# FLY TIMES


OCTOBER, 1994 - No. 13

Welcome to another issue! Although No. 13 is a little sparse, I attribute this to the anticipated and subsequent attendance of the wonderful meetings in Guelph, Ontario, which were a smashing success (read on below). Who needs to send in news when you can do the same over beer or coffee, face to face?

Issue No. 14 of the Fly Times will appear next April and all contributions should be sent by March 31, 1995 to the following.

Please note the new address:

Dr. A. Borkent,
1171 Mallory Road,
R1-S20-C43,
Enderby, British Columbia,
V0E 1V0, Canada.

In the last issue, I provided my new phone number but stupidly got the numbers mixed up (I blame this on just having returned from nine months in Costa Rica and being overly relaxed!!). Here is my new, new number: (604) 833-0931. FAXes may still be received at (604) 832-2146. My apologies to all those who, upon calling the wrong number, ended up talking to a highly irritated elderly lady who knows nothing about no-see-ums nor phylogenetics (she thought homoplastic characters were gays who use special credit cards)!

**FOURTH MEETING - NORTH AMERICAN DIPTERISTS' SOCIETY - COSTA RICA**

**August 1995**

**PLACE Albergue de Montaña Sevegre, San Gerardo de Dota.** At our last meeting in Texas I extended an invitation to hold our next meeting, scheduled for 1995, at the Monteverde Biological Station. A canvassing of the delegates at Guelph indicated that most people would prefer to go later in the summer, preferably in August. Because it is not possible to use my station during this time, I have chosen an alternative locale that has many advantages over Monteverde, the Albergue de Montañas Sevegre. An hour south from San Jose, it is directly west of the Panamerican Highway, below Cerro de la Muerte, at about 2000 metres. It has 14 cabins (=rooms?) that can accommodate up to 50 people, @ US $35 per day, including food, with its own dining room (no menu, everyone is treated equally) and meeting room. Chris Thompson and I stayed there in February 1992 during a parataxonomists' course and were well satisfied both with its accommodations and the collecting in surrounding forests.
Manuel Zumbado, Curator of Diptera, Instituto Nacional de Biodiversidad (INBio) Santo Domingo de Heredia, Costa Rica, has kindly offered to be the chairman of the local arrangements committee. Although we have not made any reservations at San Gerardo yet, we now know the Albergue is available at that time but won't be for long, so we would like to make reservations as soon as we have an idea of who is going to attend. Please send in the form at bottom of next page as soon as possible and/or e-mail me at "dmwood@ccs.carleton.ca", fax (613) 722-9213 or (613) 947-5974, or telephone (613) 996-1665 (office) or (613) 722-9213 (home)..
The first 40 people who send me a cheque for US $200.00 (or its equivalent in Canadian dollars, as a deposit on the accommodations and bus) will be assured of a place (a refund will be forthcoming if there is no meeting). If there is a good response I will book the entire hotel.

**TIME August 1-5, 1995** We propose that delegates plan to arrive in San Jose at about the same time so we can take advantage of a chartered bus from San Jose to San Gerardo. After two to three days of papers and indoor sessions, delegates can remain at San Gerardo (from which higher elevations are easily accessible), or take one of the planned field trips for the second week. Those wanting to look at the collections in INBio will have greatest access to space and microscopes on the weekends, and they might want to arrive on July 28, the weekend before the meeting, and/or stay on after the field trips. After our meeting we can stay a few days at San Gerardo before either returning home or joining one of three field trips.

**POST-MEETING FIELD TRIPS** On the assumption that delegates will want to stay a couple of weeks, we tentatively suggest three concurrent field trips, to last until mid-August, as follows:

Las Alturas Field Station, near San Vito in the south, at 1500 metres. Situated right on the edge of a vast expanse of forest extending from the paramo nearly to the Pacific, Las Alturas is a field station of Stanford University. It is here that Dave Grimaldi has found the highest diversity of drosophilids, and I collected 120 species of tachinids in a couple of mornings in August. There is a generator for electricity in the evening, but no hot water. Accommodation of no more than 10 people (comfortably) is US $16 plus $14 for food if you don't prepare your own. Manuel has offered to lead this field trip.

