



## Newsletter of the SOUTHWEST ASSOCIATION OF FRESHWATER INVERTEBRATE TAXONOMISTS

Greetings SAFIT members,

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 books or reprints to share, trade, or sell? Looking for a collecting partner? Put it here in the SAFIT Newsletter! All appropriate requests, queries, advertisements and announcements will be considered, and are free to the SAFIT membership.

There was no issue 9(4) due to lack of content and busy schedules. Remember, we need content so if you have an article you'd like to submit, photos, meeting announcements, etc., please let us know.

Pictured above is the larva of *Himalopsyche phryganea* (Ross, 1941), collected from CA: Humboldt Co., Mill Creek, 17-VII-2002. This specimen measures in at ~24 mm. There is another photo a few pages back. We've only had a couple of these larvae show up in samples here at the ABL over the years. I've never personally collected a larva, although I've caught a handful of adults in black light traps. Every time I catch an adult, my first reaction is, "wow, that limnephilid looks just like a *Rhyacophila*." I've seen this name in a number of data sets only to find that the actual specimens were larvae of either *Rhyacophila brunnea* group or *R. grandis* group. The key character is the dense tuft of gills on the meso- and metathorax as well as abdominal segments I-VIII. As you can see from the photos, dense really means **dense**.

Thanks!  
Brady Richards, Editor

## ANNOUNCEMENTS AND NOTICES

*The notices, announcements and advertisements in this section do not reflect SAFIT or SAFIT's views, opinions or policy, and do not constitute an endorsement of an advertiser's abilities, skills, or products.*

### SAFIT Meeting Agenda

20 October 2016

California Department of Fish and Wildlife Yolo Bypass Wildlife Area Headquarters  
9 am to 12 pm

- 1) Welcome & Introductions
- 2) President's update
  - a) Good year for SAFIT workshop activity – Water Mites in Long Beach (Wendy and Dessie set this up)
  - b) SFS 2016 was in Sacramento – SAFIT poster presentation and collection field trip
- 3) Treasurer's update
  - a) Revenues and expenditures for 2016
  - b) Current membership dues
- 4) Secretary's update
  - a) Elections update
    - I) Bill Isham ran unopposed for Treasurer
    - II) Dessie Underwood and John Pfeiffer ran for Vice President
      - (1) Dessie Underwood won re-election 14 to 6
  - b) Membership demographics
- 5) Workshop Committee
  - a) Workshops this past year
    - I) Water Mites in Long Beach
      - (1) The mite workshop was a success and well attended (18)
  - b) Future workshops
    - I) Dan will attend Baetid workshop in Portland, but this can also be seen via webinar through SWAMP (Eric Burres)
    - II) Locations – Corvallis, Davis, Long Beach, Logan UT have all worked well, do we want to expand the places we go, or just rotate through these?
      - (1) Will consider either Corvallis or Davis for workshop
    - III) Other Localities – we can consider Chico again now
    - IV) Next workshop, where and when??
      - (1) Bob Wisseman will look into OSU and determine which times will be available (May?)
      - (2) May host workshop around the time of CABW in October
    - V) Potential Topics
      - (1) Problematic Taxa

- (a) Poll the membership to determine which taxa to include (Plecoptera, Baetidae, etc.)
- (2) Chironomidae
  - (a) Likely in the next year or two
- 6) SAFIT STE & STE database
  - a) SAFIT STE database development – working prototype (table structures started)
- 7) Revenue deposition- Where are we at with this?? – did we sponsor anything this year??? – workshop?? Did anyone apply for any of these??
  - a) Student research grants
  - b) Page charges
  - c) Support of workshop attendance
  - d) Support of taxonomic presentations at meetings
    - I) John Sandberg will try and put together application forms for these “grants.” We will post on the website once completed.
- 8) SAFIT Logo – Finally!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
  - a) We have a logo in various color pallets and can be printed onto T-shirts, mugs etc.
  - b) Bill Isham will get the file for the logo design so the colors may be changed.



