

The Great Lakes Entomologist

Volume 54
Numbers 3 & 4 - Fall/Winter 2021 *Numbers 3 &
4 - Fall/Winter 2021*

Article 5

December 2021

An Updated Checklist to the Non-biting Midges (Chironomidae) of Illinois

Daniel R. Swanson
University of Illinois at Urbana-Champaign, drswanny@gmail.com

Erika E. Bilger
Illinois Natural History Survey, ebilger@illinois.edu

Follow this and additional works at: <https://scholar.valpo.edu/tgle>



Part of the [Entomology Commons](#)

Recommended Citation

Swanson, Daniel R. and Bilger, Erika E. 2021. "An Updated Checklist to the Non-biting Midges (Chironomidae) of Illinois," *The Great Lakes Entomologist*, vol 54 (2)
Available at: <https://scholar.valpo.edu/tgle/vol54/iss2/5>

This Peer-Review Article is brought to you for free and open access by the Department of Biology at ValpoScholar. It has been accepted for inclusion in *The Great Lakes Entomologist* by an authorized administrator of ValpoScholar. For more information, please contact a ValpoScholar staff member at scholar@valpo.edu.

An Updated Checklist to the Non-biting Midges (Chironomidae) of Illinois

Cover Page Footnote

We thank Thomas McElrath (INHS) for providing access to specimens in the Illinois Natural History Survey Collection under his care. We are grateful to Jodi Vandermyde and Anna Belyaeva of the Illinois Environmental Protection Agency (IEPA) for providing sundry IEPA reports and for correspondence concerning taxa and data therein. This manuscript greatly benefited from the expertise and comments of the late Leonard C. Ferrington, Jr., and we are inspired by his legacy toward a much greater appreciation for the midges of the Great Lakes Region. This project received support from the Illinois State Toll Highway Authority. We also thank three anonymous reviewers for their helpful comments which improved the manuscript.

An Updated Checklist to the Non-biting Midges (Diptera: Chironomidae) of Illinois

Daniel R. Swanson^{1,2,4} and Erika E. Bilger^{2,3,*}

¹Department of Entomology, University of Illinois at Urbana-Champaign, 320 Morrill Hall,
505 South Goodwin Avenue, Urbana, IL 61801, United States of America

²Illinois Natural History Survey, Prairie Research Institute, University of Illinois at Urbana-Champaign,
1816 South Oak Street, Champaign, IL 61820-6960, United States of America.

³Present address: Department of Biology, Millikin University, 1184 West Main Street,
Decatur, IL 62522, United States of America.

⁴ urn:lsid:zoobank.org:author:1F74F4E6-DA35-4A90-8572-EDC8F6660B43; <https://orcid.org/0000-0002-0830-2383>; (e-mail: drswanny@gmail.com)

* Corresponding author: (e-mail: ebilger@millikin.edu)

Abstract

The Chironomidae (Diptera), or non-biting midges, of Illinois have been untreated since the early 20th century, and the high level of taxonomic flux in the family necessitates an update, particularly for a group with importance as bio-indicators of freshwater ecosystem health. Herein, 181 species of Chironomidae in 76 genera are recorded from the state of Illinois. Each species entry is annotated with the first Illinoisan record of the species. Two genera, *Brillia* Kieffer, 1913 and *Prodiamesa* Kieffer, 1906, are recorded for the first time from Illinois, as are three species: *Xenochironomus xenolabis* (Kieffer in Thienemann and Kieffer, 1916) (Chironominae); *Brillia flavifrons* (Johannsen, 1905) (Orthoclaadiinae); and *Prodiamesa olivacea* (Meigen, 1818) (Prodiamesinae).