Monteverde - although my field station is not available for accommodations, we can use the property for collecting, and we can stay at a small field station recently developed nearby by the Monteverde Conservation League. The many good hotels in the area are often nearly empty in August. At about 1500 metres it is superficially similar to Las Alturas; perhaps a little sunnier, but probably also much windier (I don't know why Monteverde gets so much wind, while the Talamancas get so little.) Cost unknown, but probably below US$20.

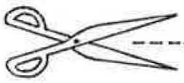
Sarapiqui and La Selva. For those wanting lowland rainforest collecting, there is a small unnamed hotel near Puerto Viejo de Sarapique with some excellent forest adjacent to it, according to reports (I have not seen it). La Selva won't allow collecting (unless Dave Grimaldi can arrange something) but is worth a visit. We don't know the cost yet.

Guanacaste. Although nothing has been investigated yet, the tropical dry forest is worth a visit at this time of the year. Please indicate your interest, and Manuel can investigate possibilities.

**Permits:** Since the Texas meeting, the Wildlife Service of Costa Rica (Ministerio de Recoursos Naturales, Vida Silvestre) has instituted a system of collecting permits that apply not only to export of insects from Costa Rica but also to collecting within the country. Although the requirements are rather stringent, INBio has worked out a system of obtaining permits for each of us that makes it almost painless. They require only two passport pictures and US $60.00, and as they did for me two weeks ago, they have agreed to make each of us an associate researcher of INBio and will provide each of us with a collecting permit and an export permit. INBio really needs our expertise, as well as some of our duplicate specimens with names on them. It is only with our cooperation that Manuel can build up the standard of identification of the INBio collection.
If you decide you really would like to apply on your own, send a fax to Dr. Rodriguez Ramirez, Ministerio de Recursos Naturales, Vida Silvestre, and ask for an application to collect. The application will ask you for, among other things including the usual vital statistics, a **notarized** letter from the director of the institution where you work (difficult for those without an institutional affiliation) and a report on your project in Spanish (fortunately it did not specify how good the Spanish had to be, for that could automatically exclude most of us). The report must be signed by your Costa Rican consulate. They also want a statement from a Costa Rican bank indicating that you can pay the fee of US $60.
We recommend the INBio route, and extend our appreciation to INBio for offering to arrange these things for us!

**Weather:** The frontal weather systems eastern North America is familiar with are unknown in Costa Rica. Weather gets warmer or cooler from day to day, but the change is very slight and subtle. Nevertheless, there are spells of warmer or cooler air, with greater or lesser amounts of rain, that change every two or three days. By far the greatest differences are in the amount of rainfall from month to month. Early August is usually called the Little Dry Season. The rainy season proper usually begins in May, intensifies in June, and tapers off in July, only to return with renewed vigour in September, October, and November, when rain may begin as early as 10 AM (but usually sunny and with good collecting at 8 AM) and occasionally it may rain all day. December to April is the dry season, also called invierno "winter!" (Little do they know!). Guanacaste has no rain at all in the dry season, with hot sunny mornings and afternoon thunderstorms in the wet season. The rest of the country is usually sunny in the morning with afternoon thundershowers on most days in the wet season, but with luck, August will not be too wet. Mountainous areas, including Las Alturas and Monteverde are less predictable.
Unfortunately, insects are cued in to the rains and are much more abundant during the rainy season. Our experience has shown that August is the best compromise between insect abundance and decent weather, but some years don't follow the "normal pattern"!

Manuel and I would like to know as soon as possible how many people are going to attend the meeting and where they would like to go afterwards. Please fill out and mail this "first circular" so we know how many reservations to make.