## Harmful Algal Blooms Meeting

Erick Burres brought this meeting to our attention. The US Environmental Protection Agency’s (EPAs) Office of Water and Region 9, in collaboration with California’s Surface Water Ambient Monitoring Program (SWAMP), will be conducting a Harmful Algal Blooms (HABs) Meeting, on April 25-27th, 2017. The Workshop will be held at the Southern California Coastal Water Research Project (SCCWRP) facility in Costa Mesa, CA.

Details at: <https://www.eventbrite.com/e/us-epa-region-9-habs-meeting-registration-31422609872>



## EMPLOYMENT OPPORTUNITIES

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

## 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: [arichards@csuchico.edu](mailto:arichards@csuchico.edu).*



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## Wanted! Specimens of *Eubrianax* and Corydalidae

Dr. Matt Cover and his students at Stanislaus State are seeking specimens of two taxa, the water penny beetle *Eubrianax edwardsii* as well as hellgrammites (Corydalidae: *Neohermes*, *Protochauliodes*, *Dysmicohermes*, *Orohermes*, *Corydalus*) from the western U.S. We are especially interested in recently collected specimens (past year or so) that have been preserved in 70% or higher EtOH, to facilitate DNA barcoding. Our goal is to investigate the distribution and landscape genetics of these taxa, among other investigations of their basic biology. If you have specimens you would be willing to share, please contact Matt at [mcover@csustan.edu](mailto:mcover@csustan.edu). On a related note, we are beginning to incorporate DNA barcoding into our general biology laboratory classes, and have the capability to produce and analyze mtDNA genetic sequences to answer questions related to larval-adult associations, landscape genetics, and cryptic biodiversity. If you have a small number (say, 5-20) of specimens (again, recently collected and >70% EtOH) that you would be willing to donate that would help you answer one of these questions, please contact me with a description of the project.



### 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.*

## Red, White and True: the story of a young perlodid

Sean Sullivan- Rhithron Associates, Inc.

As production taxonomists largely working with samples collected as part of bioassessment protocols, we are confined to seeing a majority of our specimens collected within some jurisdiction's index period. Index periods are fixed to limit the variability of the taxa based on life-history patterns, therefore mitigating against a fraction of inter-annual variation in community composition. As a result of these index periods we routinely encounter early instar larvae and nymphs. After seeing the same instars for years or decades, we start to develop hypotheses about the identity of the specimens in question. Until fairly recently, early instar associations required a site visit to obtain specimens, and then rearing them to adulthood, a process that can take a lot of time and a whole lot of luck.

Molecular tools are improving every day and are continually dropping in price. Through programs such as LifeScanner ([www.lifescanner.net](http://www.lifescanner.net)), even citizen scientists and 'non-academic' researchers now have access to the molecular tools necessary to test hypotheses without the need for laborious rearing processes. For those unfamiliar with LifeScanner, it is an offering through the University of Guelph (Guelph, Ontario) that charges roughly \$10 to have biological materials DNA barcoded, and includes all the steps from DNA extraction, amplification and sequencing of

the cytochrome oxidase I gene (COI), and identification based on the COI library in the Barcode of Life Data System (Ratnasingham & Hebert, 2007). This is a great supplementary tool for all taxonomists. It isn't a solution to all taxonomic problems by any means. In fact, I might warn taxonomists that molecular tools may lead to more questions than answers. Here I detail some insights into one such hypothesis, and some work to follow that will add to the body of knowledge of early instar perlodids in the western United States.

