

Bulletin

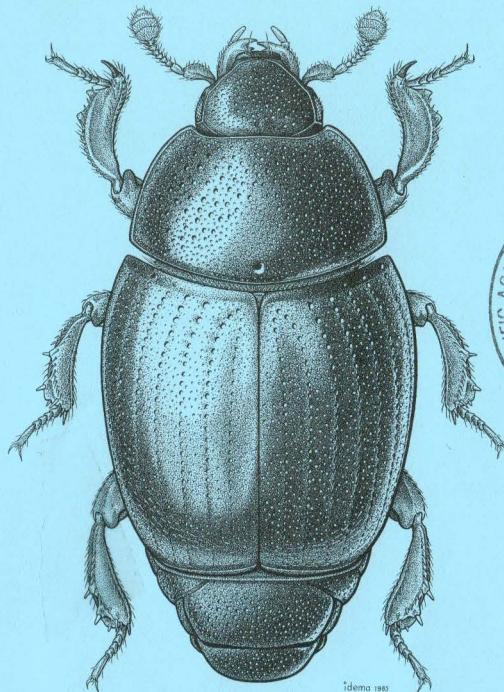
Entomological Society
of Canada

Société d'Entomologie
du Canada

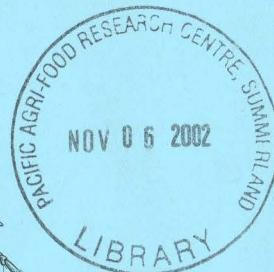
Volume 34

No. 3

September-septembre 2002



Idema 1985



Entomological Society of Canada
Société d'Entomologie du Canada

393 Winston Avenue, Ottawa,
Ontario, Canada K2A 1Y8

Table of contents on back cover / Table
des matières sur la couverture-arrière

Date of issue/Date de publication:

September 2002

Web Page for the ESC: <http://esc-sec.org/>

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 trimestriellement 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 *Carcinops pumilio* (Erichson) (Coleoptera: Histeridae). This cosmopolitan hister beetle is found all across Canada, from Newfoundland west to British Columbia. It is often found in stables, henhouses, granaries and mills, where it feeds mainly on insects and mites. Habitus drawing by R Idema, from "Bousquet Y.1990. Beetles associated with stored products in Canada—an identification guide", reproduced with permission from Agriculture and Agri-Food Canada.

On trouvera sur la couverture une illustration de *Carcinops pumilio* (Erichson) (Coleoptera: Histeridae). Ce coléoptère cosmopolite se rencontre d'un bout à l'autre du Canada, depuis Terre-Neuve jusqu'à la Colombie-Britannique. On le trouve surtout dans les écuries, les poulaillers, les silos-élevateurs et les minoteries où il se nourrit avant tout d'insectes et d'acariens. Habitus dessiné par R Idema, d'après "Bousquet Y. 1990. Beetles associated with stored products in Canada—an identification guide", reproduit avec la permission d'Agriculture et agroalimentaire Canada.

List of contents/Table des matières

Volume 34 (2), June - juin 2002

SOCIETY BUSINESS / AFFAIRES DE LA SOCIÉTÉ	109
52 nd Annual General Meeting	109
Governing Board Meeting	109
President's Midterm Report	110
MOT DU PRÉSIDENT	111
Committees and Representatives 2002 / Comités et Représentants 2002	112
Achievement Awards Committee	114
Report of the Nominations Committee	116
News and Announcements	116
 Personalia	122
 Instructions for Reviewers	123
 Biological Survey of Canada (Terrestrial Arthropods)	124
Survey Report	124
 Articles	129
PEST FACTS SHEET - LEEK MOTH	129
 News of Organizations and Meetings	154
 Membership form	155
 Scholarship form	156



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.

The **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

52nd Annual General Meeting

The Annual General Meeting of the Entomological Society of Canada will be held at the Delta Winnipeg, in Winnipeg, Manitoba, on October 6-9, 2002.

La réunion annuelle générale de la Société d'entomologie du Canada aura lieu au Delta Winnipeg, à Winnipeg, Manitoba, le 6-9 octobre, 2002.

(<http://home.cc.umanitoba.ca/esm/meet-esc.html>)

Governing Board Meeting

Governing Board, Saturday, October 5th - 0830-1730h. Room: TBA.

AGM , Tuesday. October 8th - 1630-1800h. Room: TBA

New Governing Board, Wednesday, October 9th, 1230-1400h. Room: TBA

Dr. Rick West
31 Drover's Heights
Portugal Cove - St. Philips, Newfoundland A1M 3G6
Phone and fax: (709) 895-2734 E-mail: reely.west@roadrunner.nf.net

The Canadian Entomologist and past issues of the *Memoirs* are available from the Ottawa office, and may be purchased by Mastercard, Visa, cheque or money order.

Please send correspondence concerning the Bulletin to:

Dr. Dan Johnson
Bulletin Editor
Research Centre
P.O. Box 3000
Lethbridge, AB, T1J 4B1
Tel: (403) 317-2214 / 327-1209
Fax: (403) 382-3156
E-mail: JohnsonDL@em.agr.ca

Please send all correspondence concerning Book Reviews for the Bulletin to:

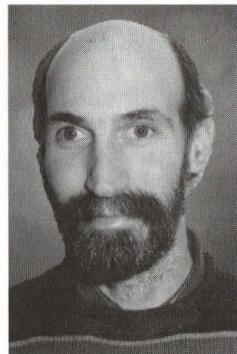
Dr. Vince Nealis
Chair, Publications Committee
506 West Burnside Road
Pacific Forestry Centre
Victoria, BC, V8Z 1M5
Tel: (250) 363-0663
Fax: (250) 363-0775
E-mail: vnealis@pfc.forestry.ca

The deadline for submissions to be included in the next issue, Vol. 34(4), is **November 1, 2002**. La date limite pour recevoir vos contributions pour le prochain numéro (Vol. 34(4)) est le **1 novembre 2002**.

President's Midterm Report

Hello,

I hope that each of you has had an enjoyable and productive summer. As we await our Annual General Meeting in Winnipeg I want to address a few subjects.



First, Editor Jean Turgeon in cooperation with the publications committee, Treasurer Gary Gibson and Past President Bob Foottit has put together a Copyright Agreement form that will be issued to all submitting authors if this form is approved at the business meeting in Winnipeg. At present, the ESC does not have a copyright policy making it very difficult to grant permission for access to papers published in *The Canadian Entomologist*. The ESC governing board fully supports this authorization form as a means of protecting both author and ESC from infringement, an issue that becomes more and more important as electronic publishing flourishes.

Second, it is never too late to donate to our scholarship fund. As I reminded you in the previous bulletin, students are the future of our society and they deserve all the support that we can muster.

Speaking of donations, our Insect Photographs Project continues to develop under the careful guidance of Charles Vincent (vincentch@em.agr.ca). If you would like to provide insect images to the project please check our website for details (<http://www.esc-sec.org/>).

Finally, if you haven't had a chance to peruse the schedule for our AGM at Winnipeg please do so (<http://home.cc.umanitoba.ca/esm/prog.html>).

You will be impressed by the breadth and depth of the program. It looks great!

See you in Winnipeg.

Bernie

MOT DU PRÉSIDENT

Bonjour,

J'espère que vous avez tous eu un été agréable et productif. En attendant le congrès annuel à Winnipeg, j'aimerais aborder quelques sujets.

Premièrement, Jean Turgeon en collaboration avec le comité de publication, le trésorier Gary Gibson et le président sortant Bob Foottit, ont élaboré un formulaire d'entente de copyright qui, s'il est approuvé lors de l'assemblée générale à Winnipeg, sera envoyé à tous les auteurs soumettant un manuscrit. La SEC n'a pas présentement de politique de copyright rendant très difficile de permettre l'accès aux articles scientifiques publiés dans le Canadian Entomologist. Le conseil d'administration de la SEC supporte entièrement ce formulaire d'autorisation qui permettra de protéger tant les auteurs que la Société contre les violations de droits d'auteur, un problème devenant de plus en plus important avec l'essor des publications électroniques.

Deuxièmement, il n'est jamais trop tard pour faire un don au fonds de bourses étudiantes. Comme je l'ai souligné dans le bulletin précédent, les étudiants sont le futur de notre Société et ils méritent tout le soutien que nous pouvons leur apporter.

En parlant de dons, notre projet de photographies d'insectes continue à se développer sous la conscientieuse direction de Charles Vincent (vincentch@em.agr.ca). Si vous désirez fournir des images d'insectes pour le projet, veuillez consulter notre site Internet pour les détails (<http://www.esc-sec.org/>)

Finalement, si vous n'avez pas eu la chance de lire le programme préliminaire du congrès à Winnipeg, vous pouvez consulter le site suivant : <http://home.cc.umanitoba.ca/esm/prog.html>.

Vous serez impressionnés par l'étendue et la profondeur de ce programme. Ça semble super!

A bientôt à Winnipeg.

Bernie

**Entomological Sociey of Canada / Société d'entomologies du Canada
Committees and Representatives 2002 / Comités et Représentants 2002**

Standing committees/Comités permanents

Nominations/Nominations

R. Foottit, Chair, Ottawa
R. Bennett, Victoria
J. Delisle, Sainte-Foy
B. Roitberg, ex officio, Burnaby

Elections/Elections

R. Hallett, Chair
J. MacIntyre-Allen, Guelph
A. Martin, Guelph
B. Roitberg, ex officio, Burnaby

Continuing Committees/Comités en cour

Achievement Awards/Prix d'excellence

S. Smith, Chair, Ottawa
B. Roitberg, ex officio, Burnaby

Annual Meeting/Réunion Annuelle

P. de Groot, Chair, Sault Ste. Marie
B. Roitberg, ex officio, Burnaby

Bilingualism/Bilinguisme

L. Royer, Chair, Corner Brook
F. Fournier, Montreal
H. Chiasson, St-Marc-sur-Richelieu
M. Roy, Québec
B. Roitberg, ex officio, Burnaby

Bylaws, Rules & Regulations/Règlements

M. Goettel, Chair, Lethbridge
N.J. Holliday, Winnipeg
G. Boiteau, Fredericton
B. Roitberg, ex officio, Burnaby

Finance/Finance

J.E. O'Hara, Chair, Ottawa
D. Parker, Ottawa
P. Mason, Ottawa
M. Sarazin, Ottawa
G. Gibson, Treasurer, Ottawa
B. Roitberg, ex officio, Burnaby

Headquarters/Siège social

V. Behan-Pelletier, Chair, Ottawa
J.M. Cumming, Ottawa
G. Gibson, ex officio, Ottawa
B. Roitberg, ex officio, Burnaby

Heritage/Heritage

D.C. Eidt, Chair, Fredericton
E.C. Becker, Ottawa
B. Roitberg, ex officio, Burnaby

Insect Common Names/

Noms communs d'insectes

H. Chiasson, Chair,
St. Marc-sur-Richelieu
M. Roy, Sainte-Foy
B. Roitberg, ex officio, Burnaby

Marketing/Comité du marketing

L. Braun, Chair, Saskatoon
H. White, Winnipeg
O. Olfert, Saskatoon
B. Roitberg, ex officio, Burnaby

Membership/Adhésion

J. Sweeney, Chair, Fredericton
T. Shore, ESBC, Victoria
R. Elliott, ESS, Saskatoon
P. MacKay, ESM, Winnipeg
D. Hunt, ESO, Harrow
N. Larocque, SEQ, Québec
G. Boiteau, Fredericton
B. Roitberg, ex officio, Burnaby

Publications/Publications

V. Nealis, Chair, Victoria
G. Boivin, St.-Jean-sur-Richelieu
R. Bennett, Victoria
P. de Groot, Sault Ste. Marie
P. Kevan, Guelph
L. Gilkeson, Victoria
D.B. Lyons, Sault Ste. Marie
J. Turgeon, ex officio, Sault Ste. Marie
D. Johnson, ex officio, Lethbridge
B. Roitberg, ex officio, Burnaby

Science Policy and Education/Politique scientifique et éducation

C. Vincent, Chair, Saint-Jean-sur-Richelieu
K.G. Davey, Downsview
P. Kevan, Guelph
T.L. Shore, ESBC, Victoria
R. Bourchier, ESA, Lethbridge
R. Elliott, ESS, Saskatoon
P. MacKay, ESM, Winnipeg
D. Hunt, ESO, Harrow
N. Larocque, SEQ, Laval
G. Boiteau, AES, Fredericton
B. Roitberg, ex officio, Burnaby

Student Affairs/Affaires étudiantes

J. Savage, Chair, Montréal
C. Schmidt, Edmonton
B. Sarauer, Saskatoon
D. Gillespie, ex officio, Agassiz
B. Roitberg, ex officio, Burnaby

Student Awards/Prix aux étudiantes et étudiants

D. Gillespie, Chair, Agassiz
J. Delisle, Sainte-Foy
J. Myers, Vancouver
D. Quiring, Fredericton
T.A. Wheeler, Ste-Anne-de-Bellevue
D.C. Currie, Toronto
D.J. Larson, St. John's
B. Roitberg, ex officio, Burnaby

Ad hoc Committees / Comités ad hoc

Joint Meeting Document

T.L. Shore, Chair, Victoria
J. Sweeney, Fredericton
R. Footitt, ex officio, Ottawa

**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 2003). 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 February 28, 2003.

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 2003) 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 28 février 2003.

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 a 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 âgé de moins de 40 ans pour toute la durée de l'année au cours de laquelle le prix est annoncé et décerné.

Report of the Nominations Committee (received May 23, 2002)

The following have been nominated and agreed to stand for election in 2002:

Second Vice-President: Bob Lamb and Lorraine Braun
Director-at-Large: Dave Gillespie, Fiona Hunter, Cynthia Scott-Dupree

News and Announcements

2002 Annual General Meeting of ESBC Call for Papers & Participation

The 2002 ESBC AGM was held at the Pacific Forestry Centre, Victoria
506 West Burnside Road, Tuesday, Sept. 24, 2002

STUDENTS: Remember - prizes for best MSc and PhD presentations and
Graduate Student Scholarship presentations.

Dr. Lorraine Maclauchlan Phone: (250) 828-4179
BC Ministry of Forests Fax: (250) 828-4953
515 Columbia Street
Email: Lorraine.Maclauchlan@gems3.gov.bc.ca
Kamloops BC V2C 2T7

Robb Bennett, PhD
Seed Pest Management Officer
BC Ministry of Forests
7380 Puckle Road
Saanichton BC V8M 1W4 CANADA
250 652-6593 fax 652-4204

"Our Bee web site will go live in one month. We and we need to know your favourite Bee sites so that we may add them as links. Please visit <http://www.sting.us.com> and register your request."

- Golden Bee Products and Kimbolton Castle Queens

The 50th Anniversary Meeting of the Entomological Society of Alberta, October 24-26 at , The Ramada Inn, Lethbridge. Highlights include a Heritage Symposium October 25, and submitted papers October 25-26. Proceedings will be available soon (contact JohnsonDL@em.agr.ca).

Heritage Symposium:

George Ball: Heritage Lecture - 50 Years of Entomology in Alberta

Gordon Pritchard: Aquatic Entomology

Herb Cerezke: Forest Entomology

Doug Colwell: Medical and Veterinary entomology

Bob Byers: Crop Entomology

Call for papers: <http://www.biology.ualberta.ca/courses.hp/esa/esa.htm>

The SEQ 2003 Meeting will be held in Quebec City, November 6-7.

The meeting theme is Exotic Insects. <http://www.seq.qc.ca/>

Submitted by: Thierry Poiré, thierryseq@hotmail.com

On behalf of the Canadian Biotechnology Advisory Committee (CBAC), I am pleased to announce the release of two major reports, now available on the CBAC web site.

The report titled PATENTING OF HIGHER LIFE FORMS AND RELATED ISSUES, at <http://www.cbac-cccb.ca/documents/en/E980_IC_IntelProp.pdf> identifies and examines issues that should be taken into consideration in deciding whether higher life forms should be patentable in Canada and, if so, under what conditions.

