Newsletter of the SOUTHWEST ASSOCIATION OF FRESHWATER INVERTEBRATE TAXONOMISTS

Greetings SAFIT members,

Welcome to Volume 3 of the newsletter. We intend to publish the newsletter quarterly with an informative but not too dry format: informal but technically accurate. Input from membership is strongly encouraged, whether as suggestion, criticism, or content. In particular we are soliciting articles for the "Field and Lab" section (unless of course you want every issue to be about stoneflies!). Sweet bug pictures, interesting collecting sites, techniques relating to field or lab, all are welcome. Special thanks to Raphael Mazor for help with the Latest Literature.

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

18th Symposium of the International Association of Astacology

The meeting registration website is now open for the 18th symposium of the International Association of Astacology, to be held 18-23 July 2010 in Columbia, Missouri, USA. You can register for the meeting and submit your abstracts for talks and/or posters. See http://muconf.missouri.edu/IAA18/Registration.html for more information on the registration process. Again, please be sure to encourage your students and other colleagues to attend the

meeting.

Please see our website for additional information but some key points are:

Early registration closes on April 26, 2010.

Abstracts are due no later than May 10, 2010.

We do have scholarship funds available for students. Please see the website for the application form, which should be sent to Annie Allert at aallert@usgs.gov no later than April 12, 2010.

Hope to see you there.
Cheers,
Jim Fetzner *IAA President-Elect*
James W. Fetzner Jr., Ph.D.
Assistant Curator of Crustacea
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Diptera Taxonomic Workshop 19-20 June Corvallis

Greetings All. Set your calendar for 18-20 June for a Diptera Workshop with Gregory Courtney in Corvallis. The 18th is an optional field trip for collecting. Let you know about logistics and cost later.

Thanks,
Mindy Allen (allensparadise@msn.com)

2010 American Malacological Society Meeting

The 76th meeting of the American Malacological Society will be a joint meeting with Western Society of Malacologists on June 26 - 30 (with optional excursions on July 1) in San Diego, California, at the San Diego State University Convention Center.

For more information
Please contact Dr. Doug Eernisse, President 2009-2010, (**deernisse@fullerton.edu**).
http://www.malacological.org/meetings/next.php

NEW BOOK

Thorp, J.H. and A.P. Covich, eds. 2009. Ecology and Classification of North American Freshwater Invertebrates (Third edition). Academic Press, San Diego, CA, USA. 1021 pp.

"This 3rd edition has been extensively revised. The chapters present up-to-date reviews on the structure, function, ecology, and systematics of each invertebrate group. The biggest change from the 2nd edition is an expansion of the taxonomic keys to allow identifying many of the taxa to the species level. References to more-detailed monographs and web sites allow users to quickly gain a fuller perspective on particular groups of interest."

John E. Havel, Ph.D.
Professor of Biology
Missouri State University

Review copied from: http://www.lavoisier.fr/notice/fr285805.html

SAFIT MEETINGS

The board of directors now meet via conference call on the 3rd Friday of the month.

EMPLOYMENT OPPORTUNITIES

Offering employment? We can post it here.

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.

Squeezing Stoneflies

by Jon Lee

In the previous Field and Lab article (Vol. 2, Issue 3&4) John Sandberg mentioned the need for aedeagus extrusion for identification of some groups of stoneflies (Plecoptera). The aedeagus is part of the male reproductive system and is used for identification of some members in the

families Chloroperlidae, Peltoperlidae, Perlidae, and Perlodidae. In these groups the aedeagus is, at rest, concealed inside the abdominal cavity and is everted from the genital opening behind sternum nine during copulation. It is mostly membranous and often adorned with various setae/spines, spine groups, and larger sclerotized structures that, along with general shape, are used for species identification.

In order to study the aedeagus it must be everted, a process often simply called “squeezing”. Only specimens that are live or recently dead (within 30 minutes) will work or a much more laborious method must be employed (see Szczytko and Stewart 1979). Some stonefly workers have good success everting aedeagi in the field “by gently squeezing and rolling the abdomen between the thumb and forefinger, toward the posterior end” (Szczytko and Stewart 1979) prior to preservation. I’ve had much better success with aedeagus extrusion under a scope in the lab.

Carry a container in which to keep live adult stoneflies when collecting stoneflies in the field. The different families can be readily determined in the field with practice. Keep adults whose aedeagus needs to be examined live. It is a good idea to keep the stonefly alive for a day or two to make sure the specimen is no longer teneral (the condition where the sclerotization hasn’t completely hardened after emergence or eclosion). After a day or two you are ready to do some squeezing. The following method has worked well for me and is based on instructions from John Sandberg and Boris Kondratieff. Materials needed include:

- a stereomicroscope
- forceps
- a teasing needle - with a fine sharpening stone dull the needle so the tip is blunt or rounded
- a container of ethanol or very hot water - large enough to completely submerge a stonefly

Grasp the male stonefly with your thumb and forefinger. Position it so the dorsal surface (terga) of the posterior abdominal segments are pressed against your forefinger while gently but firmly holding it with your thumb. Place the stonefly under the scope so you can clearly see the ninth (last visible) abdominal sternite (ventral surface is facing up), your forefinger should be supporting (underneath) the segments dorsal surface. While gently putting pressure on the abdomen with your thumb and forefinger, use the dull needle to press against the rounded or bulbous ninth sternum (I’m right handed and use my right hand to hold the stonefly and my left to hold the needle). Be patient, keep exerting pressure with the needle, gently prod if necessary, you will see the aedeagus start to protrude from the posterior margin of sternum nine, sometimes it pops right out, at other times it is a very gradual process. When it has fully everted submerge the specimen in alcohol - keeping pressure on the abdomen - for about 60 seconds. An alternative is to grasp the eighth segment with forceps, making sure the aedeagus doesn’t retract into the abdomen, and hold the specimen under not quite boiling water for a few seconds. My experience is that squeezing takes patience and practice. Too much pressure and the aedeagus or abdomen can pop. Too little and you don’t get an extrusion. Be patient, practice and before you know it, squeezing will become second nature.

Szczytko, S. W. and K. W. Stewart. 1979. The genus *Isoperla* (Plecoptera) of western North America; holomorphology and systematics, and a new stonefly genus *Cascadoperla*. Memoirs of the American Entomological Society 32:1-120.

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

We encourage SAFIT members to collect mature specimens (usually adult males for arthropods) to further taxonomic and distributional knowledge of macroinvertebrates within the SAFIT region. Immature macroinvertebrates normally dominate benthic bioassessment samples and generic level classification can be a challenge (but see below for a distinct exception). Adult collecting, particularly in out of the way places, can be both informative and entertaining. It is an eye opener to be able to confidently key specimens to the species level.

