



The Mayfly Newsletter

Volume 9 | Issue 2

Article 1

6-1-1999

The Mayfly Newsletter

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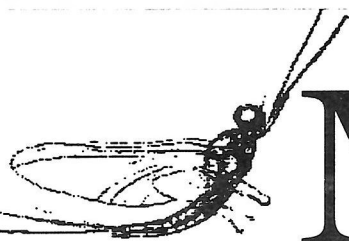
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Grant, Peter M. (1999) "The Mayfly Newsletter," *The Mayfly Newsletter*. Vol. 9 : Iss. 2 , Article 1.
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THE MAYFLY NEWSLETTER

Vol. 9 No. 2

Southwestern Oklahoma State University, Weatherford, Oklahoma 73096-3098 USA

June 1999

ISSN: 1091-4935

Preparing Mayfly Eggs for SEM

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The fine structure of the egg chorionic pattern in Ephemeroptera is frequently used, as with other insect orders, for taxonomic and phylogenetic purposes. In addition, ultrastructural studies on mayfly eggs have indicated the adhesive function of special projections, which may be involved in preventing egg drift following deposition in water.

For these investigations, proper fixation of the eggs is required to examine them with both scanning electron microscopy (SEM) and transmission electron microscopy (TEM). Nevertheless, most of us are more interested in the superficial chorionic decorations than in the fine organization and sequence of the egg envelopes (vitelline envelope and chorionic layers). Thus, the prevailing interest in SEM analysis is to study the chorionic pattern for taxonomy, whereas TEM observations are mainly left to morphological investigations.

Eggs can be dissected either from newly collected specimens (see I below) or from material stored in collections (see II below), sometimes even very old and dried material. Eggs can be dissected from both nymphs (possibly those with dark wing pads) and adults (subimago and imago).

(I) Eggs dissected from newly collected specimens can be appropriately fixed for one hour in Karnovsky's medium: 4% formaldehyde-5% glutaraldehyde in 0.1M cacodylate buffer, final pH=7.2 (Karnovsky, M. J. 1965. A formaldehyde-glutaraldehyde fixative of high osmolality for use in electron microscopy. J. Cell. Biol. 27: 137A-138A). Thereafter, eggs are rinsed several times in the same buffer, dehydrated in a graded series of ethanol, critical point dried, attached to specimen holders by silver-conducting paint, and coated with gold-palladium. The specimens are now ready to be examined under SEM.

(II) Eggs dissected from specimens preserved in alcohol (usually stored collection material) are com-

monly covered with adhesive material, because the alcohol causes the mucous material, secreted by the follicle cells or by the cells of the oviduct, to stick to the egg. This covering constitutes a big problem when we observe eggs under SEM: the mucus forms a homogeneous layer that obstructs the view of the egg pattern underneath. A technique that I have sometimes successfully employed (it depends on how old the material is), consists of hydrating the eggs (using a decreasing graded series of alcohol up to water) and leaving them for one night (or more) in a small container where some drops of glycerol were added to water. Glycerol sticks to the mucus and gradually removes it. This procedure can be repeated several times. Thereafter, eggs can be processed as though they were almost dissected from newly collected specimens. Do not be so excited, though, because this technique does not completely remove the mucous covering. However, cleaned patches allow portions of chorion to be seen under SEM. Frequently, even small portions of the chorion give us useful indications.

Good luck and do not hesitate to contact me if you need my help.

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Mayflies at the Canadian National Collection

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The Canadian National Collection in Ottawa is well known among North American mayfly workers for its holdings of primary types. Although many of us have made use of these and other materials via loans, it was a surprise to me that we have not ventured there to experience the mayfly collection as a whole. This March, through the efforts of Dr. Jim McKenzie (Director ECORC) and staff entomologists Dr. John Huber, Dr. Henri Goulet, Dr. Lubo Masner, and curatorial affiliate Raymond Hutchinson, I was able to do just that.

I am pleased to report that the primary types (pinned and slide mounted material) have been carefully curated and are accessible. Although the mayfly component of the CNC is comparatively small, there is still much to keep mayfly specialists busy for years.

The pinned collection is contained in about 5 steel cabinets that are about 7 feet tall and each has about 24 drawers. Among pinned specimens there was almost no evidence of dermestid damage or rough handling. Most pinned specimens are from Canada and the US, but there are a few from outside North America (e.g., a recent expedition to Nepal). Much of the pinned material is arranged in drawers just as McDunnough left it.