The 2000-2001 ANNUAL REPORT, at

<http://www.cbac-cccb.ca/documents/en/E829_AnnualReport.pdf> summarizes CBAC's activities from October 1, 2000 to December 31, 2001 and notes recent developments in biotechnology.

Please visit the above web addresses to download or read the reports, or visit <www.cbac-cccb.ca>.

We would like to thank all those who participated in our consultations and contributed in the creation of these reports. We encourage you to forward this email to your colleagues and other interested parties.

For more information please contact:

Conrad Bellehumeur, CBAC Senior Advisor, Communications

Telephone: (613) 954-7059 Email: bellehumeur.conrad@biotech.gc.ca

Submitted by: Arnold Naimark, Chair, Canadian Biotechnology Advisory Committee

Au nom du Comité consultatif canadien de la biotechnologie (CCCB), je suis heureux de vous annoncer la publication de deux rapports importants, maintenant disponibles sur le site Web du CCCB.

Le rapport intitulé LA BREVETABILITÉ DES FORMES DE VIE SUPÉRIEURES ET ENJEUX CONNEXES, diffusé à l'adresse

<http://www.cbac-cccb.ca/documents/fr/E980_IC_IntelProp.pdf> détermine et examine les questions qui devraient être prises en considération lorsque l'on décide d'octroyer ou non des brevets pour l'exploitation des formes de vie supérieures et, si oui, sous quelles conditions.

Pour sa part, le RAPPORT ANNUEL DE 2000-2001 du CCCB, diffusé à l'adresse

<http://www.cbac-cccb.ca/documents/fr/E829_AnnualReport.pdf> résume les activités ayant eu lieu du 1er octobre 2000 au 31 décembre 2001 et souligne les progrès récents en biotechnologie.

Veuillez visiter les adresses Web susmentionnés pour télécharger ou lire les rapports, ou consultez le site suivant : <www.cbac-cccb.ca>.

Nous souhaitons remercier tous ceux qui ont participé à nos consultations et qui ont contribué à la préparation des rapports susmentionnés. Par ailleurs, nous vous encourageons à envoyer le présent courriel à vos collègues et à d'autres parties intéressées.

Pour obtenir de plus amples renseignements, veuillez communiquer avec la personne suivante :

Conrad Bellehumeur, conseiller principal, Communications, CCCB

Téléphone : (613) 954-7059 Courriel : bellehumeur.conrad@biotech.gc.ca

Je vous prie d'agréer mes salutations distinguées.

Le président, Comité consultatif canadien de la biotechnologie, Arnold Naimark

An **Alphabetical Listing of Student Members** (with contact information and descriptions of research interests) is now posted at <http://esc-sec.org/gradstud.htm>

Submitted by Jade Savage

Entomologist position

Our Crop and Plant Management Business Unit in Vegreville, Alberta develops environmentally sound and economically acceptable practices/strategies for pest management, and revegetation and native plant community restoration.

We are seeking an entomologist to conduct research on the impact of entomopathogenic fungi on pest insects and on efficiency and efficacy of biological control agents (predators and parasitoids) in a production greenhouse system. Additional duties include analysis of population differences in susceptibility of thrips to different entomopathogens and development of biological control products. Research program development, technology transfer activities and acquisition of outside funding are part of the position responsibilities.

Candidates require university level qualification (Ph. D. preferred) in Entomology with emphasis on insect pathology. Experience in greenhouse cropping systems is preferred. Excellent interpersonal and communications skills are required.

For more information on technical requirements contact Dr. Ken Fry, Crop and Plant Management, Alberta Research Council, Phone (780) 632-8224; email ken.fry@arc.ab.ca

This is a professional position offering a stimulating work environment. This is a six-month term position with an excellent possibility of extension. Wage will be commensurate with qualifications and experience. Please apply quoting Competition WA15 before September 13, 2002 to:

Alberta Research Council
Human Resources
Bag 4000
Vegreville, Alberta
T9C 1G8

As previously noted, the **Biological Survey of Canada** has moved the BSC web site to a different directory on the U of A server. Visit <http://www.biology.ualberta.ca/bsc/bschome.htm>

The 2002 issue of the Grasslands newsletter is on the web in pdf format. Go to the newsletters section of our website for links to all issues
<http://www.biology.ualberta.ca/bsc/english/newsletters.htm#grasslands>

There is also a link from the Grasslands section
<http://www.biology.ualberta.ca/bsc/english/grasslands.htm>

Volume 8 of the Grasslands Newsletter is now available at:
<http://www.biology.ualberta.ca/bsc/pdf/grasslands8.pdf>

The new BSC home page is: <http://www.biology.ualberta.ca/bsc/bschome.htm>.

Conact: Susan Goods
Biological Survey of Canada
(Terrestrial Arthropods)
Canadian Museum of Nature
P.O. Box 3443, Station "D"
Ottawa, ON K1P 6P4
tel. 613-566-4250
fax. 613-364-4022 (note change)

email: sgoods@mus-nature.ca

The ESC insect photographs project (on the WEB): The Entomological Society of Canada is preparing a collection of photographs of insects to be offered free of charge to the public though its web site. Insect photographs (as JPEG files, preferably 300 dpi, 1200x1800 pixels, or 4x6 inches) are requested. Send images to Charles Vincent, vincentch@em.agr.ca. Please provide the name of the insect and the name of the photographer, so that we could post these information. It is understood that the photographs are copyright-free and will be made available without obligation from the ESC.

Le projet de collection de photos d'insectes (sur le WEB) de la SEC: La Société d'entomologie du Canada prépare une collection de photographies d'insectes qui seront offertes gratuitement au public à partir de son site WEB. Veuillez les faire parvenir vos photos d'insectes par courriel (préférentiellement en fichiers JPEG, 300 dpi, 1200x1800 pixels, ou 4x6 po) à: vincentch@em.agr.ca. Veuillez mentionner le nom de l'insecte et du photographe, pour que l'on puisse afficher ces informations. Il est entendu que les photographies sont exemptes de Copyright et qu'elles seront disponibles au grand public sans obligations de la SEC.

Nature Discovery Fund: Call for Applications for 2003

The Nature Discovery Fund (NDF), administered by the Canadian Museum of Nature, invites applications for funding in support of "discovering 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 will 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, 2002. Results will be made known to applicants by April 1, 2003.

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

Robert Anderson
Canadian Museum of Nature
PO Box 3443, Station D,
Ottawa, ON. K1P 6P4

tel: 613-364-4060 fax: 613-364-4027
email: randerson@mus-nature.ca

Special book price offer: **Biological Control Programmes In Canada**, Mason, P.G. and Huber, J.T. (eds.) 2001. CABI Publishing, Wallingford, UK, 608p. ISBN 0 85199 527 6
£95.00 (US\$175.00)

CABI is offering members of the Entomological Society of Canada a 20% discount on this new book, available after February 1, 2002. A URL needed to order the book at a 20% discount can be obtained by ESC members by contacting the ESC Bulletin Editor, the ESC President, ESC Headquarters, or the Chair of the Publications Committee by e-mail.

Dave Hardwick Memorial Fund: The CanaColl Foundation has established a fund in memory of David F. Hardwick. As with the other funds established by the Foundation (W. J. Brown, G. P. Holland, G. E. Shewell, etc.), the money generated will be used to support the general principles of CanaColl. In the past, approximately \$25,000 has been received in memory of various people. For those of you who may not realize the value of the Canadian National Collection of Insects (CNCI) and associated arthropods, it is considered to be the best research collection in North America and among the top 10 in the world. Nevertheless, there is still curating that needs to be done and this is where CanaColl comes in. Since 1972, CanaColl has issued a total of 281 grants; these amounted to \$211,472 and provided 570.2 person/weeks of research and curation on the CNCI. The time factor is roughly equivalent to 11 full years of work--no vacations! About 10% of the grants were for collecting, bringing collections to Ottawa, etc., therefore the person/weeks were not counted in the above figures. If you have any questions about CanaColl, I will be glad to try to answer them.

- Edward Becker (ec.becker@sympatico.ca)

Recent deaths

Jim Hudson, husband of Johanna, 1688 Grasmere Cr., Ottawa, ON, K1V 7V2, 613-739-1158, died on 15 July. Jim, a clarinet player, collapsed at a senior residence just before his small music group were to play. He died the next day. Jim worked at Health Canada with the Pest Management Regulatory Agency. He was a graduate of University of Alberta.

Submitted by Ed Becker (ec.becker@sympatico.ca)

Personalia

Phil Corbet has been awarded the Neill Medal of the Royal Society of Edinburgh. The Medal is awarded triennially for a work by a Scottish naturalist, completed or published within the last five years. Phil was awarded the Medal for his book "Dragonflies. Behavior and Ecology of Odonata", published by Cornell University Press in 1999. The Prizes Committee felt the book made "a major contribution to natural history as an extraordinary piece of scholarship and biological insight."

Book reviews

Persons interested in reviewing books, or submitting books for review, should contact Vince Nealis, Chair of the Publications Committee (vnealis@pfc.forestry.ca) .

Instructions for Reviewers

(Submitted by the Chair of the Publications Committee)

Book reviews are solicited by the Chair of the Publications Committee of the Entomological Society and are published in either English or French in the *Bulletin of the Entomological Society of Canada*.

Reviews should be approximately 600 words in length and submitted in electronic format to either the Chair of the Publication Committee or the Editor of the *Bulletin* for a final edit. We ask that reviews be submitted within 3 months of receiving the book. Reviewers may retain the book for their effort.

Each review will contain the full citation for the book including author(s), title, publisher, year and location of publication, number of pages, and availability in either cloth or paper. The ISBN and cost for both cloth and/or paper editions should be included in Canadian \$\$ if available from the publisher, or in the currency quoted by the publisher. Examples of recent reviews can be found in the *Bulletin of the Entomological Society of Canada* 33: 56-58 (2001). An example of the suggested format for the title header is:

Hochberg, M.E. and Ives, A.R. (eds.) 2000. **Parasitoid Population Biology**. Princeton University Press, Princeton, USA. xiv + 366 pp. ISBN 0-691-04981-5 (cloth) US75.00\$, ISBN 0-691-04982-3 (paper) US24.25\$.

At the end of each year, copies of the *Bulletin* containing reviews will be sent to the appropriate publishers both as a courtesy and to encourage future requests for reviews.

**Biological Survey of Canada (Terrestrial Arthropods)
Survey Report**

Biological Survey of Canada (Terrestrial Arthropods)
Survey Report

The Scientific Committee met in Ottawa on April 18-19, 2002. A more detailed account of the meeting is included in the *Newsletter of the Biological Survey of Canada (Terrestrial Arthropods)* 21(2), 2002.

Scientific projects

The scientific projects of the Survey were considered, including the following progress.

Grasslands

The grasslands newsletter and grasslands prospectus are available and posted on the web. The newsletter includes various reports and prospects. A symposium on grassland habitats will be held at the ESC / ESM annual meeting in Winnipeg. The contributions at the symposium will be part of the set of planned chapters for the first grasslands volume on Ecology and interactions in grasslands habitats.

Arctic invertebrate biology

The former *Arctic Insect News* was incorporated into the Survey newsletter as "Arctic Corner". Examples such as a Danish-Swedish expedition that hired a Canadian coast-guard icebreaker to study ecology in the Canadian arctic demonstrate that other countries are expending more resources than Canada to study Canada's geography and biota. Therefore, there is little active entomological work to report.

Seasonal adaptations

Papers on dormancy and allied responses in insects have been published recently or are in press. Other invited work is in preparation. The seasonal adaptations project therefore continues especially in synthetic mode.

Insects of Keewatin and Mackenzie

In summer 2001 sampling in the Northwest Territories greatly increased the number of blackflies known there. This year 5 researchers plan a trip on the Thelon River including the use of Malaise traps and other sampling methods.

Other scientific priorities

Arthropod fauna of soils

A special issue of the *Canadian Journal of Soil Science* featuring soil biodiversity papers is planned for 2002. The Grasslands newsletter contains an article about an unexpected mite found in Alberta. The Committee discussed the global litter invertebrate decomposition experiment, including critical comments.

Old-growth forests

Various committee members reviewed projects, especially by graduate students, in old-growth forests in various provinces. Initiatives are underway to establish infrastructures for canopy sampling in various places, though funding is difficult to secure.

Invasions and reductions

The theme for the annual meeting of the Entomological Society of Ontario in 2002 and the Société d'entomologie du Québec in 2003 is invasive species. Several invading species have drawn recent attention. The possibility of a Survey project on invasive lady beetles will be considered.

Survey web site

The Survey's site is still at the University of Alberta site, with a modified URL (<http://www.biology.ualberta.ca/bsc/bschome.htm>), despite a move of the ESC. Recent updates include the grasslands prospectus, newsletters, Requests for material or information, and a "What's new" page. Problems with the database for the list of workers and their interests have been solved by a revision of the database, which is now being updated.

Voucher specimens

The direction for the Survey's proposed publication on voucher specimens is still being decided. Problems, articles and examples were discussed, including costs, a rating scheme, vouchers from graduate work, vouchers cited in journal articles and a trend towards lower taxonomic resolution in large-scale ecological projects.

NSERC reallocations exercise

The Committee discussed the NSERC reallocations exercise and commented on perceived structural and other problems with a relevant grant selection committee. Systematics support seems to be better than a few years ago, although still not at the necessary level.

Other priorities

The Committee also reviewed updated information on earlier or currently less active Survey projects, and discussed actions and information on endangered species, damaged ecosystems, faunal analysis, survey publicity, funding for biodiversity projects, naturalists publications, arthropods and fire and other topics.

Liaison and exchange of information

Canadian Museum of Nature

Ms. Anne Breau, Chief, Canadian Centre For Biodiversity – Policy, Networks, and Biodiversity Coordination reported that the CMN is planning to coordinate a network of natural history museums in Canada, to help add to the capacity of the museum community in developing collections, conducting research and producing educational programs and exhibits. She also reported on travelling exhibits, the NSERC graduate supplement for systematics research, the recent EMAN National Conference and related Museum activities and a needs assessment of biosystematics and bioinformatics by the Federal Biosystematics Partnership. Later in the meeting, Mr. Kieran Shepherd, Acting Director of Collection Services, discussed the draft CMN's Collections Development Plan.

Eastern Cereal and Oilseed Research Centre

Dr. Lianne Dwyer, Acting Director ECORC explained that there have been few recent changes or new retirements. However, there is an agreement at the branch level to staff three new entomologists, likely specializing in Coleoptera, Hymenoptera and Diptera. Although there is no new funding the process to recruit the first of these positions is underway. The Department is moving from vertical structure to horizontal themes. One of the main themes is Environmental Health, which includes biodiversity and integrated pest management. Biodiversity will house all the systematics work done at ECORC. Dr. Dwyer announced the publication of the book on biological control programmes 1981-2000, and noted that many newly funded projects are on invasive pests.

Entomological Society of Canada

Dr. Foottit reminded the Committee that the Society is still looking for a new editor for *The Canadian Entomologist*. There is some discussion about trying a new structure with divisional editors for different disciplines. The Society is also continuing to investigate issues such as copyright associated with electronic publication.

Canadian Forest Service

Dr. John Huber, on behalf of Dr. Ben Moody, reported that there has been another reorganization within the Canadian Forest Service, reducing 10 networks to 5 to correspond with the 5 regional laboratories. All taxonomists and collection managers in the CFS are now in the Biodiversity and Forest Health Network, with management based in Fredericton, New Brunswick. CFS science research has been streamlined. One project entitled "Impacts of forestry practices on biodiversity", is led by Dr. David Langor in Edmonton and includes most of the department's taxonomists. Another project entitled "Alien species" involves cooperation with the Canadian Food Inspection Agency. CFS headquarters is involved in a number of biodiversity and biosystematic activities.

Parks Canada

Mr. Rob Alvo, Conservation Biologist/National Database Manager, Species at Risk, Ecological Integrity Branch, Parks Canada reported that several small databases, including one butterfly database, are being combined into one large database available via intranet so that each region can manage its own data. Members of the Committee drew attention to the issue of quality control for data entry once each Park can enter data. Parks Canada recently hired Dr. Donald McLennan as the new National Ecological Monitoring Coordinator and he will be charged with standardizing monitoring. Despite the ecological integrity report Parks has received no new funding and therefore there is no time or resources to deal with invertebrates.

