Sep. 1999

ISSN 0071-0709

PROCEEDINGS OF THE 46TH ANNUAL MEETING OF THE

Entomological Society of Alberta

Kananaskis, Alberta October 22-24 1998

CONTENTS

THE ENTOMOLOGICAL SOCIETY OF ALBERTA

The Entomological Society of Alberta was organized on November 27, 1952, at a meeting held in Lethbridge, Alberta, as an affiliate of the Entomological Society of Canada. A certification of incorporation was obtained under the Societies Act of Alberta on February 19, 1953.

The membership of about 70 paid-up members at that time consisted mainly of Dominion (Federal) entomologists at the Science Service Laboratories in Lethbridge (now an Agriculture and Agri-Food Canada research station), Suffield Research Station, the Forest Zoology Laboratory in Calgary, and students and staff from the University of Alberta.

One of the prime motives for establishing the Society was to encourage interest in amateur entomology, which had declined from its earlier vigour. The objectives of the Society are succinctly stated in the original Constitution, which differs only slightly from the present Bylaws:

"The object of the Society shall be to foster the advancement, exchange, and dissemination of the knowledge of insects in relation to their importance in agriculture, forestry, public health, and industry and, for its own sake, among the people of the province of Alberta."

OFFICERS 1998

President		Mark Goettel
Vice-President		Ken Fry
Past-President		Jan Volney
Secretary		Alec McClay
Treasurer		Greg Pohl
Editor		Michele Williamson
Directors	(South)	Rose DeClerck-Floate
	(Central)	Mary Reid
	(North)	Kris Justus
ESC Director		Dave Langor
Auditors		Hidejio Ono
		James Brandt

Program for the 46th annual meeting of the Entomological Society of Alberta

Thursday, October 22, 1998 Registration and Mixer

Friday, October 23, 1998

8:00 Breakfast and registration

9:00 Introduction and welcome by Mary Reid

9:05 Keynote Lecture by Dr. Jay Rosenheim, U. of California, Davis. Predators that eat other predators: Implications for biological control theory

10:05 Coffee

10:30 Submitted paper session 1

12:30 Lunch

14:00 Submitted paper session 2

15:30 Coffee

16:00 Submitted paper session 3

18:30 Banquet
Speaker: Dr. Robert Barclay, U. of Calgary. Bats aren't bugs!

Sunday, October 24, 1998

8:00 Breakfast

9:00 Submitted paper session 4

10:45 Coffee

11:00 Annual general meeting

12:00 Lunch

PRESIDENT'S REPORT
(Mark Goettel)

The yearly highlight for the Entomological Society of Alberta is of course its annual meetings. And it is always an additional bonus when we are able to meet in the mountains. Many thanks, and congratulations to Mary Reid and her team for organizing an excellent meeting at the University of Calgary Kananaskis Field Station; the air was pure, the food fantastic, the liquid refreshments plentiful and the presentations stimulating. Many thanks also to our Keynote Speaker, Dr. Jay Rosenheim and our after dinner speaker, Dr. Robert Barclay.

This year was a historical one for the Society, as we launched a web site at "http://www.biology.ualberta.ca/courses.hp/esa/esa.htm". Many thanks to Troy Danyk, who single-handedly spearheaded the project, and who is acting as our first webmaster. I encourage all members to check out this website.

The most contentious issue for this year was a proposal from the Entomological Society of Canada on a policy on revenue sharing of joint meetings. After much discussion, we decided to approve one of the alternatives provided by the ESC, but suggested some modifications. There is no doubt that this will still cause concerns in the future as the ESC comes to grip with reduced membership and financial hardship and looks to new sources of revenue.

My tenure as President was much facilitated by an excellent Executive consisting of Ken Fry as Vice-President, Jan Volney as Past-President, Michele Williamson as Editor, Greg Pohl as Treasurer, David Langor as ESC Director, Troy Danyk as Southern Region Director, Mary Reid, as Central Region Director, and Kris Justus as Northern Region Director. Thanks to you all.

I thank the membership for allowing me to serve as President of the Society during the past year, and I look forward to seeing all of you in Waterton next year.

ABSTRACT OF KEYNOTE SPEAKER

Predators that eat other predators: implications for biological control theory.

Jay Rosenheim, Dept. of Entomology, U. California, Davis

Hairston, Smith and Slobodkin proposed that terrestrial communities are comprised of three discrete trophic levels. This model has been adopted by biological control researchers working with predatory arthropods. I address the question of whether this model is appropriate as a basis for biological control theory. Direct observations of generalist predators associated with the cotton aphid, *Aphis gossypii*, in the field showed that the trophic web incorporates widespread intraguild predation and cannibalism. The predator that is most effective in suppressing aphid population growth is a green lacewing, *Chrysoperla carnea*. Direct observations documented intense predation on neonate lacewing larvae (half-life for neonate larvae = 1.4 days). Field-cage experiments showed that while lacewings alone generated strong suppression of aphids, when other predators (hemipterans) were added, lacewings were suppressed and aphid populations were released from control. Predation on lacewings is sufficiently intense to make some cotton fields "sinks" for lacewing populations, despite the presence of abundant prey. Lacewings forage actively for their sessile aphid prey, and act primarily as first-order predators. Other sit-and-wait predators have limited opportunities to encounter sessile aphid prey, but encounter the actively foraging lacewings, and therefore act primarily as second-order predators. A model of arthropod community structure that incorporates diverse roles for generalist predators is advocated.

ABSTRACTS OF SUBMITTED PAPERS

Sproule, A.T. & S.K. Ranasinghe. Impact of white pine weevil, *Pissodes strobi* (Coleoptera: Curculionidae), on tended vs. untended white spruce plantation in northeastern Alberta. We monitored the incidence and impact of white pine weevil on white spruce in a young plantation in northeastern Alberta from 1993-1998. Weevil attacks were significantly higher in the tended area compared to the untended area. Weevils preferred to attack trees with longer leaders. To date, about 25% of the attacked-trees had multiple attacks. Stem forking was evident on nearly 40% of weevil-attacked trees. All these trees recovered within five years. In the tended area, trees with single attacks recovered from loss of height growth within three years.

Whidden, T.L., M.C. Otterstatter, & R.E. Owen. Bumble bees and dipteran endoparasites. Abstract was not submitted.

Fry, K.M., M.S. Goettel, & B.A. Keddie. Evaluation of *Beauveria bassiana* (Balsamo) Vuilleman for management of western flower thrips (*Franklinialla occientalis* (Pergande)) on poinsettia. The western flower thrips (WFT), *Frankliniella occidentalis* (Pergande) is a major insect pest of greenhouse ornamentals that is becoming increasingly

resistant to insecticides and, as a result, is very difficult to manage. The aim of this project was to examine the effectiveness of three commercial *Beauveria bassiana* products and their formulations for controlling WFT on poinsettias.

Three rates for each of unaltered product and gamma-irradiated product, $1/10^{th}$ label rate, label rate, 10X label rate, and a water check were applied in 10 mL volumes to potted poinsettia plants. Gamma-irradiated material exhibited zero viability and was used to test if the formulations had any insecticidal activity. The label rates for the products are $5.3x10^8$ conidia/mL, $1.05x10^8$ conidia/mL, and $1.6x10^5$ conidia/mL. Twenty-five 3-day-old adult female WFT were added to each plant. Each treatment was applied to 5 replicates and the experiment repeated 3 times. The plants were maintained in growth chambers at 22°C, 70% relative humidity, and 12-hour photoperiod. Mortality was assessed after 7 days.

All three viable products reduced thrips populations below levels observed on control plants when applied at the label rate or higher. None of the products were able to reduce the thrips populations below that of the controls when applied at $1/10^{th}$ the label rate. Severe phytotoxicity was caused by one of the three products at 10X the label rate. The results of this study indicate that *B. bassiana* is capable of reducing WFT infesting poinsettias by 40-80%.

Mihok, S. Advances in attractive bait technology for biting flies. Box 24031, Lethbridge, AB T1H 6H1. Odour-baited cloth traps and targets are now being used extensively in Africa for the control of tsetse flies following 25 years of applied research on the visual and olfactory cues used by these insects to locate hosts. Similar efforts targeting other biting flies have been underway for only a few years, but have already revealed considerable potential for the development of efficient killing devices. Information on a new general trap design (the Nzi trap - Nzi is Swahili for fly) is presented to illustrate what can be achieved in the short-term with focused research, and what might be possible in the medium term (when more potent, economical and practical olfactory attractants have identified from more basic research). The current deficiencies of trapping devices are also discussed in terms of fly behaviour and the techniques we use to assess trap efficiency.