Oreoleptis sp. (Diptera: Oreoleptidae). *Oreoleptis torrenticola*, the "many legged fly", was described by Zloty et al. (2005) from the northern Rocky Mountains. It was quite a surprise to find a larva in a sample collected by the Yurok Tribal EPA from a tributary of the Klamath River in Humboldt Co., CA. This interesting critter cannot be mistaken!

Oreoleptis torrenticola larva. Photo courtesy J. Zloty.

Zloty, J., B. J. Sinclair, and G. Pritchard. 2005. Discovered in our backyard: a new genus and species of a new family from the Rocky Mountains of North America (Diptera, Tabanomorpha). Systematic Entomology:1-19.

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!!

Mollusca

Hershler, R. and H. P. Liu. 2010. Two new, possibly threatened species of *Pyrgulopsis* (Gastropoda: Hydrobiidae) from southwestern California. Zootaxa 2343:1-17.

Wethington, A. R., J. Wise, and R. T. Dillon. 2009. Genetic and morphological characterization of the Physidae of South Carolina (Gastropoda: Pulmonata: Basommatophora), with description of a new species. Nautilus 123:282-292.

Crustacea

Culver, D. C., J. R. Holsinger, M. C. Christman, and T. Pipan. 2010. Morphological differences among eyeless amphipods in the genus *Stygobromus* dwelling in different subterranean habitats. Journal of Crustacean Biology 30:68-74.

Hossack, B. R., R. L. Newell, and D. C. Rogers. 2010. Branchiopods (Anostraca, Notostraca) from protected areas of Western Montana. Northwest Science 84:52-59.

Larson, E. R., C. A. Busack, J. D. Anderson, and J. D. Olden. 2010. Widespread distribution of the non-native northern crayfish (*Orconectes virilis*) in the Columbia River basin. Northwest Science 84:108-111.

Ephemeroptera

Alexander, L. C., M. Delion, D. J. Hawthorne, W. O. Lamp, and D. H. Funk. 2009. Mitochondrial lineages and DNA barcoding of closely related species in the mayfly genus *Ephemerella* (Ephemeroptera: Ephemerellidae). Journal of the North American Benthological Society 28:584-595.

Baumgardner, D. E. and W. P. McCafferty. 2010. Revision of the genus *Leptohyphes* Eaton (Ephemeroptera: Leptohyphidae) in North and Central America. Zootaxa 2360:1-33.

Ditsche-Kuru, P. and J. H. E. Koop. 2009. New insights into a life in current: do the gill lamellae of *Epeorus assimilis* and *Iron alpicola* larvae (Ephemeroptera: Heptageniidae) function as a sucker or as friction pads? Aquatic Insects 31:495-506.

Gattolliat, J. L. and C. Nieto. 2009. The family Baetidae (Insecta: Ephemeroptera): synthesis and future challenges. Aquatic Insects 31:41-62.

Kluge, N. J. 2009. New version of the database "Ephemeroptera of the World" as the first experience of a permanent and objective web catalogue in biology. Aquatic Insects 31:167-180.

McCafferty, W. P. 2009. New state and provincial North American records for 100 Ephemeroptera species. Transactions of the American Entomological Society 135:353-368.

Monaghan, M. T. and M. Sartori. 2009. Genetic contributions to the study of taxonomy, ecology, and evolution of mayflies (Ephemeroptera): review and future perspectives. Aquatic Insects 31:19-39.

Newell, R. L. and M. L. Anderson. 2009. Note on the occurrence of *Siphlonurus autumnalis* (Ephemeroptera: Siphlonuridae) in a Montana spring brook. Western North American Naturalist 69:551-555.

Nieto, C. and J. L. Gattolliat. 2010. Are the Baetidae subfamilies (Insecta: Ephemeroptera) natural groups? Cladistics 26:219-219.

Pond, G. J. 2010. Patterns of Ephemeroptera taxa loss in Appalachian headwater streams (Kentucky, USA). Hydrobiologia 641:185-201.

Odonata

Caesar, R. M. and J. W. Wenzel. 2009. A phylogenetic test of classical species groups in *Argia* (Odonata: Coenagrionidae). Entomologica Americana 115:97-108.

Dumont, H. J., A. Vierstraete, and J. R. Vanfleteren. 2010. A molecular phylogeny of the Odonata (Insecta). Systematic Entomology 35:6-18.

Novelo-Gutierrez, R. 2009. Description of the larva of *Acanthagrion quadratum* Selys, with a key to the known larvae of the genus (Zygoptera: Coenagrionidae). Odonatologica 38:321-328.

Plecoptera

Bojkova, J. and J. Helesic. 2009. Spring fens as a unique biotope of stonefly larvae (Plecoptera): species richness and species composition gradients. Aquatic Insects 31:359-367.

Krno, I. and M. Holubec. 2009. Effects of land use on stonefly bioassessment metrics. Aquatic Insects 31:377-389.

Lee, J. J. and R. W. Baumann. 2010. Studies on *Sweltsa townesi* and a new species, *Sweltsa salix*, from northern California (Plecoptera: Chloroperlidae). Illiesia 6:34-40.

Li, W. H., Y. B. Wang, and D. Yang. 2010. Synopsis of the genus *Paraleuctra* (Plecoptera: Leuctridae) from China. Zootaxa 2350:46-52.

Myers, L. W. and B. C. Kondratieff. 2009. Descriptions of the nymphs of eastern North American species of *Cultus* (Plecoptera: Perlodidae). Entomologica Americana 115:109-114.

Stewart, K. W. 2010. The larva of *Paracapnia disala* (Jewett) (Plecoptera: Capniidae). Illiesia 6:11-15.

Stewart, K. W. and N. H. Anderson. 2009. The life history and larval generic character development of *Malenka bifurcata* (Claassen, 1923) (Plecoptera: Nemouridae) in an Oregon summer-dry stream. Aquatic Insects 31:391-399.

Stewart, K. W. and N. H. Anderson. 2010. The life history of *Ostrocerca dimicki* (Frison) in a short-flow, summer-dry Oregon stream. Illiesia 6:52-57.

Zwick, P. 2009. The Plecoptera - who are they? The problematic placement of stoneflies in the phylogenetic system of insects. Aquatic Insects 31:181-194.

Trichoptera

Blinn, D. W. and D. W. Ruiter. 2009. Caddisfly (Trichoptera) assemblages along major river drainages in Arizona. Western North American Naturalist 69:299-308.

Bueno-Soria, J. 2010. Some new Trichoptera (Glossosomatidae, Hydroptilidae, Hydropsychidae and Polycentropodidae) from Mexico. Proceedings of the Entomological Society of Washington 112:22-31.

