Annual Newsletter and Bibliography of the International Society of Plecopterologists



Kempnyia flava Klapálek, 1916 (and exuvium) Serra do Brigadeiro State Park, Minas Gerais, Brazil, 17 October 2022. Credit, Fred Salles

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We first profoundly thank Manuel Tierno de Figueroa (Granada, Spain) for supplying an early and extensive draft of the 2023–2024 bibliography and for submissions kindly provided by Peter Zwick (Schlitz, Germany) and Tibor Kovács (Gyöngyös, Hungary). Species File Group staff member Heidi Hopkins of Ithaca, New York, USA, has also diligently added references to Plecoptera Species File (<u>http://plecoptera.speciesfile.org</u>). This list was compared to the above sources to produce a final bibliography. Society members continue to kindly contribute updates on research activities (see "Member News"). Finally, several members contributed images for consideration to represent the cover page of this volume. All other submitted images are provided at the end of this issue with full information as

supplied by each individual.

A heartfelt thanks goes to John Brittain of the Natural History Museum University of Oslo, Norway who recently stepped down from service as Chair of the Standing Committee of the Society. John served for nearly 30 years. Ed DeWalt of the Illinois Natural History Survey took over duties of the Chair after the 2024 MF/SF Joint Meeting ended. All inquiries about Society business should be directed to <u>dewalt@illinois.edu</u>.

Photo credit to Arnold Stanicek.



International Society of Plecopterologists Policy

As of 2021 the International Society of Plecopterologists (ISP) requires no dues for membership, nor for receiving *Perla*. *Perla* is now completely electronic. Due to the size of the issue, Society members will be given notice when the issue is ready to be downloaded and from where.

Membership is maintained by the Managing Editor as a Google Sheet and new names are added when they appear in articles added to Plecoptera Species File. Others may request addition to the list of members by sending an email request to the Managing Editor at scott.grubbs@wku.edu. The list is private but may be shared with those who have direct business with the Society (e.g., those hosting the joint mayfly and stonefly meetings).

International Society of Plecopterologists Funds

R. Edward DeWalt continues as Treasurer for the International Society of Plecopterologists. Funds are managed by the University of Illinois. DeWalt will provide reports of income and expenditures annually or as requested from the Chair of the Standing Committee. Requests for disbursements may be sent by email to Dr. DeWalt (<u>dewalt@illinois.edu</u>). Please provide at least one month to arrange for payment to recipients. A brief Treasurer's report will be provided to Society members with each *Perla* issue. Accounting of the funds beginning January 1 this year is as follows.

Date	Income	Expenditure	Balance	Notes
2024-01-01			15500.00	Initial balance transferred from CSU. Noted in Perla 41.
2024-03-01		9226.20	6273.80	Four student airline tickets purchased for 2024 MF/SF Joint Meeting attendance
2024-05-01	10088.59		16362.39	RED personal donation and stonefly book sales.
2024-08-01	1000.00		17362.39	Donations from individuals and silent auction proceeds from 2024 MF/SF Joint Meeting.
2024-09-18	28.00		17390.39	Stonefly book sales.

Given rules at the University of Illinois for managing our "Custodial Funds", the University accepts donations to support the fund in the form of a check made payable to the "University of Illinois" with "Perla Fund" written in the memo line or as cash provided to the Treasurer in person. A receipt will be provided. The checks can be sent directly to the Treasurer at the following address. The funds will be delivered to fiscal personnel for deposit.

R. Edward DeWalt, Illinois Natural History Survey, University of Illinois, 1816 S Oak St., Champaign, Illinois, USA

Reminder - Plecoptera Species File moved to TaxonWorks

From R. Edward DeWalt 9/2024.

The transition of Plecoptera Species File (PSF) to TaxonWorks (TW) was accomplished in August 2023. The TW-based PSF lives at <u>https://plecoptera.speciesfile.org</u>. The older archived (static) version of PSF is still available at <u>http://plecoptera.archive.speciesfile.org</u>. The new user interface is fancy and modern but admittedly less informative, representing a compromise with the developers. I have heard your concerns and discuss them with the developers frequently. I am hopeful that some improvements are possible.

TW is open source, ICZN compliant, follows biodiversity informatics data standards, and the data are shared frequently with the <u>Catalogue of Life</u> and the <u>Global Biodiversity Information</u> <u>Facility</u>. The code, data, and images are managed by top-of-the-line servers and software, backed up constantly, and mirrored at multiple locations.

Please consider using TW as a taxonomic workbench or as your institutional collection management tool. We sign you up, you add students and collaborators, and we keep the systems running. We currently have >200 individual researchers and research groups using the software. We provide remote training and listening sessions weekly. If you want to discuss using TW, send me an email at dewalt@illinois.edu.

Obituary - Cláudio Gilberto Froehlich (1927 - 2023) A long life dedicated to the study of Neotropical Biodiversity



By: Pitágoras C. Bispo (State University of São Paulo, Assis, SP, Brazil)

Professor Cláudio Gilberto Froehlich passed away on November 27, 2023 at the age of 96. He had a prolific academic life and leaves an immense legacy for Neotropical aquatic entomology. He was born in the city of São Paulo, Brazil on June 10, 1927. In 1948, he started his undergraduate course at the University of São Paulo (USP), where he got a degree in Natural History in 1951. In 1952, he became Lecturer in Zoology at USP and in 1954, he completed his Doctorate in land planarians. In 1959, he spent a sabbatical year working with Prof. Per Brink at the University of Lund (Sweden), where he studied the morphology, systematics, and ecology of aquatic insects, including Plecoptera, which became his specialty. Prof. C. G. Froehlich remained as a Lecturer/Professor at USP from 1952 to 1985, first at the Faculty of Philosophy, Sciences and Languages, and then at the Institute of Biosciences, both in the city of São Paulo. After his retirement in 1985, he moved to Ribeirão Preto, where he became a volunteer Professor/Researcher at the Faculty of Philosophy, Sciences and Languages of Ribeirão Preto, also at USP. Throughout his career, he published 95 papers in journals (the first in 1955 and the last in 2022) and 20 book chapters, in addition to a book chapter that was published after his death in early 2024 and a manuscript that is in the final stage of review.