- I, _____, am planning to attend the Fourth Meeting of the North American Dipterists' Society (NADS) to be held in Costa Rica, August 1995.
- I would like to share accommodations with
  _____
  _____
- I would like to sign up for a post meeting collecting trip, in the following order of preference:
  1. _____
  2. _____
  3. _____
  4. _____
- I enclose a deposit towards my accommodations (to be calculated more precisely when more information is available) of US $200 (or its equivalent in Canadian dollars) to confirm my involvement (refundable in the event of cancellation). Please send to: Monty Wood, BRD CLBRR, Agriculture Canada, Ottawa, Ontario K1A 0C6.

## NEWS

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### Third International Congress of Dipterology
### August 15-19, 1994, Guelph, Ontario

By any standards, these meetings were a smashing success! Held for the first time in North America, the third Congress attracted over 300 Dipterists from all over the globe, with an excellent international representation. The organizing committee should be especially commended for facilitating the attendance of some Russians.

Because the meetings were spread over five days on a smaller campus, there was ample opportunity to meet with many colleagues in an intimate surrounding (even though I still found that there were some that I didn't get a chance to talk to!).

The program, incorporating a wide array of topics and specialized workshops on given families, was so well organized that participants were generally able to get to the talks they were most interested in attending. In addition, the rooms where talks were being held were in close proximity, making it easy to go from one to another.

Topics covered in symposia were: ethology; ecology; advances in systematics of Nematocera; molecular systematics; Diptera as anthophiles; Diptera databases, nomenclature and biodiversity inventory; functional morphology; physiology; phytophagous Diptera; Manual of Palaearctic Diptera; advances in systematics of Brachycera; medical and veterinary Diptera; forensic Dipterology. Workshops were held on the following families: Asilidae, Chloropidae, Muscidae, Anthomyiidae, Tabanidae, Stratiomyidae, families of Aschiza, Cecidomyiidae, Calliphoridae, Sarcophagidae, Tachinidae, Tipulidae, Ceratopogonidae, Sphaeroceridae, Ephydridae, families of Empidoidea, Oestridae, Culicidae, Chironomidae, Simuliidae, Syrphidae and Drosophilidae.

Generally, the talks were of high quality and it was certainly delightful to hear so many scientists talking about Diptera.

The organizing committee is to be congratulated for arranging a wonderful meeting that ran so smoothly, from the details of accommodation and coffee breaks (great donuts!) to the wide array of talks given. It takes a great deal of effort to ensure that all such details are taken care of. Fellow workers were able to focus on the sharing of their research and experiences of flies for five solid days. I was repeatedly impressed at the energy levels of colleagues who gathered in the meeting rooms or over coffee or beer to discuss the in and outs of their groups. Ultimately that is what meetings like this should be about: the exchange of our knowledge and a strengthening of the connections between all of us.

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## Active Dispersal

Robert (Bob) V. Peterson has retired from the Systematic Entomology Laboratory, USDA in Washington, D.C. as of Sept. 29 and has moved to Utah where he plans to continue his work on black flies and bat flies. Here are his new addresses:

Work: Monte L. Bean Life Science Museum,
Brigham Young University,
Provo, Utah,
84602, U.S.A.

Home: 3635 North Littlerock Drive,
Provo, Utah,
84604, U.S.A.

James E. Sublette has also changed places, as follows:

Dr. J.E. Sublette,
3550 N. Winslow Dr.,
Tucson, Arizona,
85715, USA.

Art Borkent: note new address and phone number on first page of this newsletter.

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## Diptera Ditties

George W. Byers, taking some time off from his studies of tipulids and the like, has sent in these two delightful discoveries:

Curious fly.
Vinegar jug.
Slippery edge.
Pickled bug.

A fly and a flea, in a flue
Were imprisoned, so what should they do?
"Let us flee" said the fly.
"Let us fly" said the flea.
So they flew through a flaw in the flue.