Keywords: Diptera, faunistics, distribution

Members of the family Chironomidae (Diptera: Nematocera: Culicomorpha) are delicate-looking flies that are commonly known north of Mexico as 'non-biting midges' or 'lake flies'. The larvae and pupae are largely aquatic, giving rise to an aerial imago after eclosion at the surface of the water. With the group name derived from an Ancient Greek word roughly meaning 'pantomimist', the adults of Chironomidae are easily, if informally, recognized by the elongate, often splaying forelegs. The plumose antennae of most males make sexing midges relatively straight-forward and also give rise to another common name for the group, namely 'muffleheads'. Unlike some notorious blood-sucking culicomorphs (e.g., sand flies, mosquitos, black flies), chironomids are comparatively harmless, typically with greatest annoyance coming from massive seasonal emergences of imagoes (but see Failla et al. 2015 and references therein for other negative impacts). Ferrington and Berg (2019) indicated approximately 5,000 species have been described worldwide, with 1,200 of those known from the Nearctic Region, although predictions accounting for undescribed diversity can top 20,000 and 2,000 species, respectively. No matter the

metric, it is clear that the non-biting midges are a diverse group.

Chironomidae is an ecologically important group. Chironomids are ubiquitous and often abundant in and near freshwater habitats (Pinder 1986). As accompanies high densities, they are functionally significant as consumers of primary resources as well as a major food resource for other consumers in aquatic and terrestrial food webs (e.g., Armitage et al. 1995, Furey et al. 2012, Ferrington and Berg 2019). Furthermore, the larvae serve functional roles in organic matter processing (Hirabayashi and Wootton 1998) and nutrient cycling (Hupfer et al. 2019) in aquatic ecosystems. Present in every biome (a midge is the largest terrestrial organism living in Antarctica), the group is useful for identifying and tracking biogeographic trends and processes (e.g., Porinchu and MacDonald 2003). They also are broadly incorporated in water quality assessment (e.g., Sæther 1979, Morris and Brooker 1980, Rosenberg and Resh 1993, Raunio et al. 2011, Nicacio and Juen 2015, Theissingner et al. 2018).

Despite the importance of the group, the faunistics of Chironomidae in Illinois is paradoxical. On the one hand, Illinois

Table 1. Unconfirmed records of other species of Chironomidae from Illinois.

Subfamily: Tribe	Genus-Species	Source	IL expected?	Notes
Chironominae: Chironomini	<i>Hyporhygma quadripunctatum</i>	Curtis (2009, BugGuide.net)	yes	
	<i>Paratendipes albimanus</i>	Bentley (2010, BugGuide.net)	yes	
	<i>Polypedilum albinodus</i>	Bright (2020)	yes	listed IL but record not located
Chironominae: Tanytarsini	<i>Cladotanytarsus</i> sp.	Puchalski and Gilka (2017)	yes	<i>C. viridiventris</i> expected
	<i>Stempellina</i> cf. <i>subglabripennis</i>	Bolton (2012)	no	
Orthocladiinae	<i>Toetenia</i> sp.	Harris et al. (2005)	yes	

is a state with a long history of biosurvey work (Post 1991) and the chironomid fauna were the subject of a focused treatment in the early 20th century (i.e., Malloch 1915a, b). Still, this century-old study might also rightly be called the most recent. In the interim, many additional taxa have been described and many taxonomic changes wrought. This collective flux couples with the notorious difficulty of midge identification (see Introduction in Armitage et al. 1995) to reveal a picture of chiro-fauna in Illinois that is out-dated and difficult to assimilate.

To address this shortcoming, the checklist of the Chironomidae of Illinois is herein updated and annotated, resulting in the first state-level focus on the fauna since Malloch's (1915a) over a century ago. Although the updates are largely literature-based, two genera and three species are newly recorded from Illinois, based on museum specimens and recent collections.

Materials and Methods

References. Accounting for and untangling the species records in Malloch (1915a) served as the initial starting point and foundation of the checklist. Further Illinois records were gleaned from the Illinois Natural History Survey Insect Collection as well as various family-level catalogs (i.e., Sublette and Sublette 1965, Ashe 1983, Oliver et al. 1990, Oliver and Dillon 1994a). Additionally, a few isolated studies (i.e., Dorris 1958, Paloumpis and Starrett 1960, Parkin and Stahl 1981, Webb 1981, Stahl 1986, Zullo and Stahl 1988, Walther et al. 2006) peripherally addressed various midge taxa in the state. Remaining records were

mostly sourced by hunting through bibliographies in the catalogs.