Parasitology module, Canadian Society of Zoologists

Dr. David Marcogliese reported that the protocols for monitoring parasites of vertebrate groups in biodiversity studies are still in progress. These are to be posted on the EMAN website and therefore have to be bilingual, leading to significant delays. He added that many public documents available in Environment Canada's documentation resource centre (including scientific papers) had been posted on the web but most have had to be removed because they were not available in both languages. The stickleback project proceeds with many participants. In response to questions, Dr. Marcogliese reported that the parasitologists continue to work on the development of a parasitology module for the Survey at the CMN despite a current lack of recognition and tangible support.

Secretariat activities

Ongoing operations of the Biological Survey Secretariat were reviewed, including clearing-house and coordination roles, research and other items, and Dr. Danks travels to entomological centres on behalf of the Survey to exchange information about relevant work. In 2001 and early 2002, visits were made to Victoria, BC; Edmonton, AB; Winnipeg, MB; Niagara Falls, ON; and Ste.-Anne-de-Bellevue, QC. Seminars and lectures presented, in addition to more-or-less informal treatments of the Biological Survey, included Insect fauna of the Yukon; How to assess insect biodiversity; Measuring insect life cycle duration: pitfalls and solutions; Are the life cycles of polar arthropods flexible or programmed?; Entomology in parks: General values and needs; and Dehydration in dormant insects.

Other items

Regional developments

Members of the Committee summarized information from different regions of the country. Among many other news items, in British Columbia the provincial government has cut many programs; laboratories have been closed and entomologists dismissed. The archives at the Royal British Columbia Museum have been closed and attempts are being made by individuals to retrieve some old field notes and manuscripts. These cuts have also compromised cooperative work based

in Alberta. The *Journal of the Entomological Society of British Columbia* published a volume in honour of the 100th anniversary of the Society, including historical reviews of the last 50 years. In the prairies, changes in Alberta Agriculture have led to the loss of 145 jobs including entomologists especially in extension services. The 50th anniversary of the Entomological Society of Alberta will be celebrated in October 2002. The University of Alberta is facing a cutback in its budget but in spite of that has hired three entomologists, chiefly replacing recent retirements. In Manitoba there are neither university nor governmental crises and the ESC/ESM joint meeting will be held in October. In Ontario, the Royal Ontario Museum is planning building renovations, with a large increase in gallery space and hopefully provision for research space too. Several active entomological projects were reviewed. In Quebec, the joint meeting of the 5^e Conférence Internationale Francophone d'Entomologie and Société d'entomologie du Québec will be held in Montréal in July. For Newfoundland and the Maritimes, the annual meeting of the Acadian Entomological Society will be held in Maine this year, and will include a ground beetle workshop. The small regional collections in the Maritimes are very important because they contain material not found anywhere else. For the arctic, there is a 20% reduction in funds for northern logistic support for university research. Six new research chairs for northern science were recently announced. The Canadian Polar Commission continues to publish glossy pamphlets, along with holding meetings, whereas most other polar nations have polar institutes where actual work is supported.

Other matters

The Committee also considered recent Survey publications, the annual report to the Canadian Museum of Nature, liaisons with organizations outside Canada, insect encyclopaedias in preparation, and information on various publications and meetings. The Annual General Meeting of the Biological Survey Foundation took place.

Articles:

PEST FACTS SHEET - LEEK MOTH *Acrolepiopsis assectella* (Zeller, 1839)¹

Submitted by John Garland

Synonyms:

Acrolepia assectella, combination

Source: of authors

Lita vigiliella Duponchel, 1842

Source: Gaedike 1997

Roeslerstammia assectella Zeller, 1839

Source: Gaedike 1997

Roeslerstammia betulella Herrich-Schäffer, 1854 [not Curtis, 1838]

Source: Gaedike 1997

Taxonomic Position:

Class: Insecta

Order: Lepidoptera

Family: Yponomeutidae

Source: Agassiz 1996

Subfamily: Acrolepiinae

Source: Agassiz 1996

NOTE: The subfamily Acrolepiinae has been raised to family rank, but only by some authors, e.g., Gaedike 1997.

Common Name:

English: leek moth

Source: Agassiz 1996

onion leafminer

Source: Gaedike 1997

French: teigne du poireau (f)

Source: Labeyrie 1966

HOSTS:

Larvae of this species feed on plants in the Lily family, Liliaceae (Boscher 1977, as Alliaceae; McKinlay 1992, as Amaryllidaceae; Gaedike 1997, as Alliaceae), and leek is the preferred host (Auger & Thibout 1983; Arnault & Loevenbruck 1986a, b; Hill 1987). Hosts named in the literature include:

Allium ampeloprasum var. *porrum*, see *Allium porrum*

Allium cepa - Gaedike 1997.

[*Allium cepa* var. *aggregatum*] (shallot) - Carter 1984.

[*Allium cepa* var. *cepa*] (onion) - Preobrazhenskii 1970; Simmonds 1974a, b; Anonymous 1980; Bouchet 1980; Gaedike 1980; Rahn 1982a; Scaltriti & Rezzadore 1982; Auger & Thibout 1983; Carter 1984; Plaskota & Dabrowski 1986a; Hill 1987.

[*Allium fistulosum*] (Welsh onion) - Hong *et al.* 1994 [as *Acrolepiopsis sapporensis*].

¹ NOTE: Reports pertaining to the Asian leek moth, *Acrolepiopsis sapporensis* (Matsumura, 1931), have been included and are so identified.

[*Allium porrum*] (leek) - Bouchet 1973; Mahieu & Grill 1973; Thibout 1974, 1975a, b; Boscher 1975; Lecomte 1976; Rahn 1977; Auger & Thibaut 1979; Boscher 1979; Geoffrion 1979; Rahn & Renou 1979; Anonymous 1980; Boscher 1980, cv. Malabare; Bouchet 1980; Gaedike 1980; Markkula 1981; Scaltriti & Rezzadore 1981, 1982; Auger & Thibout 1983; Boscher 1983; Carter 1984; Grill 1985; Goix 1986; Legutowska & Plaskota 1986; Plaskota 1986; Plaskota & Dabrowski 1986a, b; Hill 1987; Thibout & Nowbahari 1987; Nyrop *et al.* 1989; Cruger & Hommes 1990; Meyer & Kessler 1990; Hommes 1992; Muller-Scharer *et al.* 1992, cv. Zefa Plus; Theunissen & Legutowska 1992; Minks *et al.* 1994; Theunissen & Legutowska 1994, cv. Albana; Gaedike 1997.

[*Allium sativum*] (garlic) - Preobrazhenskii 1970; Anonymous 1980; Bouchet 1980; Carter 1984; Plaskota & Dabrowski 1986a; Hill 1987.

[*Allium schoenoprasum*] (chives) - Anonymous 1980; Carter 1984; Hill 1987; Gaedike 1997, as *Allium sibiricum*.

Allium senescens - Gaedike 1997, as *Allium montanum*.

LABORATORY REARING: For artificial diet and rearing techniques, see Arambourg *et al.* 1970, Pralavorio *et al.* 1973 (1974), Arnault 1979, 1982, Arnault & Mauchamp 1985, Arnault & Loevenbruck 1986b, Arnault & Slama 1986, and Lecomte *et al.* 1998a.

GEOGRAPHICAL DISTRIBUTION

Africa:

ALGERIA - Lecomte 1976; Thibout 1981; Thibout & Nowbahari 1987.

Asia:

JAPAN - Anonymous 1989 [as *Acrolepiopsis sapporensis*]; Saito 1990 [as *Acrolepiopsis sapporensis*]; Zhang 1994, as *Acrolepia sapporensis*.

KOREA REPUBLIC - Ahn *et al.* 1991 [as *Acrolepiopsis sapporensis*]; Lee *et al.* 1991 [as *Acrolepiopsis sapporensis*]; Hong *et al.* 1994 [as *Acrolepiopsis sapporensis*].

RUSSIA (Asian) - Labeyrie 1966, as Irkutsk; Preobrazhenskii 1970, as Buryat Autonomous Republic; Anonymous 1980, as Buryat Autonomous Republic, Irkutsk, and the Soviet Far East.

Europe: Carter 1984; Gaedike 1997.

AUSTRIA - Labeyrie 1966; Anonymous 1980; Karsholt & Razowski 1996.

BELARUS - Karsholt & Razowski 1996, as EE.

BELGIUM - Anonymous 1980; Karsholt & Razowski 1996.

BOSNIA-HERZEGOVINA - Anonymous 1980, as Yugoslavia; Karsholt & Razowski 1996, as Yugoslavia.

CROATIA - Anonymous 1980, as Yugoslavia; Karsholt & Razowski 1996, as Yugoslavia.

CZECHIA - Anonymous 1980, as Czechoslovakia; Gaedike 1980, as Bohemia and Moravia CSSR; Karsholt & Razowski 1996, as Czech Republic.

DENMARK - Labeyrie 1966, as Danemark; Anonymous 1980; Karsholt & Razowski 1996.

ESTONIA - Karsholt & Razowski 1996.

FINLAND - Markkula 1981; Karsholt & Razowski 1996.

FRANCE - Labeyrie 1966; Bouchet 1973, as the Loire Valley; Mahieu & Grill 1973, as the Nantes region; Thibout 1974; Rahn 1975; Gerst *et al.* 1977; Rahn 1977; Boscher 1979; Geoffrion 1979; Rahn & Renou 1979; Anonymous 1980; Boscher 1980, as the Val de Loire region; Thibout 1981; Ghalia & Thibout 1982, as Tours; Rahn 1982a, as northern Brittany; Rahn 1982b; Boscher 1983; Ghalia & Thibout 1983c; Grill 1985; Goix 1986; Thibout & Nowbahari 1987; Minks *et al.* 1994; Karsholt & Razowski 1996, including Corsica.

GERMANY - Anonymous 1980; Cruger & Hommes 1990; Meyer & Kessler 1990; Hommes 1992; Minks *et al.* 1994; Agassiz 1996, as Berlin and Frankfurt am Oder; Karsholt & Razowski 1996; Gaedike 1997, as Berlin and Frankfurt am Oder.

GREECE - Anonymous 1980.

HUNGARY - Anonymous 1980; Gaedike 1980, as Budapest; Karsholt & Razowski 1996.

ITALY - Labeyrie 1966; Anonymous 1980, including Sardinia and Sicily; Scaltriti & Rezzadore 1981 & 1982, as the district of Lusia; Baraniak *et al.* 1995, as northern and southern; Karsholt & Razowski 1996.

LATVIA - Karsholt & Razowski 1996.

LITHUANIA - Karsholt & Razowski 1996.

LUXEMBOURG - Karsholt & Razowski 1996.

MACEDONIA - Anonymous 1980, as Yugoslavia; Karsholt & Razowski 1996, as Yugoslavia.

NETHERLANDS - Labeyrie 1966, as Pays-Bas; Anonymous 1980; Nyrop *et al.* 1989;

Theunissen & Legutowska 1992; Minks *et al.* 1994; Theunissen & Legutowska 1994; Karsholt & Razowski 1996.

NORWAY - Anonymous 1980; Karsholt & Razowski 1996.

POLAND - Anonymous 1980; Legutowska & Plaskota 1986; Plaskota 1986; Plaskota & Dabrowski 1986a, b; Minks *et al.* 1994; Karsholt & Razowski 1996.

RUSSIA - Labeyrie 1966, as Novgorod; Anonymous 1980, as Astrakhan, Gorki, and Rostov; Karsholt & Razowski 1996, as EE; Gaedike 1997, as western Russia.

SLOVAKIA - Anonymous 1980, as Czechoslovakia; Gaedike 1980, as Slovakia CSSR; Karsholt & Razowski 1996.

SLOVENIA - Anonymous 1980, as Yugoslavia; Karsholt & Razowski 1996, as Yugoslavia.

SPAIN - Anonymous 1980; Isart *et al.* 1982, as Barcelona; Rahn 1982b; Thibout & Nowbahari 1987; Karsholt & Razowski 1996.

SWEDEN - Anonymous 1980; Thibout 1981; Thibout & Nowbahari 1987; Karsholt & Razowski 1996.

SWITZERLAND - Labeyrie 1966, as Suisse; Anonymous 1980; Muller-Scharer *et al.* 1992; Minks *et al.* 1994; Karsholt & Razowski 1996.

UKRAINE - Anonymous 1980; Karsholt & Razowski 1996, as EE.

UNITED KINGDOM - Simmonds 1974a, b, Devonshire; Anonymous 1980, as Britain; Agassiz 1996, as southeast England, chiefly coastal; Carter 1984, as the British Isles mainly coastal in southeast England and inland in Surrey and Hertfordshire; Karsholt & Razowski 1996.

YUGOSLAVIA - Anonymous 1980; Karsholt & Razowski 1996.

North America:

CANADA-ONTARIO - Handfield 1997, as Ottawa; Landry & Parker 2000, as Sarsfield.

CANADA-QUEBEC - Handfield 1997, as l'Outaouais.

Pacific Islands:

HAWAII - Zimmerman 1978, introduced in 1939; Anonymous 1980; Carter 1984; Nishida 1994 and <http://www.bishop.hawaii.org/bishop/ento/entodbhme.html> [10 July 1997, as *Acrolepiopsis sapporensis*]; Agassiz 1996; Gaedike 1997 [as *Acrolepiopsis sapporensis*]; see also <http://www.extento.hawaii.edu/kbase/crop/Type/acrolepi.htm>

NOTE: The first report from Hawaii noted certain differences between specimens of *Acrolepiopsis assetella* from Europe and the insect occurring there (Zimmerman 1978, as *Acrolepia assetella*).

DOUBTFUL RECORDS:

SCOTLAND - An old record [1875] from Midlothian is now interpreted as belonging to a different species, *Acrolepiopsis betulella* (Curtis) (Agassiz 1996).

BIOLOGY

Life Cycle: Based on laboratory observations, the time from egg to adult takes 25-31 days at 8-9°C (Bouchet 1973), and the optimum temperature for development is 20-25°C (Plaskota & Dabrowski 1986b). Excessively hot summers apparently are unfavourable for this insect (Bouchet 1980).

Egg - Eggs are laid singly on the host (Arnault & Loevenbruck 1986b), mostly on the lower leaf surface (Thibout *et al.* 1985a), and usually near the base of the plant (McKinlay 1992; Agassiz 1996). Eggs laid by females that had mated and oviposited late in life apparently develop normally (Rahn 1972 (1973)), but fertilization decreases in eggs laid toward the end of female life (Thibout 1974). Development takes about one week (McKinlay 1992; Agassiz 1996, as 5-8 days), or less under artificial rearing conditions (Pralavorio *et al.* 1973 (1974)), i.e., at 20-25°C, egg development took 5-6 days (Plaskota & Dabrowski 1986b). In Korea, egg development ranged from 5.49 days at 20°C (Lee *et al.* 1991 [as *Acrolepiopsis sapporensis*]), 3.1 days at 25°C (Hong *et al.* 1994 [as *Acrolepiopsis sapporensis*]), to 3.94 days at 30°C (Lee *et al.* 1991 [as *Acrolepiopsis sapporensis*]), the threshold for development was 4.58°C, and the total effective day-degrees for the egg stage were 88.0 (Lee *et al.* 1991 [as *Acrolepiopsis sapporensis*]).