The curated ethanol collection is organized into a single steel cabinet the same size that houses pinned specimens. This cabinet contains more than 200 vial racks that are similar in design to the "Koss-type" rack for 2 and 4 dram vials. Vial racks are organized by family and genus. Despite the large number of racks, not all are full of vials. For

example, racks of rare taxa like *Ametropus* may only have a few vials, whereas common genera have large numbers of vials. In many instances, larvae and adults of the same genus are in separate racks.

Because the ethanol material has been stored in the dark, UV fading seems to have been minimized (of course some specimens are extensively faded from long-term preservation in ethanol). Despite the age of some ethanol specimens, most were in workable condition.

Specimens that were dissected for slide mounting are all cross labeled and the slide collection is readily accessible and well organized. All slide mounts seem to have been made using Canada balsam, which has discolored extensively on the edges of some coverslips, but I did not find any that were not useable.

Despite the lack of a full time staff entomologist at the CNC working on mayflies, the mayfly collection is in remarkably good shape. I am sure much of this has been due to the efforts of Raymond Hutchinson working under the direction of Dr. John Huber.

In closing I would like to say that even though the mayflies at the CNC are no longer alive they are well! If you are interested in arranging loans of CNC Ephemeroptera or wish to visit the collection, as I did, please contact Dr. John Huber at the following address: Dr. John Huber, Research Scientist – Biosystematics, E.C.O.R.C., K. W. Neatby Building, C.E.F., Room 3135C, Ottawa, Ontario, CANADA K1A 0C6, telephone 613-759-1840, fax 613-759-1927, email Huberjh@em.agr.ca.

Stenonema

Philip A. Lewis, 1037 Wylie Road, Seaman, Ohio 45679 USA, phone (937) 764-1117, email 71334,1140

The purpose of this note is to inform ephemeropterists that the *Stenonema* specimens in my collection have been deposited in the Ohio Biological Survey, 1315 Kinnear Road, Columbus, Ohio 43212, USA. Field notes and records of all specimens examined during the preparation of the USEPA publication, "The Taxonomy and Ecology of *Stenonema* Mayflies," are also deposited in the Ohio Biological Survey.

Some specimens borrowed from individuals were not returned because of lost addresses and were included in the material deposited at the Ohio Biological Survey. All specimens from the following museums have been returned as far as I can tell: Florida A&M University, University of Wisconsin, University of Minnesota, University of Michigan, Cornell University, Canadian National Collection, Smithsonian Institution, Philadelphia Academy of Natural Science, and the Illinois Natural History Survey.

Although I have retired, I am still much interested in the *Stenonema* and would be happy to assist in any way possible in any taxonomic studies that may be undertaken. One critical need is to restudy the *Stenonema modestum* group which includes at least three distinct species and probably more.

H. H. Costa

Dr. Sriyani Dias regrets to inform us of the death of Professor H. H. Costa of Sri Lanka. Professor Costa passed away just three months after his retirement last December.

Electrogena on the Web

Carlo Belfiore has made a web site on *Electrogena*. The url is www.celleno.it/Electrogena. Carlo can be reached by email at carbelfi@unina.it.

Growth Management and Modernization of the Ephemeroptera Collection at Florida A&M University

W. L. Peters, Center for Studies in Entomology, Florida A&M University, Orr Drive, Tallahassee, Florida 32307 USA, phone (850) 599-3912, fax (850) 561-2221, email wpeters@famuedu.

[Editor's note: The National Science Foundation has recently awarded Bill Peters \$290,040 for this project. Bill provided the following project summary.]

Recent large donations of Ephemeroptera (mayflies) to Florida A&M University have made this university collection one of the largest and most significant collections of mayflies in North America. As these donations exceed normal growth, this proposal is concerned with the management and preservation of incoming collections and modernization of the entire Ephemeroptera collection. Specific objectives are (a) to continue to assure the integrity of all type and voucher material arriving at Florida A&M University, (b) to upgrade storage of the Berner collection, (c) to integrate the Traver and Edmunds collections into the existing Ephemeroptera collection, and (d) to house the Ephemeroptera collection in steel storage cabinets in such a way as to make them easily accessible for revisionary work and future growth management.