Species entries. Taxa are arranged alphabetically by the following hierarchy: subfamily, tribe, genus, subgenus (when applicable), species. For each species, we have attempted to locate the first Illinoisan record in the literature. We were not successful in all cases, and these are evident where the oldest record is attributed to one of the taxonomic catalogs, usually Oliver et al. (1990). Additionally, each of the names treated at the species-level (with records for Illinois) by Malloch (1915a) is mentioned in the checklist, either as a valid name or a synonym. Entries also include other synonyms, literature, or notes where applicable. Species-level keys are mentioned only under the first entry within a genus. Mentions of a few species in Illinois that constitute unpublished or unverified records are compiled in Table 1, with the notable exception of Illinois Environmental Protection Agency (IEPA) reports (see Discussion).

Identification. Identification of the few species newly reported herein was accomplished by the authors using Oliver and Roussel (1983), Pinder and Reiss (1983), and Epler (2001). Several keys covering a wide range of genera assisted with identification of recently collected material: Townes (1945), Roback (1971), Oliver (1981), and Epler (2001).

Institutional codens. Illinois Natural History Survey Insect Collection, Champaign, Illinois, United States (INHS) (Dmitriev 2015).

Results

As a result of this investigation, 181 species in 76 genera were found to have been reported from Illinois. Three species and two genera are newly reported from Illinois in this study. Five of the seven subfamilies present in the Nearctic are represented in Illinois; currently, no members of the subfamilies Podonominae and Telmatogetoninae are known from Illinois. For comparison, Malloch (1915a: 536) recorded 15 genera and 124 species for Illinois, marking an approximate 407% increase in genera and 46% increase in species.

The following taxa were excluded from the Illinois faunal list:

- *Trichotanypus* Kieffer, 1906c: Although included in the generic key, Malloch (1915a: 364): stated “I have not seen this genus from Illinois.”
- *Alotanypus venustus* (Coquillett, 1902a): Malloch (1915a: 377–378) stated:

“I have only a single specimen before me, and having refrained from detaching the hypopygium it is of course impossible to discover in what respects that differs from the hypopygium of [*Tanypus* (now *Ablabesmyia*)] *illinoensis*. As the tarsi of the fore legs are broken off I am unable to compare their proportions with those of the tarsi of *illinoensis*. The different coloration of the two species should serve to separate them readily.”

Illinois was included in the species range in Sublette and Sublette (1965), clearly based on Malloch (1915a). In describing *Alotanypus* Roback, 1971, Roback (1971) included Malloch’s (1915a) citation in the synonymy without comment. He also examined only species from the western United States, although a newly-described congener was recorded from the East Coast. Oliver et al. (1990) indicated that *A. venustus* was a western species.

- *Telmatogeton alaskense* Coquillett, 1900: Transferring the species from *Telmatogeton* Schiner, 1866 to *Paraclunio* Kieffer, 1911a, Malloch (1915a: 400) included the genus in the generic key but did not reference the species elsewhere.
- “*Cryptochironomus pararostris* [sic] Harnisch”: Dorris (1958: 97) listed this species from Big Lake, and it seems likely that this referred to *Cryptochironomus pararostratus*

Harnisch, 1923. However, this species was treated as a *nomen dubium* in *Parachironomus* by Ashe and Cranston (1990: 296) and was not mentioned in Oliver et al.’s (1990) catalog of Nearctic species.