Larva - The larvae hatch when the sum of temperatures above 6°C reaches about 90 degree-days (Bouchet 1973). They are solitary at first (Labeyrie 1966), mining the leaves (Thibout 1975b), but the epidermis remains intact (McKinlay 1992) Only if their mines coalesce do they become gregarious (Agassiz 1996). On leek, they bore through the folded leaves to the centre of the plant (McKinlay 1992), causing a series of pinholes and feeding on the inner leaves (Agassiz 1996). Also on leek, they prefer to feed on the youngest leaves (0-7 days old) but can consume leaves more than two months old (Boscher 1983). On onion, they feed inside the hollow leaves (Agassiz

1996). In the laboratory, fifth-instar larvae display a circadian rhythm of feeding and feed mainly at night (Al-Roux & Thibout 1988b). Frass from larvae has been shown to contain disulfides as a by-product of bacterial metabolism (Auger *et al.* 1989). There are five larval instars (Thibout & Nowbahari 1987), which last about 11-23 days under artificial conditions (Pralavorio *et al.* 1973 (1974)), i.e., at 20-25°C, larval development took 14.3-14.5, 15.0-16.8 and 16.9-17.7 days, respectively, for three successive generations (Plaskota & Dabrowski 1986b). In Korea, the larval period ranged from 14.3 days at 20°C (Lee *et al.* 1991 [as *Acrolepiopsis sapporensis*]), 13.1 days at 25°C (Hong *et al.* 1994 [as *Acrolepiopsis sapporensis*]), to 10.7 days at 30°C (Lee *et al.* 1991 [as *Acrolepiopsis sapporensis*]), the threshold for development was 2.43°C, and the total effective day-degrees were 255.9 (Lee *et al.* 1991 [as *Acrolepiopsis sapporensis*]).

Pupa - Pupation occurs mainly on the food plant but also on the soil or companion plants (Thibout & Nowbahari 1987; Agassiz 1996), or among plant debris (Carter 1984; McKinlay 1992). In the laboratory using leek, a population from Sweden pupated mainly off the plants, populations from Spain and Algeria mainly among the leaves, and one from France mainly on the leaves (Thibout & Nowbahari 1987). In a saturated atmosphere, the cocoon can absorb up to two-thirds of its weight in water; this enables pupae to lose less water in the course of development, particularly during moulting (Nowbahari & Thibout 1990). In the field, the pupal stage lasts about three weeks, or it may overwinter (Agassiz 1996). Under artificial conditions, the pupal stage lasts about nine days (Pralavorio *et al.* 1973 (1974)), i.e., at 20-25°C, pupal development took 15.8-17.8, 9.7-10 and 19.2-21.4 days, respectively, for three successive generations (Plaskota & Dabrowski 1986b). In Korea, the pupal period ranged from 8.86 days at 20°C (Lee *et al.* 1991 [as *Acrolepiopsis sapporensis*]), 7.1 days at 25°C (Hong *et al.* 1994 [as *Acrolepiopsis sapporensis*]), to 5.93 days at 30°C (Lee *et al.* 1991 [as *Acrolepiopsis sapporensis*]), the threshold for development was 6.02°C, and the total effective day-degrees were 162.6 (Lee *et al.* 1991 [as *Acrolepiopsis sapporensis*]).

Adult - The leek moth has a facultative imaginal [adult] diapause, during which females do not reproduce (Ghalia & Thibout 1983a). In the laboratory, termination of diapause can be accelerated by long days and high temperatures (Ghalia & Thibout 1983b). Also in the laboratory, if leek is absent at the termination of diapause, vitellogenesis and mating are delayed (Thibout *et al.* 1985b). In the field, adults emerge from winter quarters usually during April, and after mating the females lay eggs (Plaskota & Dabrowski 1986b; McKinlay 1992). In Italy, oviposition by overwintered females does not begin until the temperature reaches 9.5°C (Scaltriti & Rezzadore 1982); in Poland, oviposition begins when the mean daytime temperature reaches 15°C (Plaskota & Dabrowski 1986b). Adults are nocturnal (Labeyrie 1966; Rahn 1977; Lecomte & Thibout 1982). Two peaks of diurnal activity have been observed in both the laboratory and the field, the first starting at the onset of darkness with an upward movement, and the second ending at the onset of daylight with a downward movement (Lecomte & Thibout 1982). Adult flight and pairing are largely restricted to the hours of darkness (Rahn 1977), and flight rarely occurs during the daytime (Labeyrie 1966). Adult longevity varies from 7-68 days for non-hibernating adults, according to different authors, to eight months for hibernating adults (Labeyrie 1966). In the field

in Poland, females live for 23 days on average (Plaskota & Dabrowski 1986b). In captivity, adults feed on sugar water (Labeyrie 1966), males may live 15-20 days (Rahn 1971), male flight activity occurs between 21.00-24.00 hours (Rahn 1975), and females reared on a semi-synthetic diet may display a decrease in ovarian production (Arnault & Loevenbruck 1986a). At 19-23°C, female longevity was 11 days (Plaskota & Dabrowski 1986b).

OVERWINTERING: Adults from larvae collected in the autumn do not display any sexual behaviour, and reproductive diapause also is characterised by a longer pupal period and lack of development of the genitalia (Thibout 1981). Diapause is induced by photoperiods less than 16 hours (Pralavorio *et al.* 1973 (1974)), or 15 hours in moths from Tours, France (Ghalia & Thibout 1982). Algerian populations, which may remain active year-round, apparently have lost the capacity to enter diapause (Thibout 1981). In northern Europe, the leek moth survives the winters as pupae (McKinlay 1992).

GENERATION TIME: In northern Europe, there are only one or two generations per year (McKinlay 1992). In Poland, unmated third-generation adults overwinter (Plaskota & Dabrowski 1986b). In France, there are 3-5 generations a year (Ghalia & Thibout 1983c), with three generations in Alsace (Gerst *et al.* 1977), and three and a partial fourth in the Loire Valley (Bouchet 1973) and in the Nantes region (Mahieu & Grill 1973), and many stages may be present together in late autumn and early winter, including sexually mature adults and those in reproductive diapause (Ghalia & Thibout 1983c). In southern Europe, there may be four or five generations per year (Scaltriti & Rezzadore 1982; McKinlay 1992). In Hawaii, there are up to six generations per year (McKinlay 1992). In the coastal region of Algeria during the period September 1975 to October 1976, there were eight generations with no diapause (Lecomte 1976). In Korea, the adult population showed seven peaks per year in the Hwasung area (Hong *et al.* 1994 [as *Acrolepiopsis sapporensis*]).

MATING: Females of this species are generally considered to be monogamous (Ghalia & Thibout 1983a), i.e., they mate only once. In the field, mating has been observed at dusk and dawn (Thibout 1976), and temperature influences the time at which mating occurs (Rahn 1977). In leek fields in Poland, copulation occurred 24 hours after emergence (Plaskota 1986). In the laboratory, males respond to the female's sex pheromone the night following emergence (Thibout 1979). Copulation may last several hours (Labeyrie 1966). In the laboratory, a male can copulate only once in 24 hours (Thibout 1979), it can produce a spermatophore nightly for up to nine nights and can mate intermittently for the rest of its life (Rahn 1971). Also in the laboratory, mated females will not accept further mating for at least a week (Rahn 1971), but they will mate a second (Thibout 1975a), or third time (Rahn 1971).

PHEROMONES:

Male - Male pheromone inhibits wing fluttering of conspecific males (Lecomte *et al.* 1998b). The pheromone originates from an eversible abdominal scent-pencil (Thibaut 1972). To date, six n-alkanes have been identified in the hair-pencil extracts (Thibout *et al.* 1994).

Female - Virgin females produce sex pheromone throughout their adult life and can be as attractive to males at the end of adult life as recently emerged females (Rahn 1972 (1973)). The main component of the female sex pheromone is (Z)-11-hexadecenal (Rahn & Renou 1979; Renou *et al.* 1981). A blend of (Z)-11-hexadecenal (Z11-16:Ald) and (Z)-11-hexadecen-1-ol acetate (Z11-16:Ac), in a 10:1 ratio, yields the highest capture of males (Minks *et al.* 1994). In Japan, the Asian form of the leek moth is attracted to these same compounds, i.e., (Z)-11-hexadecenal, (Z)-11-hexadecenyl acetate and (Z)-11-hexadecen-1-ol (Yamada & Koshihara 1980 [as *Acrolepiopsis sapporensis*]).

OVIPOSITION: Oviposition behaviour consists of five stages: site seeking, approaching, landing, termination of egg retention, and oviposition (Thibout *et al.* 1985a). Compounds that elicit oviposition behaviour have been found in methanol extracts of *Allium* leaves (Auger & Thibout 1983), and in hexane extracts (Thibout & Auger 1996). On leek, ovipositing females show a preference for relatively large plants (Theunissen & Legutowska 1994). Oviposition can begin on the night following mating (Rahn 1975). It occurs predominantly from 18.00-6.00 hours (Rahn 1975). Under artificial rearing conditions, females could be induced to oviposit on a plastic substrate smeared with leek juice (Arnault & Loevenbruck 1986b), and at least 100 eggs were obtained from each pair of adults (Pralavorio *et al.* 1973 (1974)). In the field, oviposition lasted up to 41 days, and fecundity ranged from 150 to 250 eggs per female (Plaskota & Dabrowski 1986b). In the laboratory at 19-23°C, the oviposition period lasted only 22 days (Plaskota & Dabrowski 1986b).

HOST-PLANT INTERACTIONS: Using freshly cut leaf discs, investigators have shown that the leek plant produces volatile substances that stimulate female leek moths (Bouscher 1975). Among the substances released into the air by freshly cut or damaged leek leaves, di-propyl disulphide and other volatile sulfur-containing chemicals have been identified (Boscher 1977; Auger & Thibaut 1979; Lecomte & Thibout 1981; Thibout *et al.* 1982), especially propyl propane-thiosulfinate (Auger & Thibout 1981; Thibout & Auger 1983; Lecomte & Pouzat 1986). These chemicals have a negative action on ant predators and a protective role for the leek moth (Nowbahari & Thibout 1991, 1992).

Larva - In feeding studies with plant extracts, larval feeding was stimulated by some specific components of *Allium*, but it also seemed that there were other, non-specific, phago-stimulants in many plants (Al-Roux & Thibout 1988b). Specifically, leeks, disulfide, and thiosulfinate are attractive to first-instar larvae (Al-Roux & Thibout 1988a), whereas fifth-instar larvae are more sensitive to the disulfides emitted by leek than to the thiosulfinates and thiosulfonates, and among general green leaf volatiles, only 1-hexanol was attractive to them (Al-Roux & Thibout 1988a). Disulfides produced by bacteria in the larval frass enable the host-seeking behaviour of the parasite *Diadromus pulchellus* (Thibout *et al.* 1993; Thibout *et al.* 1995).

Adult - The leek moth is attracted by specific sulfur-containing compounds from leek (Lecomte & Thibout 1984; Lecomte *et al.* 1998a).

Natural Enemies:

The following parasites and predators have been reported:

PARASITES

Order Hymenoptera, family Braconidae

Chelonus depressus, on larvae (Labeyrie 1966)

Chelonus eleaphilus Silv., on larvae (Labeyrie 1966)

Microgaster globatus Nees, on larvae (Labeyrie 1966)

Microgaster hospes (Plaskota & Dabrowski 1986a)

Order Hymenoptera, family Ichneumonidae

Diadegma fenestrale (Holmgren) (Plaskota & Dabrowski 1986a, as *Diadegma fenestralis*)

Diadromus collaris (Gravenhorst), on pupae (Labeyrie 1966, as *Thyraella collaris*;

Lecomte 1976, as *Thyraella collaris*; Kalmes & Rojas-Rousse 1980; Kalmes et al.

1983; Rojas-Rousse et al. 1983; Lecomte & Pouzat 1985; Kalmes & Rojas-

Rousse 1988; Robert & Danielle 1988; Bekkaoui & Thibout 1991, 1992)

Diadromus pulchellus Wesm., on pupae (Rojas-Rousse 1977; Rojas-Rousse & Kalmes

1978; Kalmes & Rojas-Rousse 1980; Kalmes et al. 1983; Lecomte & Thibout

1983; Rojas-Rousse et al. 1983; Lecomte & Thibout 1984; Lecomte & Pouzat

1985; Lecomte & Thibout 1986; El Agoze 1987; Kalmes & Rojas-Rousse 1988;

Robert & Danielle 1988; Thibout 1988; Thibout et al. 1988; Auger et al. 1989;

Bekkaoui & Thibout 1991, 1992; Labeyrie 1991; Bekkaoui & Thibout 1993;

Lecomte & Thibout 1993; Thibout et al. 1993; Bigot et al. 1995; Thibout et al.

1995; Bigot et al. 1997a, b)

Itoplectus alternans Gravenhorst, on larvae (Labeyrie 1966)

Oleisicampe gracile Gravenhorst, on larvae (Labeyrie 1966, as *Limnerium gracile*)

Phaeogenes impiger (Plaskota & Dabrowski 1986a)

Zaglyptus varipes Gravenhorst, on larvae (Labeyrie 1966)

PREDATORS

Order Diptera, family Syrphidae

Xanthandrus comitus (Harris), on larvae (Labeyrie 1966)

PATHOGENS

A virus of the family Ascoviridae, *Diadromus pulchellus ascovirus* (DpAV), has been found in pupae of *Acrolepiopsis assectella* parasitized by the wasp *Diadromus pulchellus* (Bigot et al. 1997a, b).

DETECTION & IDENTIFICATION

Symptoms: Leafmines and feeding holes are most apparent on young plants (Labeyrie 1966). Observable symptoms of feeding are likely to be both fresh and old (Theunissen & Legutowska 1992).

Morphology:

EGG: The egg is about 0.4 mm in diameter ((McKinlay 1992). It is oval in shape with raised sculpturing, and iridescent white (Carter 1984; McKinlay 1992). For detail of the sculpturing, see Labeyrie 1966, and Chauvin *et al.* 1974.

LARVA: The larva is 13-14 mm long (McKinlay 1992). Its head is yellowish brown, sometimes with reddish brown maculation (Carter 1984). The body is yellowish green with inconspicuous gray-brown patches especially around the spiracles, and yellow plates speckled with brown on the first and last segments (McKinlay 1992). The hooks [crochets] on the abdominal prolegs are arranged in a circle, each enclosing 3-5 crochets in a short longitudinal row (Carter 1984). The cephalic appendages of the larva, together with the sensilla on them, have been described (Al-Roux & Thibout 1989).

PUPA: The pupa is 5.5-6.5 mm long (McKinlay 1992), and reddish brown (Carter 1984). Its abdominal spiracles are raised on tubercles (Carter 1984). The cremaster is bluntly rounded (Carter 1984; McKinlay 1992), bearing a dorsal lobe with eight hooked setae and a ventral lobe with four hooked setae (Carter 1984). The pupa occurs in an open network cocoon (Carter 1984; figured in Labeyrie 1966).

ADULT: The adult wingspan is 15 mm (Carter 1984). The forewings are slender and pale brown (McKinlay 1992), variably suffused with blackish brown and a large amount of white on the outer quarter (Carter 1984) and toward the apices (McKinlay 1992). The forewing has a conspicuous white triangle in the middle along the hind border (Carter 1984; figured in Labeyrie 1966), and a pale-coloured fringe (McKinlay 1992). The hindwing is pale gray (Carter 1984), darker towards the apex (Carter 1984), and fringed on the posterior margin (McKinlay 1992). The tarsi have at their ends either straight or curved excrescences, which fit the grooves between the ribs of leek leaves (Bonnet & Boscher 1978).

Male - The male scent-pencil is situated at the tip of the abdomen, and has racket-shaped scales along its length and piliform scales at the end; the epithelial secretory cells are at the base of the racket scales (androconia) (Thibaut 1972).

Female - The female sex-pheromone gland is situated in the intersegmental membrane between the 8th and 9th abdominal segments (Thibaut 1972).

Detection and Inspection Methods: Population monitoring is done with traps using the synthetic sex pheromone (Rahn 1979, 1980; Rahn & Renou 1979; Bouchet 1980; Rahn 1982b; McKinlay 1992).

MEANS OF MOVEMENT AND DISPERSAL

Moth flight occurs over short distances just above the level of the crop (Labeyrie 1966), and mass flights may occur (Plaskota 1986); the latter explains the moth's sporadic abundance in the south of England (Agassiz 1996), particularly in that part nearest France (Collier in Chaput 2000).

