Newsletter of the SOUTHWEST ASSOCIATION OF FRESHWATER INVERTEBRATE TAXONOMISTS

Greetings SAFIT members,

Pretty soggy up here on the North Coast but should be a good year for the bugs. Is anyone out there including annual precipitation in their bioassessment analysis? Member input to the STE is always welcome and encouraged. We also continue to solicit material that may be useful to membership to include in the newsletter, including photos. If anyone has photos of interesting collecting sites, bugs, or anything else related – please send them in.

Have a job opening that you want to announce, or are looking for a job? Let SAFIT know in the Newsletter! Looking for specimens of a certain species or a literature reference? Need material for research or comparative purposes? Let your colleagues know in the SAFIT Newsletter! Want a workshop on a particular group of organisms? Have references to sell trade or share? Looking for a collecting partner? Put it here in the SAFIT Newsletter! All appropriate requests, queries, non-commercial advertisements and announcements will be considered, and are free to the SAFIT membership.

Thanks!
Jon Lee, Editor

ANNOUNCEMENTS
SAFIT MEETINGS

The board of directors meets via conference call on the 3rd Friday of the month. Please contact one of the officers if you have anything you want on the Board of Director's Meeting agenda. The contact information for the officers is at the end of the Newsletter.

OTHER UPCOMING MEETINGS AND EVENTS

2011 California Aquatic Bioassessment Workgroup. The next CABW meeting will be 9 and 10 November 2011 at the same location (as recent meetings) on the UC Davis campus so put it on your calendar. There will be a mini-workshop in the morning of the 9th on examining targeted or point-source bioassessment data; however, none of the presentations are confirmed at this date. Please let me know if you have any suggestions on topics or speakers.

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NABS ANNUAL MEETING 2011: RESPONDING TO THE GLOBAL WATER CRISIS.
Rhode Island Convention Center, Providence, Rhode Island, USA, May 22 – 26, 2011. The NABS Technical Issues Committee will be hosting the 13th annual taxonomy fair. Bring along those tricky specimens to the meeting and get help with identifications by leaders in the field... all for FREE! We have an excellent panel of experts this year (please see the list below). So, bring your bugs and prepare those specimens on your slides! Click here http://www.benthos.org/Annual-Meeting/2011-Providence/Workshops.aspx for more information (including other workshops).

Taxonomy Fair – Providence, Rhode Island

Taxonomist	Taxonomic Group	Representing
Gail Corkum	Taxonomic Certification Program	Acadia University
Bill Crouch	Diptera (Chironomidae)	Fish and Wildlife Service
Karen Gaines	Odonata	University of New Mexico
Don Klemm	Hirudinea	US Environmental Protection Agency
Tracy Morman	Aquatic Coleoptera	North Carolina DEHNR
Dan Pickard	Mayflies	California Department of Fish and Game
Christopher Rogers	Crustacea	Kansas Biological Survey at Kansas University
Dave Ruiter	Caddisflies	Unaffiliated
Ken Stewart	Stoneflies	University of North Texas, Dept of Biological Sciences
Rebecca Winterringer	Mollusca (Unionidae)	Ecological Specialists, Inc.
Mark Wetzel	Oligochaetous Clitellata	Illinois Natural History Survey

If you have any questions, feel free to contact me, Dave Feldman (dfeldman@mt.gov).

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EMPLOYMENT OPPORTUNITIES

Please contact the editor if you would like to post on an employment opportunity.

FIELD & LAB

A feature in each Newsletter issue exploring an aspect of aquatic macroinvertebrates beyond sample processing that may be beneficial to members. Contact the editor to contribute or comment.

Detecting invasive aquatic species through ambient assessment programs

by

Raphael Mazor

The New Zealand mudsnail (*Potamopyrgus antipodarum*) is one of the most invasive freshwater invertebrates in California, generating great alarm at its spread throughout the state. It was first discovered in the Snake River, Idaho and populations are known in Putah Creek in the Central Valley, the Owens River, and a number of North Coast locations. *P. antipodarum* is a particularly alarming invader because of its habit of spreading into otherwise undisturbed areas, where it can dominate the benthic communities to the exclusion of other taxa. Bioassessment samples from infested reaches may contain over 70% *P. antipodarum*. As a parthenogenic livebearer, invasions can occur spectacularly, with reported densities of over 500,000 per m^2 (Hall et al., 2006).

The stream monitoring program of the Stormwater Monitoring Coalition (SMC) provides an opportunity to assess the extent of this invader in southern California streams—a region where it is known to have been a problem. Prior to 2009, targeted sampling by California Department of Fish and Game, as well as mapping efforts by the Santa Monica Bay Restoration Commission, identified *P. antipodarum* in several tributaries of Malibu Creek and in coastal streams along Santa Monica Bay.

In 2009, the SMC sampled 121 sites in southern California perennial wadeable streams (2^{nd} order and higher). We detected *P. antipodarum* in 8 of these samples. Because these sites were part of a probabilistic study design, we can estimate the true extent of this organism at 3%, or 50 km (± 16 SE) of stream-length in the region. *P. antipodarum* were more pervasive in urban streams (6% ± 2 SE) than undeveloped (0.3% ± 0.3 SE) streams.

All 8 sites were found within two watersheds: Santa Monica Bay in Los Angeles County and the San Juan Creek watershed in Orange County. Within the Santa Monica Bay watershed, which includes Malibu Creek, infestations were estimated at 28 km (± 9 SE)

of stream-length; within the San Juan watershed, infestations were estimated at 20 km (± 11 SE).

At two sites (one in each watershed) relative abundances were very low (<5%); however, relative abundance exceeded 40% at the other 6 sites, with a maximum of 75% at one site in the Santa Monica Bay watershed. The weight-adjusted mean percent among all samples from infested areas was 47.6%. Scores for the Southern California Index of Biotic Integrity (IBI) were poor or very poor at all these sites, with scores ranging from 9.2 to 36.4.

These estimates only apply to the target population of streams of the SMC program (that is, perennial, wadeable streams that are 2nd order and higher). The extent of *P. antipodarum* invasion in 1st order streams remains unknown. Furthermore, although *P. antipodarum* cannot tolerate drying, they are able to persist in standing pools or other wet refugia in non-perennial stream reaches.

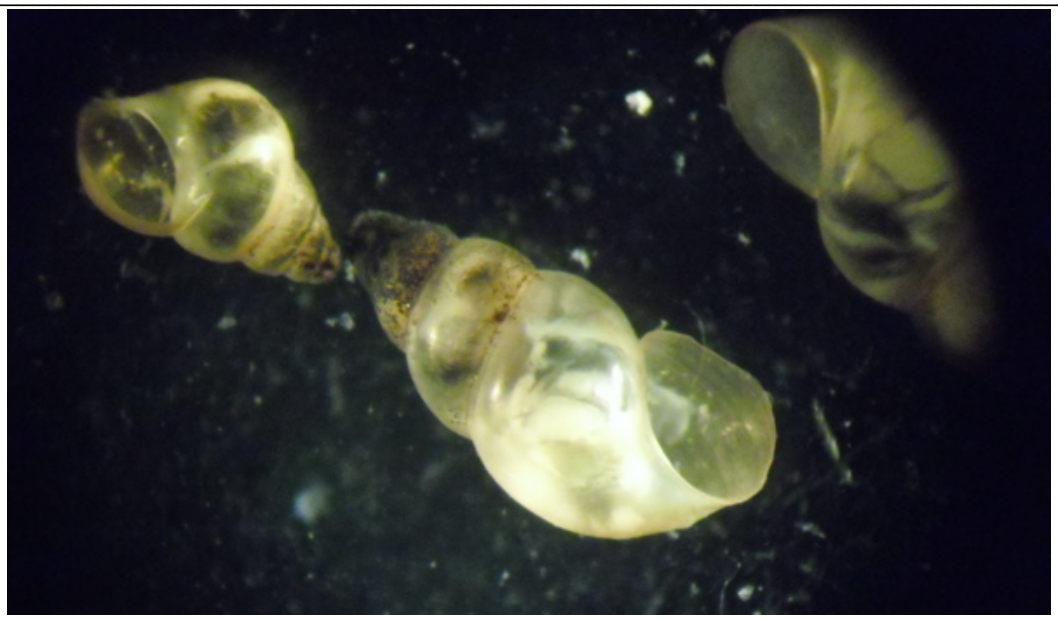
Probabilistic bioassessment programs like the SMC can effectively monitor the extent and spread of non-native species. In addition to mud snails, data collected by the SMC can assess the distribution of other invasive invertebrates (like zebra mussels), or invasive riparian plants (such as *Arundo* or *Tamarix*). Directed mapping, such as the studies conducted by the Santa Monica Bay Restoration Commission, will always provide a better assessment of the extent of exotics, and with greater spatial resolution. However, these efforts are too intensive for application across large regions, like Southern California. Therefore, ambient surveys provide an opportunity for detecting the spread and assessing the distribution of invasive species in large areas.

Despite the concern about the spread of *P. antipodarum* in California, the subject remains poorly studied, with few published articles on this subject in most bibliographic databases. A recent article by SAFIT member Dave Herbst (Herbst et al., 2008) examined ecological limits to *P. antipodarum* populations in the Owens River.

For more information on the biology of *P. antipodarum*, the University of Montana maintains an excellent website, as well as a database of known records for this species at http://www.esg.montana.edu/aim/mollusca/nzms/. New observations can be reported at this website. Information on preventing the spread of invasive species, and on proper gear decontamination methods can be found at http://www.swrcb.ca.gov/water_issues/programs/swamp/ais/decontamination.shtml. Information on the SMC monitoring program can be found at http://socalsmc.org/, or by contacting Raphael Mazor at raphaelm@sccwrp.org.

Hall Jr., R.O., M.F. Dybdahl, and M.C. Vander Loop. 2006. Extremely high secondary production of introduced snails in rivers. Ecological Applications 16:1121-1131.

Herbst, D.B., M.T. Bogan, and R.A. Lusardi. 2007. Low specific conductivity limits growth and survival of the New Zealand Mud Snail from the Upper Owens River, California. Western North American Naturalist 68:324-333.



Potamopyrgus antipodarum specimens from southern Orange County samples collected in 2010 as part of the SMC program. Photograph and determination by Wendy Willis.

Map of *P. antipodarum* observations from the first year of sampling by the Stormwater Monitoring Coalition. The SMC region extends from the Mexican Border through Ventura County. The two watersheds where mud snails (i.e., Santa Monica Bay and San Juan Creek) were detected are highlighted.

Miscellaneous bug notes (anecdotal notes, including distributional records in the SAFIT region, which may be helpful to SAFIT members). To make contributions or comments contact the editor: jlee@humboldt1.com.