Prof. C. G. Froehlich had a broad interest in biodiversity, developing throughout his life taxonomic and morphological studies on different animal groups, mainly terrestrial planarians and aquatic insects, as well as ecological studies, especially on streams and lakes. He supervised 27 master's and 25 doctoral degree students in projects on land planarians, arthropods, fish and amphibians from 1968 to 2012. He also played an important role in academia as one of the founders and first coordinator of the Graduate Program in Zoology at USP – the first in the area of Zoology in Brazil, and one of the founders and first head of the Department of Ecology at USP – one of the first in Brazil. In addition, he was fundamental for the consolidation of the Graduate Program in Entomology at USP in Ribeirão Preto.

Prof. C. G. Froehlich once said that his mission was to teach, which he did his entire life with great commitment and dedication. I myself had the privilege of being one of his students, assisting him in the graduate course "Aquatic Entomology" and sharing with him the graduate course "Diversity and Biology of Hexapoda" when I later became a Professor. In all these moments, I was able to observe his dedication and care during class preparation. Because of his extensive knowledge of biodiversity and great experience with transformations of Brazilian universities, any conversation with Prof. Cláudio was very pleasant and full of stories. Doing field activity with him was also a great privilege, since he had vast knowledge of the diversity and natural history of different biological groups. During field activities, at each step we had a lesson about the organisms and ecosystems present there. This ability to teach and bring people together led him to help train several generations of Brazilian researchers.

In the case of Plecoptera, he began studying the order in 1959 during his sabbatical year in Sweden and published his first paper one year later. In 1968, he spent a few months at River Station of the Max Planck Institute of Limnology in Schlitz, Germany, coordinated by Professor Joachim Illies, where he met researchers interested in Plecoptera and studied species types from South America. That same year, he participated for the first time in the International Plecoptera Symposium in Sweden, being frequently present in all its editions. In the 1998 edition held in Argentina, he was honored with the "Lifetime Achievement Award". His last participation in the symposium was in 2018, which took place in Brazil. I highlight that he was the first researcher born in South America to dedicate himself to the taxonomic study of Plecoptera on the continent. Throughout his career, he published more than 50 studies (among papers, book chapters, and book) on Plecoptera, describing around 85 species. Additionally, he trained and assisted dozens of researchers interested in the Neotropical Plecoptera fauna.

Prof. C. G. Froehlich had a long and productive career, having published a great number of significant studies, supervised numerous researchers, contributed to the structuring of important graduate programs and coordinated large research projects financed by funding agencies. In recognition of his work, he received various honors during his lifetime. Prof. C. G. Froehlich was one of the most generous people I have ever met. With his generosity and charisma, he helped train many researchers, whether under his supervision or not. Everyone who lived with Professor Cláudio has beautiful stories to tell. Wherever he went, he made great friends. As he always said, "it is a privilege to become friends with my students." We are all deeply saddened by the passing of such a great friend, but grateful for the good time we got to spend with him. He will always be in our fondest memories.

Details about his career and contributions to the taxonomy of land planarians and aquatic insects and ecology of aquatic environments can be found in "Mariano, R. et al. 2023. Not just a taxonomist, but a naturalist! The foundations of Froehlich's Autonomous Stonefly Republic. Revista Brasileira de Entomologia 67: 1-17." Please follow this link:

https://www.scielo.br/j/rbent/a/8ynDHnzGjNhGqcZ6bFmnrMC/?format=pdf&lang=en

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Stark, B.P., Froehlich, C.G. and Zuniga, M. C. 2009. Aquatic Biodiversity in Latin America. Volume 5. South American Stoneflies (Plecoptera). Pensoft, Sofia-Moscou. 154p.

Obituary - Edwin Charles Masteller (1934 - 2024)



Born 8/11/34 in Independence, Iowa and died 6/2/24 in Erie, Pennsylvania

Posted online on June 05, 2024, published in the Erie Times-News

Preceded in death by daughter Julie Ann Masteller and a sister, Betty Mehner. Survived by wife of 68 years Marianna Hafner Masteller of Erie, PA, daughter Melissa Masteller of Phoenix, AZ, son Mark Masteller, wife Ellen, of Erie, PA, and grandchildren Elizabeth Masteller of Rochester, NY, Andrew Masteller of Boston, MA, and David Masteller, wife Mary, of Erie, PA, great grandson James Masteller and sister Barbara Burke of Kansas City, MO (95). Ed was legendary and beloved by his 21 Burke (Masteller) and Hafner nieces and nephews.

Ed used his voracious appetite for learning and ever curious mind to contribute to science and our communities for 9 decades. He earned his Bachelor of Science degree at the University of Northern Iowa, his Master of Science degree at the University of South Dakota (Botany), and Doctor of Philosophy (Entomology) at Iowa State University. Ed chose to come to Penn State Behrend in Erie so he could continue to pursue both botany and entomology. Prior to Ed's distinguished 25-year career at Penn State Behrend, he taught high school biology in the Minnesota public school system. During his tenure at Penn State Behrend, Ed authored/coauthored 50 publications where his studies geographically ranged from Germany to Puerto Rico to Poland to Eastern Canada to Arizona's Chiricahua National Monument to his greatest focus and passion Northwestern PA and Presque Isle. The publications cover diverse topics: teaching techniques using live insects in the classroom, habitat influence on insect populations, and insect morphology and speciation. Ed received a Fulbright Scholarship and funding for his yearlong research at the Max Planck Institute in Germany in 1973-74. Following his academic career, Ed volunteered at the Erie Zoo and Sea Grant. He curated the insect collection (over 6000 species) and contributed to the botanical collection at the Tom Ridge Environmental Center from its opening in 2006 where he was the recipient of the 2012 John C. Oliver Environmental Leadership Award. After moving with Marianna to Springhill Retirement Community in late 2012, Ed began developing the butterfly garden on campus, studied methods to care for the pond, and provided information on local plant and insect life.

In addition to a lifetime of learning, working, and contributing to the biological arena, Ed was active and fit for his entire life. Ed was a scholarship Division I wrestler each year of his undergraduate studies at the University of Northern Iowa. In 1957, he was undefeated. Ed's grandchildren remember fondly his goal and completion of bicycling the number of miles to match his years of age through his 77th birthday. He cycled to Behrend from his home in Millcreek often as a method of transportation for over 30 years. For over a decade, Ed participated in Erie's Quad race and often placed within his age group. He cycled across the state of Washington with his son Mark and the states of Colorado and Arizona with his daughter Melissa. He reveled in a multi weeklong bike ride from Iowa to Maine.