PEST SIGNIFICANCE

Economic Impact: Larvae attack the aerial parts of *Allium* host plants (Plaskota & Dabrowski 1986a), causing mines and perforations particularly on young plants in early summer (Labeyrie 1966; Lecomte 1976). Damage affects plants grown both for fresh market (Labeyrie 1966), and for seed (Lecomte 1976; Plaskota & Dabrowski 1986a). In general, injury tends to be more prevalent at the field perimeter than in the centre (Nyrop *et al.* 1989), and population levels are influenced by the area under leeks, the distance between plants and farm buildings, and the proximity of other crops and hedges (Legutowska & Plaskota 1986). Although larvae may attack reproductive parts of the host plants, they usually avoid the flowers, which contain a saponin compound that inhibits their growth (Harmatha *et al.* 1987). In most areas, the leek moth is just one of many *Allium* foliage pests (Hill 1987; Cruger & Hommes 1990; Hommes 1992), and it is only a minor pest in Asia (Preobrazhenskii 1970), and the United Kingdom (Hill 1987). In the United Kingdom, for instance, it has been described as local and not plentiful (Agassiz 1996), occurring chiefly in that part of southern England nearest France (Carter 1984; Collier in Chaput 2000), and its attacks are sporadic at best (Carter 1984; McKinlay 1992).

Plants most damaged in the field are leek and onion (Auger & Thibout 1983), especially newly transplanted leeks and onions (Scaltriti & Rezzadore 1982), and to a lesser extent garlic (Plaskota & Dabrowski 1986a).

On leek, bore holes in the folded leaves become a series of small windows as the leaves grow (Hill 1987), and individual plants may be partially defoliated by two or more successive generations, but different leaves would be affected, and there are ways to minimise the damage (Boscher 1983; see Control, below).

On onion, holes in the leaves may result in secondary rot in the neck area (Simmonds 1974a) [resulting in storage losses], and the larvae themselves may penetrate the bulb (Hill 1987). In Brittany, for instance, last-generation larvae made perforations and feeding galleries in the bulbs of onions left in the field until the end of September, whereas normally they would have been harvested in July (Rahn 1982a).

Environmental Impact: Whether North American species of the genus *Allium* are subject to attack, and to what extent, is an open question. Nevertheless, leek moth populations in natural

areas would not be expected to build up to the same level as in areas where the hosts are grown in extensive monoculture and where agricultural insecticides have eliminated the naturally occurring biological control agents.

Control:

CULTURAL CONTROL: Measures that have been successful include crop rotation, early harvesting to avoid damage by last-generation larvae, and positioning susceptible crops well away from infested soil (McKinlay 1992).

On leek, measures that have proven effective include covering the crop with a net (Meyer & Kessler 1990), hand-removing pupae from the plants (Legutowska & Plaskota 1986), and cutting off all outer leaves before the durable winter leaves appear in October (Boscher 1979, 1980).

On onion, harvesting early helps to avoid bulb damage by last-generation larvae in September (Rahn 1982a).

NATURAL CONTROL: In Poland, nine species of wasps play a role in limiting populations (Legutowska & Plaskota 1986), especially in the third generation when parasitism ranges from 74 to 89% (Legutowska & Plaskota 1986; Plaskota & Dabrowski 1986a). Parasites of other insects may also be effective because *Diadromus collaris* prefers to attack the closely related diamondback moth, *Plutella xylostella* (Linnaeus) (Bekkaoui & Thibout 1992).

MICROBIAL CONTROL: In Poland, pathogens contribute up to 75% mortality of leek moth larvae (Plaskota & Dabrowski 1986b). The bacterial insecticide *Bacillus thuringiensis* (Bt) has been used to control the leek moth (McKinlay 1992). As there are no pre-harvest requirements for Bt, it is recommended as a last treatment before harvest (Gerst *et al.* 1977).

MATING DISRUPTION: There is potential for mating disruption because in Barcelona, Spain, the smallest numbers and the lowest damage rates occurred on plots treated with the leek moth's female sex pheromone (Isart *et al.* 1982).

MASS TRAPPING: Mass trapping has not been promoted in any literature so far reviewed.

GROWTH INHIBITORS: Aginoside, a saponin compound isolated from leek flowers, and in smaller quantities from the leaves, shows promise because it causes mortality and moulting failure in leek moth larvae (Harmatha *et al.* 1987).

CHEMICAL CONTROL: Where leek moth attacks are sporadic, as in the United Kingdom, chemical control is rarely necessary (McKinlay 1992).

On leeks, insecticidal dips are employed at transplanting, and powders and sprays can be applied to the crop, usually at the rate of one treatment per generation (Gerst *et al.* 1977). A sequential

sampling programme has been developed in the Netherlands (Nyrop *et al.* 1989). In Germany, an action threshold of 5% infested plants is used (Hommes 1992). In the Nantes region of France, as many as 5-7 spray applications were once thought necessary (Mahieu & Grill 1973), which just shows how important monitoring is for the correct timing of insecticide treatments (Scaltriti & Rezzadore 1981). In Italy, two applications of chemicals against each of the last three generations are recommended, the first a few days after adult emergence and the second timed according to the persistence of the insecticide concerned (Scaltriti & Rezzadore 1982).

BIBLIOGRAPHY

- Agassiz, D.J.L. 1996. Yponomeutidae. Pages 39-114, in: A.M. Emmet (Ed.). The Moths and Butterflies of Great Britain and Ireland. Vol. 3. Yponomeutidae - Elachistidae. Harley Books, Martins, Great Horkesley, Colchester, Essex, England. 452 pp.
- Ahn, S.B., S.B. Lee and W.S. Cho. 1991. Leaf feeding insect pests and their damage on Welsh onion and shallot fields in Chonrabukdo and Chonranamdo Districts [Korea Republic]. Research Reports of the Rural Development Administration, Crop Protection. 33:66-73. (In Korean) CAB Abstract.
- Al-Roux, H., and E. Thibout. 1988a. Olfactory responses to plant allelochemicals in *Acrolepiopsis assectella* larvae. / Analyse en olfactomètre de l'attraction des larves d'*Acrolepiopsis assectella* par des substances allelochimiques. Entomologia Experimentalis et Applicata. 47:231-237. (In French) CAB Abstract.
- Al-Roux, H., and E. Thibout. 1988b. Preliminary observations on the feeding behaviour of larvae of the leek moth, *Acrolepiopsis assectella*, the role of *Allium* species. / Premières observations sur le comportement alimentaire des larves de la teigne du poireau, *Acrolepiopsis assectella*, rôle des *Allium*. Acta Oecologica, Oecologia Applicata. 9:261-273. (In French) CAB Abstract.
- Al-Roux, H., and E. Thibout. 1989. Morphology of the larval cephalic sensilla of *Acrolepiopsis assectella* Zell. (Lepidoptera: Hyponomeutoidea). / Morphologie des sensilles céphaliques larvaires d'*Acrolepiopsis assectella* Zell. (Lepidoptera: Hyponomeutoidea). Annales de la Société Entomologique de France. 25:163-170. (In French) CAB Abstract.
- Anonymous. 1980. *Acrolepiopsis assectella* (Zell.). Distribution Maps of Pests, Ser. A (Agric.), Map No. 405. Commonwealth Institute of Entomology, London, U.K.
- Anonymous. 1989. Check List of Japanese Insects. Entomology Laboratory, Faculty of Agriculture, Kyushu University, Fukuoka, Japan. 1678 pp.
- Arambourg, Y., R. Pralavorio and B. Chabot. 1970 (1971). The possibility of rearing *Ageniaspis fuscicollis praysincola* Silv. a parasite of *Prays oleae* Bern. (Lep. Hyponomeutidae) in a substitute host. / Possibilités d'élevage d'*Ageniaspis fuscicollis praysincola* Silv. parasite de *Prays oleae* Bern. (Lep. Hyponomeutidae) sur un hôte de remplacement. Annales de Zoologie, Écologie Animale. 2:657-658. (In French) CAB Abstract.

- Arnault, C. 1979. The influence of host plant substances on larval development of *Acrolepiopsis assectella* (Lepidoptera: Acrolepiidae) reared on artificial diet. / Influence de substances de la plante-hôte sur le développement larvaire d'*Acrolepiopsis assectella* (Lepidoptera, Acrolepiidae) en alimentation artificielle. Entomologia Experimentalis et Applicata. 25:64-74. (In French) CAB Abstract.
- Arnault, C. 1982. The consequences of artificial diet on larval development of the leek moth, *Acrolepiopsis assectella*. / Conséquences de l'alimentation artificielle sur le développement larvaire de la teigne du poireau, *Acrolepiopsis assectella*. Entomologia Experimentalis et Applicata. 32:116-122. (In French) CAB Abstract.
- Arnault, C., and B. Mauchamp. 1985. Ecdysis inhibition in *Acrolepiopsis assectella* larvae by digitonin: antagonistic effects of cholesterol. Experientia. 41:1074-1077. CAB Abstract.
- Arnault, C., and C. Loevenbruck. 1986a. Influence of host plant and larval diet on ovarian productivity in *Acrolepiopsis assectella* Z. (Lepidoptera: Acrolepiidae). Experientia. 42:448-450. CAB Abstract.
- Arnault, C., and C. Loevenbruck. 1986b. Influence of environmental factors on the oviposition and lifespan of *Acrolepiopsis assectella* Z. (Lepidoptera, Acrolepiidae). Role of the food-plant. Variability of responses. / Influence de facteurs du milieu sur la ponte et la longévité d'*Acrolepiopsis assectella* Z. (Lepidoptera, Acrolepiidae). Rôle de la plante-hôte. Variabilité des reponses. Acta Oecologica, Oecologia Applicata. 7:27-38. (In French) CAB Abstract.
- Arnault, C., and K. Slama. 1986. Dietary effects of phytoecdysones in the leek-moth, *Acrolepiopsis assectella* Zell. (Lepidoptera: Acrolepiidae). Journal of Chemical Ecology. 12:1979-1986. CAB Abstract.
- Auger, J., and E. Thibout. 1979. The action of volatile sulfur compounds from the leek (*Allium porrum*) on oviposition in *Acrolepiopsis assectella* (Lepidoptera: Hyponomeutoidea): the preponderance of thiosulfimates. / Action des substances soufrées volatiles du poireau (*Allium porrum*) sur la ponte d'*Acrolepiopsis assectella* (Lepidoptera: Hyponomeutoidea): prépondérance des thiosulfimates. Canadian Journal of Zoology. 57:2223-2229. (In French) CAB Abstract.
- Auger, J., and E. Thibout. 1981. Emission by the leek *Allium porrum* of sulfinothioates active on the leek moth *Acrolepiopsis assectella* Z. (Lepidoptera). / Émission par le poireau *Allium porrum* de thiosulfimates actifs sur la teigne du poireau, *Acrolepiopsis assectella* Z. (Lepidoptera). Comptes Rendus Hébdomadaires des Séances de l'Académie des Sciences, III. 292:217-220. (In French) CAB Abstract.
- Auger, J., and E. Thibout. 1983. Specificity of non-volatile compounds of *Allium* eliciting leek moth *Acrolepiopsis assectella* (Lepidoptera) oviposition behaviour. Entomologia Experimentalis et Applicata. 34:71-77. CAB Abstract.
- Auger, J., C. Lecomte, J. Paris and E. Thibout. 1989. Identification of leek-moth and diamondback-moth frass volatiles that stimulate parasitoid, *Diadromus pulchellus*. Journal of Chemical Ecology. 15:1391-1398. CAB Abstract.

- Baraniak, E., R. Gaedike, O. Karsholt, P. Triberti and S. Zangheri. 1995. Lepidoptera Tineoidea II. Fasc. 82. In A. Minelli, S. Ruffo and S. La Posta (Eds.). *Checklist delle Specie della Fauna Italiana*. Calderini, Bologna. 9 pp.
- Bekkaoui, A., and E. Thibout. 1991. Chemical information in the host-parasitoid couple *Acrolepiopsis assectella* (Lep.)-*Diadromus pulchellus* Hym. *Redia*. 74: 3, Appendix, 299-300; Paper presented at the 4th European Workshop 'Insect parasitoids', held in Perugia, Italy, 3-5 April 1991. CAB Abstract.
- Bekkaoui, A., and E. Thibout. 1992. Study of cuticular non-volatile compounds of *Acrolepiopsis assectella* (Lepidoptera, Yponomeutoidea) involved in host recognition by the parasitoids *Diadromus pulchellus* and *D. collaris* (Hymenoptera, Ichneumonidae). / Rôle de substances cuticulaires non volatiles d'*Acrolepiopsis assectella* (Lep.: Hyponomeutoidea) dans la reconnaissance de l'hôte par les parasitoïdes *Diadromus pulchellus* et *D. collaris* (Hym.: Ichneumonidae). *Entomophaga*. 37:627-639. (In French) CAB Abstract.
- Bekkaoui, A., and E. Thibout. 1993. Role of the cocoon of *Acrolepiopsis assectella* (Lep.: Hyponomeutidae) in host recognition by the parasitoid *Diadromus pulchellus* (Hym., Ichneumonidae). *Entomophaga*. 38:101-113. CAB Abstract.
- Bigot, Y., J.M. Drezen, P.Y. Sizaret, A. Rabouille, M.H. Hamelin and G. Periquet. 1995. The genome segments of DpRV, a commensal reovirus of the wasp *Diadromus pulchellus* (Hymenoptera). *Virology* New York. 210:109-119. CAB Abstract.
- Bigot, Y., A. Rabouille, P.Y. Sizaret, M.H. Hamelin and G. Periquet. 1997a. Particle and genomic characteristics of a new member of the Ascoviridae: *Diadromus pulchellus ascovirus*. *Journal of General Virology*. 78:1139-1147. CAB Abstract.
- Bigot, Y., A. Rabouille, G. Doury, P.Y. Sizaret, F. Delbost, M.H. Hamelin and G. Periquet. 1997b. Biological and molecular features of the relationships between *Diadromus pulchellus ascovirus*, a parasitoid hymenopteran wasp (*Diadromus pulchellus*) and its lepidopteran host, *Acrolepiopsis assectella*. *Journal of General Virology*. 78:1149-1163. CAB Abstract.
- Bonnet, B., and J. Boscher. 1978. Ecological importance of the superficial structures of the leaf of leek (*Allium porrum* L.) for one of its consumers, the leek moth (*Acrolepiopsis assectella* Zell.). / Importance écologique des structures superficielles de la feuille du poireau (*Allium porrum* L.) pour l'un de ses consommateurs, la teigne (*Acrolepiopsis assectella* Zell.). *Comptes Rendus Hébdomadaires des Séances de l'Academie des Sciences*, D. 287:479-482. (In French) CAB Abstract.
- Boscher, J. 1975. Preliminary investigations on the substances emitted by the leek (*Allium porrum* L.) and stimulating egg-laying of the Tineid (*Acrolepia assectella* Zell.). / Recherches préliminaires sur les substances émises par le poireau (*Allium porrum* L.) et stimulant la ponte de la teigne (*Acrolepia assectella* Zell.). *Annales de Zoologie, Écologie Animale*. 7:499-504. (In French) CAB Abstract.
- Boscher, J. 1977. Evidence of the role of dipropyl disulphide released by leek leaves (*Allium porrum* L.) in the egg-laying of the leek moth (*Acrolepiopsis assectella*). / Mise en évidence du rôle du disulfure de dipropyle émis par les feuilles de poireau (*Allium porrum* L.) dans la ponte de la teigne du poireau (*Acrolepiopsis assectella* Zell.). *Comptes Rendus*

Hébdomadaires des Séances de l'Académie des Sciences, D. 284:635-637. (In French)
CAB Abstract.

