



ONTARIO INSECTS

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Contents



Vol. 9, No. 2

Jan 2004

Announcements	17
Upcoming Meetings	18
Toronto Centre Butterfly Count	20
The Asian Long-Horned Beetle in Ontario	21
Plant - Insect Interactions on Joker's Hill	22
Corrections and additions to the Leslie Spit List	24
The Karner Blue in Ontario	24
The Black Flies of Arctic Canada	25
The Bookworm	27
News	28
Monarch News	29
TEA Activities	30
TEA Lepidoptera and Odonata Summaries	32
Flea Market (Classifieds)	Inside Back Cover
Items for Sale through the T.E.A.	Outside Back Cover

Front Cover Photograph: *Celastrina neglecta* larva on New Jersey Tea (*Ceanothus americanus*), July 15, 2002 in a Toronto downtown backyard, by Michael van der Poorten.

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DEADLINE INFORMATION - Members Please Note:

The deadline for submissions to the April 2004 issue of Ontario Insects is March 1. Late submissions may be added at the discretion of the Editor after that date. If there are any questions or concerns regarding submissions, please feel free to contact Colin Jones at the address below.

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Submissions to: Colin D. Jones, Editor of Ontario Insects, Box 182, Lakefield, ON, K0L 2H0, naturalist@algonquinpark.on.ca, (705) 652-5004

TEA members are welcome to submit any entomologically relevant materials. Please see the inside back cover for Notice to Contributors for more information. Deadlines for submission are 1 month prior to publication.

For general inquiries about the TEA contact: Alan Hanks, Treasurer, TEA, 34 Seaton Dr. Aurora, ON, L4G 2K1, alan.hanks@sympatico.ca, (905) 727-6993 or check our website at: www.ontarioinsects.org

Mission Statement

The Toronto Entomologists' Association (TEA) is a non-profit educational and scientific organization formed to promote interest in insects, to encourage co-operation among amateur and professional entomologists, to educate and inform non-entomologists about insects, entomology and related fields, to aid in the preservation of insects and their habitats and to issue publications in support of these objectives.

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Colin D. Jones	Editor, Ontario Insects

Membership Information:

Annual dues are as follows:

Individual	\$25
Student	\$15
Family	\$30

All membership queries and payment of dues can be directed to Alan Hanks, Treasurer, 34 Seaton Drive, Aurora, Ontario, Canada, L4G 2K1. (905) 727-6993. alan.hanks@sympatico.ca

Publications received as part of a TEA membership include:

- 3 issues of Ontario Insects per year
- annual Ontario Lepidoptera Summary

THE TEA IS A REGISTERED CHARITY (#1069095-21); ALL DONATIONS ARE TAX CREDITABLE.

Announcements

2004 Student Symposium - An invitation to attend

The T.E.A. invites you to the Annual Student Symposium on **Saturday, March 27, 2004** at 1 pm (Room 432, Ramsey Wright Zoological Building, University of Toronto, Harbord & St. George).

Postdoctoral fellows, graduate students and senior undergraduate students will present their research with a talk or poster.

Please e-mail us at

info@ontarioinsects.org if you are interested in presenting or would like more information.

Final Call for Applicants: The W.J.D. Eberlie Award for Original Research into Ontario Insects

The T.E.A. announces that it is now taking applications for the W. John D. Eberlie Field Research Travel Award 2004.

The T.E.A. is offering a research travel award of \$300 to assist graduate or undergraduate students conducting original field research into Ontario insects. The award is intended as a travel grant to defray costs of travel to field sites used for research. The award will be made on the basis of merit and quality. Applicants must be a member* of the T.E.A. and a graduate or undergraduate student at an Ontario university. To apply, submit a properly completed application form, postmarked no later than March 25, 2004.

An application form for the award, or for membership in the T.E.A., may be downloaded from our website: www.ontarioinsects.org.

*Membership is \$15 per year for students and includes a subscription to Ontario Insects, the annual Lepidoptera summary and discounts on books.

Last year's recipients, **Melanie Youngs** and **Tara Stephens** of the University of Guelph reported that they had a successful project. Their report *Flower colour and architecture as visual cues used by female crab spiders (Misumena vatia) in hunting site selection* will appear in the next issue of Ontario Insects.

Volunteers needed

The T.E.A. will be taking part in a number of activities this year and your help is appreciated. The T.E.A. will supply all the information, you just need to show up and talk to people! It helps if you can come for even an hour. Some of the anticipated activities include:

Sunday February 22, 10 a.m. to 5 p.m
- Get the Jump on Spring at the Toronto Botanical Garden's Annual Horticultural Open House (Leslie & Lawrence, Toronto)

Saturday & Sunday, May 1 & 2, 10 am to 5 pm - Ontario Insect Fair at the University of Guelph Arboretum

Saturday May 8, 10 am to 4 pm - North American Native Plant Society annual plant sale - lots of interest in butterfly gardening!

Saturday, May 29 - FON Annual General Meeting, Black Creek Pioneer Village, Toronto

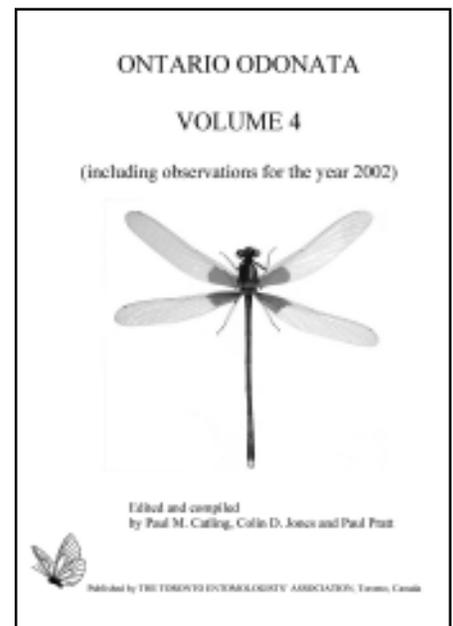
Junior Entomologists Page

You'll find the second issue of the TEA's Junior Entomologists page in OI. Thanks to the Bug Lady, Jean Godawa, for preparing it. It still needs a name!

The first issue was well received and we continue to get requests for more copies. If you would like a copy to give to a child, please do let us know.

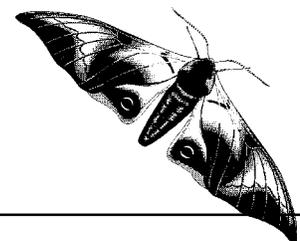
Ontario Odonata 2002 (Volume 4) is now available

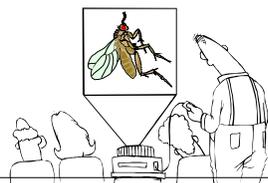
The fourth volume in this well-praised series is now available. It includes records of Odonata seen in 2002 and earlier and 12 articles including information about notable records of Emeralds from Leeds-Grenville county, *Anax junius* overwintering in eastern Ontario, dragonflies at sewage lagoons in relation to water quality and the report of a species that is new to Canada. Cost is \$25 Canadian (\$25 US).



TEA now has a portable generator available for rent!

The TEA recently purchased a portable generator that is now available for rent to TEA members. It's a Coleman portable that weighs about 22 pounds and can power one or two 150 watt lamps for about two hours - perfect for mothing!





Upcoming Meetings



Everyone is welcome. Bring a Friend!

Saturday, February 28, 2004 1 PM
SPECIAL PLACES, SPECIAL BUGS
Steve Marshall

Steve Marshall is a Professor of Entomology in the Department of Environmental Biology at University of Guelph. He also authored and provided the photographs for the marvellous booklet, *Insects of Algonquin Provincial Park*. Most of his research is in fly systematics, especially acalyprate flies. He has just finished a new book on North American insects to be published soon by Firefly. In his presentation Steve will introduce us to some of the fascinating insects he's encountered along the way.

Saturday, March 27, 2004 1 PM
STUDENT SYMPOSIUM

LOCATION: ROOM 432, Ramsey Wright Zoology Building
25 Harbord St, at the south west corner of St George St.
Near to the St. George Subway Station, St. George St. exit

Come to hear the latest research into insects! Topics may include:

The influence of pollen availability on the behaviour of spring-reared honey bee workers

To feed or not to feed: the effects of pollen availability on the development of overwintering populations of honey bees

*The evolution of *Glischrochilus reitteri*: implications for its biological control*

and more....

Saturday, April 24, 2004 1 PM
BUTTERFLY CONSERVATORY FOR EDUCATION
Roy Gucciardi

Roy Gucciardi is a landscape architect and owner of Blue Willow Garden & Landscape Design Centre on Highway 48 just north of Davis Drive and south of Baldwin. He will discuss his newest venture: the addition of a Butterfly Conservatory to his garden centre. He rears moths as well as butterflies and is active in using the facility to teach grade school children about butterflies and their importance to mankind environmentally and socially.

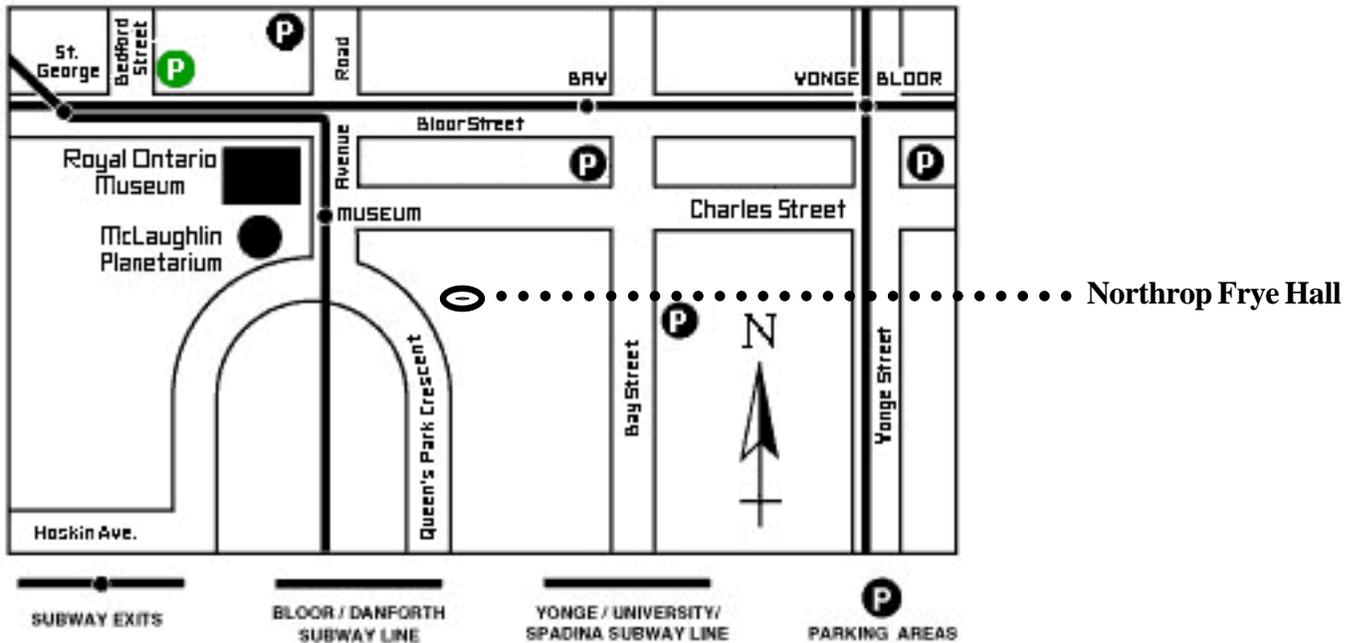
The schedule for field trips will be posted in early April. Check our website for details.

All meetings (except for March 27) are held at:

Northrop Frye Hall Room 113
Victoria University (at the University of Toronto)
73 Queens Park Crescent Toronto, ON
(Museum subway stop; opposite the Museum, on the east side).

See the next page for map and parking directions.
For more information, call Alan Hanks at
(905) 727-6993

Also check www.ontarioinsects.org



To reach Northrop Frye Hall by subway or bus:

Get off at the **Museum** stop on the University-Spadina subway line or take the Avenue Bus #5 south from the Eglinton Subway Station. Go to the east side of Avenue Road and walk south. Northrop Frye Hall is on the left just at the bend.

To reach Northrop Frye Hall by highway:

QEW: If you are driving in on the Queen Elizabeth Way (QEW), follow the Gardiner Expressway to York Street. Go north on University Avenue (University Avenue changes into Queens Park Crescent above College St, and then into Avenue Road above Bloor St.). Northrop Frye Hall is just south of Bloor Street.

Highway 401: From Highway 401, take Avenue Road south to Bloor Street OR take the Don Valley Parkway south to the Bloor Street Ramp and proceed west along Bloor to Avenue Road.

Parking

There is some on-street parking in the area (check the signs carefully!) and there are several paid parking lots within walking distance of Northrop Frye Hall:

- Bloor Street and Bedford Road, 1 Block west of Avenue Road.
- On Cumberland Street, 1 block north of Bloor, east off Avenue Road.
- Behind the Colonnade at 131 Bloor St. West.
- One block north of Bloor Street West on Avenue Road

Parking on a Saturday is usually a flat rate of \$5 or more depending on the lot.

Ninth Annual Toronto Centre Butterfly Count - July 12th, 2003

By John Carley

On Saturday, July 12, 2003, the Ninth Annual Butterfly Count for the Toronto Centre count circle took place. Nineteen counters, in seven parties, censused butterflies in the 15 mile diameter circle centred on the intersection of Dundas Street West and Bloor Street West.

This year's count took place on a discouraging, dismal day, with temperatures ranging from 17°C to 19°C, winds from 35 km/hr to 50 km/hr from generally the south west, and with drizzle and rain. The routes censused included the Leslie Street Spit, High Park, the Humber River, the Lambton prairie, Downsview Airport, and other parklands, ravines and so-called "wastelands" in the city.

Amazingly, given the weather conditions, 38 species were tallied. However, in total only 1473 individual butterflies were counted. This species total is the not the lowest of the 9 years in which the count has been conducted and in fact is close to the average (39.5); however the numeric count total is the second lowest! The overall cumulative species list remains at 55.

Numerically, our high count was again European Skipper at 730. We set no new high counts for butterflies. For the first year ever, no Orange Sulphurs were counted, and only 4 Clouded Sulphurs were recorded! The Compton Tortoiseshell recorded was only our third year, and the Eyed Brown counted has only been seen on four counts.

Also, for the first year, no White Admiral/Red-spotted Purples were recorded! [yet one White Admiral was reported the next day!]

The 2004 Count date is set for Saturday, July 10 with a rain date for Sunday, July 11th. Those interested in participating in the 10th Annual Toronto Centre Butterfly Count should contact the writer at 218 Humbercrest Blvd., Toronto, M6S 4L3, (416) 766-1330 or carley.la@sympatico.ca.

Observers: A. Adamo, M. Bates, S. Blayney, D. Bone, J. Carley, D. Cattrall, H. Currie, S. Hawkins, N. McPherson, E. Mihalj, B. Porter, E. Redrupp, A. Riley, D. Riley, G. Riley, C. Sellers, J. Stirrat, S. van der Grinten, R. Yukich.



Long dash (*Polites mystic*)
(Photo: Michael van der Poorten)

Common Name	Scientific Name	Numbers
Black Swallowtail	<i>Papilio polyxenes</i>	5
Eastern Tiger Swallowtail	<i>Papilio glaucus</i>	4
Cabbage White	<i>Pieris rapae</i>	337
Clouded Sulphur	<i>Colias philodice</i>	4
Coral Hairstreak	<i>Satyrium titus</i>	5
Acadian Hairstreak	<i>Satyrium acadica</i>	17
Edwards' Hairstreak	<i>Satyrium edwardsii</i>	5
Banded Hairstreak	<i>Satyrium calanus</i>	2
Hickory Hairstreak	<i>Satyrium caryaevorum</i>	1
Eastern Tailed-Blue	<i>Everes comyntas</i>	23
Summer Azure	<i>Celastrina neglecta</i>	5
Pearl Crescent	<i>Phyciodes tharos</i>	1
Northern Crescent	<i>Phyciodes cocyta</i>	4
Silvery Checkerspot	<i>Charydrys nycteis</i>	1
Question mark	<i>Polygonia interrogationis</i>	4
Eastern Comma	<i>Polygonia comma</i>	1
Compton Tortoiseshell	<i>Nymphalis vau-album</i>	1
Mourning Cloak	<i>Nymphalis antiopa</i>	2
American Lady	<i>Vanessa virginiensis</i>	1
Red Admiral	<i>Vanessa atalanta</i>	33
Viceroy	<i>Limenitis archippus</i>	1
Eyed Brown	<i>Satyroides eurydice</i>	1
Little Wood-Satyr	<i>Megisto cymela</i>	144
Common Wood-Nymph	<i>Cercyonis pegala</i>	24
Monarch	<i>Danaus plexipus</i>	28
Silver-spotted Skipper	<i>Epargyreus clarus</i>	11
Northern Cloudywing	<i>Thorybes pylades</i>	9
Least Skipper	<i>Ancyloxypha numitor</i>	3
European Skipper	<i>Thymelicus lineola</i>	730
Peck's Skipper	<i>Polites peckius</i>	1
Tawny-edged Skipper	<i>Polites themistocles</i>	2
Crossline Skipper	<i>Polites origenes</i>	1
Long Dash	<i>Polites mystic</i>	1
Northern Broken-Dash	<i>Wallengrenia egeremet</i>	23
Little Glasswing	<i>Pompeius verna</i>	3
Delaware Skipper	<i>Anatrytone logan</i>	4
Dion Skipper	<i>Euphyes dion</i>	1
Dun Skipper	<i>Euphyes vestris</i>	22

Polygonia sp - 2
Unidentified sp - 3
Skipper sp - 3

Total: 38 species, 1473 individuals.



The Asian Long-Horned Beetle in Ontario

By Carol Sellers

On December 15, 2003, Carolyn King and I attended a meeting put on by the Canadian Food Inspection Agency (CFIA) to educate nature groups about the Asian Long-Horned Beetle (ALHB). The beetle, *Anoplophora glabripennis* or Starry Night Sky Beetle, is a handsome 3 cm long bluish-black longhorn with variable white spotting. Unfortunately it is a major pest of hardwood trees in its native China and has now surfaced in North America. The first North American infestation was discovered in New York in 1996, followed by Chicago (1998), New Jersey (2002) and Toronto/Vaughan (2003). The first discovery in Ontario was in a Waterloo warehouse in August 1998, in packing material from China.

The CFIA estimate that the beetle has been in the Toronto area for 4-6 years. Their surveys have identified a list of preferred host trees: maples, particularly Manitoba maples, top the list, followed by horsechestnut. Willow, elm, birch, sycamore, hackberry, poplar, and mountain ash are also used. An ALHB infestation can kill a healthy mature tree in 4-5 years.

There are no known effective predators of the beetle, even in China. Pheromones don't work, and there are no insecticides that are effective on infested trees. The CFIA control strategy is removal of all host trees within a 400 metre radius of the last known infested tree; this range could be extended to 800 metres. A pesticide, Imidacloprid, is not yet approved for use in Canada, but the approval process is underway and the pesticide could be used as a soil treatment for trees in the 400-800 metre range. Four consecutive years of no beetle sightings are required to declare an area free of infestation. The U.S. procedure of removing only infested trees has not achieved this.

The Asian Long-Horned Beetle seems to have a 1-year life cycle in North America. The egg, which is white and looks like a dried cucumber seed or flattened grain of rice, is laid in a slit in the bark, probably starting in July. It hatches in about 11 days and the early instars feed on the cambium layer. Then the larva moves into the heartwood and feeds until pupation in early spring. The larva is NOT attractive: a 5 cm white grub with some brown on the prothorax. Adults begin to emerge in late May/early June; populations peak in early July. The emergence hole of the adult is quite distinctive: a perfect circle, 1 cm in diameter. Although the adults can fly 300-400 metres, the females seem to prefer to lay their eggs on their "parent" tree. The adult beetle feeds on twigs, petioles, and some foliage and prefers edge habitat and open stands to forest for its feeding and breeding.

What can we as individuals do to stop the beetle in its tracks? Most of us spend a lot of time outdoors looking for insects. Knowing the ALHB's host tree preferences, we can keep our eyes peeled for signs of the beetle's presence: chewed bark indicating an egg has been laid, thin white eggs

in a bark slit, sawdust frass, large round exit holes, the adult beetle itself. While the CFIA climbs trees to survey them, we can use binoculars to check the canopy of mature trees before the foliage emerges. Not that easy, but worth trying. From late May on, we can be especially alert for adult beetles.

The Asian Long-Horned Beetle is really attractive and normally we'd take a live-and-let-live approach to it. However with no natural controls, its potential for destruction of our hardwood trees is enormous. And the prospect of losing 400-metre swaths of mature trees in the control effort is hard to accept. So let's do what we can as insect spotters. Any sightings should be reported immediately to the CFIA at 1-800-442-2342. In the event of a find, please DO NOT move or transport the beetle or any part of the host tree.



Photos courtesy of Tari Stock

Plant - Insect Interactions on Joker's Hill

By W.D. McIlveen

This article about the field trip of the Field Botanists of Ontario to Joker's Hill on July 12, 2003 was first printed in the FBO newsletter and is reprinted here with permission.

Despite an overcast day and an occasional rain shower, the weather did not prove to be any great problem for the approximately 25 participants on the FBO outing to look at the interactions of plants and insects. In fact, the temperature was not too hot and there were numerous insects to be found. The leaders for this trip were Marc Johnson, Carl Rothsfel, and Will Godsoe. Marc is a Ph.D candidate at the University of Toronto, Carl is employed by the Royal Botanical Gardens, and Will is an undergraduate at the University of Guelph.

The trip took place on the Koffler Scientific Reserve at Joker's Hill located about 3 km southwest of Newmarket. The 1000 acre parcel of land was recently donated to the University of Toronto by the Kofflers (of Shopper's Drugmart fame) in order to support biological research. It is located on the Oak Ridges Moraine and therefore has a rolling topography of uplands and wet areas that form the headwaters of streams that flow towards Lake Ontario. The property is extensively covered in woodlands, both as natural stands and plantations. The land has relatively few invasive plants and measures are being taken to prevent the spread of those species that do occur. The site therefore provides tremendous opportunities for conducting ecological research.

The first item on the trip agenda for the day was a taste test. The leaders handed around small samples of Mossy Stonecrop (*Sedum acre*) for the participants to chew. The slightly peppery taste was illustrative of the first of three main types of strategies plants use to cope with herbivores. This was an example of the mechanism known as "constitutive defences" present in many plants; these are defences that are always present, at the ready to thwart would be herbivores. Examples of such defences include the presence of a chemical compound (such as that which caused the Stonecrop to have the peppery taste), or the development of physical barriers such as bark, thorns, or hairs. The second response is "induced defences" in which new chemicals are formed *de novo* following an attack by insects. These chemicals are not present unless the plants are attacked by some agent and they are effective at reducing future herbivory. The third response is "tolerance" to being attacked. In this situation, the affected plant simply tries to replace or outgrow the lost tissue. A classic case of tolerance is demonstrated by grasses that are able to sustain repeated cutting or cropping. When it is considered that lawns are maintained by regular mowing by that super urban herbivore 'the lawnmower', one starts to appreciate the magnitude or capacity of plants to respond in this manner.

Plants have other important interactions with insects and other organisms. Parasites, pathogens, and herbivores can regulate plant populations under the conditions imposed through evolution. Such is the case with Garlic Mustard (*Alliaria petiolata*). Because few pathogens or parasites specific to the species accompanied it when it was introduced to North America, Garlic Mustard has become a major pest. In its native Europe, the situation is quite different and the plant populations are maintained in smaller numbers. The importance of insects as a controlling influence on this weed are therefore evident. At one location, the effect of ant activity in controlling vegetation around an anthill was evident (Fig. 1). The ants damage the roots of goldenrod within about 30 cm of the margin of the anthill and none of these plants could develop, while grasses appear little affected. The sun could therefore readily warm the colony.



Figure 1: The vegetation around the ant colony has been controlled by the ants which damage the roots of goldenrod plants. The ant hill is opened up to receive more sunlight.

Plant species can identify and react to individual insect species and respond accordingly via specific defence strategies tailored for that species. For example, flea beetles (*Chrysomelidae*), Three-lined Potato Beetle (*Lema trilinea*; *Chrysomelidae*), Tortoise Beetle (*Plagiomatriona clavata*), and slugs (*Limacidae* and *Arionidae*) are all recognized individually by Climbing Nightshade (*Solanum dulcamara*). The response of plants to counter the effects of insect attacks is a tradeoff by the plants with respect to their investment of resources. In effect, they must either use their energy and other resources against the herbivores by increasing the amount of energy invested in producing a large number of seed (to provide the greatest potential for species propagation) or by using that energy to form defensive

chemicals or other mechanisms that will reduce the rate herbivore attack but give a greater assurance that seed will be produced although the numbers of seed will be less.

The chemical constituents of Common Milkweed (*Asclepias syriaca*), composed of both latex and cardenolides (a heart-stopping compound) have been extensively studied. It has been established that these chemicals are accumulated in the tissues of the caterpillars of the Monarch Butterfly (*Danaus plexippus*) that feed on the Milkweed foliage thereby rendering the insect either toxic or distasteful to predators. Less well known is the dense cover of hairs on the leaves of these plants that act as a physical barrier to insects. Tannins, which are present in notable concentrations in the tissues of conifers and other species such as oak, act to protect the plant in another way. When the plant tissue is consumed, the tannins bind to proteins in the gut of insects and slow their rate of food digestion. While this mechanism by itself will not greatly influence the life of the insects involved, it will diminish their overall performance and thus slow the rate of growth of the insect population. Some plant species such as grass, and notably Horsetails (*Equisetum* sp.), contain high concentrations of silica. The silica acts as a physical barrier that slows the rate of feeding by insects. In air, the latex produced by certain plants such as Milkweed and Dogbanes (*Apocynum* spp.) will start to solidify and gum up the mouthparts of most insects that attempt to feed on the tissues. Some species have found the means to overcome this problem, including the Monarch Butterfly, the Milkweed Tussock Moth (*Euchaetes egle*, Arctiidae), and the Dogbane Beetle (*Chrysochus auratus*, Chrysomelidae) (Fig. 2), by severing the latex carrying tissues.