Ed and Marianna traveled extensively with their three young children throughout the United States and Western Europe, most frequently with a tent trailer, tent, hiking boots, butterfly nets, and insect traps. Road trips to visit Burke (Masteller) and Hafner family in Iowa, Colorado, and Missouri were often and treasured. Arizona became a second home for Ed and Marianna to explore and create community with Melissa's move there in 1982. Stepping up adventure travel in "retirement", Ed and Marianna traveled to Spain, Greece, Amsterdam, Australia, France, Mexico, Peru, the Canadian Rockies, and multiple national parks of the Western USA.

Ed's legacy of love for nature, wilderness and wildlife, adventure, learning, curiosity, family, and the sanctity of all life lives on with his thousands of students. His advice to his grandson David on his wedding day to Mary was, "Get out and enjoy nature whenever you can". Ed made sure to pass on his appreciation for God's wonderful landscapes. With the birth of Ed and Marianna's grandchildren Elizabeth, Andrew, and David, they diligently and with great joy attended events from middle school band concerts to high school sporting events. Ed wanted to be a part of his grandchildren's lives and showcase his support. His family love continued to his great grandchild James whom he loved seeing for weekly dinners.

The Masteller family extends a heartfelt thank you to family, friends, caregivers, and medical staff who have supported Ed over especially the past three years of life.

Summary 13th North American Plecoptera Symposium (NAPS)



The 13th NAPS was held Tuesday, June 25 through Thursday June 27 2024 in the scenic Adirondack Mountains of upstate New York (USA) at the Atmospheric Sciences Research Center (SARC) - Whiteface Mountain Field Station, administered by the University of Albany - State University of New York (SUNY). Although we typically hold these meetings every three years, circumstances since the prior conference was held in 2019 predicated that we were not able to reconvene until 2024. Nonetheless, we had 20 attendees that contributed to one workshop, two posters, and 12 oral presentations that varied in scope with a special emphasis on conservation. The full meeting agenda can be viewed at https://linktr.ee/rockbug.

Please note that the 14th NAPS is in early planning to be held in May 2026 at the Highlands Biological Station, Highlands, North Carolina, USA. Detailed information will be forthcoming in Perla 43.

Summary: Workshop, Poster Session and Oral Presentations

<u>Workshop</u>

Heidi Hopkins - TaxonWorks

Poster Session

- 1. John Sandberg & Luke Myers Drumming signal summary of Nearctic stoneflies (Plecoptera): 1977-2015.
- 2. Lily Hart, R. Edward DeWalt & Phillip Hogan The stoneflies of Arkansas: progress in building a checklist and comprehensive dataset for publication.

Oral Presentations

- 1. Dan Spada A history of Adirondack Park
- 2. Paul Casson History of the Whiteface Mountain Field Station
- 3. Chris Verdone: NAPS 2026
- R. Edward DeWalt, Scott Grubbs, Luke Myers & Boris Kondratieff -Northeastern USA status assessment of stonefly (Insecta, Plecoptera) Regional Species of Greatest Conservation Need
- 5. Josie Griffith & Scott Grubbs Assessing Regional Responsibility of Plecoptera (Stoneflies) across two U.S. Fish and Wildlife Service Regions
- 6. Scott Grubbs & R. Edward DeWalt Why taxonomy and systematics matter with conservation research: a case study on the Mountain Needlefly, *Leuctra monticola* Hanson, 1941 (Plecoptera: Leuctridae)
- 7. Phillip Hogan & R. Edward DeWalt Agricultural intensification winners and losers: which life history traits predict stonefly range shifts?
- 8. Luke Myers, Boris Kondratieff, Timothy Mihuc, R. Edward DeWalt, Scott Grubbs & Lindsey Pett - A multidimensional analysis of the distribution and diversity of the stonefly (Insecta, Plecoptera) fauna of New York State
- 9. Jack Merola-Lapson & Scott Grubbs A spatial and temporal analysis of stonefly (Insecta, Plecoptera) biodiversity of Pennsylvania
- 10. Heidi Hopkins TaxonWorks Introduction
- 11. Theodore Cook & R. Edward DeWalt The stoneflies of West Virginia
- Chris Verdone, Bronwyn Williams, Steven Beaty, Victor Holland, Scott Grubbs & R. Edward DeWalt - The larvae, adults and systematics of the Nearctic Oemopteryx Klapálek, 1902 (Plecoptera: Taeniopterygidae)



NAPS 2024 meeting location Atmospheric Sciences Research Center (ASRC), Whiteface Mountain Field Station, SUNY-Albany



Dinner time at ASRC

Individuals in clockwise order from front left: R. Edward DeWalt, Luke Myers, Josie Griffith, Jack Merola-Lapson, Lily Hart, Phillip Hogan, Heidi Hopkins (standing at back), Theodore Cook, Dan Spada, John Sandberg, Chris Verdone, Michele Quaglia, and David Burton.



Dan Spada - kicking off NAPS 2024 summarizing the history of Adirondack Park



Heidi Hopkins - Overview of TaxonWorks



Phillip Hogan - Changing Midwestern (USA) stonefly fauna



Theodore Cook - West Virginia (USA) stoneflies



R. Edward DeWalt - Conservation focus on Northeastern USA stoneflies, but first with kind deference to the late and great Boris C. Kondratieff



John Sandberg - Impassioned discussion of stonefly drumming patterns to five graduate students.

Individuals in order from back left to front right are: Jack Merola-Lapson, Josie Griffith, Lily Hart, Theodore Cook, and Phillip Hogan.