- Boscher, J. 1979. Remarks on the counting of 'attacks' with reference to an example: the leek moth (*Acrolepiopsis assectella* Zell.). / Rémarques sur les dénombrements d'"attaques" a propos d'un exemple: 'la teigne du poireau' (*Acrolepiopsis assectella* Zell.). Comptes Rendus des Séances de l'Académie d'Agriculture de France. 65:924-934. (In French) CAB Abstract.
- Boscher, J. 1980. The method of growth of leek leaves: a possibility for the control of phytophagous organisms. / Le type de croissance des feuilles de poireau: une possibilité de lutte contre les phytophages. Revue Horticole. 1980, No.204, 37-39. (In French) CAB Abstract.
- Boscher, J. 1983. Effect of the phytophage *Acrolepiopsis assectella* Zell. on the foliar demography of *Allium porrum* L. / Action du phytophage *Acrolepiopsis assectella* Zell. sur la démographie foliaire d'*Allium porrum* L. Acta Oecologica, Oecologia Plantarum. 4:335-344. (In French) CAB Abstract.
- Bouchet, J. 1973. The forecasting of attacks by the leek moth at the agricultural warning station of the Loire. / La prévision des attaques de la Teigne du poireau à la station d'avertissements agricoles des pays de la Loire. Phytoma. 25:24-28. (In French) CAB Abstract.
- Bouchet, J. 1980. The leek tineid. A pest of vegetable crops undergoing a renewed outbreak. / La teigne du poireau. Un ravageur des cultures légumières en recrudescence. Phytoma. 1980, No. 319, 8-9. (In French) CAB Abstract.
- Carter, D.J. 1984. Pest Lepidoptera of Europe with special reference to the British Isles. Dr. W. Junk, Publishers. Series Entomologica. Vol. 31. 431 pp.
- Chaput, J. 2000. The leek moth. European invader in Canada? Ontario Ministry of Agriculture and Rural Affairs, Guelph. Facts Sheet. 2 pp. [unpublished]
- Chauvin, G., R. Rahn and R. Barbier. 1974. Comparison of the eggs of the Lepidoptera *Phalera bucephala* L. (Ceruridae), *Acrolepia assectella* Z. and *Plutella maculipennis* Curt. [xylostella (L.)] (Plutellidae): Morphology and special ultrastructures of the chorion in contact with the plant support. / Comparaison des oeufs des lépidoptères *Phalera bucephala* L. (Ceruridae), *Acrolepia assectella* Z. et *Plutella maculipennis* Curt. (Plutellidae): morphologie et ultrastructures particulières du chorion au contact du support végétal. International Journal of Insect Morphology and Embryology. 3:247-256. (In French) CAB Abstract.
- Cruger, G., and M. Hommes. 1990. Pests and diseases of leek. Gemuse Munchen. 26:130-135. (In German) CAB Abstract.
- El Agoze, M.M. 1987. Reproductive activity of two parasitoids: *Diadromus pulchellus* (Wsm.) and *Bruchocida vuilleti* (Crawford) during a limited time of their host presence. Bulletin de la Société Entomologique d'Egypte. 67:113-121.
- Gaedike, R. 1980. Beitrag zur Kenntnis der Mikrolepidopterenfauna der Tschechoslowakei und Ungarns (Acrolepiidae, Douglasiidae, Epermeniidae). [Contribution to the knowledge of the microlepidopteran fauna of Czechoslovakia and Hungary (Acrolepiidae, Douglasiidae,

- Epermeniidae.)] Acta Faunistica Entomologica Musei Nationalis Pragae. 16:23-32. (In German)
- Gaedike, R. 1997. Acrolepiidae. In J.B. Heppner (Ed.), *Lepidopterorum Catalogus* (New Series). Association for Tropical Lepidoptera, Gainesville, Florida. Fasc. 55, Pages 1-20.
- Geoffrion, R. 1979. The leek tineid. / La teigne du poireau. Phytoma. 1979, No. 309, 5-6. (In French) CAB Abstract.
- Gerst, J.J., C. Gachon, B. Stengel and M. Stengel. 1977. Leek moth in Alsace. A review of five years of pheromone trapping. / La teigne du poireau en Alsace. Réflexions sur cinq années de piégeage sexuel. Pépinieristes-Horticulteurs-Maraîchers. 1977, No.182, 31-39. (In French) CAB Abstract.
- Ghalia, A.A., and E. Thibout. 1982. Frequency of reproductive diapause as a function of the progress of the photoperiod at constant temperatures and investigations on the susceptible stage of a strain of *Acrolepiopsis assectella* (Lep., Yponomeutoidea). / Fréquence de la diapause reproductrice en fonction de l'évolution de la photoperiode à températures constantes et recherche du stade sensible chez une souche d'*Acrolepiopsis assectella* (Lep., Yponomeutoidea). Annales de la Société Entomologique de France. 18:173-179. (In French) CAB Abstract.
- Ghalia, A.A., and E. Thibout. 1983a. The action of the leek (*Allium porrum*) on the reproductive activity of the female leek moth, *Acrolepiopsis assectella*, after the termination of its adult diapause. / Action du poireau (*Allium porrum*) sur l'activité reproductrice après la diapause imaginaire chez le teigne du poireau, *Acrolepiopsis assectella*. Entomologia Experimentalis et Applicata. 33:188-194. (In French) CAB Abstract.
- Ghalia, A.A., and E. Thibout. 1983b. Termination of diapause and resumption of sexual activity in the leek moth (*Acrolepiopsis assectella* Zell.) (Lepidoptera). / Levée de la diapause imaginaire et reprise de l'activité sexuelle chez la teigne du poireau (*Acrolepiopsis assectella* Zell.) (Lepidoptera). Agronomie. 3:717-722. (In French) CAB Abstract.
- Ghalia, A.A., and E. Thibout. 1983c. Influence of the periodic factors on the development of the leek moth *Acrolepiopsis assectella* (Zell.) and the adaptive value of the reproductive diapause (Lep. Yponomeutidae). / Influence des facteurs périodiques sur le développement de la teigne du poireau *Acrolepiopsis assectella* (Zell.) et valeur adaptative de la diapause reproductrice (Lep. Yponomeutidae). Bulletin de la Société Entomologique de France. 88:316-323. (In French) CAB Abstract.
- Goix, J. 1986. The leek tineid. / La teigne du poireau. Phytoma. No. 379, 37. (In French) CAB Abstract.
- Grill, D. 1985. The diseases and pests of the leek. / Les maladies et ravageurs du poireau. Phytoma. 1985, No. 371, 39-41. (In French) CAB Abstract.
- Handfield, L. 1997. Liste des Lépidoptères du Québec et du Labrador. Fabreries, Suppl. 7. 155 pp.
- Harmatha, J., B. Mauchamp, C. Arnault and K. Slama. 1987. Identification of a spirostanol-type saponin in the flowers of leek with inhibitory effects on growth of leek-moth larvae. Biochemical Systematics and Ecology. 15:113-116. CAB Abstract.

- Hill, D.S. 1987. Agricultural Insect Pests of Temperate Regions and Their Control. Cambridge University Press. 659 pp.
- Hommes, M. 1992. Simple control thresholds for foliage pests of leek. Bulletin OILB SROP. 15:115-121. CAB Abstract.
- Hong, K.J., M.H. Kim, S.K. Kim and J.S. Yang. 1994. Injury, seasonal occurrence and developmental period of allium leafminer, *Acrolepiopsis sapporensis* (Matsumura) in Kyeonggi area. RDA Journal of Agricultural Science, Crop Protection. 36:332-336. (In Korean) CAB Abstract.
- Isart, J., B. Frerot and F.M. Chichon. 1982. First test of control by mating disruption against the leek moth: *Acrolepiopsis assectella* (Zeller) in the Barcelona region. / Premier essai de lutte par confusion sexuelle contre la teigne du poireau: *Acrolepiopsis assectella* (Zeller) dans la région de Barcelone. Les mediateurs chimiques agissant sur le comportement des insectes. Symposium international. Versailles, 16-20 novembre 1981. Pages 373-387. Colloques de l'INRA no. 7, Institut National de la Recherche Agronomique, Paris, France. (In French) CAB Abstract.
- Kalmes, R., and D. Rojas-Rousse. 1980. Nutritional balance of *Diadromus collaris* and *D. pulchellus* (Hymenoptera Ichneumonidae) belonging to two sympatric populations; solitary endoparasites of *Acrolepiopsis assectella* pupae (Lepidoptera Yponomeutidae). / Étude du bilan nutritionnel de *Diadromus collaris* et *D. pulchellus* (Hymenoptères Ichneumonidae) appartenant à deux populations sympatriques; endoparasites solitaires des chrysalides d'*Acrolepiopsis assectella* (Lépidoptère Yponomeutidae). Entomologia Experimentalis et Applicata. 27:59-68. (In French) CAB Abstract.
- Kalmes, R., and D. Rojas-Rousse. 1988. Energy losses as a function of temperature during the development of *Diadromus collaris* and *D. pulchellus*, solitary endoparasites of *Acrolepiopsis assectella* (Lepidoptera: Plutellidae). Journal of Insect Physiology. 34:291-297. CAB Abstract.
- Kalmes, R., M.P. Hedderwick, D. Rojas-Rousse and D. Chessel. 1983. Interactions between two parasitoids *Diadromus collaris* and *D. pulchellus* (Ichneumonidae): the survival of male parasitoids in pupae of *Acrolepiopsis assectella* with or without intra- and interspecific competition. / Interactions entre deux parasitoides *Diadromus collaris* et *D. pulchellus* (Ichneumonides): survie des parasitoides males dans des chrysalides d'*Acrolepiopsis assectella* soumis ou non à une compétition intra- et interspécifique. Canadian Journal of Zoology. 61:627-632. (In French) CAB Abstract.
- Karsholt, O., and J. Razowski. 1996. The Lepidoptera of Europe. A Distributional Checklist. Apollo Books, Stenstrup. 380 pp.
- Labeyrie, V. 1966. Sous-famille des Acrolepiinae. Pages 233-249, in A.S. Balachowsky (Ed.), Entomologie Appliquée à l'Agriculture. Traité. Tome II, Lépidoptères, Vol. 1. Masson et Cie., Paris.
- Labeyrie, V. 1991. Influence of polymorphism on trophic relations of *Diadromus pulchellus* (Ichneumonidae). Redia. 74: 3, Appendix, 211-215; Paper presented at the 4th European Workshop 'Insect parasitoids', held in Perugia, Italy, 3-5 April 1991. CAB Abstract.

- Landry, J.F., and D.J. Parker. 2000 (June 28). Agriculture Canada. Plant Protection Division. Pest Identification Report No. 00-1250. [unpublished]
- Lecomte, C. 1976. First observations on the biology and damage caused by the leek tineid *Acrolepiopsis (Acrolepia) assectella* Zeller (Microlepidoptera Plutellidae) on the coast of Algeria. / Premières observations sur la biologie et les dégâts de la teigne du poireau *Acrolepiopsis (Acrolepia) assectella* Zeller (Microlépidoptère Plutellidae) sur le littoral algérois. Bulletin de la Société d'Histoire Naturelle de l'Afrique du Nord. 67:49-56. (In French) CAB Abstract.
- Lecomte, C., and J. Pouzat. 1985. Electroantennogram responses of two ichneumonid parasites, *Diadromus pulchellus* and *D. collaris*, to odours emitted by plants, the phytophagous host *Acrolepiopsis assectella* and the sexual partner. / Réponses électroantennographiques de deux parasitoïdes Ichneumonides, *Diadromus pulchellus* et *D. collaris*, aux odeurs de végétaux, du phytopophage-hôte *Acrolepiopsis assectella* et du partenaire sexuel. Entomologia Experimentalis et Applicata. 39:295-306. (In French) CAB Abstract.
- Lecomte, C., and J. Pouzat. 1986. Electroantennogram study of the reception of olfactory stimuli of plant origin in *Acrolepiopsis assectella*. / Étude électroantennographique de la réception de stimulus odorants d'origine végétale chez *Acrolepiopsis assectella*. Entomologia Experimentalis et Applicata. 40:13-24. (In French) CAB Abstract.
- Lecomte, C., and E. Thibout. 1981. Attraction of the leek moth, *Acrolepiopsis assectella*, in an olfactometer, by volatile allelochemical compounds found in the leek, *Allium porrum*. / Attraction d'*Acrolepiopsis assectella*, en olfactomètre, par des substances allélochimiques volatiles d'*Allium porrum*. Entomologia Experimentalis et Applicata. 30:293-300. (In French) CAB Abstract.
- Lecomte, C., and E. Thibout. 1982. Observations of circadian vertical movements and effects of the host plant, age and fecundation on the activity rhythm of the leek moth, *Acrolepiopsis assectella* Zell. (Lepidoptera). / Mise en évidence de mouvements verticaux quotidiens et influences de la plante-hôte, de l'âge et de la fécondation sur le rythme d'activité de la teigne du poireau, *Acrolepiopsis assectella* Zell. (Lépidoptère). Acta Oecologica, Oecologia Applicata. 3:233-240. (In French) CAB Abstract.
- Lecomte, C., and E. Thibout. 1983. Analysis, by means of a tube olfactometer, of the effect of different olfactory stimuli in host-searching by *Diadromus pulchellus* (Hym. Ichneumonidae). / Analyse, en olfactomètre tubulaire, de l'influence de différents stimulus olfactifs dans la recherche de l'hôte par *Diadromus pulchellus* (Hym. Ichneumonidae). Entomophaga. 28:217-226. (In French) CAB Abstract.
- Lecomte, C., and E. Thibout. 1984. Olfactometer study of the effects of some plant volatiles on host searching by *Diadromus pulchellus* (Hymenoptera, Ichneumonidae). / Étude olfactométrique de l'action de diverses substances allelochimiques végétales dans la recherche de l'hôte par *Diadromus pulchellus* (Hymenoptera, Ichneumonidae). Entomologia Experimentalis et Applicata. 35:295-303. (In French) CAB Abstract.
- Lecomte, C., and E. Thibout. 1986. Analysis, in two types of olfactometers, of the search behaviour of females of *Diadromus pulchellus* in the presence of odours from a phytophagous host and its damaged food plant. / Analyse, dans deux types

- d'olfactomètres, du comportement de quête des femelles de *Diadromus pulchellus* en présence d'odeurs du phytopophage-hôte et du végétal attaqué ou non. Entomophaga. 31:69-78. (In French) CAB Abstract.
- Lecomte, C., and E. Thibout. 1993. Pre- and post-imaginal experience in a specialist parasitoid *Diadromus pulchellus* (Hym.: Ichneumonidae). Entomophaga. 38:175-184. CAB Abstract.
- Lecomte, C., D. Pierre, J. Pouzat and E. Thibout. 1998a. Behavioural and olfactory variations in the leek moth, *Acrolepiopsis assectella*, after several generations of rearing under diverse conditions. Entomologia Experimentalis et Applicata. 86:305-311. CAB Abstract.
- Lecomte, C., E. Thibout, D. Pierre and J. Auger. 1998b. Transfer, perception, and activity of male pheromone of *Acrolepiopsis assectella* with special reference to conspecific male sexual inhibition. Journal of Chemical Ecology. 24:655. CAB Abstract.
- Lee, S.G., H.G. Goh and Y.M. Choi. 1991. Effect of temperature on the development of the allium leafminer, *Acrolepiopsis sapporensis* Matsumura (Lepidoptera: Acrolepiidae). Research Reports of the Rural Development Administration, Crop Protection. 33:41-43. (In Korean) CAB Abstract.
- Legutowska, H., and E. Plaskota. 1986. Influence of environmental conditions and cultural practices on two pests of vegetable crops: the carrot fly (*Psila rosae* Fab.) and the leek moth (*Acrolepiopsis assectella* Z.). Colloques de l'INRA. No. 36, 61-73. CAB Abstract.
- Mahieu, N., and D. Grill. 1973. The protection of market-garden crops in the Nantes region. / La protection des cultures maraîchères dans la région nantaise. Phytoma. 25:17-25. (In French) CAB Abstract.
- Markkula, M. 1981. Pests of cultivated plants in Finland in 1980. Annales Agriculturae Fenniae. 20:25-27. CAB Abstract.
- McKinlay, R.G. (Ed.). 1992. Vegetable Crop pests. CRC Press, Boca Raton, Florida. 406 pp.
- Meyer, W., and H. Kessler. 1990. Examples of integrated pest management in leek. Gesunde Pflanzen. 42:295-300. (In German) CAB Abstract.
- Minks, A.K., S. Voerman and J. Theunissen. 1994. Improved sex attractant for the leek moth, *Acrolepiopsis assectella* Zell. (Lep., Acrolepiidae). Journal of Applied Entomology. 117:243-247. CAB Abstract.
- Muller-Scharer, H., C.A. Potter and B. Hurni. 1992. Cover plants in field planted leek: impact on yield, insect pests and nitrogen availability in the soil. Proceedings of the 1st International Weed Control Congress. 2:353-355. CAB Abstract.
- Nishida, G.M. (Ed.). 1994. Hawaiian Terrestrial Arthropod Checklist. Second Edition. Bishop Museum, Honolulu, Hawaii. Bishop Museum Technical Report No. 1. 287 pp.
See also: <http://www.bishop.hawaii.org/bishop/ento/entodbhome.html> [10 July 1997]
- Nowbahari, B., and E. Thibout. 1990. The cocoon and humidity in the development of *Acrolepiopsis assectella* (Lep.) pupae: consequences in adults. Physiological Entomology. 15:363-368. CAB Abstract.
- Nowbahari, B., and E. Thibout. 1991. Defensive role of sulfur compounds of *Allium* plants on generalist entomophagous insects. Redia. 74: 3, Appendix, 169-170; Paper presented at

the 4th European Workshop 'Insect parasitoids', held in Perugia, Italy, 3-5 April 1991.
CAB Abstract.