Ito, T. 2009. A new species of the genus *Palaeagapetus* Ulmer (Trichoptera, Hydroptilidae) from Japan. Limnology.

Johanson, K. A. and M. Espeland. 2010. Phylogeny of the Ecnomidae (Insecta: Trichoptera). Cladistics 26:36-48.

Ruiter, D. E. and D. W. Blinn. 2009. Illustrations for several previously un-associated Arizona Trichoptera females. Braueria (Lunz am See, Austria) 36:4-10.

Coleoptera

Alarie, Y., M. C. Michat, A. N. Nilsson, M. Archangelsky, and L. Hendrich. 2009. Larval morphology of *Rhantus* Dejean, 1833 (Coleoptera: Dytiscidae: Colymbetinae): descriptions of 22 species and phylogenetic considerations. Zootaxa 2317:1-102.

Gentili, E. and M. Fikacek. 2009. Taxonomic notes on *Laccobius*, subgenus *Glyptolaccobius*, with new records and description of four new species (Coleoptera: Hydrophilidae). Acta Entomologica Musei Nationalis Pragae 49:607-624.

Diptera

Elberg, K., R. Rozkosny, and L. Knutson. 2009. A review of the Holarctic *Sepedon fuscipennis* and *S. spinipes* groups with description of a new species (Diptera: Sciomyzidae). Zootaxa 2288:51-60.

Evenhuis, N. L., J. E. O'Hara, T. Pape, and A. C. Pont. 2010. Nomenclatural studies toward a world list of Diptera genus-group names. Part I: Andre-Jean-Baptiste Robineau-Desvoidy. Zootaxa 2373:1-265.

Neugart, C., K. Schneeberg, and R. G. Beutel. 2009. The morphology of the larval head of Tipulidae (Diptera, Insecta) - the dipteran groundplan and evolutionary trends. Zoologischer Anzeiger 248:213-235.

Ronderos, M. M. and G. R. Spinelli. 2009. Description of the immatures of the predaceous midge *Bezzia blantoni* Spinelli & Wirth (Diptera: Ceratopogonidae). Zootaxa 2295:46-54.

Sanseverino, A. M., S. Trivinho-Strixino, and J. L. Nessimian. 2010. Taxonomic status of *Nimbocera* Reiss, 1972, a junior synonym of *Tanytarsus* van der Wulp, 1874 (Diptera: Chironomidae). Zootaxa 2359:43-57.

Tejerina, E. G. and A. C. Paggi. 2009. A redescription of *Rheotanytarsus lamellatus* Reiss in all stages (Diptera: Chironomidae) and new records from Argentina. Zootaxa 2315:31-38.

Miscellaneous

Carter, J. L., A. H. Purcell, S. V. Fend, and V. H. Resh. 2009. Development of a local-scale urban stream assessment method using benthic macroinvertebrates: an example from the Santa Clara Basin, California. Journal of the North American Benthological Society 28:1007-1021.

Fenoglio, S., T. Bo, M. Cammarata, G. Malacarne, and G. Del Frate. 2010. Contribution of macro- and micro-consumers to the decomposition of fish carcasses in low-order streams: an experimental study. Hydrobiologia 637:219-228.

Girgin, S. 2010. Evaluation of the benthic macroinvertebrate distribution in a stream environment during summer using biotic index. International Journal of Environmental Science and Technology 7:11-16.

Hedrick, L. B., S. A. Welsh, J. T. Anderson, L. S. Lin, Y. S. Chen, and X. C. Wei. 2010. Response of benthic macroinvertebrate communities to highway construction in an Appalachian watershed. Hydrobiologia 641:115-131.

Holzenthal, R. W., D. R. Robertson, S. U. Pauls, and P. K. Mendez. 2010. Taxonomy and systematics: contributions to benthology and J-NABS. Journal of the North American Benthological Society 29:147-169.

Imoobe, T. O. T. and E. Ohiozebau. 2010. Pollution status of a tropical forest river using aquatic insects as indicators. African Journal of Ecology 48:232-238.

Kefford, B. J., L. Zalizniak, J. E. Dunlop, D. Nugegoda, and S. C. Choy. 2010. How are macroinvertebrates of slow flowing lotic systems directly affected by suspended and deposited sediments? Environmental Pollution 158:543-550.

Mesa, L. M. 2010. Effect of spates and land use on macroinvertebrate community in Neotropical Andean streams. Hydrobiologia 641:85-95.

Radwell, A. J. and N. B. Camp. 2009. Comparing chemiluminescent and LED light for trapping water mites and aquatic insects. Southeastern Naturalist 8:733-738.

Resh, V. H. and D. M. Rosenberg. 2010. Recent trends in life-history research on benthic macroinvertebrates. Journal of the North American Benthological Society 29:207-219.

Selvakumar, A., T. P. O'Connor, and S. D. Struck. 2010. Role of stream restoration on improving benthic macroinvertebrates and in-stream water quality in an urban watershed: case study. Journal of Environmental Engineering-Asce 136:127-139.

Vieira, N. K. M., B. C. Kondratieff, D. E. Ruiter, and R. S. Durfee. 2009. The aquatic insects of the Valles Caldera National Preserve, Sandoval County, New Mexico, excluding Diptera, with notes on new state records. Journal of the Kansas Entomological Society 82:250-262.

Willkommen, J. 2009. The tergal and pleural wing base sclerites - homologous within the basal branches of Pterygota? Aquatic Insects 31:443-457.

Yoshimura, M. 2009. Comparison of stream benthic invertebrate particularly stonefly assemblages in the temperate forest in Japan in relation to forest types. Aquatic Insects 31:369-376.

THANK YOU FOR YOUR MEMBERSHIP!

Newsletter of the SOUTHWEST ASSOCIATION OF FRESHWATER INVERTEBRATE TAXONOMISTS

Greetings SAFIT members,

Summer has finally arrived in northern California. We hope everyone had a good spring collecting season. The SAFIT website is progressing nicely as is an updated version of the STE. 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.

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

Free Entomological Literature

The Entomological Society of Canada (ESC) has posted a number of monographs on insects and other invertebrates as free downloadable PDFs at their website (http://www.esc-sec.ca/aafcmono.html). Many of these works are out of print and some are very difficult or expensive to obtain. Of particular interest is the 3-volume Manual of Nearctic Diptera. A recent copy of this set had an asking price of $1500 for all three volumes so this *free* PDF is quite the

bargain! Below is a selected list which might be of interest to SAFIT members, but check the website for the complete list.