Some spring creek Simuliidae (by Jon Lee). Spring creek BMI samples are often missing in bioassessment surveys; therefore some interesting critters are missed. While attempting to collect *Paracapnia* larvae in spring creeks in northern California (pictures below) some infrequently collected (at least in my experience) black fly larvae were found in the benthic samples. These included (my determinations not confirmed by a specialist): *Tlalocomyia andersoni* Currie, Adler & Wood and *Greniera humeralis* Currie, Adler & Wood in the same sample; and *Twinnia* sp. and *Stegopterna xantha* Currie, Adler & Wood, as well as *Prosimulium secretum* Currie, Adler & Wood in the same sample. Although *Prosimulium* turns up fairly regularly and *Stegopterna* occasionally I had never seen the other three genera. *Twinnia* is particularly distinct in lacking labral fans while *Tlalocomyia*, *Greniera* and *Stegopterna* all have a trilobed appearing hypostoma. Currie et al. (2004) do a great job (in my opinion) treating the family Simuliidae; including keys to adults, pupae and larvae, many illustrations, and information and distribution maps for each species.

Adler, P.H., D.C. Currie and D.M. Wood. 2004. The black flies (Simuliidae) of North America. Cornell University Press, 941 pp.

Capnia fialai habitat.

Paracapnia baumanni habitat where *Tlalocomyia* and *Greniera* were collected.

Paracapnia humboldta habitat.

Overlooking a portion of the Willow Creek watershed, Humboldt County, CA.

LATEST LITERATURE

If you know of any literature or if you yourself have published any papers of interest to the SAFIT membership, please send copies or the citations to Brady Richards (arichards@csuchico.edu) for inclusion in the next issue of the SAFIT Newsletter. Thanks!!

Asterisk (*) indicates author is a SAFIT member.

Mollusca

Hershler, R., H. P. Liu, and J. J. Landye. 2011. Two new genera and four new species of freshwater cochliopid gastropods (Rissooidea) from Northeastern Mexico. Journal of Molluscan Studies 77:8-23.

Hovingh, P. 2011. Distribution of a unique limpet (Gastropoda: Ancylidae) in the Colorado River Drainage Basin, Western North America. Western North American Naturalist 70:508-515.

Crustacea

Aguilar, A. 2011. Weak phylogeographic structure in the endemic western North American fairy shrimp *Branchinecta lynchi* (Eng, Belk and Erickson 1990). Aquatic Sciences 73:15-20.

Glazier, D. S. and T. J. Deptola. 2011. The amphipod *Gammarus minus* has larger eyes in freshwater springs with numerous fish predators. Invertebrate Biology 130:60-67.

Rocha-Ramirez, A. and A. Penaloza-Daniel. 2011. *Caecidotea xochimilca* (Isopoda, Asellidae), a new species from Lake Xochimilco, Mexico, with a key to Mexican species of the genus *Caecidotea*. Crustaceana 84:93-106.

Ephemeroptera

McCafferty, W. P., D. R. Lenat, L. M. Jacobus, and M. D. Meyer. 2011. The Mayflies (Ephemeroptera) of the Southeastern United States. Transactions of the American Entomological Society 136:221-233.

Odonata

Fulan, J. A., R. Raimundo, D. Figueiredo, and M. Correia. 2011. Abundance and diversity of dragonflies four years after the construction of a reservoir. Limnetica 29:279-285.

Gade, G., P. Simek, and H. W. Fescemyer. 2011. Adipokinetic hormones provide inference for the phylogeny of Odonata. Journal of Insect Physiology 57:174-178.

Raebel, E. M., T. Merckx, P. Riordan, D. W. Macdonald, and D. J. Thompson. 2011. The dragonfly delusion: why it is essential to sample exuviae to avoid biased surveys. Journal of Insect Conservation 14:523-533.

Plecoptera

Baumann, R. W. and B. C. Kondratieff. 2011. Collecting endemic and rare stoneflies (Plecoptera) in California, U.S.A. Perla 29:13-19.

Coleoptera

De Jong, G. D. 2011. Report of *Graphoderus occidentalis* Horn (Coleoptera Dytiscidae) from Mississippi, with distributional notes on *Graphoderus* Dejean in the contiguous United States. Coleopterists Bulletin 64:388-389.

Klecka, J. and D. S. Boukal. 2010. Lazy ecologist's guide to water beetle diversity: Which sampling methods are the best? Ecological Indicators 11:500-508.

Diptera

Arslan, N., O. Ayik, and Y. Sahin. 2011. Diversity and structure of Chironomidae (Diptera) limnofauna of Lake Uluabat, a Ramsar Site of Turkey, and their relation to environmental variables. Turkish Journal of Fisheries and Aquatic Sciences 10:315-322.

Gelbic, I. and J. Olejnicek. 2011. Ecology of Dolichopodidae (Diptera) in a wetland habitat and their potential role as bioindicators. Central European Journal of Biology 6:118-129.

Plant, A. R. 2011. Hemerodromiinae (Diptera: Empididae): a tentative phylogeny and biogeographical discussion. Systematic Entomology 36:83-103.

Miscellaneous

Brua, R. B., J. M. Culp, and G. A. Benoy. 2010. Comparison of benthic macroinvertebrate communities by two methods: Kick- and U-net sampling. Hydrobiologia 658:293-302.

Burlakova, L. E., A. Y. Karatayev, V. A. Karatayev, M. E. May, D. L. Bennett, and M. J. Cook. 2011. Endemic species: contribution to community uniqueness, effect of habitat alteration, and conservation priorities. Biological Conservation 144:155-165.

Caires, A. M., M. R. Vinson, and A. M. D. Brasher. 2011. Impacts of hikers on aquatic invertebrates in the North Fork of the Virgin River Utah. Southwestern Naturalist 55:551-557.

Campbell, E. Y., M. E. Benbow, S. D. Tiegs, J. P. Hudson, G. A. Lamberti, and R. W. Merritt. 2011. Timber harvest intensifies spawning-salmon disturbance of macroinvertebrates in southeastern Alaskan streams. Journal of the North American Benthological Society 30:49-59.

Clements, W. H., J. L. Arnold, T. M. Koel, R. Daley, and C. Jean. 2011. Responses of benthic macroinvertebrate communities to natural geothermal discharges in Yellowstone National Park, USA. Aquatic Ecology 45:137-149.

DeWalt, R. E. 2011. DNA barcoding: a taxonomic point of view. Journal of the North American Benthological Society 30:174-181.

Dos Santos, D. A., C. Molineri, M. C. Reynaga, and C. Basualdo. 2010. Which index is the best to assess stream health? Ecological Indicators 11:582-589.

Judson, S. W. and C. R. Nelson. 2011. Diversity, phenology, and elevational distribution of Ephemeroptera, Plecoptera, and Trichoptera in American Fork Canyon, Utah. Western North American Naturalist 70:526-540.

Kondratieff, B. C. and R. S. Durfee. 2010. Aquatic insects (Ephemeroptera, Odonata, Hemiptera, Coleoptera, Trichoptera, Diptera) of Sand Creek Massacre National Historic Site on the Great Plains of Colorado. Journal of the Kansas Entomological Society 83:322-331.

Nelson, S. M. 2011. Response of stream macroinvertebrate assemblages to erosion control structures in a wastewater dominated urban stream in the southwestern U.S. Hydrobiologia 663:51-69.

Resh, V. H. 2011. *Aquatic Insects of California* (1956): a landmark event and unique collaboration in benthic biology. Journal of the North American Benthological Society 30:1-10.

THANK YOU FOR YOUR MEMBERSHIP!

Newsletter of the SOUTHWEST ASSOCIATION OF FRESHWATER INVERTEBRATE TAXONOMISTS

Greetings SAFIT members,

The flagship product of SAFIT, the STE, has been updated, ratified and accepted by the membership. This newsletter issue includes a statement from Brady and Christopher regarding the 2011 update and its significance. A PDF of the STE is available on the SAFIT website (http://www.safit.org/ste.html). We continue to solicit contributions to the newsletter from the membership. Photos, interesting bugs, tricks of the trade, a good burger joint in an interesting collecting area, any relevant contributions – please send them in.

Have a job opening that you want to announce, or are looking for a job? Let SAFIT know in the Newsletter! Looking for specimens of a certain species or a literature reference? Need material for research or comparative purposes? Let your colleagues know in the SAFIT Newsletter! Want a workshop on a particular group of organisms? Have references to sell trade or share? Looking for a collecting partner? Put it here in the SAFIT Newsletter! All appropriate requests, queries, non-commercial advertisements and announcements will be considered, and are free to the SAFIT membership.

Thanks!
Jon Lee, Editor

The New and Improved STE

By
Brady Richards

What's new in this version of the STE? Mostly, it is the same as the 2006 version. We've added a column for Utah, although some of the taxonomic lists for that state are still incomplete. We've added authorities for every name in the list. Although many labs don't

use authorities on a day-to-day basis, this move ties each name to the literature: an important step for overall quality assurance.

Many names have been added, more distribution and ecological information has been added. There were very few big taxonomic changes. Some of the more noticeable ones include the following:

There have been considerable revisions to the Ephemerellidae since the 2006 STE. Notably, *Serratella teresa* is now *Matriella teresa* while *Serratella tibialis* and *S. velmae* are now in *Ephemerella*. The *Caudatella heterocaudata* group has been reworked so that the species may be separated, at least for last instar specimens. *Fallceon quilleri* is no longer the only *Fallceon* species known from California. Since there isn't a key that will separate the species now known to occur here, we suggest leaving specimens at genus.

There are a couple new "slash" IDs this time around. We've added one for *Aeshna/Rhionaeshna* since only late instars may be separable. Two species of *Dolophilodes* were removed to the new genus *Sisko*. Since the larvae of *Sisko* haven't been described but are likely similar to *Dolophilodes*, any larvae keying to *Dolophilodes* in existing keys should be treated as *Dolophilodes/Sisko* for the time being.

Finally, there was a mix-up in the hydrobioid snail list during the final construction of the 2006 STE. This was addressed in the Additions/Corrections file, which is available on the SAFIT website. Several taxa were removed to separate families, leaving only *Pyrgulopsis* in the Hydrobiidae. Immature specimens of all other hydrobioid snails should be backed off to a different level, preferably to Hypsogastropoda. Also, the New Zealand Mudsnail's family association hasn't been determined and so should not be considered as a hydrobiid.

For the complete list of changes in the new version of the STE, well, see the STE!

When should labs start using the 2011 STE? For SWAMP work, the new STE should be used for 2011 samples. Doug Post tells me that the SWAMP database has all the new names and changes. The ABL will switch over once we start processing our 2011 samples.