Partial group photo

Individuals in order from left-to-right: R. Edward DeWalt, Jack Merola-Lapson, Luke Myers, Chris Verdone, Lily Hart, David Burton, Heidi Hopkins, John Sandberg, Theodore Cook, Maddie Metzger, Phillip Hogan, Josie Griffith, Lindsay Pett, Scott Grubbs, and Elizabeth Metzger

Announcements

European Plecoptera Meeting

First announcement, contributed by David Murányi

During evening conversations in the IJMEP 2024 meeting in Turin, stonefliers agreed in organizing yearly or biannual European meetings between the international symposia, similar to the North American and Japanese stonefly meetings. The next one is scheduled for August 2025, and will be organized by Anna Dénes from the Babes-Bolyai University, Cluj-Napoca, Romania. Anna proposed the research station of her university, the Apáthy István Education and Research center, in Senetea, Harghita county (46.62550, 25.58694) as the place for the meeting. The facility has 22 beds and additional places for about 10 sleeping bags, a common dining and lecture room, two shower rooms, and outside toilets. This facility is located at the foothills of Eastern Carpathians in the Giurgeu basin, close to the National Park Cheile Bicazului – Hăşmaş. There will be plenty of possibilities to collect fascinating stoneflies.

For more information regarding facilities and the surrounding region, see <u>https://apathy.ro</u> and <u>https://visitharghita.com/en/places/a-bekas-szoros-nagyhagymas-nemzeti-park-eh8ifptwyjwadq</u>







Three images of the prospective meeting facility

Plecoptera Award Winners 2024 Joint Meeting of the XVII International Conferences on Ephemeroptera and XXI International Symposium on Plecoptera

Although a summary and photographs of the 2024 Joint Meeting will follow in 2025 Perla 43, I thought it was appropriate to announce the following award winners for stonefly workers, with much thanks to Dr. John Brittain for providing this information:

Lifetime Achievement Awards

Professor Yu-Zhou Du Institute of Applied Entomology and College of Horticulture and Plant Protection, Yangzhou University 48 Wenhui Road (East), Yangzhou 225009 Jiangsu, China *Taxonomy and molecular systematics of Chinese Plecoptera and other aquatic insects Active group*

Professor Shigekazu Uchida

Department of Civil Engineering Aichi Institute of Technology 1247 Yakusa, Toyota 470-0392 JAPAN *Taxonomy, phylogeny and ecology of Japanese stoneflies*

Professor Ding Yang

China Agricultural University, Department of Entomology, Beijing, China Taxonomy, molecular systematics of Chinese Plecoptera, especially Nemouridae. Coauthor of Plecoptera catalogs. Trained prolific Plecoptera scientists. Expert in many other insect groups.

Professor Günther Theischinger

Research Associate, Australian Museum (Entomology), Sydney NSW, Australia Taxonomy of Australian Plecoptera, including several revisions of difficult genera. Also, taxonomy of Odonata, Megaloptera, and Tipuloidea.

Awarded travel scholarships from the Plecoptera committee

Mellis Rippel, Brazil Tácio Duarte, Argentina Abigail Kirkaldy, South Africa Abdur Rehman, China/Pakistan (unable to attend due to Visa difficulties)

Best Plecoptera poster presentation

David Garoffolo Betschmann, Lausanne, Switzerland

Best Plecoptera oral presentation

Anna Eichert, American Museum of Natural History, New York, USA

Member News

David K. Burton - Faculty of Education, University of Ottawa, Ottawa, Ontario, Canada K1N 6N5 and Canadian National Collection of Insects, Arachnids and Nematodes, Agriculture Canada, Central Experimental Farm, Ottawa, Ontario, Canada K1A 0C6, <u>dburton@uottawa.ca</u>

A digital database and NatureServe reassessment of Plecoptera in Canada

As part of a contract with Environment Canada to reassess the conservation status of Plecoptera species in Canada, digital databases were made of all the known observations from literature references and the available specimens in museum collections. Fourteen digital databases were constructed, one for all 10 of the Canadian provinces, with Newfoundland and Labrador separated into two databases and for the three Canadian territories. These databases were used to reassess the Conservation status of all plecopteran species in Canada using the NatureServe rank calculator software.

The databases created are primarily based on all published literature and on the information available in the electronic databases of the Canadian National Collection of Insects, Arachnids and Nematodes (CNC), the Illinois Natural History Survey (INHS) and the University of Guelph Barcode of Life Data System (DEBU). Additional specimen information has been added from the following Canadian collections: Royal Ontario Museum (ROM), University of Montreal Collection (UMC), Royal British Columbia Museum (RBCM), and the University of Manitoba, R.E. Roughly Museum (RER)

For many of the species, the collection information available is insufficient to make a reliable assessment of their conservation status in Canada. Some species of concern would include: the status of *Attaneuria ruralis* and *Capnura manitoba* in Manitoba; *Allocapnia maria*, *Sweltsa naica*, and *Taeniopteryx metequi* in Ontario; *Allocapnia indianae* and *Nemocapnia carolina* in Quebec; and *Leuctra baddecka* in Nova Scotia.

This study increases the recorded species of Plecoptera in Canada to 287 from the 267 species reported for Canada by Kondratieff *et al.* (2019).

Reference

Kondratieff BC, DeWalt RE, Verdone CJ (2019) Plecoptera of Canada. In: Langor DW, Sheffield CS (Eds) The Biota of Canada – A Biodiversity Assessment. Part 1: The Terrestrial Arthropods. ZooKeys 819: 243–254. <u>https://doi.org/10.3897/zookeys.819.23535</u>

Theodore Z. Cook, University of Illinois, Department of Entomology. <u>tcook10@illinois.edu</u>, R. Edward DeWalt, University of Illinois, Illinois Natural History Survey, Prairie Research Institute. <u>dewalt@illinois.edu</u>

The Stoneflies of West Virginia

The rugged state of West Virginia is home to 157 species of stoneflies, according to Plecoptera Species File. The state possesses the third highest plecopteran species diversity in the Northeastern US after Pennsylvania and Virginia, yet the scientific literature describing West Virginia stonefly distribution remains sparse. The most recently published state checklists lack both location specificity and preserved specimens to support them. Neither do they account for

recent taxonomic revisions of important genera, such as *Isoperla*. The goal of my master's research is to assemble an annotated checklist and atlas of stonefly diversity found in West Virginia. For this purpose, I plan to construct a dataset of specimen records from literature sources, digitization of existing specimens at regional and national museums (Illinois Natural History Survey, Colorado State University, Brigham Young University, and the US National Museum), and from new collecting that focuses on state and regional species of greatest conservation need. The growing dataset currently comprises 1674 specimen records. Site locations for these records are shown in the figure below, overlaid on a map of HUC 8-level watersheds. I have accounted for 128 out of 157 listed species, as well as records of species not previously reported for the state, such as *Soyedina merritti* Baumann & Grubbs, 1996 and *Leuctra variabilis* Hanson, 1941. I fully expect to add more state records as more specimens are examined. Construction of this dataset from verified records will contribute to the knowledge of stonefly diversity and conservation status in the state of West Virginia.



