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The Mayfly Newsletter

Peter M. Grant

Southwestern Oklahoma State University, peter7grant@gmail.com

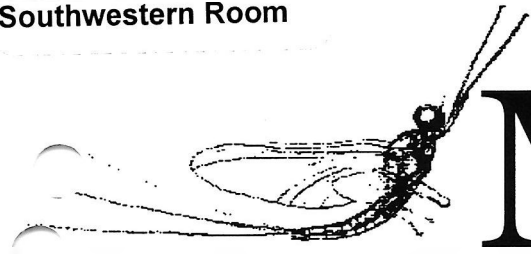
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THE MAYFLY NEWSLETTER

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Viaggio Italiano

The 2001 International Joint Conference, combining the Xth International Conference on Ephemeroptera and the XIVth International Symposium on Plecoptera, began the evening of 5 August in Perugia, Italy, with registration and a reception. Registrants were welcomed with a wonderful assortment of gifts, information, and supplies to assist them during their time in Perugia.

The meeting was formally opened on Monday morning when Elda Gaino, conference convenor, presented her opening remarks. Elda identified those sponsoring the meeting and thanked them. Five academic and government officials then welcomed the participants to Perugia. The participants then toasted the opening of the conference with a drink.

Next, John Flannagan read the obituaries of our departed colleagues: You Da-Shou (Peoples Republic of China), Mick Gillies (England), and Bill Peters (USA). One minute of silence was held to remember these colleagues.

The invited speaker, R. Dallai of the University of Siena, then presented an interesting lecture on "The Sperm Structure of Paleoptera Revisited." The first set of oral presentations on behavior was chaired by John Brittain.

The conference then stopped for lunch, which, for many participants, was an event in itself. Four or more courses of deliciously prepared food, delectable wines, wonderful conversation, all spread over a 90 minute period. Our senses were overwhelmed during lunch, so it was good planning by Elda to give us enough time to rest from this sensory overload before the afternoon session!

The afternoon paper session continued with behavior as a theme as did the poster papers. The mayfly committee held a business meeting that evening (see p. 3).

On Tuesday, Tomas Soldan opened the oral presentations with his paper entitled, "Current Knowledge on the Order Ephemeroptera: Present State and Future Perspectives." The main theme of the oral and poster presentations was systematics, taxonomy and phylogeny of Ephemeroptera. Michael Hubbard chaired the oral presentations. A group photo was taken just before lunch.

That afternoon, Michel Sartori chaired the session on life history and reproduction, which was also the theme of the poster presentations. The auction, a fundraiser for the travel scholarship fund, began that afternoon, too.

On Wednesday morning, the participants left for an all day

field trip. Two stops were made to collect in the River Nera and the River Sordo. We also stopped for lunch in Castelluccio di Norcia, which had a spectacular view of the Pian Grande. During the field trip, Elda discovered that aquatic entomologists respond quickly to the sound of a bell, and she used that knowledge effectively to herd us back into the buses at the appropriate times.

For most evenings, the participants were on their own to locate a place to dine. Those with whom I ate dinner found it enjoyable to walk around Perugia (always uphill!) to locate a place to eat.

Also, while the entomologists were attending the presentations, their guests were on tours of area churches, museums, and shops, absorbing the history and culture of Perugia.

Peter Zwick began the Thursday session with his talk, "Plecoptera Research Today: Questions to be Asked in the New Millennium." Claudio Froehlich chaired the morning session on systematics, taxonomy and phylogeny of Plecoptera, which was also the poster presentation theme that morning. Before lunch, the participants voted on whether they preferred an integrated international conference (with stonefly and mayfly papers mingled, as during the Perugia conference) or a back-to-back conference, where one conference would be followed by the other. (See business report on p. 4 for outcome of vote.) After lunch, the theme for oral and poster presentations was biogeography, biodiversity and ecology. Carlo Belfiore chaired the oral presentations.

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The auction was completed that evening (see article on this page) and a joint business meeting of the mayfly and stonefly committees was held at the end of the day (see p. 4).

Friday morning began with the continuing theme of biogeography, biodiversity and ecology for oral and poster presentations. Ken Stewart chaired the morning session and Javier Alba-Tercedor the afternoon session.

On Friday evening, the social dinner was held at a former monastery. First, the participants were treated to a tour of the monastery's medieval garden. We then entered the monastery and gathered in the courtyard for drinks and hors d'oeuvres. The meal was absolutely fabulous! A local group of folk dancers provided entertainment.

During the evening ceremony, a number of presentations were made. Jan Peters and Eva Gillies were each presented a plaque by Elda to commemorate the link between the past and the present. Elda thanked the staff who assisted her with the conference and colleagues who chaired sessions. The best poster award, selected by a vote of the conference participants, was presented by Tomas Soldan to Terry Hitchings and Arnold Staniczek for their poster, "Taxonomy and Phylogeny of the New Zealand Mayfly Genus *Nesameletus*." The two travel scholarship recipients were announced – Roman Godunko (Ukraine) and Dr. Koji Tojo (Japan). Tomas Soldan, representing the mayfly committee, presented a plaque to Elda for organizing the conference. On behalf of both committees, certificates were presented to those who assisted Elda.

