenoptera): proposed designation of *Tenthredo montana* Scoppoli, 1763 as the type species; and *Tenthredo rustica* Linnaeus, 1758: proposed conservation of usage of the specific name by the replacement of the syntypes with a neotype

Stephan M. Blank and Andreas Taeger, Deutsches Entomologisches Institut, Schicklerstrasse 5, D-16225 Eberswalde, Germany (e-mail: blank@dei-eberswalde.de; taeger@dei-eberswalde.de)

Abstract. The purpose of this application is to conserve the understanding of the name *Macrophya* Dahlbom, 1835, which has been used for a genus of sawflies included in the family TENTHREDINIDAE (tribe MACROPHYINI) since its original publication. However, in 1934 the name of the type species of the genus, *Tenthredo rustica* Linnaeus, 1758, was transferred to a species of sawfly included in the genus *Arge* Schrank, 1802 (family ARGIDAE), thereby formally rendering the name *Macrophya* a junior subjective synonym of *Arge*. It is proposed that *Tenthredo montana* Scoppoli, 1763 be designated as the type species of *Macrophya* in accord with the long-established and universal usage of the generic name. It is also proposed that the name-bearing status of the syntypes of *Tenthredo rustica* Linnaeus, 1758 be set aside and a neotype designated in accord with the use since 1934 of the specific name for a well-known and widespread species of *Arge*.

Keywords: Nomenclature; taxonomy; Hymenoptera; TENTHREDINIDAE; MACROPHYINI; ARGIDAE; sawflies; *Macrophya*; *Macrophya montana*; *Arge rustica*.

Case 3124 *Apis proava* Menge, 1856 (currently *Electrapis proava*; Insecta, Hymenoptera): proposed conservation by designation of a neotype

Michael S. Engel, Department of Entomology, American Museum of Natural History, Central Park West at 79th Street, New York, N.Y. 10024-5192, U.S.A.

Abstract. The purpose of this application is to provide stability to the name *Apis proava* Menge, 1856 for a species of fossil bee occurring in the Eocene fauna of Europe. The lectotype designated by Zeuner & Manning (1976) is now in extremely poor condition and little information on the bee's identity can be gleaned from this specimen. The paralectotype, however, is in relatively good condition and can be confidently assigned. It is proposed that the original lectotype designation be set aside and the paralectotype be designated as neotype, thereby stabilizing the identity of *Apis proava*.

Keywords. Nomenclature; taxonomy; Hymenoptera; APIDAE; fossil bees, Baltic amber; Eocene; *Apis proava*.

Opinions published in the Bulletin of Zoological Nomenclature

The following Opinions were published on 30 June 1999 in Vol. 56, Part 2 of the *Bulletin of Zoological Nomenclature*. Copies of these Opinions can be obtained free of charge from the Executive Secretary, I.C.Z.N., c/o The Natural History Museum, Cromwell Road, London SW7 5BD, U.K. (e-mail: iczn@nhm.ac.uk).

OPINION 1927. *Lactura* Walker, 1854 (Insecta, Lepidoptera): conserved, and the specific name of *Eustixis pupula* Hubner, [1831] (currently *Lactura pupula*): conserved

PERSONALIA

IN MEMORY

Conrad Charles Loan (1926-1999)

Conrad Loan died on July 9, 1999 when his car collided with an oncoming truck near Perth, Ontario. An autopsy showed that he had suffered a heart attack. Visitation with the family took place at their home near Kemptville, Ontario on July 14, and this was followed by a private funeral. Conrad is survived by his wife Louise, his five children, eight grandchildren, one great-grandchild, and by his three brothers and two sisters. He was 72.

Conrad was a superb naturalist. He made himself familiar with the wild plants of eastern Ontario, and was a creative gardener. He kept bees. He made maple syrup. He and Louise bred Great Pyrenees dogs and, in addition, raised many exotic breeds of poultry and livestock. At one time Conrad taught goat-rearing at Kemptville Agricultural College. In retirement, he was a school-bus driver for the local school board. He also tutored in an adult literacy program and transported cancer patients to their medical appointments.

Conrad was born in Ottawa on August 10, 1926. He served briefly in the Canadian Armoured Corps, then, at the end of hostilities, entered McMaster University, graduating in 1949. Like many Canadian entomologists, he worked through university by serving as a Student Assistant in the government labs during summers. The late Jack Martin once related how he and Conrad became stranded while collecting insects for the Northern Insect Survey in Yukon Territory. Bad weather delayed the arrival of the supply plane, and the two men had nothing to eat for several days but one duck.

Conrad did his Master's and Doctorate degrees at the University of Minnesota, where he completed the requirements in entomology in 1960. He served as Research Scientist at Belleville from 1953 to 1972. While there, he initiated a vigorous program on the systematics and biology of parasitic insects attacking various crop pests. His first publications dealt with potentially destructive weevils of the genus *Sitona* which attack various clovers, alfalfa, or vetch. Conrad soon discovered that significant mortality of these weevils could be attributed to certain species of euphorine (Braconidae) parasites belonging to the genera *Microctonus*, *Peristenus*, and *Leiophron*. He patiently worked out the biology and potential usefulness of these parasites, and eventually extended his study to Europe where he found additional species for possible introduction to Canada. By 1972, when the Belleville lab was shut down, Conrad had published 16 or more solid contributions detailing rates of parasitism, mating behaviour, and recognition characters for more than 30 species of euphorines.

Conrad moved to Ottawa in 1972, where he joined the hymenopterists of the Entomology Research Institute. Here he continued his euphorine research begun at Belleville, but also published on the Ichneumonidae. More than twenty additional papers resulted, the later ones dealing with parasites of canola- or alfalfa-infesting beetles. A visit to Europe broadened his knowledge of the Old World euphorines, and joint publications with colleagues there attest to Conrad's collaborative nature.