Graham, A. Semi-aquatic spiders associated with a freshwater pond in central Alberta. Diversity and habitat ranges of spiders were studied by pitfall trapping around a freshwater pond during late spring and summer in central Alberta. 34 species in 11 families were found, and each common species analyzed had a distinct region along transects between pond and forest where it was active and collected in high numbers. Soil moisture was also measured along transects and examined in relation to species abundance. Abundance of some species had no correlation with moisture, but several had significant relationships with moisture which were reflected in their habitat ranges. A new, more inclusive definition of the term semi-aquatic was established based on habitat range and moisture, and four species were determined to be semi-aquatic according to this definition: *Pirata piraticus* (Clerck), *Pardosa fuscula* (Thorell), *Dolomedes triton* Walckenaer and *Neoantistea magna* (Keyserling).

Spence, J.R. & W.J.A. Volney. You are what you eat II. Foliage, feeding, FTC and fecundity. Abstract was not submitted.

Robertson, I. & B[1] Roitberg. Duration of parental care in the pine engraver: Why do larger males care less? 1. Simon Fraser University. Male pine engravers, *Ips pini* (Coleoptera: Scolytidae), assist their mates during reproduction by removing the debris that accumulates while females excavate oviposition tunnels in the phloem tissue of host tree bark. Despite a positive relationship between duration of male care and reproductive success, large males leave their mates and brood sooner than small males. I address two hypotheses to explain the earlier departure of larger males from their breeding galleries: (1) females oviposit most rapidly when paired with large males, thereby reducing the length of time that paternal care increases male reproductive success, (2) larger males have better prospects for future reproduction, and thus leave their galleries in search of new breeding opportunities sooner than smaller males.

Pritchard, G. The Colombian Chiribiquete: An entomologist's paradise? Part I. The area. Abstract was not submitted.

Zloty, J. The Colombian Chiribiquete: An entomologist's paradise? Part II. The damselflies. Abstract was not submitted.

Hindmarch, T. Changes in diversity and abundance of bark beetles (Coleoptera: Scolytidae) associated with commercial thinning of lodgepole pine. Scolytid beetles were captured in funnel traps baited either with pheromones ipsdienol or lanierone, or with a tree volatile α-pinene in four commercially thinned stands and their unthinned counterparts for the first three years following harvesting. Preliminary analyses suggest that species evenness, and therefore diversity, is not significantly different between stand types. Two species were much more abundant than any other: the striped ambrosia beetle *Trypodendron lineatum* and pine engravers, *Ips pini*. These two species were significantly more abundant in thinned stands than in unthinned stands. However, pine engraver abundance significantly decreased in the second and third year after thinning compared to the first year after thinning. These results suggest that habitat abundance, and not microclimate, determines patterns of bark beetle abundance.

Bjornson, S. & B.A. Keddie. The egg files. Abstract was not submitted.

McFarlane, M.A., L.M. Dosdall, & P. Palaniswamy. The lesser of two weevils: *Ceutorhynchus neglectus* Blatchley, a minor pest of Canola in Western Canada.

A study was undertaken to determine aspects of the life history, behaviour, and host plant feeding preferences of *Ceutorhynchus neglectus* Blatchley (Coleoptera: Curculionidae), a minor pest of canola (*Brassica napus* L. and *Brassica rapa* L.) in western Canada. The final-instar larva was described for the first time. *Ceutorhynchus neglectus* was univoltine, with adults first occurring on host plants in early June. Mating occurred throughout June and July, and eggs were laid into the distal ends of developing siliques of flixweed, *Descurainia sophia* (L.) Webb (Brassicaceae). Mate guarding behaviour was observed for males of *C. neglectus*, which remained attached to females long after copulation was completed, and if necessary, struggled with rival males to prevent them from fertilizing their mates. Larvae fed upon developing seeds, and when mature, bored through

the pods and constructed earthen cells approximately 2 cm beneath the soil surface where they pupated. Laboratory host preference studies concurred with field observations which indicated that among selected species of Brassicaceae, leaves and siliques of *D. sophia* were preferred by adults of *C. neglectus* as feeding sites. In contrast to flea beetles [*Phyllotreta cruciferae* (Goeze) (Coleoptera: Chrysomelidae)], which can also damage canola seedlings, adults of *C. neglectus* caused less cotyledon damage per individual and tended to feed on cotyledon edges whereas *P. cruciferae* adults fed in a random manner over the entire cotyledon surface. Because of its biology and host plant preferences, *C. neglectus* should remain a minor pest of canola, and can only be expected to invade the crop when its preferred host (flixweed) is unavailable.

Durand, A. Delayed inducible resistance in trembling aspen clones: Is it a defense against future forest tent caterpillar attacks? Secondary defensive chemicals have been isolated from trembling aspen (*Populus tremuloides*) and found to adversely affect forest tent caterpillar (FTC) (*Malacosoma disstria*) performance. However, it is unclear whether a severe defoliation event could induce the tree to produce defensive chemicals aimed at preventing future attacks. When the plant's defensive responses are delayed it is known as delayed inducible resistance (DIR). I compared FTC performance on trees affected by natural or artificial defoliation, to determine if DIR occurs in aspen. Trees from 4 clones were 75% defoliated in late June 1997 either by FTC or manually clipped using scissors. In early May of 1998, groups of 15 first instar caterpillars were enclosed on branches of the previously manipulated trees and allowed to feed for two weeks on the new, expanding leaves. The change in average biomass per caterpillar was determined. Then at the end of May, leaves were also fed to 4th instars in the lab and development times to complete that stadium were recorded. Average biomass and development times were significantly different among clones. In two clones, the biomass of first instars were significantly lower for insects fed foliage from naturally defoliated trees than those fed leaves from control or artificially defoliated trees. However, the development times of 4th instars were significantly longer for larvae feeding on the artificially defoliated trees of one clone. Lower biomass and longer development times indicated that leaf quality declined. Because DIR occurred in some aspen clones, they would be better defended against future FTC attacks.

Hartley, D. Urban carabid diversity in Edmonton. Abstract was not submitted.

Sousa, J. Wasp density and mating status: How often does *Tiphodytes geriphagus* do the hokey-pokey and turn herself around. Effects of mating status and wasp density on oviposition behaviour of the egg parasitoid *Tiphodytes gerriphagus* was studied. As wasp density increased, the number of probes per host egg and the number of larvae per host egg increased. Superparasitism occurred most frequently when more than one parasitoid was in a patch, and groups of mated wasps superparasitised more frequently than groups of unmated wasps at 78.1 % and 62.9 %, respectively. The number of probes per host egg was significantly higher from single mated wasps (3.03 + 0.212) (mean + SE) than from single unmated wasps (2.41 + 0.183), but there was no significant difference in the number of larvae per host egg at (1.00 + 0.000) and (1.03 + 0.029), respectively. It is

suggested that mated wasps examine host eggs more often than unmated wasps to increase the probability of progeny survival.

McClay, A.S., R.A. Butts, R. Bourchier[1], P. Lacasse, D.A. Lee, C. Kirkpatrick & J. Walker-Larsen. Field and laboratory studies on Lema cyanella as a biocontrol agent for Canada thistle. 1. Agriculture and Agri-Food Canada, Lethbridge Research Centre. The leaf-feeding chrysomelid *Lema cyanella* (L.) was approved in the mid-1980s for release in Canada as a biological control agent for Canada thistle, *Cirsium arvense* (L.) Scop. (Asteraceae). It was first released in 1993, and a field population has been established since 1994 at Vegreville, Alberta. We evaluated overwintering survival, dispersal, host range and impact of *L. cyanella* to assess its potential as a biological control agent. *L. cyanella* can easily complete development within the growing season in Alberta, as predicted by a degree-day model and confirmed by phenological observations in field quadrats and outdoor rearing cages. The field population remained confined to an area of about 4 ha over a four-year period. Host preference and impact studies of *L. cyanella* on Canada thistle and several native *Cirsium* species, as tested in field plots and in large outdoor cages, suggest that *L. cyanella* is unlikely to be an effective agent for Canada thistle, and it may pose a significant risk to some native thistle species. Further redistribution of this insect is not recommended.