Peter Zwick pointed out how well Elda "wove together the two conferences" and presented her with a gift of specially woven cloth from Schlitz, Germany. Francene Stewart presented Elda with an engraved bell. Also, Sylvester Ogbogu gave Elda a gift from Nigeria for organizing the conference.

The youngest participant at the conference was Pietro Salerno. Patricia Flannagan and Eva Gillies presented a certificate to all of the children who attended.

Next, various "awards" were presented by John Flannagan. These ranged from "Tallest Italian in a Pink Shirt" (Carlo Belfiore) to "Able to Do the Greatest Number of Different Jobs At the Same Time" (Silvia Gaino).

Lifetime achievement awards for the advancement of the study of Plecoptera were presented to Carl Alberto Ravizza

and Elisabetta Ravizza Dematteis (Italy) by Peter Zwick and to Ken Stewart (USA) by Stan Szczytko.

Short presentations were made by those who submitted proposals to host the next conference in the USA – Stan Szczytko for Jack Stanford (Montana) and Pete Grant (Oklahoma). Ballots were distributed and the participants then voted for the next conference site.

The dinner ended at approximately 1:40.

On Saturday, the last day of the conference, Elda chaired the oral presentations on physiology, morphology and ultrastructure. Poster papers continued this theme.

At the end of the conference, several individuals provided concluding remarks. Tomas Soldan reported that the

participants chose the Flathead Lake Biological Station in Montana (USA) as the site of the next conference. Both committees will ask Jack Stanford to organize the 2004 conference. [For more information about the station, visit its web site at <http://www.umt.edu/biology/flbs>.]

Tomas provided concluding remarks on behalf of the mayfly committee. He thanked Elda and her staff for this successful conference. Establishing personal relationships among scientists all over the world is important and this

goal was reached at the conference. This meeting was also characterized by a large number of people coming from countries outside Europe and North America. Moreover, many young scientists were in attendance.

Peter Zwick provided concluding remarks for the stonefly committee. He also thanked Elda and her staff. Peter noted that many people came from all over the world and that boundaries no longer seem to be a problem. The opportunity to meet young and "less young" colleagues is always stimulating. He asked presenters to submit a paper for the proceedings. Even though these proceedings do not have a high impact index, they nevertheless are a valuable tool for all stonefly and mayfly workers. He acknowledged the organizers who waived registration fees for two young stonefly workers. Peter stressed that we, mayfly and stonefly scientists, need to stand together.

Elda concluded the meeting by indicating that it was a great challenge to organize this meeting, but it brought her great satisfaction. She hopes that the spirit of collaboration will continue and she looks forward to see all of us in Montana in 2004.

Auction Results

The first auction to benefit the William L. Peters Scholarship Fund was held during the Perugia conference. The purpose of this fund is to provide travel scholarships for individuals to attend mayfly conferences.

At least 19 items were donated prior to the conference and many more were donated during the conference.

The auction raised Can\$ 2301.80. Add to that the sale of past proceedings and direct donations, Can\$ 2218.00, and the total raised adds up to a whopping Can\$ 4519.80!

Everyone who contributed, whether by donating items for the auction, bidding in the auction, or providing support are to be congratulated on an excellent job. With the success of this auction, the Permanent Committee hopes to make this a traditional event at future conferences.

Minutes of the Business Meetings at the International Conference

Business Meeting - Mayfly Committee 6 August 2001

The meeting was called to order by John Flannagan, acting chair, at 18:14. Committee members attending were J. Alba-Tercedor, J. Brittain, E. Dominguez, J. Flannagan, E. Gaino, P. Grant, M. Sartori, T. Soldan, and guest P. Zwick.

The main topic of discussion was the planning for the international meetings.

Should there be a joint committee, composed of mayfly and stonefly workers, to organize the conferences or should each committee organize its own portion of the conference? With an additional organizing committee, there would now be three committees (mayfly, stonefly, joint) that would have to coordinate activities and information. This new committee would also need a set of agreed upon guidelines. This question will be addressed further at the joint business meeting on Thursday.

One option was for each committee to take turns hosting a conference.

The members agreed to continue combined conferences. The primary question was whether the international meeting should be a joint meeting (i.e., one conference immediately followed by the other conference as was done in Argentina) or an integrated meeting (i.e., combined papers as is being done at this conference in Perugia).

Those in favor of a joint conference pointed out that integrated meetings would be more expensive for the participants (it would require them to attend the entire week). Also, a joint conference would be smaller than an integrated conference, thus being more intimate and fostering more interactions among the participants. These types of meetings would also make it easier for the groups (mayfly and stonefly) to maintain their traditions which are important for some participants.