Another note on two genera: it is here recognized the unsettled status of two pairs of synonymous genera: (1) *Demicryptochironomus* Lenz, 1941a and *Schadinia* Lipina, 1939 (see Sæther 1977: 131; Ashe 1983: 20; Ashe and Cranston 1990; Oliver et al. 1990: 45; Spies & Sæther 2004: 64; Yan et al. 2005: 1; Özkan & Akiska 2017: 181) and (2) *Parachironomus* Lenz, 1921 and *Kribiocryptus* Kieffer, 1921a (see Freeman and Cranston 1980: 194; Spies & Sæther 2004: 64). In each case, the former is the generic name in common usage, despite the latter having priority. In these cases, we have deferred to the status quo.

Family CHIRONOMIDAE
(76 genera, 181 species)

Subfamily CHIRONOMINAE
(32 genera, 97 species)

Tribe CHIRONOMINI
(27 genera, 77 species)

Genus AXARUS Roback, 1980

Axarus festivus (Say, 1823).—Illinois: Say (1823: 13), as *Chironomus festivus*. Malloch (1915a: 470) also reported this species from Illinois, as *Chironomus festivus*. Ferrington (1992) discussed larval habitat preferences for this species. Townes (1945: 92) keyed the adults, and Roback (1962: 238–239) keyed the larvae and pupae, each under the genus *Xenochironomus*.

Axarus scopula (Townes, 1945).—Illinois: Townes (1945: 93), as *Xenochironomus scopula*.

Axarus taenionotus (Say, 1829).—Illinois: Townes (1945: 95), as *Xenochironomus taenionotus*.

Genus CHIRONOMUS Meigen, 1803

Subgenera CAMPTOCHIRONOMUS
Kieffer, 1918a; CHAETOLABIS Townes,
1945; CHIRONOMUS Meigen, 1803;
and LOBOCHIRONOMUS Ryser, Wülker,
and Scholl, 1985

Chironomus (*Camptochironomus*) *pallidivittatus* Malloch, 1915a.—Illinois: Malloch (1915a: 445), as *Chironomus tentans* var. *pallidivittatus*. Malloch’s (1915a: 443–445) records of *Chironomus tentans* Fabricius, 1805 also are referred here (Townes, 1945). *Chironomus dilutus* Shobanov, Kiknadze, and Butler, 1999 also is

a synonym. See Shobanov et al. (1999) and Martin et al. (2011).

Chironomus (Chaetolabis) atroviridis (Townes, 1945).—Illinois: Malloch (1915a: 457–459), as *Chironomus viridicollis*. Nearctic records of the Palearctic *Chironomus viridicollis* Wulp, 1859 are referred here.

Chironomus (Chironomus) crassicaudatus Malloch, 1915a.—Illinois: Malloch (1915a: 453–454).

Chironomus (Chironomus) decorus Johannsen, 1905.—Illinois: Malloch (1915a: 472–473). This species has previously been recorded in the literature as *Chironomus attenuatus auct.*, nec Walker, 1848. *Chironomus similis* Johannsen, 1905, also reported from Illinois by Malloch (1915a: 481), was synonymized by Townes (1945: 120).

Chironomus (Chironomus) harpi Sublette in Wülker, Sublette, and Martin, 1991.—Illinois: Wülker et al. (1991: 74).

Chironomus (Chironomus) maturus Johannsen, 1908.—Illinois: Malloch (1915a: 469).

Chironomus (Chironomus) plumosus (Linnaeus, 1758).—Illinois: Malloch (1915a: 447–448). It has also been reported from Illinois under the junior synonyms *Chironomus cristatus* Fabricius, 1805 and *Chironomus ferrugineovittatus* Zetterstedt, 1850 (Malloch 1915a: 481, 446, respectively).

Chironomus (Chironomus) riparius Meigen, 1804.—Illinois: Malloch (1915a: 443). *Chironomus serus* Malloch, 1915a, described from Illinois, was synonymized by Townes (1945: 124).

Chironomus (Chironomus) staegeri Lundbeck, 1898.—Illinois: Malloch (1915a: 438–439), as the junior synonym *Chironomus fasciventris* Malloch, 1915a (syn. Townes 1945: 129).