Various authors, 1983, Manual of Nearctic Diptera. Volume 1, 674 pp

Various authors, 1987, Manual of Nearctic Diptera. Volume 2, 658 pp

Various authors, 1990, Manual of Nearctic Diptera. Volume 3, 249 pp

Bousquet, Y., 1991, Checklist of beetles of Canada and Alaska, 430 pp

Martin, J.E.H., 1977, Collecting, preparing, and preserving insects, mites, and spiders, Insects and Arachnids of Canada Handbook Series, 1 (English), 182 pp

Oliver, D.R. & Roussel, 1983, The genera of larval midges of Canada: Diptera, Chironomidae, Insects and Arachnids of Canada Handbook Series, 11, 263 pp

Schmid, F., 1980, Genera des Trichoptères du Canada et des États adjacents, Insects and Arachnids of Canada Handbook Series, 7 (French), 296 pp

Wood, D.M., Dang, P.T. & Ellis, R.A., 1979, The mosquitoes of Canada: Diptera: Culicidae, Insects and Arachnids of Canada Handbook Series, 6 (English), 390 pp

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Revised Water Beetles of Florida Identification Manual now available

John Epler has just revised his Water Beetles of Florida identification manual and made it available for free download at URL: http://www.floridadep.org/labs/cgi-bin/sbio/keys.asp#keys. Download “Beetles10.pdf”. Warning: this file is 152 MB, but worth the wait. There are many other interesting PDFs on this page, although they are all geared toward the Florida fauna.

As in all of Epler’s identification manuals, the keys are straightforward and illustrations are located next to the corresponding couplet so no flipping pages looking for hidden illustrations. This revised manual includes color photos of nearly all the Florida beetles along with many key characters. All the chapters have been extensively revised from the first addition. New to this edition are chapters on the Chrysomelidae and Curculionidae. Although species and their distribution information is restricted to Florida and the surrounding states, this is a useful resource when identifying Nearctic water beetles. For those interested, Epler’s webpage can be found at URL: http://home.comcast.net/~johnepler3/index.html. Epler has provided lists of his publications, and links to PDFs of many, as well as the distribution lists he maintains for Floridian bugs, beetles and midges.

Call for specimens

I am finally getting to work on several description projects I've had on my desk for too many years now. Although I collect my own material for these projects, it would be beneficial to me to look at specimens from other collections. If you have specimens (with good locality data) that match my list below, please contact me at arichards@csuchico.edu. In return for seeing specimens and hopefully, keeping some, I will return determined material for your reference collections.

Trichoptera: Hydroptilidae: Specifically, I'm looking for larval and adult specimens of *Nothotrichia shasta* Harris and Armitage. I'm also interested in obtaining a series of *Agraylea* larvae for comparison. If you think you have *Nothotrichia* larvae, or if you have specimens that seem similar to *Agraylea* in shape and case construction, but are lacking the sclerite between the forecoxae, I'd love to take a look at them. My plan is to describe the larva of *Nothotrichia shasta* and provide characters to revise existing keys. For that matter, if you have weird hydroptilids and can use some help identifying them, contact me.

Coleoptera: Eulichadidae: *Stenocolus scutellaris* LeConte. I have reared larvae to adults and plan to describe the pupa of this California endemic. I'll look at larvae but I'm particularly interested in seeing adults so that I may flesh out the distribution and temporal emergence for the species. Incidentally, the adult emergence usually starts the last week of June/first week of July but may be delayed this year due to unseasonably cool and wet weather here in California.

Coleoptera: Ptilodactylidae: *Anchycteis*. I have morphological and DNA data that shows there is a second species here in California in addition to the one described species, *A. velutina* (Horn). I'm interested in seeing adults and larvae, especially from northern California and other states. Preliminary data shows that the larvae are separable for the two forms, but it would be helpful to see if there are intergrade forms. I plan to describe the new species, redescribe *A. velutina* and describe the larvae for both species.

Coleoptera: Ptilodactylidae: *Araeopidius monachus* LeConte. Okay, there isn't anything new here, but I figured as long as I'm working on *Stenocolus* and *Anchycteis*, I might as well do a modern redescription of *Araeopidius* as well.

Thanks in advance,

Brady Richards
CDFG ABL-Chico
arichards@csuchico.edu

California Stormwater Quality Association: The CASQA annual conference will be held November 1-3, 2010 at the Westin Mission Hills in Rancho Mirage. Further information can be found at: http://www.StormwaterConference.com/

California Aquatic Bioassessment Workshop: The 2010 CABW will take place November 16-17 at UC Davis.

SAFIT MEETINGS

The board of directors now meet via conference call on the 3rd Friday of the month.

The SAFIT Annual Meeting will take place the week of November 15-19, 2010, the same week as the CABW. Elections for the SAFIT positions of Vice President and Treasurer will be part of the agenda. Exact meeting date and location have not been finalized.

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.

Collecting Water Mites

by Jon Lee

This June I had the opportunity to accompany water mite specialist Dr. Ian M. Smith, of the Canadian National Collection of Insects and Arachnids, Ottawa, Ontario, on a collecting trip to the Willow Creek drainage in Humboldt Co., CA. Dr. Smith, who is collecting fresh material for DNA barcoding, indicated that northern California and southern Oregon possess an interesting water mite (Hydrachnidiae) fauna including "Tertiary relics" (see Smith et al. 2009). It was very informative discussing aspects of water mite distribution, evolution and ecology, and instructive observing the water mite collecting technique.

Water mites regularly show up in bioassessment samples collected with D-framed kick-nets. However, there is a mite-specific collecting technique. The technique is described in Smith et al. (2009) and briefly outlined here for running water habitats. Materials required include a wide mouthed net with 250 µm mesh size, standard sieves of 250 µm and 2 mm mesh sizes, a small

spade, large and strong clear plastic bags, and one liter sample containers. The substrate is thoroughly disturbed upstream of the net with the aid of the spade (to dig into the substrate), dislodged organisms and substrate particles are swept into the net. Contents of the net are placed into a plastic bag containing a small amount of water and allowed to settle. This process is repeated until the plastic bag is approximately half full of material. Fresh water is added and the contents of the plastic bag are then thoroughly stirred and poured into the series of sieves (larger mesh size on top). Running water mites are tenacious clingers so if aquatic moss was collected the moss is thoroughly agitated before pouring into the sieves. After thorough rinsing with water, the contents of the top sieve are returned to the creek. The contents of the bottom sieve are transferred to a container that is filled with water, stirred and poured through the small mesh sieve to remove as much sediment as possible. Once elutriation is complete, the contents remaining in the sieve are placed into a container filled with source water and put on ice for live sorting in the laboratory.