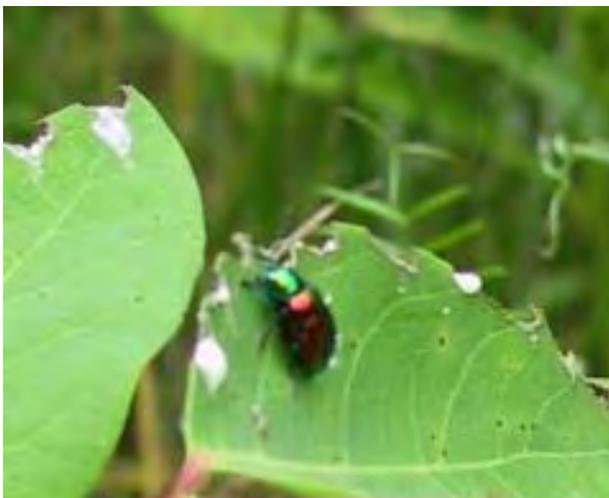


Figure 2: Dogbane Beetle feeding on *Apocynum androsaemifolium*. Note white latex oozing from damaged edge of the leaf.

Recently, it has been recognized that volatile compounds released by Solanaceous species, like Clammy Ground Cherry

(*Physalis heterophylla*) attracts parasitoids that attack insects that would otherwise feed on this plant species. This relationship is an “indirect” means of self protection and has likely evolved as a plant adaptation to reduce herbivory. Work is underway at Joker’s Hill to determine whether the phenomenon works under field conditions as well.

Herbivorous insects that feed on the surface of plants could be quite vulnerable to attack by many predators and many have adapted different strategies to avoid this threat. This includes seeking shelter within the plant tissues themselves. One group has taken to feeding within the tissues of leaves. This necessitates that the particular insects involved are rather small so as to fit within the narrow confine between the upper and lower epidermis of single leaves. At least five different leaf miners of at least three rather different insect types were noted without taking the time to search for others during the trip. One was a miner (unknown species) that caused large blotches on the foliage of Leatherwood (*Dirca palustris*), while the others were a fly (*Phytomyza aquilegiae*, Agromyzidae) that attacks Wild Columbine (*Aquilegia canadensis* L.) (Fig. 3), a sawfly (*Fenusa pusilla*, Tenthredinidae) that is a common leaf mining pest of Paper Birch (*Betula papyrifera* Marshall), and a moth (*Phyllocnistis populiella*, Gracillariidae) that causes a distinctive Serpentine Mine on the leaves of poplar (*Populus* spp.) species. Leaves of Sugar Maple (*Acer saccharum* Marshall ssp. *saccharum*) were injured by the Maple Blotch Leaf-miner (*Cameraria aceriella*: Gracillariidae)



Figure 3: Feeding tunnels left by the leaf-mining Agromyzid fly (*Phytomyza aquilegiae*) on the foliage of Wild Columbine

Some insects take the association to a greater level of interaction and cause the cells forming the plant tissues attacked to multiply and form swellings known as galls. A

sample of a gall produced on Wood Nettle (*Laportea canadensis*) was examined by the group. A gall formed by the fly *Chirosia betuleti* (Anthomyiidae) on Ostrich Fern (*Matteuccia struthiopteris*) and known as a Frond Knotting Gall that was mentioned during the walk was discovered later in the day. The familiar Ball Gall that forms on Tall Goldenrod (*Solidago altissima* var *altissima*) was also discussed. Both the plant and the gall-forming fly (*Eurosta solidaginis* Tephritidae) are undergoing a co-evolutionary game of ping pong: the plant is evolving to cause the gall to be smaller so that parasitoids can more easily reach the young insect, while the fly is evolving to increase the size of the gall to reduce the probability that insects within can be accessed by the ovipositors of the parasitoids.

One of the most interesting finds was the larvae of the Cherry Gall Azure butterfly *Celastrina* sp. (Lycaenidae), a species not previously recorded on the property. The larvae feed on the spindle galls that are produced on the foliage of Black Cherry (*Prunus serotina* Ehrh) and Choke Cherry (*P. virginiana*) by the mite *Eriophyes padi* (Eriophyidae) (Fig. 4). Not only was the plant supporting the mites and consequently the butterfly as a secondary beneficiary but an ant was observed tending the butterfly larvae. Many members of this butterfly family have developed a relationship with ants that obtain a sugary solution released by the larvae.



Figure 4: Larva of the Cherry Gall Azure butterfly *Celastrina* sp. feeding on Black Cherry Spindle Galls caused by the mite *Eriophyes padi*.

I am certain that I am not alone in saying that this field trip was extremely interesting and very worthwhile and helped our understanding of the ecological relationships between plants and insects. Not only was the trip informative, but the leaders demonstrated a very great ability to explain the topic. To find such a blend of expertise, knowledge, and enthusiasm among a rather youthful group of botanists/ecologists certainly bodes well for the future of these disciplines in Ontario. It is contagion that is sure to invigorate those of us who have been around for some years. Thank you Marc! Thank you Carl! Thank you Will!

More information about Marc's research and that of his advisor (Prof. Anurag Agrawal) and contemporaries can be found at www.herbivory.com.

Corrections and additions to the Leslie Spit list

By Barry Harrison

Common Sooty Wing - bred for a few years in the 1980's at the Western base; it likes open, freshly plowed areas and the base has grown in so is no longer an attractive site for it

Sachem - fresh female, July 29, 2003 on the Western base

Fiery Skipper - status is 'uncommon'; has been seen several times over the years

Gray Comma - Bill Edmonds reported this on September 27, 1981

Red Spotted Purple - Additional sightings by Barry Harrison and Joe Jones on August 14, 1979

The Karner Blue in Ontario

Ontario Insects Vol. 8, No. 1, Sept 2002 - Some additions and an up-date by Quimby Hess

1. In Figure 3 the photo caption is corrected as follows: "TEA, OMNR and local nature club members".

2. On page 11, 2nd last paragraph - please note the following additional name, i.e. Alan L. Patterson of Kettle Point. A pensioner, he resided on a lot leased from the First Nation Reserve. He was another Lambton County photographer and his photo of a Dainty Sulphur is shown on page 76 of THE ONTARIO BUTTERFLY ATLAS.

3. Update on the situation which has developed at the St. Williams Forest as reported by the retired Superintendent: "We now have quite a thriving population of lupines in the "Rowanwood" nature sanctuary; offspring of the St. Williams population. The lupines probably are also suffering from the droughts though and I suspect that even if there were Karner Blues, their second generation would have a very difficult time finding anything to eat."...

"The Norfolk Field Naturalists had a speaker this year who is an entomology professor in Guelph and he termed the Manester Tract one of the most valuable sites in Ontario. He had found several beetle species of which there were no earlier records in Ontario."

The former Superintendent also expressed concern over the management (or lack thereof) of the St. Williams forest and its future.

Strange things done ‘neath the midnight sun: searching for milugiak (AKA black flies) in arctic Canada

By Doug Currie

The black flies (Diptera: Simuliidae) of arctic Canada.

Black flies are conspicuous (and loathed) members of the arctic insect fauna. Yet despite their notoriety as bloodsucking pests of birds and mammals, arctic black flies have received little scrutiny since the termination of Canada’s “Northern Insect Survey” in 1953. To date, only 22 species have been reported from arctic Canada west of the Mackenzie River (Danks 1981), contrasting with the 76 species of black flies reported from Alaska and the Yukon Territory (Currie 1997). Whether this disparity in species is the result of biogeographical factors (i.e., the failure of black flies to recolonize the arctic following deglaciation), or an artifact of inadequate collecting, is unknown.

Black flies are legendary in northern landscapes because of their large numbers and the bloodsucking habits of adult females. Indeed, they are among the few groups of insects (primarily Diptera) to be bestowed names by the aboriginal peoples of arctic Canada. For example, the Inuktitut word “milugiak” or “milugiaq” distinguishes black flies from other groups of Diptera such as mosquitoes (kiktubiaq), no-see-ums (kirgavaitchauraq), caribou bot flies (miluyuuq), and ‘dung flies’ (anaqsiubayuk). Their unsavory bloodsucking habits notwithstanding, black flies are important constituents of arctic stream communities because their larvae serve as food for other aquatic invertebrates, fishes, and waterfowl.

In association with Peter Adler (Clemson University) and Donna Giberson (University of Prince Edward Island), I undertook a series of 4 collecting expeditions the remote and sparsely collected territory between the Mackenzie River and Hudson Bay, as follows: the Horton River valley in 2000, southwestern Northwest Territories in 2001, the Thelon River valley in 2002, and eastern mainland Nunavut in 2003 (Currie et al. 2000; Currie and Adler 2000; Currie et al. 2002; Giberson and Shaverdo 2003). Given the absence of roads from most of the Northwest Territories and Nunavut, a variety of means were used to access collecting sites including commercial- and chartered aircraft, canoes, motorboats, and all-terrain vehicles.

A wide variety of running-water habitats were sampled in each of the collecting areas, and the immature stages were fixed in Carnoy’s solution and ethanol to facilitate chromosomal- and molecular analyses, respectively. Additionally, adults were collected by aerial netting and malaise trapping. In total, 240 collections were taken from arctic- and subarctic localities, yielding more than 25,000 specimens. Chromosomal- and morphological analyses of

these collections reveals 8 genera and 43 species, almost doubling the 22 species previously known from arctic Canada. Two species are new to science and two others were previously known only from the Palearctic Region.

Despite our collecting efforts, two enigmatic and little-known species of black flies escaped detection. One of these species, *Simulium giganteum*, is known in the Nearctic Region from a single specimen collected from the McConnell River valley — not far from Arviat (formerly Eskimo Point) on the western shore of Hudson Bay. The other, an undescribed species of *Simulium* subgenus *Hellichiella* from the James Bay region of Quebec, is currently known only from a description of its chromosomes. It is clear that knowledge about black fly diversity in arctic Canada is still incomplete.

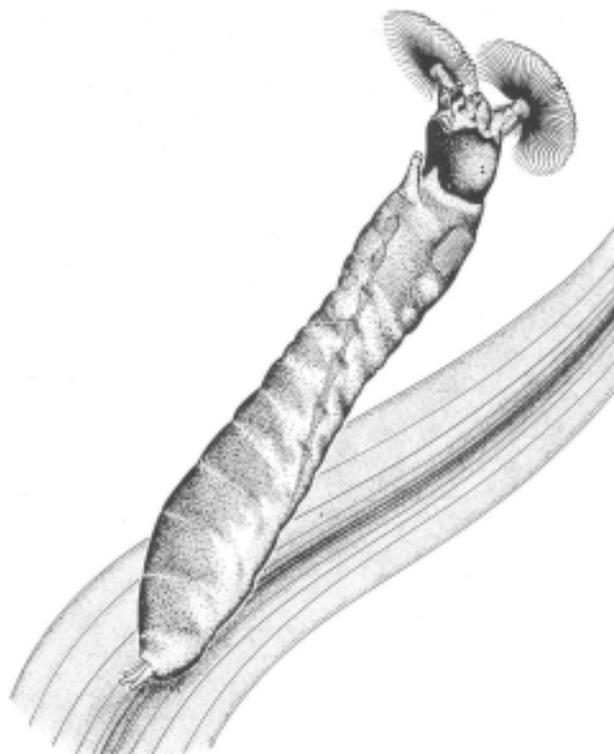


Fig. 1. Larva of *Simulium vittatum* (ex Currie 1986)

Marked species-composition differences were noted between eastern- and western sites, indicating that community structure is far from homogenous across arctic Canada. This probably reflects the importance of different source areas for organisms that repopulated the north following deglaciation. Furthermore, nearly 50% (20 species) of arctic black flies exhibit a Holarctic distribution, underscoring the close historical association between the Nearctic- and Palearctic black-fly faunas at high latitudes.

In terms of feeding habits, 20 species (47%) are mammalophilic, 13 species (30%) are ornithophilic, and 10 species (23%) are autogenous (i.e., the females do not blood feed). The autogenous component is an order of magnitude higher than for black flies as a whole, in which only 2.4% of species are classified as autogenous (Crosskey 1990). The relatively high percentage of non-biting species probably reflects the difficulties associated with finding hosts at high latitudes. Among anautogenous (i.e., bloodsucking) species, virtually nothing is known about specific host preferences other than their apparent predilection for mammals or birds. However, the most severe anthropophilic (i.e., human biting) species are members of the *Simulium venustum* Say complex.

The results of our expeditions reveal that the arctic black fly fauna is far richer than previously supposed. The knowledge gained provides a sounder base from which to interpret biogeographical patterns, and opens up other lines of investigation including aspects of life-history characteristics, community structure, host preferences, and host/parasite interactions, to name a few. Future fieldwork is planned for the Seward Peninsula of westernmost Alaska and yet-to-be determined locations in northern Quebec and Labrador.

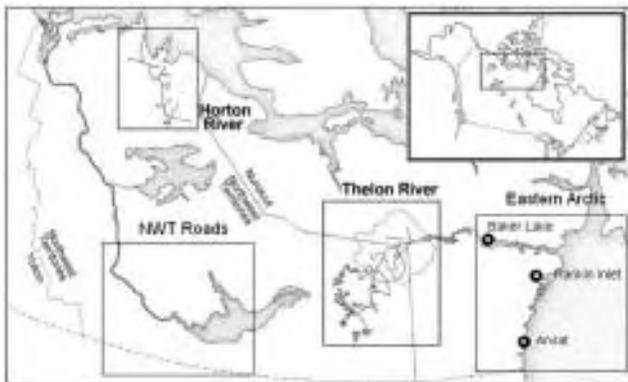


Fig. 2. Map of collecting localities (modified from D. Giberson)

Literature Cited

- Crosskey, R. W. 1990. The natural history of blackflies. John Wiley & Sons Ltd., Chichester, England. 711 pp.
- Currie, D. C. 1986. An annotated list of and keys to the immature black flies of Alberta (Diptera: Simuliidae). Memoirs of the Entomological Society of Canada No. 134. 90 pp.
- Currie, D. C. 1997. Black flies (Diptera: Simuliidae) of the Yukon, with reference to the black-fly fauna of northwestern North America. Pp. 563-614 in H.V. Danks and J.A. Downes (Eds.), Insects of the Yukon. Biological Survey of Canada (Terrestrial Arthropods), Ottawa. 1034 pp.
- Currie, D.C. and P.H. Adler. 2000. Update on a survey of the black flies (Diptera: Simuliidae) from the Northwest Territories and Nunavut Project. Arctic Insect News 11: 6-9.
- Currie, D.C., D. Giberson, and P.H. Adler. 2002. Insect biodiversity in the Thelon Wildlife Sanctuary. Newsletter of the Biological Survey of Canada (Terrestrial Arthropods) 21(2): 59-64.
- Currie, D.C., D. Giberson, and B.V. Brown. 2000. Insects of Keewatin and Mackenzie. Newsletter of the Biological Survey of Canada (Terrestrial Arthropods) 19(2): 48-51.
- Danks, H. V. 1981. Arctic Arthropods: a review of systematics and ecology with particular reference to the North American fauna. Entomological Society of Canada, Ottawa. 608 pp.
- Giberson, D.J. and H.V. Shaverdo. 2003. Update on the survey of aquatic insects from Keewatin and Mackenzie project: The predaceous water beetles (Coleoptera: Adepaga: Dytiscidae and Gyrinidae). Newsletter of the Biological Survey of Canada (Terrestrial Arthropods) 22(2): 61-64.

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M5S 2C6



The Bookworm

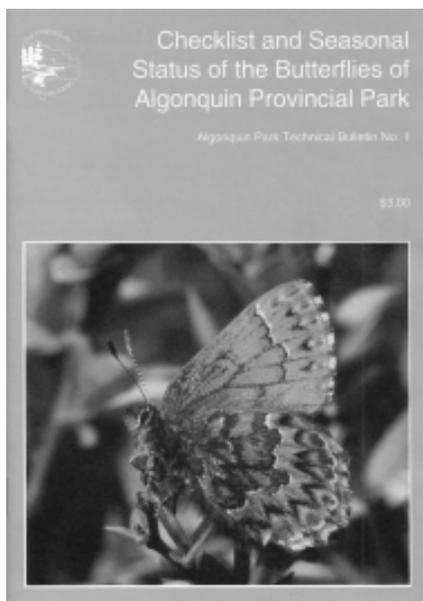


Checklist and Seasonal Status of the Butterflies of Algonquin Provincial Park

By Colin D. Jones

20 pages, The Friends of Algonquin Park, ISBN 1-896709-89-X, \$3.00. Available from The Friends of Algonquin Park, P.O. Box 248, Whitney, ON, K0J 2M0, Tel: 613-637-2828. Order online at www.algonquinpark.on.ca

This publication replaces the 1988 Algonquin Park checklist and includes all of the species recorded within the Park up to 2002 (82 species). For each species, the status (e.g. common, rare) on both the East and the West sides of the park is provided, along with some general notes on habitat, habits and larval foodplants. In addition, phenograms are included that indicate



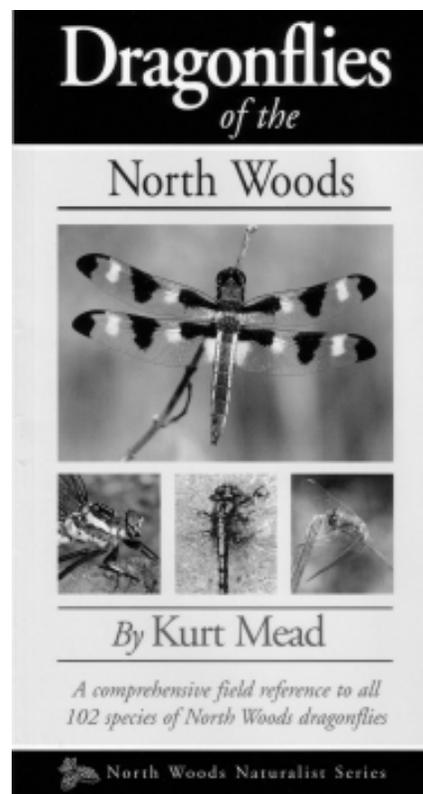
the recorded flight dates within the Park. There is also a listing of recommended areas within the Park to look for butterflies. Three appendices are also featured: an annotated section on excluded species; an annotated list of possible additions (two species - Crossline Skipper and Baltimore Checkerspot - were added in 2003!); and a listing of scientific plant names that correspond to the common names featured in the text.

Dragonflies of the North Woods

By Kurt Mead

203 pages, Kollath-Stensaas Publishing, ISBN 0-9673793-6-9, US\$18.95. Available from most books stores or directly from the author at www.dragonfliesofthenorthwoods.com

Another new regional dragonfly guide, this one covering dragonflies within the northern portions of Minnesota, Wisconsin, Michigan and Ontario. The guide begins with a general overview of dragonfly biology and behaviour, including information and tips on dragonfly observation. The species accounts cover 102 dragonflies (most of Ontario's fauna) and feature colour photographs, species descriptions, and notes on similar species and behaviour. A few common damselflies are featured but are otherwise not covered. The back of the book includes a glossary, a checklist, and flight dates.



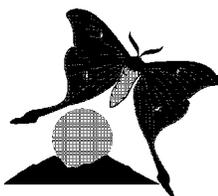
Websites of note

www.cbif.gc.ca/spp_pages/noctuoidea/eastindex_e.php

Illustrated check lists of the Noctuoidea of eastern Canada (with an image library).

www.biology.ualberta.ca/facilities/strickland/noctuoidea/index.htm

Contains 1700 images of the 1500 noctuoids known from Canada and is mainly a pictorial atlas in an image library.



News



Canadian Photographer Chosen for 2004 Butterfly Calendar by National Geographic

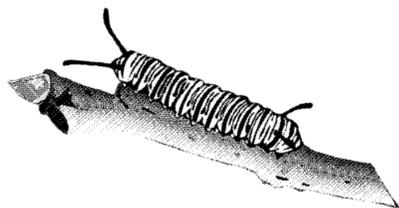
Some of London, Ontario's beautiful butterflies are being used to illustrate the 2004 butterfly calendar published by the National Geographic Society.

The 24 photographs are the work of London graphic designer Jay Cossey, whose longtime hobby is photographing butterflies and other insects. Cossey has had his photos published in butterfly and insect guides over the years. After submitting samples of his work to the editor of National Geographic, Cossey was asked to provide photos for the entire calendar.

Cossey photographs his subjects in their natural surroundings, with as little interference as possible. He'll sometimes spend hours pursuing one of his subjects, waiting for the moment to squeeze off the perfect shot.

Cossey uses slide rather than print film to take his pictures. His camera is an "unsophisticated" single lens reflex model without auto focus. He captures his brilliant images by using a ring flash and another flash.

Cossey's Web address is:
www.images.on.ca/JayC.



National Heritage Information Centre Observes its 10th Anniversary

In November 2003, the Natural Heritage Information Centre (NHIC) celebrated its 10th anniversary. In those 10 years, staff of the NHIC have found over 25 species new to Ontario and have rediscovered 20 others thought to have disappeared from the province. Last summer, a new dragonfly for Canada - the Mocha Emerald (*Somatochlora linearis*) - was discovered by staff (TEA member Colin Jones and Peter Burke) conducting field surveys for the Sydenham River Recovery Plan (see photo page 32).

The NHIC connects science and conservation through a network of government and non-government partners including Bird Studies Canada, Ducks Unlimited Canada, the Federation of Ontario Naturalists, The Nature Conservancy of Canada and the Ministry of Natural Resources.

This information is shared in order to set priorities for the conservation of natural areas, and to support NHIC projects through technical input and project funding. Conservation groups, governments and corporations use the data to make decisions about managing natural resources, land and water use planning, wildlife monitoring and protecting species at risk.

The NHIC also shares information and expertise with the global conservation community and represents Ontario's interests in many national and international conservation matters.

For more information on the NHIC, visit their website at:
www.mnr.gov.on.ca/MNR/nhic/nhic.cfm

Proposed Odonate Symposium 2005

The Rainy River Valley Field Naturalists may be hosting a 3-5 day odonate symposium including speakers, tours of various habitats and some collecting and species indexing. We have close to 80 species of dragonflies and 15 damselfly within the Rainy River District. The area is very much under-surveyed so there is a good chance that we would find some interesting additions. Because we are on the border of Minnesota, Ontario and Manitoba and adjacent to Rainy Lake and Lake of the Woods, our area offers great opportunities for collecting and surveying a number of unique and diverse habitats.

If you are interested in this proposed event, please respond with your name and contact information. We need this info before we commit to such an event. If you would be interested in presenting during the symposium, please let me know that as well. Timing for the event would probably be June-July 2005.

Bill Morgenstern, Rainy River Valley Field Naturalists
<earthmoodsphoto@yahoo.com>



Leucorrhinia intacta (Dot-tailed whiteface) feeding on another odonate



Monarch News

submitted by Don Davis



Monarch Watch

2002 Season Recoveries for Don Davis of Toronto, Ontario

Tag Number	Tag Location and Date	Reporter	Report Location and Date	Miles
AAR518	Presqu'ile P.P. 8/27/01	L. Martinez	El Rosario, Mx 3/7/03	2251
AAR670	Presqu'ile P.P. 9/1/01	M. Mondragon	El Rosario, Mx 3/3/03	2251
AAR555	Presqu'ile P.P. 9/1/01	C. Jesus	El Rosario, Mx 3/6/03	2251
AAR702	Presqu'ile P.P. 9/1/01	R. Hernandez	El Rosario, Mx 3/7/01	2251
AAR872	Presqu'ile P.P. 9/2/01	L. Gonzelez	El Rosario, Mx 3/7/03	2251
AAR833	Presqu'ile P.P. 9/2/01	V. Garcia	El Rosario, Mx 3/24/03	2251
BGQ531	Presqu'ile P.P. 8/31/02	M. Mondragon	El Rosario, Mx 3/3/03	2251
BGR362	Cobourg, ON 9/12/01	M. Gonzalez	El Rosario, Mx 3/6/03	2110
AAS433	Toronto, ON 9/12/01	M. Gonzalez	El Rosario, Mx 3/6/03	2053
AAS229	Toronto, ON 9/12/01	R. Hernandez	El Rosario, Mx 3/7/03	2053
AAS580	Toronto, ON 9/13/01	J. Gonzalez	Sierra Chincua, Mx 3/3/03	2053
BGQ604	Toronto, ON 9/6/02	D. Kust	Sierra Chincua, Mx 3/26/03	2053
BGQ904	Cambridge, ON 9/14/02	D. Milan	El Rosario, MX 3/24/03	2001
BGR303	Whitby, ON 9/21/02	L. Swain, E. Dillan	Reedsville, Ohio 9/26/02	359

This data is also posted at: www.monarchwatch.org. Those monarchs noted above that were tagged in the fall of 2001 were reported late (2003) as Monarch Watch ran out of funds in the spring of 2002 to purchase tags from the guides at the monarch overwintering sites. Tags are purchased at a rate of \$5.00 American per tag. A record number of tagged monarchs were recovered in the spring of 2002 because of the severe winter storm that struck central Mexico in January 2002.