In the Western United States a unique early instar perlodid is frequently encountered. The specimens share a striking character state that sets them apart from other perlodids in a given sample, coloration. As shown in Figure 1 the early instar has a unique red and white color pattern, with the head, mesothorax, and metathorax colored a distinct shade of red and the prothorax, posterior end of abdomen a pale white color. Given the characters described in Stewart & Stark (2002) these specimens were impossible to key to a particular genus. Specimens are unkeyable mainly due to the state of the lacinia, which depending on instar can be bidentate or unidentate (Figure 2). Thanks to the work of Stewart & Sandberg (2003) we see that the early instar larvae of *Kogotus modestus* (Banks, 1908) collected in Colorado display this very phenomenon during larval development. This led me to consider the larvae of these 'red and white' perlodids to be of the genus *Kogotus*. Hundreds of specimens of these red and white perlodids have been seen in bioassessment samples throughout the western United States (Figure 4), most often being recorded at the family level.

A 'red and white' specimen collected from the Puget Sound area was retrieved from a bioassessment sample and sent to The University of Guelph through the Lifescanner project for sequencing of COI. Results of the molecular analysis suggest that these red and white specimens to be *K. modestus*. The 'red and white' larval specimen I sequenced clusters together with other specimens of *K. modestus* that form the Barcode Index Number (Ratnasingham & Hebert, 2013) BOLD:AAQ2338. The BIN BOLD: AAQ2338 contains 11 specimens with several adult males, females and larvae verified by Dr. Kondratieff. Sequences of nine other early instar larvae from British Columbia with the same red and white color pattern and identified only as "Plecoptera" are publicly available in BOLD and cluster with an adult male collected in Oregon identified as "*Kogotus* sp.". This cluster of sequences has a 4.88% mean (4.76% min) divergence from the *Kogotus modestus* BOLD:AAQ2338 BIN, suggesting there may be multiple species present (i.e. *Kogotus nonus*) (Ratnasingham & Hebert, 2007).

As far as I can determine, all 'red and white' perlodids in BOLD match *Kogotus*. Given the lacinia development and the molecular identifications I suggest that the red and white perlodids encountered in samples can be identified, with some confidence, as the genus *Kogotus* and comments be made in the data that the specimens are "red and white".

However, this is not the end of the story. Also encountered in bioassessment samples are co-occurring perlodids of similar instar. These other perlodids resemble the red and white *Kogotus*, but differ in coloration and have a brown and white color pattern (Figure 3). The brown and

white perlodids have been collected from throughout the west but largely from west of the Sierra's, Coast Range and Cascades (Figure 4). An early hypothesis is that these specimens represent another genus, possibly *Rickera* Jewett, 1954 or *Cultus* Ricker, 1952. There are no specimens of *Rickera* or western *Cultus* sequenced in BOLD. Specimens of brown and white perlodids are in the hopper to be barcoded and will either support or refute the hypothesis that some early instar western perlodids can be differentiated by color pattern. I am more than willing to accept donations of specimens, records of the immature perlodids matching these descriptions, and any adults or larvae of *Cultus* or *Rickera* you may have.

Stay tuned for the conclusion of the story. . . .

Citations:

Banks, N. 1908. Neuropteroid insects -- notes and descriptions. Transactions of the American Entomological Society 34:255-267.

Jewett, S. G., Jr. 1954. New stoneflies from California and Oregon (Plecoptera). Pan-Pacific Entomologist 30:167-180.

Ratnasingham, S. and P. D. N. Hebert. 2007. BOLD: the Barcode of Life Data System (<http://www.barcodinglife.org>). Molecular Ecology Notes 7:355-364. Available at URL: <http://onlinelibrary.wiley.com/doi/10.1111/j.1471-8286.2007.01678.x/full>.