Those in favor of an integrated meeting pointed out the overlapping interests of ephemeropterists and plecopterologists (e.g., biology, ecology, biogeography). Taxonomic interests are less overlapping, so perhaps the beginning of an integrated conference could focus on stonefly systematics while the end could focus on mayfly systematics. Another option was to present mayfly and stonefly systematics at concurrent sessions.

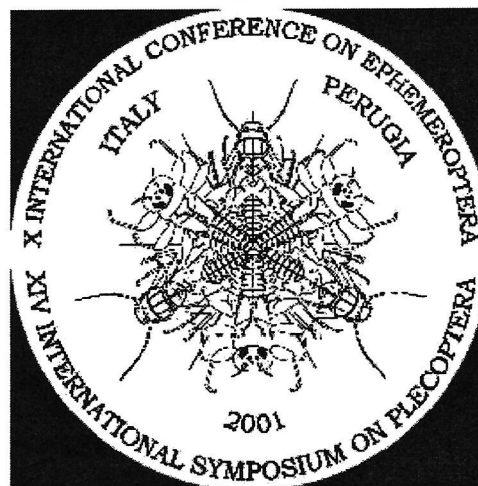
It was pointed out that regardless of meeting format (integrated or joint), the previously recommended and accepted strategy was to at least combine similar events (e.g., banquet, guest speakers, field trip) to reduce cost for the participants and simplify organization for the convenor.

It was suggested that the participants at the Perugia conference vote on their preference for an integrated or a

joint conference. Tomas will meet with a representative of the stonefly committee to draw up a ballot for the participants to indicate their preference.

A joint meeting of stonefly and mayfly committees will be held Thursday evening to make a final decision on these matters.

The next order of business was to elect a new chair of the mayfly committee. John Flannagan listed the responsibilities of the chair: provides assistance to the conference convenor, writes letters of invitation for conference participants when necessary, appoints members of subcommittees, speaks at



conferences and provides a summary of the conference, has experience organizing a previous conference, maintains traditions, and serves for six years.

Tomas Soldan was nominated for the position by John Flannagan. This was seconded by Javier. The committee approved the nomination.

Next, the committee discussed whether a vice chair should be elected to assist the chair and fill in when the chair is not available. The committee concluded that adding this position was not necessary – there is sufficient expertise on the committee to offer assistance to the chair. Also, one member of the committee would certainly be willing to fill in for the chair if necessary.

It was then suggested that the committee elect a secretary who would be responsible for taking minutes of committee meetings, submitting these minutes for publication in *The Mayfly Newsletter*, and co-signing the tax form for the committee's scholarship fund. Peter Grant was nominated and elected to this position.

The committee agreed to hold a joint meeting with the stonefly committee on Thursday, after the presentations.

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The meeting adjourned at 20:16.

Joint Business Meeting – Mayfly and Stonefly Committees 9 August 2001

The meeting was called to order at 19:25. Members of both committees were in attendance.

The site of the 2004 conference was discussed first. Two proposals were submitted to host this conference in the USA – one by Jack Stanford (communicated by Stan Szczytko) in Montana and the other by Peter Grant in Oklahoma. The relative merits of both proposals were discussed. August was suggested as a better time for our European colleagues to attend a conference.

The committees found both proposals acceptable and so it was agreed that Stan and Pete will each present a 5 minute summary of the proposals during the banquet on Friday evening, after which the participants will vote on their preference. Elda will make additional copies of the two proposals for review and will also make ballots.

Next, the site of the 2007 meeting was discussed. Two preliminary proposals were submitted: Yasuhiro Takemon and Shigekazu Uchida for Japan and Helen Barber-James and Elira Haigh for South Africa. There was also the possibility that proposals may be submitted eventually to hold the conference in France or Austria. Several concerns were identified for the submitted proposals, so it was suggested that representatives of the two committees meet with the authors of the proposals to inform them of the committee's concerns. Peter Zwick will meet with Yasuhiro Takemon and Michel Sartori will meet with Helen Barber-James. The authors will have the option of submitting official proposals to both committees one month before the 2004 conference.

The committees agreed that there should be a set of guidelines for those submitting proposals to host conferences. Conferences should be held throughout the world. As a suggestion, perhaps the committees could alternate hosting these conferences, although this is not a rigid rule. Peter Zwick, Michel Sartori and Peter Grant will meet to compile a list of guidelines for those who plan to submit proposals in the future. These guidelines will be published in the spring/summer 2002 issues of *Perla* and *The Mayfly Newsletter*.

Regarding the type of conference, integrated vs. joint, the conference participants voted 32 for joint conferences and 26 for integrated conferences. Since there was not a large difference in this vote, it was suggested that the meeting format be left up to the convenor. Several of the mayfly committee members disagreed, arguing that the majority vote should be honored.