Montes de Oca., E. Dung beetles in central Alberta: A virtual increase in diversity? In Central Alberta as in many other cold temperate regions dung beetle assemblages are represented mostly by species of the genus *Aphodius*. About 90% of the 47 species of *Aphodius* occurring in Alberta can be found associated with mammal feces, mainly dung of large herbivores. The present study shows the results obtained in a short field survey carried out in June 1998 by means of pitfall trapping with cow and sheep dung as baits and hand collecting in cow and sheep pats. Sampling took place mainly in open habitats of grassland at the University of Alberta Farm in Edmonton and in a farm in George Lake located 100 km NW Edmonton. Occasional hand collecting in bison and cow pats in open areas of Elk Island National Park (EINP) and Blackfoot Grazing Reserve (BFGR) were also made. An overall of 1505 individuals of thirteen species of *Aphodius*, one species of *Onthophagus* and one species of *Ochodaeus* were found. 69 % of the material collected was conformed by six species of *Aphodius* whereas *Onthophagus nuchicornis* made up 29% of the overall. With the exception of two species all of those dominant species are introduced. *Aphodius omissus torpidus*, a native species, was found only in EINP and BFGR. I compared the results of this brief study with the results produced by Floate and Gill (1998) after three years of pitffall trapping during several months per year in Lethbridge, South Alberta. Some evidence based upon abundance distribution curves, diversity indices and rarefaction curves suggest a higher diversity on dung beetle fauna in central Alberta than in south Alberta. Several factors such as climate change, land use and cattle management practices are discussed as causes of the difference in diversity between the two regions.

Shorthouse, D.P. The diversity and succession of wandering spiders on Inco Ltd. reclaimed mine tailings. INCO Ltd. of Copper Cliff, Ontario has generated over 450,000

tonnes of tailings material, contained in roughly 2,225 ha. INCO Ltd. tailings are finely ground, waste bedrock generated from the milling process that contains little to no nutrients but elevated levels of sulfide-complexed heavy metals (Cu, Ni, Fe). INCO Ltd. is in the process of ameliorating their disturbed property by spreading massive amounts of lime, fertilizer and straw directly on top of the tailings substrate. Grasses are later seeded and trees planted. These tailings sites form an anthropogenic gradient from bare, unreclaimed tailings, through grassland habitats, to a mixed-wood habitat, ending in stands dominated by conifers. It is assumed that animal life also follows a similar successional pattern.

In order to assess the biological success and sustainability of the reclamation process, a guild of ground-dwelling spiders was inventoried. Members of this "wandering spider" guild share a similar habitat and are considered ideal ecological indicators. Wandering spiders were pitfall trapped on four tailings habitat types throughout the summer of 1996. The diversity of these spider communities was compared to the diversity of communities on control sites located within the Sudbury region, assumed to represent healthy, or equilibrium states.

The results obtained in this study add to the knowledge of wandering spider diversity in the Sudbury region as well as provide insight into the health of INCO Ltd. reclaimed tailings habitats.

Dosdall, L.M., A. Good, B.A. Keddie, & J. Gavloski. Toward development of canola resistant to infestation by root maggots (*Delia* spp.) (Diptera: Anthomyiidae). In central Alberta, infestations of the root maggots, *Delia radicum* (L.) and *D. floralis* (Fallén), are responsible for substantial economic losses in the production of canola. Although several cultural and chemical control strategies can be implemented to reduce crop losses due to root maggot infestations, these pests can still cause substantial economic losses. Consequently, our research has focused on developing canola resistant to root maggot infestation as a method for providing sustainable, long-term control of these pests. Our strategy has been to identify sources of resistance to root maggots within the Brassicaceae, to cross resistant host plants with *Brassica napus* to produce hybrid lines, to use molecular cultivars of canola. White mustard, *Sinapis alba*, was identified as the species least susceptible to root maggot attack among several evaluated, and was used as a parental genotype for introgressing root maggot resistance to canola. To date, we have identified at least 10 intergeneric hybrids developed from crosses of *Brassica napus* x *Sinapis alba* that have a level of resistance comparable to the *S. alba* parent. Moreover, two of these hybrids are also resistant to attack by flea beetles, *Phyllotreta* spp. Future research will focus on mapping the location(s) of the genes for resistance and transferring them to commercial canola cultivars.

Reid, M.L. & T. Robb. Tree quality and pine engravers: Vigour is better.

The role of plant vigour in affecting the success of bark beetles (Scolytidae) remains unclear. In this study, we examined reproduction of pine engravers, *Ips pini*, in 20 freshly felled jack pine trees (*Pinus banksiana*). Pine engraver success was enhanced in trees that had been growing vigorously: parental males and females established more readily, egg galleries were longer, eggs were more successful, and the total number of offspring produced was greater in more vigorous trees (most $R^2 > 0.4$). Conversely, phloem

thickness was never important in predicting reproductive parameters. These results indicate that phloem quality (via tree vigour) and not quantity is important to bark beetles. Moreover, in the absence of induced defences, vigour is better.

Buddle, C.M. & H.E.J. Hammond. On the use of pan and pitfall traps to sample spiders (Araneae) and ground beetles (Carabidae) in a mixedwood forest. During the summer of 1997, a series of 16 pitfall and 16 pan traps were used to sample spiders (Araneae) and ground beetles (Coleoptera: Carabidae) from a mixedwood forest at the George Lake Field station northwest of Edmonton. The purpose of this experiment was to test whether catch rates differed between these trapping techniques, and to assess whether detergent added to the preservative resulted in a marked increase in catch rates. Overall 46 species of spiders from 858 individuals and 27 species of carabids from 2204 individuals were collected. Species richness, overall abundance, and abundance by sex and size were analyzed. Results show that pitfall traps were more successful in trapping spiders and pan traps were more successful in trapping carabids. Adding detergent did not influence catch rates of spiders, but certain species of carabids appeared to be attracted to, or repelled by detergent in the preservative solution. Small changes in the preservative solution may have undesired consequences due to these species-specific responses. This research further supports the need to keep trapping methods consistent for ecological studies. However, taxonomic or inventory projects targeting spiders should use pitfall traps, and projects targeting carabid beetles would benefit from the use of pan traps.

Cartar, R.V. What do flower thrips cost the flower? Flower-inhabiting thrips are well-known consumers of pollen and plant cells, but evidence that thrips consume floral nectar is anecdotal. This study tests whether presence of thrips has a detectable effect on the standing crop of nectar in flowers of *Hedysarum sulphurescens*, studied on the SE slopes of Moose Mountain in Kananaskis Country. Nectar in inflorescences from which thrips had been experimentally removed with Vapona was compared with nectar in inflorescences from which thrips were not removed, measured on a plant by plant basis (i.e., matched pair design). Inflorescences were bagged to prevent visitation by other organisms, and nectar allowed to accumulate for 24h. Live thrips in the non-Vaponaed inflorescences were twice as common as the number of dead thrips in the Vaponaed inflorescences; this difference was significant. There was significantly more nectar (roughly 30% more) in inflorescences from which thrips had been removed, relative to control inflorescences. Despite this apparent nectar consumption by thrips, the natural distribution of thrips within and among inflorescences (measured in a separate study) could not be accounted for by presence of nectar. Overall, thrips would seem to be a parasitic consumer of flower nectar, which makes them a potential competitor of this plant's most important pollinator: the bumble bee.

Morneau, L., J.R. Spence, & W.J.A. Volney. Lepidoptera diversity in the boreal mixedwoods. Lepidopteran defoliators play an important role in forest dynamics. They are potential indicators of change due to their sensitivity to disturbance. The lepidopteran community is being studied before and after disturbance (partial cutting and

lepidopteran community is being studied before and after disturbance (partial cutting and fire) in the boreal mixedwood forest of northern Alberta. Results from one control season of light trapping are presented.

Hodnett, K. Settlement patterns and signal parisitization in the Bark Beetle *Ips pini*. This study was performed to determine whether individual *Ips pini* employ different strategies when choosing a nuptial chamber location. Due to variance in male quality and pheromone production, one would expect different settlement strategies to be present. High quality (large) males are predicted to be strong signallers and gain the greatest reproductive benefits by settling alone or in low-density aggregations, due to reduced competition. Whereas, lower quality (small) males with limited signalling capacity will receive the greatest reproductive advantages by settling into already existing aggregations, closer to high quality males in order to exploit or parasitze a high quality signal.