The sorted mites should be preserved in Koenike's solution, consisting of 5 parts glycerin, 4 parts water, and 1 part glacial acetic acid, by volume. Alcohol dehydrates the mites and makes them more difficult to identify. However, mites preserved in alcohol can still be used. The taxonomic keys for water mites are for slide-mounted specimens. Dr. Smith compared keying mites to keying chironomids: if a slide is well prepared so that key characters can be seen, mites are not difficult to key.

Water mites are an old and species-rich group. As with many macroinvertebrate groups, younger researchers need to be enlisted to carry the taxonomic torch. Larval mite taxonomy has advanced and research in larvae-host relationships should prove valuable to the bioassessment community. Dr. Smith is very enthusiastic, approachable, and is a nice guy. He is interested in leading a water mite taxonomic workshop covering the SAFIT region, and mentioned recruiting a colleague to discuss water mite ecology. He is also open to looking at specimens SAFIT members are having trouble keying. Dr. Smith can be reached at: smithi@agr.gc.ca

Smith, I.M., D.R. Cook, and B.P. Smith. 2009. Water mites (Hydrachnidiae) and other Arachnids. pp. 485-586 *in* Thorp, J.H. and A.P. Covich (eds.) Ecology and Classification of North American Invertebrates (Third edition). Academic Press, San Diego, CA, USA.

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

Zapada cinctipes – while collecting stonefly adults this winter some interesting looking *Zapada* were caught – they had simple, unbranched cervical gills but the male terminalia looked like *Z. cinctipes*. These specimens were collected from riparian vegetation at Sulfur Creek – aptly named judging by the strong odor of sulfur compound(s). The specimens were sent off to Dr. Richard Baumann and he confirmed that they were *Z. cinctipes* but with simple cervical gills and sent the following note:

Odd gill numbers and shapes in the stonefly *Zapada cinctipes*

The genus *Zapada* in the stonefly family Nemouridae bears distinct cervical gills in the neck region as the name implies. These gills are easily seen in nymphal specimens and are often used for separating the several species in the genus during the immature stages. Most *Zapada* species have four sausage-like gills in the neck region two on each side of the midline. However, the most common species in western North America, *Zapada cinctipes* exhibits a branching of each of the main gills. The number of gill branches is usually 4 on each gill but can be variable depending on developmental problems that occur because of physical or environmental factors. The exact mechanism has not been studied but often when *Z. cinctipes* nymphs are placed in an environment that is stressful the cervical gills are adversely affected. Sometimes whole gills are lost but most often the shape and number of branches is altered so that the insect is malformed and thus is difficult to determine using existing taxonomic keys.

Richard W. Baumann
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Provo, Utah 84602

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!!

Mollusca

Allen, D. C. and C. C. Vaughn. 2010. Complex hydraulic and substrate variables limit freshwater mussel species richness and abundance. Journal of the North American Benthological Society 29:383-394.

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Miscellaneous

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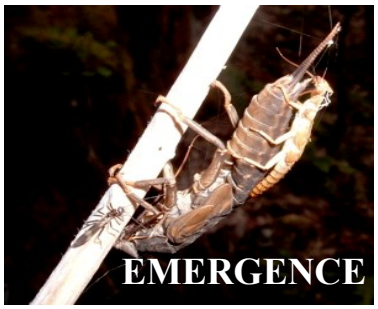
THANK YOU FOR YOUR MEMBERSHIP!



Newsletter of the SOUTHWEST ASSOCIATION OF FRESHWATER INVERTEBRATE TAXONOMISTS

Greetings SAFIT members,

We had some hold-ups getting this issue of the newsletter out but hopefully better late than never! 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

BIOLIEF 2011 - 2nd World Conference on Biological Invasions and Ecosystem Functioning. Mar del Plata, Argentina, November 21-24, 2011.

BIOLIEF 2011 will be a forum for the presentation, discussion, and synthesis of research on biological invasions in its broadest sense. The conference will place a particular emphasis on studies concerning the impact of invasive species on ecosystem functioning and/or services,

irrespective of taxonomic groups or ecosystem types. However, studies on any other ecological aspect of biological invasions will also be welcome. Topics such as the spread of invasive species into ecosystems, the biogeography and history of species introductions, and the community- or species-level impact of biological invasions will also have an important coverage in the final conference program.
Contact: Jorge L. Gutiérrez
E-mail: <mailto:biolief@grieta.org.ar>biolief@grieta.org.ar
For more information about this meeting, visit our website (<http://www.grieta.org.ar/biolief/>http://www.grieta.org.ar/biolief/). You can also follow us in Facebook for news and updates (<http://www.facebook.com/?ref=home#%21/pages/BIOLIEF-2011/126444150720221?ref=sgm>http://www.facebook.com/?ref=home#!/pages/BIOLIEF-2011/126444150720221?ref=sgm).

California Aquatic Bioassessment Workgroup

17th Annual Meeting
16 – 17 November 2010
8 am – 4 pm
The Ballroom
Activities and Recreation Center Conference Facility
University of California
Davis, CA
For information contact Jim Harrington: (916) 358-2862, **jharring@ospr.dfg.ca.gov**

SAFIT MEETINGS

The board of directors now meet 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.

2010 SAFIT Annual Meeting. 18 November 2010; 9 am - 5 pm.
California Department of Fish and Game Yolo Bypass Wildlife Area Headquarters
Elections for the SAFIT positions of Vice President and Treasurer will be part of the agenda.

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.

Adult identification in benthic samples.

by Jon Lee

While recycling old vials recently (nice to see 10 + year old specimens in good shape in ½ dram snap cap vials) I started pulling what looked like interesting specimens. Mostly Baetidae I don't see too often but also *Rhyacophila* pupae and pre-emergent Plecoptera. When processing these samples over ten years ago Trichoptera pupae were a headache and pre-emergent stoneflies were nice to see just because they keyed easily. Now, after dabbling in adult identification, I look forward to caddis pupae and certain late instar stoneflies that can often be determined to species level.

Many insect species diagnostic characteristics are based on male genitalia, which is often elaborate and distinct even when it is difficult to determine the larvae and females. Pharate adult stoneflies (adult characters visible through the larval cuticle) and pharate caddisflies (adult characters visible through the pupal cuticle) can be used to determine species and associate larvae with adults.