Chironomus (Chironomus) tuxis Curran, 1930.—Illinois: Oliver et al. (1990: 43).

Chironomus (Lobochironomus) dorsalis Meigen, 1818.—Illinois: Dorris (1958: 97), as *Tendipes dorsalis*. Records of *Chironomus (Lobochironomus) longipes* Staeger, 1839 are referred here; see discussion in Spies and Sæther (2004: 38–40).

CHIRONOMUS incerti subgeneris

Chironomus harti Malloch, 1915a.—Illinois: Malloch (1915a: 457).

Genus *CLADOPELMA* Kieffer, 1921a

Cladopelma amachaerum (Townes, 1945).—Illinois: Townes (1945: 168), as *Harnischia (Harnischia) amachaerum*. Townes (1945: 153–155) keyed the adults under *Harnischia (Harnischia)*.

Cladopelma collator (Townes, 1945).—Illinois: Brigham et al. (1985: 9A-18), as *Harnischia collator*.

Cladopelma viridulum (Linnaeus, 1767).—Illinois: Townes (1945: 168), as *Harnischia (Harnischia) viridulum*.

Genus *CRYPTOCHIRONOMUS* Kieffer, 1918a

Cryptochironomus digitatus (Malloch, 1915a).—Illinois: Malloch (1915a: 483), as *Chironomus digitatus*. Sæther (2009: 3–5) keyed the Nearctic adult males, larvae, and pupae.

Cryptochironomus fulvus (Johannsen, 1905).—Illinois: Malloch (1915a: 478), as *Chironomus fulvus*. *Chironomus abbreviatus* Malloch, 1915a and *Chironomus parvilamelatus* Malloch, 1915a are synonyms (Oliver et al. 1990: 44).

Genus *CYPHOMELLA* Sæther, 1977

Cyphomella grisea (Malloch, 1915a).—Illinois: Townes (1945: 165), as *Harnischia (Harnischia) grisea*. Sæther (1977: 102) keyed the adult males.

Genus *DEMEIJERIA* Kruseman, 1933

Demeijeria brachialis (Coquillett, 1901a).—Illinois: Malloch (1915a: 426), as *Chironomus brachialis*. Heyn (1992) restricted the North American members of the genus to two species, including *D. brachialis*. Townes (1945: 137) keyed the adults under *Glyptotendipes (Demeijeria)*.

Genus *DEMICYPTOCHIRONOMUS* Lenz, 1941a

Subgenus *IRMAKIA* Reiss, 1988

Demicyptochironomus (Irmakia) cuneatus (Townes, 1945).—Illinois: Townes (1945: 163), as *Harnischia (Harnischia) cuneata*. Townes (1945: 153–155) and Sæther (1977: 133) keyed the adults under *Harnischia (Harnischia)* and *Demicyptochironomus*, respectively.

Demicyptochironomus (Irmakia) fastigatus (Townes, 1945).—Illinois: Townes (1945: 162–163), as *Harnischia (Harnischia) fastigata*.

Genus *DICROTENDIPES* Kieffer, 1913a

Dicrotendipes fumidus (Johannsen, 1905).—Illinois: Malloch (1915a: 480), as the junior synonym *Chironomus incognitus* Malloch, 1915a (syn. Townes 1945: 104). Epler (1987: 23–27) keyed the Nearctic adults, pupae, and larvae.

Dicrotendipes lucifer (Johannsen, 1907).—Illinois: Malloch (1915a: 477), as the junior synonym *Chironomus indistinctus*

Malloch, 1915a (syn. Townes 1945). In some references, including Brigham et al. (1985), this species was treated under the species *nervosus* Staeger, 1839.

Dicrotendipes modestus (Say, 1823).—Illinois: Malloch (1915a: 476–477), as *Chironomus modestus*.

Dicrotendipes neomodestus (Malloch, 1915a).—Illinois: Malloch (1915a: 475–476), as *Chironomus neomodestus*.