Three approaches were employed to examine the possibility of signal parisitization. First males of different size classes (large and small) were implanted on logs placed in the forest during a natural flight time. Large and small males were either placed in aggregations or implanted in uninhabited logs where they were pioneers, in order to determine the relative fitness of each size class in an aggregation setting and in a pioneer setting. Secondly, settlement patterns of naturally attacked logs were mapped daily. Nearest neighbour distances were calculated and all males were measured, in order to determine where different sized males were settling on the log in relation to the beetles already present on the log. The final experiment involved direct observation of beetle settlement in the lab. During observations male-male aggression as well as movement patterns of each male were recorded. Each of these experiments gave insight into how and why individual Ips pini differ in their settlement strategies.

Jacobs, J. K. Gandhi, & J.R. Spence. Biodiversity of subalpine saproxylic beetles in the northwest Rocky Mountains: Are fire skips important refuges for old growth saproxylic beetle species? Abstract was not submitted.

McIntyre, G.S. & R.H. Gooding. Competition experiments in insects: Another fine mess. Abstract was not submitted.

Williams, D.J. & D. Langor. A study of larvae of the *strobi*-group of the genus *Pissodes* (Coleoptera: Curculionidae). The *strobi*- group of the genus *Pissodes* contains four species, two of which, *P. terminalis* Hopping and *P. strobi* (Peck), are considered pest species. These four species, while quite different and distinct in their life histories, have defied diagnosis by classic morphological systematic means, at least in the adult stage. Life history differences are most pronounced in larvae, so a study of larvae was initiated in hopes that life history differences would be reflected in larval morphology.

Floate, K.D., B.A. Khan, & G.A.P. Gibson[1]. Hymenopterous parasitoids of filth fly (Diptera: Muscidae) pupae in cattle feedlots of Alberta, Canada. 1 Agriculture and Agri-Food Canada, Lethbridge Research Centre, Lethbridge AB. A 2-year survey in Alberta identified a parasitoid fauna of filth flies distinct from that generally reported for

cattle confinements in the United States. Twenty-two feedlots were surveyed using freeze-killed sentinel house fly pupae. Parasitism averaged 0.25 percent. Ten species of hymenopterous parasitoids were recovered. As a percentage of the total number of pupae parasitized, these species were: *Muscidifurax raptor* Girault & Saunders (37.4%), *Trichomalopsis sarcophagae* Gahan (23.9%), *Urolepis rufipes* (Ashmead) (18.5%), *Muscidifurax zaraptor* Kogan & Legner (6.9%), *Nasonia vitripennis* Walker (6.5%), *Trichomalopsis* sp. (3.7%) (Pteromalidae), *Phygadeuon* sp. (2.9%) (Ichneumonidae), *Dibrachys cavus* (Walker) (0.1%) (Pteromalidae), *Synacra* sp. (0.1%) (Diapriidae), and an unidentified Braconidae (0.1%). Three categories of seasonal activity were identified that expand on previous groupings of species by their geographic distributions. The abundance of *T. sarcophagae*, and rarity of species of *Spalangia*, contrasts with results of surveys in the United States. This difference suggests that species used to manage populations of pestiferous flies associated with livestock in the United States could be inappropriate for use in Canada.

Holmberg, R.G., Natural and Human Science, Athabasca University, Athabasca, AB, T9S 3A3. Harvestmen (Arachnida, Opiliones) of Alberta, Saskatchewan and Manitoba
The following table summarizes the results.

AB, SK, MB	Opiliones Sclerosomatidae	*Nelima paessleri* (Roewer 1910)	
Boreal PlainsEcozones		*Leiobunum calcar* (Wood 1868), *Leiobunum vitattum* (Say 1821)	
Boreal Plains, Boreal Shield, Prairies	Sabaconidae	*Sabacon* n. sp.	
Montane Cordillera		*Togwoteeus biceps* (Thorell 1877)	
Boreal Plains, Prairies	Phalangiidae	*Liopilio glaber* Schenkel 1951	
Montane Cordillera		*Odiellus pictus* (Wood 1868)	
Boreal Plains, Boreal Shield, Prairies		*Opilio parietinus* (DeGeer 1778)	
Boreal Plains, Prairies		*Paroligolophus agrestis* (Meade 1855)	
Prairies (introduced)		*Phalangium opilio* Linné 1758	
Boreal Plains, Boreal Shield, Prairies, Taiga Shield	Totals 8	6	5

ENTOMOLOGICAL SOCIETY OF ALBERTA
MINUTES OF EXECUTIVE MEETING

Thursday October 22, 1998, University of Calgary Kananaskis Field Station

Present: Mark Goettel, President; Ken Fry, Vice-President; Alec McClay, Secretary; Michele Williamson, Editor; Mary Reid, Director for Central Alberta. Unable to attend: Greg Pohl, Treasurer; David Langor, ESC Director; Troy Danyk, Southern Region Director; Kris Justus, Northern Region Director; Jan Volney, Past President.

The meeting was called to order at 8:00 p.m.

Action:

1. Approval of agenda

Reid/Fry CARRIED

Action:

2. Approval of minutes, Executive Meeting, Sunday October 5, 1997

Change should be made to show that science fair judging was done by Héctor Cárcamo. Minutes approved as amended: Williamson/Fry CARRIED.

3. Reports

3.1 Treasurer (Pohl)

Report was presented by Williamson for Pohl. The Society's balance at the end of 1997 was $12,379.14. There are 79 regular members, 36 student members, 5 honorary members and 26 library subscriptions.

3.2 Editor (Williamson)

The Proceedings of the 1997 Annual meeting have been distributed. Two hundred copies were produced at a cost of $465.20.

3.3 Regional Director to ESC (Langor)

A report was presented by Williamson for Langor. The main issue to be decided is that of profit sharing with ESC for joint meetings.

4.1 Undergraduate Awards

There were no nominations for the undergraduate award this year. Reid volunteered to prepare a poster for distribution to universities and colleges to publicize the award.

4.2 Student Travel Grants

Six travel grants of $50 were awarded to students to attend the 1998 ESA annual meeting. There was some discussion of procedures for applying for and awarding travel grants. It was agreed that Danyk would work with the Awards Committee to develop revised procedures. — Danyk, Goettel

4.3 Amateur Award (Carr Award)

There was no Amateur Award given in 1998.

4.4 Science Fairs

Concerns expressed by Danyk regarding the lack of involvement by ESA in

Action:

Science Fairs in some regions. These were discussed.

4.5 ESA Website

Danyk has volunteered to maintain the ESA's website and proposed that a position of website editor should be formally established within the Society.

4.6 Revenue Sharing with ESC

The options for revenue sharing with ESC were discussed in preparation for the general meeting.

5. New business:

5.1 Elections

Vice-President Fry agreed to form a nominating committee to propose candidates for vacant positions on the executive at the General Meeting.

6. Adjournment

The meeting was adjourned at 9:30 p.m.

ENTOMOLOGICAL SOCIETY OF ALBERTA
MINUTES OF ANNUAL MEETING

Saturday October 24, 1998, University of Calgary Kananaskis Field Station

The meeting was called to order at 11:00 a.m.

Action:

1. Approval of agenda

The agenda was approved as circulated.

2. Approval of minutes, Annual Meeting 1997

The minutes of the 1997 Annual Meeting were approved as published in the Proceedings.

4. Reports

4.1 Treasurer

Action:

ESA/ESC Annual Meeting Financial Notes:

Williamson presented Pohl's report. These finances were managed in a separate account by Jim Ryan. The meeting made a profit of approximately $10,000.00. This amount was transferred to the ESA in 1998, so it does not appear on the 1997 ESA statement. 1996 was the last year that the local society did NOT have to split the meeting profits with the ESC. Therefore, we must manage this money wisely - we will not see large profits like this again.

Two cheques intended for the ESA/ESC meeting were deposited in the ESA account, and then transferred to the ESA/ESC account:

March 6, 1997, $1000 from The City of Edmonton
March 27, 1997, $1000 from Alberta Environment

These funds are accounted for in the ESA/ESC meeting financial statement, attached to the 1998 ESA financial statement. They were channeled through the ESA, because these bodies required that donations be given to a registered Society.

Bank account at end of 1997:

chequing account	$1,136.61
term deposit #2 - 4 yrs. at 5.4% (matures Aug. 16, 2000)	$5,000.00
term deposit #4 - 30 day autorenewing, floating %	$5,118.82
term deposit #5 - 30 day autorenewing, floating %	$1,044.71
credit union shares	$79.00
total closing bank assets	$12,379.14

Dues collected in 1997 (receipt numbers 97-01 to 97-29, 98-01 to 98-57)

Regular	83@ $10 ea.	$830.00
Student	26@ $5 ea.	$130.00
Library	0@ $10 ea.	$0.00
total		$960.00

1997 ESA Membership

Regular:	79
Student:	36
Honorary:	5
Library:	26
total	146

4.2 Editor

The proceedings were distributed at this meeting. Total costs were $465.20. Williamson would like to thank Robin Leech for taking photographs at the meeting. The editor made the photographic plates to

Action:

save money.