The final topic was whether we should continue to publish the proceedings of these conferences. Concerns with the proceedings included difficulty with finding and working with publishers, cost of publication, variable quality of

submitted manuscripts, and the fact that these proceedings have a low impact factor. Advantages of the proceedings were that we can produce a document that works best for us, we are capable of maintaining high quality with appropriate editing, they contain a large amount of current information, and they have a high impact factor among those who study mayflies and stoneflies. It was agreed that we continue to publish the proceedings.

The meeting adjourned at 21:20.

Aquatic Insects of Nepal Catalogue

Dr. Subodh Sharma, Department of Biological and Environmental Sciences, Aquatic Ecology Center, Kathmandu University, Dhulikhel, P. O. Box 6250, Kathmandu, NEPAL, phone 00977 11 61399, 61237 (Res), fax 00977 11 61443, email sharmaku@yahoo.com

The Nepalese mayflies are very poorly known to me as compared to other groups of insects. Only the species in the families Baetidae, Ephemerellidae, Ephemeridae and Heptageniidae are listed in this catalogue. A huge collection of larvae are with Prof. Otto Moog at the Department of Hydrobiology, University of Agricultural Sciences, Vienna. Many of these specimens are likely new species, as identified by me under the supervision of Dr. H. Bauernfeind at the Natural History Museum, Vienna.

As reported by Hubbard and Peters (1978), in *A Catalogue of the Ephemeroptera of the Indian Subregion*, contributions on the Ephemerellidae from Nepal have been done by Ueno (1955), Allen and Edmunds (1963), and Allen (1971, 1973). Most of the taxonomic works on the Nepalese fauna have been carried out by researchers abroad. Probably, insects from Nepal, as described by Hope in *Synopsis of Nepal Insects* published in 1831 (Atkinson, 1980), is one of the earliest contributions. Unfortunately, the literature on Nepalese fauna (aquatic or terrestrial) is highly scattered.

The present knowledge of Nepalese Ephemeroptera has been made possible due to Japanese Himalayan Expeditions in 1952-53 and 1960, Yugoslavian Nepal Expedition in April/May 1978, and the results of Himalaya Expeditions of J. Martens in 1983-84. Similarly, the materials collected by Prof. H. Janetschek, in a Research Scheme Nepal Himalaya Expedition-1961, have been the basis for many publications all over the world.

I am involved in compiling a bibliography and catalogue of aquatic insects recorded from Nepal. In the Ephemeroptera chapter, only 29 species are recorded: Baetidae (1), Ephemerellidae (8), Ephemeridae (1), and Heptageniidae (19). I am in the process of updating the aquatic insects of Nepal catalogue. Therefore, all who are working on the mayflies of Nepal are requested to send a report of new records to the me at the above address. Reprints of any new species described or materials examined from Nepal will be extremely helpful. When it is sufficiently completed, the catalogue will be available on the Kathmandu University web site.

I am looking forward to your cooperation.

Phylogeny of the Ephemeroptera of the World: A Call for Specimens

T. HEATH OGDEN¹, W. P. MCCAFFERTY² AND MICHAEL F. WHITING³

¹Department of Zoology, Brigham Young University,
Provo, Utah 84602, USA, email heath_ogden@byu.edu

²Department of Entomology, Purdue University, West Lafayette, Indiana 47907, USA, email
pat_mccafferty@entm.purdue.edu

³Department of Zoology and Bean Life Science Museum, Brigham Young University,
Provo, Utah 84602, USA, email Michael_whiting@byu.edu

Introduction

Until recently, the phylogeny of mayflies was poorly known, and classifications did not closely reflect phylogenetic relationships (Landa, 1973; McCafferty and Edmunds 1976; and McCafferty and Edmunds, 1979). Recent cladistic studies based on morphology have provided resolution in some ephemeropteran groups (McCafferty, 1991; Bae and McCafferty, 1995; McCafferty, 1997; and McCafferty and Wang, 2000), however, there has yet to be a comprehensive analysis of familial level relationships.

We have begun an exciting, novel, and much needed project to address the higher-level phylogeny for Ephemeroptera using DNA sequence information combined with morphological data. Our goal is to sequence a wide range of exemplar taxa for multiple genes, combine this information with morphological data, and use these data to gain new insights into ephemeropteran systematics and evolution.

The section below (Phylogenetic Questions) briefly describes some views of the current state in ephemeropteran systematics and some questions that we wish to address with our study.

A critical component of this research is to obtain a wide range of ephemeropteran taxa, and this project will not succeed without the collaboration of investigators throughout the world. Consequently we are seeking assistance from any investigators who can provide us with material for DNA analysis, and we are also seeking input on interesting questions in ephemeropteran systematics. Material can be collected into 95-100% ethanol, and specimens up to 5 years provide good results. In addition, we will organize the material into the first tissue bank of Ephemeroptera, where specimens will be stored at -80° C. All tissue will be available for any future studies and collaborations. We currently have tissue banks established for Plecoptera, Mecoptera, Siphonaptera, Strepsiptera, Phasmida, and Dermaptera, among others.