Unique collecting events depicted on a map of HUC8 watersheds in West Virginia (USA).

Jane Earle

Continuing research on Pennsylvania Stoneflies

I plan to finish articles I have started on Pennsylvania Taeniopterygidae and Capniidae. These include GIS distribution maps and information on pollution tolerance and life cycles. Other families such as Chloroperlidae will be addressed later. I will be assisting Mary Walsh of The Nature Conservancy with an update of conservation rankings for Pennsylvania stonefly species. I plan to edit and self-publish the final mid-Atlantic stonefly nymph identification guide for water pollution, state agency, and other biologists. These notes were handed out at the EPA sponsored annual biologists' meetings held at Cacapon State Park in West Virginia.

Romolo Fochetti

A collaboration has begun between the University of Viterbo (Italy) and the Federal University of Viçosa - UFV Museu de Entomologia (Brazil) to study the ultrastructure of the spermatozoa of tropical Plecoptera by means of electronic microscopy analysis techniques, both scanning and transmission. The study will initially concern species of the *Anacroneuria* and *Kempnyia* genera (Perlidae, Anacroneuriinae) to compare the data obtained with those concerning European Perlidae (*Perla*, *Dinocras*) present in the literature. Subsequently, it could be of extreme interest to broaden the research to species of the suborder Antarctoperlaria (Austroperlidae, Gripopterygidae, Eustheniidae, Diamphipnoidae), distributed in the southern hemisphere, for which there is no data relating to the sperm ultrastructure. The data thus obtained can be used for systematics inference and for the reconstruction of phylogenetic relationships within the order and with the other orders of insects within the superclass Hexapoda.

Maribet Gamboa, Assistant Professor, Universidad Católica de la Santísima Concepción in Chile

I have received a four-year research grant from the ANID governmental agency in Chile to study *Andiperla* species from the glaciers of Chile and Argentina. The project, number 1240712, is titled "Understanding the Association between Climate Change Impacts on Patagonian Glaciers and the Endemic Patagonian Ice-Dragon Species: A Multidisciplinary Approach to Improve Glacier Monitoring Efforts." The primary aim of this project is to identify these species as sentinel indicators of climate change, thereby enhancing glacier monitoring efforts. The research will utilize genomics, species distributions, and climatic information. The project, which began in July 2024, includes collaboration with Pablo Pessacq and R. Edward Dewalt.

Rodrigo Gastaldo

I am currently working on my Master's Thesis under professor Frederico Salles at the Universidade Federal de Viçosa. My work focuses mainly on *Anacroneuria* (Perlidae) taxonomy and identification. Considering that Brazilian Perlidae belong to an Acroneuriinae tribe which is considerably different from other Perlidae, I am developing an illustrated atlas on male Anacroneuriini morphology, and I hope to introduce interactive identification to *Anacroneuria* research in Brazil. I have worked previously on Perlidae ecology and morphometrics in Rio de Janeiro, investigating whether stonefly nymphs display shape differences according to their substrate use and preference.

Scott Grubbs, Department of Biology and Center for Biodiversity Studies, Western Kentucky University (WKU), Bowling Green, Kentucky, USA. <u>scott.grubbs@wku.edu</u>

Conservation status of the Karst Snowfly, Allocapnia cunninghami

Thanks to the Kentucky Ecological Services Field Office of the US Fish and Wildlife Service (USFWS), funding has been provided since 2018 to address the conservation status of *Allocapnia cunninghami*. This species has a small known range in central Kentucky and middle Tennessee, USA (Grubbs 2021) and was one of three species petitioned by the Center for Biological Diversity in 2010 for formal status assessments by the USFWS. Following the research conducted in winters of 2019 and 2020, Malaise traps has been placed at several public and private properties within the anticipated range of this species during the subsequent next four winters with fieldwork also planned for this upcoming winter. I will be seeking collaboration to assist with preparing a formal conservation assessment and iterative distributional models.

Stoneflies of Pennsylvania

Current WKU M.S student Jack Merola-Lapson and I are heading a project to present the first quantitative analysis of the stonefly fauna of the USA state of Pennsylvania. This project includes fieldwork during 2024, accumulation of digitized museum data present at the Carnegie Museum of Natural History and Illinois Natural History Survey (INHS), working through and digitizing material available at Brigham Young University, Colorado State University, Pennsylvania State University, University of Kentucky, and the personal collection kindly provided by Mr. Pete Woods (Western Pennsylvania Conservancy), and the incorporation of valid records present in the literature. Jack will defend his M.S. Thesis in spring or summer 2025 and a manuscript submission is anticipated in 2025.

Systematics and taxonomy of Nearctic Leuctra

This is a collaborative project together with recent WKU M.S. students (Maddie Metzger and Madison Layer) and Ed DeWalt (INHS). We are slowly working through individual species groups (*sensu* Harper & Harper 1997) and making steady progress on the *L. biloba* and *L. ferruginea* groups. The first manuscript submission is expected later in 2024.

Systematics and taxonomy of Nearctic Perlesta (Perlidae)

This is a collaborative project together with Ed DeWalt, Luke Myers, Eric South (Lyon College), and Phillip Hogan (University of Illinois) to prepare an update on Nearctic *Perlesta*. Our plans

include expanding upon the phylogenetic treatment presented in South et al. (2019) and to make it easier for the novice and expert alike to navigate through the species covered in Stark (2004) and the several described since that time. A manuscript submission is anticipated in 2025.

Systematics and taxonomy of the Spiny Forestfly, Nemoura spiniloba

This is a collaborative project together with Dick Baumann (Brigham Young University) and John Sandberg (California Department of Fish and Wildlife and CSUC Enterprises California State University) to assess the evolutionary relationship of Nearctic *Nemoura spiniloba* within the *N. cercispinosa* group plus all other species of *Nemoura* whose barcodes are readily available on the Barcode of Life Database and GenBank. A manuscript submission is anticipated in 2025.