Conrad's final six years serving Canadian agriculture were spent with Doug Harcourt in investigation of the population dynamics of the alfalfa weevil. Euphorine parasites were found to be important mortality factors in field populations of this pest.

Conrad is greatly missed by his family, friends, and entomological colleagues in Canada and abroad.

Charles D. Dondale

**Scientist's discovery spelled the end for alfalfa weevil:
pesticide-free solution eliminated economic threat to farmers**

July 23, 1999, National Post

Conrad Loan, who has died at 72, was an eclectic scientist, gardener, small-scale farmer and poultry fancier who, while working for Agriculture Canada, discovered a way to do in the alfalfa weevil without using pesticides.

While working at the Dominion Parasite Lab in Belleville, in eastern Ontario, Conrad Loan studied strains of European wasps that were the natural enemies of the alfalfa weevil. He discovered that the wasps laid their eggs in the larvae of the alfalfa weevil, and, when the weevils grew to be adults, the eggs hatched, killing the weevils.

Gruesome stuff, but it had been going on for millions of years and was a lot safer than huge dollops of pesticide. Mr. Loan brought the tiny wasps to Canada from Europe. They did their job and the alfalfa weevil is no longer considered an economic threat to Canada's farmers.

Kevin D. Floate
Lethbridge

Bryan Beirne (1918-1998)

Dr. Bryan Beirne, an internationally known pioneer in the field of pest management, died on March 28, 1998 at home. He is survived by his son, Patrick, and daughter, Anne, and their families.

Beirne was born in Ireland in 1918. He entered Trinity College in Dublin at 16 years of age. The College lacked an entomology program and when he received his PhD in 1940, he was one of the few wholly self-taught professional entomologists.

Beirne was appointed Lecturer in Entomology at the College, and was one of two fulltime teaching staff of the Department of Zoology during the 1940's. In addition, he worked in the then University Museum of Zoology and Comparative Anatomy. To supplement his salary, Beirne established and operated a commercial pest control business.

In 1949, Beirne was appointed to the Canada Department of Agriculture in Ottawa, to work on the systematics of leafhoppers, plant bugs, and their relatives. Beirne was promoted in 1955 to Director of what would become the Research Institute for Biological Control in Belleville, Ontario.

Beirne was a proponent of integrated strategies for the management of pests. He proposed that the Institute move to a university campus where its speciality could be related to other aspects of pest management and where its specialists could train graduate students. Those proposals were rejected, and in 1967 he and seven colleagues resigned and joined the faculty of Simon Fraser University (SFU) to organize the world's first structured professional program leading to the degree of Master in Pest Management (MPM).

Beirne served as the Centre's first Director, and his research program centered on the principles and practice of biological control and pest management and, with graduate students, on the bionomics of individual pest species. In 1979, he was appointed Dean of Graduate Studies at SFU. Upon retirement in 1983, he was appointed Professor Emeritus of Pest Management with continuing special interests in encouraging interdisciplinary and applied programs. In addition, he was involved in development of innovative business enterprises in the areas of electronic communications and non-chemical controls.

Beirne's career brought him significant honours. He served on a number of academic, editorial, government, national, and international committees, and was an invited lecturer or consultant in some 20 countries. He published 15 books or monographs, and more than 120 technical research papers, and numerous smaller publications and reports. Honours include Member of the Royal Irish Academy, Gold Medalist and Fellow of the Entomological Society of Canada, Chairman's Award for Career Achievement Award from the Science Council of BC, Fellow of the Society for British Entomology, and Honorary Member of various societies and associations concerned with entomology or pests. Named after him is the insect Genus, *Beirneola*, and a number of species of insects and a species of fungus, *al beirnei*, a section of a university library (at Ataturk, Turkey), and the BP Beirne Prize in Pest Management (at SFU).

A reception was held on April 9, 1998 at SFU's Diamond Club in honour of Beirne. It was a happy affair and the eight invited speakers told anecdotes (most of them funny) about their connections with Beirne. The speakers were Patrick Beirne; Mike Smith, Chair of the Department of Biological Sciences at SFU, who first met Beirne when he was a student in 1983; Jack Blaney, President of SFU; Peter Belton, Adjunct Professor at SFU, who talked about the Belleville days; Bill Saywell, Past-President of SFU; Zamir Punja, Director of the Centre for Pest Management, who spoke about the Centre which Beirne founded and about the 25th Anniversary celebration of the Centre; Carole Conlin, Departmental Assistant in the Department, who related some stories about her time as Beirne's secretary; and John Borden, Professor in the Department, who was one of the founders of the BP Beirne Prize.

The BP Beirne Prize was established more than ten years ago in honour of Beirne. It is an annual prize, currently valued at \$1,000, and is awarded to an outstanding graduate from the Master of Pest Management program. For information about donating to the BP Beirne Prize in Pest Management, contact: Development Office, BP Beirne Prize in Pest Management, Simon Fraser University, 8888 Barnet Highway, Burnaby, BC, V5A 1S6.

Peter and Elspeth Belton
Carole Conlin
Mike Smith

Albert E. McCollom

The death of Mr. Albert E. McCollom, of 221 Ellerdale Street, Saint John, husband of Constance (Clarke) McCollom, occurred on Saturday, December 26, 1998 at the Saint John Regional Hospital. He was the last surviving member of his immediate family. Born in Saint John, he was the son of the late John and Ada (Finnamore) McCollom. Albert was a member of the Masonic Lodge #26, F&AM, Thistle St. Andrews Curling Club, St. James the Less, Renforth and was a former Councillor in the Village of Renforth. Besides his wife, Constance, he is survived by one daughter, Helen (Mrs. William Craft) of Saint John, two grandchildren, Kenneth and Linda, one great grandson, David, several nieces and nephews. He was predeceased by five sisters. By request of the family there was no visiting at the funeral home.