Phylogenetic Questions

Ordinal Position

The phylogenetic position of Ephemeroptera among the other orders has been controversial, and two main theories exist: (1) placement as the sister group to Odonata

(=Paleoptera) and (2) placement as the most basal pterygote lineage.

The monophyly of Paleoptera has been proposed based on the following characters: (1) venation with prominent Y-shaped intercalaries; (2) MA braced shortly with RP, CuA braced shortly with M; (3) RA and RP remaining separate, M always with basal stem; and (4) no anastomosis of CuP and anterior anal vein (Kristensen, 1991; Kukalova-Peck, 1991). However, these characters are not entirely convincing because of the difficulty of clearly differentiating apomorphic from plesiomorphic venation states in these taxa. Indeed, it is possible that the characters listed above merely reflect symplesiomorphic character states.

Other characters suggest that Ephemeroptera may be the most basal pterygote lineage and support the monophyly of Odonata+Neoptera: (1) the anterior articulation of the mandible is a non-permanent sliding groove and track system in Ephemeroptera, but in other pterygote lineages this articulation is more permanent; (2) subimago stage present in Ephemeroptera but absent in other pterygotes; (3) tracheation absent in arch of wing base and in posterior portion of the leg in Ephemeroptera; (4) direct spiracular musculature absent in Ephemeroptera but present in odonates and neopterans; (5) never more than one tentorial-mandibular muscle in Odonata and Neoptera, but multiple muscles in Ephemeroptera; and (6) annulated caudal filament presumably present in Archaeognatha, Monura, Zygentoma, and Ephemeroptera but absent in the remaining pterygotes (Kristensen, 1991; Kukalova-Peck, 1991; Whiting et al., 1997). In addition, molecular data suggest a paraphyletic Paleoptera (Whiting et al., 1997; Wheeler et al., 2001). The problem with at least some of these morphological characters (e.g., subimago) is that it is not clear whether these are autapomorphies for Ephemeroptera or synapomorphies for Odonata and Ephemeroptera and hence uninformative at the interordinal level. We thus consider the phylogenetic position of Ephemeroptera as still unresolved.

Familial Phylogeny

Extant mayflies are classified in 37 families and four suborders. The phylogeny of this insect order has been worked out for some groups, however the phylogenetic

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relationships of other groups are not convincing (McCafferty, 1991; McCafferty, 1991a; Tomka and Elpers, 1991; Kluge et al., 1995; McCafferty and Wang, 2000; McCafferty, pers. comm., 2001). This confusion is due, in part, to the lack of a complete matrix coded for all families. Some of the concerns we hope to address through this project are: (1) is Carapacea a separate branch or should it be included among the Pannota; (2) what are the exact branching sequences among the three other proposed suborders, in particular, is Setisura a sister group to Furcatargalia or Pisciforma; (3) is Behningiidae or Leptophlebiidae sister group to Scaphodontia; (4) could Setisura have been derived from somewhere within the Pisciforma; (5) what are the relationships among the Pisciforma; and (6) do the current classifications represent monophyletic groupings?

Conclusion

Past phylogenetic studies have provided important information on this group of insects, which have been useful in addressing a number of systematic concerns. We hope to add to this knowledge through a comprehensive molecular and morphological analysis. The increased knowledge of the phylogeny of this group could help explain other important questions, such as evolutionary history, behavior, phylogeographics, conservation, and ecological diversity. It is a bold, exciting, and novel undertaking in which we invite all to participate, bringing us to a clearer understanding of the critical and interesting relationships among Ephemeroptera.

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Mayfly Newsletter, Department of Biological Sciences, Southwestern Oklahoma State University, 100 Campus Drive, Weatherford, Oklahoma 73096-3098 USA, phone (580) 774-3294, fax (580) 774-7140, email grantp@swosu.edu. This publication was authorized by the Dean of Arts and Sciences and was printed at a cost of \$350.00 for 500 copies.

Publications on Mayflies

Bauernfeind, E. and U. H. Humpesch. 2001. *Mayflies of Central Europe (Insecta: Ephemeroptera) - Identification and Ecology*. ISBN 3-900-275-86-6. EUR 53.00. English summary, text in German, more than 500 line drawings, numerous graphs and tables.

The area covered includes Luxembourg, Belgium, the Netherlands, Germany, Austria, Switzerland, Czech Republic, and southwestern Slovakia and Hungary west of the River Danube. All species hitherto recorded from the region (141 spp.) are keyed for last instar larvae and imagines. For each genus, the number of species known so far from Europe is given as well as information concerning taxonomy, nomenclature and nearly related taxa outside the area covered. Main characters for identification (including egg chorionic structures), variability and confusing species are discussed for all families and genera as well as an annotated bibliography of taxonomic papers. Body length, length of fore wing, period of flight and short ecological notes useful for identification are provided in the keys for every species. To facilitate comparison between confusing species, drawings of similar structures have been arranged on the same plate, and important discriminating characters are indicated by arrows. Plates follow each major taxonomic grouping, (i.e., families or larger genera).