What's next for the STE? Well, Christopher Rogers and I are already working on the next revision, that is, we're tracking name changes and new literature. The next version will differ from previous versions in that there are plans underway to move all the information into a database format. The PDF that is available on the website is actually a behemoth that caused much anxiety to put together and format. All information in the STE comes from a master source file in the form of an Excel spreadsheet that is increasingly unwieldy. Importing this information as tables into a Word file creates a file that is bigger than it needs to be with all sorts of -- shall we say, *interesting* – problems and concerns. Hopefully, once all the information has been migrated into a database, many of these problems will go away making for the construction of the STE more seamless and less aggravating.

Christopher and I would like to thank the STE Committee for their critical reviews of the master source file and the new STE. Doug Post, Jon Lee and Larry Serpa in particular provided considerable help and useful criticism. The SAFIT Board of Directors also provided a round of review and constructive suggestions. Kim Kratz helped with formatting issues for the PDF.

ANNOUNCEMENTS
SAFIT MEETINGS

The board of directors meets via conference call on the 3rd Friday of the month. Please contact one of the officers if you have anything you want on the Board of Director's Meeting agenda. The contact information for the officers is at the end of the Newsletter.

First Announcement of a Trichoptera Workshop

Instructors: Bob Wisseman and Dave Ruiter

Location: California State University, Chico

Date: 14, 15 and 16 October 2011.

There will be an optional field collecting trip on the 14th to various locations in the Northern Sierra Mountains. On the 15th and 16th there will be concurrent laboratory training sessions in the taxonomy of Trichoptera larvae, pupae and adults. Watch for a more detailed announcement on the upcoming workshop at our website www.safit.org.

SAFIT ELECTIONS

SAFIT will be holding elections for three positions on the Board of Directors at our upcoming annual meeting (November 11, following the California Bioassessment Workgroup meeting in Davis, CA). All SAFIT members are eligible to run, and may nominate themselves or another SAFIT member. SAFIT Treasurer Raphael Mazor will run this election. Please email your nominations to raphaelm@sccwrp.org by September 30.

Duties of the Board of Directors are described in the SAFIT By-Laws. The three positions up for election are **President**, **Secretary**, and **Member-At-Large**. The first two positions are also defined in the By-Laws.

President

The President shall be the chief executive officer of the corporation and shall, subject to the control of the Board of Directors, supervise and control the affairs of the corporation and the activities of the officers. He or she shall perform all duties incident to his or her office and such other duties as may be required by law, by the articles of incorporation of

this corporation, or by these bylaws, or which may be prescribed from time to time by the board of directors. Unless another person is specifically appointed as chairperson of the board of directors, he or she shall preside at all meetings of the board of directors. If applicable, the president shall preside at all meetings of the members. Except as otherwise expressly provided by law, by the articles of incorporation, or by these bylaws, he or she shall, in the name of the corporation, execute such deeds, mortgages, bonds, contracts, checks, or other instruments which may from time to time be authorized by the board of directors.

Secretary
The Secretary shall:

Certify and keep at the principal office of the corporation the original, or a copy of these bylaws as amended or otherwise altered to date.

Keep at the principal office of the corporation or at such other place as the board may determine, a book of minutes of all meetings of the directors, and, if applicable, meetings of committees of directors and of members, recording therein the time and place of holding, whether regular or special, how called, how notice thereof was given, the names of those present or represented at the meeting, and the proceedings thereof.

See that all notices are duly given in accordance with the provisions of these bylaws or as required by law.

Be custodian of the records and of the seal of the corporation and see that the seal is affixed to all duly executed documents, the execution of which on behalf of the corporation under its seal is authorized by law or these bylaws.

Keep at the principal office of the corporation a membership book containing the name and address of each and any member, and, in the case where any membership has been terminated, the secretary shall record such fact in the membership book together with the date on which such membership ceased.

Member-at-Large
The position of Member-At-Large is not defined in the By-Laws, but provides an additional opportunity for SAFIT members to participate in Board decisions as a voting member.

OTHER UPCOMING MEETINGS AND EVENTS

Great Plains Bioassessment Symposium

We are pleased to announce that a Great Plains Bioassessment Symposium is now planned for **10 – 12 August 2011** at the University of Kansas, Lawrence, hosted by the

Kansas Biological Survey. This symposium is for everyone (students and professionals) conducting aquatic ecological studies that contribute to the field of biological monitoring in the central USA. This is an opportunity to meet, present posters or oral presentations of our work and research, and look for collaborative opportunities. All fields of freshwater biology and associated water regulatory issues are welcome: phycology, entomology, ichthyology, taxonomy, water quality, invasive species, biomonitoring, permitting and regulation. Please forward this email to all potentially interested parties.

The cost is $40 per person. We can only accept checks at this time. **Please make checks out to the Kansas Biological Survey**. Checks can be **mailed to:** D. Christopher Rogers, Kansas Biological Survey, Kansas University, Higuchi Hall, 2101 Constant Avenue, Lawrence, KS 66047-3759. Please include the name of the attendee, telephone number and email address. Receipts (if necessary) will be provided at the venue.

Abstracts must be submitted by 15 July 2011 to dcrogers@ku.edu. Abstracts must be a single paragraph, single-spaced, Times New Roman, 12 pt. font. Abstract must not be longer than 250 words. Oral presentations are limited to 15 minutes, plus five minutes for questions. Presenter's name, email address, and affiliation must be included.

General attendees (not presenting): if you are interested in coming, please email us (before 15 July 2011), send your name, email address and affiliation. We look forward to seeing you in Kansas!

If you have any questions, please call or email:

D. Christopher Rogers (dcrogers@ku.edu / 785.864.1714)
Don Huggins (dhuggins@ku.edu / 785.864.1548)
Debbie Baker (dbaker@ku.edu /785.864.1551)

MEDECOS XII - Linking Science with Resources Management.
The International MEDECOS Conference on Mediterranean-climate ecosystem ecology will be held September 6-9, 2011, in Los Angeles at the Covel Commons Conference Center on the UCLA campus. The international MEDECOS Conferences on the ecology, biodiversity, and conservation of the world's five Mediterranean climate ecosystems began in 1971 in Valdivia, Chile. This year will mark the 40th Anniversary of this conference at the University of California, Los Angeles.

This year's conference theme, ***Linking Science with Resource Management,*** emphasizes our interest in highlighting research findings that directly inform critical management decisions. Please note, however, that all topics pertaining to the ecology, biodiversity and conservation of the world's Mediterranean-climate ecosystems are welcome. The UCLA Institute of the Environment and Sustainability and the La Kretz Center for California Conservation Science is the lead sponsor for this event, and will also be organizing field trips to Stunt Ranch in the Santa Monica Mountains.

There will be several sessions on stream and riparian ecology organized by Vince Resh (UC Berkeley), Matt Kondolf (UC Berkeley), Raphael Mazor (SoCal Coastal Water Research Project), and Karen Ensler (Stellenbosch Water Institute, South Africa). Registration is now open for MEDECOS XII - LOS ANGELES, CA - 2011 (http://medecos2011.com/index.html).

Abstracts may be submitted through July 15.

EMPLOYMENT OPPORTUNITIES

Please contact the editor if you would like to post on an employment opportunity.

FIELD & LAB

A feature in each Newsletter issue exploring an aspect of aquatic macroinvertebrates beyond sample processing that may be beneficial to members. Contact the editor to contribute or comment.

Changes in shipping regulations for biological specimens
By
Brady Richards

For those of us who ship ethanol, isopropyl and formaldehyde solutions, there is an exciting new change in the shipping regulations: Special Provision A180, which may be found in the new International Air Transport Association (IATA) Dangerous Goods Regulations. This change has been long in the making and there are several discussions that can be found by Google search. For a full discussion plus PDFs of the new regulation and supporting documentation, see this post from the Entomological Collections Network (ECN) listserver: http://listsrv.unl.edu/cgi-bin/wa?A2=ind1012a&L=ECN-L&D=0&F=P&P=71. The regulation can also be found in the 2011 edition of IATA's Dangerous Goods Regulations.

In short, regulations for shipping under Limited and Bulk Quantities remain unchanged. Special Provision A180 only applies to shipments of small quantities of ethanol solutions, formalin and isopropyl. Rather than an upper limit on vial size, there is now a limit on the amount of ethanol, etc. per vial/container. This allows for shipping larger biological items which may be wetted so long as the amount of ethanol is under 30 mL per inner container. The upper limit of ethanol per package is now 1 L, rather than 0.5 L as under Excepted Quantities. So if you are shipping vials containing ethanol, the new regulation doubles the number of vials per package than were allowed under the Excepted Quantities regulations.

Special packaging is now required, but the only restriction is that now everything must be in heat-sealed plastic bags within a heat-sealed plastic bag. Shipping larger biological specimens requires a third layer of heat-sealed bag. There are several brands of food sealant devices on the market in a variety of price levels. I won't advertise for any

particular one here but I chose a brand that is available in many stores and for which the sealant bags are reasonably priced. The box must be marked "Scientific Research specimens, not restricted. Special Provision A180 applies." This phrase must also appear on the waybill. Otherwise, requirements for packing materials and boxes are as they were before.

I've been shipping under the new regulation for a couple months now. I have had some issues arise because of the vacuum/heat seal. Using the vacuum feature is nice in that the inner packaging can be reduced considerably and there is more internal support so that the vials don't rattle around. However, it turns out that the vacuum pump is strong enough to draw ethanol out of snap-cap vials, even when the caps are taped in place. I haven't had this happen with screw-cap vials. Some of the vials I've shipped have been broken. It was unclear whether the vacuum pump was the culprit, or whether I hadn't used enough cushioning. I suggest anyone using the vacuum feature to not "overdo it".

Anyone reading this needs to check out the new regulation for themselves. I've written this note simply to inform people about the new regulation. Personally, I'm still planning to maintain my certifications for shipping hazardous materials.

Disclaimer: none of this should be construed as the final word or as a replacement for training. Remember: regulations change yearly.

Miscellaneous bug notes (anecdotal notes, including distributional records in the SAFIT region, which may be helpful to SAFIT members). To make contributions or comments contact the editor: jlee@humboldt1.com.

Odd Diptera larva. An odd looking Diptera larva (Figs. 1-4) has been showing up in bioassessment samples from Humboldt and Mendocino Counties over the years. This little critter (2 – 4 mm long) appears to belong to the Orthorrhaphous-Brachycera assemblage. It has ventral creeping welts (or at least hooks) on the abdominal segments (I'm using these for dorsal/ventral orientation) and the integument is finely striate. The most unusual characters are eight elongate, caudal processes: the six dorsal and lateral processes long and filamentous, approaching abdomen length; the two ventral processes shorter and slightly curved.

I don't think I've collected this interesting critter but have found it occasionally in BMI samples. I believe it occurs in third order streams in at least the Eel River watershed.

If anyone knows what it is or has seen it outside of northern California, please let me know.