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## Request for info from John Stoffolano

Recently, I wrote a review chapter entitled "Regulation of a carbohydrate meal in adult Diptera, Lepidoptera and Hymenoptera" for a book on Regulation of Feeding in Insects (G. deBoer and R.F.Chapman, eds.) to be published by Chapman Hall. In that review I have a section on "bubbling" and "licking" behavior by adult flies. This "bubbling" behavior has been reported for several species with little emphasis on its physiology or ecological significance. David Headrick has given me some information on the tephritid species he works with. The "licking" behavior is where the adult male licks the females anal/genital area or both make proboscis contact and exchange something. This behavior has been observed in Drosophila where it is a major component of their mating ritual. Headrick also provided me with some references in the tephritids where this occurs. I would appreciate individuals sending me reprints and/or literature citations where these behaviors have been observed. Proper credit will be given for your assistance.

If you can help, contact John at the following address or see him at the Diptera Congress. He will be briefly discussing this behavior in his plenary talk entitled The Sated Fly: A tribute to Professor V. G. Dethier. Bring your reprints with you.

Dr. J. Stoffolano,
Dept. of Entomology,
Fernald Hall,
Amherst, Massachusetts,
01003, USA.

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## Sad News

It is with a sense of tremendous loss that I report that Dr. Willis W. Wirth died on Sept. 3, 1994 after a year long battle with cancer. His comprehensive work on Ceratopogonidae laid the ground work for the family on a world wide basis and provides a solid basis for all future systematic studies. His work on Chironomidae and Canacidae also provided important taxonomic revisions for these groups.

Bill will be long remembered for the remarkable breath of his knowledge and his generous spirit. He always gave unstintingly to those who shared his enthusiasm for these

wonderful flies. A list of his approximately 400 publications includes as coauthors the names of numerous colleagues whom he attracted to his investigations.

A memorial issue of the Memoirs of the Entomological Society of Washington is being planned.

Those wanting to make a memorial contribution on Bill's behalf may send donations to the following:

Hospice of North Central Florida,
P.O. Box 15235,
6500 Newberry Road,
Gainesville, Florida,
32604, U.S.A.

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Informal Conference - North American Dipterist's Society
1994 Entomological Society of America Meeting

The ESA meetings will be held this year in Dallas, Texas on Dec. 13-17. The Dipterists hope to gather for another informal conference. Contact Riley Nelson, who has agreed to coordinate this year's gathering, if you want further information. Here's his address and electronic numbers:

Dr. D.R. Nelson,
Dept. of Zoology,
University of Texas,
Austin, Texas,
78712-1064, U.S.A.

Telephone: (512) 472-2783
FAX (512) 471-9651

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Biting Fly Workshop - 1994

This year's meeting took place in Easton, Maryland on June 1-3. Talks were given on "Geographic information systems and vector-borne disease" by G.E.G. Glass, "Field biology of Culicoides variipennis larvae" by J.A. Vaughan, "Visual ecology of biting flies" by S.A. Allan and "A tribute to G.B. Sandy Fairchild" by T. Simpson. In addition, discussion groups were held on Ceratopogonidae, Psychodidae, Similiidae and Tabanidae.

Participants also spent some time collecting and visiting the Horsehead Wetlands Center.

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# Puparial survival of Leucopis (Chamaemyiidae) after exposure to harsh conditions

Stephen D. Gaimari (University of Illinois at Urbana-Champaign)

While at Washington State University, my MS research included a scanning electron microscope (SEM) study on the morphology of the immature stages of three Leucopis Meigen species (Chamaemyiidae) (Gaimari 1993). In the course of this work, several puparia survived exposure to seemingly harsh conditions.

To view immatures through the SEM, the normal preparation for the greater part of the study consisted of killing in 70% ethyl alcohol. The eggs and larvae were dehydrated by running them through an ethanolic step series, and were critical point dried to prevent the collapse of soft-bodied specimens. Puparia, however, were sufficiently sclerotized to air dry without any collapse. In the case being considered, six puparia of Leucopis ninae Tanasijtshuk and 18 puparia of two other Leucopis species were sampled randomly from colonies in the Biological Control Insectary at Washington State University. Instead of killing them in alcohol, they were placed into a freezer (-0.5°C) for three days. Working on the incorrect assumption that the puparia were dead, they were removed, placed on SEM stubs with double stick tape, and left to air dry for a week.