Following cremation, interment took place at Cedar Hill Cemetary. A memorial service was held at the Loch Lomond Villa Chapel at a later date.

SCIENTISTS HONOURED

Borden elected fellow of Royal Society of Canada

Biology professor John Borden has been elected a fellow in the Royal Society of Canada. Fellowship in the society is considered Canada's senior academic accolade to which scholars and scientists aspire. Borden is responsible for major discoveries in insect-plant interactions, chemical ecology, semio-chemical composition, production and function. He has led an interdisciplinary group of scientists who have made seminal contributions to the understanding of the chemical systems that are used by insects to communicate with one another. Borden and his students have used these laboratory discoveries to develop viable pest management programs to protect forests, stored products and fruit and vegetable crops from insect attack.

Prix d'excellence pour l'internationalisation

UQAM La Banque Scotia et l'Association des universités et collèges du Canada (AUCC) ont décerné récemment un prix d'excellence pour l'internationalisation à l'Université du Québec à Montréal. Ce prix récompense les universités canadiennes qui ont démontré concrètement leur souci d'apporter une perspective internationale dans l'enseignement, la recherche et les services à la collectivité de leur campus.

Ce sont les multiples retombées d'un projet de collaboration entre le département des sciences biologiques, l'Institut des sciences de l'environnement de l'UQAM et l'Université fédérale du Para, Brésil, qui ont permis à l'UQAM de remporter le prix dans la catégorie "Contribution de projets de développement international universitaires à l'internationalisation". Sous la direction de Domingos de Oliverira, automate professeur en sciences biologiques, le projet de coopération, intitulé "Impacts et gestion environnementale en Amazonie", avait pour objectifs la formation de ressources humaines (Échanges de professeurs et d'étudiants) et l'établissement de liens durables entre les chercheurs du Québec et du Brésil.

Outre la formation d'étudiants de 2e et de 3e cycles, le projet a donné lieu à une vingtaine de publications sur diverses thématiques telles que la biodiversité, la pollinisation par les insectes et la contamination par le mercure, ainsi que la tenue de trois ateliers internationaux sur la gestion environnementale en Amazonie.

HERITAGE ARTICLES

Who was C.E. Atwood?

The following article was written for the Atlantic Forestry Centre in-house newsletter Out on a Limb in celebration of the Canadian Forestry Service centennial, "A century of innovative solutions".

Carl Atwood started his career as a "junior entomologist" at Fredericton in 1933, where he was responsible for "several of the studies carried out there". He was involved in biological studies of European spruce sawfly, the fir sawfly, and assisted in plot work and surveys in NS and NB.

Carl continued until 1936 and went on to an outstanding career. He studied wild pollinators during the famous apple pollination studies in Nova Scotia coordinated by WH Brittain, another Maritimer who went on to great things in agricultural entomology. Most of his career was as a professor of zoology at U of Toronto, where he supervised the master's programs of Charlie Miller, Reg Underwood (originally from

Kennetcook), and the late Donald Cameron, all former CFS employees. He was also on my master's examining committee where the criticism that stands out in my mind was his dislike of the Maritimes expression "down along" as in my geographical description "down along the coast".

Carl's influence on forest entomology in the Maritimes continued to be felt through the life-long friendship of his family and that of the late Reg Balch, Officer-in-Charge of forest entomology and pathology research in the Maritimes. Balch, the inexperienced Englishman, gave Carl credit for having taught him how to backpack, manage a canoe, pitch a tent, and survive in the Canadian woods. It was no accident that the three staff members (and perhaps others I don't know about) were sent to U of T for post-graduate studies.

All this entomological stuff is probably pretty dull to most of you, but you'll perk up when I tell you he was the father of author Margaret Atwood. In fact, Margaret babysat the Balch children, Norval and Cynthia, on occasion.

Carl Atwood died in 1993 in his 87th year after long and distinguished service to forest entomology, conservation, and education. To this end the University of Toronto established a trust fund to support the CE Atwood Memorial Lecture Series.

Such were the kinds of people who built our heritage.

Doug Eidt
Fredericton

Who was R. Franklin Morris?

The following article was written for the Atlantic Forestry Centre in-house newsletter Out on a Limb in celebration of the Canadian Forestry Service centennial, "A century if innovative solutions" .

There was a time when CFS at Fredericton was synonymous with Frank Morris to many people all over the world. They were those people concerned with the dynamics of animal populations, an extremely important discipline from the standpoints of pest control, wildlife management, and conservation. Frank was an excellent naturalist who saw beyond the obvious to wonder about why populations grew and shrank, sometimes virtually exploding and then crashing.

Frank applied actuarial techniques to insect populations to develop what he called "life tables". These tables described the factors, parasites, predators, food supply, weather, anything that could be documented that affected survival and mortality during the stages of development of an insect. He built hypotheses and tested them with extensive field and laboratory experiments. He exchanged ideas with like-minded scientists in four continents and built a team of thinkers and experimenters that included not just fellow CFS staff but others elsewhere in Canada.

Frank was in charge of the Green River Project where the principal study insect was the spruce budworm. The work culminated in the publication of the multi-authored treatise *The Population Dynamics of the Spruce Budworm*. In the later years until he retired in 1979, he studied the fall webworm, not because it was of economic importance, but because the webworm was more suitable to study the principles governing the dynamics of populations.

Earlier in his career he published on a wide range of topics including land mammals, elaterid predation on sawfly cocoons, sampling techniques, and the outbreak history, epidemiology and control of a variety of forest insects.