Additionally, ecological information concerning central European mayflies (larvae and adults) has been updated and summarized in a separate chapter on ecology by U. H. Humpesch. This section includes the habitats, habits and feeding behavior, egg hatching, larval growth, biomass and production, life cycles, emergence and flight periods, flight behavior and mating, fecundity and oviposition behavior as well as egg development.

For additional information, contact Ernst at vogelsammlung@nhm-wien.ac.at, Uwe at uwe.humpesch@oeaw.ac.at, or see <http://www.nhm-wien.ac.at/NHM/Verlag/bauernfeind.htm>.

Entomology and Fly Tying. Reisinger, Bauernfeind and Loidl.

In German, including more than 500 color photographs of mayflies, stoneflies, caddisflies and artificials. Contact Ernst Bauernfeind (vogelsammlung@nhm-wien.ac.at) for more information.

Guia para la determinación de los Artrópodos bentónicos Sudamericanos. Editors: H. R. Fernandez and E. Dominguez. 282 pp. Orders treated include Ephemeroptera, Trichoptera, Plecoptera, Megaloptera, Lepidoptera, Coleoptera, Diptera, Acari and Crustacea Malacostraca. Price US\$25 plus shipping. Contact Eduardo Dominguez for further information at Miguel Lillo 205, 4.000 Tucuman, ARGENTINA, fax 54-381-4248025, mayfly@unt.edu.ar.

Trends in Research in Ephemeroptera and Plecoptera Eduardo Dominguez, ed. 2001. Kluwer Academic/Plenum Publishers. ISBN 0-306-46544-2. 490 pp. EUR 156.00, USD 135.00, GBP 95.00.

These are the proceedings of the IXth International Conference on Ephemeroptera and the XIIIth International Symposium on Plecoptera, held in Tucuman, Argentina, in 1998. The latest information from Kluwer is that this book has been published and is now available for purchase. The publisher expects that conference participants will soon be receiving their personal copies in the mail.

See the publisher's website (<http://www.wkap.nl/prod/b/0-306-46544-2?a=2>) for additional information or to order a copy.

The Korean Society of Aquatic Entomology Newsletter

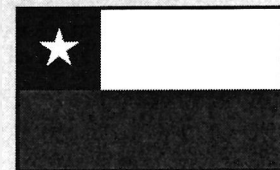
For information about this newsletter, contact Dr. Yeon Jae Bae, The Korean Society of Aquatic Entomology, Department of Biology, Seoul Women's University, 126 Kongnung 2-dong, Nowon-gu, Seoul 139-774, KOREA, phone +82-2-970-5667, fax +82-2-970-5669, email yjb@swu.ac.kr.

Proceedings of the Fourth International Conference on Ephemeroptera. V. Landa, T. Soldan and M. Tonner, eds. 1984.

Three copies of these proceedings remain, which we believe to be the last copies available. To purchase a copy, send US\$50.00 to Peter Grant, Department of Biological Sciences, Southwestern Oklahoma State University, 100 Campus Drive, Weatherford, Oklahoma 73096-3098, USA. To reserve a copy, you might want to email me first at grantp@swosu.edu.

Money earned from the sale of these proceedings will be deposited in the William L. Peters Scholarship Fund.

Chilean Mayflies



Maritza Mercado, Instituto de Zoología, Universidad Austral de Chile, Campus Isla Teja, Valdivia, CHILE, email mmo@chile.com

I want to offer my assistance to anyone who might need specimens or information on the mayflies from Chile. I can be contacted at the above address.

Taxonomy and Biodiversity Web Sites

[Editor's note: The following information was distributed on the ECOLOG-L listserve. The original source was an email from Internet Newsbrief, a weekly news service from the U. S. Environmental Protection Agency Headquarters Library. Internet Newsbrief is now defunct. Permission to reproduce this information was given as long as the following disclaimer was included: The information provided in Internet Newsbrief was correct, to the best of our knowledge, at the time of publication. It is important to remember, however, the dynamic nature of the internet. Resources that are free and publicly available one day may require a fee or may restrict access later on, and the location of items may change as menus and homepages are reorganized.]

Integrated Taxonomic Information System **<http://www.itis.usda.gov>**

The Integrated Taxonomic Information System (ITIS) is a database with reliable information on species names and their hierarchical classification. The database will be reviewed periodically to ensure high quality with valid classifications, revisions, and additions of newly described species. The ITIS includes documented taxonomic information of flora and fauna from both aquatic and terrestrial habitats. ITIS does not intend to serve as a forum for cutting-edge taxonomic classifications. Rather, ITIS is meant to serve as a standard to enable the comparisons of biodiversity datasets. It therefore aims to incorporate classifications that have gained broad acceptance in the taxonomic literature by professionals who work with the concerned taxa.