After the puparia were supposedly dry, the specimens were sputter coated with a 30 nm thick layer of gold by a process called "plasma sputtering" (Postek et al. 1980), which entails applying a low vacuum (0.01 torr), replacing some of the air with large, inert, argon molecules. These molecules are excited by the electric field produced between the positive and negative poles in the sputtering chamber with application of high voltage to the negative pole. The cathode (negative pole) is at the top of the chamber, while the specimen is just above the anode (positive pole) at the bottom of the chamber. The excited states of the molecules cause ionization, releasing electrons which, in their excited state, dislodge particles of gold from the cathode target, making the gold available to coat the specimen surface.

Each gold coated specimen was then viewed through an SEM running at an accelerating voltage of 20 KV. Normally, to view living specimens a very low (5-10 KV) accelerating voltage is used. The high accelerating voltage causes deeper penetration of the specimen by the electron beam. Every individual was exposed to the conditions within the SEM (including a low vacuum) for at least ten to fifteen minutes before being removed. After the session was completed, the specimens were boxed and placed into a drawer. Some of these were subsequently viewed through the SEM again in the course of the next week.

About one week later, upon pulling the boxes from the drawer, several Leucopis adults were found dead at the bottoms of the boxes, and a few live adults were also present. Two of the six L. ninae puparia had emerged, along with nine of the 18 other Leucopis specimens. Unfortunately, I did not get any information on the viability or fertility of these specimens.

Although this phenomenon may not be spectacular to a professional electron microscopist, it was a complete surprise to me. Apparently, each puparium was grounded due to its contact with the stub. Then, after coating with gold, the contact point with the stub remained uncoated, leaving the specimen grounded. While viewing a specimen through the SEM, the current from the electron beam followed the gold plating around the puparium, never affecting the grounded pupa inside. So, it is not that odd for the pupae to have survived exposure to the SEM conditions. Nor is it that odd that they survived freezing for three days. I would think that their spiracles would have become clogged with gold during the coating process, but the layer may have been thin enough to be easily broken. The strangest thing seems to be that they survived the conditions of plasma sputtering, i.e., a low vacuum of high voltage and argon gas. In addition to the high voltage in the sputtering chamber, plasma sputtering often causes intense heating of the specimens (Postek et al.).

So, although these conditions may seem harsh, about one-half of the specimens exposed survived at least to the point of adult emergence. This stresses an already familiar fact: insects (at least these chamaemyiid flies in the genus Leucopis) are hardy animals with a wide tolerance to conditions.

Reference cited:

Gaimari, S. D. 1993. Comparative life histories and morphology of the immature stages of three Leucopis spp. (Diptera: Chamaemyiidae), and methods for rearing Leucopis. M.S. thesis. Dept. Entomol., Washington St. Univ., Pullman, Washington. 120 pp.

Postek, M. T., K. S. Howard, A. H. Johnson, and K. L. McMichael. 1980. Scanning Electron Microscopy: A Students Handbook. Ladd Research Industries, Inc. 305 pp.

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Request for Assistance for Russian Colleague

Dr. Andrew Przhiboro, a young Russian entomologist with broad interests in littoral entomology (all insect groups) will soon be joining the permanent staff of the Zoological Institute, St. Petersburg. He is eager to establish contacts with North American workers for mutual exchange of information and publications and for possible collaborative work. Dr. Przhiboro writes English well. Any interested readers are encouraged to send correspondence and reprints to:

Dr. Andrew Przhiboro.
Zoological Institute,
Russian Academy of Sciences,
Universitetskaya nab., 1,
St. Petersburg, 199034,
Russia.
FAX (812) 114-04-44