USA Northeast Regional Species of Greatest Conservation Need (RSGCN)

Species of Greatest Conservation Need (SGCN) are listed in individual USA State Wildlife Action Plans as the taxa that are likely in need of conservation practices and protection. The USFWS has provided \$300,000 to fund formal conservation status assessments of 33 regional SGCNs in the 13 northeastern state region from Virginia north to Maine. This is a collaborative project together with Ed DeWalt and Luke Myers (SUNY Plattsburgh). Our objectives include (a) accumulation of museum specimen and literature data, (b) development of standard operating protocols for field and museum work, (c) training of graduate students, state biologists, and regional conservation staff, (d) incorporating volunteers to help with data collection, and (e) formal conservation assessments. Current WKU M.S. student Josie Griffith is currently working in my lab to develop objective protocols for how to prioritize species for study. We welcome collaborations and help with our work, including fieldwork, access to collections that may harbor our species of interest, advice on where to collect, and insights on potentially important contacts, both personal and professional. Please feel free to contact me – I look forward to talking with everybody interested.

Lily Hart, R. Edward DeWalt, Phillip Hogan. University of Illinois, Illinois Natural History Survey. LVHart2@illinois.edu

The stoneflies of Arkansas: progress in building a checklist and comprehensive dataset for publication

Stoneflies are indicators of good water quality. Their sensitivity to anthropogenic changes make it crucial to monitor their populations. States such as Arkansas partner with the USFWS to protect habitat and wildlife through the production of State Wildlife Action Plans (SWAPS). Plants and wildlife species often enter these plans as Species in Greatest Conservation Need (SGCNs). Arkansas has a history of funding research of these SGCN species and currently has eight SGCN stoneflies. Currently, a comprehensive data set of stonefly records is lacking from which to holistically assess completeness of sampling, conservation status, and temporal changes in the distribution of Arkansas stonefly species. This project will compile such a specimen data set from Illinois Natural History Survey Insect Collection (INHS) and other museum specimen data, from literature sources, and targeted sampling. Using the TaxonWorks[™] bioinformatics management system, we imaged, digitized, and georeferenced over 3000 specimen records in the INHS, building the first specimen level data set for Arkansas stoneflies.

The INHS Arkansas data accounts for 87 stonefly species, closely matching published

records found in https://plecoptera.speciesfile.org/. Perlidae contributed 34 of these species followed distantly by Perlodidae, Capniidae, and Taeniopterygidae species. Using the R packages "vegan" and "ggplot2", a preliminary species accumulation curve estimates that sampling is not nearly complete with a Chao1 Estimate for Arkansas species being 103.1 ± 11.0 . This is a work in progress and after more data checking on identification we will publish a data paper by late July 2024. The data set will be in Darwin Core Archive format and be available for various purposes by our team, other researchers, and the State of Arkansas. We plan to continue work in Arkansas to find additional species, and assess rarity, endemicity, and potential decline of stoneflies in Arkansas.

Phillip N. Hogan, University of Illinois, Illinois Natural History Survey, pnhogan2@illinois.edu

Historical reconstruction of the Midwest, USA stonefly fauna

Large-scale landscape conversion of the Midwest, USA to row crop agriculture and urbanized areas resulted in widespread losses within the stonefly fauna. Using distribution modeling methods, I modeled 96 of the 153 species recorded from the Midwest, providing insight into how species distributions have shifted over the past two centuries. The majority of modellable species demonstrated range contractions between pre-European colonization and contemporaneous periods. To supplement distribution models, the change in detections of each species over time was analyzed and species were classified as declining, stable, or increasing. Large-bodied, semivoltine perlid stoneflies were most strongly correlated with declines, supporting the results of DeWalt et al. (2005).

DeWalt RE, Favret C Webb DW. 2005. Just How Imperiled are Aquatic Insects? A Case Study of Stoneflies (Plecoptera) in Illinois. Annals of the Entomological Society of America 98: 941-950. <u>https://doi.org/10.1603/0013-8746(2005)098[0941:JHIAAI]2.0.CO;2</u>

Phylogeographic analysis and systematics of the eastern Nearctic *Allocapnia* **Claassen, 1924** *Allocapnia* Claassen, 1924 is the second-most diverse stonefly genus in eastern North America with species distributions largely structured by glacial history. Using Restriction site Associated DNA sequencing (RADseq) techniques, I will assess how three widespread species (*A. granulata* (Claassen, 1924), *A. pygmaea* (Burmeister, 1839), and *A. rickeri* (Frison, 1942)) recolonized the upper Midwest following the last glacial maximum. During the winters of 2022 and 2023, targeted collections of these three species were completed. DNA extractions and sequencing will commence later this summer. Distribution modeling using paleoclimatic variables will be completed by winter 2024 to help identify dispersal pathways used by each species to recolonize historically glaciated regions. Additionally, our collections recovered 45 of the 47 valid species in preparation for a RADseq-based phylogeny and an updated systematic review of the genus. Initial notable results include new state records and two potential new species.

Weihai Li Laboratory, Xinxiang, Henan, China, lwh7969@163.com

The stoneflies of China

I am currently preparing a color atlas of the Plecoptera of China, aiming at covering over 80% of the known species. To enhance understanding of the fauna, this book will provide color photographs and diagnostic descriptions. Presently, I still lack male specimens of some taxa and am identifying unsorted materials. The draft is expected to be submitted in the coming year. I warmly invite colleagues and researchers to contribute any relevant Plecoptera specimens, habitus photos of live or preserved specimens, especially for those rare or only known from old types. Your contributions will greatly enhance the quality of this monograph. We hope it will provide valuable reference materials for the academic community and stimulate greater interest of this group in the public. Thank you for your support and cooperation!

Mellis Layra Soares Rippel, Graduate Program in Entomology - PhD, Universidade Federal de Viçosa - UFV, Viçosa, Minas Gerais - Brazil

Mellis Rippel, a PhD student at Universidade Federal de Viçosa, Brazil, under the guidance of Professor Frederico F. Salles, is conducting research on the taxonomy and internal anatomy of Gripopterygidae, with co-advisors Professor Pablo Pessacq and Professor José Lino Neto. The focus of the research is to explore, describe, and comparatively analyze potentially significant yet underexplored morphological traits of Gripopteryginae. Specifically, Mellis is investigating internal morphological features, such as the reproductive systems of adults and immatures across different genera of the subfamily, with emphasis on those found in Brazil, such as *Gripopteryx*, *Paragripopteryx*, *Tupiperla*, and *Guaranyperla*. The aim is to establish a comprehensive database for potential inferences regarding phylogenetic, evolutionary, ecological, and behavioral aspects of subfamily members. Additionally, Mellis is engaged in a taxonomic revision of the gripopterigid genus *Guaranyperla*, utilizing both morphological and molecular data.