Frank was born in Woodstock, NB, in 1916. He graduated from UNB in 1938, received his MSC from SUNY at Syracuse in 1940. On a scholarship from the Pulp and Paper Assoc. of Canada he earned

his PhD at the U of Michigan in 1947. He was a student assistant summers of 1936 to 39, and was hired full-time in 1940. His first assignment was the European spruce sawfly plot study at Acadia, during which he also took on the bronze birch borer study. He took charge of the Green River Project in 1945.

Frank was the first recipient of the prestigious Gold Medal of the Entomological Society of Canada in 1962. It recognized his contribution to population dynamics and the scientific basis he provided for assessment and management of the spruce budworm.

Frank had a special friend and protector: a large dog he brought to work with him every day. No problem, but for some reason only dogs would understand, it took a particular dislike to Rose Marie Brown, who did Frank's typing. It got so that Rose would knock, push the work under the door, and run. Tragically, Frank became embittered when an abrupt change in policy against research without a foreseeable application was implemented. He lived out his retirement as a recluse, the last few years without his wife and longtime companion, Celia. Frank died in 1996, having left an indelible mark on entomology, population dynamics, and forestry.

Doug Eidt
Fredericton

PUBLICATIONS

BOOK REVIEWS

Wiggins, G.B. 1998. *The Caddisfly Family Phryganeidae (Trichoptera)*. University of Toronto Press, Toronto, Buffalo, London (In association with National Research Council Research Press). ix+(4)+306 pp. \$Can.120.00. £90.00. ISBN 0 8020 4241 4.

The text is organised in two main sections - General, and Systematic, followed by Acknowledgements, Literature Cited, Distribution Maps, Appendix, and Index. The General Section - The Introduction outlines Trichoptera study since Linnaeus, the place of phryganeids, and their distinctive characteristics as larval case-makers. Materials & Methods follow: collections visited; data treatment. General features of the Phryganeidae details adult, larval, and pupal structural features. Sections on behaviour follow, adults last. Ecological Aspects (larvae) are examined, including prospects for the future - of the insects themselves. The section closes with Evolution of the Phryganeidae which amalgamates life stage structure, behaviour, and distribution. Relationships and monophyly are examined, with Phryganopschoidea and Limnephiloidea as out-groups, Plectrotarsidae as potential sister group. Characters used and states are discussed. An Hypothesis of Phylogeny for each level, in 15 sections, deals with branching points and character states. Techniques are: cladogram development by inspection of polarised character states; cladistic analysis using PAUP. Comments on weaknesses and strengths, featuring behavioural/morphological complementarity ends the section. Fossils are considered - most being wings; phryganeids are thought to precede extant Integripalpia. Generic distribution patterns are considered with reference to the pangaeen break-up - phryganeids are a laurasian family. Finally, an Evolutionary Epilogue presents an review of phryganeid geological position. Yphriinae pupation behaviour is compared with that of Phryganeinae/Phryganopsychidae/ Integripalpia/ Annulipalpia. Female genitalic variation in *Agrypnia vestita* and *Hagenella apicalis*, and implications for speciation, are considered.

The Systematic Section treats Yphriinae (1 genus, 1 sp.), and Phryganeinae (14 genera, 73 spp). Generic keys to life stages of Phryganeinae follow family and subfamily diagnoses. Species (adults only) are keyed in sections about each genus. For each taxon level a general synopsis of knowledge and history of the taxon, and points of interest are given. Generically, diagnostic statements for adults and immatures are given, with notes concerning way of life and distribution. Phylogenetic reconstructions, with hypothesised phylogenetic trees, are discussed for each taxon level. Supra-generic taxa are presented in order of

the hypothesised phylogenetic tree on p. 24. Sub-generic taxa follow no consistent order. Genitalia, immatures, structural features, and wing patterns are illustrated. Geographical ranges of only the 24 North American species are mapped. The Appendix is in two parts - Abbreviations (codens) for institutions housing material, and Material Examined (with literature records). The Index is taxonomic and subject combined. Three new species, and synonymies are included.

The excellent table of contents, to the species level, might serve as a checklist for the family, as would the Classification of Phryganeidae on p. 241. Excellent cross-referencing in the text is most useful. Why are maps limited to North American species? The maps given might, without loss, have been reduced to four per page, rather than one, leaving room for maps of Eurasian species. An apparent scattered presentation of topics, esp. phylogeny, proves no real problem, though some may think phylogeny should have been concentrated in a last chapter.

Despite a minor galaxy of artists over the decades, the superb illustrations are remarkably uniform. The large format (28x22 cm) gives full scope for their display. The acid-free paper is non-glare - even photographs may be examined without blinding. Easily read 10 pt serifed type, in two columns, is used. Bound in signatures, with illustrated, stout end-boards the book is designed to last. One labelling and two typographical errors were found - p. 9, fig. 3 pronotom for pronotum; p. 19, para. 2, line 7 - 'or' should be 'of'; and p. 25, first column, penultimate line, parsimoniuis for parsimonious.

A thesis 40 years on. Parts published intermittently, much information added, thesis and book are bookends to 40 years magnificent, scholarly work on Caddisflies, centred on larvae, but with considerable study of adults, in the search for answers to problems in Trichoptera Systematics. While, one hopes, more will be learned of Phryganeidae, this book will serve for many years. It's a must for trichopterologists, and is earnestly recommended to aquatic biologists who may encounter phryganeids in their work. Behavioural evolutionists should also find it interesting, with a view to future projects. The immediately valuable (and largest) part of the book is the Systematic section.

At last! *Agrypnia* Curtis without tears. Identifying these adults has been the bane of my existence for years! My thanks to George Ball for checking the MS with his usual thoroughness.