Genus *ENDOCHIRONOMUS*
Kieffer, 1918b

Endochironomus nigricans (Johannsen, 1905).—Illinois: Malloch (1915a: 434–435), as *Chironomus nigricans*. Grodhaus (1987: 173–179) keyed the Nearctic adults, pupae, and larvae.

Endochironomus subtendens Townes, 1945.—Illinois: Malloch (1915a: 449–450), as *Chironomus viridis*. Many authors, including Malloch (1915a) had mistakenly treated this species as the Palearctic *Chironomus viridis* Macquart, 1834.

Genus *GILLOTIA* Kieffer, 1921a

Gillotia alboviridis (Malloch, 1915a).—Illinois: Malloch (1915a: 482–483), as *Chironomus alboviridis*. Sæther (1977: 134) keyed the larvae.

Genus *GLYPTOTENDIPIES*
Kieffer, 1913b

Subgenus *GLYPTOTENDIPIES*
Kieffer, 1913b

Glyptotendipes (Glyptotendipes) barbipes (Staeger, 1839).—Illinois: Malloch (1915a: 436–437), as *Chironomus barbipes*. Heyn (1992) studied the systematic position of the North American species, and Sublette and Sublette (1973) studied the structure of *G. barbipes*. Townes (1945: 139–140) keyed the adults under *Glyptotendipes (Phytotendipes)*.

Glyptotendipes (Glyptotendipes) lobiferus (Say, 1823).—Illinois: Malloch (1915a: 430–431), as *Chironomus lobiferus*. Heyn (1992) studied the systematic position of the North American species.

Genus *HARNISCHIA* Kieffer, 1921a

Harnischia curtilamellata (Malloch, 1915a).—Illinois: Townes (1945: 166–167). See treatments concerning the *Harnischia* complex of genera by Beck and Beck (1969) and Sæther (1977). Pagast (1931) described the adults and larvae as *Chironomus (Harnischia) pseudosimplex* Goetghebuer, 1923 (syn. Sæther 1971: 349). Townes (1945: 153–155) keyed the adults under *Harnischia (Harnischia)*.

Genus *KIEFFERULUS*
Goetghebuer, 1922

Subgenus *KIEFFERULUS*
Goetghebuer, 1922

Kiefferulus (Kiefferulus) dux (Johannsen, 1905).—Illinois: Malloch (1915a: 479–480), as the junior synonym *Chironomus obscuratus* Malloch, 1915a (syn. Townes 1945: 110). Townes (1945: 110–111) provided a description and figured the adult under *Tendipes (Kiefferulus)*.

Genus *KRIBIODORUM* Kieffer, 1921a

Kribiodorum perpulchrum (Mitchell, 1908).—Illinois: Malloch (1915a: 429), as *Chironomus perpulcher*. This species was previously treated under the genus *Stelechomyia* Reiss, 1982, and Epler et al. (2013) transferred it to the current genus. Reiss (1982: 294–299) redescribed the larva, pupa, and adult imago under *Stelechomyia perpulchra*.

Genus *MICROCHIRONOMUS*
Kieffer, 1918b

Microchironomus nigrovittatus (Malloch, 1915a).—Illinois: Malloch (1915a: 456), as *Chironomus nigrovittatus*. This genus has only one described Nearctic species.

Genus *MICROTENDIPIES*
Kieffer, 1915

Microtendipes caducus Townes, 1945.—Illinois: Malloch (1915a: 454–455), as *Chironomus pallidus* Johannsen, 1905. Townes (1945: 23) keyed the adults.

Microtendipes pedellus (De Geer, 1776).—Illinois: Malloch (1915a: 436), as *Chironomus pedellus*.

Genus *PARACHIRONOMUS*
Lenz, 1921

Parachironomus abortivus (Malloch, 1915a).—Illinois: Malloch (1915a: 465), as *Chironomus abortivus*. Spies (2000: 139–141) keyed the adults; Epler (2001: 106–109) keyed the larvae of several species found in Illinois.

