Editorial

The Ecology and Taxonomy of Chironomidae (Diptera): A Memorial Issue to Honor Leonard C. Ferrington, Jr.

This memorial issue is published to express our appreciation of Dr. Leonard C. Ferrington, Jr., and his contributions to the field of aquatic entomology, ecology, and especially research on the family Chironomidae. We honor Len and his work in three ways. First, a written tribute portraying a life well lived, including his extensive research record, his many talents and, most importantly, as a man who was loved and respected by family and friends (Bouchard et al. 2021). Second, the extent of Len's influence in chironomid research was exemplified by the 17 international presentations submitted to the 2024 Society for Freshwater Science (SFS) Special Session: Ecology and Taxonomy of Chironomidae (Diptera): A Memorial Session to Honor Leonard C. Ferrington, Jr. (Fig. 1). The meeting was aptly held in Pennsylvania (USA), where Len began his research career. Third, this Memorial Issue includes several of the papers presented at the SFS Special Session and other contributions submitted by researchers who could not attend the 2024 SFS annual meeting yet wished to recognize Len. The authors of these papers include collaborators and colleagues who began work with Len in the 1980s and those who were still working with him through 2021, when he passed away. Len built a community of chironomid researchers during his 41 years in Pennsylvania, Kansas, and Minnesota. The interconnectedness of his research, exemplified by the papers of this Memorial Issue, reflects the exceptional training his students received and the true collaborative nature of Len Ferrington's research.

Figure 1. Some participants from the 2024 SFS Special Session honoring Leonard C. Ferrington, Jr. gather for a photo with Deborah Ferrington, Len Ferrington's wife. Participants and attendees from left to right are Will Bouchard, Hannah Bodmer, Alyssa Anderson, Tracey Anderson, Susan Gresens, Valeria Lencioni, Tessa Durnin, Sabrina Moore, Corrie Nyquist, Kaitlynn Davis, Fabio Laurindo da Silva, Joseph Phillips, and Deborah Ferrington.

Ecology and SFPE

A major theme in Len Ferrington's research was on aquatic ecology and emergence of Chironomidae. Len studied emergence patterns of Chironomidae from mesocosms (Goldhammer et al. 1992), tropical streams (Ferrington et al. 1993), cold springs (Ferrington 1987a), and an estuary (Kranzfelder and Ferrington 2018). Len and others developed an early protocol in the USA for collecting and using surface-floating pupal exuviae (SFPE) in bioassessment and ecology (Ferrington et al. 1991); field and laboratory techniques associated with this protocol were reinforced in a later publication (Kranzfelder et al. 2015). During his tenure at the Kansas Biological Survey of the University of Kansas, Len collaborated with Dr. Tracey Anderson who was then a graduate student. A paper contributed by Anderson et al. (2025) titled "Chironomids shed light on organic matter dynamics in macroinvertebrate communities in prairie pothole lakes in west-central Minnesota, USA" describes the functional contribution of Chironomidae to these unique habitats of the Northern Great Plains, USA. Len's research interest in intermittent streams (see Chou et al. 1999) is connected to the paper contributed by Bouchard (2025) "Long-term emergence patterns of Chironomidae (Diptera) from an intermittent stream." Work by Lencioni et al. (2025) "Diet and functional feeding groups of Chironomidae (Diptera) in Alpine freshwater habitats" honors Len's long-term interest in cold spring ecology.

Life on the Edge

Another theme of Len Ferrington's research was unique and extreme ecosystems such as the hyporheic zone of streams and rock pools (Ferrington 1987b, Egan and Ferrington 2015). His research on cold springs transitioned into the study of winter or hibernal emergence of Chironomidae in the Great Plains and other regions of the Upper Midwest of North America (i.e. Ferrington 2000, Anderson et al. 2011, Nyquist et al. 2020) and elsewhere (e.g. Baranov and Ferrington 2013). Len also began studying cold tolerance of chironomids in Minnesota. His work as well as research by others on these topics is summarized within the contribution of Anderson et al. (2025) "Midges Below Zero: A Review of Hibernal Emergence of Chironomidae in Temperate Regions." Len's enthusiasm for winter research was contagious – he often worked to engage others in winter insect studies, and this is captured in the article "Bugs Below Zero: Communicating Science and Engaging the Public with Winter Active Aquatic Insects and Stream Food Webs" by Anderson et al. (2025). Len's survey work in Tasmania uncovered associations between tidal rock pool chironomids and their symbiotic gut-fungi, Harpellales (Ferrington et al. 2005). Discovering marine chironomids inspired the contribution by Hayford et al. (2025) "*Eretmoptera* from Washington State, USA: maritime or terrestrial midge?"

Taxonomy

Len published taxonomic work throughout his career ranging from descriptions of new species (Coffman et al. 1988, Chen et al. 2017) and genera (Ferrington and Sæther 2006) to major revisionary works (Ferrington and Sæther 2011, da Silva and Ferrington 2018). Some of Len's most important contributions to taxonomy were in co-authoring the keys to Chironomidae of North America (Ferrington et al. 2008, Ferrington and Berg 2019), in which he included provisional taxa. One of these taxa, Orthocladiinae *Genus 5*, has been described as a new species in the paper contributed by Fasbender et al. (2025) "Description of *Parakiefferiella ferringtoni* with discussion of relationships within the *Parakiefferiella* group." *Parachaetocladius lenferringtoni* Bouchard and Namayandeh was described and named in honor of Len (Bouchard and Namayandeh 2024). Molecular analysis supports the species status of *P. lenferringtoni* as shown in the Namayandeh et al. (2025) contribution "DNA analysis confirms the new species *Parachaetocladius lenferringtoni* Bouchard et Namayandeh, 2024 (Chironomidae: Diptera)." DNA analysis was also useful in describing new species and clarifying taxonomy of the Orthocladiinae tribe, Corynoneurini in a paper contributed to this Memorial Issue by Stur et al. (2025) titled "A contribution to the understanding of European Corynoneurini, with the description of three species new to science." Len's interest in hyporheic ecosystems (Ferrington 1987b) and pupal exuviae is shared in Egan's (2025) contribution "*Lopescladius* (Chironomidae) from the Nearctic, including keys and new pupal exuviae descriptions" which includes associated immatures described for the first time as well as range extensions.

Conclusion

We thank all the authors for their contributions to this Memorial Issue. Just as Len inspired many of the contributing authors, we hope the work shared here will encourage and support other chironomid researchers. More information on Len Ferrington's scientific works can be found within Bouchard et al. (2021) and on Google Scholar: https://scholar.google.com/citations?user=ydEaYTEAAAAJ&hl=en&oi=sra.

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