Andrew P. Nimmo
Edmonton

Coast, G.M. and Webster, M.G. (Eds) 1998. *Recent Advances in Arthropod Endocrinology*. Edited by Society for Experimental Biology Experimental Seminar Series 65. Cambridge University Press, 40 West 20th Street, New York, NY 10011-4211. Hardback ISBN 0-521-59113-9 \$110 U.S. 406 pages.

The rapidly expanding field of arthropod neuropeptide research is at the heart of this collective work, which arose from a symposium held as part of the 1996 annual meeting of the Society for Experimental Biology. The volume is divided into 18 chapters, each written by scientists currently considered world authorities in their respective areas of insect, crustacean or tick endocrinology. The various contributions are organized around four themes: (i) arthropod development and reproduction, (ii) intermediary metabolism, (iii) myotropic and myoinhibitory neuropeptides, and (iv) possible applications for insect pest control.

It is clear from the outset that this book does not cover all aspects of arthropod endocrinology and that it is more or less restricted to a review of recent developments relating to arthropod neuropeptide research. Therefore, those looking for a detailed account of recent progress in juvenile hormone (JH) or ecdysteroid research will be disappointed as these two hormones are discussed only in terms of how their biosynthesis is regulated by neuropeptides such as allatostatins in insects (Weaver et al.) or the molt inhibiting hormone (MIH) and the mandibular organ inhibiting hormone (MIOH) in crustaceans (Webster). An exception to the above observation is the chapter by Xavier Bellés on endocrine effectors in insect

vitellogenesis, in which the author provides a good synthesis of the interplay between JH and ecdysteroids in the regulation of vitellogenin synthesis and uptake across several insect taxa. The possible roles of ecdysteroids and juvenoids in tick development and reproduction are also examined in the chapter by Lomas and Rees, which includes a useful comparison of endocrine functions in insects, crustaceans and ticks.

The remaining chapters deal with the significant headway made during the past ten years in the discovery and identification of arthropod neuropeptide hormones. As pointed out by the editors in their preface, progress has been facilitated by rapid advances in techniques for peptide purification, sequence analysis and mass determination. In addition, the availability of antisera raised against various vertebrate and invertebrate neuropeptides has made it possible for researchers to conduct heterologous immunohistochemical analyses, thereby identifying tissues or cells in a given arthropod species containing material that is immunologically related to known neuropeptides in other species or taxa. The tissues thus identified may then be used for the extraction, purification and sequence analysis of the putative peptide(s) they contain. Alternatively, molecular approaches for fishing out the gene(s) encoding such peptides may be used, employing known nucleotide or amino acid sequences from other species as a starting point. Such strategies, however, have resulted in the identification of many arthropod neuropeptides whose biological functions are largely unknown. This is a recurrent theme throughout the book, but one that is best exemplified by the chapter by Nässel et al. on tachykinin-related peptides. The true tachykinins have been best studied in vertebrates and owe their name to the fast contractile action they exert on smooth muscle. However, many different related peptides have now been discovered in insects – particularly in cockroaches and locusts – but their functions remain mostly hypothetical.

Thus, much of the research that is currently being conducted on invertebrate neuropeptides involves exploratory work, including a great deal of immunocytochemistry, the development of assays, the search for likely functions, amino acid sequence analysis, gene structure analysis, studies on structure-activity relationships and the elucidation of signal transduction mechanisms. That is why many chapters of this book contain large sections of descriptive data, for example showing where a given peptide is found in the animal's body, or comparing amino acid sequences among different peptides from various organisms, in an attempt to gain a better understanding of their evolution and functions. Although this type of information is very critical to the development of this area of arthropod endocrinology, it may not be of much interest to those who are not very familiar with the field and who are simply looking for a general review of recent advances in arthropod endocrinology. However, some authors such as Weaver et al. (allatostatins), Coast (diuretic hormone) and Orchard and Lange (FLRFamide-related peptides) did a better job than others at presenting this type of information in an interesting fashion. The latter chapter presents the results of some very interesting structure-activity relationship studies showing that a single amino acid substitution in an FLRFamide peptide can produce opposite muscle responses in a bioassay, even though both substituted and unsubstituted peptides bind to the same receptor. This type of work provides a good example of how complex and subtle peptide-receptor interactions can be.

The last two chapters of the book deal with two research areas that are considered relevant to the development of neuropeptide-based pest control strategies: *in vivo* processing and degradation of peptides by specific enzymes (Isaac et al.), and the design of peptidomimetics that can both resist such degradation and display enhanced hydrophobicity in order to penetrate the insect cuticle (Nachman et al.). The latter authors describe some of the strategies employed to achieve these two goals, and present some very promising results. Clearly, the study of arthropod neuropeptides may turn out to have important implications for the development of bio-rational insecticides while providing new insights into the complexity of endocrine systems in animals.

Michel Cusson
Canadian Forest Service
Sainte-Foy, Quebec

Barbosa, Pedro (editor). 1998. *Conservation Biological Control*. Academic Press, San Diego, xxii + 396 pp, \$ 69.95 (US), hardcover.

Conservation biological control, states the editor Pedro Barbosa, is the "manipulation of the environment of natural enemies so as to enhance their survival, and/or physiological and behavioral performance". Since such manipulations may be applied to releases of natural enemies (classical or augmentative biological control programs) or to enhance resident populations of natural enemies, conservation biological control can be regarded more as a context for the use of natural enemies in an integrated pest management programme than as a specific tactic in pest control.