4.3 Regional Director

Williamson presented Langor's report. The ESC President has changed. Costs and processing time of The Canadian Entomologist have been reduced by NRC press. The ESC has proposed revenue-sharing options to provincial affiliates. The Standing Rules and Committee Guidelines should be finalized this year. A membership drive was undertaken. ESC will be held in Saskatoon in 1999. ESC, ES America and SEQ will hold a joint meeting in Montreal in 2000.

4.4 President

The President presented the revenue-sharing option proposed by Langor and the two options proposed by ESC.

5. Old business

5.1 Profit from 1997 Joint Annual Meeting

A motion was carried to forgive a debt of $530.73 from ESC to ESA which resulted from expenditures on ESA functions at the Joint Annual Meeting in 1997.

5.2 Revenue Sharing with ESC

The draft recommendations from ESC regarding the balance-sheet of joint annual meetings were discussed. A motion was carried to approve one of the alternatives presented by ESC, with one modification, as follows:

i. ESC functions should be costed as part of the meeting package, and not billed separately to the ESC.
ii. If a meeting is profitable then the monetary advances from the ESC should be returned in full (or to the extent of the profit if it is less than the amount of the advances), but any additional profit should accrue to the host Affiliated Society.
iii. If a meeting loses money, the ESC will cover 50% of the loss.
iv. A limit on the cost of ESC functions shall be agreed in advance between ESC and the hosting Society.

5.3 Amateur Award

Members were asked to bring possible candidates for the Amateur Award to the attention of the Awards Committee.

Action:

5.4 Website

The Society's website is now operational at http://www.biology.ualberta.ca/courses.hp/esa/esa.htm. The site was developed by Troy Danyk. The following resolution was passed to establish an official ESA webmaster position:

Rules and Regulations:

renumber 4 (h) as 4 (i)

insert new 4(h) Webmaster – Member: one person appointed by Executive as required. Duties: to maintain and update the Society's website.

6. New business

6.1 Elections

The following were elected to vacant positions on the Executive:

Vice-President:	Daryl Williams
Regional Director (Central):	Rob Longair
Regional Director (North):	Lloyd Dosdall (to replace Kris Justus)
Secretary:	Gerald Hilchie

Louis Morneau was appointed as auditor.

6.2 1999 Annual Meeting

An offer from the Southern Region to host the 1999 Annual Meeting was accepted. Waterton or Lethbridge will be investigated as possible venues. Danyk

6.3 Resolutions

The following resolution was proposed by the Resolutions Committee (Joe Shemanchuk) and carried unanimously: McClay

Whereas the success of the 46th Annual Meeting of the Entomological Society of Alberta is attributed to: the Organizing Committee for the preparation of an excellent program and selecting a very suitable meeting location; to the Chef and his staff for the preparation of excellent meals; to Dr. Jay Rosenheim for a very informative Keynote Lecture; to Dr. Robert Barclay for the entertaining and informative after-dinner presentation;
Therefore be it resolved that the Secretary write letters of thanks and appreciation to Mary Reid, Chair of the Organizing Committee, Mr. Ernest Stadler, Chef, Dr. Jay Rosenheim, Keynote Speaker, and Dr. Robert Barclay, After-Dinner Speaker.

Action:

7. Adjournment

The meeting was adjourned at 12:15 p.m.

ENTOMOLOGICAL SOCIETY OF ALBERTA
AUDITED FINANCIAL STATEMENT
fiscal year ending Dec. 31, 1998
(submitted by Pohl, Nov. 1999)

OPENING BALANCE (Jan. 1, 1998): chequing account	$1,136.61
term deposit #2 - 4 yrs. at 5.4% (matures Aug. 16, 2000)	$5,000.00
term deposit #4 - 30 day autorenewing, floating %	$5,118.82
term deposit #5 - 30 day autorenewing, floating %	$1,044.71
credit union shares	$79.00
total opening bank balance	$12,379.14
opening cash on hand	$13.78
total opening assets	$12,392.92
CREDITS	
ESA/ESC 1997 meeting profits (transfer from meeting acct.)	$10,176.74
membership dues	$781.13
1998 Kananaskis meeting revenue*	$1,651.00
term deposit interest	$468.12
bank dividends	$37.74
total credits	$13,114.73
DEBITS	
bank service charges	$22.48
corporate registry	$8.00
travel expenses (Williamson)	$27.79
proceedings prep and printing	$1,037.74
student travel grants	$250.00
science fair (Danyk)	$50.13
office supplies & postage (Pohl)	$210.87
total debits	$1,607.01
BALANCE SHEET:	
total opening assets	$12,392.92
total credits	$13,114.73
total debits	$1,607.01
closing balance	$23,900.64

CLOSING BALANCE (Dec. 31, 1998):	
chequing account	$2,406.06
term deposit #2 - 4 yrs. at 5.4% (matures Aug. 16, 2000)	$5,000.00
term deposit #4 - 30 day autorenewing, floating %	$5,285.55
term deposit #5 - 30 day autorenewing, floating %	$1,076.10
term deposit #6 - 30 day autorenewing, floating %	$10,000.00
credit union shares	$116.74
total closing bank balance	$23,884.45
closing cash on hand	$16.19
total closing assets "$23,900.64"	

* note - this represents a portion of the revenues. Williams, Dunlop and Williamson collected this amount, while local organizers collected the rest. As of Dec. 31, 1998, I was still awaiting the local portion, as well as several outstanding bills arising from the meeting.

ESA MEMBERSHIP LIST
updated Dec, 1998

address 1 = Dept. Biological Sciences, University of Alberta, Edmonton, AB, T6G 2E9
address 2 = Northern Forestry Centre, Canadian Forest Service, 5320 - 122 St., Edmonton, AB, T6H 3S5
address 3 = Agriculture and Agri-Food Canada, Lethbridge Research Centre, P.O. Box 3000, Lethbridge, AB, T1J 4B1
address 4 = Dept. Biological Sciences, University of Calgary, Calgary, AB, T2N 1N4
address 5 = Alberta Environment Centre, Bag 4000, Vegreville, AB, T9C 1T4,

Honourary Members

Carr, John 24 Dalrymple Green NW, Calgary, AB, T3A 1Y2, H 288-4634
Gurba, Joe 9415 - 144 St., Edmonton, AB, H 452-6752
Gushul, Evan 1714 15 Ave. South, Lethbridge, AB, T1K 0W9, H 328-2426
Larson, Ruby 410 20, 3 St. South, Lethbridge, AB, T1K 4P1, H 327-2089
Nelson, Bill 1020 Fern Crescent, Lethbridge, AB, H 327-4736

Regular Members

Abe, Tricia address 1, tabe@gpu.srv.ualberta.ca, W 492-3080
Acorn, John 132 Walsh Cr., Edmonton, AB, T5T 5L7, janature@compusmart.ab.ca, H 486-2390
Anand, Harish 1111 - 61 St., Edmonton, AB, T6L 3W2, H 461-3482
Anweiler, Gary 7212 - 103 Ave., Edmonton, AB, T6A 0V1, gganweiler@sprint.ca, W 452-4245, H 468-2916
Ball, George address 1, gball@gpu.srv.ualberta.ca, W 492-2084, F 492-9234
Ball, Kay 8108 - 138 St., Edmonton, AB, T5R 0C9, H 483-4951
Barr, Bill 12316 - 93 St., Edmonton, AB, T5G 1G4, H 487-4561