Ratnasingham, S. and P. D. N. Hebert. 2013. A DNA-based registry for all animal species: the Barcode Index Number (BIN) System. Plos One 8:e66213.  
doi:10.1371/journal.pone.0066213

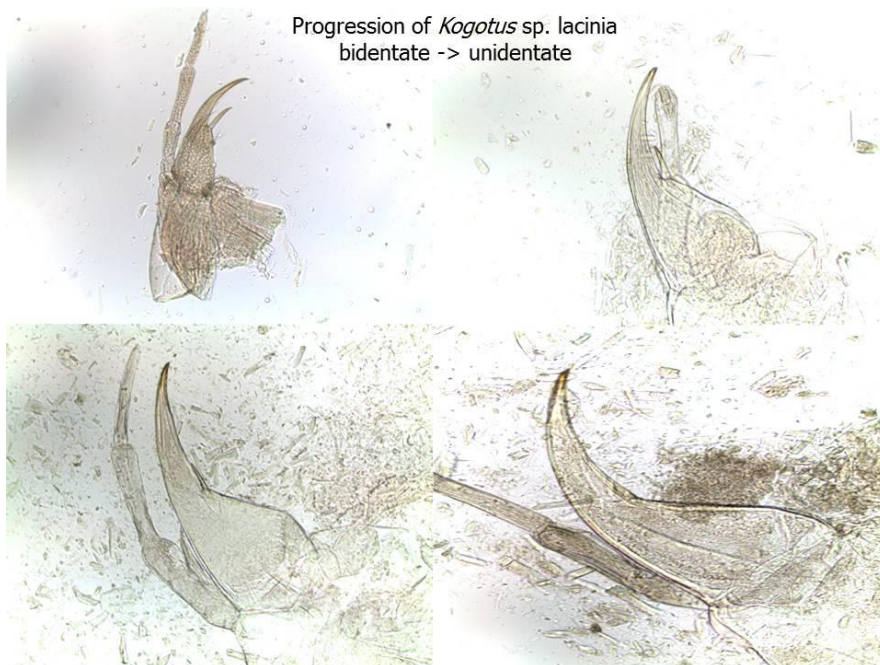
Ricker, W. E. 1952. Systematic studies in Plecoptera. Indiana University Publications, Science Series:1-200.

Stewart, K. W. and B. P. Stark. 2002. Nymphs of North American stonefly genera (Plecoptera). Columbus, Ohio, The Caddis Press, xi + 510 pp.

Stewart, K. W. and J. B. Sandberg. 2003. The life history of a Colorado population of *Kogotus modestus* (Plecoptera: Perlodidae), Pages 195-200 in E. Gaino, ed. Research Update on Ephemeroptera & Plecoptera. Perugia, Italy, University of Perugia.