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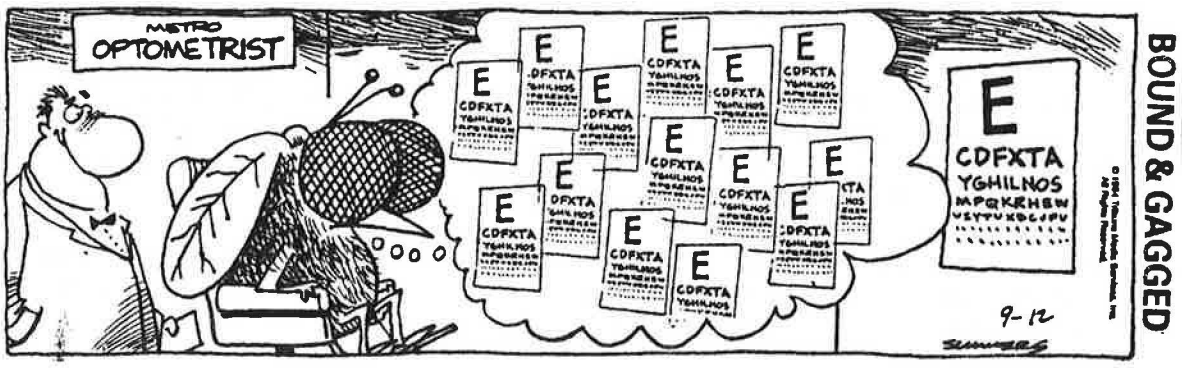


from Chris Maier

Books and Publications

Evenhuis, N.L. 1994. Catalogue of the fossil flies of the world (Insecta: Diptera). Backhuys Publishers, Leiden, The Netherlands. viii + 600 pp., $108 US.

This book provides a listing of the names of all fossil Diptera published up to 1994 (about 5,000 names), providing full citation, type locality, geographical distribution and mode of preservation. Introductory chapters list the sites where the fossils were found, their ages, and where the specimens are currently housed.

Neal, with his usual meticulous care, has provided us with a vital catalog to deal with the fossils in each of our groups. As many of you know, such information is often scattered in obscure and difficult to locate journals or books. For the first time we have a complete and detailed compendium thoroughly listing all fossil taxa and we should make good use of it! Many of these fossils will provide us with a wealth of knowledge on the diversification of our groups.

Thompson, F.C. and N.L. Evenhuis. 1994. Resource directory for Diptera systematics. 61 pp.

This worldwide checklist of Dipterists provides names, addresses, and area of interest for 1,945 people studying fly systematics. The list is cross-indexed by family and country. If you want a copy (free, with the condition that you send reprints of your papers), write to the following:

Dr. F.C. Thompson,
Systematic Entomology Lab., USDA,
NHB-168, U.S. National Museum,
Washington, D.C.,
20560, U.S.A.

Courtney, G.W. 1994. Revision of Palaearctic mountain midges (Diptera: Deuterophlebiidae), with phylogenetic and biogeographic analyses of world species. Systematic Entomology 19:1-24.

Courtney, G.W. 1994. Biosystematics of the Nymphomyiidae (Insecta: Diptera): life history, morphology, and phylogenetic relationships. Smithsonian Contributions to Zoology. Number 550, iii + 41 pp.

Griffiths, G.C.D. 1994. Relationships among the major subgroups of Brachycera (Diptera): a critical review. Canadian Entomologist 126:861-880.

Wiegmann, B.M., C. Mitter and F.C. Thompson. 1993. Evolutionary origin of the Cyclorrhapha (Diptera): tests of alternative morphological hypotheses. Cladistics 9:41-81.

For those who have not yet sent in a synopsis of their interests for the Directory of North American Dipterists, the following form is provided. Please restrict yourselves to no more than 20 words when listing the titles of your major projects and the animals you work with.

The completed form may be sent to Jeff Cumming at the following address:

Dr. J. M. Cumming,
Centre for Land and Biological
Resources Research,
Agriculture Canada,
K.W. Neatby Building,
Ottawa, Ontario,
K1A 0C6, Canada.

Should any of you like to expand or modify your entries from the last list, use the form to indicate the changes.

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Full name:_____
Address:_____
_____
_____
Telephone Number:_____
FAX Number:_____
E-mail:_____
Projects and taxa studied:_____
_____
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_____
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