Thanks,
Jon Lee (jlee@humboldt1.com)

Figure 1. Diptera larva, ventral.

Figure 2. Diptera larva, caudal end.

Figure 3. Diptera larva, head capsule, ventral.

Figure 4. Diptera larva, head capsule, lateral.

Photo credit: Dave Ruiter.

LATEST LITERATURE

If you know of any literature or if you yourself have published any papers of interest to the SAFIT membership, please send copies or the citations to Brady Richards (arichards@csuchico.edu) for inclusion in the next issue of the SAFIT Newsletter. Thanks!!

Asterisk (*) indicates author is a SAFIT member.

Mollusca

Burlakova, L. E., A. Y. Karatayev, V. A. Karatayev, M. E. May, D. L. Bennett, and M. J. Cook. 2011. Biogeography and conservation of freshwater mussels (Bivalvia: Unionidae) in Texas: patterns of diversity and threats. Diversity and Distributions 17:393-407.

Cheng, Y. W. and L. L. LeClair. 2011. A quantitative evaluation of the effect of freezing temperatures on the survival of New Zealand mudsnails (*Potamopyrgus antipodarum* Gray, 1843), in Olympia Washington's Capitol Lake. Aquatic Invasions 6:47-54.

Mazza, G., N. Agostini, L. Aquiloni, S. Cianfanelli, E. Tricarico, and F. Gherardi. 2011. Ecological characterisation of streams invaded by the New Zealand mud snail *Potamopyrgus antipodarum* (Gray 1843): the case study of a National Park in Italy. Ethology Ecology & Evolution 23:151-164.

Rizhinashvili, A. L. 2011. On the controversial questions of the taxonomy of Bivalvia (Mollusca): Too many species or too few characters? Biology Bulletin 38:311-317.

Shea, C. P., J. T. Peterson, J. M. Wisniewski, and N. A. Johnson. 2011. Misidentification of freshwater mussel species (Bivalvia: Unionidae): contributing factors, management implications, and potential solutions. Journal of the North American Benthological Society 30:446-458.

Crustacea

Faulkes, Z. 2011. The spread of the parthenogenetic marbled crayfish, *Marmorkrebs* (*Procambarus* sp.), in the North American pet trade. Aquatic Invasions 5:447-450.

MacNeil, C., D. Platvoet, J. T. A. Dick, N. Fielding, A. Constable, N. Hall, D. Aldridge et al. 2011. The Ponto-Caspian 'killer shrimp', *Dikerogammarus villosus* (Sowinsky, 1894), invades the British Isles. Aquatic Invasions 5:441-445.

Martin, P., H. Shen, G. Fullner, and G. Scholtz. 2011. The first record of the parthenogenetic *Marmorkrebs* (Decapoda, Astacida, Cambaridae) in the wild in Saxony (Germany) raises the question of its actual threat to European freshwater ecosystems. Aquatic Invasions 5:397-403.

Nagakubo, A., K. Sekine, Y. Tanaka, R. B. Kuranishi, S. Kanada, and K. Tojo. 2011. Rapid expansion of the distributional range and the population genetic structure of the freshwater amphipod *Crangonyx floridanus* in Japan. Limnology 12:75-82.

Ozbek, M. and N. Ozkan. 2011. *Dikerogammarus istanbulensis* sp. n., a new amphipod species (Amphipoda: Gammaridae) from Turkey with a key for the genus. Zootaxa 2813:55-64.

Ephemeroptera

Salles, F. F., R. Boldrini, Y. Shimano, and H. R. S. Cabette. 2011. Review of the genus *Aturbina* Lugo-Ortiz & McCafferty (Ephemeroptera: Baetidae). Annales De Limnologie-International Journal of Limnology 47:21-44.

Plecoptera

Shepard, W. D. and R. W. Baumann. 2011. Canopy fogging in the Valdivian forest of southern Chile produces stoneflies (Plecoptera). Illiesia 7:127-132.

Stewart, K. W. and B. P. Stark. 2011. Further descriptions of western North American *Podmosta* larvae and their separation from *Ostrocerca* larvae (Plecoptera: Nemouridae). Illiesia 7:104-117.

Megaloptera

Contreras-Ramos, A. 2011. Phylogenetic review of dobsonflies of the subfamily Corydalinae and the genus *Corydalus* Latreille (Megaloptera: Corydalidae). Zootaxa 2862:1-38.

Trichoptera

Flint, O. S., Jr. and K. M. Kjer. 2011. A new species of *Neophylax* from Northern Virginia, USA (Trichoptera: Uenoidae). Proceedings of the Entomological Society of Washington 113:7-13.

*****Lee, J. J. and *****D. E. Ruiter. 2011. *Rhyacophila weitchpec* sp. nov. from northern California, with discussion of the *Rhyacophila viquaea* Milne 1936 species group (Trichoptera: Rhyacophilidae). The Pan-Pacific Entomologist 86:126-130.

Limm, M. P. and M. E. Power. 2011. The caddisfly *Dicosmoecus gilvipes*: making a case for a functional role. Journal of the North American Benthological Society 30:485-492.

Malm, T. and K. A. Johanson. 2011. A new classification of the long-horned caddisflies (Trichoptera: Leptoceridae) based on molecular data. BMC Evolutionary Biology 11.

Morris, M. W. L., M. Hondzo, and M. E. Power. 2011. Scaling *Glossosoma* (Trichoptera) density by abiotic variables in mountain streams. Journal of the North American Benthological Society 30:493-506.

Stocks, I. C. 2011. Description of the female of *Parapsyche cardis* Ross (Hydropsychidae: Arctopsychinae) and a revised key to the genera of Hydropsychidae (Trichoptera: Annulipalpia) of the southeastern United States, using wing characters. Zootaxa 2831:23-38.

Coleoptera

Angus, R. B. 2011. *Boreonectes* gen. n., a new genus for the *Stictotarsus griseostriatus* (De Geer) group of sibling species (Coleoptera: Dytiscidae), with additional karyosystematic data on the group. Comparative Cytogenetics 4:123-131.

Diptera

De Oliveira, C. S. N. and F. L. Da Silva. 2011. Two new species of Larsia Fittkau, 1962 (Diptera: Chironomidae: Tanypodinae) from Neotropical Region, with a checklist of *Larsia* species of the world. Zootaxa 2786:27-41.

Du, J., X. H. Wang, and O. Saether. 2011. Redescriptions of species of *Bryophaenocladius* Thienemann, 1934 (Diptera: Chironomidae) described by Brundin (1947). Zootaxa 2743:40-48.

Ferrington, L. C. and O. A. Saether. 2011. A revision of the genera *Pseudosmittia* Edwards, 1932, *Allocladius* Kieffer, 1913, and *Hydrosmittia* gen. n. (Diptera: Chironomidae, Orthocladiinae). Zootaxa 2849:1-314.

Siri, A., M. Donato, G. Orpella, and J. Massaferro. 2011. *Alotanypus vittigera* (Edwards) comb. nov.: adult redescription, immature description and a phylogenetic analysis of the genus (Diptera: Chironomidae: Tanypodinae). Zootaxa 2795:46-64.

Miscellaneous

Ferreira, W. R., L. T. Paiva, and M. Callisto. 2011. Development of a benthic multimetric index for biomonitoring of a neotropical watershed. Brazilian Journal of Biology 71:15-25.

Keizer-Vlek, H. E., P. W. Goedhart, and P. F. M. Verdonschot. 2011. Comparison of bioassessment results and costs between preserved and unpreserved macroinvertebrate samples from streams. Environmental Monitoring and Assessment 175:613-621.

Medeiros, A. S., C. E. Luszczek, J. Shirley, and R. Quinlan. 2011. Benthic biomonitoring in Arctic tundra streams: a community-based approach in Iqaluit, Nunavut, Canada. Arctic 64:59-72.

Merriam, E. R., J. T. Petty, G. T. Merovich, J. B. Fulton, and M. P. Strager. 2011. Additive effects of mining and residential development on stream conditions in a central Appalachian watershed. Journal of the North American Benthological Society 30:399-418.

Zherdev, V. N., A. V. Lynov, and A. E. Shevyreva. 2011. A new model of light traps for collecting benthic invertebrates. Zoologichesky Zhurnal 90:240-242.

THANK YOU FOR YOUR MEMBERSHIP!

Newsletter of the SOUTHWEST ASSOCIATION OF FRESHWATER INVERTEBRATE TAXONOMISTS

Greetings SAFIT members,

I hope everyone had a good summer and is looking forward to the fall collecting season. The CABW, SAFIT annual meeting, and SAFIT elections are rapidly approaching. Details for these upcoming events can found under Announcements. We continue to solicit contributions to the newsletter from the membership. Photos, interesting bugs, tricks of the trade, a good burger joint in an interesting collecting area, any relevant contributions – please send them in.

Have a job opening that you want to announce, or are looking for a job? Let SAFIT know in the Newsletter! Looking for specimens of a certain species or a literature reference? Need material for research or comparative purposes? Let your colleagues know in the SAFIT Newsletter! Want a workshop on a particular group of organisms? Have references to sell trade or share? Looking for a collecting partner? Put it here in the SAFIT Newsletter! All appropriate requests, queries, non-commercial advertisements and announcements will be considered, and are free to the SAFIT membership.

Thanks!
Jon Lee, Editor

ANNOUNCEMENTS

SAFIT MEETINGS

The board of directors meets via conference call on the 3rd Friday of the month. Please contact one of the officers if you have anything you want on the Board of Director's Meeting agenda. The contact information for the officers is at the end of the Newsletter.

The SAFIT Annual Meeting

Date: Friday, 11 November 2011 - The day AFTER the CABW meeting.

Time: 9AM to 4PM.

Location:

California Department of Fish and Game Yolo Bypass Wildlife Area Headquarters
45211 County Rd 32B (Chiles Rd)
Davis, CA 95618
DFG Information Line: 530-757-2461
DFG Headquarters Office Hours: Monday through Friday 8am-4pm
Wildlife Area Manager: Dave Feliz

Directions: from Davis, take Interstate 80 east to the Covell/Mace/Chiles Road Exit east of Davis. Turn left onto Chiles Road, cross Covell/Mace Road. Drive past the gas stations, hotels, Enterprise Car Rental, and CDF station. The Yolo Bypass Headquarters will be on your right marked by a wooden sign. If you reach the Produce Market or the Yolo Bypass Levee and the road turns under Interstate 80 you have gone too far.

For more about the wildlife area go to:
http://www.dfg.ca.gov/lands/wa/region3/yolo/index.html

Lunch and refreshments: We provide doughnuts and cold beverages during the meeting. We typically order out for lunch and take a quick informal break and then resume the meeting. Please bring cash for your lunch order.