Conservation of Monarch butterflies in central Mexico: -Protection of a Biological Phenomenon in BIODIVERSITY, Volume 4, #3, September 03, Pages 14 - 20

Article is authored by William Toone and Thomas Hanscom of the Zoological Society of San Diego. You can see the excellent cover of this journal, with a lovely line drawing of roosting monarchs, at:

www.tc-biodiversity.org/biopreview.htm

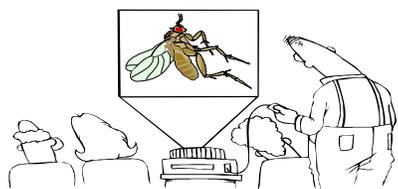
Also, the cover of the Fall 2003 issue of *American Entomologist* bears a large photo of a monarch feeding on yellow butterfly bush.

International Congress of Entomology – Brisbane Australia, 15-21 Aug 2004

Registration and call for papers for the Congress are currently open and details can be found at <http://www.ice2004.org> or from International Congress of Entomology Secretariat (Carillon Conference Management Pty Ltd)
Telephone: +61 7 3368 2644
Facsimilie: +61 7 3369 3731
Email: Ice2004@ccm.com.au
Post: PO Box 177, Red Hill QLD 4059, Australia

Butterfly Conservatory Closed For Renovations

The Niagara Parks Butterfly Conservatory will be closed to the public from January 5/04 to March Break for renovations that include replacing the netting that lines the interior of the Conservatory. Other maintenance such as plant pruning will also take place during this time. The butterflies inside the conservatory will be captured, allowed to mate and be used for educational purposes. For more information, go to www.niagaraparks.com



TEA Activities



September

TEA general meeting

Twenty-four people attended the first meeting of the season which was a lively one as people shared photos, specimens, rearing tips and travel stories.

Jean Godawa, the writer of OI's Junior Entomologist page, told us of some of her experiences with teaching kids about insects and about her proposal to have an Insectarium at the Toronto Botanical Garden (formerly the Civic Garden Centre). More of that in the months to come.

Bill Crowley brought slides of various insects in different places – butterflies from the Niagara and Blue Willow butterfly conservatories, spiders from the August spider walk and various critters from his back garden.

Sarma Hanzns showed slides of various moths and butterflies, some of which she had raised from eggs, including Mourning Cloak, Great Spangled Fritillary, Eastern Black Swallowtail and Red Admiral.

Ann Millett told us of her trip to Churchill to take the Arctic Ecology course with Dr. Peter Kevin that was advertised in OI last year. She highly recommends the course as well as going to Churchill! She had photos for us to enjoy as well.

Chris Rickard brought the rearing cage that he uses for his moths and told us of his successes and difficulties. Others joined in the discussion of methods to raise butterflies and moths at home.

Karen Yukich let us know that she is now representing the TEA on the High Park Citizens Committee and will bring us more news as time goes on.

Alan McNaughton shared some of his findings from a trip to the Natural History Museum in London England. He saw the earliest pinned insect specimen from 1702 and told us of the museums' new policy not to use chemicals in the insect collections. Instead, all collections are inspected for insects and each one is given a treatment in the freezer at least once a year. He also told us of a new 'baiting' technique: take a piece of rope, soak it in wine and sugar and drape it across vegetation – a little easier than painting trees.

Don Davis gave us up-to-date monarch news including sighting of many monarchs going down Broadview Avenue, Toronto a few days before.

At the break, we looked at specimens, books and shared more experiences.

October

TEA general meeting

We had an excellent turnout to hear Rick Beaver tell us the story of the Alderville Nature Reserve, a 100 acre black oak and savanna tall grass prairie on the Rice Lake plains. The Mississauga-Ojibway group has lived in this area since the 1880's. It is the largest remnant of this type of habitat in Central Ontario. It has been maintained over the years due to the groups' custom of burning the land to promote vegetation that supports ungulates, clearing of the land to grow crops, and for "spring entertainment" (watching the fire). The band had the foresight to grant the area environmental and cultural preserved status.

This unique area has 74 species of birds, 51 species of butterflies, 21 species of dragonflies (there is no water on the land itself), 111 native flowering herbs and 45 non-native 'weeds'.

This area is being considered for the reintroduction of the Karner blue butterfly. It has remnant populations of lupines; seeds have been collected, germinated and transplanted with good success. There is some indirect evidence that the Karner blue existed in this area previously.

Rick is the coordinator of activities at the reserve. He says that they welcome visitors, especially those who can help to add to their knowledge of the flora and fauna of the area. They can arrange tours as well. Please call ahead of time (905-352-2402) to arrange your visit. Check out their website at: www.aldervillesavanna.ca.

There was no other business.

November

TEA general meeting

Doug Currie seemed surprised at the good turnout to hear his talk about those beloved black flies! Please see his article in page 24 of this issue.

Lepidoptera Summary 2002

The 2002 Lepidoptera Summary is now available. Thanks to Colin Jones and Jeff Crolla for a great job! You'll find a new design, interesting articles, summaries, photos and a CD with all records that were submitted.

Unfortunately Jeff is unable to continue as co-editor - we thank him for his time, energy and ideas over the past two years.

The 2003 summary is in progress.

TEA at High Park

TEA member **Karen Yukich** represents the TEA on the High Park Community Advisory Council, Natural Environment Committee. She sends in this report:

Habitat improvements in High Park

High Park, Toronto's premier urban park and a highly accessible site for nature study, is undergoing significant habitat improvements that may increase the number and variety of insect species.

The rare Black Oak savannah that dominates the tablelands has been under restoration for the last ten years. Areas that were mown for decades are now being returned to near-original condition with tall prairie grasses, flowers such as Wild Lupine (host plant for Karner Blue) and shrubs such as New Jersey Tea, as well as naturally regenerating young oaks. The prescribed burn program, initiated in 1997, is well ahead of schedule in stimulating the regeneration and growth of suppressed oak savannah and prairie species.

Several wetland improvements are planned for 2004. The southern section of the Upper Duck Pond, in the southeast corner of the park, is scheduled for grading and remediation to create enhanced wetland habitat. The entire south shore of Grenadier Pond is slated for restoration. This will link the previously restored southeast and southwest corners of the pond to provide an extensive area of continuous shoreline edge habitat. (Both ponds were already quite productive for a variety of Odonata species in 2003.) Also, in the northeast corner of the park, the recently renovated sedimentation ponds will be planted with native wetland vegetation.

Will all these habitat improvements result in greater numbers and diversity of insect life? Only time will tell. In the meantime, City planners and volunteers are working on the premise "Build it and they will come!"

TEA at Leslie Spit

TEA members **Nancy van der Poorten** and **Anne Gray** represent the TEA on the Natural Environment Committee of the High Park Community Advisory Council. Nancy sends in this report:

In 2000, the Toronto Region Conservation Authority (TRCA) revived the Natural Areas Advisory Council for the Tommy Thompson Park and invited the TEA to be a member. We met informally until August 2003 when the Terms of Reference for the committee were formally accepted.

Tommy Thompson Park aka The Leslie Street Spit (The Spit)

With the proposed opening of St. Lawrence Seaway in 1959, the Toronto Harbour Commission expected that there would be an increase in shipping traffic. They began a project to fill in the lake to build an Eastern Headland that was intended to provide the land needed for a port and sheltered outer harbour area. During construction, however, the shipping industry declined so there was no further need to use the area for shipping purposes. Plants were naturally establishing themselves; many species of wildlife including birds were now living on the site or using it as a migratory stop-over point. The public had also begun to use the site on the weekends as a car-free area to walk, cycle and enjoy nature.

In the late 1970's, the Ontario government handed over a portion of this area to the Toronto and Region Conservation Authority to develop as a public park. The park's Master Plan is to preserve significant species, protect environmentally significant habitat and enhance aquatic and terrestrial habitat while keeping the area as an urban wilderness with minimal human interference. The Tommy Thompson Park is designated an Environmentally Significant Area (ESA) for its rare plant species and large variety of wildlife

species and as a Globally Significant Important Bird Area (Global IBA) by BirdLife International and its Canadian partners, Bird Studies Canada and the Canadian Nature Federation.

The Natural Areas Advisory Council

The council gives advice on many issues with a view to keeping the Spit as natural as possible. The waterfront is a hot issue now and there is a lot of talk and pressure to develop it. Keeping the Spit natural and undeveloped is a challenge! The TRCA however also now has some money to spend on the Spit for a number of items that are needed. A new gateway and signage are proposed and an observation area has been built. Bird banding activities are now based at the Spit. New bird and insect checklists will be coming out soon. There are also a number of problems with vandalism at the site that need to be taken into consideration. Anyone who is interested in becoming involved with activities at the Spit, please contact us. We hope to be doing more demonstrations and any help is welcome.

Toronto City-Wide Tree By-law

The former City of Toronto has a private tree bylaw that advocates are hoping will become the bylaw for the entire city. You can view this bylaw at www.city.toronto.on.ca/trees/pdfs/municipalcodechapter331.pdf

The TEA has been asked to write a letter of support to help get this initiative passed. If you would also like to send your thoughts, please contact Bruce Sudds at bsudds@toronto.ca or 416 392 4010 or Joe Pantalone, Toronto Councillor, Deputy Mayor and Tree Advocate 416-392-4009.

T.E.A. Lepidoptera and Odonata Summaries

T.E.A. invites all members and non-members to contribute sightings to the annual insect summaries. There are two summaries: one for Lepidoptera (butterflies and moths); and one for Odonata (dragonflies and damselflies). The sightings are published in two separate publications. Both summaries also feature papers, articles and notes on a variety of topics covering the respective insect orders. The Lepidoptera summary is sent to members as a benefit of membership. The Odonata summary (titled Ontario Odonata) is not included with membership but must be purchased separately. Either of the yearly summaries may be purchased by non-members. We recommend that you contact the compiler directly for more details.

Lepidoptera summary

What information to send:

Make note of the name of the butterfly or moth, the date seen, and where it was seen. Be fairly specific if possible indicating at least a city/town/conservation area and the county. Including geographic coordinates in the form of a UTM or Latitude and Longitude (read from a topographic map or derived from a handheld GPS unit) would also be beneficial but is not mandatory. Please also note how many individuals you see and, if possible, whether they are male or female. Distinguishing between sight and specimen based records is also tremendously useful. Any particular behaviour such as nectaring, egg-laying etc. is also of interest. Please send in the order that the species are listed in the summary.

When and where to send:

Submissions should be sent by February 28, 2004. Electronic submissions are encouraged, preferably in a spreadsheet or database application such as Microsoft Excel or Corel Quattro Pro. Records submitted in a wordprocessing application (e.g. Microsoft Word or Corel Wordperfect) are also fine as are handwritten records. Records should be sent to the following compilers:

Butterflies: Colin D. Jones (Box 182, Lakefield, ON K0L 2H0. work: 705-755-2166, home: 705-652-5004, colin.jones@mnr.gov.on.ca).

Moths: Jeff Crolla (2-642 Dovercourt Road, Toronto, ON M6H 2W6. Home: 416-533-2267, jeff@primus.ca).



Mocha Emerald - *Somatochora linearis*
Photo by Colin Jones, Sydenham River

Odonata summary

What information to send:

Species name, county, precise location (e.g. 1 km W of Mine Centre on south shore of Little Turtle Lake), number of individuals, an accurate UTM and/or Lat./Long. reference either using a GPS or 1 inch maps, and observation date. Please contact one of the compilers to receive an electronic form (or a hard copy) containing all the necessary fields. It is strongly encouraged that (if possible) you compile your data using a database file such as dBase, Access, or Excel.

When and where to send:

Submissions should be received by December 31, 2003. Late submissions included at the compiler's discretion.

Northern Ontario: (north of Algonquin Park, Nipissing District and including Haliburton, Muskoka, Renfrew and Peterborough) - Colin D. Jones (Box 182, Lakefield, ON K0L 2H0. work: 705-755-2166, home: 705-652-5004, colin.jones@mnr.gov.on.ca).

Central Southern and Eastern Ontario (Provincial Compiler): (most of the region east of a line from the south end of Georgian Bay, east to the Ottawa and St. Lawrence valleys with the exceptions of Peterborough, Haliburton and Muskoka) - Paul Catling at catlingp@agr.gc.ca. Paul is also Provincial Compiler.

Southwestern Ontario: (south and southwest of a line connecting the south end of Georgian Bay to Hamilton and Niagara on the Lake) - Paul Pratt (7100 Matchette Rd., LaSalle, ON N9C 2S3. 519 966 5852, prairie@netcore.ca).

For more details, see Ontario Insects, Vol 4, No 3, May 1999, p 48-52, a previous issue of Ontario Odonata or the provincial compiler.



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TEA Member, Mark Lurz, is
interested in the Cerambycidae
(long horn beetles) and would like
to hear from others with the same
interest.

You can contact him at:
21 Birchview Crescent, Bolton
ON L7E 3W9.

Notice to Contributors

Who Can Contribute:

Observations, articles, etc., to be published in
Ontario Insects, are welcome from members
of the **Toronto Entomologists' Association**.
There are no page charges, however, submis-
sions from non-members will require a mem-
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Contributions to **Ontario Insects** may ad-
dress any subject or aspect related to entomo-
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Research papers -may include original research
or scholarly reviews following an appropriate
journal format

Feature articles -informative & entertaining,
format open to the author's choice

Notes or short communications -may be ob-
servations, interpretive, historical, review or
experimental studies which do not fall under
the purview of research papers

Book reviews -preferably titles published
within the last three years

Original artwork, puzzles -art should be clear,
easily reproduced in black & white

Guest columns in Entomophilia -any subject
related to the love of insects

Opinions, Letters, Queries -anything entomo-
logical under 500 words that may be of inter-
est to the membership

Classified ads -free to members

Format for Submissions:

Ontario Insects is produced on a PC. Text
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are scanned or obtained from licensed CD-
ROM collections and edited in CorelDRAW
4.0 with final page layout in PageMaker 6.5.
The original is printed on a 600 dpi laser
printer.

All submissions are encouraged, however,
submissions of articles and/or artwork on disk
or email are preferred. If articles are submitted
via email, formats in Microsoft Word (.DOC)
or rich text format (.RTF) are preferred. Please
send all submissions and questions to the editor
(see inside cover for address). Offprints are
available at cost + 10% + postage.

Items for Sale through the TEA

Books: reproductions of out-of-print books

The Odonata of Canada & Alaska (3 volumes) by E.M. Walker
\$196 Can (\$190 for TEA members who pick it up); In USA: \$145 US surface; \$150 US airmail

The Cicindelidae of Canada (tiger beetles) by J.B. Wallis (1961) with colour plates
\$28 Can (\$23 for TEA members who pick it up); In USA: \$23 US surface; \$26 US airmail

The North American Dragonflies of the Genus Aeshna by E.M. Walker (1921) with colour plates
\$65 Can (\$60 for TEA members who pick it up); In USA: \$50 US surface; \$53 US airmail

The North American Dragonflies of the Genus Somatochlora by E.M. Walker (1925)
\$55 Can (\$50 for TEA members who pick it up); In USA: \$43 US surface; \$46 US airmail

Books: Other publishers

Damselflies and Dragonflies (Odonata) of Ontario: Resource Guide and Annotated List By P.M. Catling and V.R. Brownell 2000. Annotated list of 168 species of odonata in Ontario including conservation status, flight period, habitat, distribution and identification. \$34 Can; In USA: \$25 US.

Books: T.E.A. publications

The Ontario Butterfly Atlas by A.M. Holmes, R.R. Tasker, Q.F.Hess, A.J.Hanks (1991)
ISBN: 0921631111 \$25 Can (\$20 for TEA members who pick it up); In USA: \$20 US

Ontario Insects – T.E.A. Newsjournal

Back Issues: \$5 Can each; In USA: \$5 US; Subscription: \$25 Can; In USA: \$25 US

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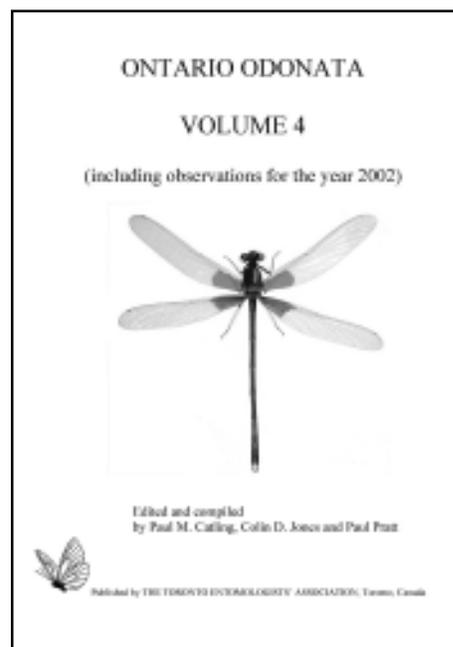
Checklist of the Butterflies of the Toronto Region: 135 years of history (2nd edition) Includes flight seasons. Compiled by Barry Harrison.

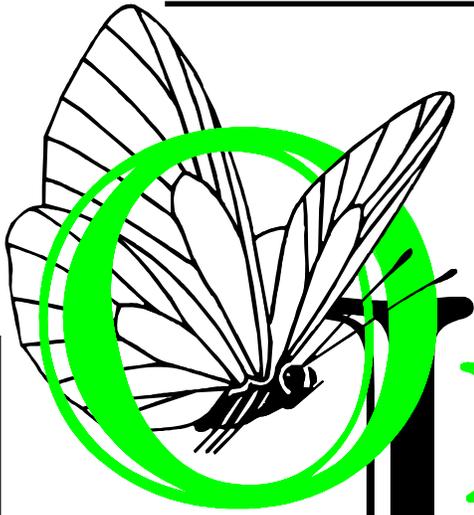
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For complete details and to order, contact:

Alan Hanks, 34 Seaton Drive, Aurora Ontario L4G 2K1
(905) 727-6993; alan.hanks@sympatico.ca

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ONTARIO INSECTS

THE NEWSJOURNAL OF THE TORONTO ENTOMOLOGISTS' ASSOCIATION



VOLUME 9, NUMBER 3

MAY 2004

Contents



Vol. 9, No. 3

May 2004

Announcements	33
Field trips and Insect Counts	34
TEA Student Symposium Abstracts	36
Historical Records for the Giant Swallowtail in the GTA	40
Sandbanks Provincial Park Butterfly Survey 2002 & 2003	41
Singing Insects in the Toronto Region	42
Flower colour and architecture as visual cues used by female crab spiders (<i>Misumen vatia</i>) in hunting site selection	43
TEA Insect Collecting Code	48
Monarch News	49
The Bookworm	50
TEA Activities	51
TEA Lepidoptera and Odonata Summaries	52
Flea Market (Classifieds)	Inside Back Cover
Items for Sale through the T.E.A.	Outside Back Cover

Front Cover Photograph: *Chlosyne gorgone* (Gorgone Checkerspot) nectaring on Black-eyed Susan (*Rudbeckia hirta*) by Michael van der Poorten.

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DEADLINE INFORMATION - Members Please Note:

The deadline for submissions to the September issue of Ontario Insects is September 1. Late submissions may be added at the discretion of the Editor. If there are any questions or concerns regarding submissions, please feel free to contact Colin Jones at the address below.

Ontario Insects (ISSN: 1203-3995) is published tri-annually by the Toronto Entomologists' Association (TEA), 34 Seaton Drive, Aurora, Ontario, Canada, L4G 2K1. Copyright © 1995 by the Toronto Entomologists' Association. All rights reserved. The statements of contributors do not necessarily represent the views of the TEA and the TEA does not warrant or endorse products or services of advertisers. Copyright of artwork and photographs remains with the artist or photographer.

Submissions to: Colin D. Jones, Editor of Ontario Insects, Box 182, Lakefield, ON, K0L 2H0, naturalist@algonquinpark.on.ca, (705) 652-5004

TEA members are welcome to submit any entomologically relevant materials. Please see the inside back cover for Notice to Contributors for more information. Deadlines for submission are 1 month prior to publication.

For general inquiries about the TEA contact: Alan Hanks, Treasurer, TEA, 34 Seaton Dr. Aurora, ON, L4G 2K1, alan.hanks@sympatico.ca, (905) 727-6993 or check our website at: www.ontarioinsects.org

Mission Statement

The Toronto Entomologists' Association (TEA) is a non-profit educational and scientific organization formed to promote interest in insects, to encourage co-operation among amateur and professional entomologists, to educate and inform non-entomologists about insects, entomology and related fields, to aid in the preservation of insects and their habitats and to issue publications in support of these objectives.

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Annual dues are as follows:

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All membership queries and payment of dues can be directed to Alan Hanks, Treasurer, 34 Seaton Drive, Aurora, Ontario, Canada, L4G 2K1. (905) 727-6993. alan.hanks@sympatico.ca

Publications received as part of a TEA membership include:

- 3 issues of Ontario Insects per year
- annual Ontario Lepidoptera Summary

THE TEA IS A REGISTERED CHARITY (#1069095-21); ALL DONATIONS ARE TAX CREDITABLE.

Announcements

Volunteers needed

The T.E.A. will be taking part in a number of activities this year and your help is appreciated. We supply all the information - you just need to show up and talk to people! It helps if you can come for even an hour. Some of the events include:

Saturday & Sunday, May 1 & 2, 10 am to 5 pm - Ontario Insect Fair at the University of Guelph Arboretum. To help, call Alan at 905-727-6993

Saturday May 8, 10 am to 4 pm - North American Native Plant Society annual plant sale - lots of interest in butterfly gardening! Location: Toronto Botanical Garden, Leslie & Lawrence. To help, call Nancy at 416-466-9013.

Ontario's First Insect Fair

The TEA will be having a booth at the first insect fair in Ontario to be held at the Arboretum at the University of Guelph May 1 & 2, 10 am to 5 pm.

Exhibitors and activities include:

- books from Sciences Nat-France and Hillside Books, UK (specialist books which can be found nowhere else)
- pinning and mounting demonstrations
- dried specimens for decoration & collections
- insect frames and on site framing services
- custom cabinets, display cases
- setting boards, pins etc. and more.....

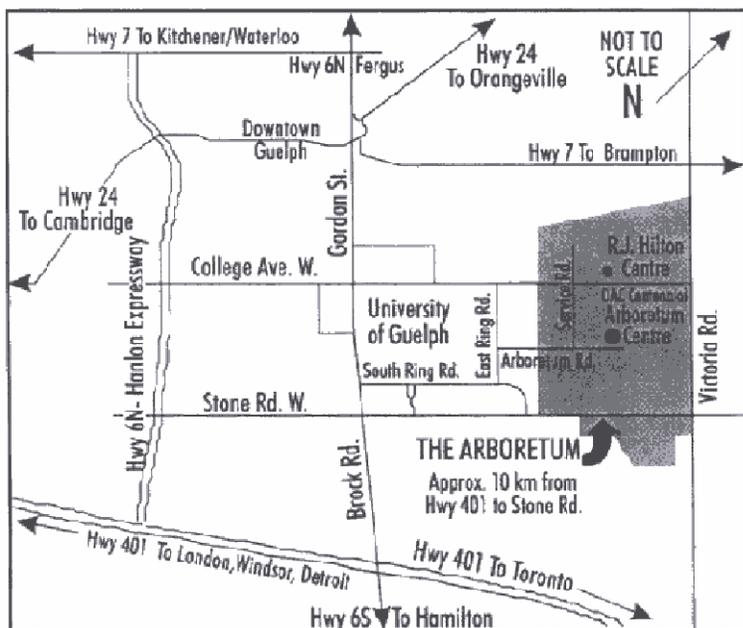
TEA needs your help!

We will be having elections for the board in September and I will not be available to continue as president or with the other things that I do. So if you can help with any of the following or have questions, please contact me asap. Thanks! Nancy van der Poorten, president (416)-466-9013; email: nmg.vanderpoorten@sympatico.ca

- Website maintenance (update content about 1x month)
- Answer emails (once or twice a week)
- Ontario Insects - editor; layout (knowledge of Pagemaker 6.5)
- prepare NABA report yearly
- Leslie Spit Advisory Committee - alternate committee member
- help with annual Student Symposium

Thanks to Bill McIlveen who is taking over the administration of the Research Grant and Ann Gray who will take over as the primary member for the Leslie Spit Advisory Comm.

Thanks to everyone, especially the board without whom little would get done! I've enjoyed my 6 years as president and feel that the association has continued, and will continue, to grow and prosper while promoting the study and appreciation of insects in Ontario



Directions to the Ontario Insect Fair at the Arboretum at the University of Guelph

Meeting dates for 2004/05

- September 25: Member's meeting
- October 23: Gard Otis - The Emerald Ash Borer
- November 27: Darryl Gwynne - Mormon Crickets
- January 22: TBA
- February 26: TBA
- March 26: Student Symposium
- April 23: TBA

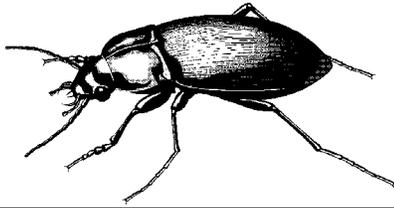
Nothing? TEA has a portable generator for rent

The TEA recently purchased a portable generator that is now available for rent to TEA members. It's a Coleman portable that weighs about 22 pounds and can power one or two 150 watt lamps for about two hours - perfect for nothing!

Contact Carolyn King at cking@yorku.ca or 416-222-5736.

Walker's Odonate Haunts

It has been more than 50 years since Walker and others did their odonate studies. TEA member Paul Catling has suggested that this season we could revisit those places: the Credit River, Humber River, Don Valley, Grenadier Pond and the Digrassi Point on Lake Simcoe. Since we have reasonably good indications of the earlier dragonfly fauna at these sites, we can do some comparisons. So add these to your field locations list and send in your observations (see p 52).



2004 Field Trips



Everyone is welcome. Bring a Friend!