As in all biological control, conservation biological control is based on the premise that natural enemies can maintain pest populations below some economic threshold. With this premise firmly in hand, the contributing authors review the subject and generate working hypotheses. The introductory chapters are broad and put forward a few, almost intuitive, generalizations. Given that the approach is applied ecology, it was surprising to find little population biology or predator/prey theory reviewed in these chapters although Deborah Letourneau provides a good primer on metapopulations and management of biodiversity. The overall tone of these first chapters is curiously pessimistic. The authors, all taking the perspective of agricultural pest management, concede that it is the highly modified and frequently disturbed habitats of modern agriculture that present the greatest difficulties for successful conservation biological control. To be sure, the middle chapters of the book that focus on the interactions among crops, pests, natural enemies, and their environments, record the wide range of possible ecological outcomes that warn against anything other than a case-by-case approach. The final chapters present these specific cases and, contrary to the feeling that you expect by this point in the book, the results are actually encouraging. The description of the control of spider mites in apple orchards by Jan Nyrop and colleagues shows how one has to nest practical considerations within a population ecology framework to gain incremental progress in integrated pest management. Nonetheless, surprises seem always to be lurking around the corner. Charles Wilson's description of the epiphytic micro-organisms battling it out on post-harvest fruit poses for me the new dilemma of whether I should wash my apples twice as thoroughly as before or not at all.

Interestingly, the inspiring cases in this book, all involve perennial cropping systems (orchards). This may be the most useful generalization of the volume. Perennial systems are more heterogeneous and long-term than annual cropping systems and it is these attributes that seem most favourable for conservation biological control. Regrettably, there are no contributions from forest systems which may have offered additional insights along these lines although Barbosa draws extensively on research in forest pest systems in one of his chapters. Conservation biological control may be most promising in forest systems where disturbances are more infrequent, economic thresholds are higher, and heterogeneity is the rule.

The presentation of Conservation Biological Control benefits from an experienced editor. The writing styles are consistent and a common format for each chapter with a detailed table of contents makes cross-referencing possible despite the absence of a subject index. Subject coverage, with the notable absence of forest and greenhouse systems, is otherwise comprehensive. References follow each chapter and are current. Figures are sparse, reflecting the dearth of data available, and could have been of higher quality. Conservation Biological Control should be of interest to most entomologists looking for a starting point in integrating natural enemies with current pest control tactics.

Vince Nealis
Victoria, B.C.

Schwartz, Michael D. and Robert G. Foottit. 1998. *Revision of the Nearctic Species of the Genus *Lygus* Hahn, with a Review of the Palaearctic Species (Heteroptera: Miridae)*. Associated Publishers, Gainesville, Florida. 428 p. \$(US)65.00. ISBN 1-56665-06606.

Michael Schwartz and Bob Foottit have completed the efforts of Leonard Kelton, and finally (we hope) sorted out the complexities of the difficult and economically important genus *Lygus*. Their volume, the tenth in the Memoirs on Entomology, International series, is an excellent (and inexpensive) piece of scientific literature as well as a useable field guide. With apologies to the author of a gender incorrect nursery rhyme, be you rich man (crop pest manager?), poor man (systematist?), beggar man (taxonomist?), thief (appreciator of high quality taxonomic illustrations?) – buy it, you'll like it.

Within this work "The Nearctic species of the Holarctic genus *Lygus* Hahn are revised and the Palaearctic species are reviewed. Fifty-one species are recognized, with 29 . . . found in the Nearctic region only, and 20 from the Palaearctic region only. Two species . . . are considered Holarctic." A phylogenetic analysis of states of 65 morphological characters of 49 *Lygus* (two Palaearctic species were unavailable for study) and 9 outgroup species is used as a tool to define (finally!) a monophyletic *Lygus*. A yet-to-be-published analysis of molecular data evidently supports the proposed within-*Lygus* relationships. Two new genera are proposed for species now excluded from the monophyletic *Lygus*, synonyms and homonyms are found and fixed, and lectotypes are designated as necessary. Sixteen preliminary pages introduce the work and discuss characters, materials, and methods. The bulk of the text (about 360 pages) is devoted to taxonomy of the 51 *Lygus* species and five species in four "related genera." Clearly, the great strengths and usefulness of this work lie in these genus and species descriptions and their associated identification keys and natural history data.

The taxonomic section commences with a detailed synonymy listing, adult diagnosis and redescription, late-instar nymph diagnosis, world distribution, and checklist of valid and invalid species names for the genus *Lygus*. Separate keys are provided for Nearctic and Palaearctic species of *Lygus* (and associated "related genera"). Both keys appear easy to use, appropriately detailed, well illustrated, and reasonably short. The Palaearctic key is the first ever produced containing all known species. Descriptions of *Lygus* species are grouped by zoogeographic region and follow the pattern established in the genus description. Added details are presented in the form of sections including measurement statistics (range, mean + standard deviation) for a variety of adult characters, discussion of intraspecific variation, diagnosis of the 5th nymphal instar, discussion of host plants, general remarks, and exhaustive listings of specimen localities. A bonus is the alphabetical listing of species descriptions (what a concept!). This, coupled with subject headers on each page, helps make this volume a joy to use.

Dorsal habitus drawings of adult males (including examples of variation, especially as observed in newly synonymized species) and 5th instar nymphs, scanning electron micrographs of important characters, drawings of genitalic characters (females and some males), and range maps are presented for all Nearctic and "related genera" species (genitalic drawings lacking for some species). Reference should be made to discussion of illustrations in "Materials and Methods" to understand fully the wonderfully intricate detailing of the adult habitus drawings.

Schwartz and Foottit should be commended for producing a useful, timely, and timeless piece of science. Such works are really the product of the efforts of a great many researchers from around the world. Those folks and, in particular, Agriculture and Agri-Food Canada and its research scientists and technical staff should be commended for their support of the authors and their work.

Robb Bennett
Saanichton, B.C.

WEBSITE NEWS

Young Entomologists' Society Websites: Come Visit Us on the Internet!