SAFIT elections

Elections for three positions on the Board will take place at the annual meeting on November 11 (and also over email for members unable to attend). The positions up for election are the President, Secretary, and Member-at-Large. Nominations for these positions closed on September 30, and candidates will release position statements in early October. Because the Secretary position is up for a vote, the Treasurer will coordinate the election. For information, please contact him (Raphael Mazor) at raphaelm@sccwrp.org

Trichoptera Workshop

The Trichoptera Workshop, originally scheduled for 14, 15, and 16 October 2011, has been rescheduled:

First Announcement

SAFIT Trichoptera Taxonomy Workshop (Tentative)

18 and 19 February 2012

Chico State University, Chico California

Instructors: Robert Wisseman and David Ruiter

The planned workshop will have 2 concurrent sessions covering the taxonomy of caddis adults and pupae in one session and the taxonomy of larvae in the other.

We will have some specimens from California for workshop participants but the workshop instructors strongly recommend that you bring adult and pupal specimens from your local watersheds to identify during the sessions.

Please contact me if you are interested in attending this workshop. I have space for 35 people and I need to know if there is enough interest among SAFIT members to make the workshop viable.

I will provide additional information via the listserv when I know how much interest there is and what the workshop will cost.

Please contact me at jslusark@csuchico.edu if you are interested in attending the workshop as soon as you can.

OTHER UPCOMING MEETINGS AND EVENTS

2011 California Aquatic Bioassessment Workshop

Hello Everyone,

The CABW meeting on November 9 and 10 is just around the corner so I wanted to give you an update on the agenda. This year the CABW meeting will be organized into five sessions consisting of several instructional workshops and presentations covering the following topics:

Session 1 – Aquatic Invertebrate and Benthic Algae Sampling and Physical Habitat Data Collection

Session 2 – Aquatic Invertebrate and Benthic Algae Laboratory Analysis

Session 3 – Bioassessment Data Entry and Output

Session 4 – Ambient and Point-source Bioassessment Data Interpretation

Session 5 – Biological Objectives and Stressor Identification
Each session will have an introductory overview of the topic, updates on new

developments and the opportunity for attendees to ask questions and discuss any concerns they might have on the topic. The idea is to make the CABW a training opportunity for everyone involved with assessing aquatic resources or administering bioassessment projects. I also hope to get input on possibly establishing workgroups where information can be distributed and discussed throughout the year.

I will be sending out a detailed agenda soon, but for now please be sure to register and make arrangements to attend the CABW meeting on the UC Davis campus. Nancy Barker from UCD nlbarker@ucdavis.edu can send you the registration flyer and list of accumulations in the Davis area if you need them.

See you soon, jim

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Algae Laboratory Processing Workshops

Dear stream bioassessment community,
A pair of back-to-back workshops will be held at Cal State University, San Marcos in late October of this year on the diatom and soft-bodied algae laboratory processing and enumeration procedures used for stream bioassessment in California's SWAMP program. The all-day (9am-5pm) workshops will be taught by Prof. Patrick Kociolek of University of Colorado, Boulder (diatoms: Thursday 27 October) and Prof. Robert Sheath and Dr. Rosalina Stancheva of CSU San Marcos (soft-bodied algae: Friday 28 October). These workshops are geared toward helping build state capacity for taxonomic analysis of algae samples, with a focus on southern California taxa. They will be open to staff at the Regional Boards, the Water Board, and other agencies, consulting companies, and non-profit organizations of the state.
In each workshop, information will be presented on sample processing and specimen enumeration/quantification, as well as a brief introduction to the taxonomic analysis of algae samples for water quality monitoring. This will provide participants with some exposure to what is entailed in the laboratory procedures. (Note, however, that the goal of the workshops is not to turn participants into expert taxonomists, which would require a great deal more training.) Each workshop will include lecture-format presentations and some lab-based microscopy work.
Registration for both workshops is free, however space is limited, and registrants will be admitted on a first-come/first-served basis. Prospective participants must register through the State Water Board's Training Academy website at
http://www.trainingforce.com/5/lp/gowater.aspx?ot=8&otid=381 and

http://www.trainingforce.com/5/lp/gowater.aspx?ot=8&otid=380. In an effort to broaden participation across institutions as much as possible, only one participant from any given institution will be permitted to attend a given workshop, so please coordinate within your institutions to decide who is the most appropriate party to participate before registering. Also note that anyone interested in taking both workshops must register separately for each one. Please feel free to forward this message to other interested parties, and let me know if you have any questions.
Best wishes,
Betty Fetscher
--
!~!
A. Elizabeth Fetscher, Ph.D.
Senior Scientist - Biology Department
So. Cal. Coastal Water Research Project (SCCWRP)
3535 Harbor Blvd., Suite 110
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Phone: 714-755-3237; Fax: 714-755-3299
Email: bettyf@sccwrp.org
URL: http://www.sccwrp.org/view.php?id=219
!~!

The Crustacean Society Summer Meeting

3-7 June 2012 Athens, Greece

Information can be found at: http://www.cssm2012.gr/

Furthermore, please ask young crustacean researchers in your group or society to become a member of TCS and attend meetings.
Please access the following web-page and become members!

https://timssnet.allenpress.com/ECOMCRSO/timssnet/memberships/tnt_membership.cfm

Sincerely,
Akira

Akira Asakura
President, The Crustacean Society
Professor, Department of Biology, Graduate School of Science, Kobe University
Rokkodai 1-1, Nada-ku, Kobe, 657-8501 Japan
Dept. Biol. URL<http://www.edu.kobe-u.ac.jp/fsci-biol/en/>
Tel +81-(0)78-803-5707 E-mail: asakura@people.kobe-u.ac.jp

EMPLOYMENT OPPORTUNITIES

Please contact the editor if you would like to post on an employment opportunity.

FIELD & LAB

A feature in each Newsletter issue exploring an aspect of aquatic macroinvertebrates beyond sample processing that may be beneficial to members. Contact the editor to contribute or comment.

Active collecting methods for riparian adults of aquatic larvae

By
Jon Lee

Insect species descriptions are based on adult morphological characters, generally adult male reproductive structures. Terrestrial adults of aquatic taxa are often found on streamside vegetation, rocky banks, or manmade structures. Adult stoneflies (Plecoptera), caddisflies (Trichoptera), and beetles (Coleoptera) can be abundant but not noticed by the casual observer due to their cryptic coloration and often-sedentary nature. If one sits streamside and is patient and observant, these creatures can appear out of the shadows. For those who lack patience, some simple collecting techniques using inexpensive tools can be employed.

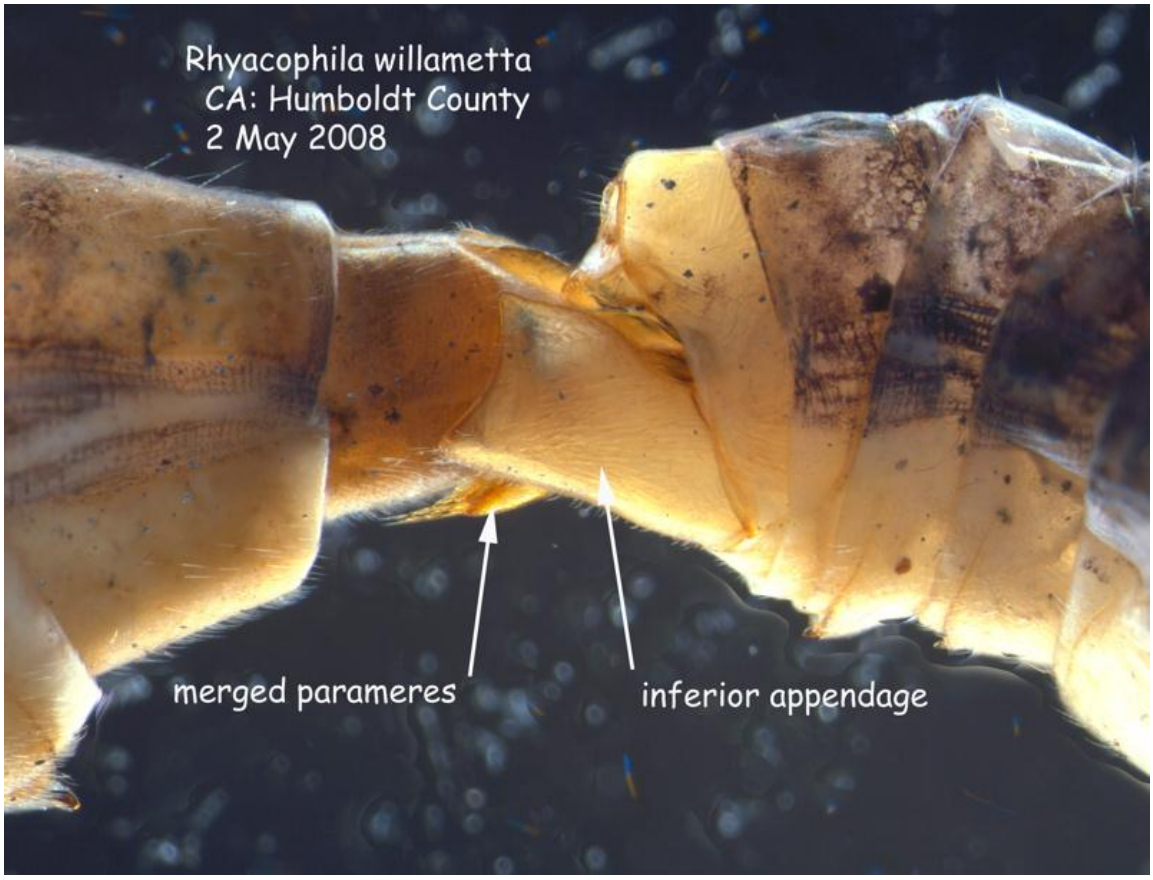
The simplest collecting method is to just pick specimens from a surface with soft forceps (Featherweight Forceps) or with the aid of an aspirator. Soft forceps can grasp a soft-bodied insect without crushing it. The forceps have a hole through one end where a cord can be strung to help prevent loss. This feature is especially beneficial to those of us who have lost expensive forceps in the field. A simple aspirator has a pair of tubes connected to a collecting vial via a two holed rubber stopper. By inhaling on one tube insects are vacuumed up by the end of the other tube and deposited into the collecting vial. This is a more efficient method of collecting many insects and preferred by many, but I prefer picking with forceps. Some insects emit a foul smelling substance that is not pleasant to inhale (but different aspirator styles can alleviate this) and I have had trouble damaging insects that I wanted to keep alive, when using an aspirator.