**Saturday June 19, 10 AM
INSECTS OF THE COPETOWN BOG**

Leader: Marvin Gunderman

The Copetown Bog near Ancaster is a great place for lepidoptera, including the Bog Copper. And with Marvin's expertise, we should also be able to find some interesting beetles. To get to Copetown from Toronto, take the QEW to Hwy 403 to Hwy 6 North to Hwy 5 West to Hwy 52 South. Copetown is at the junction of Hwys 52 and 99. Continue south on Hwy 52 past Hwy 99 (Governor's Rd) for about a kilometer to the large parking lot on the right side where we will meet. Bring nets, insect containers, lunch, water and waterproof footwear. Call Carol Sellers (416-421-7398) if you plan to attend.

**Thursday July 1, 9 AM
TEA EAST TORONTO BUTTERFLY COUNT**

Co-ordinator: Tom Mason

Bone up on your ID skills and help count butterflies in the Rouge or Don Valley. This is an official NABA count and the TEA will pay your participation fee. For those counting in the Rouge, meet at the Pearse House. From Sheppard Ave go north on Meadowvale Rd; take the exit to the Toronto Zoo but turn RIGHT at the first turn and park along the side of the road. Call Tom Mason (905-839-6764) if you plan to participate. Bring nets, containers, lunch and water. No collecting in the Rouge.

**Saturday July 3, 10 AM
LESLIE ST SPIT No Leader**

Join fellow TEA members to look for insects at the base of the Leslie St Spit (aka Tommy Thompson Park). The Spit is a favourite wild spot with lots of weedy habitat and some water. Meet in the parking lot at the foot of Leslie St (access is from Lakeshore Blvd). Bring insect containers, water and lunch. Use of nets should be minimal and there is no collecting.

**Saturday July 24, 7 PM
MOTHS, MOTHS, MOTHS**

Leader: Dave Beadle

Once again we're off to find moths on the Oak Ridges Moraine. TEA member Brian Henshaw will set up his overnight trap and we'll start the outing in his garden, checking out what moths came to the trap. Then we'll move to a location on the Moraine to set up the lights and sheets *and*

wait for the moths to arrive. We've had 100+ species on our previous outings here. Meet at 172 Way St in Brooklin which is just north of the junction of Hwy 7 (Winchester Rd) and Hwy 12 (Baldwin St). Turn northwest onto Way St from Baldwin. Bring insect containers, a flashlight, and a sweater; the Moraine is very cool at night. No collecting. Call Carol Sellers (416-421-7398) if you plan to attend.

**Tuesday July 20, 8:15 PM
HIGH PARK MOTH NIGHT**

Leaders: Dave Beadle, Tom Mason

This is a joint outing with the High Park Community Advisory Council. Members of the public are invited to join TEA members Dave Beadle, Carolyn King, Tom Mason and Karen Yukich for an evening of moth catching and identification. A \$2 donation is requested. Meet at the benches across from the Grenadier restaurant at 8:15 pm. Children especially have enjoyed this outing in the past. For more information contact Carolyn King at 416-222-5736 or cking@yorku.ca. No collecting. Bring insect containers and a flashlight.

**Sunday August 15, 10 AM
SPIDERS OF BLACKWATER/BEAVER CREEK**

Leader: Tom Mason

We've had such a good time here looking at spiders and everything else, we're going back again. Streams, ponds, bridges, weedy vegetation: all the places spiders like to be. Meet on the road shoulder where Beaver Creek flows under Hwy 12 just south of Blackwater. Bring insect containers, nets, hand lens, water and lunch. Call Carol Sellers (416-421-7398) if you plan to attend.

**Saturday August 28, 10 AM
RATTRAY MARSH No Leader**

Come out and explore the stream, marsh and meadows for all types of insects. The Harvester butterfly breeds here, and there should be lots of other insects with such a diverse habitat. Meet in the parking lot at the south end of Jack Darling Memorial Park. Entrance to the park is from Lakeshore Blvd, about halfway between Mississauga Rd and Clarkson Rd. Bring nets, containers, lunch. No collecting.

NOTE: Occasionally we have to change the date or start time of an outing, so it's important that we know whether you plan to attend. The focus for these outings is educational.



2004 Ontario Insect Counts



BUTTERFLIES

Date (Rain date)	Location	Contact	Telephone	Email
Sat Jun 5	Algonquin East Side	Colin Jones	(705)652-5004	colin.jones@mnr.gov.on.ca
Wed June 23	Sandbanks PP	Yvette Bree	(613)393-3319 x227	yvette.bree@mnr.gov.on.ca
Sat Jun 26 (27)	Pinery Prov. Park	Brenda Kulon	(519)869-2833	bkulon@cogeco.ca
Sun Jun 27	Oshawa	James Kamstra	(905)985-4497	jkamstra@gartnerlee.com
Sun Jun 27 (Jul 4)	Muskoka Bala	Ron Stager	(705)684-9192	ronstager@sympatico.ca
Thu Jul 1	Toronto T.E.A.	Tom Mason	(905) 839-6764	tmason@torontozoo.ca
Sat Jul 3 (4)	Lake Dore	Chris Michener	(613)625-2263	cmichener@renc.igs.net
Sat Jun 3	Orillia	Bob Bowles	(705)325-3149	rbowles@rogers.com
Sat Jul 3	Windsor	Paul Pratt	(519)978-1339	pprat@city.windsor.on.ca
Sat Jul 3	Long Point	Chauncey Wood	(519)426-0039	cwood@kwic.com
Sun Jul 4	Skunk's Misery	Ann White	(519)457-6586	dwhite@odyssey.on.ca
Sun Jul 4	Sunderland	James Kamstra	(905)985-4497	jkamstra@gartnerlee.com
Wed July 7	Presqu'ile Prov. Park	Philip Careless	(613)475-4324	pcareles@uoguelph.ca
Sat Jul 10	Hwy 60 Algonquin	Colin Jones	(705)652-5004	colin.jones@mnr.gov.on.ca
Sat Jul 10	Hamilton	Bill Lamond	(519)756-9546	kathgard@hotmail.com
Sat Jul 10	Toronto Centre	John Carley	(416)766-1330	carley.la@sympatico.ca
Sat Jul 10 (11)	McGregor Point P.P.	Mary Rapati	(519)389-6231	butterfly@bmts.com
Sat Jul 10 (11)	Haliburton Highlands	Ed Poropat	(705)457-3018	edporopat@halhinet.on.ca
Sun Jul 11	Carden Plains	Bob Bowles	(705)325-3149	rbowles@rogers.com
Sun Jul 11	Rondeau Prov. Park	Sandy Dobbyn	(519)674-1772	sandy.dobbyn@mnr.gov.on.ca
Sat Jul 17 (18)	Hog Island	Chris Michener	(613)625-2263	cmichener@renc.igs.net
Sat Jul 17 (18)	Petroglyphs Prov. Park	Jerry Ball	(705)745-3272	
Sat Jul 31	Pelee Island	Bob Bowles	(705)325-3149	rbowles@rogers.com
Sat Aug 7 (8)	Point Pelee Nat. Park	Sarah Rupert	(519)322-5700 x13	sarah_rupert@pc.gc.ca

Counts held in the past but without dates for this year

Misery Bay, M.I.	Nancy Ironside	(705)326-4384	nancy.ironside@sympatico.ca
Severn Township	Nancy Ironside	(705)326-4384	nancy.ironside@sympatico.ca

DRAGONFLIES

Date	Location	Contact	Telephone	Email
Sun Jul 11	Algonquin Odonate	Colin Jones	(705)652-5004	colin.jones@mnr.gov.on.ca
Sun Jul 11	Hamilton	Carl Rothfels	(905)527-1158 x 238	crothfels@yahoo.ca
Sat Jul 17	Carden Plains Odonate	Bob Bowles	(705)325-3149	rbowles@rogers.com
Thu Jul 22	Royal Botanical Gardens	Carl Rothfels	(905)527-1158 x238	crothfels@rbg.ca
Sun Aug 1	Pelee Island Odonate	Bob Bowles	(705)325-3149	rbowles@rogers.com
Sat Aug 7	Lake Dore Odonate	Carey Purdon	(613)625-2610	purdon@renc.igs.net

Dates are subject to change! Please check with the count organizer in advance. Everyone is welcome, whatever your skill level. Please note that many of these counts are done for the North American Butterfly Association and that there may be a nominal charge for participating. Please be prepared for the count activity with sunscreen, water, hat and food and other items suggested by the count organizer.

TEA Student Symposium 2004 - Abstracts

Male and female mate choice in the white spotted pine sawyer beetle *Monochamus s. scutellatus* (Say) (Coleoptera: Cerambycidae)

Aguayo¹, Ingrid., P. de Groot² and S.M. Smith¹

¹ Faculty of Forestry, University of Toronto, 33 Willcocks St., Ontario M5S 3B3

² Canadian Forest Service, Great Lakes Forestry Centre, 1219 Queen Street E., Sault Ste Marie, Ontario P6A 5M7

The white spotted sawyer beetle, *Monochamus s. scutellatus*, has a polygynandrous mating system. The hypothetical advantages of polygynandry to a female may be sperm-replenishment and material-benefit from the selected males, and genetic-benefit for both sexes. We investigated the importance of mate choice in relation to the genetic-benefit, expressed as a phenotypic quality of body size, by examining the mating behaviour of *M. s. scutellatus*. Body sizes of field-collected insects were measured and categorised into three classes: small (<1.8cm), medium (1.8, 2.0cm), and large (>2.0cm). A male-male competition/female choice was carried out in a laboratory arena, wherein one size class female was given a choice of two males differing in size from each other. The inverse procedure was carried out for female-female competition/male choice. A corollary study was also carried out in the field by capturing mating pairs and measuring their body size in order to compare male and female size in natural mating pairs. In the experimental group, neither females ($\chi^2=1.49$, $P=0.47$, $df=2$, $N=135$) nor males ($\chi^2=0.036$, $P=0.98$, $df=2$, $N=135$) showed any significant difference in choice of mates of different sizes. Similarly, the body sizes of naturally mating male and female pairs were not significantly correlated ($\chi^2=0.175$, $P=0.24$, $N=47$), and mating pair class sizes did not differ (Fisher's exact test, $P=0.5739$, $N=47$). These experimental results show a non-discriminating pattern of mate choice by *M. s. scutellatus*. We speculate that there must be characteristics other than size influencing mate preference, e.g. physiological competence, or augmentation of genetic diversity in their offspring, possibly chosen in a cryptic manner by females.

Ingrid Aguayo was the recipient of the prize for 'best talk'

Phylogenetic analysis of the corbiculate Apinae based on morphology of the sting apparatus (Hymenoptera: Apidae)

Sophie Cardinal

Department of Biology, York University, 4700 Keele Street, Toronto, Ontario M3J 1P3

This paper aims to test the various competing hypotheses regarding the relationships among the four tribes of corbiculate apine bees (Euglossini "orchid bees", Bombini "bumble bees", Meliponini "stingless bees", and Apini

"honey bees") against a completely new set of previously unstudied morphological characters. A cladistic analysis based on morphological characters derived from the sting apparatus was performed. In all of the morphological analyses to date, the posterior abdominal segments including the sting apparatus have been largely ignored. Results of cladistic analyses based on morphological characters from the sting are congruent with most studies based on morphological and combined morphological/molecular data, i.e., Euglossini + (Bombini + (Meliponini + Apini)), but do not support the results based upon just molecular data.

Reintroducing the Karner Blue butterfly (*Lycaeides melissa samuelis*) in Ontario — Now, Later or Never? Pak Kin Chan

Department of Biology, York University, 4700 Keele Street, Toronto, Ontario M3J 1P3

Since the extirpation of the Karner Blue Butterfly (*Lycaeides Melissa samuelis*) in Ontario in 1991, a Recovery Team was established and restoration work has been done to various potential reintroduction sites in Ontario, trying to improve the quality of the habitats and prepare for reintroduction of the butterfly from the USA. Though promising results have been observed, no systematic scheme has been employed to evaluate the quality of these restored sites to see if they are ready for reintroduction of the Karner Blue. This study tries to evaluate five potential Karner Blue reintroduction sites in Ontario by looking at both biotic (vegetation, especially the larval host plant *Lupinus perennis*, 1st and 2nd brood adult nectar source plants, and tending ant species) and abiotic (temperature, relative humidity and light intensity) aspects. Field data were collected in summers of 2002 and 2003. The results show that all five potential reintroduction sites in Ontario are of lower quality, at least in certain aspects, compared to the three potential source butterfly sites in the USA. This suggests that the Ontario sites need further restoration before reintroduction of the butterfly should proceed. Comparison of the Ontario and US sites also reveals that Indiana Dunes National Lakeshore is the most similar to four of the five Ontario sites in terms of vegetation community and microhabitat structure. Indiana Dune National Lakeshore should therefore be identified as the priority source butterfly site for Karner Blue reintroduction in Ontario.

The Nearctic Nitidulinae: evolutionary grade or monophyletic clade (Coleoptera, Nitidulidae)?

Charmaine E. Condy

Department of Zoology, University of Toronto and Center For Biodiversity & Conservation Biology, Royal Ontario Museum, 100 Queens Park, Toronto, Ontario, Canada M5S 2C6

This study presents the first comprehensive phylogenetic analysis of Nearctic representatives of nitidulid subfamilies (Coleoptera, Nitidulidae). Seven subfamilies and 13 genera were represented by 21 exemplar species. Forty-three characters derived from external morphology and genitalia were identified, and a maximum parsimony analysis yielded one most parsimonious tree (length=130, consistency index = 0.45, homoplasy index = 0.55, retention index = 0.70). The results support the monophyly of the family Nitidulidae. However, the monophyly of the subfamilies Nitidulinae and Epuraeinae is not supported on the basis of the present analysis. Further research is needed to test these preliminary conclusions. Additional character systems and further taxon sampling must be explored before implementing formal revisions to the current taxonomy.

Female behaviour of *Xylocopa virginica* in the northern extent of its range

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Xylocopa virginica, the only species of large carpenter bees in Ontario, exhibits unusual colony social behaviour. Egalitarian bees live communally, they work and share reproduction. Foundresses do equal work and have similar reproductive rates. In caste-based colonies, one foundress dominates reproduction. In caste-based colonies, most females (workers) have little reproduction, but do significant work. A few females (queens), will have reduced work but high reproduction. *Xylocopa virginica* is not egalitarian, but is not traditionally caste-based. Excavation of nests, and measures of wear and reproductive rates, indicate that *X. virginica* lives in societies where one or more foundresses dominate both reproduction and work. This results in a situation where the same individual does the most work, and also has highest reproductive rates. This social environment is in contrast to egalitarian and classical caste based societies.

Evolutionary transformations in the structure and function of black fly wings (Diptera: Simuliidae)

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Black fly wings are readily distinguishable from those of all other Diptera, and exhibit characteristic form at the subfamilial-, tribal-, and generic levels. Yet despite evident differences in overall shape and patterns of wing venation, few studies have attempted to interpret such variation in a phylogenetic framework. The dearth of previous studies is perhaps related to subtle- and difficult-to-quantify differences in overall wing shape and vein position. The objective of the present study is to quantify wing shape and wing-vein configuration using relative warp analysis (RWA) — a landmark-based method of geometric morphometrics that can reveal subtle (though potentially significant) morphological discontinuities. Analysis of 24 species representing all major lineages of black flies reveals that overall wing shape is relatively conserved, and that most of the variation is attributable to shifts in wing-vein configuration. Major transformations include crowding of veins toward the anterior wing margin, a shortening (or loss) of the branch of the radial sector, and shortening of the basal radial- and basal medial cells. The aerodynamic- and evolutionary implications of these transformations will be discussed. Future work will focus on how to code the character states identified by RWA for inclusion in a comprehensive phylogenetic analysis of black flies.

Topicals for tropicals: cheating death by inducing imaginal diapause in butterflies

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Abstract: Butterflies are believed to live an average adult lifespan of two weeks. This limited longevity necessitates the frequent and extensive importation of pupae from butterfly breeding farms to butterfly conservatories. Wings of Paradise® Butterfly Conservatory (Cambridge, ON, Canada) spends approximately \$150,000 each year to have 2000 live butterflies on display at any given time. The purpose of this study is to attempt to significantly extend tropical butterfly longevity by topical application of precocene II (6,7-dimethoxy-2,2-dimethylchromene). Precocene II can induce reproductive diapause in some insects and can suppress production of juvenile hormone by causing necrosis of the corpora allata. Its effects have not been investigated in tropical butterflies. The three proposed objectives for this study are to 1) quantify the longevity of butterflies in Wings

of Paradise® Butterfly Conservatory, 2) evaluate the efficacy of precocene II as a method of increasing butterfly longevity, and 3) determine the appropriate dosage of topically applied precocene II for five butterfly species (*Parthenos sylvia*, *Hypolimnas bolina*, *Danaus plexippus*, *Morpho peleides*, *Papilio memnon*, *Caligo memnon*) through bioassay guided trials. The proposed research has the potential to significantly increase adult butterfly longevity and thereby significantly decrease the extensive costs associated with maintaining live butterfly displays.

Recent systematic work in the family Clusiidae

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Caloren & Marshall's 1998 revision of the New World *Clusiodes* Coquillett was the first systematic work on the Clusiidae published out of the University of Guelph Insect Systematics Laboratory. A short paper followed this work discussing the behaviour and taxonomy of Australian Clusiidae (Marshall 2000). Recently, a major project on the Costa Rican Clusiidae led to the senior author's recruitment and ultimately to his MSc revision of the *Sobarocephala flaviseta* species group and his current PhD work on the remainder of the genus. Now that the University of Guelph has become a center for clusiidology, ongoing projects include revisions or reviews for almost all genera in the family, particularly those found in the New World. In addition to redefining subfamilies, erecting tribes and producing the first phylogenetic analysis of the Clusiidae at the generic level, at least 230 species new to science (in the New World alone) will be described in the next several years. While the vast majority of New World clusiids belong to the extremely diverse genus *Sobarocephala* Czerny (containing well over 200 species, most of which are undescribed), 9 smaller genera are known to occur throughout the Nearctic and Neotropical Regions. These include *Craspedochaeta*, *Heteromeria*, *Chaetoclusia* and *Procerosoma*, which are discussed here.

The influence of pollen availability on the behaviour of spring-reared honey bee (*Apis mellifera*) workers

Heather R. Mattila and Gard W. Otis

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Pollen stored by overwintering colonies may become depleted in early spring as colonies begin intensive brood rearing, and if nutritionally stressed, trade-offs are made in the quality and quantity of workers that are produced. In a previous study, colonies supplied with high amounts of pollen in April reared 4

times more brood than pollen-stressed colonies and worker lifespan was 15 days longer. To determine the cause for this increase in longevity, the influence of colony nutritional status on the ontogeny of brood care and foraging behaviour of spring-reared bees was examined. Cohorts of newly emerged workers from colonies that were pollen-stressed (pollen trapped in the fall), pollen-rich (provided with pollen patties in the fall or spring or with a spring pollen substitute patty) or left with natural levels of pollen (control) were marked and introduced to a common observation hive in late April. In-hive behaviour and foraging of marked bees was recorded daily from 1 to 35 days of age. Workers from colonies that were fed in the spring were more often seen performing brood associated tasks, and if fed pollen, had reduced longevity and foraging capacity compared to workers from pollen-stressed colonies. This is contrary to previous research that suggested that increased lifespan results from a protracted period of nursing and that the energy devoted to foraging is static.

To feed or not to feed: the effects of pollen availability on the development of overwintering populations of honey bees (*Apis mellifera*)

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In temperate climates, honey bee colonies survive the long winter months by producing a population of winter bees that cluster in the hive and maintain adequate hive temperatures through thermoregulation. Winter bees are characterized by greatly increased lifespan relative to their summer counterparts (8 months versus 25 days, respectively) and enlarged hypopharyngeal glands and fat bodies that store high levels of proteins and fats. Colonies begin rearing brood in early spring, at which time the proteins and fats that workers have stored in their bodies and in the hive itself as pollen are mobilized to rear brood. As the population of winter bees was reared in the fall, we manipulated pollen levels (3 treatments: pollen-fed, pollen-trapped and control) to determine the effect of pollen availability on the size and timing of development of the overwintering population, worker longevity and brood rearing ability in the spring. Pollen-fed colonies reared 1.4 times more brood in the fall than pollen-trapped colonies, but pollen-trapped workers from cohorts that made significant contributions to the overwintering population had increased survivorship and relatively long lives compared to the other treatments. Cohort survivorship and longevity of pollen-fed workers were generally lower and closer to that of the control colonies. This made trapped colonies functionally equivalent to the other treatments in terms of the size of the winter bee population and "bee days"

available to the colony. It is possible that the anticipated effects of pollen deficit were counteracted by lower nursing loads for workers due to reduced brood rearing, which is known to extend worker longevity.

The beetle that kicks ash: controlling Emerald Ash Borer with Imidacloprid trunk injections

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The Emerald Ash Borer (EAB) (*Agrilus planipennis* Fairmaire) is an invasive exotic pest that was discovered in Windsor Ontario in summer 2002. The beetle has the potential to damage all ash trees (*Fraxinus* spp.) and a substantial part of Canada's \$1.4 billion hardwood forest industry. Trials began summer 2003 for testing imidacloprid trunk injections as a potential method of controlling adult EAB. Potted green ash trees were injected by pipette with six concentrations of imidacloprid to determine those that provide control of adult EAB. Foliar and stem tissue samples were collected periodically throughout the summer to examine temporal trends in uptake, translocation, and distribution of imidacloprid residues. Initial trials indicate imidacloprid is effective at providing 83% control of adult EAB at the injected concentration of 0.015g active ingredient/tree. Residue samples from the foliar and stem tissue indicate imidacloprid is persistent within the tree for the duration of the natural beetle feeding period.

Effects of nectar robbing on nectar dynamics and bumblebee foraging strategies in *Linaria vulgaris* Mill. (Scrophulariaceae)

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Abstract. Inefficient pollinators are likely to use holes made by nectar robbing bees, and may therefore contribute to negative effects of this type of parasitism. We observed various aspects of the pollination and nectar robbing ecology of *Linaria vulgaris* in the Colorado Rocky Mountains with emphasis on the impacts of differences in proboscis length. We found that, although *L. vulgaris* flowers are apparently adapted for pollination by long-tongued bees, short-tongued bees that could not reach the nectar standing crop visited them legitimately nonetheless for traces of nectar, but switched to secondary robbing in the presence of primary robbers. Long-tongued bees were more efficient than

shorter-tongued bees, and did not switch to secondary robbing even when ~ 100% of flowers had holes. Robbing affected nectar standing crop and the proportion of empty flowers per inflorescence, but the upper part of inflorescences were robbed less and visited by more legitimate pollinators than the lower part. We discuss some of the reasons that *L. vulgaris*' pollination ecology and growth form might temper the potentially negative effect of nectar robbing.

Daniel A. Newman was the recipient of the prize for 'best poster'

Sexual selection on age- and condition-dependent traits in the ambush bug *Phymata americana* (Heteroptera: Phymatidae)

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A series of studies were conducted to determine the strength of selection on various morphological traits in the ambush bug *Phymata americana*, as well as the ontogeny of these traits. The first part of the study measured the sexual selection on traits in both sexes during two (early vs. late season) sampling periods. It was shown that though there was no significant directional selection on male lateral colouration early in the season, this trait experienced significant positive directional selection in the late season. No directional selection was detected on male dorsal colouration or body size (pronotum width) in either sampling period. For females, reproductive condition (residual body mass) was a good predictor of female mating status in both early and late sampling periods. There was no significant directional selection on female body size (pronotum width) during either sampling period. The second part of the study demonstrated the effects of age and condition on the expression of colouration and body size in either sex. It was shown that larval condition (food availability) had a significant effect on adult body size in both sexes. Colour pattern changed (darkened) with age in both sexes, but condition also had a significant effect on male lateral colouration – high-condition males became darker than low-condition males. The directional selection and strong condition-dependence of male lateral colouration suggests that this trait may be a sexual ornament, conveying information regarding male age and condition.

Patterns of richness at various taxonomic levels in bee communities

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For some taxonomic groups, such as bees (Hymenoptera: Apoidea), identification skills take many months to develop. For some groups (e.g. *Dialictus* sp.), members of the same subgenus are lumped together since identifications at the species level are nearly impossible to achieve. Problems of identification combined with inadequate sampling have made understanding the patterns and processes that shape the diversity of communities difficult. However, when estimates of various taxonomic richnesses are considered, a remarkably consistent pattern emerges: higher level taxonomic groupings (at least at the level of genus) can accurately predict species richness. This comes as great relief for scientists as it provides some assurance that patterns of richness are consistent at higher levels of taxonomy. If identifications are incorrect at the species level but correctly identified to genus, then there is a great deal of valuable information in these data sets. Moreover, this means that studies can move forward in their research programs with identifications at a higher taxonomic level if highly skilled taxonomists are required but unavailable. It is also interesting that taxonomic organization reflects some ecological relationships in bee communities.



Giant Swallowtail, Point Pelee
Photos by Michael van der Poorten



Historical Records for the Giant Swallowtail in the GTA

Compiled by Craig S A McLaughlan

Location	Observer	Date	Notes
Loran Park, Toronto	Pall Hahn	1900	
Unwin Av, Toronto	Barry Harrison, Mike King, Leon Schlichter	July 30, 1999	
Thicksons Woods, Whitby	Dennis Barry	Aug 7, 2000	
Thicksons Woods, Whitby	Dennis Barry	Aug 29 2000	Seen after 3 days of strong south-west winds
Cranberry Marsh, Whitby	Satu Pernanen	Aug 21, 2002	
Sheridan Nurseries, Mississauga	Garth Riley	June 22, 2003	
Markham	Alan Wormington, Erin Blenkhorn, Erin James	June 26, 2003	Condition: ragged
Quebec Av, Toronto	Bev & Craig McLaughlan	Aug 15, 2003	Also seen on Aug 16 & 20 (and believed to be the same butterfly). Condition: Fresh
Lichen Place, Toronto	Jean Iron	Aug 15, 2003	
Beaver Creek Ravine, Richmond Hill	Ron Stager	Aug 18, 2003	Also possibly seen on Aug 29, 2003
Speyside (north of Milton)	Seabrooke Leckie	Aug 19, 2003	Also seen on Aug 20, 2003
Oakville	Donna Sheppard	Aug 21, 2003	Seen laying eggs on Rue plant. Also seen on Aug 22, 2003
Brounty Harbour, Oakville	Don Davis	Aug 23, 2003	Captured and re-released
High Park, Toronto	Bob Yukich	Aug 28, 2003	Condition: ragged
Park Lawn Av, Toronto	Ray Geras	Aug 30, 2003	

Sandbanks Provincial Park Butterfly Survey - 2002 & 2003

By Yvette Bree

Sandbanks Provincial Park is located along the south-western shoreline of Prince Edward County, approximately 25 kilometres south of Belleville. Known for its sandy beaches and summer recreational opportunities, this Natural Environment park is, nonetheless, a spectacular natural landscape.