- Nowbahari, B., and E. Thibout. 1992. Defensive role of *Allium* sulfur compounds for leek moth *Acrolepiopsis assectella* Z. (Lepidoptera) against generalist predators. Journal of Chemical Ecology. 18:1991-2002. CAB Abstract.
- Nyrop, J.P., A.M. Shelton and J. Theunissen. 1989. Value of a control decision rule for leek moth infestations in leek. Entomologia Experimentalis et Applicata. 53:167-176. CAB Abstract.
- Plaskota, E. 1986. Biological principles of leek moth (*Acrolepia assectella* Zeller, Lepidoptera: Plutellidae) control. III. Reproductive behaviour of the leek moth. Annals of Warsaw Agricultural University SGGW AR, Horticulture. No. 13, 47-51. CAB Abstract.
- Plaskota, E., and Z.T. Dabrowski. 1986a. Biological principles of leek moth (*Acrolepia assectella* Zeller, Lepidoptera: Plutellidae) control. I. Host plants, damage caused by leek moth larvae, and leek moth parasites. Annals of Warsaw Agricultural University SGGW AR, Horticulture. No. 13, 27-34. CAB Abstract.
- Plaskota, E., and Z.T. Dabrowski. 1986b. Biological principles of leek moth (*Acrolepiopsis assectella* Zeller, Lepidoptera: Plutellidae) control. II. Biology. Annals of Warsaw Agricultural University SGGW AR, Horticulture. No. 13, 35-46. CAB Abstract.
- Pralavorio, R., Y. Arambourg, G. Guennelon, S. Poitout and R. Bues. 1973 (1974). Work to develop a permanent rearing method for *Acrolepia assectella* Zeller (Lepidoptera, Hyponomeutidae) on an artificial medium. / Essai de mise au point d'un élevage permanent d'*Acrolepia assectella* Zeller (Lepidoptera, Hyponomeutidae) sur milieu artificiel. Annales de Zoologie, Écologie Animale. 5:569-580. (In French) CAB Abstract.
- Preobrazhenskii, V.V. 1970. Pests of onion in Buryatia. Zashchita Rastenii. 1970, 15: 10, 39. (In Russian) CAB Abstract.
- Rahn, R. 1971. Development of the mating potentialities of the males and females of *Acrolepia assectella* Z. (Lepidopt. Plutellidae). / Évolution des potentialités d'accouplement des mâles et des femelles d'*Acrolepia assectella* Z. (Lépidopt. Plutellidae). Annales de Zoologie, Écologie Animale. 3:337-345. (In French) CAB Abstract.
- Rahn, R. 1972 (1973). The influence of age on the emission of sexual pheromones by virgin females of *Acrolepia assectella* Z. / Influence de l'âge sur l'émission de phéromones sexuelles par les femelles vierges d'*Acrolepia assectella* Z. Comptes Rendus des Séances de la Société de Biologie. 166:1162-1166. (In French) CAB Abstract.
- Rahn, R. 1975. Presentation of a simple device for the study of the activity rhythms of sexual display and oviposition of *A. assectella* (Lep. Plutellidae). Technical note. / Présentation d'un dispositif simple pour l'étude des rythmes d'activité de pariade sexuelle et de ponte chez *A. assectella* (Lep. Plutellidae). Note technique. Sciences Agronomiques Rennes. École Nationale Supérieure Agronomique et Centre de Recherches de Rennes, Rennes, France. Pages 133-137. (In French) CAB Abstract.
- Rahn, R. 1977. New findings on the influence of external factors (light and temperature) on the rhythm of reproductive activity of *Acrolepia assectella* (Lep. Plut.). / Nouvelles données sur l'influence de facteurs externes (lumière et température) sur le rythme des activités de

reproduction chez *Acrolepia assectella* (Lep. Plut.). Annales de Zoologie, Écologie Animale. 9:1-10. (In French) CAB Abstract.

Rahn, R. 1979. The leek moth, *Acrolepiopsis assectella* Z.: possibility of issuing general agricultural warnings on the basis of sexual trapping using synthetic products. / La teigne du poireau, *Acrolepiopsis assectella* Z.: possibilité de généralisation des avertissements agricoles par piégeage sexuel à l'aide de produits de synthèse. Annales de Zoologie, Écologie Animale. 11:611-616. (In French) CAB Abstract.

Rahn, R. 1980. The use of a synthetic pheromone against the leek tineid. / L'utilisation d'une phéromone de synthèse contre la teigne du poireau. Phytoma. 1980, No. 320, 22. (In French) CAB Abstract.

Rahn, R. 1982a. Effects of changes in cultural methods on the development of phytophages: case of the growing of onions (*Allium cepa*) and the population dynamics of the leek moth, *Acrolepiopsis assectella* Z. (Lep., Plutellidae). / Incidence du changement de méthode culturale sur le développement des phytophages: cas de la culture de l'oignon (*Allium cepa*) et de la dynamique de population de la teigne du poireau, *Acrolepiopsis assectella* Z. (Lep., Plutellidae). Agronomie. 2:695-699. (In French) CAB Abstract.

Rahn, R. 1982b. Sex-pheromone trapping of the leek moth, *Acrolepiopsis assectella* Z. (Lepid. Yponomeutidae - Acrolepiinae) using Z 11 H DAL. Results of the 1981 programme. / Piégeage sexuel de la teigne du poireau, *Acrolepiopsis assectella* Z. (Lepid. Yponomeutidae - Acrolepiinae) à l'aide du Z 11 H DAL. Resultats de la campagne de 1981. Agronomie. 2:957-962. (In French) CAB Abstract.

Rahn, R., and M. Renou. 1979. Towards the utilisation of a synthetic pheromone, (Z)-11-hexadecenal, in the control of the leek moth, *Acrolepiopsis* (ex. *Acrolepia*) *assectella* Z., Lepidoptera Plutellidae. / Vers l'utilisation d'une phéromone de synthèse, l'hexadécène 11 Z, Al 1 dans la lutte contre la teigne du poireau, *Acrolepiopsis* (ex. *Acrolepia*) *assectella* Z., Lepidoptera Plutellidae. Comptes Rendus des Séances de l'Académie d'Agriculture de France. 65:759-765. (In French) CAB Abstract.

Renou, M., C. Descoins, E. Priesner, M. Gallois and M. Lettere. 1981. A study of the sex pheromone of the leek moth, *Acrolepiopsis assectella* (Lepidoptera: Acrolepiidae). / Étude de la phéromone sexuelle de la teigne du poireau *Acrolepiopsis assectella*. Entomologia Experimentalis et Applicata. 29:198-208. (In French) CAB Abstract.

Robert, K., and R.R. Danielle. 1988. The dynamics of a system of competitive solitary endoparasitic species of Hymenoptera: *Diadromus collaris* and *D. pulchellus*. / Dynamique d'un système d'espèces d'Hyménoptères endoparasitoïdes solitaires compétitives: *Diadromus collaris* et *D. pulchellus*. Acta Oecologica, Oecologia Generalis. 9:3-12. (In French) CAB Abstract.

Rojas-Rousse, D. 1977. The influence of elimination of overpopulation by super-parasitism on the survival of the progeny of virgin females of *Diadromus pulchellus*, Hymenoptera, Ichneumonidae. / Influence de l'élimination des parasites en surnombre sur la survie de la descendance des femelles vierges de *Diadromus pulchellus*, hyménoptère, ichneumonide. Entomologia Experimentalis et Applicata. 21:38-50. (In French) CAB Abstract.

- Rojas-Rousse, D., and R. Kalmes. 1978. The development of male *Diadromus pulchellus* (Hymenoptera: Ichneumonidae) in the pupae of *Acrolepiopsis assectella* (Lepidoptera: Plutellidae): comparison of assimilation and energy losses under two temperature regimes. Environmental Entomology. 7:469-481. CAB Abstract.
- Rojas-Rousse, D, R. Kalmes and N. Pasteur. 1983. Examination of some factors of coexistence in two species of *Diadromus* (Ichneumonidae), solitary endoparasites of the same host. / Examen de quelques facteurs de coexistence chez deux espèces de *Diadromus* (Ichneumonides), endoparasitoïdes solitaires d'un même hôte. Acta Oecologica, Oecologia Generalis. 4:193-204. (In French) CAB Abstract.
- Saito, O. 1990. Seasonal prevalence of the allium leafminer, *Acrolepiopsis sapporensis* (Matsumura) [Acrolepia sapporensis] caught by sex pheromone trap at Sapporo. Annual Report of the Society of Plant Protection of North Japan. No. 41, 129-130. (In Japanese) CAB Abstract.
- Scaltriti, G.P., and G. Rezzadore. 1981. *Acrolepiopsis assectella* (Zeller) (Lep. Acrolepiidae) in the Venice district: biology and prospects for control. Bollettino del Laboratorio di Entomologia Agraria 'Filippo Silvestri'. 38:213-229. (In Italian) CAB Abstract.
- Scaltriti, G.P., and G. Rezzadore. 1982. Leek moth: biology and control prospects. Informatore Agrario. 38:2151-2152. (In Italian) CAB Abstract.
- Simmonds, S.P. 1974a. Onions attacked by *Acrolepia assectella* (Zell.). Plant Pathology. 23:49. CAB Abstract.
- Simmonds, S.P. 1974b. *Acrolepiopsis assectella* (Zell.) (Lep., Yponomeutidae) on onions in Devon. Entomologist's Monthly Magazine. 110: 1316-18, 5. CAB Abstract.
- Theunissen, J., and H. Legutowska. 1992. Observers' bias in the assessment of pest and disease symptoms in leek. Entomologia Experimentalis et Applicata. 64:101-109. CAB Abstract.
- Theunissen, J., and H. Legutowska. 1994. Plant size as host plant selection criterion in leek by leek moth (*Acrolepiopsis assectella*) females. Proceedings of the Section Experimental and Applied Entomology of the Netherlands Entomological Society. 5:141-144. CAB Abstract.
- Thibout, E. 1972. Male and female exocrine glands intervening in the courtship behaviour of *Acrolepia assectella* (Lepidoptera: Plutellidae). / Glandes exocrines mâles et femelles intervenant dans le comportement de pariade d'*Acrolepia assectella* (Lépidoptère: Plutellidae). Annales de la Société Entomologique de France. 8:475-480. (In French) CAB Abstract.
- Thibout, E. 1974. The influence of the food-plant and of pairing on the duration of adult life, oviposition, ovarian production and fertility of females of *Acrolepia assectella* Zell. (Lepidoptera:Plutellidae). / Influences respectives de la plante-hôte et de la copulation sur la longévité, la ponte, la production ovarienne et la fertilité des femelles d'*Acrolepia assectella* Zell. (Lepidoptera:Plutellidae). Annales de Zoologie, Écologie Animale. 6:81-96. (In French) CAB Abstract.
- Thibout, E. 1975a. Analysis of the causes of inhibition of sexual receptivity and the influence of a contingent second pairing on reproduction in the leek moth, *Acrolepia assectella* (Lepidoptera: Plutellidae). / Analyse des causes de l'inhibition de la réceptivité sexuelle et

de l'influence d'une éventuelle seconde copulation sur la reproduction chez la teigne du poireau, *Acrolepias assectella* (Lepidoptera: Plutellidae). Entomologia Experimentalis et Applicata. 18:105-116. (In French) CAB Abstract.

Thibout, E. 1975b. Study of the factors determining the movements of first-instar larvae of *Acrolepiopsis (Acrolepias) assectella* Zell. (Lepidoptera) in the food-plant. / Étude du déterminisme des déplacements des larves de premier stade d'*Acrolepiopsis (Acrolepias) assectella* Zell. (Lepidoptera), dans la plante-hôte. Comptes Rendus Hébdomadaires des Séances de l'Academie des Sciences, D. 281:1039-1042. (In French) CAB Abstract.

Thibout, E. 1976. Demonstration of the circadian rhythm of the response of males of *Acrolepiopsis (Acrolepias) assectella* Zell. (Lepidoptera) to the pheromones of their females. / Mise en évidence du rythme circadien de réponse des mâles d'*Acrolepiopsis (Acrolepias) assectella* Zell. (Lepidoptera) aux pheromones de leurs femelles. Comptes Rendus Hébdomadaires des Séances de l'Academie des Sciences, D. 282:1371-1374. (In French) CAB Abstract.

Thibout, E. 1979. The sexual receptivity and competitiveness of mated males of *Acrolepiopsis assectella* (Lepidoptera: Hyponomeutoidea). / L'activité sexuelle et la compétitivité des mâles accouplés d'*Acrolepiopsis assectella* (Lepidoptera: Hyponomeutoidea). Entomologia Experimentalis et Applicata. 25:342-345. (In French) CAB Abstract.

Thibout, E. 1981. Preliminary observations and characterisation of reproductive diapause in the leek moth, *Acrolepiopsis assectella* Zell, (Lepidoptera, Hyponomeutoidea). / Observations préliminaires et caractérisation de la diapause reproductrice chez la teigne du poireau, *Acrolepiopsis assectella* Zell, (Lepidoptera: Hyponomeutoidea). Acta Oecologica, Oecologia Generalis. 2:171-182. (In French) CAB Abstract.

Thibout, E. 1988. The specificity of *Diadromus pulchellus* (Hymenoptera: Ichneumonidae) towards its host *Acrolepiopsis assectella*, the leek moth. / La spécificité de *Diadromus pulchellus* (Hyménoptère: Ichneumonidae) vis-a-vis de son hôte *Acrolepiopsis assectella*, la teigne du poireau. Entomophaga. 33:439-452. (In French) CAB Abstract.

Thibout, E., and J. Auger. 1983. Secondary chemical substances in *Allium* regulating oviposition behaviour in the leek moth *Acrolepiopsis assectella* (Zell.). (Lep. Yponomeutidae). / Substances chimiques secondaires des *Allium* déterminant le comportement de ponte de la teigne du poireau *Acrolepiopsis assectella* (Zell.) (Lep. Yponomeutidae). Bulletin de la Société entomologique de France. 88:359-368. (In French) CAB Abstract.

Thibout, E., and J. Auger. 1996. Behavioural events and host constituents involved in oviposition in the leek moth *Acrolepiopsis assectella*. Entomologia Experimentalis et Applicata. 80:101-104. CAB Abstract.

Thibout, E., and B. Nowbahari. 1987. Selection of pupation site in the leek tineid *Acrolepiopsis assectella* (Lep.): exogenous determination and interpopulation variations. / La sélection du lieu de nymphose chez la teigne du poireau, *Acrolepiopsis assectella* (Lep.): déterminisme exogène et variations interpopulations. Annales de la Société Entomologique de France. 23:183-192. (In French) CAB Abstract.