A beating sheet is a standard collecting tool for terrestrial insects. Many insects will do a free fall when disturbed. "Beating" exploits this behavior. The beating sheet is placed under a tree branch (or other vegetation) and the branch is hit with a stick or net handle. The fallen insects are picked or aspirated from the sheet. The beating sheet (Figure 1) is cloth stretched over two crossed supports. Pictured are a 1 m^2 nylon ripstop sheet over PVC plastic tubing and a smaller canvas sheet over a wooden frame. They both work well but the larger one, though lightweight, tends to feel heavy and unwieldy if used for an extended period of time. Any stick will do for beating but I prefer a 48" long, 1" diameter hardwood dowel. One can give a branch a good whack and the long reach is helpful. The beating sheet works best in cool weather. As the temperature climbs the critters become much quicker and often fly as soon as they hit the sheet. I've attached a section of hardwood dowel to the aluminum handle of a heavy-duty aerial net to double as a warm weather beating stick. This works well for beating and if one is quick, the critters flying from the sheet can be netted. If the temperature is hot, using the aerial net for flying insects, or using it to sweep vegetation, may be the most affective active collecting method.

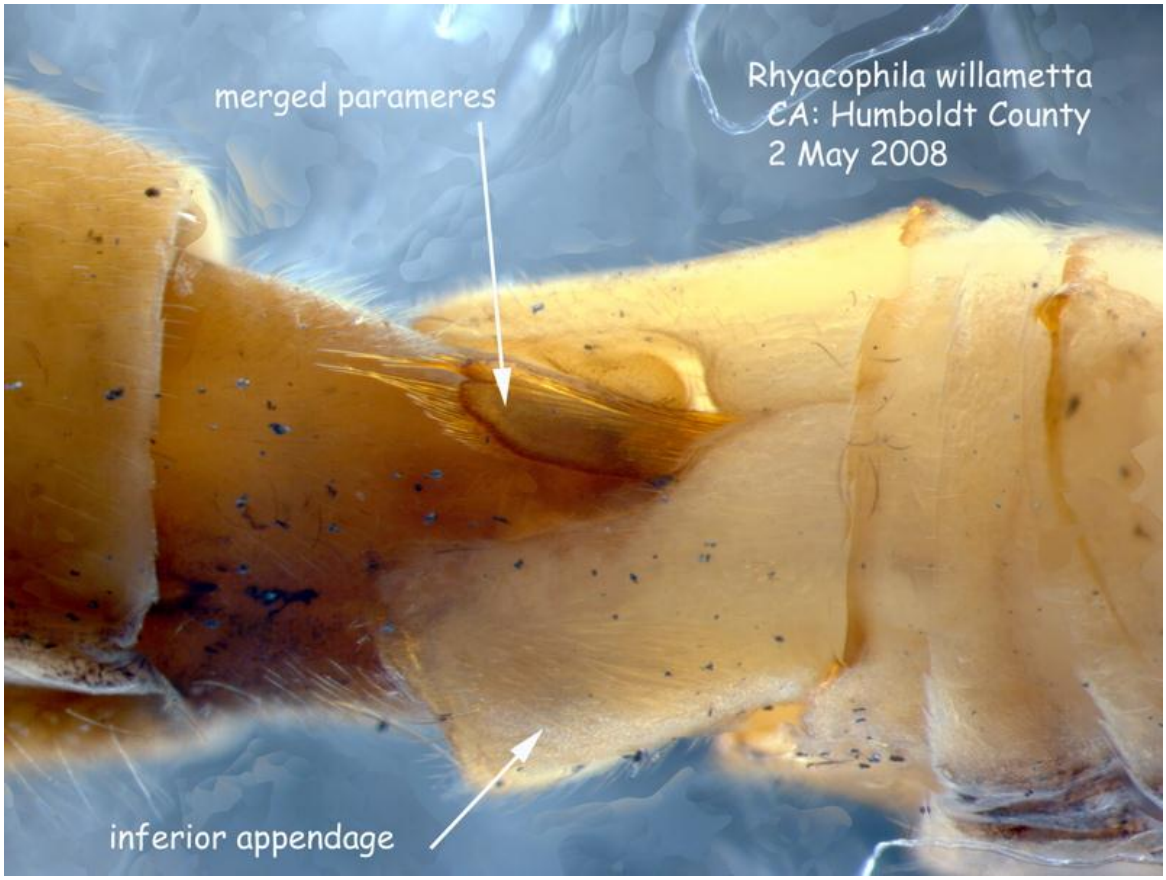
Figure 1. Canvas beating sheet, heavy-duty aerial net with extended handle, nylon beating sheet, and 48" hardwood dowel.

Miscellaneous bug notes (anecdotal notes, including distributional records in the SAFIT region, which may be interesting or helpful to SAFIT members). To make contributions or comments contact the editor: jlee@humboldt1.com.

***Rhyacophila willametta* Ross, 1950 in copula.** A mating pair of the caddisfly *R. willametta* was captured and did not separate when preserved in ethanol. It was very interesting to see that the apical segment of the inferior appendage (clasper) of the male was folded against the basal segment so that the outer part of the apical segment was holding the female segment VIII. The pair was sent to Dave Ruiter who cleared the abdomens and took the following pictures. It is also interesting to see the parameres (paired processes that are part of the male phallic apparatus) merged and cradling the exterior of female segment VIII.



Rhyacophila willametta in copula, lateral view. Female on left, male on right.



Rhyacophila willametta in copula, ventrolateral view. Female on left, male on right.

Rhyacophila willametta in copula, dorsal view. Female on left, male on right.

Photo credit: Dave Ruiter.

LATEST LITERATURE

If you know of any literature or if you yourself have published any papers of interest to the SAFIT membership, please send copies or the citations to Brady Richards (arichards@csuchico.edu) for inclusion in the next issue of the SAFIT Newsletter. Thanks!!

Asterisk (*) indicates author is a SAFIT member.

Crustacea

Buric, M., M. Hulak, A. Kouba, A. Petrusek, and P. Kozak. 2011. A successful crayfish invader is capable of facultative parthenogenesis: a novel reproductive mode in decapod crustaceans. Plos One 6.

Favaro, L., T. Tirelli, M. Gamba, and D. Pessani. 2011. Sound production in the red swamp crayfish *Procambarus clarkii* (Decapoda: Cambaridae). Zoologischer Anzeiger 250:143-150.

Holsinger, J. R., L. M. Ansell, and J. Shafer. 2011. Four new species of the subterranean amphipod genus *Stygobromus* (Amphipoda: Crangonyctidae) from shallow groundwater habitats on the Coastal Plain and eastern margin of the Piedmont in Maryland and Virginia, USA. Zootaxa 2872:1-21.

Macdonald, K. S., R. Sallenave, and D. E. Cowley. 2011. Morphologic and genetic variation in *Triops* (Branchiopoda: Notostraca) from ephemeral waters of the Northern Chihuahuan Desert of North America. Journal of Crustacean Biology 31:468-484.

Pessacq, P., L. B. Epele, and *****D. C. Rogers. 2011. A new species of *Lynceus* (Crustacea: Branchiopoda: Laevicaudata) from Patagonia, with comments on laevicaudatan systematics. Zootaxa 3043:25-32.

Mollusca

Alonso, A. and J. A. Camargo. 2011. Subchronic toxic effects of fluoride ion on the survival and behaviour of the aquatic snail *Potamopyrgus antipodarum* (Hydrobiidae, Mollusca). Archives of Environmental Contamination and Toxicology 60:511-517.

Alonso, A. and J. A. Camargo. 2011. Toxic effects of fluoride ion on survival, reproduction and behaviour of the aquatic snail *Potamopyrgus antipodarum* (Hydrobiidae, Mollusca). Water Air and Soil Pollution 219:81-90.

Ephemeroptera

Dias, L. G., T. Bacca, L. Navarro, F. E. Acevedo, P. M. Benavides, and P. S. F. Ferreira. 2011. Association of nymphs and adults of Ephemeroptera (Insecta) using the amplified fragment length polymorphism (AFLP) technique. Annales De Limnologie-International Journal of Limnology 47:151-157.

Odonata

Abbott, J. C. and T. D. Hibbitts. 2011. *Cordulegaster sarracenia*, n. sp (Odonata: Cordulegastridae) from east Texas and western Louisiana, with a key to adult Cordulegastridae of the New World. Zootaxa 2899:60-68.

Plecoptera

Béthoux, O., Y. Cui, B. Kondratieff, B. P. Stark, and D. Ren. 2011. At last, a Pennsylvanian stem-stonefly (Plecoptera) discovered. BMC Evolutionary Biology 11:1-12.

*****Lee, J. J. and R. W. Baumann. 2011. *Mesocapnia aptera* (Plecoptera: Capniidae) a new wingless winter stonefly from northern California, U.S.A. Illiesia 7:192-196.

*****Sandberg, J. B. 2011. The *Isoperla* of California (Plecoptera: Perlodidae); larval descriptions and a key to 17 western Nearctic species. Illiesia 7:202-258.

Stark, B. P. and S. Green. 2011. Eggs of western Nearctic Acroneuriinae (Plecoptera: Perlidae). Illiesia 7:157-166.

Stewart, K. W., E. F. Drake, and B. P. Stark. 2011. Larvae of five species of the winter stonefly genus *Capnia* (Plecoptera: Capniidae) from California, U.S.A. Illiesia 7:167-181.

Coleoptera

Arce-Perez, R. and M. A. Moron. 2011. Synopsis of the Hydrophiloidea of Mexico (Coleoptera: Hydrophilidae, Helophoridae, Epimetopidae, Georissidae, and Hydrochidae), with a key for the identification of genera. Revista Mexicana De Biodiversidad 82:491-514.

Inoda, T. 2011. Cracks or holes in the stems of oviposition plants provide the only exit for hatched larvae of diving beetles of the genera *Dytiscus* and *Cybister*. Entomologia Experimentalis Et Applicata 140:127-133.

King, J. G., J. R. Starr, and P. K. Lago. 2011. Molecular data resolves relationships within Heteroceridae (Coleoptera: Dryopoidea). Systematic Entomology 36:435-445.

Diptera

Bouchard, R. W. and L. C. Ferrington. 2011. The effects of subsampling and sampling frequency on the use of surface-floating pupal exuviae to measure Chironomidae (Diptera) communities in wadeable temperate streams. Environmental Monitoring and Assessment 181:205-223.

Miscellaneous

Koperski, P., E. Dumnicka, and J. Galas. 2011. Abiotic parameters determining fauna composition in karstic springs. Polish Journal of Ecology 59:159-169.

Weigel, B. M. and J. J. Dimick. 2011. Development, validation, and application of a macroinvertebrate-based Index of Biotic Integrity for nonwadeable rivers of Wisconsin. Journal of the North American Benthological Society 30:665-679.

THANK YOU FOR YOUR MEMBERSHIP!