The first butterfly survey was conducted in June 2001 (Ontario Insects May 2002, Volume 7, #3, pg.56); surveys followed in 2002 and 2003. The purpose of the surveys is twofold: to determine butterfly species within the park; and to provide a training opportunity for park staff. Small teams (3-4 people), led by a more experienced individual, were sent to different areas of the park to survey for butterflies. Following are the results from the last two years.

Butterfly Survey 2002 - July 17th

This survey was conducted from 1PM - 4PM on a very hot day. 445 individuals were seen, representing 25 different species. Most numerous were Canadian/Eastern Tiger Swallowtail (76), Clouded Sulphur (72), Cabbage White (48) and Common Wood-Nymph (47). Species for which only one individual was recorded were Leonard's Skipper, Long Dash Skipper, Black Swallowtail, Viceroy and Eyed Brown. A total of 36 person hours was spent on this survey. In an effort to be more consistent, butterfly surveys in the future will be conducted during the last week of June.

An interesting species, new to Sandbanks, was identified later in the summer of 2002. An American Snout (*Libytheana carinenta*) was seen on several occasions in August by park naturalist staff Joanne Dewey and Angela Doxsee, and visiting naturalist David Bree.

Butterfly Survey 2003 - June 23rd

This survey was conducted from 10AM - Noon and from 1PM - 2:30PM. It was approximately 23C & quite windy, which probably kept butterflies low. A total of 880 individuals were seen, representing 22 species. Most numerous species were Common Ringlet (309), Little Wood-Satyr (167), Hobomok Skipper (144) and Pearl/Northern Crescent (87). Species for which only one individual was recorded were Least Skipper, Painted Lady and Red Admiral. A total of 66.5 hours were spent on this survey.

Thanks go to the participants: Meghan Babin, Christina Baldasti, Joanne Dewey, Corina Brdar, David Bree, Yvette Bree, Vicki Clowater, Angela Courneyea, Carrie Crane, Bill Crowley, Angela Doxsee, Josiane Dufault, Walter Frey, Karen Hartley, Shannon Harvey, Ed Heuvel, Wendy Hookey, Jane Hurst, Patricia Jamieson, Nathan Luffman, Casey Ringham, Agneta Sand & Lisa Solomon.

Common Name	Scientific Name	2002	2003
Skippers			
Silver-spotted Skipper	<i>Epargyreus clarus</i>	26	31
Least Skipper	<i>Ancyloxypha numitor</i>	3	1
European Skipper	<i>Thymelicus lineola</i>	14	25
Leonard's Skipper	<i>Hesperia leonardus</i>	1	
Long Dash Skipper	<i>Polites mystic</i>	1	prob.
Hobomok Skipper	<i>Poanes hobomok</i>	11	144
Dun Skipper	<i>Euphyes vestris</i>	2	
Skipper spp.		32	7
Swallowtails			
Black Swallowtail	<i>Papilio polyxenes</i>	1	3
Tiger Swallowtail	<i>Papilio glaucus/canadensis</i>	76	3
Whites & Sulphurs			
Mustard White	<i>Pieris napi</i>	3	
Cabbage White	<i>Pieris rapae</i>	48	6
Clouded Sulphur	<i>Colias philodice</i>	72	4
Orange Sulphur	<i>Colias eurytheme</i>	10	
White spp.		9	2
Hairstreaks & Coppers			
American Copper	<i>Lycaena phlaeas</i>		5
Summer Azure	<i>Celastrina neglecta</i>	8	9
Silvery Blue	<i>Glaucopsyche lygdamus</i>		45
Blue spp.			17
Brush-footed Butterflies			
Great Spangled Fritillary*	<i>Speyeria cybele</i>	2	
Pearl Crescent**	<i>Phyciodes tharos/cocytia</i>	21+1	dead 87
Northern Crescent**	<i>Phyciodes cocytia</i>	1	
Eastern Comma	<i>Polygonia comma</i>	3	
Painted Lady	<i>Vanessa cardui</i>		1
Red Admiral	<i>Vanessa atalanta</i>		1
White Admiral	<i>Limenitis arthemis</i>	14	3
Viceroy	<i>Limenitis archippus</i>	1	6
Northern Pearly-Eye	<i>Enodia anthedon</i>	2	
Eyed Brown	<i>Satyroides eurydice</i>	1	
Little Wood-Satyr	<i>Megisto cymela</i>		167
Common Ringlet	<i>Coenonympha tullia</i>	9	309
Common Wood-Nymph	<i>Cercyonis pegala</i>	47	2
Monarch	<i>Danaus plexippus</i>	13	5
Crescent spp.		11	
Fritillary spp.		2	2
Brown spp.			8
Other unknowns			4

* Great Spangled & Aphrodite Fritillaries are not separated.

** Pearl & Northern Crescents are not separated except for one confirmed Northern Crescent.

Butterfly Survey 2004 - Wednesday June 23rd. For more information and to verify timing, please contact Sandbanks Provincial Park at (613) 393-3319 or e-mail Yvette Bree at yvette.bree@mnr.gov.on.ca

Singing Insects in the Toronto Region

By Charles Heller

During the past summer I have been fascinated, not to say deafened, by the sounds of crickets chirping in my backyard in Toronto. As Darwin (1874, p.291) noted, these sounds, as well as being attractive to others of the same species, are “not unmusical even to the human ear”. I give here the names of a few species that I was able to positively identify, and would be pleased to hear from anyone else who has worked on the crickets and grasshoppers in the Toronto area. Carolyn King and Colin Jones kindly directed me to two important key works: Vickery and Kevan (1985), and the “Singing Insects” website at <http://buzz.ifas.ufl.edu/>. (Note that the species listed here were all found at numerous other places in the Toronto region in addition to the localities mentioned.)

Grylloptera

Oecanthus fultoni T. J. Walker: on trees and bushes in Bayhampton Court (North York)

O. nigricornis F. Walker: on trees and bushes in Bayhampton Court, Darcel Ave. (Malton, Mississauga) and the Country Day School (King City)

Gryllus pennsylvanicus Burmeister: at Ross Lord Park (North York)

Orthoptera

Schistocerca sp.: at Darcel Ave. and Ross Lord Park

Dissosteira carolina (L.): at Darcel Ave. and Ross Lord Park

Oecanthus fultoni (commonly called the Snowy Tree Cricket because it is almost colourless) is particularly interesting for several reasons. It is known as the “thermometer cricket” because its chirp rate is directly related to the air temperature. Vickery and Kevan (1985, p. 264) give the formula as:

$$\text{temperature (degrees F)} = n + 40$$

where n = number of chirps in 13 seconds. Some authorities use a time period of 14 seconds. I was able to match the temperature derived from this formula (using a time period of 14 seconds) to the temperature according to CITY-TV. Some books give this formula:

$$\text{temperature (degrees C)} = N + 4$$

where N = number of chirps in 8 seconds.

I have heard two *O. fultoni* males when in proximity synchronizing their chirps something like this (Fig. 1):

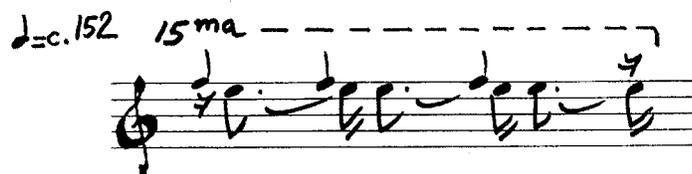


Fig. 1: A rough transcription of two *O. fultoni* males chirping synchronously

I take it that this is what Vickery and Kevan (1985 p.263) mean by “synchronizing their chirps but not their pulses” (i.e. the individual clicks which together form a “chirp”).

This raises the question, what is the advantage to a male of singing to attract a female if this occurs in groups where other males are also singing at the same time and therefore presumably competing for the females? One theory is that in this way an “increased peak signal output” is produced by a group of males that is competing for mobile females with another group of males elsewhere (Merker, 2000 p.317). This theory also applies to the question of why humans like to dance in groups. Music and dancing evolved in humans as a mechanism for males to attract females, as pointed out by Darwin (1874, p.593). A large group makes it more efficient for the sexes to congregate in the first place. The females select the “best” dancers and musicians, who are identified as those who can best entrain their movements to the beat of the group - in musical terms, we say they can “keep time”. As a result, genes for musical and dancing ability have evolved in humans. Note that group behaviour provides the environment for the sexual selection through which music has evolved; there is no need to invoke any “group selection” for musical ability.

References

Darwin, C., *The Descent of Man, and Selection in relation to Sex*. (2nd U.S. ed., 1874). Reprinted: New York: Prometheus Books, 1998

Merker, B., “Synchronous Chorus and Human Origins”, in: Wallin, Nils L., et al., *The Origins of Music*. Cambridge, MA: MIT Press, 2000

Vickery, V. R., and Kevan, D. K. McE., *The Insects and Arachnids of Canada Part 14: Grasshoppers, Crickets and Related Insects of Canada and Adjacent Regions*. Ottawa: Biosystematics Research Institute, Agriculture Canada, 1985.

Flower colour and architecture as visual cues used by female crab spiders (*Misumena vatia*) in hunting site selection

W.J.D.Eberlie Research Award Report

Melanie Youngs and Tara Stephens, University of Guelph

January 2004

Abstract

According to the optimal foraging theory, predators may increase their net energy intake and subsequently their lifetime fitness by selecting the best hunting sites based on a variety of cues. The purpose of this study was to investigate the use of floral colour and architecture as visual cues used by female crab spiders (*Misumena vatia*: Thomisidae) to select hunting sites in the absence of prey stimuli. Spiders were run through two independent trials. Trial 1 tested colour (yellow versus white) and Trial 2 tested floral architecture (simple versus complex) as visual cues by providing the spiders with a choice between two flowers of the same architecture but different colour and two flowers of the same colour but different architecture, respectively. Experiments on flower selection were conducted over a two year period in Algonquin Provincial Park, Ontario using fresh flowers in the first year and artificial in the second. The results of this study suggest that colour is not used by female *M. vatia* as a visual cue in selecting hunting sites; however, *M. vatia* exhibited a strong preference for complex flowers suggesting that floral architecture is an important cue. The extended length of time that complex flowers are attractive to pollinating insects may enable *M. vatia* to optimize its net energy intake by remaining at a profitable hunting site for a longer period of time. Choosing complex flowers may therefore improve the lifetime fitness of *M. vatia* and thus make it an optimal foraging strategy.

Introduction

Most animals inhabit patchy environments and consequently face formidable challenges in choosing the best hunting sites (Pyke *et al.* 1977, Krebs *et al.* 1981). By selecting the best hunting sites, predators are able to optimize their net energy intake and increase their lifetime fitness. This foraging behaviour is passed on to future generations, resulting in the evolution of an optimal foraging strategy. The hypothesis that animals forage optimally is central to the optimal foraging theory (Pyke 1984). To test this hypothesis many investigations have focused primarily on predicting how foragers should utilize various types of prey, types of patches or move most efficiently between patches (Pyke *et al.* 1977, Krebs 1978).

Anthophilous ambush predators, such as the crab spider *Misumena vatia* (Thomisidae), provide an excellent

opportunity to study the optimal foraging behaviour of individuals that inhabit patchy environments (Morse 1985). Morse (1999) reported that female *M. vatia* make non-random patch choice decisions by utilizing simple cues that require little or no learning. In accordance with the optimal foraging theory, Morse (1988) reported that female *M. vatia* select patches with the highest rate of insect visitation. However under various conditions, such as inclement weather or chance alone, insect stimuli may not be available as a cue for selecting an optimal hunting site. In most circumstances when the quality of a hunting patch is unknown, a predator resorts to sampling and abandoning patches until a high quality patch is found. *M. vatia* has limited mobility, however, and must descend the stem of their current hunting site, walk along the ground to the chosen flower and ascend that stem. Because of the substantial investment in time and energy required to switch hunting sites, *M. vatia* can not afford to sample and abandon patches until a suitable site is found. Consequently, in order to maintain an optimal foraging strategy crab spiders must use other cues in the absence of prey stimuli to improve their chances of selecting a higher quality site.

Greco and Kevan (1994) investigated flower species, plant parts and floral colour as botanical cues used for floral patch choice by *M. vatia* and *Phymata americana* (an ambush bug: Phymatidae) in the absence of prey stimuli. Although they found that *M. vatia* preferred goldenrod over the other flower species tested, they did not test what specific visual cue was used by *M. vatia* in making that selection. When plant parts were investigated, *M. vatia* preferred flowers with intact inflorescences and leaves over flowers with incomplete leaves or inflorescences. When *M. vatia* were presented with paper discs of different colours (yellow, white, blue and red) they preferred yellow discs over the other available colours. However, Greco and Kevin (1994) did not report the colour of the spiders tested nor did they record the flower the spider was collected from. Consequently, it could not be determined if the spiders were choosing flowers that complemented their body colour or if they were choosing based on prior experience. Aside from flower species, plant parts and floral colour, another botanical cue that could be used by *M. vatia* in hunting site selection is floral architecture. This cue has never been investigated.

The purpose of this study was to investigate the use of floral colour and architecture as visual cues used by female *M. vatia* to select hunting sites in the absence of prey stimuli. Specifically this study addressed the following questions and their associated hypotheses:

Question 1: Is flower colour a visual cue used by adult female *M. vatia* in hunting site selection?

Hypothesis A: Female *M. vatia* will exhibit a preference for yellow or white flowers.

Hypothesis B: Female *M. vatia* will prefer flowers that complement their body colour over flowers that contrast with their body colour in order to be less visible to potential prey and predators.

Question 2: Is flower architecture used as a visual cue by female *M. vatia* in hunting site selection?

Hypothesis: Female *M. vatia* will exhibit a preference for simple or complex flowers.

Question 3: Is there an effect of most recent experience on flower selection?

Hypothesis: *M. vatia* females will exhibit an affinity for the flower species that they were found on.

Experiments on flower selection were conducted over a two-year period in Algonquin Provincial Park, Ontario. There was a progression of ideas and methodologies throughout the study period as the results from one experiment led to further questions that were tested in subsequent experiments.

Methods

The first set of experiments on flower selection was conducted in Algonquin Provincial Park, Ontario, at the Wildlife Research Station (45.59°N, 78.52°W) in the third week of August 2002. Adult female *M. vatia* were collected from Oxeye Daisy (*Chrysanthemum leucanthemum*), Black-eyed Susan (*Rudbeckia serotina*), Narrow-leaved Meadowsweet (*Spiraea serotina*), Yarrow (*Achillea spp.*), and goldenrod (*Solidago spp.*) along the Highway 60 corridor. These flowers were chosen because *M. vatia* are readily found on them and because they can be grouped by colour and architecture. Oxeye Daisy, meadowsweet, and Yarrow have white inflorescences whereas Black-eyed Susan and goldenrod have yellow inflorescences. Oxeye Daisy and Black-eyed Susan consist of a solitary, terminal disk of tubular florets encircled by radiating petals (Schmalhofer 2001) which we have defined as a simple architecture. Meadowsweet, Yarrow, and goldenrod on the other hand consist of a terminal inflorescence composed of multiple recognizable subunits (Newcomb 1977) which we have defined as a complex floral architecture.

The collected spiders were housed in plastic vials with a portion of the flower that they were collected from ("host flower"). A number was randomly assigned to each spider and the species name of the spider's host flower and the spider's colour were recorded. Each spider was run through two independent trials. Trial 1 tested colour and Trial 2 tested floral architecture as visual cues. In Trial 1, spiders were given a choice between their host floral species and a

flower with a similar architecture but different colour. In Trial 2, spiders were given a choice between their host floral species and a flower with a similar colour but different architecture. By using their host flower as one of the flower choices in each trial we were able to test for an effect of previous experience on hunting site selection.

Each spider was randomly assigned to a separate arena consisting of two defoliated fresh flowers connected by a stick bridge. The order in which the spiders completed Trial 1 and Trial 2 was randomized. In each trial, the spiders were placed on the bridge facing a neutral direction equidistant from each flower. The spiders were given the entire day to make a flower selection and then their choice was recorded.

Statistical Analysis - Statistical analyses for this and all subsequent experiments were carried out using the Chi Square test on SPSS statistical software for Windows Standard Version (2002). In order to maintain an overall experimental alpha level of 0.05 we applied a Bonferroni correction to the independent trials to account for the fact that the same spiders were used in both trials.

Results

There was no evidence that female *M. vatia* preferred flowers that complemented their body colour over flowers that contrasted with their body colour ($n=39$, $X^2=3.103$, $p=0.078$) (figure 1) nor did they exhibit a significant preference for yellow or white flowers ($n=39$, $X^2=1.256$, $p=0.262$) (figure 2). The spiders did however exhibit a strong preference for complex floral architectures over simple architectures ($n=39$, $X^2=11.30$, $p<0.001$) (figure 3). There was no evidence that female *M. vatia* preferred their host flower over the other flower choice in either the colour or shape trial ($n=39$, $X^2=0.231$, $p=0.631$ and $n=39$, $X^2=0.231$, $p=0.631$, respectively).

New Problem

The use of real flowers prevented us from eliminating the possibility that the spiders were using another floral cue that we had not accounted for, such as odour, in their substrate selections. This problem prompted us to ask the question: Will female *M. vatia* still use architecture and not colour as a visual cue when artificial flowers are used in place of real flowers? Furthermore, the strong preference exhibited by *M. vatia* for complex floral architectures led to another question: Do female *M. vatia* consistently use architecture and not colour as a visual cue for substrate selection when tested in different months of the summer?

Method

The second set of experiments was conducted in Algonquin Provincial Park, Ontario, at the Harkness Laboratory of Fisheries Research (45.63°N, 78.37°W) in the third week of July and August 2003. The spiders were

collected and housed according to the methods set out in 2002. These experiments differed from the 2002 experiments, however, in several ways. The first difference is that artificial flowers were used in 2003 to control for any confounding effects associated with the use of real flowers in 2002. Silk artificial flowers exhibiting simple and complex architectures were spray-painted yellow or white with Design Master® floral paint in order to simulate all the combinations of flower colour and shape.

The second major difference between the 2002 and 2003 methodologies was the initial placement of the spiders before making their floral selection. It is frequently cited in the literature that when crab spiders switch flowers they descend the stem of their current site, walk along the ground to a new flower, and ascend that stem (Greco and Kevan 1994, Greco *et al.* 1995, Kevan and Greco 2001). Consequently, many studies investigating the substrate choices of crab spiders place them on the ground and allow them to make a choice (Morse 1993, Greco and Kevan 1994, Greco *et al.* 1995, Kevan and Greco 2001). This knowledge caused us to question the validity of our 2002 methodology because it did not seem realistic that spiders would ever make substrate choices at the level of the inflorescence in nature. Consequently, we altered our methodology so that the spiders were placed on the ground rather than on a bridge between the two inflorescences.

Each spider was randomly assigned to a separate arena that was lined with artificial turf. Two defoliated artificial flowers of the same height were erected equidistant from the centre of the arena. The spiders were placed in the centre of the arena facing the flowers and were left for one hour. At the beginning of the second hour the floral choice of the spider was recorded and those spiders that were neither at the starting position nor on a flower were placed back at the starting position. The spiders were checked at regular intervals for another hour. At the end of the second hour the position of the spiders was recorded and the artificial flowers and the turf were washed with water to ensure that possible scent markings or silk residues from the spiders in the previous trial would not influence the flower choices of spiders in successive trials. The length of time that the spiders were given to choose a flower was shortened from a full day in 2002 to a two hour period in 2003. This was based on the findings of Morse and Fritz (1982) who reported that *M. vatia* made most of their flower choices in the first two hours of a six-hour observation period.

Results

July - Similar to our findings in 2002, there was no evidence that female *M. vatia* preferred flowers that complemented their body colour over flowers that contrasted with their body colour ($n=71$, $X^2=1.704$, $p=0.192$) (*figure 1*). They also did not exhibit a significant preference for yellow or

white flowers ($n=71$, $X^2=0.014$, $p=0.906$) (*figure 2*). Unlike our findings in August 2002, however, the spiders did not exhibit a strong preference for complex floral architectures over simple architectures ($n=37$, $X^2=3.270$, $p<0.071$) (*figure 3*). There was no evidence that female *M. vatia* preferred their host flower over the other flower choice in either the colour or shape trial ($n=71$, $X^2=0.014$, $p=0.90$ and $n=37$, $X^2=0.027$, $p=0.869$, respectively).

August - Once again there was no evidence that female *M. vatia* preferred flowers that complemented their body colour over flowers that contrasted with their body colour ($n=70$, $X^2=1.429$, $p=0.232$) (*figure 1*). And again, they did not exhibit a significant preference for yellow or white flowers ($n=70$, $X^2=2.800$, $p=0.094$) (*figure 2*). Similar to August 2002, the spiders exhibited a strong preference for complex floral architectures over simple architectures ($n=65$, $X^2=12.938$, $p<0.0005$) (*figure 3*). As in all other trials, there was no evidence that female *M. vatia* preferred their host flower over the other flower choice in either the colour or shape trial ($n=70$, $X^2=2.800$, $p=0.094$ and $n=65$, $X^2=0.015$, $p=0.901$, respectively).

Discussion

In both 2002 and 2003, there was no evidence of a host effect in either the colour or shape trial, increasing our confidence that the spiders were making clear choices of flower colour and shape and were not simply responding to floral cues that they had recently experienced.

There was no evidence that female *M. vatia* prefer flowers that complement their body colour. It is possible that the spiders do not need to choose a flower of complementary colour because they are able to change colour, as observed by Gabritschewsky (1927). During the course of the study, however, yellow spiders were commonly found on white flowers and white spiders on yellow flowers. It is therefore possible that camouflage by cryptic colouration is not a necessary adaptation for hunting success in *M. vatia*. Furthermore, a study by Morse (2000) reported finding *M. vatia* successfully hunting on Pasture Rose (*Rosa carolina*) and Common Milkweed (*Asclepias syriaca*). Both of these flowers are pink and therefore out of the colour range of *M. vatia*, illustrating that these spiders can be successful on flowers that do not match their body colour. Morse (1988) also provided evidence to suggest that the presence of crab spiders on flowers does not influence pollinator foraging behaviour and that pollinators show no sign of avoiding flowers occupied by spiders. Heiling *et al.* (2003) have even suggested that the presence of crab spiders on flowers creates a colour pattern in the ultra-violet spectrum that makes the flowers more attractive to pollinators by exploiting the insect's pre-existing preference for flowers with colour

patterning. In addition to exhibiting no preference for flowers that match their body colour, *M. vatia* did not exhibit a preference for yellow or white flowers. These results conflict with Greco and Kevan's (1994) findings that female *M. vatia* prefer yellow flowers. Due to the fact that *M. vatia* did not exhibit a colour preference nor did they choose flowers that complement their body colour in 2002 or 2003 using two different methods, it is likely that colour is not a visual cue used by female *M. vatia* when selecting flowers.

Although colour was not used as a visual cue by female *M. vatia*, there was consistent evidence to suggest that shape was an important cue used in hunting site selection. Female *M. vatia* exhibited a strong preference for complex floral architectures in August of both years and this may be because spiders are able to hunt more efficiently on complex flowers. Morse (1981) reported that although more bumblebees attend flowers of simple architecture, such as Pasture Rose, the proportion of successful attacks was approximately four times greater on flowers of complex architecture, such as goldenrod and milkweed. On simple flowers the prey landed so close to the spider that the spider attacked before orienting itself to the prey, resulting in many unsuccessful attacks. Conversely, on complex flowers prey land a short distance away from the spider, forcing the spider to first orient towards the prey and then strike. This resulted in a much greater proportion of successful attacks on complex flowers. Because the same number of bumblebees can be caught on both flower types despite the fact that twice as many prey attend simple flowers (Morse 1981), there must be another attribute of complex flowers that make them a more attractive hunting site to *M. vatia*. In Oxeye daisy, and Black-eyed Susan disk florets mature from the outer edge of the disk inward over a period of several days (Gilbert 1983), whereas, in goldenrod the inflorescence is indeterminate and matures over a period of ten or more days (Morse 1981). Not only do complex flowers have nectar-secreting florets available for a longer period of time but, because they are visited by fewer insects than simple flowers, their nectar resources are not depleted as rapidly. This may enable the spider to remain on complex flowers much longer than simple flowers, reducing the time and energy used to find a new hunting site.

Although there was no statistically significant evidence to suggest that *M. vatia* selected flowers based on shape in July, more spiders chose complex flowers than simple flowers. This is consistent with the trend seen in August in both 2002 and 2003 and the lack of statistically significant evidence may be attributed to the small sample size in July.

Conclusion

The results of this study have suggested that colour is not used by female *M. vatia* as a visual cue in selecting hunting sites; however, the strong preference for complex

flowers suggests that floral architecture is an important cue. The extended length of time that complex flowers are attractive to pollinating insects enables *M. vatia* to optimize its net energy intake by remaining at a profitable hunting site for a longer period of time. Therefore, choosing complex flowers may improve the lifetime fitness of *M. vatia* and thus make it an optimal foraging strategy.