Manuel J. López Rodríguez and J. Manuel Tierno de Figueroa, University of Granada, Departments of Ecology and Zoology, Granada, Spain, <u>manujlr@ugr.edu</u>, jmtdef@ugr.es

In the last year we finished sampling Plecoptera from the Sierra Nevada National Park (southern Spain) within the European project LIFEWatch-ERIC and now we are analyzing data on development and growth of several species to build their life cycles and to compare them with data from >15 years ago. Within this project, we have completed a database with ecological information on the stonefly species inhabiting streams from the Sierra Nevada that has been uploaded to GBIF.

We are also supervising the Ph.D. Thesis of Alejandra Tierno-Cinque entitled "Crosssectional study of the metacommunity of aquatic organisms of the Guadiana River basin (Iberian Peninsula) in the framework of Global Change", in which, among other aspects, the biology and demography of particular species of stoneflies is being studied, in order to discuss if they may be used as "sentinel species" of climate change. A part of this project is funded by the European Commission through the regional government (*Junta de Andalucía*, Spain) and the University of Granada, in which the genetic structure of several populations of Plecoptera will be also analyzed to detect if they behave as a metapopulation and their conservation status.

We have been collaborating since 2023 in a four-year project entitled "Advanced tools for the assessment of the ecological status of Mediterranean temporary rivers during the dry phase" (Ministry of Science and Innovation, Government of Spain). Within this project we are compiling information on traits of Mediterranean stoneflies and other macroinvertebrates to build a database that will be useful for further functional diversity studies that will be accomplished afterwards.

We are also involved in the project "Towards the conservation of Iberian Arthropods using digital tools" funded by the National Research Agency of Spain in which an occurrence data base of Plecoptera, as well as other Arthropod groups, in the Iberian Peninsula is being built.

We carry on maintaining collaborations with some colleagues for particular studies, such as feeding habits of Japanese adult Capniidae (with D. Murányi and K. Földi), nymphal biology of Chilean Plecoptera and Ephemeroptera (with P. Fierro and D. Barrientos), drumming on French stonefly species (with A. Ruffoni) and long-term population dynamics and biocoenosis diversity of Croatian Plecoptera (with M. Vilenica and M. Ivković).



Figure 1. Pictures of four Spanish rivers in which stonefly samplings are being carried out.

Alexandre Ruffoni

I am currently in the process of finalizing a key to the larvae and exuviae of Plecoptera from France (mainland and Corsica) with help of the Office pour les insects et leur environnement (Opie). Work started in 2014 and is currently being formatted. It will come out next year. Seven families, 29 genera, and 100 taxa are covered, including 91 described and present in France (i.e. all the Perlodidae, Perlidae, Chloroperlidae, Taeniopterygidae and Capniidae). Richly illustrated, it includes stacking photographs and photographs of live larvae (in total about 1500). Nearly 300 drawings illustrate the keys and help focus attention on important criteria. The book should be completed and available in 2025.



On the other hand, Opie and its Opie-benthos working group have been working on a red list of Plecoptera in France (mainland and Corsica) with the help of the Paris Natural History Museum and the IUCN. We put out a call for data in Perla 39 (thanks to all those who responded). The results will probably be published in early 2025.

This year (as every year) Opie-benthos also organized benthos days in the Vosges in April (two days of presentations and field trip), and next year they will take place near Mont Blanc (Giffre valley, probably in April 2025).

John B. Sandberg, Aquatic Bioassessment Lab, CDFW and CSUE, Chico, California USA jsandberg@csuchico.edu

Stonefly drumming behavior descriptions of three *Soliperla* Ricker, 1952 species (Plecoptera: Peltoperlidae) <u>https://doi.org/10.11646/zoosymposia.24.1.5</u>

The collection and rearing of adults and larvae for this project occurred throughout April to May 2020 and covered six northern California counties (Glenn, Humboldt, Plumas, Shasta, Tehama, and Trinity). The peltoperlid stream habitats were forested and usually had moss, ferns, and small cataracts or falls that ranged from dripping to running water. Two of the three species had drumming characters that overlapped but did not occur together (1A and 2A below). It is thought that species with similar drumming characters would not have sympatric distributions or have different phonologies.



New stonefly (Plecoptera) drumming signal descriptions for *Kogotus nonus* (Perlodidae) and *Yoraperla mariana* (Peltoperlidae)

The collection and rearing of material used in this study occurred in May 2022, during the last great California collecting trip made with friend and colleague Dr. Boris Kondratieff. We visited 23 stream and river locations and over 400 stonefly adults, larvae and exuviae were collected over a 7-day excursion. Seventy-one adults were reared from larvae that were collected live and contained in mobile rearing chambers. Our target species was *Kogotus nonus* which was collected at seven streams in six northern California counties. The adults used for recordings were reared from Mad R., Salt Cr. and Terwer Cr. in Trinity, Mendocino and Del Norte Counties respectively. *Kogotus* adults sometimes made long exchanges (Fig. 1). *Yoraperla* live adults were collected from Butte Creek, Butte County and called with long monophasic signals.



New drumming descriptions for *Bisancora pastina* and *Taenionema grinnelli* (Plecoptera); First report of tremulation in Taeniopterygidae

During recent 2024 collecting trips targeting *Baumannella alameda* and *Bisancora pastina*, two *Taenionema* species were also collected live and recordings were attempted. For the third time, *Taenionema californicum* would not drum and the *B. alameda* populations seem to be in decline. However, good signals for analysis were recorded from *B. pastina* from Secret Ravine, Placer County and *Taenionema grinnelli* from Zim Zim Creek and Cold Creek, Napa and Solano Counties respectively. *Taenionema californicum* occurred at both sites but emerged a month earlier. The male call of *B. pastina* consisted of repeated monophasic signals and *T. grinnelli* calls were tremulation signals new to science (Fig. 2). The new tremulation signal method differed from the previous tap-like tremulation calls of *Suwallia pallidula* (Alexander & Stewart 1997). The *T. grinnelli* calls were long musical notes (similar to rub method signals) created by extremely rapid vertical abdominal vibrations (sounding similar to mosquito or bee wing beats). Oscillographs did not provide sufficient detail to allow the measurement of each vertical vibration, rather only the duration could be measured.