Newsletter of the SOUTHWEST ASSOCIATION OF FRESHWATER INVERTEBRATE TAXONOMISTS

2012 greetings SAFIT members,

SAFIT has been active since the last issue of the newsletter. Elections were held in November and we welcome new Secretary, Wendy Willis and new Member at Large, Dawn Hamilton, to the Board of Directors. The Trichoptera Workshop has been scheduled for February. Details for these events can be found under Announcements. We continue to solicit contributions to the newsletter from the membership. Photos, interesting bugs, tricks of the trade, a good burger joint in an interesting collecting area, any relevant contributions – please send them in.

Have a job opening that you want to announce, or are looking for a job? Let SAFIT know in the Newsletter! Looking for specimens of a certain species or a literature reference? Need material for research or comparative purposes? Let your colleagues know in the SAFIT Newsletter! Want a workshop on a particular group of organisms? Have references to sell trade or share? Looking for a collecting partner? Put it here in the SAFIT Newsletter! All appropriate requests, queries, non-commercial advertisements and announcements will be considered, and are free to the SAFIT membership.

Thanks!
Jon Lee, Editor

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SAFIT MEETINGS

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Workshop on the
Trichoptera of Western North America
Larval, Pupal and Adult Taxonomy, plus Distribution and Biology
February 18-19, 2012
Briggs Hall Room 122, University of California-Davis

Southwest Association of Freshwater Invertebrate Taxonomists (SAFIT) is sponsoring a 2-day workshop that will provide comprehensive instruction in the taxonomy of larvae, pupae and adults of the insect order Trichoptera (caddisflies) of western North America. The course instructors are:

***Bob Wisseman**, Aquatic Biology Associates, Inc., Corvallis OR, has studied the biology and distribution of western North American caddisflies for over 30 years.*

***Dave Ruiter**, EPA retired, Centennial, CO, has focused on caddis for nearly 40 years with the primary emphasis on western North American taxa.*

***Joe Giersch**, USGS, West Glacier, MT, focuses on the taxonomy and morphology of larval and adult* Rhyacophila*, and insects in alpine streams.*

Attendees will receive a complete introduction to the biology, taxonomy, and biogeography of the Trichoptera of western North America as well as training in the proper preparation of specimens for study. Attendees will also receive identification manuals and supporting materials prepared by the instructors for this workshop.

This is also an opportunity for guest lecturers to present updates, new keys, figures and photos for groups other than caddisflies. Please contact Robert Wisseman if you are interested is making a short presentation or have material to hand out (bobwisseman@mac.com). Also feel free to bring problematic specimens from any freshwater invertebrate group. There will be many specialists attending to help on identification.

The workshop will be held on the UC Davis campus. Special thanks to Steve Heydon and the Bohart Museum of Entomology for hosting this SAFIT event.

Location:	*UC Davis Campus* *Briggs Hall* *Room 122*	
Date:	*February 18th and 19th, 2012*	
Instructors:	*Robert Wisseman, David Ruiter, and Joe Giersch*	
Cost to attend:	*SAFIT members*	*$275.00*
	Non members	*$375.00*

To ensure your place in this workshop payment is due ASAP. We only have room for 40 positions in this workshop. Positions will be filled on a first come first served basis. We will accept people up to the day of the workshop or until all positions are filled.

Send checks to:

Wendy Willis
AQUATIC BIOASSAY CONSULTING
LABORATORIES INC.
29 NORTH OLIVE
VENTURA, CA 93001

Please make checks payable to SAFIT.

Workshop Schedule

Day 1. Saturday February 18, 2012. 8:00 am to 5:30 pm. Briggs Hall 122.

8:00-8:30 am. Registration and introduction of attendees to each other, to organizers, and exploration of individual backgrounds and needs from course.

8:30-9:45 am The biology of caddisflies – life-history, ecology, biomonitoring significance and biogeography.

9:45 – 10:10 am. Coffee break.

10:10 – 11:50 am. Introduction to larval taxonomy and standard taxonomic effort. Material to augment Wiggins (1996) will be in the workshop manual. Please bring your own copy of Wiggins 1996. Larvae of the North American Caddisfly Genera (Trichoptera).

11:50-1:15 pm. Lunch break allowing time off campus.

1.15 – 2:15 pm Species and species groups of the genus Rhyacophila*. Joe Giersch will introduce a new key to North American* Rhyacophila *larvae.*

2:15-3:00 pm Guest presentations on non-caddis freshwater invertebrates.

3:00-5:30 pm Open lab on larvae. We will have identified larval material available, but also encourage you to bring your own specimens to share and work on. More advanced attendees can test themselves on vials of mixed unknown larvae.

Day 2. Sunday February 19, 2012. 8.00 am to 4.30 pm. Briggs Hall 122.

9:00-10:00 am. Systematics of Trichoptera and introduction to adult morphology.

10:00-10:30 am Coffee break

10:30-11:50 am Adult caddisflies of western North America, keys to families and genera. Attendees will be provided their own copies of Schmid 1998. Genera of the Trichoptera of Canada and Adjoining or Adjacent United States, and Ruiter 2000. Generic Key to the Adult Ocellate Limnephiloidea of the Western Hemisphere (Insecta: Trichoptera). The workshop manual will expand and augment these publications. Species level identification of select genera will be covered.

11:50-1:15 pm. Lunch break allowing time off campus.

1:15-2:00 pm Demonstration of techniques for adult taxonomy. Collecting methods for adults. Discussion on future workshops.

2:00-4:30 pm Open lab on adults. We will have identified adult material available, but also encourage you to bring your own specimens to share and work on. More advanced attendees can test themselves on vials of mixed unknown adults.

SAFIT Elections yield new Board of Directors

On November 11, SAFIT elected a new Board of Directors at the annual meeting. Although previous SAFIT elections have largely been formalities, with most candidates running unopposed, this election was more competitive, with two candidates each running for two of the three open positions. A total of 25 ballots were cast (including 5 over email). Incumbent Joe Slusark was re-elected to a third term as president. Wendy Willis received the majority of votes cast for Secretary. Dawn Hamilton received the majority of votes for the position of Member at Large. Joe, Wendy, and Dawn join current Vice President Christopher Rogers and me (Raphael Mazor), the current Treasurer, as SAFIT's new Board of Directors. Complete election results are summarized in the table below.

President	**# Votes**
Joe Slusark	23
Jim Harrington (write in)	1
Secretary	
Wendy Willis	13
Bill Isham	12
Member-At-Large	
Dawn Hamilton	16
Kim Kratz	9

EMPLOYMENT OPPORTUNITIES

Please contact the editor if you would like to post on an employment opportunity.

FIELD & LAB

A feature in each Newsletter issue exploring an aspect of aquatic macroinvertebrates beyond sample processing that may be beneficial to members. Contact the editor to contribute or comment.

Passive collecting methods for riparian adults of aquatic immatures (Part 1)

By

Brady Richards

In the previous issue, Jon Lee wrote about active collecting methods for riparian adults. While there's something to be said for beating stoneflies out of a tree or chasing down a flying caddisfly with an aerial net or crawling through a culvert to look for either caddisflies or stoneflies, I am also a big fan of passive collecting methods. Why expend the energy catching bugs when you can get them to capture themselves? Below are a few such methods.

Let there be light!

Or, simply put, light traps. Many insects are attracted to lights and not just the aquatics. In fact, most of my light trapping over the past few years has been for terrestrial beetles. But let's concentrate on the aquatics for now.

One of the simplest and cheapest light traps is a black light on a pan of preservative/soapy water placed next to a body of water (Figures 1 and 2). I tend to use either soapy water, since all I need is some water from the stream and a dollop or two of dishwashing detergent, or the dilute "used" ethanol that invariably accumulates after processing lots of benthic samples. I'll often run a series of lights on a given night, sometimes stretched out across many miles. I place the lights before dark and then either collect them after a few hours or the next morning. Everything gets preserved in fresh ethanol. The yield from this type of light trap can be fantastic. That's also a drawback – I've had many trapping sessions yield hydroptilid adults in the tens of thousands. Other drawbacks: lights and batteries are subject to the elements; the lights may be bumped by animals (raccoons love to throw them into the water!); the lights may be stolen. I've only had the latter happen a couple of times. Usually, if I take some time to think about the placement of my traps, I can find a spot that's not visible from the road but still has a lot of exposure to the water body I'm sampling. Most of the black lights I use cost $20 or less plus batteries.

Figure 1. Black light pan trap.

Figure 2. Black light pan trap with a night's catch.

Another light trap method is to hang a sheet and then put the black light or a mercury vapor (MV) light in front of it (Figure 3). Insects of all kinds will be attracted to the light and will land on the sheet where they may be collected with forceps or an aspirator – okay, so this method is only partially passive. I keep the MV set up on my porch for most of the summer, except when I take it on the road. Then I run the MV off my truck battery with the sheet hanging on the side of the truck. Like the black light pan trap, trapping using this method can bring in more insects than you might care to collect. Unlike the pan trap method, you can pick and choose what to collect with this method. I had an interesting night running the MV along the West Branch of the Feather River last year. After getting the usual variety of hydropsychid and *Rhyacophila* species just after dusk, hundreds of *Allocosmoecus partitus* Banks adults descended upon the sheet. It's always cool to see that many limnephilid adults at once. The cost for running an MV can be steep. I use the rain shields sold by BioQuip so as to avoid losing a bulb to rain. If you are running yours solely during the dry summer months, a mercury vapor bulb can cost as low as about $12, a cheap fixture can run about the same. You'll need an AC/DC power converter to run the MV either off your car battery or as a stand alone unit and those can run $50 and up. All of this assumes you already have the car . . .

Figure 3. Mercury vapor light on back porch.

One more thing on lights . . . anywhere there are lights near water, you can find aquatic insects attracted to them. Highway rest areas or gas stations next to lakes or streams are

great places to collect as they are usually well lit. You can always collect the bugs while they are flying, but remember to check the walls under light fixtures, or, as a certain SAFIT member from Colorado likes to point out, there are probably *already* caddisflies *in* the light fixtures just ready for the taking. (Part 2. "**It's not night, now what?"** will appear in the next issue).

Miscellaneous bug notes (anecdotal notes, including distributional records in the SAFIT region, which may be interesting or helpful to SAFIT members). To make contributions or comments contact the editor: jlee@humboldt1.com.

A new elmid genus (article by Brady Richards)

Barr, C. B. 2011. *Bryelmis* Barr (Coleoptera: Elmidae: Elminae), a new genus of riffle beetle with three new species from the Pacific Northwest, U.S.A. The Coleopterists Bulletin 65:197-212.

Bryelmis siskiyou.

Photo credit: Traci Grzymala

This is a description that has been many years in the making. Cheryl Barr first recognized this taxon as a new genus back in 1985. Since then, she has traveled up and down the

Pacific Northwest multiple times searching for new populations. Several SAFIT members (Jon Lee and Bob Wisseman) and bioassessment labs (the ABL, EcoAnalysts and the BugLab) – to name a few – contributed specimens used in the description.