The Young Entomologists' Society now has a total of six websites online. Each site features a wealth of resource information (text, images and links), and all but one are available as free resources to interested minibeast enthusiasts. Please feel free to stop by and check them out yourself! We welcome linkages with other similar sites. Also, we would be most grateful if you could help spread the word about these valuable educational websites. Thank you.

IMPORTANT NOTICE: This message may be sent from a variety of e-mail accounts, but only YESbugs@aol.com is monitored for incoming e-mail. Please use THAT ADDRESS ONLY when writing to us (don't use auto-response).

Y.E.S. Homepage (<http://insects.ummz.lsa.umich.edu/yes/yes.html>) - information on membership, publications and services.

Minibeast World of Insects and Spiders (<http://members.aol.com/YESedu/welcome.html>) - information on insects and spiders for kids and educators (minibeast virtual museum, teacher's tower, research library, butterfly gardening, youth center, and links).

Minibeast Merchandise Mall (<http://members.aol.com/YESsales/minimall.html>) - an online catalog of educational materials and gifts relating to minibeasts; listing of outreach services; special science olympiad section; and resource center.

Tiger Beetle World (<http://members.aol.com/YESedu/tigerbtl.html>) - information on tiger beetles of North America (biology, ecology, identification, techniques for study, research library, resources, cicindelophile directory, and links).

Dragonfly for Michigan State Insect Website (<http://members.aol.com/YESnetwk/index.html>) - find information on the green darner dragonfly and the status of the campaign to make it Michigan's state insect.

Member's Clubhouse and Resource Center (by password only) see preview at any of the above sites.

MEETINGS

The annual meeting of the Canadian Forum for Biological Control (CFBC) will be held in Saskatoon on Thursday, September 30, 1999. This meeting is to follow the Entomological Society of Canada conference. A symposium on the topic of "Mass-production, Fermentation and Delivery" has been organized and the list of speakers is being finalized. Also, a tour of the Saskatchewan Research Council Fermentation Pilot Plant has been planned. A scientific program in the form of posters is also being coordinated.

For more information, please contact:

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107 Science Place, Saskatoon, SK S7N 0X2
Tel. 306-956-7619, Fax 306-956-7247
Email BoyetchkoS@em.agr.ca

SCHOLARSHIPS AND GRANTS

Entomological Society of Canada Graduate Research-Travel Grants Invitation for Applications

Preamble

To foster graduate education in entomology, the Entomological Society of Canada will offer two research-travel grants, awarded annually on a competitive basis. The intent of these grants is to help students increase the scope of the graduate training. These grants, up to a maximum of \$2,000, will provide an opportunity for students to undertake a research project or to do course work pertinent to their thesis subject that could not be carried out at their own institution.

Eligibility

To be eligible, a student must:

- 1) be enrolled as a full-time graduate student
- 2) be an active member of the Entomological Society of Canada

Format of the Application Form

The application form will be in the format of a grant proposal, where the applicant will provide the following information: 1) the subject of the thesis; 2) a pertinent review of the literature in the field; 3) a concise presentation of the status of the ongoing thesis research; 4) a description of the research or course work to be undertaken, clearly indicating a) the relevance to the overall goal of the thesis, b) an explanation of why such work cannot be carried out at the student's own university and c) the justification of the site where the research/course work will be carried out; 5) a budget for the proposed project; 6) anticipated dates of travel and date on which grant money is needed.

The application form should also be accompanied by: 1) an up-to-date C.V.; 2) a supporting letter from the senior advisor; 3) When appropriate, a support letter from the scientist or Department Head at the institution where the applicant wishes to go.

Evaluation Procedure

The scientific merit of each application will be evaluated by a committee that has the option of sending specific projects out for external review by experts in the field. A constructive written report, underlining the positive and negative aspects of the proposal, will be returned to the applicant.

Timetable and Application Procedure

Application forms, which may be obtained from the Secretary of the Society, must be completed and returned to the Secretary of the Society by **15 January 2000**. The committee will evaluate all applications by 30 April 2000 and determine if, and to whom, grants will be awarded. The successful applicants will be informed immediately, thereby providing sufficient time for students wishing to start in the fall to make necessary arrangements. Grants must be used in the 12 months following the award.

Recipients must provide a short final report, as well as a detailed list of expenses, in the three months that follow the trip. Any money not spent must be returned to the Society.

La Société d'entomologie du Canada Allocations de Voyage pour Étudiants Gradués Appels pour Allocations

Préambule

Afin de promouvoir les études graduées en entomologie, la Société d'Entomologie du Canada offrira deux bourses de voyage associées à la recherche. Celles-ci seront décernées annuellement sur une base compétitive. Le but de ces bourses est de permettre aux étudiants gradués d'élargir les horizons de leur formation. Les bourses, d'une valeur maximale de \$2,000 permettront à des étudiants de réaliser un projet de recherche, ou de suivre des cours pertinents à leur sujet de thèse qui ne peuvent être entrepris dans leur propre institution.

Éligibilité

Afin d'être éligible, l'étudiant doit:

- 1) être inscrit à temps plein comme étudiant gradué
- 2) être un membre actif de la Société d'Entomologie du Canada

Format du Formulaire de Demande

Le formulaire de demande sera dans le style d'une demande d'octroi et l'étudiant devra fournir les renseignements suivants: 1) le sujet de la thèse; 2) une présentation de la littérature pertinente au domaine d'étude; 3) une présentation concise du statut du projet de recherche en cours; 4) une description de la recherche ou des cours qui seront entrepris, indiquant clairement a) la pertinence des objectifs généraux de la thèse, b) les raisons pour lesquelles ce travail ne peut être entrepris à l'université où l'étudiant est inscrit, et c) une justification concernant le choix de l'endroit où la recherche/les cours seront entrepris; 5) un budget pour le projet proposé; 6) dates prévues pour le voyage et date pour laquelle la bourse sera requise.