Felipe Ribeiro Pereira Sarmento

I am currently pursuing a Master's degree at the Universidade Federal de Viçosa in Brazil under the esteemed guidance of Prof. Frederico F. Salles and co-advised by Prof. Daniela M. Takiya. His research endeavors are primarily focused on the Phylogeny of *Tupiperla* Froehlich, 1969 (Gripopterygidae), utilizing molecular data as the primary source of investigation.

The research aims to explore, describe, and compare the potentially significant yet relatively unexplored molecular data of *Tupiperla*. The objective is to elucidate the evolutionary history of the genus. *Tupiperla*, the most diverse genus of Gripopterygidae in South America, holds significant potential for such studies.

The ultimate goal of this research is to establish a comprehensive database that could

serve as a foundation for potential inferences regarding the genus members' phylogenetic, evolutionary, ecological, and behavioral aspects. This would significantly contribute to the understanding of the genus and its various species.

In addition, Felipe is actively engaged in the integrative taxonomy of the gripopterigid genus *Tupiperla*. This involves the utilization of both morphological and molecular data to delimit species, thereby providing a more thorough understanding of the genus. This integrative approach is expected to yield valuable insights into the taxonomy of *Tupiperla*.

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The Larvae, Adults and Systematics of the Nearctic *Oemopteryx* Klapálek, 1902 (Plecoptera: Taeniopterygidae) – Chris J. Verdone, Bronwyn W. Williams, Steven R. Beaty, Victor B. Holland, Scott A, Grubbs, R. Edward, Dewalt.

This project dates back to 2021 when we found a new species of *Oemopteryx* Klapálek, 1902 from Coastal Plain in North Carolina. The project grew to include all the Nearctic species of *Oemopteryx* including several new species. Larvae and adults of all species were fully described/re-described. Additionally, we revised the Taeniopterygidae keys to genus for larvae and adults. The manuscript will be complemented with distribution maps, close to 200 color photographs, 50+ SEMs, and an analysis of the COI gene. We hope to submit this for publication in fall 2024.



Oemopteryx contorta (Needham & Claassen, 1925) (Taeniopterygidae). Male. Cove Creek, 662, 37.17837, -81.29900, 14 February 2024. Credit, Chris Verdone.

Revision of the "Larvae of the Southeastern USA Mayfly, Stonefly, and Caddisfly Species" – Editors John C. Morse, Luke M. Jacobus, and Chris J. Verdone.

The North Carolina Biological Assessment Unit has the great honor of building upon the work of the venerable Dr. Bill Stark and will begin updating the Plecoptera chapter in the Southeastern larval EPT key this fall. This endeavor is expected to take about two years. Updates will include new keys for at least the *Isoperla* Banks, 1906 Taeniopterygidae Klapálek, 1905, *Oemopteryx* Klapálek, 1902, and *Pteronarcys* Newman, 1838 supported by color photographs and illustrations.

Peter Zwick

Eustheniidae do move their gills !

Galileo Galilei's public support of Kopernikus' heliocentric model of the world was in conflict with the then belief and doctrine in which the earth stood still in the centre of the world while the moon, sun, planets, and stars circled around it. This heretical opinion got him into trouble with the Church. In a court case Galileo was indeed forced to to revoke publicly and legend has it that, while leaving the court hall, he murmored *"Eppur si muove" - despite all, earth does move.*

My case is not nearly as severe – I voluntarily revoke my opinion that Eustheniidae do not perform respiratory movements. In the 1960s I worked on stonefly morphology when the possible homology of segmental abdominal gills with abdominal legs was of interest. Having no access to live material and at that time knowing no colleague whom I could ask, I dissected numerous preserved larvae of Eustheniidae and Diamphipnoidae, looking for muscles at the gill bases that might move the gills in a leg-like fashion. I found numerous delicate muscle fibres in the gills but none at their base that seemed suitable to move the gill as a whole. Later IAN MCLELLAN also told me he had never seen such movements in New Zealand Eustheniidae. Eustheniid larvae are rheophilic; gas exchange by simple exposure to the cool running water seems feasible.

After the World War ARTURS NEBOISS left Europe and eventually became expert of Australian Trichoptera. After his retirement he offered me a spool of an 8 mm film he had produced in the 1950s: *The Archaic Stonefly*. Adults of the three species of *Thaumatoperla* play the main roles, but at the end of the film larvae are also shown. Having been kept in standing water they were under respiratory stress and performed vigorous *push-ups* and rapid gill beats!

Diamphipnoidae have an even greater number of fine muscle filaments in their copious epaulette-like gills but I never read about gill movements. Can somebody in South America please have a look? Perhaps the animals need some motivation by experimental respiratory stress.

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Additional images that were submitted for the cover page

Megaleuctra williamsae Hanson, 1941 (Leuctridae)

Adult male. Whitetop Creek, Mud Creek Lane, 36.63930, -81.59629, 26 May 2024. Grayson County, Virginia. Specimen not collected. Photo submission and credit, Chris Verdone, North Carolina Department of Environmental Quality, Raleigh, North Carolina, USA



Salmoperla sylvanica Baumann & Lauck, 1987 unnamed tributary to Willow Creek, California, USA. Credit, John Sandberg.



Acroneuria kosztarabi Kondratieff & Kirchner, 1993 Adult male. Wolf Creek, 37.14670, -81.26720, 25 May 2024, Bland County, Virginia, USA. Specimen not collected. Credit, Chris Verdone.



Isoperla evanescens Verdone & Kondratieff, 2016 Adult female. Wolf Creek, 37.14670, -81.26720, 25 May 2024, Bland County, Virginia, USA. Specimen not collected. Credit, Chris Verdone.



Oconoperla innubila (Needham & Claassen, 1925) Adult male. Washington Creek, 35.44911, -83.24215, 8 May 2024, Jackson County, North Carolina, USA. Specimen not collected. Credit, Chris Verdone.