Barrington-Leigh, Rosalind address 1, rbarring@gpu.srv.ualberta.ca, W 492-3080, F 492-9234, H 439-0393
Battigelli, Jeff address 1, jbattige@gpu.srv.ualberta.ca, W 492-0463, F 492-9234
Birse, Ian City of Edmonton, Community Services, W 496-4956, F 496-4978
Bjornson, Susan address 1, sbjornso@gpu.srv.ualberta.ca, W 492-3080, F 492-9234
Brandt, James address 2, jbrandt@nrcan.gc.ca, W 435-7326, F 435-7359, H 471-0947
Brandt, Randall address 3, brandtr@em.agr.ca, W 327-4561, F 382-3156, H 381-7759
Braun, Lorraine Agriculture and Agri-Food Canada, 107 Science Place, Saskatoon, SK, S7N 0X2 3, braunl@em.agr.ca, W 306-956-7650 F 306-956-7247
Brière, Charity address 2, W 435-7210, H 439-0687
Buddle, Chris address 1, cbuddle@gpu.srv.ualberta.ca, W 492-3080, H 439-9497
Butts, Rick address 3, butts@em.agr.ca, W 317-2265, F 382-3156, H 320-1240
Byers, Bob address 3, byers@em.agr.ca, W 327-4561 F 382-3156
Byrtus, Gary 16531 - 114 St., Edmonton, AB, T5X 3V6, gbyrtus@env.gov.ab.ca, W 427-9911, F 422-5120, H 457-2984
Cárcamo, Hector address 4, hcarcamo@acs.ucalgary.ca, W 220-5948, F 289-9311
Cartar, Ralf Dept. of Biological Sciences, University of Lethbridge, Lethbridge, AB, T1K 3M4, cartar@uleth.ca, H 329-2122
Cerezke, Herb 11215 - 36A Ave., Edmonton, AB, T6J 0E9, H 435-6007
Companiytsev, Valery 301, 12704 - 133A Ave., Edmonton, AB, T5L 3T6, valeryc@hotmail.com, H 451-9439
Cooke, Barry address 1, bcooke@gpu.srv.ualberta.ca, W 492-2539, F 492-9234
Cryer, Karen address 1, kcryer@ualberta.ca, W 492-0463, H436-4445
Csotonyi, Julius address 1, csotonyi@gpu.srv.ualberta.ca, W 492-1299, H 892-2784
Cuny, Robert Lakeland College, 5713 - 28 St., Lloydminster, AB, T9V 2R8, W 875-8828, H 875-4925
Danyk, Troy address 3, danyk@em.agr.ca, W 327-4591 Ext. 462, H 382-3156
DeClerck-Floate, Rose address 3, floate@em.agr.ca, W 317-2270, H 382-3156
Dolinski, Mike Pest Prevention & Management Unit, Alberta Agriculture, 7000 - 113 St., Edmonton, AB, T6H 4P2, dolinsk@agric.gov.ab.ca, W 427-4873, H 422-0783
Dosdall, Lloyd address 5, lloyd@arc.ab.ca, W 632-8225, F 632-8379, H 464-2651
Dunlop, Julie address 2, jdunlop@nrcan.gc.ca, H 481-6141
Durand, Andrea address 1, adurand@gpu.srv.ualberta.ca, W 492-3080, F 492-9234
Evans, George address 1, wevans@gpu.srv.ualberta.ca, W 492-3376, F 492-9234
Finnamore, Bert Natural History Section, Provincial Museum of Alberta, 12845 - 102 Ave., Edmonton, T5N 0M6, Afinnamore@mcd.gov.ab.ca, W 427-1731, H 482-2893
Floate, Kevin address 3, floatek@em.agr.ca, W 317-2242, F 382-3156
Fox, Andy 1713 - 18 Ave. S., Lethbridge, AB, T1K 1C1. foxla@uleth.ca H 327-9806
Fownes, Sherri address 1, sfownes@gpu.srv.ualberta.ca, W492-1178, F 492-9234
Fry, Ken address 5, kenf@aec.arc.ab.ca, W 632-8224, F 632-8612, H 458-2775
Gandhi, Kamal address 1, kgandhi@gpu.srv.ualberta.ca, W 492-3080, F 492-9234
Goettel, Mark address 3, goettel@em.agr.ca, W 317-2264, F 382-3156
Gooding, Ron address 1, ron.gooding@ualberta.ca, W 492-3929, F 492-9234
Griffiths, Graham 117 Collingwood Cove, 51551 RR 212A, Sherwood Park, AB.

T8G 1B2 H 922-3221

Hammond, Jim address 2, W 435-7210, H 439-3184

Harris, Brenda Dow Agro Sciences,1144 - 29 Ave. NE, Calgary, AB. T2P 7P1. bjharris@dowagro.com, W 735-8829

Harris, Peter address 3, harris@em.agr.ca, W 327-4561, F 382-3156, H 381-0655

Hartley, Dustin address 1, djh1@gpu.srv.ualberta.ca

Heming, Bruce address 1, bheming@gpu.srv.ualberta.ca, W 492-4173, F 492-9234

Heming, Karin 10948 - 75 Ave, Edmonton, AB, T6G 0G9, H 435-5791

Hergert, Colin 2316 Crestwood Road SE, Calgary, AB, T2C 0C6, colin.hergert@bbs.logicnet.com, W 272-8753, F 569-2467, H 279-2658

Hiebert, Jennifer address 1, jhiebert@gpu.srv.ualberta.ca, W 492-3080, F 492-9234

Hilchie, Gerald address 1, gerald.hilchie@ualberta.ca, W 492-0465, F 492-9234

Hindmarch, Trevor address 4, tdhindma@acs.ucalgary.ca, 220-7930

Hodnett, Kyle address 4, khodnett@acs.ucalgary.ca

Holmberg, Robert Centre for Natural & Human Science, Athabasca Univ., Athabasca, T AB, 9S 1A1, robert@cs.athabascau.ca, W 675-6203, F 675-6186, H 675-3102

Hughes, Robert address 5, rob@aec.arc.ab.ca H 632-8237, F 632-8379, H 632-4942

Jacobs, Joshua address 1, jjacobs@ualberta.ca

Jones, Jim Agronomy Unit, 6903 - 116 St., Edmonton, AB, T6H 4P2, jonesj@agric.gov.ab.ca, W 427-7098, F 422-9745, H 362-4056

Justus, Kris address 1, kjustus@gpu.srv.ualberta.ca, H 433-8194

Kanashiro, Derrick address 3, kanashiro@abrsle.agr.ca, W 327-4560, F 382-3156

Karner, Brent address 1, bkarner@gpu.srv.ualberta.ca, W 492-3080, F 492-9234

Kaufman, Reuben address 1, reuben.kaufman@ualberta.ca, W 492-1279, F 492-9234

Keddie, Andy address 1, akeddie@gpu.srv.ualberta.ca, W 492-0455, F 492-9234

Khan, Badruddinali Alberta Agriculture, 7000 - 113 St., Edmonton, AB, T6H 5T6

Kirkpatrick, Cara address 5, cara@aec.arc.ab.ca, H 467-2154

Klingenberg, Christian Duke University, North Carolina, USA

Koga, Hiro Agriculture and Agri-Food Canada Rm. 654, 220 - 4th Ave. S.E., Calgary, AB, T2G 4X3, kogah@abfpca.agr.ca, W 292-4993, F292-6629,

Korinus, Luisiana see address 1, lkorinus@ualberta.ca, W (780) 492-0463

Kutash, Tracy address 1, H 988-6854

Langor, Dave address 2, dlangor@nrcan.gc.ca, W 435-7330, F 435-7359, H 435-6147

Larson, David Augustana University College, Camrose, AB, T4V 2R3, larsd@vivaldi.augustana.ab.ca, W 479-1179, F 679-1129,

Lee, Erica Alberta Environmental Protection, Land and Forest Service, Hinton, AB, elee@env.gov.ab.ca, W 865-8267

Leech, Robin Biosciences, Northern Alberta Institute of Technology, 11762 - 106 St., Edmonton, AB, T5G 2R1, robinl@nait.ab.ca, W 471-8850, F 471-8590, H 452-1311