**Figure 1: Dorsal habitus of *Kogotus* (red and white) larvae**

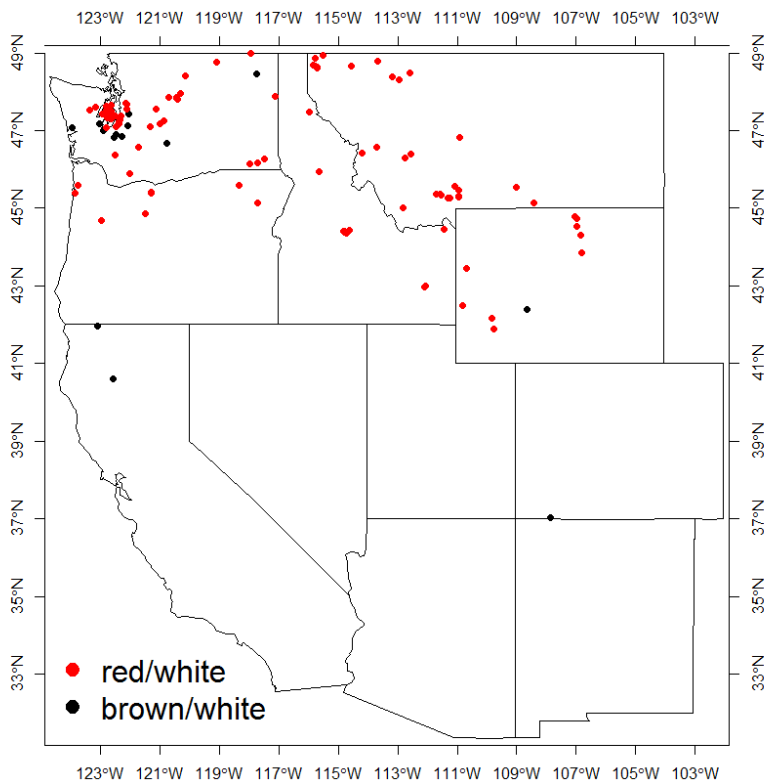


**Figure 2: Progression of a series of the *Kogotus* (red and white) lacinia, confirming the loss of the second tooth.**





**Figure 3: Dorsal habitus of Perlodidae (brown and white) early instar**



**Figure 4: Localities of red/white and brown/white early instar perlodids examined.**

## Entomological Etymology

from Christopher Rogers

The genus *Pulex* (common fleas) is literally the Latin word for "flea". The French degraded the word to "Puce" (flea), which for some reason the English used as the word for the colour of flea bites. The earliest documented use of "Puce" as a colour is from 1778. We also take a direct translation from the french "marché aux puces", literally "flea market". And of course the word "ukulele" is from Hawai'ian, literally translated as uku "flea" + lele "to jump", or "leaping flea", supposedly describing the fingers' movements while playing the instrument.



## TOUGH CHARACTERS

*Got a TOUGH CHARACTER? The more difficult diagnostic characters and key couplets for those taxa that are tricky to separate are elucidated in this column. Plenty of good grudge matches will be presented in photos, figures and descriptions. Think there are tough characters that are being missed? Submit your tough characters and get them compared with other character states right here.*

## LATEST LITERATURE

*If you know of any recent 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](mailto:arichards@csuchico.edu)) for inclusion in the next issue of the SAFIT Newsletter. Thanks!!*

**Asterisk (\*) indicates author is a SAFIT member.**

### Mollusca

Maine, A., C. Arango, and C. O'Brien. 2016. Host fish associations of the California Floater (*Anodonta californiensis*) in the Yakima River Basin, Washington. *Northwest Science* 90:290-300.

Stagliano, D. M. 2016. Current population status of a locally endemic springsnail (Hydrobiidae: *Pyrgulopsis bedfordensis*) in Montana. *Western North American Naturalist* 76:509-513.

### Crustacea

Adams, K. J., and J. C. Marks. 2016. Population response of the invasive crayfish *Orconectes virilis* (Hagen, 1870) (Decapoda: Astacoidea: Cambaridae) to restoration: what are the consequences of changes in predatory regulation and physical habitat in Fossil Creek, Arizona, USA? *Journal of Crustacean Biology* 36:597-606.

Ivey, C. D., J. M. Besser, C. G. Ingersoll, \*D. C. Rogers, S. Saimondo, C. R. Bauer, and E. J. Hammer. 2016. Acute sensitivity of the vernal pool fairy shrimp, *Branchinecta lynchi*

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(Anostraca; Branchinectidae), and surrogate species to 10 chemicals. *Environmental Toxicology and Chemistry* 36:797-806.

Mabidi, A., M. S. Bird, R. Perissinotto, and \*D. C. Rogers. 2016. Ecology and distribution of large branchiopods (Crustacea, Branchiopoda, Anostraca, Notostraca, Laevicaudata, Spinicaudata) of the Eastern Cape Karoo, South Africa. *ZooKeys* 618:15-38.

\*Rogers, D. C., and J. Olesen. 2016. Laevicaudata catalogus (Crustacea: Branchiopoda): an overview of diversity and terminology. *Arthropod Systematics and Phylogeny* 74:221-240.

Sigvardt, Z. M. S., \*D. C. Rogers, and J. Olesen. 2017. Functional morphology of amplexus (clasping) in spinicaudatan clam shrimps (Crustacea, Branchiopoda) and its evolution in bivalved branchiopods: a video-based analysis. *Journal of Morphology* 278:523-546.