The donations include the transfer of the entire Berner collection (including the Lyman collection) from the University of Florida and a portion of the Edmunds and Traver collections from the University of Utah to Florida A&M University. The greatest significance in the Berner collection is the historical record for the mayflies of the Southeastern United States. Additional material comes from many other areas, including Africa. The Berner collection is a specimen-based collection, so that any published record can be accessed by specimen in a few minutes using a system of

card catalogs and indices. In the time the Berner collection has been at Florida A&M University, it has been the source of frequent loans as revisions of North American mayfly genera or species must return to the published Berner distributions. The Edmunds and Traver collections are worldwide in scope, with greatest strength in the Neotropical representatives of Leptophlebiidae and Leptohyphidae and material from students and colleagues of Edmunds and Traver (R. K. Allen, L. Berner, W. C. Day, S. L. Jensen, R. W. Koss, V. K. Mayo, J. G. Needham, J. Packer, J. G. Penniket, E. F. Riek, and W. L. Peters). The Edmunds and Traver collections contain type material for over 100 species, including 55 primary types.

Specific curatorial needs for these collections include replacing all bakelite lids on 16 oz jars with polypropylene closures, replacing all rubber-lined closures on a 50-year assortment of different sized jars with standard-sized museum jars (16-oz, 32-oz) and polypropylene closures, and disintegrating stoppers. All collections, those in racks and those in jars, will be placed into steel storage cabinets. For future access, they will be stored phylogenetically by family or superfamily group. All type material in alcohol will be curated into a double storage vial system (inner and outer vials) in museum jars.

It is anticipated that it will take one biological scientist three years with student and technical assistance to accomplish all objectives.

New Entomological Taxa (NET)

Scientific Reference Resources has announced the publication of a relatively new journal, *New Entomological Taxa* (NET). The first two issues of NET are available for viewing at www.sciref.org/net/index.htm.

"NET catalogues the new taxa of insects, acari, arachnids and myriapods, in addition to parasites and pathogens associated with these groups of arthropods, which appear in the current literature. Nomenclatural changes, such as new combinations, new synonyms and taxa of new or revised status, are also included." Approximately 850 journal and serial titles are covered.

Subscription information is available at the above web site. For example, internet access to NET for one taxonomic section is US\$25 annually. Not a bad price for those who want to keep up with the taxonomic changes of their favorite order.

Scientific Reference Resources can also be contacted by mail at P.O. Box 73674, Davis, California 95616, USA.

Updating Nomenclatural Changes in Mayflies

Along the same lines as the NET article on this page, Jean-Luc Gattolliat, Michel Sartori and I have been discussing the possibility of publishing an updated list of nomenclatural changes for mayflies each year in *The Mayfly Newsletter*. Once I provide some additional information to Jean-Luc and Michel, we will make a final decision about whether this is feasible.

If you have some ideas or comments about this possibility, let one of us know.

Publications on Mayflies

Australian Leptophlebiidae

John Dean has just written *Preliminary Keys for the Identification of Australian Mayfly Nymphs of the Family Leptophlebiidae*. This was published by the Cooperative Research Centre for Freshwater Ecology as Identification Guide No. 20. Copies may be purchased from the Cooperative Research Centre for Freshwater Ecology, Murray-Darling Freshwater Research Centre, P.O. Box 921, Albury, 2640, AUSTRALIA, phone 0260582300, fax 0260431626.

VIth Proceedings/World Catalog

St. Lucie Press recently advertised two publications of interest to ephemeropterists. The first is *Overview and Strategies of Ephemeroptera and Plecoptera*, edited by J. Alba-Tercedor and A. Sanchez-Ortega. This book includes the proceedings of the VIth International Ephemeroptera Conference and the Xth International Symposium on Plecoptera held in 1989 in Granada, Spain. Refer to catalog no. SLSC12, ISBN 1-87774-308-9, US\$110.

The other is *Mayflies of the World: A Catalog of the Family and Genus Group Taxa* by Michael D. Hubbard. Refer to catalog no. SLSC10, ISBN 1-87774-306-2, US\$59.95.