Plecoptera that possess distinct sclerotized external genitalia (at least some Capniidae, Leuctridae, Nemouridae, and Chloroperlidae) will have the male genitalic characters visible through the last larval cuticle if collected at the right stage. This can be particularly valuable for Capniidae (possessing a distinct epiproct) and some Chloroperlidae whose nymphs can be difficult to determine to genus. The epiproct structure morphology can be used to separate *Capnia* and *Mesocapnia* (Capniidae) in pharate male specimens. *Alloperla fraterna* Frison is a common chloroperlid species in northern California that lacks the characteristic *Alloperla* feathery cercal setal fringe in Oregon specimens (Stewart and Stark 2002). I've seen pharate males in springtime benthic samples from several sites and would have left them at Chloroperlidae if not for the visible epiproct. It is also nice to be able to put a species name on pre-emergent male *Sweltsa* nymphs.

Milne (1938) introduced the "Metamorphotype Method" of associating Trichoptera larvae with adults using the pre-emergent pupae. This method uses the pharate adult, larval sclerites, and pupal armature to associate the three stages. Having some knowledge of adult morphology can be very helpful when a male pupa is free of its case and associated larval sclerites are missing. This has proven particularly useful for keying *Rhyacophila* to species group and Philopotamidae to genus. I'm not aware of Trichoptera pupal keys to genus but for Philopotamidae having some knowledge of adult morphology sure beats having to use Ross (1944)!

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

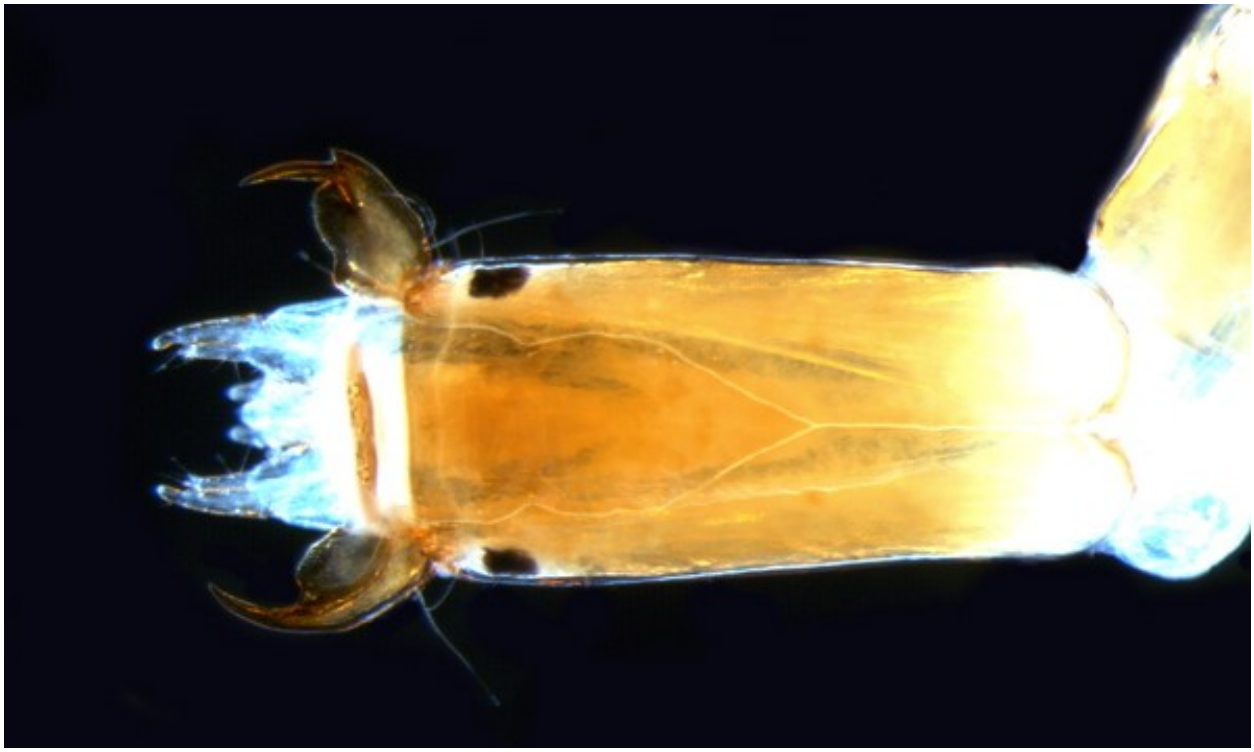
***Zaitzevia posthonia* Brown**

Have you ever been scratching your head keying an elmid larva to *Zaitzevia* but thinking this just doesn't look right? I was discussing this with Brady Richards when he suggested *Zaitzevia posthonia*. Additional samples from small, cascading streams in northern California contained the same perplexing larvae but also several adults. The adults fit *Z. posthonia*. Just a heads up to be aware that *Z. posthonia* is out there.

***Rhyacophila* sp. larvae**

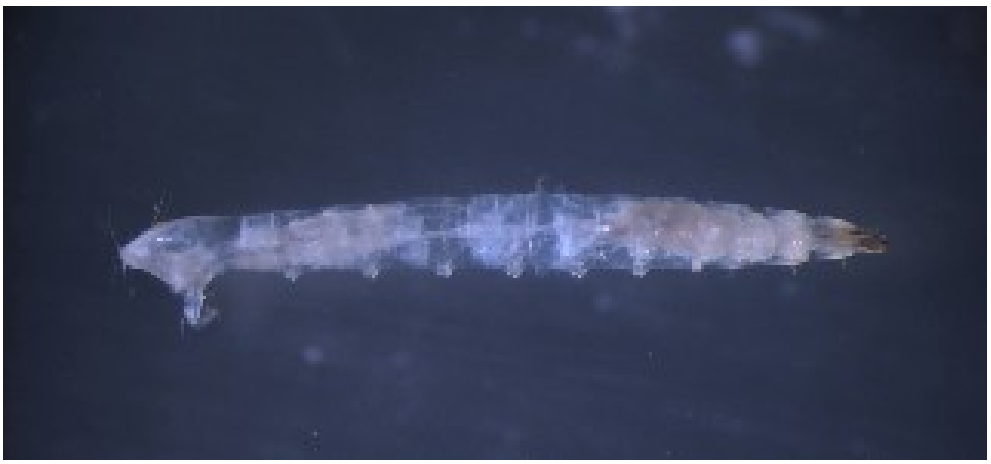
Dave Ruiter took the following headshots of a "posing" *Rhyacophila* larva. Bob Wisseman thinks the specimen is in the *R. viquaea* species group, but adds that metamorphotypes or DNA matching will be needed to confirm this placement. Please note that the *Rhyacophila viquaea* species group name is not used for larvae in the current STE.

This apparently rarely collected larva was found in a small, cold, rubble bottomed creek in the Redwood Creek watershed, Humboldt Co., CA. Please contact the editor with collection data if you run across this interesting *Rhyacophila*.