Leonhard, Christel #101, 10240 - 118 St., Edmonton, AB, T5K 1Y5, H 436-3494

Longair, Robert address 4, longair@acs.ucalgary.ca, W 220-7387, F 289-9311

Lucas, Rob address 1, rlucas@nrcan.gc.ca, H 475-4624

Lysyk, Tim address 3, lysyk@em.agr.ca, W 327-4591 Ext355, F 382-3156, H 381-1796

Macaulay, Doug Site 17, Box 18 RR#2, Barrhead, AB, T7N 1N3, H 674-2693

Mao, Helen address 1, W 492-1280
Maximchuk, Mike Alberta Land and Forest Service, Bag 900-39, Peace River, AB, T8S 1T4, mmaximch@env.gov.ab.ca, W 624-6221, F 624-5511
McClay, Alec address 5, alec@aec.arc.ab.ca, W 632-8207, F 632-8379
McCloskey, Catherine 9975 Scurfield Dr. NW, Calgary, AB, T3L 1X1, H 547-2268
McFarlane, Mike address 5, H 488-9235
McIntyre, Grant address 1, W 492-3929, F 492-9234
McLean, Mary Ann address 4, malmclea@acs.ucalgary.ca, W 220-5948, F 289-9311
Mengersen, Ernest Land & Horticultural Sciences, Olds College, Olds, AB, T4H 1R6, W 556-8696
Mitchell, Bev address 1, bev.mitchell@ualberta.ca, W 492-4637, F 492-9234
Montes de Oca, Enrique see address 1, enrique@gpu.srv.ualberta.ca
Morneau, Louis address 1, lmorneau@nrcan.gc.ca, W 435-7369, H 439-9432
Mutch, Robert Medicine Hat College, 299 College Drive S.E., Medicine Hat, AB, T1A 3Y6, W 529-3973
Nimmo, Andy address 1, F 492-9234, H 437-3479
Noronha, Christine.....see address 3, noronhac@em.agr.ca
Ono, Hideji AB Land & Forest Service, Forest Insect and Disease, 10th Fl., 9920 108 St., Edmonton, T5K 2M4, hono@env.gov.ab.ca, W 427-6807, F 422-7230
Otani, Jennifer address 3, otani@em.agr.ca, W 382-3158, H 329-8671
Otterstatter, Michael address 4, mcotters@ucalgary.ca, H 252-8256
Pike, Ted address 4, W 220-6791, F 289-9311
Pohl, Greg address 2, gpohl@nrcan.gc.ca, W 435-7211, F 435-7359, H 922-2333
Pommen, Greg address 1, H 434-5082
Pritchard, Gordon address 4, gpritcha@acs.ucalgary.ca, W 220-6791 F 289-9311
Ranasinghe, Sunil AB Land & Forest Service, Forest Insect and Disease, 10th Fl., 9920 108 St., Edmonton, T5K 2M4, sranasin@env.gov.ab.ca, W 427-6807
Reichardt, Todd Calgary Parks and Recreation, Central Parks Services #75, P.O. Box 2100, Stn. M., Calgary, AB, T2P 2M5, treichar@gov.calgary.ab.ca, W 221-4693, F 221-4698, H 251-7238
Reid, Mary address 4, mreid@acs.ucalgary.ca, W 220-3033, F 289-9311
Rickert, Jobst 10475 - 143 St., Edmonton, AB, T5N 2S5, H 454-4725
Rivet, Marie-Pascal address 1, mprivet@gpu.srv.ualberta.ca
Robertson, Ian address 1, ian@gpu.srv.ualberta.ca, H 469-3769
Robins, Geneva 152 Alpine Cres., Airdrie, AB, T4B 1L4, H 948-3454
Ryan, Jim 8613 - 108A St., Edmonton, AB, T6E 4M7, 403 433-8062, H 433-8062
Sargent, Risa address 4, H 282-3178
Saunders, Chris Pest Management Services, Box 2359, Edmonton, AB, T5J 2R7, treebugs@wnet.gov.edmonton.ab.ca, W 496-6395
Schaaf, Al Big Horn Pest Control Ltd., 1212 - 6 Ave South, Lethbridge, AB, T1J 1A4, W 320-1555, F 320-1555, H 328-8426
Scholefield, Pat 239-4140, , 7245 - Scenic Park Gate NW, Calgary, AB, T3L 1N7, W 239-4140, H 239-4140
Shemanchuk, Joe 1050 Henderson Lake Blvd., Lethbridge, AB, T1K 3B2, H 328-2171

Shorthouse, David see address 1, dps1@ualberta.ca, W 492-3080
Sorensen, Troy address 5, troy@arc.ab.ca, W 632-8305, F 632-8379, H 712-4359
Sousa, João address 1, jsousa@gpu.srv.ualberta.ca, W 492-3080, F 492-9234
Spence, John address 1, john.spence@ualberta.ca, W 492-3003, F 492-9234
Sperling, Felix College of Natural Resources, Dept. Environmental Science, Policy & Management, Univ. of California, Berkeley, 201 Wellman, Berkeley, CA, USA 94720, sperling@nature.berkeley.edu, W 510 642-4296, F 642-7428,
Sperling, Janet 2135 California St., Berkeley, CA, USA 94703
Sproule, Al Grande Prairie Regional College, 10726 - 106 Ave., Grande Prairie, AB, albertsproule@gprc.ab.ca, W 539-2061
Tansey, Jim address 1, jtansey@gpu.srv.ualberta.ca, W 492-3080
Thormin, Terry Natural History Section, Provincial Museum of Alberta, 12845 - 102 Ave., Edmonton, AB, T5N 0M6, tthormin@mcd.gov.ab.ca, W 427-1731, H 482-1389
Volney, Jan address 2, jvolney@nrcan.gc.ca, W 435-7329, F 435-7359, H 988-5647
Weber, Jim address 2, jweber@nrcan.gc.ca, W 435-7334, F 435-7359
Weintraub, Jerry 1310 - 29 St. South, Lethbridge, AB, T1J 4B1, W 327-4561, H 328-3985
Welke, Sylvia address 4, sewelke@acs.ucalgary.ca, W 220-5948, F 289-9311
White, Katrina c/o R. Cartar, Dept. of Biological Sciences, University of Lethbridge, 4401 University Drive, Lethbridge, AB, T1K 3M4, katrina.white@uleth.ca, W 380-6273
Whidden, Troy address 4, twhidden@ucalgary.ca
Wilkins, Simon Calgary Parks & Recreation, Central Parks Services, #75, Box 2100, Stn. M., Calgary, AB, T2P 2M5, wilkins@abrsle.agr.ca, W 974-4920, ,
Williams, Daryl address 2, dwilliams@nrcan.gc.ca, W 435-7252, F 435-7359
Williamson, Michele address 1, michelew@gpu.srv.ualberta.ca, W 492-3080
Zidek, Eva Alberta Environmental Protection, Land and Forest Service, Calgary, AB. W 678-2808
Zloty, Jack address 4, jzloty@ucalgary.ca

Paid Library Subscriptions

Albert R. Mann Library Serials Unit, Acquisitions Division,, Ithaca, NY, USA 14853-4301
British Museum (Natural History) Library Dept. Library Services, Aquisitions Section, Cromwell Road, LONDON, U.K., SW7 5BD
Colorado State University Library Serials Section, Fort Collins, CO, USA 80523
D.H. Hill Library Acquisitions Department, P.O. Box 5007, Raleigh, NC , USA 14853
Senckenbergische Bibliothek Bockenheimer Landstr. 134 - 138, 6000 FRANKFURT AM MAIN 1, GERMANY

Free Library Subscriptions

Athabasca University College Library 1 University Drive, Athabasca, AB, T9S 3A3
Augustana University College Library 4901 - 46 Ave., Camrose, AB, T4V 2R3
Concordia University College Library 7128 - Ada Blvd., Edmonton, AB, T5B 4E4
Glenbow Alberta Institute 130 - 9th Ave. SE, Calgary, AB, T2G 0P3
Grande Prairie Regional College Library 10726 - 106 Ave., Grande Prairie, AB, T8V 4C4

Lakeland College Library 5707 - 47 Ave. West, Vermilion, AB, T9X 1K5
Agriculture and Agri-Food Canada, Lethbridge Research Station P.O. Box 3000, Lethbridge, AB, T1J 4B1
Medicine Hat College Library 299 College Dr. SE, Medicine Hat, AB, T1A 3Y6
N.A.I.T. Library 11762 - 106 St., Edmonton, AB, T5G 2R1
National Library of Canada Canadian Acquisition Division and Legal Deposit Office, 392 Wellington St., Ottawa, ON, K1A 0N4
Olds College Library 4500 - 50 St., Olds, AB, T4H 1R6
Provincial Museum and Archives 12845 102 Ave., Edmonton, AB, T5N 0M6
Red Deer College Library Box 5005, Red Deer, AB, T4N 5H5
S.A.I.T. Library 1301 - 16 Ave. NW, Calgary, AB, T2M 0L4
University of Alberta Library Cameron Library Periodicals Section, Edmonton, T5G 2E3
University of Calgary Library Calgary, AB, T2N 1N4
University of Lethbridge Library 4401 University Drive, Lethbridge, AB, T1K 3M4

ENTOMOLOGICAL SOCIETY OF ALBERTA BY-LAWS

ARTICLE I

Title

This society shall be known as the Entomological Society of Alberta in affiliation with the Entomological Society of Canada.

ARTICLE II

Object

The object of the Society shall be to foster the advancement, exchange, and dissemination of the knowledge of insects in relation to their importance in agriculture, horticulture, forestry, public health, industry, and for its own sake, among the people of the Province of Alberta.