In North and South America, Asia, Australia, and New Zealand, contact St. Lucie Press at 2000 N.W. Corporate Boulevard, Boca Raton, Florida 33431-9868 USA; inside the continental US: phone 1-800-272-7737, fax 1-800-374-3401; outside the continental US: phone 1-561-994-0555, fax 1-561-998-9114; email orders@crcpress.com. In Europe, Middle East and Africa contact CRC Press UK, Pocock House, 235 Southwark Bridge Road, London SE1 6LY, ENGLAND, phone (44) 171-407-7355, fax (44) 171-407-7336, email enquiries@uk.crcpress.com. The web address is www.crcpress.com.

The Biology of Mayflies

E. W. Classey Ltd. recently indicated that a copy of the original edition of Needham et. al (1935) *The Biology of Mayflies* was available for £75, but it is no longer available. For inquiries, contact them at P.O. Box 93, Faringdon, Oxon SN7 7DR, United Kingdom, phone 01367 244700 (international +44 1367 244700), and fax 01367 244800 (international +44 1367 244800). You may also check their web site at www.abebooks.com/home/bugbooks/. Their email is bugbooks@classey.demon.co.uk.

Also...

Lastly, a copy of Eaton's *A Revisional Monograph of Recent Ephemeridae or Mayflies* was listed for sale by Pemberly Books. It, too, is no longer available. However, you may request to be placed on the mailing list for their entomology catalog by contacting them at P.O. Box 334, Hayes, Middlesex, UB4 0XX, ENGLAND, phone/fax 0181 561 5494 (international +44 181 561 5494), and email ij@pembooks.demon.co.uk. Their web site is located at www.pembooks.demon.co.uk.

Mailing Lists

Earlier this year I was contacted by Swets & Zeitlinger Publishers. They wanted to distribute a brochure about their journal, *Aquatic Insects*, to the recipients of *The Mayfly Newsletter*, and they requested a copy of the mailing list to do so.

I felt that such a request was appropriate to the needs and interests of the recipients of the newsletter. Also, Swets & Zeitlinger agreed that the mailing list would not be sold, reproduced or distributed in any way and that it would only be used to distribute one brochure about their journal.

I will continue to make the mailing list for *The Mayfly Newsletter* available for appropriate requests. Other than convenors of the conferences, there have been only two requests for the list since 1990.

Research Projects

Michael D. C. Goulart

Universidade Federal de Minas Gerais, Inst. Ciências Biológicas, Depto. Biologia, Lab. Limnologia/Ecologia de Bentos, C.P. 486 31.270-901, Belo Horizonte, MG – BRAZIL, email goulark@mono.icb.ufmg.br
Michael is an undergraduate who is beginning an ecological study on mayflies in a project concerning structure, distribution and diversity of benthic macroinvertebrates in mountain rivers of Serra do Cipó, Minas Gerais State, Brazil.

Milca Petrovici

Babes-Bolyai University of Cluj-Napoca, Faculty of Biology and Geology, Department of Ecology and Genetics, Str. Clinicilor nr. 5-7, Cluj-Napoca 3400, ROMANIA, email mpetrov@hasdeu.ubbcluj.ro
Milca is beginning a second year of Ph.D. work in aquatic ecology on the structure, dynamics and production of mayflies from some of the major rivers in Transylvania.

Paiboon Getwongsa

Freshwater Biology Laboratory, Department of Biology, Faculty of Science, Khon Kaen University, THAILAND 40002, email Paiget1@kkucc1.kku.ac.th
Paiboon is a graduate student working on species diversity of mayflies in Phu Phan National Park in northeastern Thailand.

Adam Richardson

Department of Biological Sciences, Southwestern Oklahoma State University, 100 Campus Drive, Weatherford, Oklahoma 73096-3098, USA, email richardson_a@alph.swosu.edu
Adam is an undergraduate who is conducting a study of the substrate preference and seasonality of the mayflies in a sandy bottom stream in western Oklahoma.

Address Update - New, Corrections, Changes

Changes or additions to the mailing list and email addresses since the last issue are listed below. Updated addresses will be published as they become available. Please inform the editor of any changes in postal or email addresses.

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WHERE ARE THEY? I NEED THE CURRENT ADDRESSES OF THE FOLLOWING:

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Rock (not the substrate) and Roll - Mayflies U.S.A

[Editor's note: The following has been reprinted from a web site called "outer sound," <http://www.outersound.com/>.]