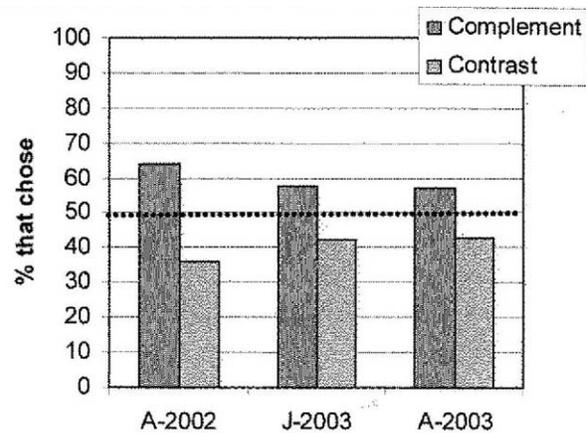


Figure 1: Percentages of spiders that chose flowers that complemented and contrasted their body colour in August 2002, July 2003, and August 2003.

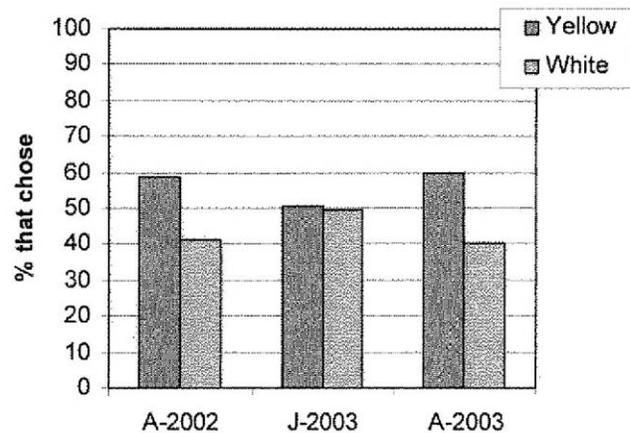


Figure 2: Percentages of spiders that chose yellow and white flowers in August 2002, July 2003, and August 2003.

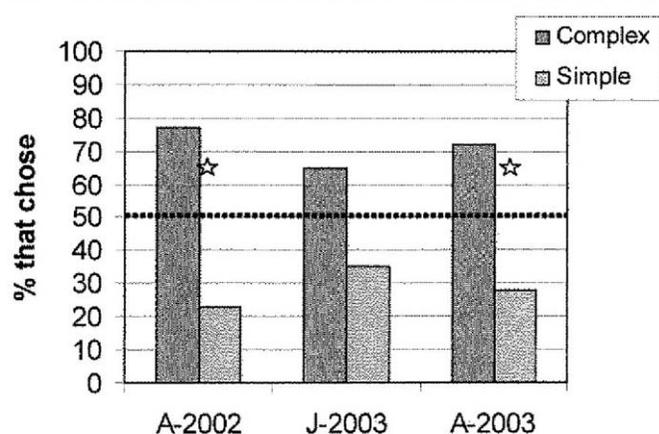


Figure 3: Percentages of spiders that chose flowers complex and simple architecture in August 2002, July 2003, and August 2003. ☆ indicates a significant difference.

References

- Gabritschewsky, E. 1927. Experiments on colour changes and regeneration in the crab spider *Misumena vatia*. *Journal of Experimental Zoology* 47: 251-267.
- Gilbert, F.S. 1983. The foraging ecology of hoverflies (Diptera, Syrphidae): circular movements of on composite flowers. *Behavioral Ecology and Sociobiology* 13: 253-257.
- Greco, C.F. and Kevan, P.G. 1994. Contrasting patch choosing by anthophilous ambush predators: vegetation and floral cues for decisions by a crab spider (*Misumena vatia*) and males and females of an ambush bug (*Phymata americana*). *Canadian Journal of Zoology* 72: 1583-1587.
- Greco, C.F., Weeks, P., and Kevan, P.G. 1995. Patch choice in ambush predators: Plant height selection by *Misumena vatia* (Araneae, Thomisidae) and *Phymata americana* (Heteroptera, Phymatidae). *Ecoscience* 2: 203-205.
- Heiling, A. M., Herberstein, M.E., and Chittka, L. 2003. Crab-spiders manipulate flower signals. *Nature* 421: 334.
- Kevan, P.G., and Greco, C.F. 2001. Contrasting patch choice behaviour by immature ambush predators, a spider (*Misumena vatia*) and an insect (*Phymata americana*). *Ecological Entomology* 26: 149-153.
- Krebs, J.R. 1978. Optimal foraging: decision rules for predators. Pages 23 – 63 in Krebs, J.R., and Davies, N.B. *Behavioural ecology: an evolutionary approaches*. Sinauer Associates, Sunderland, Massachusetts, USA.
- Krebs, J.R., Housaon A.I., and Charnov, E.L. 1981. Some recent developments in optimal foraging, p. 3-18. In: Kamil, A.C. and Sargent, T.D. *Foraging behavior. Ecological, ethological and psychological approaches*. Garland, New York.
- Morse, D.H. 1981. Prey capture by the crab spider *Misumena vatia* (Thomisidae) on three common native flowers. *The American Naturalist* 105: 358-367.
- Morse, D.H. and Fritz, R.S. 1982. Experimental and observational studies of patch choice at different scales by the crab spider *Misumena vatia*. *Ecology* 63: 172-182.
- Morse, D.H. 1985. Foraging behaviour of crab spiders (*Misumena vatia*) hunting on inflorescences of different quality. *The American Midland Naturalist* 116: 341-347.
- Morse D.H. 1988. Cues associated with patch-choice decisions by foraging crab spiders *Misumena vatia*. *Behaviour* 107: 297-313.
- Morse, D.H. 1993. Choosing hunting sites with little information: patch-choice responses of crab spiders to distant cues. *Behavioural Ecology* 4: 61-65.
- Morse, D.H. 1999. Choice of hunting site as a consequence of experience in late instar crab spiders. *Oecologia* 120: 252-257.
- Morse, D.H. 2000. The role of experience in determining patch use by adult crab spiders. *Behaviour* 137: 265-278.
- Newcomb, L. 1977. *Newcomb's Wildflower Guide*. New York: Little, Brown and Company.
- Pyke, G.H., Pulliam, H.R., and Charnov, E.L. 1977. Optimal foraging: a selective review of theory and tests. *Quarterly Review of Biology* 52: 137-154.
- Pyke, G.H. 1984. Optimal foraging theory: a critical review. *Annual Review of Ecology and Systematics* 15: 523-575.
- Schmalhofer, V.R. 2001. Tritrophic interactions in a pollination system: impacts of species composition and size of flower patches on the hunting success of a flower dwelling spider. *Oecologia* 129: 292-303.

Melanie Youngs and Tara Stephens were the recipients of the W.J.D.Eberlie Research Travel Award from the TEA in 2003. This report is based in part on the research that they undertook for that award.

TEA Insect Collecting Code

“Code for Insect Collecting” for the TEA, summarized and paraphrased from the “Code for Insect Collecting” issued by the Joint Committee for the Conservation of British Insects in 1971 and also from the statement of the Committee on Collecting policy of the Lepidopterists’ Society in the USA.

Benefits of collecting Lepidoptera and other insects:

1. It is a means of introducing people, particularly children to an awareness and study of an important part of their natural environment.
2. It has an essential role in the elucidation of scientific information, both for its own sake and as a basis from which to develop rational means for protecting the environment and its resources.
3. It is a recreational activity that can be pursued in a manner not detrimental to the environment.

Purpose of collecting:

1. To create a reference collection for study, appreciation and education.
2. To document regional diversity, frequency and variability of species and as voucher material for published records. This includes the important matter of monitoring the fluctuation of populations.
3. To document faunal representation in environments threatened with alteration by man or natural forces.
4. To participate in the development of regional checklists and institutional reference collections. The Canadian National Collection and collections in museums and universities have depended to a large extent on the efforts of amateur collectors.
5. To complement a planned research endeavour.

Ethics of collecting:

1. A collection of adults should be limited to sampling the population concerned.

2. Insects should be examined while alive, and if not required, released where they were captured.
3. The same species should not be taken in numbers year after year from the same locality.
4. Specimens for exchange should be taken sparingly.
5. Insects should not be collected for commercial purposes; for such purposes, they should be reared or obtained from old collections.
6. Species which are listed as threatened, vulnerable or rare should be collected with the greatest restraint. It is suggested that one pair is sufficient. Likewise, one pair of distinct local forms should also be regarded as sufficient.
7. When collecting where the extent or fragility of the population is unknown, great caution and restraint should be exercised.
8. Previously unknown localities for rare species should be reported, e.g. to the editors of the TEA Seasonal Summary, but the exact locality should not be published, only the township or nearest town or village.
9. Light traps: live traps are preferable and should be visited regularly and the catch should not be killed wholesale for subsequent examination.
10. Always respect restrictions on collecting in national and provincial parks, nature reserves and conservation areas. Cause as little damage to the environment as possible.
11. Rearing from a captive fertilized female, or from pairing in captivity is preferable to taking a series in the field, if for personal collection.
12. Never collect more larvae than can be supported by the available food supply.
13. Insects reared in excess of need should be released in the original locality.
14. Malaise traps probably should not be used by amateurs. In any case, they should be limited to planned studies.



TEA field trip Rouge Valley 2003
Photo by Karen and Bob Yukich

Responsibilities for collected material:

1. All specimens should be preserved with full data attached.
2. All material should be protected from physical damage and deterioration.
3. Collections should be available for examination by qualified researchers.
4. Collections, with their full data, should be willed or offered to an appropriate scientific institution, e.g. a museum or university, in case of lack of space, loss of interest, or death.
5. Type specimens, especially holotypes or allotypes, should be deposited in appropriate institutions.

Related activities:

1. Collecting should include field notes regarding habitat, weather conditions and other pertinent information.
2. Recording of observations of behaviour and biological interactions should receive as high a priority as collecting; such observations are particularly welcomed for inclusion in TEA Seasonal Summaries or Newsletters.
3. Photographic records are to be encouraged, but it is emphasized that full data for each photograph should be recorded.
4. Education of the public regarding collecting and conservation as reciprocally beneficial activities should be undertaken whenever possible.



Monarch News

submitted by Don Davis



Current Position of the Ontario Ministry of Natural Resources Regarding the Use of Monarch Butterflies for Instructional Purposes in Schools

“Dear Mr. Davis:

Re: Use of Monarch butterflies as a teaching aid in schools

In response to your email sent to Barbara Card dated Feb. 24, 2004, I would like to thank you for your interest in promoting wildlife in the class rooms of Ontario schools. As you outline in detail, the use of invertebrates such as butterflies can provide excellent teaching aids and do cross many different academic areas. However, the use of Monarch Butterflies is controlled under the Fish and Wildlife Conservation Act (FWCA), where they are listed as Specially Protected Invertebrate (SPI). A revision to this act to remove Monarch Butterflies is not likely to occur any time soon. The Monarch Butterfly is listed in Canada under the COSEWIC listing as a Species of Special Concern and is therefore protected under federal Species at Risk legislation.

In Ontario, you are correct in saying that the Monarch Butterfly is not endangered but this does not preclude MNR from providing this species some protection and specifically from commercial operations. The FWCA does provide for an individual to possess one specimen of a SPI, however to allow classroom butterfly projects to utilize scheduled species, a wildlife scientific collectors authorization is required. It is suggested that an individual school, or to cut down on numbers of authorizations, an individual school board could apply for the scientific collectors authorization. Another suggestion is to utilize an invertebrate species that is not listed as an SPI under the FWCA, such as Painted Ladies, which can be obtained from some facilities that produce biological materials for educational purposes. I realize that this does not provide answers to some of your concerns, however the process for classrooms to be legitimate with Monarch Butterflies is to have a Wildlife Scientific Collectors Authorization. If you would like to discuss the details of the FWCA and the Scientific Collectors Authorization further, I suggest you contact Tom Cumby, Wildlife Services Coordinator, (705) 755-1825, who is very knowledgeable with regard to the history and processes of this legislation.

Yours truly, Original Signed by/John Boos, A/Regional Wildlife Biologist, Southern Region Planning Unit”

Status of the Monarch Butterfly Population

(Excerpts from a recent report provided by Dr. Orley “Chip” Taylor of Monarch Watch)

“This is another good news/bad news report. The good news is that the monarchs are headed north from their overwintering grounds and have been reported from a number of inland localities in southern Texas. The bad news is that the number of returning monarchs is low due to the massive mortality resulting from two winter storms in Mexico in January 2004.

In most years, the first monarchs sighted inland from the coast are reported toward the end of the first week in March, usually around the 5th. The first sighting in 2004, away from the coast or the lower Rio Grand Valley, was in Eldorado, Texas about 150 miles NW of San Antonio. This observation was followed by another sighting on the 2nd in Boerne, TX and one on the 5th in Austin. The distances from the overwintering sites to the first locations in Texas usually exceed 650 miles, giving rise to speculations in the past that these monarchs are not from the overwintering sites but have overwintered elsewhere. The assumption has been that the monarchs do not leave the colonies until the middle of March; this probably isn’t the case.

Some years ago Eligo Garcia Serrano, who spent many years monitoring the overwintering monarch population, stated that monarchs began to move north in the second half of February. Such departure times are consistent with the small numbers of arrivals reported in the first two weeks of March each year in Texas. This points to the fact that little is known about when and how monarchs leave the overwintering sites. Do they have specific routes they take on the way north?

A critical question each March is: how many monarchs survived the winter? Unfortunately, because some of the colonies move after catastrophic storms such as those that occurred this year and because the newly formed colonies are not measured (indeed some of them may not even be found), it is difficult to arrive at any quantitative assessment number of surviving monarchs. Roughly, very roughly, only 30% of the population appears to have survived. This works out to 1,222 trees with monarchs, or 3.37 hectares.

Fortunately, winter rainfall in Texas has been abundant and well distributed and conditions should be favorable for monarch reproduction. I expect monarchs to do well in Texas in March and April. A check of the drought monitor site www.drought.unl.edu/dm/monitor.html shows that moisture conditions are favorable throughout the breeding area with the exception of the Dakotas, eastern Nebraska, and Minnesota. However, monarchs will not reach these areas until mid May or later and spring rains could improve conditions in these areas before their arrival.

The storms of January 2004 produced an abundance of tags. In all, we purchased 2,377 tags at a cost of nearly \$12,000. This exceeds the 1,900 tags purchased after the winter storm in 2002. The number of records for recovered tags this year will exceed 2,600. Although tag recoveries following winter storms produce masses of data, they also increase our costs in other ways, since there are increased mailings (certificates), higher communication costs, and we need to hire hourly students to help collate the data. Therefore, we are still in need of contributions to the Tag Recovery Fund. Our funding for tag purchases has now been depleted, and the Ejidos in Mexico still have hundreds of tags for us to purchase.”

Forthcoming Book:

THE MONARCH BUTTERFLY: Biology and Conservation
 Edited by Karen S. Oberhauser and Michelle J. Solensky
 Published by Cornell University Press; Available June 2004

The knowledge of citizen scientists, biologists, and naturalists informs this book’s coverage of every aspect of the monarch butterfly’s life cycle (breeding, migration, and overwintering) from the perspective of every established monarch population (western North American, eastern North American, and Australian). In addition to presenting the most recent basic research on this species, *The Monarch Butterfly* contains the first publication of data compiled from two established citizen science projects, Journey North and the Monarch Larva Monitoring Project. It also reports for the first time on two major events of long-term importance to monarch conservation and biology: the creation of a larger protected area in the Mexican overwintering sites and a weather-related mortality event during the winter of 2002.

Monarch butterflies are arguably the most recognized, studied, and loved of all insects, and the attention that scientists and the general public have paid to this species has increased both our understanding of the natural world and our concern about preserving it. The unique combination of basic research, background information, and conservation applications makes this book a valuable resource for ecologists, entomologists, naturalists, and teachers.



The Bookworm

Newest Moths of North America (PHYCITINAE) fascicle is published

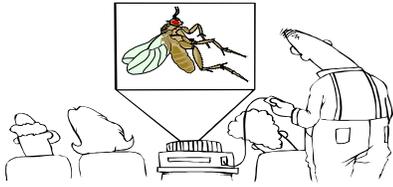
The Wedge Entomological Research Foundation announces publication of the most recent fascicle in the Moths of America North of Mexico (MONA) series of monographs. The fascicle (number 15.5) revises 47 genera of Phycitinae (Pyalidae) in North America. Authored by Dr. H. H. Neunzig, a recognized authority on this group, this 338 page fascicle includes 10 color plates, ten black-and-white plates and 116 line drawings text that illustrate morphological characters of adults and larvae.

The Phycitinae, a large subfamily in the family Pyalidae, are a diverse and important group of Lepidoptera faunistically and economically. This fascicle includes the descriptions of 22 species and 4 genera new to science. Of particular interest are the genera *Dioryctria*, which includes many economically important species, and *Pyla*, which has many day-flying species. A synonymic check list of the described species updates the Check List of the Lepidoptera of North America.

In 33 years of publication, the MONA series has documented the occurrence of 2,589 species. Three hundred seventy-eight species and forty-four subspecies were described as new to science in the series. The MONA series is meant to be an authoritative replacement for the long out-of-date W. J. Holland’s *The Moth Book*, originally published in 1903 and reprinted in 1968. This publication and previous fascicles are available from the publisher and many natural history book dealers. For more information, please contact The Wedge Entomological Research Foundation, Dr. Ronald Hodges, 85253 Ridgetop Dr., Eugene, OR 97405-9535 USA. (541) 684-0484. rwhodges@earthlink.net. Shipping for fascicle 15.5 from the publisher is \$4.00 US per copy (U. S., Canadian, and Mexican orders) or \$5.00 US per copy (all other countries).

“Beauty with Brains” in National Wildlife, April/May 2004, Vol. 42 #3, Pages 39–47 written by Doug Stewart

Article makes note of a certain monarch researcher who transported monarchs in his carry-on luggage during a flight from Kansas to Washington with the purpose of releasing the monarchs in Washington to see which way the insects would try to migrate when they reached Washington.



TEA Activities



January

TEA general meeting

David Gibo presented a fascinating but graphic account of Forensic Entomology. He challenged us - is it an art or a science? How much do we really know that can be applied confidently in helping to solve a case? We know that different insects come to a dead body at different times but climate, microclimate, and other factors can greatly affect the progression and make definite determinations difficult. It was an interesting account of a growing field of study.

TEA board meeting

The board met for the first time in a while with a large slate of items. We agreed to write **letters of support** for the Toronto Tree Bylaw and for David McCallum who is proposing to do a movie on Monarch Migration. David is a TEA member who did the movie *The Secret Life of Butterflies*. We agreed to participate in the **upcoming activities** as outlined in the January 2004 issue of OI. **Finances:** our membership fees do NOT cover all costs of membership; we have a shortfall of about \$600. One reason is that the Lepidoptera summary costs about \$16 per unit rather than our estimated \$10. We agreed that this publication is extremely important and that we want to do it well. Therefore, we will keep costs contained but will supplement any excess with money from the book account which continues to grow as we continue to sell the publications. A similar situation exists for Ontario Odonata which, while not a member publication (ie not included in membership), is expensive to produce and it is difficult to recover costs. Any surplus will be paid for from the book

account. We are trying to find a **sponsor** for Ontario Odonata and any suggestions are helpful. We also want to **increase our membership**, which will help our finances. Any suggestions as to how to do so are welcome. If you are able to promote the TEA in any way, please let us know. We can supply you with membership brochures and meeting flyers. All these issues led us back to the issue that we need to **change our name**. 'Toronto' is too restrictive as people assume that our focus is Toronto only, which it is not! The board agreed in principle to change our name. One suggestion is: Ontario Insect Association. Let us know what you think.

February

TEA Jump into Spring

The TEA had a booth at the Toronto Botanical Garden's show in February. TEA members Carolyn King, Barry Harrison and Jean Godawa manned the table, answering questions. We had photos and information about gardening for butterflies. It was a successful day for all. Thanks to everyone for their help.

TEA general meeting

Steve Marshall whetted our appetite for the spring about to come with gorgeous photos of special bugs from special places. He had just returned from a trip to southwestern Australia and Tasmania where he had the enviable task of finding and identifying flies and other insects. Australia is known for its different mammalian fauna and its insect fauna is also unique. We saw photos of decaying seaweed (and flies) that is home to a genus of flies, found worldwide, but only in decaying

seaweed. The 'upside down fly' finds its home only in the Grass Tree in western Australia where it is common. A rare species of pitcher plant houses a micropezid fly that looks just like an ant. Steve also recommended us to Tasmania and its myrtle forests. Steve then showed us special bugs in special places in Ontario – orthopteroids that are relatively rare and newly recorded or relatively rare hemiptera, true bugs, from St. Williams, Clear Creek, Ojibway Park, Point Pelee and the Bruce Peninsula among others. We saw pink katydids, shield back grasshoppers, tree crickets and bark beetles.

March

TEA general meeting

Our annual Student Symposium was well attended by both student participants and an audience of interested people. We had a full afternoon with 6 talks and 8 posters - the abstracts are printed in this issue.

Thanks to Doug Currie, Carolyn King, Chris Darling and Peter Hallett for helping to make such a successful meeting.



Eristalis dimidiatus (a Syrphid fly) on *Salix* sp., Harmony Valley Conservation Area, Oshawa, April 2003, C.D. Jones

T.E.A. Lepidoptera and Odonata Summaries

T.E.A. invites all members and non-members to contribute sightings to the annual summaries: Ontario Lepidoptera (butterflies and moths) and Ontario Odonata (dragonflies and damselflies). Both summaries list all records submitted and also feature papers, articles and notes on a variety of topics. Ontario Lepidoptera is sent to members as a benefit of membership. Ontario Odonata is not included with membership but must be purchased separately. Both of the summaries may be purchased by non-members. Please contact the compiler directly for more details.

Suggestions for locations to visit in 2004

York County for dragonflies
 Petroglyphs Park for butterflies and dragonflies
 Alderville Nature Reserve
 Walkers' haunts: Credit River, Humber River, Don Valley,
 Grenadier Pond and the Digrassi Point on Lake Simcoe

Lepidoptera summary

What information to send

Make note of the name of the butterfly or moth, the date seen, and where it was seen. Be fairly specific if possible indicating at least a city/town/conservation area and the county. Including geographic coordinates in the form of a UTM or Latitude and Longitude (read from a topographic map or derived from a handheld GPS unit) would also be beneficial but is not mandatory. Please also note how many individuals you see and, if possible, whether they are male or female. Distinguishing between sight and specimen based records is also tremendously useful. Any particular behaviour such as nectaring, egg-laying etc. is also of interest. Please send in the order that the species are listed in the summary.

When and where to send

Submissions should be sent by February 28, 2005. Electronic submissions are encouraged, preferably in a spreadsheet or database application such as Microsoft Excel or Corel Quattro Pro; wordprocessing applications (e.g. Microsoft Word or Corel Wordperfect) are also fine as are handwritten records. Please send records to:
Butterflies: Colin D. Jones (Box 182, Lakefield, ON K0L 2H0. work: 705-755-2166, home: 705-652-5004, colin.jones@mnr.gov.on.ca).
Moths: tba



Eastern Comma, Warsaw Caves Conservation Area, Peterborough Co., April 27, 2003, C.D. Jones

Odonata summary

What information to send

Species name, county, precise location (e.g. 1 km W of Mine Centre on south shore of Little Turtle Lake), number of individuals, an accurate UTM and/or Lat./Long. reference either using a GPS or 1 inch maps, and observation date. Please contact one of the compilers to receive an electronic form (or a hard copy) containing all the necessary fields. It is strongly encouraged that (if possible) you compile your data using a database file such as dBase, Access, or Excel.

When and where to send

Submissions should be received by December 31, 2004. Late submissions included at the compiler's discretion.
Northern Ontario: (north of Algonquin Park, Nipissing District and including Haliburton, Muskoka, Renfrew and Peterborough) - Colin D. Jones (Box 182, Lakefield, ON K0L 2H0. work: 705-755-2166, home: 705-652-5004, colin.jones@mnr.gov.on.ca).
Central Southern and Eastern Ontario (Provincial Compiler): (most of the region east of a line from the south end of Georgian Bay, east to the Ottawa and St. Lawrence valleys with the exceptions of Peterborough, Haliburton and Muskoka) - Paul Catling at catlingp@agr.gc.ca. Paul is also Provincial Compiler.
Southwestern Ontario: (south and southwest of a line connecting the south end of Georgian Bay to Hamilton and Niagara on the Lake) - Paul Pratt (7100 Matchette Rd., LaSalle, ON N9C 2S3. 519 966 5852, prairie@netcore.ca).

For more details, see Ontario Insects, Vol 4, No 3, May 1999, p 48-52, a previous issue of Ontario Odonata or the provincial compiler.



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Arctic and Boreal Entomology Field Course

Where: Churchill Northern Studies Centre (CNSC), Churchill, Manitoba.

Cost: \$1,000US (inc. room/ board, supplies etc but NOT travel to/from Churchill).

Date: July 31 - August 14, 2004

Format: Evening lectures and discussions; field excursions; field exercises; individual projects

Contact: Peter Kevan,
pkevan@uoguelph.ca. Dept. of
Environmental Biology, University of Guelph,
Guelph N1G 2W1.

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ESO meeting Entomological Society of Ontario

5-7 November 2004
Brock University
St. Catharines, ON

www.entsocont.com

Notice to Contributors

Who Can Contribute:

Observations, articles, etc., to be published in **Ontario Insects**, are welcome from members of the **Toronto Entomologists' Association**. There are no page charges, however, submissions from non-members will require a membership purchase prior to publication. Classified ads may be placed by non-members at the rates outlined in the classified section.