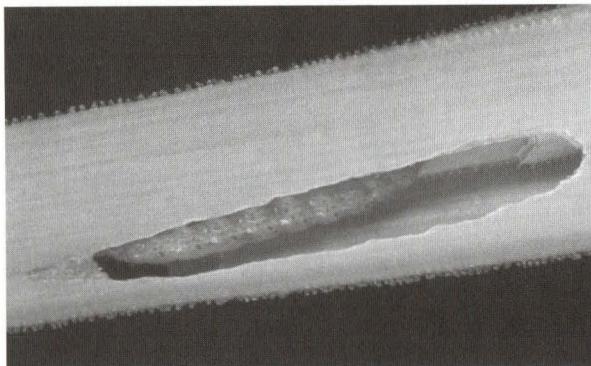
Thibout, E., J. Auger, C. Lecomte, J.H. Visser (ed.) and A.K. Minks. 1982. Host plant chemicals responsible for attraction and oviposition in *Acrolepiopsis assectella*. Proceedings of the

- 5th International Symposium on Insect-Plant Relationships, Wageningen, the Netherlands, 1-4 March 1982. Pages 107-115. CAB Abstract.
- Thibout, E., J. Auger and M. Dakkouni. 1985a. Short-term conservation of chemical information from the food-plant at the time of oviposition by the leek moth (Lepidoptera). / Conservation à court terme de l'information chimique issue de la plante-hôte lors de la ponte chez la teigne du poireau (Lépidoptère). Comptes Rendus Hébdomadaires des Séances de l'Académie des Sciences, III Sciences de la Vie. 300:489-492. (In French) CAB Abstract.
- Thibout, E., J. Huignard and J. Pouzat. 1985b. Synchronizing role of the food plant in the reproduction of specialist phytophagous insects: the leek moth (Lepidoptera) and the Bruchidae (Coleoptera). / Rôle synchronisateur de la plante-hôte dans la reproduction d'insectes phytophages spécialistes: la teigne du poireau (Lépidoptère) et les Bruchidae (Coléoptères). Bulletin de la Société Zoologique de France. 110:279-284. (In French) CAB Abstract.
- Thibout, E., C. Lecomte and J. Auger. 1988. *Diadromus pulchellus*: search for a host and specificity. Colloques de l'INRA. No. 48, 7-14. CAB Abstract.
- Thibout, E., J.F. Guillot and J. Auger. 1993. Microorganisms are involved in the production of volatile kairomones affecting the host seeking behaviour of *Diadromus pulchellus*, a parasitoid of *Acrolepiopsis assectella*. Physiological Entomology. 18:176-182. CAB Abstract.
- Thibout, E., S. Ferary and J. Auger. 1994. Nature and role of sexual pheromones emitted by males of *Acrolepiopsis assectella* (Lep.). Journal of Chemical Ecology. 20:1571-1581. CAB Abstract.
- Thibout, E., J.F. Guillot, S. Ferary, P. Limouzin and J. Auger. 1995. Origin and identification of bacteria which produce kairomones in the frass of *Acrolepiopsis assectella* (Lep., Hyponomeutoidea). Experientia. 51:1073-1075. CAB Abstract.
- Yamada, H., and T. Koshihara. 1980. Interspecific attractiveness of female sex pheromone components of the diamondback moth, *Plutella xylostella* (L.) and their analogue to the stone leek miner, *Acrolepiopsis sapporensis* Matsumura. Kontyu. 48:104-110. (In Japanese) CAB Abstract.
- Zhang, B.C. 1994. Index of Economically Important Lepidoptera. CAB International, Wallingford, Oxon, U.K. 599 pp.
- Zimmerman, E.C. 1978. *Insects of Hawaii*. Vol. 9, Microlepidoptera. The University Press of Hawaii, Honolulu. Part 1. 881 pp., 8 plates.

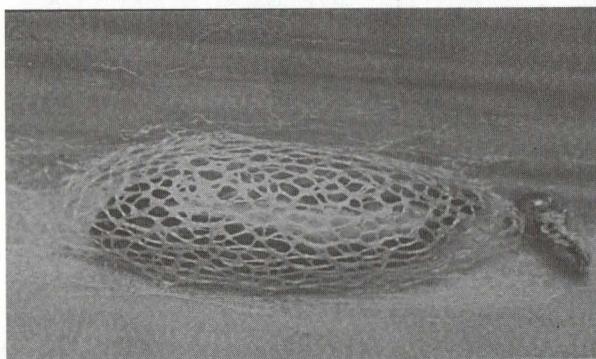
IMAGES

Source: <http://www.inra.fr>

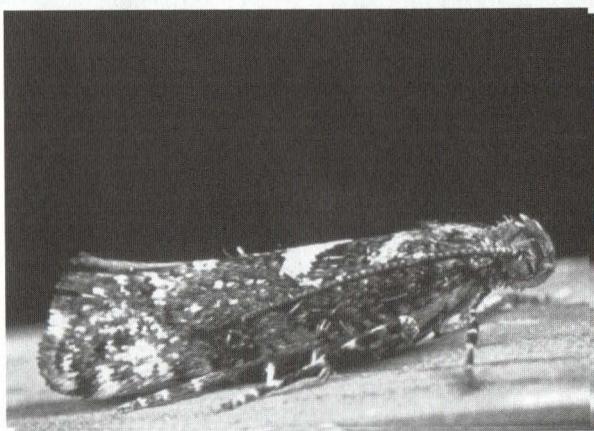
Feeding larva



Pupa in cocoon



Adult at rest



News of Organizations and Meetings

II International Congress of Coleopterology

Prague, Czech Republic, Sept 14 - 21, 2003,

European Association of Coleopterology, Czech Entomological Society and
Forestry and Game Management Research Institute Jiloviste

Announcement of the Congress, Online Registration and Registration Form:

<http://www.coleocongress2003.cz/>

Milos Knizek, Secretary of the Congress

Forestry and Game Management Research Institute

Jiloviste - Strnady

Praha 5 - Zbraslav

CZ - 156 04, Czech Republic

Tel: +420-2-57921643

Fax: +420-2-57920648 or 57921444

email: knizek@vulhm.cz

The XVth International Plant Protection Congress, Beijing, China, July 6-11, 2003. Sponsored by The International Association for the Plant Protection Sciences, and Organised by the China Society of Plant Protection.

(Editor's note: having recently attended an annual entomology meeting in China as a plenary speaker, and having met with the organizers of the 2003 IPPC, I personally recommend this meeting for both the scientific content and the beautiful and fascinating setting.)

For further information, contact: Ms. WEN Liping,

Secretariat, 15th IPPC, c/o Institute of Plant Protection,

Chinese Academy of Agricultural Sciences, Beijing 100094 China,

Tel: 0086 10 62815913

Fax: 0086 10 62815913

e-mail: ippc2003@ipmchina.net

<http://www.ipmchina.net/ippc/ippcwelcome.html>

**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):

1000

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

10. The following table shows the number of hours worked by 1000 workers in a certain industry.

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

Fax:

ANSWER

Electronic mail address / Adresse electronique:

1000

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 appartiennent à l'individu. La cotisation des membres s'applique à l'année civile.

MEMBERSHIP DUES / COTISATION

REGULAR DUES / Cotisation régulière Cdn \$80.00 + \$5.60 GST (Can) \$

MEMBER: Canadian Publishers Association, US\$6.00 + \$3.00 GST (Can.) and The Canadian Entomologist & Bulletin US\$72.40 (\$100 Cdn) (U.S.A. & Int'l)

Student member / Cotisation étudiant with/avec Cdn \$20.00 + \$1.40 GST (Can) \$

US\$18 (\$25 Cdn) (U.S.A. & Int'l)

or with/ou avec The Canadian Entomologist & Bulletin. Cdn \$40.00 + \$2.80 GST (Can) — \$

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:

Please copy and distribute to interested non-members. Thankyou

**ENTOMOLOGICAL SOCIETY OF CANADA
SOCIETE D'ENTOMOLOGIE DU CANADA**
393 WINSTON AVENUE OTTAWA ON K2A 1Y8

bin: 10730 6003 RT
URL: <http://esc-sec.org>

Phone: 613-725-2619
Fax: 613-725-9349
E-mail: entsoc.can@sympatico.ca

***Donation to the Scholarship Fund of the Society
Don au fonds des bourses d'études de la Société***

to be applied as follows/pour application comme suit:

Regular Annual Scholarships/Bourses annuelles régulières \$.....

John Borden Scholarship/Bourse John Borden \$.....

Keith Kevan Scholarship in Systematics/Bourse Kevan en systématique \$.....

Total/Totale \$.....

Payable by/payable par:

cheque/chèque money order/mandat

Please make payable to: ENTOMOLOGICAL SOCIETY OF CANADA
Prière de payer à: SOCIÉTÉ D'ENTOMOLOGIE DU CANADA

MASTERCARD AMEX or/ou VISA

#..... EXP.DATE/.....

SIGNATURE.....

Name/nom

Date:

Address/adresse

.....
.....

Thank you for your gift to the Society's Scholarship Fund(s) for students in Entomology.
Merci de votre don aux fonds des bourses d'études de la Société d'entomologie.

Your name may be listed in the Bulletin of the Society as a contributor to the given scholarship?
Votre nom peut-il apparaître dans le Bulletin de la Société comme donneur à la bourse nommée?

Yes/Oui No/Non

*Receipt for income tax purposes in Canada will be issued.
Un reçu sera émis pour fins de déduction d'impôt canadien.*

**ENTOMOLOGICAL SOCIETY OF CANADA - 2001/2002
LA SOCIÉTÉ D'ENTOMOLOGIE DU CANADA - 2001/2002**

Executive Council - Conseil Exécutif

President / Président

Bernard Roitberg
Department of Biological Science
Simon Fraser University
Burnaby, British Columbia V5A 1S6
Tel: (604) 291-3585
Fax: (604) 291-3496
E-mail: roitberg@sfu.ca

First Vice-President / Premier Vice-Président

Sandy Smith
Faculty of Forestry
33 Willcocks St., University of Toronto
Toronto, Ontario M5S 3BS
Tel: (416) 978-5482
Fax: (416) 978-3834
E-mail: smith@larva.forestry.utoronto.ca

Second Vice-President / Second Vice Président

Charles Vincent
Horticultural Research and Development Centre
Agriculture and Agri-Food Canada
430 Gouin Blvd
Saint-Jean-sur-Richelieu
Quebec, Canada J3B 3E6
Tel: (450) 346-4494, ext. 202
Fax: (450) 346-7740
E-mail: vincentch@em.agr.ca

Past President / Président sortant

Robert Footitt
Agriculture and Agri-Food Canada, ECORC
960 Carling Ave.
Ottawa, Ontario K1A 0C6
Tel: (613) 759-1774
Fax: (613) 759-1927
E-mail: footitr@em.agr.ca

Head Office

Entomological Society of Canada
393 Winston Avenue
Ottawa, Ontario K2A 1Y8
Tel: (613) 725-2619
Fax: (613) 725-9349
E-mail: entsoc.can@sympatico.ca
<http://esc-sec.org/>

Trustees - Fiduciaries

Treasurer / Trésorier

Gary Gibson
Entomological Society of Canada
393 Winston Avenue
Ottawa, Ontario K2A 1Y8
Tel: (613) 759-1823
Fax: (613) 759-1927
E-mail: gibsong@em.agr.ca

Scientific Editor/Rédacteurs Scientifique

The Canadian Entomologist, Editor / Rédacteur

Jean Turgeon
1219 Queen St. E.
Sault Ste. Marie, Ontario P6A 2E5
Tel: (705) 759-5740 ext. 2082
Fax: (705) 759-5709
E-mail: Editor.CanEnt@nrcan.gc.ca

Secretary / Secrétaire

Rick West
31 Drover's Heights
Portugal Cove-St. Philips,
Newfoundland A1M 3G6
Tel: (709) 895-2734
Fax: (709) 895-2734
E-mail: reely.west@roadrunner.nf.net

Bulletin Editor

Dan Johnson
Agriculture and Agri-Food Canada
Research Centre, P.O. Box 3000
Lethbridge, Alberta T1J 4B1
Tel: (403) 317-2214 / 327-1209
Fax: (403) 382-3156
E-mail: JohnsonDL@em.agr.ca

Directors-at-Large:

Rob Bennett (2001), Peter de Groot (2002),
Owen Olfert (2003)

Regional Directors/Directeurs régionaux:

Terry Shore (ESBC), Rob Bourchier (ESA),
Robert Elliott (ESS), Patricia MacKay (ESM),
David Hunt (ESO), Nancy Laroque (SEQ),
Gilles Boiteau (AES).

OFFICERS OF AFFILIATED SOCIETIES, 2001-2002**ENTOMOLOGICAL SOCIETY OF
BRITISH COLUMBIA**

President Lorraine Maclauchlan
 President-Elect Gail Anderson
 Past President Rob Cannings
 Sec.-Treasurer Robb Bennett
 B.C. Ministry of Forests, 7380 Puckle Rd.,
 Saanichton, British Columbia V8M 1W4
 Tel: (250) 652-6593 Fax: (250) 652-4204
 E-mail: robb.bennett@gems6.gov.bc.ca
 Editor (Journal) Ward Strong
 Editor (Boreus) Cris Guppy

**ENTOMOLOGICAL SOCIETY OF
ALBERTA**

President Hector Carcamo
 Past President Simon Wilkins
 Secretary Mike Undershultz
 Treasurer Greg Pohl
 #181, 52312 RR 223,
 Sherwood Park, Alberta T8C 1B3
 Tel: (403) 435-7211
 E-mail: gpohl@nrcan.gc.ca
 Editor (Proceedings) Erica Mueller
 Editor (Website) Troy Danyk

**ENTOMOLOGICAL SOCIETY OF
SASKATCHEWAN**

President Chrystel Lefol
 President-Elect Cedric Gillott
 Treasurer Dwayne Hegedus
 Secretary Larry Grenkow
 Agriculture and Agri-Food Canada,
 107 Science Place,
 Saskatoon, Saskatchewan S7N 0X7
 Tel: (306) 956-7667
 E-mail: Hegedusd@em.agr.ca
 Newsletter eds. Wayne Goerzen, Brian Galka

ACADIAN ENTOMOLOGICAL SOCIETY

President Andrei Alyokhin
 Treasurer Charlene Donahue
 Secretaries Steve Woods, Connie Stubbs
 Department of Biological Sciences,
 5722 Deering Hall, University of Maine
 Orono, ME 04469 USA
 E-mail: woods@maine.edu, and
 cstubbs@maine.edu

**ENTOMOLOGICAL SOCIETY OF
ONTARIO**

President Barry Lyons
 President-Elect Bruce Gill
 Past-President Gard Otis
 Secretary David Hunt
 Agriculture and Agri-Food Canada
 Research Centre, 2585 Country Road 20,
 Harrow, Ontario N0R 1G0
 Tel: (519) 738-2251 ext 427
 E-mail: Hundt@em.agr.ca
 Treasurer Blair Helson
 Editor (Journal) Yves Prévost
 Editor (Newsletter) Neil Carter

**ENTOMOLOGICAL SOCIETY OF
MANITOBA**

President Paul Fields
 President-Elect Neil Holliday
 Past-President Ian Wise
 Secretary Noel White
 Agriculture and Agri-Food Canada
 Cereal Research Centre, 195 Dafoe Road,
 Winnipeg, Manitoba R3T 2M9
 Tel: (204) 983-1452
 E-mail: nwhite@em.agr.ca
 Treasurer Bill Preston
 Newsletter Editors Nicole Lauro
 Editor (Proceedings) Terry Galloway
 Member-at-Large Robyn Underwood

**SOCIÉTÉ D'ENTOMOLOGIE DU
QUÉBEC**

Président Daniel Gingras
 Président Sortant Yves Mauffette
 Vice-Président Michel Cusson
 Trésorier Stéphane Villeneuve
 Secrétaire Annabelle Firlej
 Centre de Recherche et de Développement en
 Horticulture, Agriculture et Agro-Alimentaire
 Canada, 430 Boul. Gouin,
 St-Jean-sur-Richelieu, Québec J3B 3E6
 E-mail: secretariat@seq.qc.ca
 Rédacteur (Antennae) Christine Jean
 Webmaster Thierry Poiré

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