Empididae unknown genus

The larvae have 8 pairs of prolegs, though the first seven pair are more like creeping welts. The last pair of prolegs on the anal segment are very long and retractable, with very long hooks. The anal segment is truncated in dorsal view. There are setal tufts on the posterior edge and a pair of tufts on either side of the mid-dorsal region of the anal segment.



This larva has been turning up in the last couple of years from the Pacific Northwest. I can only assume at this point that it is possibly the genus *Proclinopyga* (Clinocerinae), the larva of which

has not been identified. I hope to look into some molecular identification to verify this assumption but have not gotten very far. My colleagues are attempting to collect additional material and rear out the adults.

I encourage you to try to rear the larvae and then I can easily determine the genus. The genus is in need of revision, but there are some 10 western species of this genus from California to Alaska.

Cheers,
Brad

Dr. Bradley J. Sinclair
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(Contributed by Bob Wisseman).

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!!

Ephemeroptera

Arimoro, F. O. and W. J. Muller. 2010. Mayfly (Insecta: Ephemeroptera) community structure as an indicator of the ecological status of a stream in the Niger Delta area of Nigeria. Environmental Monitoring and Assessment 166:581-594.

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THANK YOU FOR YOUR MEMBERSHIP!

Board of Directors:

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Newsletter of the SOUTHWEST ASSOCIATION OF FRESHWATER INVERTEBRATE TAXONOMISTS

Season's greetings SAFIT members,

It is finally winter stonefly collecting time. Hope you're collecting some interesting sites. 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

A call for Amphipoda and Isopoda specimens:
G.O. Graening (SacState Dept. Biological Sciences), who recently joined SAFIT, is a conservation biologist focusing on rare invertebrates, primarily those dependent upon groundwater and cave habitats. Graening is attempting to assemble California checklists of Amphipoda and Isopoda in freshwater habitats, and is soliciting the help of SAFIT members. Christopher Rogers will be collaborating, as well as taxonomic specialists John Holsinger (Old Dominion University) and J. Jerry Lewis (Lewis Bioconsulting), who have published the most recent species descriptions of Californian endemics. Graening is requesting occurrence records

and/or specimens of Amphipoda and Isopoda from freshwater sites in California, and will employ Holsinger and Lewis to eventually identify these collections to the specific level. Dr. Jonathan Witt (University of Waterloo) is also participating, and will gladly accept any specimens of *Hyalella*, as he has been using genetic analyses to differentiate species in the *H. azteca* complex. Graening has previously published checklists of the Amphipoda and Isopoda of Arkansas and Oklahoma, but these were relatively easy compilations compared to assembling a checklist for California, which has a more complicated landscape with exotics and euryhaline species present. Rogers (2005) list of genera was a starting point.

Please contact Dr. Graening concerning records/specimens.

Dr. G. O. "Geo" Graening, Adjunct Professor

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Entomology Seminars
As many of you already know, UC Davis has weekly Entomology seminars from 12:10 to 1:00 PM on Wednesdays in room 1022 Life Sciences Addition. What you may not know is that they are now providing a free webcast that can be watched live, or as an archived file. For those of us not living in the area, it is now possible to keep up with lectures on current entomological research via the web. The schedule and links to the webcasts can be accessed here: http://entomology.ucdavis.edu/courses/deptseminar/distinguishedseminarseries.cfm

(Taken from **Bits and Pieces:** Newsletter of the Pacific Coast Entomological Society, Number 217, January 2011).

SAFIT MEETINGS

The board of directors meet 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

The California Sustainability Indicators Symposium will be held on Thursday, February 24 at the University of Southern California's Davidson Conference Center. Sustainability is possible if we invest in measuring our impacts and the effectiveness of our solutions. The **Los Angeles & San**

Gabriel Rivers Watershed Council and the **Sacramento River Watershed Program** are proud to host this two-day statewide event. This symposium will initiate a statewide conversation about sustainability report cards. Bringing together experts to discuss indicators and report cards for community and environmental well-being will allow attendees to grasp the significant efforts underway and consider the benefits and challenges of implementing a regional reporting mechanism. Learn what is already underway throughout California and lend your own ideas and expertise to the discussion. Registration closes at noon on February 20.

The **California Headwater to Oceans (H2O)** will be on May 24-26 at the Catamaran Resort Hotel and Spa on Mission Bay in San Diego. The conference will focus on California's coast, ocean beaches, wetlands, rivers, and watersheds, and includes sessions on a number of topics of potential interest to SAFIT members, such as watershed planning, sediment management, managing for threatened and endangered species, wetland restoration and enhancement, community outreach and education, monitoring and assessment, wetland and riparian ecology, watershed hydrology, and conservation biology.

The Geomorphic and Ecological Fundamentals for River and Stream Restoration Short Course will be held at the Sagehen Creek Field Station in Lake Tahoe, California from August 15 to August 19. Registration is now open.

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.

We need article contributions from the membership!

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

***Parapsyche* spp.** Givens and Smith (1980) recognize five *Parapsyche* species in the western United States. They provide keys for males of the five species, females of three species, and larvae of only two species, *P. almota* Ross and *P. elsis* Milne. These two larvae are easily separated but be aware that the remaining three larvae are undescribed. Putting specific names on *Parapsyche* larvae may not be prudent without associated adults.

Parapsyche larvae are characteristic of small, cold streams (Wiggins 1996) where larvae can be easily collected. Adults seem to be secretive, or at least have avoided most of my collection attempts. I have specimens of *P. turbinata* Schmid (specimens not confirmed) and *P. spinata* Denning (specimens confirmed) from more than one creek in northern California (including both species from one creek). *P. extensa* Denning is apparently only known from the holotype (http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/invert/Insects_Trichoptera/Parapsyche_extensa.pdf).

It has been over 30 years since the Givens and Smith (1980) synopsis of *Parapsyche*. Collecting metamorphotypes and attempting to associate the undescribed larvae with adults would be a good collective project for SAFIT members.

Givens, D.R. and S.D. Smith. 1980. A synopsis of western Arctopsychinae (Trichoptera: Hydropsychidae). Melanderia 35:1-24.

Wiggins, G.B. 1996. Larvae of North American caddisfly genera (Trichoptera). University of Toronto Press, Toronto. xiii + 457pp.

Stoneflies and habitat protection. A call for habitat protection of stonefly (Plecoptera) species with limited distributions in Montana and Idaho has recently been publicized. Impacts of climate change (http://www.nationalparkstraveler.com/2011/01/endangered-species-act-protection-sought-aquatic-insect-glacier-national-park7411) and habitat degradation as well as climate change (http://www.xerces.org/wp-content/uploads/2010/06/capnia_lineata__capnia_zukeli_-petition.pdf) are cited as potential negative impacts on these apparently rare species.