The Mayflies U.S.A. are a 4-piece guitar band from Chapel Hill, North Carolina, that plays noisy, melodic pop in the vein of Guided By Voices and Revolver-era Beatles. The Mayflies' combination of jittery guitars, tight harmonies, infectious hooks, and slightly skewed lyrics recalls vintage British pop informed by the unorthodox guitar sound that characterizes their hometown.

The band formed in February 1996 and began playing out and recording within weeks. Early response to the Mayflies' home 8-track recordings and energetic local live shows was extremely positive, and the band soon began playing shows throughout Virginia, the Carolinas, and Florida. By the end of 1996, the Mayflies U.S.A. had toured north Florida three times, gaining an impressive following without the benefit of a 7-inch single, a CD, or radio play.

The first Mayflies U.S.A. release, a 5-song CD EP on Washington, DC's Superhero Records, was released on April 17th and is already receiving substantial airplay on dozens of East Coast stations. Following a series of shows with Archers of Loaf, the band will tour the Southeast in June and head north in July in support of their new CD.

The Mayflies U.S.A. are David Liesegang (drums), Adam Price (bass/vocals), Matthew Long (guitar/vocals), and Matthew McMichaels (guitar/vocals).

Web Sites for Ephemeropterists

(note new web addresses)

Mayfly Central

[http://www.entm.purdue.edu/entomology/
research/mayfly/mayfly.html](http://www.entm.purdue.edu/entomology/research/mayfly/mayfly.html)

Ephemeroptera Galactica

<http://168.223.36.3/mayfly/>

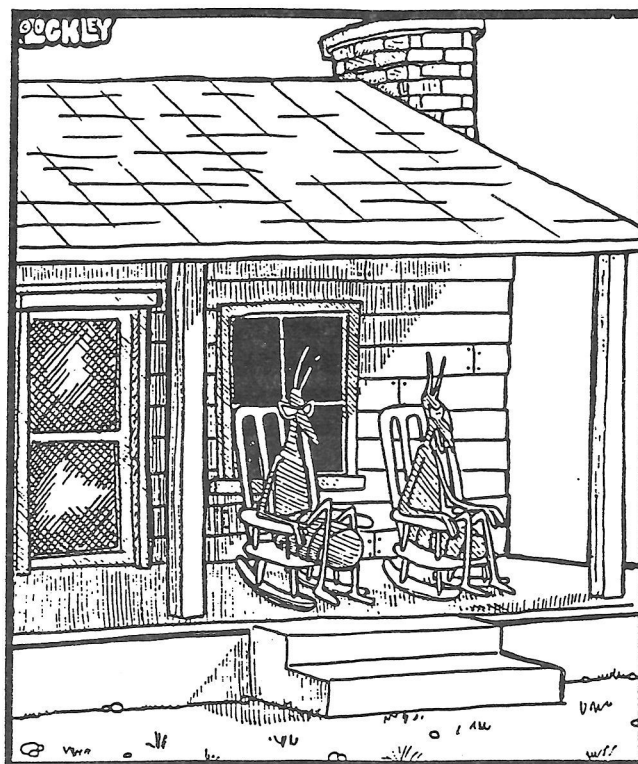
2001: A Mayfly Conference

Perugia, Italy

Elda Gaino's proposal to host the Xth International Conference on Ephemeroptera and the XIVth International Symposium on Plecoptera in Perugia, Italy, was accepted earlier by both governing bodies.

She informs us that the most favorable date for this next joint meeting is 5-10 or 5-11 August 2001.

The Mayfly Newsletter is the official newsletter of the International Conferences on Ephemeroptera and is published twice a year to facilitate communication among ephemeropterists. Subscriptions to the *Newsletter* are free. To place your name on the mailing list or to contribute information for the next issue, contact Peter M. Grant, editor, *The Mayfly Newsletter*, Department of Biological Sciences, Southwestern Oklahoma State University, 100 Campus Drive, Weatherford, Oklahoma 73096-3098 USA, phone (580) 774- 3294, FAX (580) 774-3795, email grantp@swosu.edu. This publication was authorized by the Dean of Arts and Sciences and was printed at a cost of \$125.00 for 500 copies.



DANGED YOUNG MAYFLIES... WHEN I WAS THEIR AGE I HAD IT ROUGH... OF COURSE THAT WAS ONLY THIS MORNING...