ARTICLE III

Memberships, Dues, and Expenditures

a. Any persons interested in entomology may become a Full Member by submitting a completed membership application form and membership fee payment to the Secretary of the Society.

Honourary Life Membership may be conferred on anyone who has performed long and distinguished service in the field of entomology. The total of Honourary Life Members shall not exceed five percent of the total membership at the time of election. An Honourary Life Member will enjoy all the rights and privileges of Full Members but will be exempt from payment of dues. All Full Members are entitled to propose the name of prospective Honourary Life Members provided each such proposal is supported by two other Full Members and documentation is submitted in writing to the Secretary at least one month prior to the Annual Meeting. Such Honourary Life Members will be elected at an Annual Meeting.

b. A member may withdraw from the Society upon giving notice to the Secretary.

c. An annual fee necessary for the operation of the Society shall be levied for each member as provided for in Section I of the Rules and Regulations.

d. The Executive shall have power to meet expenses required in the normal operation of Society business. Such expenditures shall be subject to subsequent ratification at the Annual Meeting by the majority of the members present.

e. A member who neglects to pay the annual fee for two consecutive years shall automatically cease to be a member.

ARTICLE IV

Meetings

Meetings may be called each year by the President at times and places suitable to the majority of the members. The fall meeting shall be considered the Annual Meeting and shall be held in the locality decided upon the preceding Annual Meeting. One-quarter of the total paid-up memberships shall constitute a quorum.

ARTICLE V

Officers

These Officers shall constitute the Executive of the Society with full power to act on behalf of the Society within the bounds of the Rules and Regulations, and to appoint committees as necessary.

ARTICLE VI

Council

The Council shall consist of the five Officers, the immediate Past-President, a Regional Director to the Entomological Society of Canada, and three Ordinary Directors. The Ordinary Directors shall represent the various fields of entomology and the geographic areas of Alberta as widely as possible.

ARTICLE VII

Elections

Elections shall be held once a year at the Annual Meeting, and Officers so elected shall take office at the beginning of the following calendar year and remain in office for a term of one year.

The office of President shall not normally be held by the same person for two consecutive years. The Vice-President shall normally follow his/her term for office with a term as President. The Secretary, Treasurer, and Editor shall be eligible for immediate re-election.

The Directors shall also take office at the beginning of the calendar year following their election. The Regional Director shall be elected for a period of three years, with his/her

term of office beginning at the end of an Annual Meeting of The Entomological Society of Canada. A regional Director is not immediately eligible for re-election.

The term of office of each Ordinary Director shall be three years, with one Director replaced in each year. Ordinary Directors are not immediately eligible for re-election.

ARTICLE VIII

Vacancies

Vacancies in any office (except that of President) on the Council between elections shall be filled by appointment by the President, with the concurrence of Council, the tenure of such co-opted members to terminate at the end of the calendar year during which the appointments is made. A vacancy in the office of President shall be filled by the Vice-President who will then serve his/her normal term as President.

Members elected at the Annual Meeting to fill vacancies on Council shall complete the period of service of the Council members whose places they have taken. On completion of this term they shall be eligible for re-election only if their period of service (co-opted and/or elected) had not exceeded 18 months.

ARTICLE IX

Duties of Officers

The President shall preside at all meetings and act ex-officio on all committees. The Vice-President shall, in the temporary absence or disability of the President, perform the duties and exercise the powers of the President, shall chair the Science Fair Liaison Committee and the Membership Committee, and shall perform such other duties as shall from time to time be imposed upon the Vice-President by the Council.

The Secretary shall maintain a record of all meetings and act as custodian of minute books and current correspondence, and shall forward appropriate material to the Agriculture Canada Station in Lethbridge for storage in the Society's archives.

The Treasurer shall receive and disperse all funds, handle all correspondence relating to membership in the Society, and prepare the annual financial statement.

The Editor shall receive and record reports and publications on behalf of the Society and act as editor of the Proceedings.

ARTICLE X

Signing Officers

The signing officers of the Society shall be the Treasurer and either the President or Secretary.

ARTICLE XI

Alteration of the By-Laws

The By-Laws may be altered or amended at any Annual Meeting of the Society with the approving vote of three-fourths of the members present and in good standing. Such alterations must be made by Notice in Motion, which shall have been sent to the Secretary and a copy of such forwarded to all members at least two weeks before the Annual Meeting.

Nov. 1998

ENTOMOLOGICAL SOCIETY OF ALBERTA
RULES AND REGULATIONS

1. a. The annual fee for full membership shall be $10.00.

   b. The annual subscription fee for the Proceedings is $10.00 for institutions outside the Province of Alberta. Free subscriptions are available to institutions within Alberta and to the National Library of Canada.

   c. The fiscal year of the Society shall coincide with the calendar year; fees are payable in advance, at the time of the Annual Meeting.

2. a. The interim financial statement shall be presented by the Treasurer at the Annual Meeting and the final, year-end statement at the first general meeting following the end of the fiscal year.

   b. Two Auditors shall be elected at each Annual Meeting to examine the accounts of the current year and the annual financial statement.

3. a. Registration fees for student members of the Entomological Society of Canada attending the Entomological Society of Canada meeting shall be reduced when these meetings are held in Alberta with the Entomological Society of Alberta as host.

4. The following standing committees shall exist to assist the ESA Council achieve the objectives of the Society:

   a. Awards Committee - members: Past President, Regional Director to ESC, and the Regional Directors of the ESA. Duties: to solicit and generate nominations of the Entomological Society of Alberta members for Entomological Society of Canada awards (e.g., Gold Medal, Gordon Hewitt, Normal Criddle) and Entomological Society of Alberta awards (e.g., Honourary Membership, Undergraduate Award, Student Travel Grant, Amateur Award).

b. Environment Council of Alberta - one ESA member shall be elected to represent of Society.

c. ESA-ESC Joint Meeting Committee - to be established a year preceding any joint meeting of the Entomological Society of Canada and the Society; members to be selected from Society membership.

d. Nomination Committee - members: the Past President, the Vice-President, and one member in good standing shall prepare a nomination slate prior to each Annual Meeting and the Vice-President shall present the slate of nominated Executive Committee at the Annual Meeting.

e. Resolutions Committee - members: two Society members shall be appointed by the Nomination Committee immediately preceding each Annual Meeting.

f. Science Fair Liaison Committee - members: Vice-President (as chair) and three Ordinary Directors. Other members to be appointed as necessary by the Committee. Duties: to maintain contact with the principal Science Fairs in AB.

g. Membership Committee - members: Vice-President (as chair), and three Ordinary Directors. Duties to publicise the objectives and activities of the Society in such a way to recruit new members to the Society.

h. Webmaster - member: one person appointed by Executive as required. Duties: to maintain and update the Society's web site.

i. All elections and appointments are not to exceed one year unless otherwise approved by the Society.

5. a. The Rules and Regulations may be changed by a motion approved by the majority of the members present at any general meeting.

Nov. 1998

Photos by Robin Leech

Rustic Kananaskis	Collectors & their collection	Developing a systematic approach	
The morning after	The predator was this big *Jay Rosenheim*	Ecckkkk! *Lloyd Dosdall*	Relax *Al Sproule*
I'm not stressed *Mary Reid*	Found that tick *Dustin Hartley*	Up a creek with a pointer *Alice Graham*	Susan Bjornson
Louis Morneau	Settler *Kyle Hodnett*	Joao Sousa	Don't mess with *Grant McIntyre*
Andrea Durand	Daryl Williams	*Mike McFarlane* Parasites ...	... Love filth *Ali Khan*
Dave Shorthouse	Ralf Cartar	Spiders are here *Robert Homberg*	I can't look *Troy Whidden*


Hymenopterous parasitoids of filth fly (Dipte
feedlots of Alberta, Canada

Chris Buddle	Trevor Hindmarch	VP *Ken Fry*	Jack Zloty
Enrique Montes de Oca	Gordon Pritchard	The Business Executive	I can add *Mark Goettel*
Resolved *Joe Schemanchuk*	Jobst Rickert	Karin Heming	*Chris Buddle* or is it Tuddle
Thanks for the talks	Clara Shemanchuk	Kay Ball	Chow time
Back to collecting	Contemplating the salt of life		Don't bug us
Jobst Rickert splits	They're not quitters	Harmonica playing	*Steve Mihok* Bye for now

CONTENTS CONTINUED FROM FRONT PAGE