Although these species are not known from the area covered by SAFIT, several stoneflies within the SAFIT region are known only from the type localities or from few records. These are primarily winter stoneflies (adults emerge during the winter months) in the family Capniidae – but see the *Lednia* paper (Baumann and Kondratieff 2010) cited in the Latest Literature. It is a good time to go collecting capniid adults. Additional collection records, determining if certain species are indeed rare and not just undercollected, and locating undescribed species would be important contributions to baseline data and to the knowledge of stonefly distribution.

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

Brenneis, V. E. F., A. Sih, and C. E. de Rivera. 2010. Coexistence in the intertidal: interactions between the nonindigenous New Zealand mud snail *Potamopyrgus antipodarum* and the native estuarine isopod *Gnorimosphaeroma insulare*. Oikos 119:1755-1764.

Kerans, B. L., C. A. Cada, and J. Zickovich. 2010. Asymmetrical behavioral interactions between the New Zealand Mud Snail, *Potamopyrgus antipodarum*, and scraping, collector-gathering and collector-filtering macroinvertebrates. Journal of Freshwater Ecology 25:657-666.

Walther, A. C., J. B. Burch, and D. O. Foighil. 2010. Molecular phylogenetic revision of the freshwater limpet genus *Ferrissia* (Planorbidae: Ancylinae) in North America yields two species: *Ferrissia* (*Ferrissia*) *rivularis* and *Ferrissia* (*Kincaidilla*) *fragilis*. Malacologia 53:25-45.

Crustacea

Correa-Araneda, F., A. Contreras, and P. De Los Rios. 2010. Amphipoda and Decapoda as potential bioindicators of water quality in an urban stream (38 degrees S, Temuco, Chile). Crustaceana 83:897-902.

Johnson, D. P. 2010. Four new crayfishes (Decapoda: Cambaridae) of the genus *Orconectes* from Texas. Zootaxa 2626:1-45.

Rabet, N. 2010. Revision of the egg morphology of *Eulimnadia* (Crustacea, Branchiopoda, Spinicaudata). Zoosystema 32:373-391.

*Rogers, D. C., D. Dasis, and D. G. Murrow. 2011. A new species of *Branchinecta* (Crustacea: Anostraca) with comments on the large branchiopod crustaceans of Kansas. Zootaxa 2749:62-28.

Ephemeroptera

Funk, D. H., B. W. Sweeney, and J. K. Jackson. 2010. Why stream mayflies can reproduce without males but remain bisexual: a case of lost genetic variation. Journal of the North American Benthological Society 29:1258-1266.

Jacobus, L. M. 2010. Taxonomic review of the *Caudatella heterocaudata* (McDunnough) and *C. hystrix* (Traver) complexes (Insecta: Ephemeroptera: Ephemerellidae). Psyche 2010:1-5.

Odonata

Bonifait, S. and M. A. Villard. 2010. Efficiency of buffer zones around ponds to conserve odonates and songbirds in mined peat bogs. Ecography 33:913-920.

Campbell, W. B., R. Novelo-Gutierrez, and J. A. Gomez-Anaya. 2010. Distributions of odonate richness and diversity with elevation depend on windward or leeward aspect: implications for research and conservation planning. Insect Conservation and Diversity 3:302-312.

Magoba, R. N. and M. J. Samways. 2010. Recovery of benthic macroinvertebrate and adult dragonfly assemblages in response to large scale removal of riparian invasive alien trees. Journal of Insect Conservation 14:627-636.

Plecoptera

Baumann, R. W. and B. C. Kondratieff. 2010. The stonefly genus *Lednia* in North America (Plecoptera: Nemouridae). Illiesia 6:315-327.

Baumann, R. W. and B. P. Stark. 2010. Studies on the Plecoptera of the Kootenay Lake Drainage: a revisitation of the stoneflies from the Purcell Range, British Columbia, Canada. Illiesia 6:292-302.

*Sandberg, J. B. 2011. Vibrational communication of *Isoperla* Banks from California and Oregon (Plecoptera: Perlodidae). Illiesia 7:1-23.

Trichoptera

Hinchliffe, R. and A. R. Palmer. 2010. Curious chiral cases of caddisfly larvae: handed behavior, asymmetric forms, evolutionary history. Integrative and Comparative Biology 50:606-618.

Coleoptera

Ciampor, F. and J. Kodada. 2010. Taxonomy of the *Oulimnius tuberculatus* species group (Coleoptera: Elmidae) based on molecular and morphological data. Zootaxa 2670:59-68.

Diptera

Acosta, R. and N. Prat. 2010. Chironomid assemblages in high altitude streams of the Andean region of Peru. Fundamental and Applied Limnology 177:57-79.

Ekrem, T., E. Stur, and P. D. N. Hebert. 2010. Females do count: documenting Chironomidae (Diptera) species diversity using DNA barcoding. Organisms Diversity & Evolution 10:397-408.

Miscellaneous

Durance, I. and S. J. Ormerod. 2010. Evidence for the role of climate in the local extinction of a cool-water triclad. Journal of the North American Benthological Society 29:1367-1378.

Ebach, M. C. 2011. Taxonomy and the DNA barcoding enterprise. Zootaxa 2742:67-68.

Harmon, S. M. and F. E. Wiley. 2010. Effects of pollution on freshwater organisms. Water Environment Research 82:1945-2000.

*Herbst, D. B. and S. D. Cooper. 2010. Before and after the deluge: rain-on-snow flooding effects on aquatic invertebrate communities of small streams in the Sierra Nevada, California. Journal of the North American Benthological Society 29:1354-1366.

Jackson, J. K., J. M. Battle, and B. W. Sweeney. 2010. Monitoring the health of large rivers with macroinvertebrates: do dominant taxa help or hinder the assessment? River Research and Applications 26:931-947.

Lawrence, J. E., *K. B. Lunde, *R. D. Mazor, L. A. Bêche, E. P. McElravy, and V. H. Resh. 2010. Long-term macroinvertebrate responses to climate change: implications for biological assessments in Mediterranean-climate streams. Journal of the North American Benthological Society 29:1424-1440.

Loke, L. H. L., E. Clews, E. W. Low, C. C. Belle, P. A. Todd, H. S. Eikaas, and P. K. L. Ng. 2010. Methods for sampling benthic macroinvertebrates in tropical lentic systems. Aquatic Biology 10:119-130.

Nichols, S. J., W. A. Robinson, and R. H. Norris. 2010. Using the reference condition maintains the integrity of a bioassessment program in a changing climate. Journal of the North American Benthological Society 29:1459-1471.

THANK YOU FOR YOUR MEMBERSHIP!