Le demande devra aussi être accompagnée: 1) d'un C.V. complet mis-à-jour; 2) d'une lettre de recommandation du directeur de thèse; et 3) lorsque convenable, une lettre d'appui d'un administrateur de l'institution que le candidat désire fréquenter.

Évaluation

La valeur scientifique de chaque demande sera évaluée par un comité qui aura l'option d'envoyer des demandes spécifiques pour évaluation par un lecteur externe, expert dans le domaine. Un rapport écrit, contenant une critique constructive, faisant ressortir les aspects positifs et négatifs de la demande, sera retourné à chaque candidat.

Échéances et Procédures

Les formulaires de demande, qui peuvent être obtenus du Secrétaire de la Société, doivent être remplis et retournés pour le **15 janvier 2000** au Secrétaire de la Société. Le comité évaluera toutes les demandes pour le 30 avril 2000 et déterminera si, et à qui, les bourses seront décernées. Les candidats choisis seront contactés immédiatement, cela afin d'allouer suffisamment de temps pour les préparatifs nécessaires à un départ possible à l'automne. La bourse doit être utilisée dans les 12 mois suivant l'octroi.

Les récipiendaires devront préparer un court rapport final, en plus d'une liste détaillée de leurs dépenses, dans les trois mois suivant le voyage. Tout argent non dépensé devra être remis à la Société.

The Nature Discovery Fund

The Canadian Museum of Nature, with the participation of Canadian author Margaret Atwood, recently launched the Nature Discovery Fund (NDF), a non-profit fund seeking to encourage public support for systematics through an enhanced public profile and by making available additional financial resources for the study of systematics in Canada. The launch of the Fund drew attention to the great diversity of insects and their relatives in Canada, and to the fact that only one-half of them are named.

The Fund emphasizes the value of the scientific names of species: every insect species needs a unique scientific latinized name under which all information about that species is filed. In the past, these names have been reserved for special features about the organism. For example, they might reflect where it was found, refer to a striking feature of structure or colour, or honor the person who collected it or even a fellow scientist who contributed to study of the group. The Fund undertakes, in recognition of a \$500 donation [NOTE: should this read: 'a donation of \$500 or more'?], to arrange for a species to be named (within 24 months) in honor of the donor or in recognition of someone or something they designate. Donations are viewed not as the purchase of names, but as practical support for the science of systematics.

In September of each year NDF will invite applications for use of the donated funds by recognized Canadian entomologists in the field of systematics, especially those seeking to sample and study previously unexplored or poorly explored areas or habitats within Canada. Further details of the application process are provided below.

To request an information package about the Nature Discovery Fund including detailed procedures for making donations please contact the Canadian Museum of Nature, P.O. Box 3443, Station D, Ottawa, On. K1P 6P4; 1-800-263-4433 or visit <http://www.nature.ca>

Nature Discovery Fund: Call for Applications 1999

The Nature Discovery Fund (NDF), administered by the Canadian Museum of Nature, invites applications for funding in support of rediscovering and naming Canada's insect biodiversity. Established in December of 1998, NDF is a non-profit fund seeking to provide resources to recognized entomologists in support of field-based scientific exploration and research in systematics within Canada. The NDF is financed through individual donations in support of Biodiversity research.

Projects which seek to document the fauna by field work in previously unexplored or poorly explored areas or habitats are preferred. Support is also available for the completion and publication of already existing projects with a similar focus, but for which additional field work is not necessary. Recipients of NDF financing will be encouraged to support the continuation of the program by recognizing NDF donors in the naming of newly discovered species.

All applications will be assessed by a review panel composed of 3 Canadian systematists. Various levels of funding are possible (generally \$500-\$3000), but the number and level of awards are contingent upon resources available within the Fund.

Deadline for receipt of applications is **December 31, 1999**. Results will be made known to applicants by April 1, 2000.

Application materials and more information can be obtained from Robert Anderson, Canadian Museum of Nature, P.O. Box 3443, Station D, Ottawa, On. K1P 6P4, or via email: randerson@mus-nature.ca

ENTOMOLOGICAL SOCIETY OF CANADA
LA SOCIÉTÉ D'ENTOMOLOGIE DU CANADA

393 Winston Ave., Ottawa, Ontario K2A 1Y8

Application for membership - (new members only)
Demande d'adhésion (nouveaux membres seulement)

Name and Address (please print):
Nom et Adresse (lettres moulées):

telephone (bus.) / téléphone (au travail):

Fax:

Electronic mail address / Adresse électronique:

Keywords describing interest (up to six):
Décrivez vos intérêts en utilisant jusqu'à six mots clés.

Please copy and distribute to interested non-members. Thankyou.

Membership is a personal affiliation; publications are the personal property of the individual member. Membership is on a calendar year basis.

Cotisation est une affiliation personnelle; publications payées ici appartient à l'individu. La cotisation des membres s'applique à l'année civile.

MEMBERSHIP DUES / COTISATION

Regular member / Cotisation regulier with/avec...Cdn \$80.00 + \$5.60 GST (Can)\$.....
The Canadian Entomologist & Bulletin US\$74 (\$100 Cdn) (U.S.A. & Int'l)

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US\$36 (\$45 Cdn) (U.S.A. & Int'l)

(ask your professor to endorse this form/demande l'appui de votre professeur)

Endorsement/Signature du professeur

Enclose cheque or money order (or use Mastercard or VISA) payable to : Entomological Society of Canada

Inclure un chèque ou mandat (ou utilisez Mastercard ou VISA) payable à: Société d'Entomologie du Canada

If you need an official receipt, please check:

Si vous désirez un reçu officiel, indiquez, s'il vous plaît:

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LA SOCIÉTÉ D'ENTOMOLOGIE DU CANADA - 1999

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