Three species are described. *B. idahoensis* is known only from Idaho. The other species are both found in the SAFIT region. *B. rivularis* is known from southern Washington and northern Oregon and *B. siskiyou* is known from southern Oregon and northern California. All of the species are found in small, headwater streams and are associated with liverworts. With the description of *Bryelmis*, the number of *described* elmid genera known from the U.S. has risen to 28 (Shepard, 2002).

Adults will key to *Cleptelmis* and the larvae key to *Ampumixis* in White and Roughley (2008) a.k.a., the new Merritt & Cummins. Personally, I think the larvae are most likely to be confused with *Heterlimnius* based on the triangular cross section, coloration, etc. Barr's paper includes modifications to these existing keys to separate out *Bryelmis*, as well as a key to separate the adults of the three species. The larvae are, at present, inseparable except by distribution.

As many people can attest, this publication was particularly exciting to me. I've known about this new genus since the late 1990s when Cheryl first told me about it. Not long afterwards, the guys at EcoAnalysts sent me specimens of what is now known as *B. idahoensis*. Since arriving in California in 2001, I have sampled many small streams in northern California looking for these critters – including, as chance would have it, the type locality for *B. siskiyou*. I didn't personally collect specimens, however, until 2010, when Jon Lee took me to a couple localities where he had already collected *Bryelmis*.

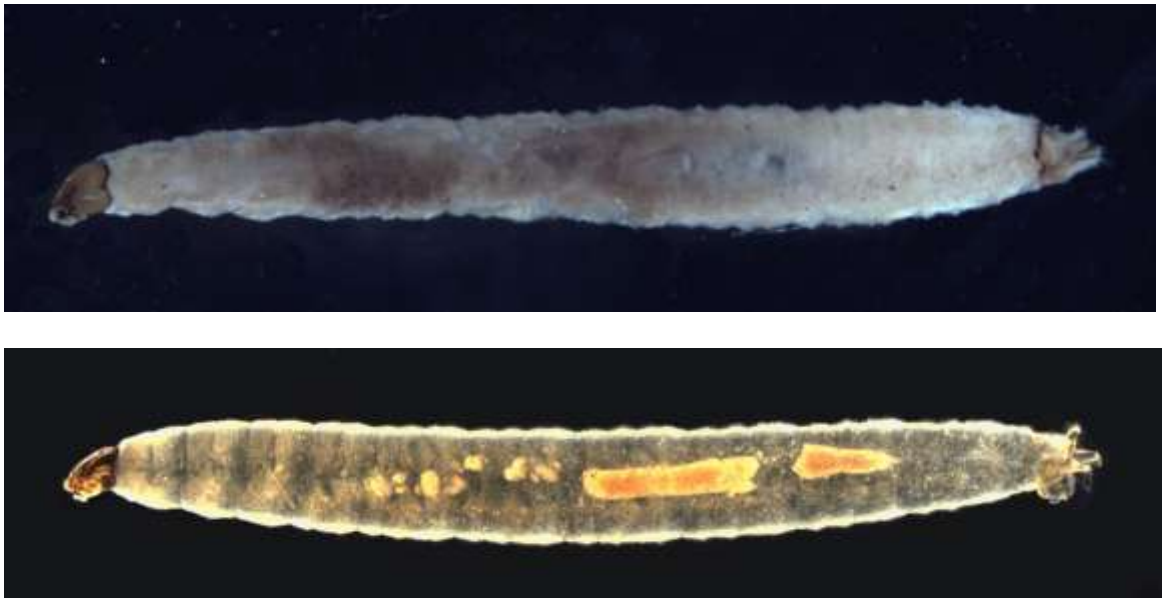
Dragsaw Spring Creek, Humboldt Co., CA., *Bryelmis siskiyou* habitat.

Other literature cited:

Shepard, W. D. 2002. Family 43. Elmidae Curtis, 1830, Pages 117-120 *in* R. H. Arnett, Jr., M. C. Thomas, P. E. Skelley, and J. H. Frank, eds. American Beetles. Volume 2. Polyphaga: Scarabaeoidea through Curculionidea. xiv + 861 pp. Boca Raton, London, New York and Washington, D.C., CRC Press LLC.

White, D. S. and R. E. Roughley. 2008. Chapter 20: Aquatic Coleoptera, Pages 571-671 *in* R. W. Merritt, K. W. Cummins, and M. B. Berg, eds. An introduction to the aquatic insects of North America, fourth edition, xvi + 1158 pp. + 39 color plates. Dubuque, Iowa, Kendall/Hunt Publishing Company.

More odd Diptera larvae. A few years back, SAFIT member Tom King passed around a strange Diptera larva he had found in a stream sample from El Dorado Co., CA. The larval habitus, pictured below, had a Psychodidae look but a spiracular disc more like that of Tipulidae. It left people scratching their heads and was jokingly called "Psychotipulidae".



Diptera larva, El Dorado Co., CA, habitus (KOH cleared in bottom photo).

Diptera larva, El Dorado Co., CA, spiracular disc (KOH cleared).

Recently, similar looking larvae were found in a Klamath River tributary (Humboldt Co., CA) BMI sample, collected by the Yurok Tribal Environmental Program. These larvae have a similar appearance but a dissimilar spiracular disc (pictured below). Both larvae are amphipneustic (spiracles on the prothorax and anal division) as in Psychodidae but they lack dorsal sclerotized plates on the abdomen. Does anyone know what these critters are or have a guess? Please send in your thoughts.

Diptera larva, Humboldt Co., CA, habitus.

Diptera larva, Humboldt Co., CA, spiracular disc.

Photo credit: Dave Ruiter.

LATEST LITERATURE

If you know of any literature or if you yourself have published any papers of interest to the SAFIT membership, please send copies or the citations to Brady Richards (arichards@csuchico.edu) for inclusion in the next issue of the SAFIT Newsletter. Thanks!!

Asterisk (*) indicates author is a SAFIT member.

Crustacea

Ahyong, S.T., J.K. Lowry, M. Alonso, R.N. Bamber, G.A. Boxshall, P. Castro, S. Gerken, G. S. Karaman, J. W. Goy, D. S. Jones, K. Meland, *****D.C. Rogers and J. Svavarsson. 2011. Subphylum Crustacea Brünnich, 1772. In: Zhang, Z.-Q. (Ed.), Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness. Zootaxa 3148:1-237.

*Rogers, D. C. and J. S. Coronel. 2011. A redescription of *Branchinecta* Pollicifera Harding, 1940, and its placement in a new genus (Branchiopoda: Anostraca: Branchinectidae). Journal of Crustacean Biology 31:717-724.

Ephemeroptera

McCafferty, W. P. 2011. A new genus and species of small minnow mayflies (Ephemeroptera: Baetidae) from far northern North America. Transactions of the American Entomological Society 137:11-14.

McCafferty, W. P. 2011. Notable new North and Central American records of Ephemeroptera species. Transactions of the American Entomological Society 137:1-10.

Webb, J. M. and W. P. McCafferty. 2011. Contributions to the larvae of North American *Nixe* (Ephemeroptera: Heptageniidae), with the description of *N. dorothae* sp. nov. from southern Indiana. Zootaxa 3065:27-37.

Plecoptera

Heinold, B. D. and B. C. Kondratieff. 2011. Description of the female of *Capnia arapahoe* (Plecoptera: Capniidae). Entomological News 121:281-283.

Trichoptera

Chamorro, M. L. and R. W. Holzenthal. 2011. Phylogeny of Polycentropodidae Ulmer, 1903 (Trichoptera: Annulipalpia: Psychomyioidea) inferred from larval, pupal and adult characters. Invertebrate Systematics 25:219-253.

Coleoptera

Alarie, Y., M. C. Michat, and K. B. Miller. 2011. Notation of primary setae and pores on larvae of Dytiscinae (Coleoptera: Dytiscidae), with phylogenetic considerations. Zootaxa 3087:1-55.

Angus, R. B. and A. G. Tatton. 2011. A karyosystematic analysis of some water beetles related to *Deronectes* Sharp (Coleoptera, Dytiscidae). Comparative Cytogenetics 5:173-190.

Barr, C. B. 2011. *Bryelmis* Barr (Coleoptera: Elmidae: Elminae), a new genus of riffle beetle with three new species from the Pacific Northwest, U.S.A. The Coleopterists Bulletin 65:197-212.

Dressler, C., S. Q. Ge, and R. G. Beutel. 2011. Is *Meru* a specialized noterid (Coleoptera, Adephaga)? Systematic Entomology 36:705-712.

Diptera

Byers, G. W. and P. H. Arnaud. 2011. *Tipula oleracea* Linnaeus in West-Central California (Diptera: Tipulidae). Journal of the Kansas Entomological Society 84:153-154.

Gilka, W. 2011. Six unusual *Cladotanytarsus* Kieffer: towards a systematics of the genus and resurrection of *Lenziella* Kieffer (Diptera: Chironomidae: Tanytarsini). Zootaxa 3100:1-34.

Jacobson, A. J., G. R. Curler, G. W. Courtney, and J. K. Moulton. 2011. New species of *Blepharicera* Macquart (Diptera: Blephariceridae) from eastern North America, with a discussion of the phylogenetic relationships and biogeography of all Nearctic species. Systematic Entomology 36:768-800.

Saether, O. A. 2011. Notes on Canadian *Ablabesmyia* Johannsen, with keys to known Nearctic immatures of the genus (Diptera: Chironomidae). Zootaxa 3069:43-62.

Saether, O. A. and P. H. Langton. 2011. New Nearctic species of the *Psectrocladius limbatellus* group (Diptera: Chironomidae). Aquatic Insects 33:133-163.

Miscellaneous

Hanson, P., M. Springer, A. Ramirez, R. W. Flowers, C. De la Rosa, and P. E. Gutierrez-Fonseca. 2010. Introduction to aquatic macroinvertebrate groups. Revista De Biologia Tropical 58 (Suppl. 4):3-37.

Myers, L. W., B. C. Kondratieff, T. B. Mihuc, and *D. E. Ruiter. 2011. The mayflies (Ephemeroptera), stoneflies (Plecoptera), and caddisflies (Trichoptera) of the Adirondack Park (New York State). Transactions of the American Entomological Society 137:63-140.

Wägel, H., A. Klussmann-Kolb, M. Kuhlmann, G. Haszprunar, D. Lindberg, A. Koch, and J. W. Wägele. 2011. The taxonomist - an endangered race. A practical proposal for its survival. Frontiers in Zoology 8:1-7.

Zhang, Z.-Q. 2011. Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness. Zootaxa 3148:1-237.

THANK YOU FOR YOUR MEMBERSHIP!

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