ITIS is a partnership among a number of US and international agencies: Environmental Protection Agency (EPA), National Oceanic and Atmospheric Administration (NOAA), National Museum of Natural History – Smithsonian Institution, Natural Resources Conservation Service, National Biological Information Infrastructure (NBII), Agriculture and Agri-Food Canada, and the National Commission for the Knowledge and Use of Biodiversity (Conabio). A detailed overview of ITIS is available at <http://www.itis.usda.gov/organ.html>.

Taxonomic Resources Expertise Directory **<http://www.nbii.gov/datainfo/syscollect/tred/index.html>**

A Taxonomic Resources Expertise Directory (TRED) is an integral part of the ITIS. The TRED facilitates the ITIS review process and allows those in need of more detailed information to locate appropriate taxonomic specialists. The TRED will also help to identify gaps in expertise across the range of taxonomic levels. Taxonomists will be able to enter

their expertise information for the TRED database either on the World Wide Web or through paper form.

Integrated Taxonomic Information System – Canada **<http://sis.agr.gc.ca/itis>**

This is the Canadian version of ITIS. It is maintained by the Eastern Cereal and Oilseed Research Centre (ECORC), which is one of the 19 research centers of the Research Branch of Agriculture and Agri-Food Canada that focuses on strategic and specialized research of national importance.

Integrated Taxonomic Information System – Mexico **<http://siit.conabio.gob.mx/>**

This is the Mexican version of ITIS. It is maintained by Conabio, whose mission is to coordinate conservation and research efforts designed to preserve biological resources. Conabio promotes and develops scientifically-based activities whose aim is to explore, study, protect or find a sustainable use for biological resources.

BioNET-INTERNATIONAL **<http://www.bionet-intl.org>**

BioNET-INTERNATIONAL, the Global Network for Taxonomy, is a world-wide inter-governmental initiative for capacity building in biosystematics in developing countries. BioNET-INTERNATIONAL is dedicated to enabling developing countries to achieve realistic self-reliance in the skills of identifying and understanding the relationships of the different organisms which constitute our living environment.

Global Biodiversity Information Facility **<http://www.gbif.org>**

The Global Biodiversity Information Facility (GBIF) will be an interoperable network of biodiversity databases and information technology tools that will enable users to navigate and put to use the world's vast quantities of biodiversity information to produce national economic, environmental and social benefits. The purpose of establishing GBIF is to design, implement, coordinate, and promote the compilation, linking, standardization, digitization and global dissemination of the world's biodiversity data, within an appropriate framework for property rights and due attribution. This site has a good collection of links on biodiversity (<http://www.gbif.org/frames/hotlinks.htm>).

2000 Mayfly Bibliography

[Editor's note: This bibliography was published as the Ephemeroptera portion of the 2000(2001) North American Benthological Society's (NABS) *Current and Selected Bibliography on Benthic Biology*.]

The following is a list of current publications on Ephemeroptera that have been published up to and during 2000 and have not appeared in previous NABS Bibliographies.

I would appreciate receiving a reprint or complete bibliographic reference of any article about mayflies, especially if it contains scientific names, so that it may be included in next year's bibliography. Also, I would like to be informed of any corrections or omissions in this or past bibliographies. For example, included below are the papers published in the Proceedings of the Seventh International Conference on Ephemeroptera, which I have failed to list in previous bibliographies. Suggestions are always welcome.

Please send all correspondence to Peter M. Grant, Department of Biological Sciences, Southwestern Oklahoma State University, 100 Campus Drive, Weatherford, Oklahoma 73096-3098 USA, phone (580) 774-3294, fax (580) 774-7140, email grantp@swosu.edu.

If you would like an electronic copy of this year's mayfly bibliography, simply send me a request via email. I will send this file to you as an attachment. This bibliography is also available on my website: <http://www.swosu.edu/~grantp/research.htm>.

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J W ARTHUR
7697 S COUNTY RD S
LAKE NEBAGAMON WI
54849-9154
USA

S L BALL
DEPARTMENT OF ZOOLOGY
UNIVERSITY OF GUELPH
GUELPH ONTARIO
CANADA N1G 2W1
sball@uoguelph.ca

J E BRITTAIN
FRESHWATER ECOL & INLAND FISH
LAB
THE NATURAL HISTORY MUSE-
UMS BOTANICAL GARDEN
UNIVERSITY OF OSLO
PO BOX 1172 BLINDERN
0318 OSLO
NORWAY
j.e.brittain@nhm.uio.no

C CAMARGO
TR 27 #142-77
APTO 502
BOGOTA
COLOMBIA
caro_cam@yahoo.com

B COLBURN
178 CENTER ROAD
SHIRLEY MA 01464
USA

J M ELOUARD
INSTITUT DE RECHERCHE POUR
LE DEVELOPPEMENT
BOITE POSTALE 5045
F-34032 MONTPELLIER CEDEX 1
FRANCE
Jean-Marc.Elouard@mpl.ird.fr