### **Ephemeroptera**

Stagliano, D. M. 2016. Mayflies (Insecta: Ephemeroptera) of conservation concern in Montana: status updates and management needs. *Western North American Naturalist* 76:441-451.

### **Plecoptera**

Mayorga, A. 2016. A new species of *Anacroneuria* Klapálek (Plecoptera: Perlidae) and complementary descriptions of three additional species from Mexico, with comments on the current knowledge of Mexican species of the genus. *Illiesia* 12:64-73.

### **Trichoptera**

\*Lee, J. J. 2016. *Farula klahhane* sp. nov. (Trichoptera: Uenoidae) from Olympic National Park, Washington, U.S.A. *The Pan-Pacific Entomologist* 92:127-132.

### **Coleoptera**

Kanda, K., R. A. Gomez, R. Van Driesche, K. B. Miller, and D. R. Maddison. 2016. Phylogenetic placement of the Pacific Northwest subterranean endemic diving beetle *Stygoporus oregonensis* Larson & LaBonte. *ZooKeys* 632:75-91.

### **Diptera**

Evenhuis, N. L., T. Pape, and A. C. Pont. 2016. Nomenclatural studies toward a world list of Diptera genus-group names. Part V: Pierre-Justin-Marie Macquart. *Zootaxa* 4172:1-211.

Kownacki, A., O. Woznicka, E. Szarek-Gwiazda, and P. Michailova. 2016. Larva of *Glyptotendipes (Glyptotendipes) glaucus* (Meigen 1818) (Chironomidae, Diptera)-morphology by scanning electron microscope (SEM), karyotype, and biology in laboratory conditions. *Zootaxa* 4169:555-570.

### Miscellaneous

Hall, L. W., Jr., R. D. Anderson, and W. D. Killen. 2016. Spatiotemporal trends analysis of benthic communities and physical habitat during non-severe drought and severe-drought years in a residential creek in California. *California Fish and Game* 102:55-70.

Kotov, A., and M. A. Gololobova. 2016. Traditional taxonomy: Quo vadis? *Integrative Zoology* 11:500-505.

Rosati, M., M. Cantonati, S. Fenoglio, S. Segadelli, G. Levati, and G. Rossetti. 2016. Is there an ideal protocol for sampling macroinvertebrates in springs? *Journal of Freshwater Ecology* 31:199-209.



# THANK YOU FOR YOUR MEMBERSHIP!

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### SAFIT Newsletter Publication Guidelines

Submissions and questions about submissions should be directed to the SAFIT Newsletter Editor, at: [arichards@csuchico.edu](mailto:arichards@csuchico.edu), 530.898.4792. Submissions should be Word files, 12 pt., Times New Roman font, and left justified. Please submit an announcement, as you would like it to appear in the newsletter, preferably in Word format. Images should be high quality.

Deadline for SAFIT newsletter announcements: send to editor one week before publication date.

Issue	Submission Deadline	Publication Date
I	24 March	31 March
II	23 June	30 June
III	23 September	30 September
IV	24 December	31 December

#### Advertisements:

- Employment Opportunity ads should be one page maximum (8.5 x 11), should list the position(s) available, basic qualifications required, and provide contact information.
- Employment Wanted ads may include a brief statement describing the position sought, basic experience, and contact information. For example: “Looking for work as phytoplankton taxonomic. Experience includes M.S. thesis from the University of Malpractice, and working on several long-term bioassessment projects for the state of East Carolina. Resume and references upon request. Please contact Martin E. Serumgaard, [mserumgaard@fakeaddress.net](mailto:mserumgaard@fakeaddress.net), (555) 555-555.” Do not include *curriculum vitae* or resume, photos, or political statements.
- General Advertisements should be limited to one page (8.5 x 11) and may include a high quality logo image, and must not include political statements or other potentially offensive material.

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