Types of Submissions:

Contributions to **Ontario Insects** may address any subject or aspect related to entomological study. Submissions may be made in the following categories:

Research papers -may include original research or scholarly reviews following an appropriate journal format

Feature articles -informative & entertaining, format open to the author's choice

Notes or short communications -may be observations, interpretive, historical, review or experimental studies which do not fall under the purview of research papers

Book reviews -preferably titles published within the last three years

Original artwork, puzzles -art should be clear, easily reproduced in black & white

Guest columns in Entomophilia -any subject related to the love of insects

Opinions, Letters, Queries -anything entomological under 500 words that may be of interest to the membership

Classified ads -free to members

Format for Submissions:

Ontario Insects is produced on a PC. Text editing is done in **Microsoft Word**, graphics are scanned or obtained from licensed CD-ROM collections and edited in CorelDRAW 4.0 with final page layout in PageMaker 6.5. The original is printed on a 600 dpi laser printer.

All submissions are encouraged, however, submissions of articles and/or artwork on disk or email are preferred. If articles are submitted via email, formats in Microsoft Word (.DOC) or rich text format (.RTF) are preferred. Please send all submissions and questions to the editor (see inside cover for address). Offprints are available at cost + 10% + postage.

Commercial Advertising Space 10 cm x 5.5 cm \$10 per issue or \$20 for 3 issues.

Personal Ads Free to Members

Items for Sale through the TEA

Books: reproductions of out-of-print books

The Odonata of Canada & Alaska (3 volumes) by E.M. Walker
\$196 Can (\$190 for TEA members who pick it up); In USA: \$145 US surface; \$150 US airmail

The Cicindelidae of Canada (tiger beetles) by J.B. Wallis (1961) with colour plates
\$28 Can (\$23 for TEA members who pick it up); In USA: \$23 US surface; \$26 US airmail

The North American Dragonflies of the Genus Aeshna by E.M. Walker (1921) with colour plates
\$65 Can (\$60 for TEA members who pick it up); In USA: \$50 US surface; \$53 US airmail

The North American Dragonflies of the Genus Somatochlora by E.M. Walker (1925)
\$55 Can (\$50 for TEA members who pick it up); In USA: \$43 US surface; \$46 US airmail

Books: Other publishers

Damselflies and Dragonflies (Odonata) of Ontario: Resource Guide and Annotated List By P.M. Catling and V.R. Brownell 2000. Annotated list of 168 species of odonata in Ontario including conservation status, flight period, habitat, distribution and identification. \$34 Can; In USA: \$25 US.

Books: T.E.A. publications

The Ontario Butterfly Atlas by A.M. Holmes, R.R. Tasker, Q.F.Hess, A.J.Hanks (1991)
ISBN: 0921631111 \$25 Can (\$20 for TEA members who pick it up); In USA: \$20 US

Ontario Insects – T.E.A. Newsjournal
Back Issues: \$5 Can each; In USA: \$5 US; Subscription: \$25 Can; In USA: \$25 US

Annual Ontario Lepidoptera Summaries (for 1987, '88, '93, '95 to present)
\$10 each; In USA: \$10 US surface; \$15 US airmail; (free with T.E.A. membership)

Ontario Odonata: annual summary including articles, notes and records

Volume 1 (1999) 16 articles plus records - conservation status ranks, natural history, migration, lists and records, and an illustrated key to the mature nymphs and exuviae of eastern Canadian *Stylurus*. Cost: \$25 Can; In USA/overseas, \$25 U.S.

Volume 2 (2000) 16 articles plus records - significant range extensions ecology, regional lists, conservation and a museum collection. Cost: \$25 Can; In USA/overseas, \$25 U.S.

Volume 3 (2001) 18 articles plus records - county and regional lists, range expansions, behavioural notes, conservation status and identification problems. Cost: \$25 Can; In USA/overseas, \$25 U.S.

NEW!: Volume 4 (2002): 12 articles plus records - notable records, new species for Canada, ecology, dragonflies and water quality. Cost: \$30 Can; In USA/overseas, \$32 U.S.

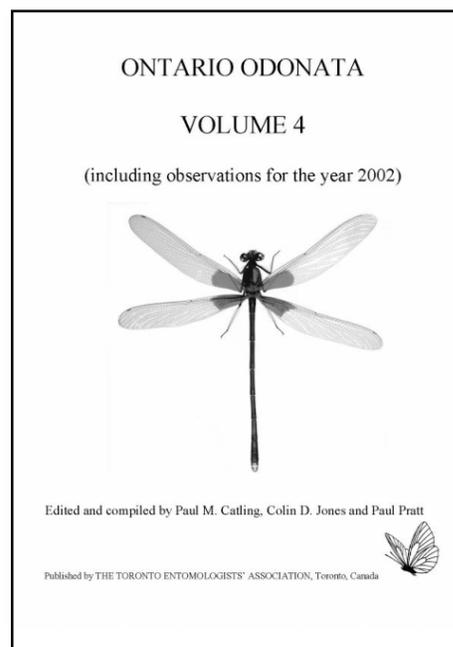
Checklist of the Butterflies of the Toronto Region: 135 years of history (2nd edition) Includes flight seasons. Compiled by Barry Harrison.

\$2.50 Can (\$2 for TEA members who pick it up); In USA: \$3 US

For complete details and to order, contact:

Alan Hanks, 34 Seaton Drive, Aurora Ontario L4G 2K1
(905) 727-6993; alan.hanks@sympatico.ca

Please make cheques or money orders payable to the Toronto Entomologists' Association





ONTARIO INSECTS

THE NEWSJOURNAL OF THE TORONTO ENTOMOLOGISTS' ASSOCIATION



VOLUME 10, NUMBER 1

SEPTEMBER 2004

Contents



Vol. 10, No. 1 September 2004

Announcements	1
Upcoming meetings	2
Field trip reports	4
TEA Lepidoptera and Odonata Summaries	7
Monarch News	8
The Bookworm	10
TEA Activities	11
DSA meeting notice	12
Flea Market (Classifieds)	Inside Back Cover
Items for Sale through the T.E.A.	Outside Back Cover

Front Cover Photograph: The ambush bug *Phymata americana* with its prey, a bald faced hornet. Photo by David Punzalan.

Issue Date: September 25, 2004

ISSN: 1203-3995

DEADLINE INFORMATION - Members Please Note:

The deadline for submissions to the January issue of Ontario Insects is December 1. Late submissions may be added at the discretion of the Editor. If there are any questions or concerns regarding submissions, please feel free to contact Colin Jones at the address below.

Ontario Insects (ISSN: 1203-3995) is published tri-annually by the Toronto Entomologists' Association (TEA), 34 Seaton Drive, Aurora, Ontario, Canada, L4G 2K1. Copyright © 1995 by the Toronto Entomologists' Association. All rights reserved. The statements of contributors do not necessarily represent the views of the TEA and the TEA does not warrant or endorse products or services of advertisers. Copyright of artwork and photographs remains with the artist or photographer.

Submissions to: Colin D. Jones, Editor of Ontario Insects, Box 182, Lakefield, ON, K0L 2H0, naturalist@algonquinpark.on.ca, (705) 652-5004

TEA members are welcome to submit any entomologically relevant materials. Please see the inside back cover for Notice to Contributors for more information. Deadlines for submission are 1 month prior to publication.

For general inquiries about the TEA contact: Alan Hanks, Treasurer, TEA, 34 Seaton Dr. Aurora, ON, L4G 2K1, alan.hanks@sympatico.ca, (905) 727-6993 or check our website at: www.ontarioinsects.org

Mission Statement

The Toronto Entomologists' Association (TEA) is a non-profit educational and scientific organization formed to promote interest in insects, to encourage co-operation among amateur and professional entomologists, to educate and inform non-entomologists about insects, entomology and related fields, to aid in the preservation of insects and their habitats and to issue publications in support of these objectives.

Executive Officers:

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Carol Sellers	Field Trips Co-ordinator
Colin D. Jones	Editor, Ontario Insects

Membership Information:

Annual dues are as follows:

Individual	\$25
Student	\$15
Family	\$30

All membership queries and payment of dues can be directed to Alan Hanks, Treasurer, 34 Seaton Drive, Aurora, Ontario, Canada, L4G 2K1. (905) 727-6993. alan.hanks@sympatico.ca

Publications received as part of a TEA membership include:

- 3 issues of Ontario Insects per year
- annual Ontario Lepidoptera Summary

THE TEA IS A REGISTERED CHARITY (#1069095-21); ALL DONATIONS ARE TAX CREDITABLE.

Announcements

Be a part of TEA's future

Dear TEA members,
It has been my pleasure to be entrusted to the position of president for 6 years but it is now time for me to 'retire'. My heartfelt thanks to the many members who have served on the board and who I could always count on to do what needed to be done. I believe that the TEA plays an important role in protecting the insects of Ontario through our publications, field trips, public education activities and affiliations with other organizations. I'm sure that we will continue to move forward in many areas.

We do need help for a number of activities. A few hours of your time every week or every month or once a year adds to what we accomplish. Please let us know what you can help with:

1. Answering emails (1 or 2 people)

We get only 2 or 3 emails a week; very little spam. You can reply to the ones that you can and forward the others to the appropriate person.

2. Student symposium coordinator; liaise with the academic coordinator

- from Sept to Mar, send notices advising the university community of the symposium (contact information is available)
- book room for the symposium (usually the U of T Zoology seminar room)
- prepare agenda
- on the day of the symposium (end of March), set up room, chair the meeting, order lunch for students etc.
- send out thank you notes

3. Ontario Insects newsjournal

- Editor - Solicit articles, proofread etc
- Layout (knowledge of Pagemaker 6.5)
OI is published for Sept/Jan/Apr meetings.

Thanks to the following who have already offered to take on some duties:
Bill McIlveen – Research Grant coordinator

Ann Gray – Leslie Spit Advisory Committee – main member
Barry Harrison – Leslie Spit Advisory Committee – alternate member
Alan McNaughton – Website update and administration

Call for Applicants: The W.J.D. Eberlie Award for Original Research into Ontario Insects

The T.E.A. announces that it is now taking applications for the W. John D. Eberlie Field Research Travel Award 2005.

The T.E.A. offers an award of \$300 to assist graduate or undergraduate students conducting original field research into Ontario insects. The award is intended as a travel grant to defray costs of travel to field sites used for research. The award will be made on the basis of merit and quality. Applicants must be members of the TEA and a graduate or undergraduate student at an Ontario university. To apply, submit a completed application form postmarked no later than March 25, 2005.

Membership in the T.E.A. (\$15 per year for students) includes a subscription to Ontario Insects and the annual Lepidoptera summary.

An application form for the award or for membership in the TEA may be downloaded from the TEA website: www.ontarioinsects.org.

Meeting notices

- Ontario hosts the Annual General Meeting of the Dragonfly Society of the Americas - July 8-12, 2005 (see p 12)
- 2004 Entomological Society of Ontario Annual Meeting, *Ancient Insects*. Nov 5-7th, Brock University, St. Catharines.
- Montreal Insect Fair - Oct 16/17 (see inside back cover)
- Dr Lincoln Brower Oct 23-25 (see pg 9)

Student receives W.J.D. Eberlie Award

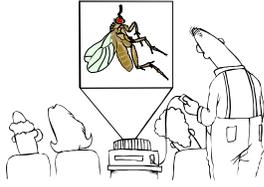
The TEA is pleased to announce that the W. John D. Eberlie Research Travel Award for 2004 was awarded to **David Punzalen, Department of Zoology, University of Toronto** for the project "Thermoregulation and sexual dimorphism in the ambush bug *Phymata americana*". This award will help subsidize David's travel costs to his study site, the Koffler Scientific Reserve at Joker's Hill, King Ontario. His supervisors are Dr. Locke Rowe and Dr. Helen Rodd. Congratulations David!

Abstract: "The ambush bug *Phymata americana* exhibits a puzzling example of sexual dimorphism where the sexes express different components and levels of colour pattern. Although previous work suggests that components of male colour pattern are subject to sexual selection, its proximate function remains unclear. Here I propose that colour pattern in *P. americana* is a thermoregulatory adaptation that mediates competition for mates and speculate on its potentially broad implications for explaining sexual selection and sexual dimorphism."

Student Symposium 2005 - First Call for Titles

The T.E.A. is pleased to invite postdoctoral fellows, graduate students and senior undergraduate students to present a talk or poster at the Annual Student Symposium on **Saturday, March 19, 2005** at 1 pm. Everyone is welcome to attend the symposium.

If you are interested in participating or would like more information, please e-mail the TEA (info@ontarioinsects.org). Provisional titles, final submitted and edited abstracts will be published in Ontario Insects. Longer reports are optional. We look forward to your participation and attendance at the symposium.



Upcoming Meetings

Everyone is welcome. Bring a Friend!



Saturday, September 25, 2004 1 PM
MEMBERS' MEETING

How was your summer!? Bring in your slides, photos, specimens etc of what you've seen over the summer. We hope to have a computer so that those of you with digital photos can also show us your photos. We'll also be hearing about the status of monarchs and 'the year of the cicada'.

Saturday, October 23, 2004 1 PM
ASH TREES AT RISK: THE BIOLOGY, EFFECTS AND CONTROL OF THE EMERALD ASH BORER
Gard Otis

Gard has been a professor at the University of Guelph since 1982 in the department of Environmental Biology. His research has focussed mostly on honey bee ecology, behaviour, evolution, and pests. His current interests concern breeding honey bees for resistance to parasitic mites, the biology of honey bee sperm, all aspects of the biology of Asian honey bees, butterfly ecology and the Emerald Ash Borer and its effects on natural ecosystems. He'll speak to us about this fairly recent introduction from Asia that is killing ash trees in the US and the Windsor area.

Saturday, November 27, 2004 1 PM
MORMON CRICKETS: WHEN GOOD KATYDIDS GO BAD
Darryl Gwynne

Darryl is Professor of Biology at the University of Toronto in Mississauga. His research concerns sexual selection and mating behaviour for which he uses insects and spiders to test the hypotheses. He will discuss his own and his collaborative research on a well known katydid found in western North America - the Mormon cricket. This flightless species appears to form both "solitary" and "gregarious" phases (partly revealed through great differences in sexual behaviour). He will discuss recent research on genetic differences between the two types of Mormon cricket as well as their well-known "marching" movements.

Saturday, January 22, 2005 1 PM
HOT ON THE TRAIL OF THE MIGRATORY MONARCH
Don Davis

Don is a TEA member who has been fascinated by the migratory Monarch butterfly since high school. He has: worked with the Urquharts; tagged Monarchs annually at Presqu'ile since 1985; visited the overwintering site in Mexico twice; and contributed to documentaries, books, TV and radio programs. Interest in the migratory Monarch has grown substantially over the years and Don has kept his pulse on all the discoveries about it as they have emerged. He will bring us up to date on the new research as well as issues and concerns.

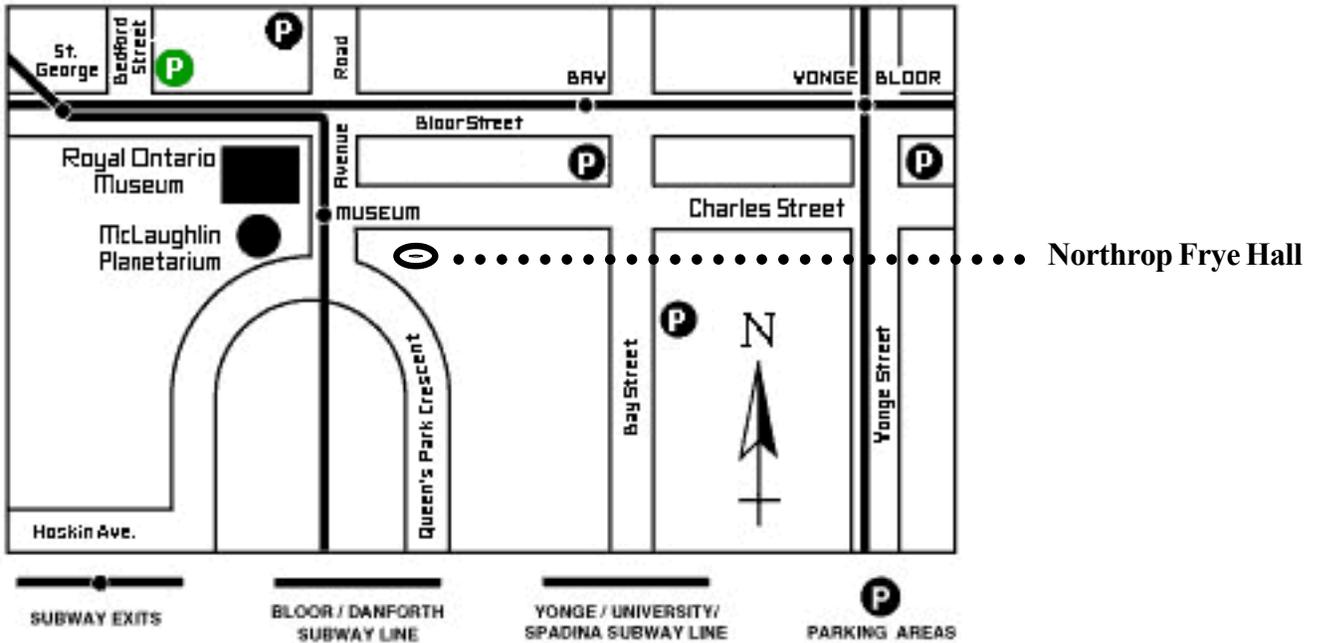
February 26, 2005 - TBA; March 19, 2005 - Student Symposium – Location TBA (NOTE: because of the Easter holiday, this is earlier than the usual date); April 23, 2005 – Glen Richardson – Insect Rearing

All meetings are held at:

Northrop Frye Hall Room 113
Victoria University (at the University of Toronto)
73 Queens Park Crescent Toronto, ON
(Museum subway stop; opposite the Museum, on the east side).

See the next page for map and parking directions.
For more information, call Alan Hanks at
(905) 727-6993

Also check www.ontarioinsects.org



To reach Northrop Frye Hall by subway or bus:

Get off at the **Museum** stop on the University-Spadina subway line or take the Avenue Bus #5 south from the Eglinton Subway Station. Go to the east side of Avenue Road and walk south. Northrop Frye Hall is on the left just at the bend.

To reach Northrop Frye Hall by highway:

QEW: If you are driving in on the Queen Elizabeth Way (QEW), follow the Gardiner Expressway to York Street. Go north on University Avenue (University Avenue changes into Queens Park Crescent above College St, and then into Avenue Road above Bloor St.). Northrop Frye Hall is just south of Bloor Street.

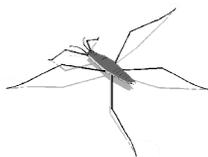
Highway 401: From Highway 401, take Avenue Road south to Bloor Street OR take the Don Valley Parkway south to the Bloor Street Ramp and proceed west along Bloor to Avenue Road.

Parking

There is some on-street parking in the area (check the signs carefully!) and there are several paid parking lots within walking distance of Northrop Frye Hall:

- Bloor Street and Bedford Road, 1 Block west of Avenue Road.
- On Cumberland Street, 1 block north of Bloor, east off Avenue Road.
- Behind the Colonnade at 131 Bloor St. West.
- One block north of Bloor Street West on Avenue Road

Parking on a Saturday is usually a flat rate of \$5 or more depending on the lot.



Field Trip Reports

by Carol Sellers, Field Trip & Program Coordinator



This year we doubled the number of TEA outings and - wonder of wonders - it didn't rain on any of them! There is so much to learn about insects and not nearly enough good field guides so outings are a terrific way to expand our knowledge. Many thanks to our capable leaders and to all TEA members who shared their expertise to make the outings a success.

June 19

Insects of the Copetown Bog

Leader: Marvin Gunderman

The day started off really cold (10C), overcast and windy but within an hour it was a beautiful sunny day. The water level in the bog was high so we took a lovely wooded trail and made forays to the edges of the bog. Four students from York University joined us at the bog and were amazed by the diversity of insects. In addition to odonates (thanks, Michael, for the list) we saw 10 species of butterflies and several other interesting insects. Scariest was the Bumble Bee-mimic Robber Fly - very convincing! After lunch in Marvin's very pleasant back yard, we took a short excursion to nearby Tiffany Falls to round out a fine day in the field. Thanks, Marvin.

Butterflies

European skipper	Northern Crescent
Hobomok skipper	Red Admiral
E. Tiger Swallowtail	Red-spotted Purple
Cabbage White	Ringlet
Common Sulphur	Little Wood Satyr
Spring Azure	

Odonates

<i>Ishnura verticalis</i>	<i>Libellula luctuosa</i>
<i>Erythemis simplicicollis</i>	<i>Libellula pulchella</i>
<i>Aeshna canadensis</i>	<i>Pachydiplax longipennis</i>
<i>Leucorrhinia intacta</i>	<i>Platthemis lydia</i>
<i>Leucorrhinia proxima</i>	<i>Nehalennia</i> sp
<i>Sympetrum internum</i>	Damsel sp (blue)
<i>Libellula semifasciata</i>	



Marvin and TEA members at Copetown (photo by Ann Gray)

July 1

Toronto NABA Butterfly Count

Leader: Tom Mason

Report by Tom Mason

Although 43 species were caught representing a good number, only one species, *Phyciodes selenis* were actually good numbers of individuals. The rest appear much weaker in numbers. Several areas that once held good populations now produce practically nothing. This year I purposely walked through these areas and Dog Strangler Vine, almost entirely fills them. This is quickly becoming critical in the Rouge and the Don River valleys.

Species that are of particular concern would be *Euphyes vestris*, the Dun skipper, (It was once the commonest small brown skipper in the region.) and *Pompeius verna*, the Little Glassy Wing, (the first sightings in 3 years). Most skippers seem down as a whole. Fields that in the past were filled with skippers now appear quiet. Hopefully it is just a low cycle that will rebound in the next couple of years. This year we added the Lucas farm to our survey and it has only been the last two or three years that we have included the fields to the east of Meadowvale. Several areas on the Toronto Zoo property are not included anymore because of the overgrowth of meadows and difficulty in surveying them.

The participants were: Ann Gray, Steve Laforest, Carolyn King, Carol Sellers, Siglinde Van Der Grinten, Nancy & Michael van der Poorten, Roger Sutton (Vacationing from

England), Mark Kubisz, Darcie & Cameron McKelvey, Jim Fairchild, Roger Sutton, Glen Richardson, Tom Mason.

For a complete list of species, see *Ontario Lepidoptera 2004*.

July 3

Leslie St Spit

No leader

It was a nice sunny day with a cool breeze. There was lots of cow vetch in bloom, and though we diligently checked most of it, butterflies were scarce: 11 species, nothing in abundance and only 1 Monarch. However, it was a nice day, the company was good, and the Spit is a great place to spend a summer's day.

Butterflies

Silver-spotted skipper
 European skipper
 Cabbage White
 Common Sulphur
 Orange Sulphur
 Monarch

Spring Azure
 Silvery Blue
 Mourning Cloak
 Painted Lady
 Ringlet

July 20

High Park Moths

Leader: Dave Beadle, Tom Mason

Report by George Bryant

In conjunction with the High Park Citizen's Advisory Council, our annual urban moth night attracted about 30 human participants and 42 moth species. Tom Mason provided a splendid introduction to moth study while David Beadle pronounced assuredly on all identifications. Amongst the various Idias, Waves, Owlets and Spanworms, three Eurasian immigrants stood out. Double-lobed Moth (*Apamea ophipogramma*) a rather rare species, Large Yellow Underwing (*Noctua pronuba*) too new to be included in Covell's Field Guide to the Moths but now common everywhere and Gypsy Moth (*Lymantria dispar*), interesting because only two individuals were noted. For diversion, Michael van der Poorten demonstrating his net prowess by capturing a Small-eyed Sphinx (*Paonias myops*) which was perched 20' directly over our heads in the rafters.

See *Ontario Lepidoptera 2004* for a complete list of species.



High Park moth table

July 24

Moths, Moths, Moths

Leader: Dave Beadle

The evening was clear and cool and so was the previous evening so moths were not quite as abundant as in previous years. But we still got 84 species! Again we started at Brian Henshaw's house in Brooklin to look at the moths he had trapped overnight. Then we headed to the Oak Ridges Moraine near Balsam to set up the sheets and lights and bait some trees. The beauty of the sheets is that the moths stay still long enough for everyone to get a really good look. Thanks, Dave, for leading and identifying; Brian, for trapping and organizing the Moraine location; and Carolyn/Steve for bringing the generator.

See *Ontario Lepidoptera 2004* for a complete list of species.



August 17

Spiders of Blackwater/Beaver Creek

Leader: Tom Mason

It was a perfect day for our third annual spider outing at Blackwater. There was a shortage of the big orb weavers - *Araneus* and *Argiope* - but we had 18 other species including a nest of nursery web youngsters. In addition to the spiders there were a few late butterflies - Dun Skipper, Acadian and Striped Hairstreak - and lots of meadowhawks. Gray tree frogs and *Succinia* snails were abundant. We found several interesting bugs and beetles, including a Wheel Bug with red mite attached. Identifying spiders is a challenge, to say the least, so thanks, Tom, for sharing your expertise again.

Family Linyphiidae

Platform spider - *Microlinyphia* sp.

Bowl and Doily spider - *Frontinella pyramitela*

Family Aranaeidae

Barn spider - *Araneus cavaticus* (web only)

Furrow spider - *Nutenea cornuta*

No common name - *Nuctenea patagiata*

Bridge spider - *Nuctenea sericata*

Family Tetragnathidae The long-jawed spiders

No common name - *Tetragnatha laboriosa*

No common name - *Tetragnatha elongata*

Family Agelenidae

Grass spider - *Agelenopsis naevia*

Family Pisauridae

Rafting spider - *Dolomedes triton* (also known as 6-spotted fishing spider)

Family Lycosidae

Wolf spider - *Hogna frondicola*

Family Clubionidae

Sac spider - *Clubionus riparia*

Family Thomisidae

Flower spider - *Misumena vatia*

Pale crab spider - *Misumenops oblongus*

No common name - *Xysticus elegans*

No common name - *Xysticus* sp.