T FUJITANI
ENTOMOLOGICAL LAB
COLLEGE OF AGRICULTURE
OSAKA PREFECTURE UNIVER-
SITY

1-1 GAKUENCHO SAKAI OSAKA
599-8531
JAPAN
fujitani@plant.osakafu-u.ac.jp

D W GIBSON
SAN DIEGO REGIONAL WATER
CONTROL BOARD
9174 SKY PARK COURT
SAN DIEGO CA 92123
USA
gibsd@rb9.swrcb.ca.gov

R GODUNKO
STATE MUSEUM OF NATURAL
HISTORY OF NAS UKRAINE
TEATRAL'NA STR 18
79008 L'VIV
UKRAINE
museum@lviv.net

K HETH
1135 FOREST
CARTHAGE MO 64836
USA

G A HOOVER
DEPARTMENT OF ENTOMOLOGY
543 ASI BLDG PENN ST UNIV
UNIVERSITY PARK PA 16802
USA
gah10@psu.edu

M MERCADO
INSTITUTO DE ZOOLOGIA
UNIVERSIDAD AUSTRAL DE
CHILE CAMPUS ISLA TEJA
VALDIVIA
CHILE
mmo@chile.com

P ODE
9333 CLARITA CT
WILTON CA 95693-9651
USA

S S OGBOGU
DEPARTMENT OF ZOOLOGY
OBAFEMI AWOLowo

UNIVERSITY
220005 ILE-IFE
NIGERIA
sogbogu@oauife.edu.ng

J RICHTER
4936 SE 76TH AVE
PORTLAND OR 97206-4914
USA
jrichter@teleport.com

W ROCK
5109 N EAST RIVER RD
APT 1L
CHICAGO IL 60656
USA
MACHINE21M@aol.com

M P ROZO
CRA 33# 91A-46
INT 8 APT0 302
BOGOTA
COLOMBIA
maparogo@yahoo.com

S SHARMA
DEPT BIOLOGICAL AND ENVI-
RONMENTAL SCIENCES
PO BOX 6250 KATHMANDU UNIV
DHULIKHEL
NEPAL
sharmaku@yahoo.com

W T THOENY
SOBRAN INC C/O USEPA
26 WEST MARTIN LUTHER KING
DRIVE
CINCINNATI OH 45268
USA
thoeny.william@epa.gov

K TOJO
BIOLOGICAL SCIENCES UNIVER-
SITY OF TSUKUBA
TENNOUDAI 1-1-1 TSUKUBA
305-8572 IBARAKI
JAPAN
tojo@biol.tsukuba.ac.jp

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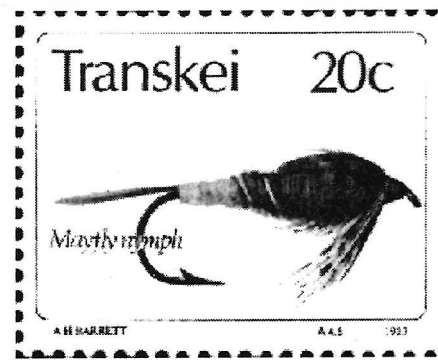
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X TONG
COLLEGE RES & ENVIRONMENT
S CHINA AGRICULTURAL UNIV
GUANGZHOU 510642
GUANGDONG
PEOPLES REPUBLIC OF CHINA
xtong@scau.edu.cn

E R TOOT
1811 KALE ADAMS RD SW
WARREN OH 44481-9781
USA

R D WALTZ
IN DEPT NAT RES DIV ENTOMOL
& PLANT PATHOLOGY
402 WEST WASHINGTON ST
ROOM W290
INDIANAPOLIS IN 46204-2649

USA
bwaltz@dnr.state.in.us

N C WATANABE
FACULTY OF AGRICULTURE
KAGAWA UNIVERSITY
2393 IKENOBE MIKI KITA-GUN
KAGAWA 761-0795
JAPAN
naoshi@ag.kagawa-u.ac.jp

D U YUZHOU
DEPT PLANT PROTECTION AND
INST APPLIED ENTOMOL
AG COLLEGE YANGZHOU
UNIVER YANGZHOU
JIANGSU 225009
PEOPLES REPUBLIC OF CHINA
yzdu@mail.yzu.edu.cn

Address Unknown

K EDELSTEIN
DEPT NATURAL RESOURCES
106 FERNOW HALL
CORNELL UNIVERSITY
ITHACA NY 14853-3001
USA

M STEINER
THE NATURE CONSERVANCY
201 DEVONSHIRE ST 5TH FLOOR
BOSTON MA 02110-1402
USA

Deceased

W DOWNS
10953 S BEACH DRIVE NE
BAINBRIDGE ISL WA 98110
USA