Family Salticidae Jumping spiders

No common name - *Phidippus clarus*

No common name - *Metaphidippus galathea*

Report by Tom Mason

We found 18 species, one more than the first year we did this, but the species were quite different. The main difference is the decrease of orb weaving spiders which is very likely due to the increase in wasps in the region since spiders are a favourite food. The nicest sighting was probably the nursery web spider nest that we saw at the end of the north walk. There were also a few small jumping spiders in the tall sedges not caught and identified that would probably have added a couple of species. As specimens are not actually collected, identification would be very difficult.

I think the idea of returning to the same site over the years and walking the same transect at approximately the same time could be very interesting. If done over five years, it could leave a record similar to the nesting bird studies. I've been quite amazed at the differences in species that we are seeing over the years and look forward to seeing more changes in the future.



Rafting spider - *Dolomedes triton* (photo by Bill McIlveen)



Caligrapha beetle (photo by Bill McIlveen)

August 21

Bronte Creek Moths

Leader: Dave Beadle

With permission from staff at Bronte Creek Provincial Park we were able to add this outing to the schedule. We were joined by 9 campers from the park, which brought our numbers up to 27! Again it was a cool, clear night, not ideal for moths, but some Underwings were lured to the baited trees. We also found a Camel cricket lurking at the base of a tree, and a Bombardier beetle. A large Hangingfly appeared to be foraging at the lighted sheet: probably scooping up small insects. Again, thanks, Dave, for leading and Carolyn & Steve for bringing the generator.

951	<i>Machimia tentoriferella</i>	Gold-striped Leaf-tier
6740	<i>Xanthotype urticaria</i>	False Crocus Geometer
6796	<i>Campaea perlata</i>	Pale Beauty
6798	<i>Ennomos subsignaria</i>	Elm Spanworm
7196	<i>Eulithis diversilineata</i>	Lesser Grapevine Looper
7390	<i>Xanthorhoe lacustrata</i>	Toothed Brown Carpet
7399	<i>Euphyia unangulata</i>	Sharp-angled Carpet
7423	<i>Hydrelia albifera</i>	Fragile White Carpet
8090	<i>Hypoprepia fucosa</i>	Painted Lichen
8784	<i>Catocala obscura</i>	Obscure Underwing
8788	<i>Catocala resecta</i>	Yellow-gray Underwing
8801	<i>Catocala ilia</i>	Ilia Underwing
9382	<i>Apamea devastator</i>	Glassy Cutworm
9638	<i>Amphipyra pyramidoides</i>	Copper Underwing
10937	<i>Lacinipolia renigera</i>	Bristly Cutworm
10438	<i>Pseudaletia unipuncta</i>	Armyworm
10459	<i>Leucania inermis</i>	Unarmed Wainscot

August 28

Ratray Marsh

No leader

It was a muggy, overcast day that started auspiciously with a low-flying adult Bald Eagle. Spiders were plentiful, especially the large Garden spider (*Araneus diadematus*). Our best spider find was the uncommon Orchard Spider (*Leucauge venusta*) which was ID'd later by Tom Mason from a photo by Bill McIlveen. Other interesting insect finds were Progressive Bee Fly, Scorpionfly, and Locust Borer. Highlight of the outing was the Silver-spotted Skipper caterpillars hiding between the hog-peanut leaves. Thanks to Glenn Richardson for finding these and the Azure caterpillar. Thanks to Steve for keeping the list.



Orchard spider (*Leucauge venusta*) - (Photo by Bill McIlveen)

Continued from inside back cover...Age forces disposal of...
 (4) Books, Field Guides etc.
 (5) Framed autographed paintings of butterflies by Wm. H. Howe (author of *The Butterflies of North America*).
 Contact Quimby Hess at phone: (416) 482-1637

T.E.A. Lepidoptera and Odonata Summaries

T.E.A. invites all members and non-members to contribute sightings to the annual summaries.

Lepidoptera summary

What information to send: Make note of the name of the butterfly or moth, the date seen, and where it was seen. Be fairly specific if possible indicating at least a city/town/conservation area and the county. Including geographic coordinates in the form of a UTM or Latitude and Longitude would also be beneficial. Please also note how many individuals you see and, if possible, whether they are male or female. Any particular behaviour such as nectaring, egg-laying etc. is also of interest.

When and where to send: Submissions should be sent by February 28, 2005. Electronic submissions are encouraged, preferably in a spreadsheet or database application such as Microsoft Excel or Corel Quattro Pro; wordprocessing applications (e.g. Microsoft Word or Corel Wordperfect) are also fine as are handwritten records. Please send records to: **Butterflies:** Colin D. Jones (Box 182, Lakefield, ON K0L 2H0. work: 705-755-2166, home: 705-652-5004, colin.jones@mnr.gov.on.ca). **Moths:** tba

Odonata summary

What information to send: Species name, county, precise location (e.g. 1 km W of Mine Centre on south shore of Little Turtle Lake), number of individuals, an accurate UTM and/or Lat./Long. reference either using a GPS or 1 inch maps, and observation date. Please contact one of the compilers to receive an electronic form (or a hard copy) containing all the necessary fields. It is strongly encouraged that (if possible) you compile your data using a database file such as dBase, Access, or Excel.

When and where to send: Submissions should be received by December 31, 2004. Late submissions included at the compiler's discretion. **Northern Ontario:** Colin D. Jones (Box 182, Lakefield, ON K0L 2H0. work: 705-755-2166, home: 705-652-5004, colin.jones@mnr.gov.on.ca). **Central Southern and Eastern Ontario (Provincial Compiler):** Paul Catling at catlingp@agr.gc.ca. Paul is also Provincial Compiler. **Southwestern Ontario:** Paul Pratt (7100 Matchette Rd., LaSalle, ON N9C 2S3. 519 966 5852, prairie@netcore.ca).

For more details, see Ontario Insects, Vol 4, No 3, May 1999, p 48-52, a previous issue of Ontario Odonata or contact the provincial compiler.



Monarch News

submitted by Don Davis



Notes on the European Paper Wasp (*Polistes dominulus*, Vespidae)

Following up on a posting to the Monarch Watch Update that stated that

European paper wasps presented a new threat to monarch butterfly larva, I decided to learn more about this species.

Polistes dominulus was first reported in Massachusetts, near Boston in 1981. It apparently has the potential to colonize much of North America. This species ranges throughout most of Europe and south to the Mediterranean including North America. It is also found in much of Eurasia and reaches China. Before its arrival, the northern paper wasp, *Polistes fuscatus*, was the most frequently encountered species.

Whitney Cranshaw, an economic entomologist and specialist on garden insects at Colorado State University, reports that the wasp has spread rapidly over the past 5 years in Colorado. "It has extirpated essentially every caterpillar in Ft. Collins by mid-July in the past 2 years and I am sure is having a major ecological impact." He further states, "I don't think there has been any introduced insect that I have observed in my 20 years here that has so rapidly spread and impacted insect life in Colorado."

Speculations for the rapid expansion of range include:
- earlier seasonal establishment of colonies allowing *P. dominulus* to establish workers before our native species, thereby benefiting forage activities and colony expansion

- avoidance of native bird predators by early nest establishment. Early establishment provides the nest with more workers to protect the larvae
- a more varied diet

There are various reports on the ferocity of the species. Some state that the species only becomes aggressive if interfered with. One American bluebird enthusiast reports that they are highly aggressive, and more aggressive than native species when he probes their nests out of nestboxes with a stick.

Noted Canadian entomologist Dr. David Gibo at Erindale College, University of Toronto, reports: "I first noticed *Polistes dominulus* foraging in goldenrod on the campus of the University of Toronto in Mississauga in the late 90's. By 2001, their colonies were common, both on campus and in the surrounding suburbs, and the wasp had largely displaced our native species, *Polistes fuscatus*. Although *P. dominulus* has declined in abundance somewhat since the summer of 2001, it has remained the dominate *Polistes* species, at least locally."

Where are all the Monarch Butterflies?

Considerable concern has been raised concerning the scarcity of monarch butterflies in Ontario this summer. The number of monarch butterflies counted on almost every Ontario butterfly count was down considerably. Reasons given for this decline include:

- two severe winter storms in January in Mexico
- continued illegal logging in Mexico, resulting in a thinning of the forests

- less than ideal breeding conditions – a cool damp summer in the northern range
- global warming

For those of us who have monitored the monarch butterfly population for many years, there have been many years in the past when the number of monarch butterflies has appeared low. Some feel that there is no need for concern and that the population will rebound, as it did after the disastrous winter storm in January 2002. Noted monarch researcher Dr. Lincoln Brower is particularly concerned that the combined impact of the above noted factors and other factors merit continued observation and study. The September 2004 article on Global Warming in National Geographic refers to possible climate changes in the area near monarch overwintering sites in Mexico. As of early September 2004, teachers and other educators were very unhappy that they were having great difficulty finding monarch eggs and larva for study purposes in their classrooms.

Spring Migration

The spring 2004 migration appeared to go well and monarchs gradually arrived in Ontario. There were many Ontario sightings noted, including:

May 6 – Point Pelee National Park
May 15 – Rondeau Provincial Park
May 15 – Pelee Island
May 27 – Waterdown, Dyers Bay (Bruce Peninsula)
May 29 – Port Hope
May 30 – Mansfield, Toronto, Camlachie, Carden Plain (Kirkfield)
May 31 – Monarch eggs (Scarborough)

June 1 – Long Point
June 2 – Sauble Beach
June 5 – Tobermory
June 8 – Elliot Lake,
June 9 – Thunder Bay
June 10 – Port Carling, Bracebridge,
Sandbanks Provincial Park
June 11 – Pancake Bay Provincial Park
June 12 – Killaloe, Bolton, Uxbridge
Township
June 14 – Presqu'ile Provincial Park
June 15 – Algonquin Provincial Park
June 18 – Kingston
June 20 – Perth
June 26 – Pinery Provincial Park
June 28 – Agawa Bay (Lake Superior
Provincial Park)

Other reports – June 16 – Trail, B.C.;
June 17 – Winnipeg, MB

Illegal Logging in Mexico Escalates

Continued illegal logging in the monarch overwintering sites and the buffer zone in Mexico was carried out this spring in an extensive, clandestine manner. Headlines about this situation appeared in the June 2/04 New York Times after Times reporters in Mexico were detained, had their cameras and recording equipment confiscated by illegal loggers, and one of their crew members was beaten. Local citizens have also been threatened and assaulted. Subsequently, the Mexican army moved into the Mariposa Monarca Biosphere Zone and recently, hidden camera have been installed in these forests to monitor the situation. There are also plans to purchase a large helicopter so that enforcement personnel can be quickly moved into areas where illegal logging is taking place. Unfortunately, these illegal loggers often work quickly by night and use cell phones to communicate when authorities are approaching. There are concerns that these measures will only have a temporary impact on the illegal logging issue

2003 Recovery Data

Monarch Watch is continuing to compile the results of tagged monarch butterflies recovered in Mexico this past spring. To date, Don Davis has had 29 tagged monarchs recovered in 2003 – an amazing figure given that in the past, one had to tag about 1000 monarchs before one recovery was obtained. Some of these 29 tags were placed on monarchs in the fall of 2001 and 2002. They were primarily recovered at the El Rosario site, with a few being found at the Chincua and Pelon sites.

Monarch Watch Update

Monarch Watch issues a monthly update by e-mail, describing various issues and developments related to the monarch butterfly and Monarch Watch. These updates are archived at: www.monarchwatch.org/update. To receive these updates each month, register at: <http://www.monarchwatch.org/update>. About 9000 people have signed up to receive this update!

Use Care in Handling Tropical Milkweed

There have been a few reports this summer of individuals handling tropical milkweed (*A. currasavica*), wiping away perspiration on their foreheads with their hands, and then having perspiration and milkweed sap run into their eyes. These individuals had to subsequently seek medical attention as their corneas damaged by this sap. One person lost his cornea. Due to the possibility of allergic reaction or toxic effects from many plant species, it makes sense that one take precautions by wearing gloves and washing hands.

Dr. Lincoln Brower, world renowned Monarch Butterfly Researcher, visits Ontario

Professor Lincoln Brower has conducted research at the monarch overwintering sites in central Mexico since 1977. In his lecture, entitled “THE GRAND SAGA OF THE MONARCH BUTTERFLY”, Dr. Brower will illustrate how monarchs may find their way to Mexico, the importance of the high altitude Oyamel fir forest ecosystem and how monarchs recolonize their northern breeding ranges. Massive illegal logging endangers this remarkable biological phenomenon.

Joining Dr. Brower will be Jose Luis Alvarez of Mexico. Sr. Alvarez will describe how the Michoacan Reforestation Fund and the La Cruz Habitat Protection Project, with almost 1.5 million trees planted since 1997, is playing a crucial role in the survival of the monarch butterfly and local communities.

Tickets for the lecture at the Royal Ontario Museum on Sunday, October 24, 2004, are now available at: www.rom.on.ca.

They will also be making appearances on Saturday, October 23rd at Wings of Paradise Butterfly Conservatory (Cambridge) and at the Royal Botanical Gardens (Hamilton) and on Monday, October 25th in Kingston, Ontario.

For further information, contact Don Davis at donald_davis@yahoo.com



The Bookworm



The Last Monarch Butterfly by Phil Schappert ISBN: 1552634051

Phil Schappert, PhD, is the editor of the News of Lepidopterists' Society, author of *A World for Butterflies* and professor at the University of Texas at Austin and past president of the TEA.

“The Last Monarch Butterfly is the definitive environmental reference on this endangered species. It provides a thorough and essential overview of these delightful creatures and helps readers to understand their plight. The book documents the monarch’s life cycle to provide a clear understanding of its natural condition including its migratory nature.

The western butterfly winters in California and the eastern butterfly winters in Mexico. Natural disasters such as a recent cold snap in Mexico imperil the already depleted monarch populations. Areas in California that once hosted the monarch are now being used for residential and industrial development. Even the vast fields of flowering weeds that supported the monarch in the northern states are depleted for new development.”

The Monarch Guide: Attracting monarchs and creating monarch habitat

A new 18 page booklet about attracting monarch butterflies and creating monarch habitat is available from the Canadian Nature Federation. Order from Kate McNeil, CNF Stewardship Programs Coordinator at (800) 267-4080, Ext. 245. cnf@cnf.ca

The Monarch Butterfly: Biology & Conservation.

Comstock: Cornell Univ. 2004. c.336p. ed. by Karen S. Oberhauser & Michelle Solensky. ISBN 0-8014-4188-9. \$39.95.

Where do North American monarch butterflies fly to each fall? Though millions watch their annual migrations, it was not until 1975 that the spectacular overwintering locality was discovered in the mountains of central Mexico. Since then, four international conferences have been held to formulate protection policies for overwintering monarchs; thousands of people have tagged, monitored, and studied monarchs to understand every aspect of their biology. Ecologists Oberhauser and Solensky (both Univ. of Minnesota) have assembled the results of those efforts into 27 chapters written by 46 authors. Covered is every facet of monarch breeding, migration, and overwintering, as well as population modeling and management; the results of several important studies are being published here for the first time. The text is clearly written, and the mathematical formulas included in certain chapters are not essential to understanding the main ideas. The most up-to-date and comprehensive publication on monarch butterfly biology, this will be an important reference tool in high school and public libraries and for interested citizens and scientists.

Review by Annette Aiello, Smithsonian Tropical Research Inst., Panama

New publications on Entomology from China: please visit www.hceis.com; www.hceis.com/product/index/Insects.htm

The Black Flies (Simuliidae) of North America

Peter H. Adler, Douglas C. Currie, and D. Monty Wood

This book compiles everything known about black flies, including basic biological facts, keys to all life stages, aquatic and terrestrial ecology, behavior, control, social and economic impacts, and taxonomy. It is copiously illustrated in color, showcasing the new work of some of the best insect illustrators.

Cornell University Press/ROM, 2004, 1072 pages. 255 distribution maps, 888 line drawings, 97 black-and-white photos, and a 24-page color folio. Cloth ISBN: 0-8014-2498-4 * Price: \$99.95

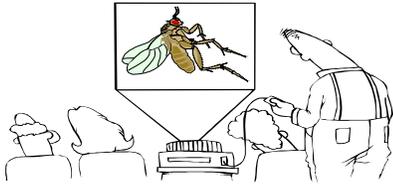
Caterpillars/butterflies poster available from the CWF: A CWF volunteer, Christine Sharma (416-236-7234), left a msg with the TFN that they have 4 types of posters available: birds, bats, wildflowers, and insects.

Newsletter of the Entomological Society of Ontario: The newsletter of the ESO is now available on-line at: www.entsocont.com/.

“Beauty with Brains” in National Wildlife, April/May 2004, Vol. 42 #3, Pages 39-47 written by Doug Stewart

Photo Field Guide to some Caterpillars of Southern Ontario:

St. Thomas Field Naturalist Club Inc. Box 23009, St. Thomas, ON N5R 6A3. 72 page color guide is \$10.00 plus \$2.00 shipping.



TEA Activities



April

TEA general meeting

Roy Gucciardi is a landscape architect and owner of Blue Willow Garden & Landscape Design Centre on Highway 48 just north of Davis Drive and south of Baldwin. He told us of his journey from landscape designer to expert butterfly breeder and educationalist. The idea to build a Butterfly Conservatory started off as a simple plan but he quickly learned that it was not that straightforward. He had to deal with government regulations, weather conditions and the vagaries of the market. The Butterfly Conservatory is his passion though. He rears moths as well as butterflies and is active in using the facility to teach grade school children about butterflies and their importance to mankind environmentally and socially. Roy helped us all to see how one person can do a lot to raise awareness and appreciation of the insects that we love.

TEA at the North American Native Plant Society Plant Sale

The TEA once again had a table at the NANPS plant sale on Saturday, May 8, 2004 where the focus was on butterfly gardening and beneficial insects. We answered many questions about migrating monarchs, how to attract butterflies and butterfly releases in schools.

Thanks to Carolyn King, Steve Laforest and Michael van der Poorten for their help.

Give us your ideas!

Programs: Carol Sellers is the Programs Coordinator and welcomes any ideas for speakers for the Oct - Apr meetings. Who would you like to hear from? Please write to her at: programs@ontarioinsects.org.

Field trips: Steve LaForest and Carolyn King are the Field Trips Coordinators and also welcome ideas for places to go and leaders. Do you have a favorite spot to share with others or is there somewhere you'd like to go? Please write to them at: fieldtrips@ontarioinsects.org.

Ontario Insect Fair

The first Ontario Insect Fair was sponsored by Thorne's Insect Shop and held on May 1 & 2, 2004 at the University of Guelph Arboretum. There was a dazzling array of insects of all types – butterflies, moths, beetles etc etc as well as dealers selling entomological supplies, frames and other enticing items.

The TEA had a booth and fielded many questions from the public. Thanks to Alan Hanks, Carolyn King and Steve LaForest for manning the booth!



Do you know?

All donations to the TEA are tax-creditable (a receipt is issued).

Any amount is welcome but the following suggested amounts support these TEA initiatives:

\$300: W.J.D.Eberlie Research Travel Award

\$50: Help to sponsor the printing of *Ontario Odonata*

\$40: Sponsor the printing of the Kid's Page in Ontario Insects

\$34: A copy of *Damselflies and Dragonflies (Odonata) of Ontario: Resource Guide and Annotated List* can be donated to a university library

\$25: A copy of *Ontario Odonata* (annual) can be donated to a university library.

\$15: A copy of *Ontario Lepidoptera* (annual) can be donated to a university library.

Note: The University of Guelph library has indicated their interest in receiving TEA publications. If you have contacts at other universities, we would be happy to pursue those options as well.

Please send your tax creditable donation to: Alan Hanks, Treasurer, TEA, 34 Seaton Drive, Aurora, Ontario L4G 2K1

2005 Dragonfly Society of the Americas meeting to be hosted in Ontario July 8-12

Organizers: Paul Catling, Colin Jones and Brenda Kostiuk

With great pleasure, we would like to announce that the annual Dragonfly Society of the Americas (DSA) meeting will be held in Arnprior, Ontario on **8-12 July 2005**. This meeting draws professional and amateur Odonatologists from across North America. It promises to be an excellent opportunity to meet many of the leading North American experts and to visit some outstanding areas in the Ottawa valley in search of Odonata.

Plans for the meeting

Attendees will arrive and register in the evening of 8 July and depart on morning of 12 July. Two days will be devoted to field trips while another day will be devoted to both popular and scientific presentations and workshops. Although the field trips have not yet been completely arranged, we will likely visit the Petawawa River, the Mississippi River, White Lake Fen, Beachburg Pools and Westmeath bog as well as small woodland springs and lake shores. Insect repellent, bug jackets, sun screen, lunch, drinks, appropriate clothing and extra (dry) clothes will be needed on field days, as well as cameras, binoculars and nets.

Within 80 kilometres of Arnprior, 110 of the 169 Ontario species of dragonflies and damselflies have been recorded. Species often associated with rivers such as *Gomphus fraternus* (Midland Clubtail), *Gomphus notatus* (Elusive Clubtail) and *Gomphus vastus* (Cobra Clubtail) are present on the Ottawa River as is the dusk-flying *Neurocordulia yamaskanensis* (Stygian Shadowdragon). Several dragonflies with rather restricted North American

distributions are present in the area including *Arigomphus cornutus* (Horned Clubtail), *Arigomphus furcifer* (Lilypad Clubtail), *Gomphus borealis* (Beaverpond Clubtail), *Neurocordulia michaeli* (Broad-tailed Shadowdragon), *Ophiogomphus anomalus* (Extra-striped Snaketail), and *Cordulegaster diastatops* (Delta-spotted Spiketail). Bogs, fens and a variety of wetlands in the immediate vicinity will produce many other species including the smallest dragonfly in the north, the Elfin Skimmer (*Nannothemis bella*). We will be watching for *Gomphus ventricosus* (Skillet Clubtail) last seen on the Ottawa River many decades ago. On other rivers we will be looking for the first Ontario records of *Ophiogomphus howei* (Pygmy Snaketail) and *Ophiogomphus asperses* (Brook Snaketail).

On 12 July, a 2-3 day post-conference field trip will depart, probably for areas to the north. The plans will be finalized by participants just before and during the meeting. It is likely that the group will be studying diversity in particular habitats such as fens and /or rivers.

Accommodation

The main conference facility will be the Quality Inn on 70 Madawaska Blvd (#27 on the website "townmap" - <http://www.arnprior.ca> - click on "community" for the map). The cost of the double occupancy rooms is \$95.20 which includes 12% taxes. Sixty rooms have been reserved for attendees (July 8 to 11 inclusive) but the reservations will only last until 8 May (60 day hold). Call 613 -623-7991 to book a room. For more information visit the Inn's website at www.arnpriorqualityinn.com. Attendees should confirm costs with the Inn nearer to the meeting date since there is always a possibility that the cost of accommodation will be reduced somewhat. It is also necessary to indicate your attendance at DSA in order to qualify for the reasonable deal that has already been negotiated.

Alternative motel accommodation several blocks away includes Twin Maples Motel (613-623-4271) and Arnprior Motor Inn (613-623-7906). There is also the Country Squire Motel (613-623-6556) on the edge of town near the Trans-Canada Highway. These alternatives are about \$20-30 less per night but they have fewer facilities.

Camping is available in Fitzroy Harbour Provincial Park (www.ontarioparks.com/english/fitz-facilities.html) 10 miles NE of town. Electrical sites are \$27.25, non-electrical \$23.25 (2004 rates) and showers, laundry facilities, park store and playground are available. Campsite reservations can be made up to 5 months beforehand (and reservations should be made months ahead) by calling the reservation number 1-888-668-7275. The \$12.00 reservation fee is non-refundable. For more information on the park and map, see the website.

About the DSA

The Dragonfly Society of the Americas was organized during 1988 by several US Odonatologists. Membership consists primarily of US and Canadian Odonatologists, but the DSA serves all of North, Central and South America. It is open to anyone in the world, however, who has an interest in Odonata.

Purposes of the DSA are to encourage scientific research, habitat preservation and aesthetic enjoyment of Odonata through (1) cooperation and comradeship among odonatologists worldwide; (2) fostered interchange between amateur and professional enthusiast; (3) establishment of publications to disseminate information relating to Odonata; (4) support for wetlands and habitat preservation as the most effective manner for odonate conservation; and (5) cooperation with organizations sharing common goals of environmental preservation.

For more information on DSA publications and membership consult the website www.afn.org/~iori/dsaintro.html



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(2) World butterflies, moths, beetles, etc., with data, in cases. Includes *O. victoria* & *Titanus giganteus*.

(3) Collection of voles, shrews, & mice of the Kapuskasing area, all with scientific data

>>>continued on page 7>>>>>>>>
Contact Quimby Hess at phone: (416) 482-1637

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Notice to Contributors

Who Can Contribute:

Observations, articles, etc., to be published in **Ontario Insects**, are welcome from members of the **Toronto Entomologists' Association**. There are no page charges, however, submissions from non-members will require a membership purchase prior to publication. Classified ads may be placed by non-members at the rates outlined in the classified section.

Types of Submissions:

Contributions to **Ontario Insects** may address any subject or aspect related to entomological study. Submissions may be made in the following categories:

Research papers -may include original research or scholarly reviews following an appropriate journal format

Feature articles -informative & entertaining, format open to the author's choice

Notes or short communications -may be observations, interpretive, historical, review or experimental studies which do not fall under the purview of research papers

Book reviews -preferably titles published within the last three years

Original artwork, puzzles -art should be clear, easily reproduced in black & white

Guest columns in Entomophilia -any subject related to the love of insects

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