Parachironomus frequens (Johannsen, 1905).—Illinois: Malloch (1915a: 452), as *Chironomus frequens*.

Parachironomus hirtalatus (Beck and Beck, 1964).—Illinois: Oliver et al. (1990: 49).

Parachironomus hazelriggi Spies, 2000.—Illinois: Townes (1945: 160), as *Harnischia (Harnischia) monochromus*. Spies (2000) indicated that *Chironomus monochromus* Wulp, 1874 is not found in the Nearctic, and described *monochromus auct.* as *P. hazelriggi*.

Parachironomus pectinatellae (Dendy and Sublette, 1959).—Illinois: Oliver et al. (1990: 49).

Parachironomus potamogeti (Townes, 1945).—Illinois: Parkin and Stahl (1981: 122).

Parachironomus tenuicaudatus (Malloch, 1915a).—Illinois: Malloch (1915a: 475), as *Chironomus tenuicaudatus*.

Genus **PARACLADOPELMA**
Harnisch, 1923

Paracladopelma galapterum (Townes, 1945).—Illinois: Malloch (1915a: 439), as preoccupied *Chironomus claripennis* Malloch, 1915a. Jackson (1977: 1326–1329) keyed the Nearctic adults, pupae, and larvae.

Genus **PARALAUTERBORNIELLA**
Lenz, 1941b

Paralauterborniella nigrohalteralis (Malloch, 1915a).—Illinois: Malloch (1915a: 440), as *Chironomus nigrohalteralis*. This genus has only one described Nearctic species.

Genus **PARATENDIPES**
Kieffer, 1911b

Paratendipes duplicatus (Johannsen, 1937).—Illinois: Malloch (1915a: 441), as the junior synonym *Chironomus basalis* Malloch, 1915a (syn. Townes 1945: 30). Hayford (1998: 33–38) keyed the Nearctic adults, pupae, and larvae.

Paratendipes subaequalis (Malloch, 1915a).—Illinois: Malloch (1915a: 440), as *Chironomus subaequalis*.

Genus **PHAENOPSECTRA**
Kieffer, 1921a

Phaenopsectra flavipes (Meigen, 1818).—Illinois: Malloch (1915a: 493), as the junior synonym *Tanytarsus flavicauda* Malloch, 1915a (syn. Townes 1945: 76). Townes (1945: 71–72) keyed the adults under *Tanytarsus* (*Tanytarsus*).

Phaenopsectra obediens (Johannsen, 1905).—Illinois: Malloch (1915a: 492), as *Tanytarsus obediens*.

Genus **POLYPEDILUM** Kieffer, 1913c

Subgenera **COLLARTOMYIA**
Goetghebuer, 1948; **POLYPEDILUM**
Kieffer, 1913c; **TRIPODURA** Townes,
1945; and **URESIPEDILUM**
Oyewo and Sæther, 1998

(Maschwitz and Cook (2000: 24–25) keyed the adult males by subgenus)

Polypedilum (*Collartomyia*) *ontario* Walley, 1926a.—Illinois: Boesel (1985: 258). This subgenus has only one Nearctic species. This species was previously in the subgenus

Cerobregma Sæther and Sundal, 1998, which was recently shown to be a junior synonym of *Collartomyia* (Tang et al. 2021).

Polypedilum (*Polypedilum*) *angulum* Maschwitz and Cook, 2000.—Illinois: Maschwitz and Cook (2000: 37–40). Boesel (1985: 247–252) keyed the Ohioan adults, pupae, and larvae, and Maschwitz and Cook (2000: 25–33) keyed the adults, pupae, and larvae.

Polypedilum (*Polypedilum*) *angustum* Townes, 1945.—Illinois: Maschwitz (1975: 172–175).

Polypedilum (*Polypedilum*) *fallax* (Johannsen, 1905).—Illinois: Malloch (1915a: 435), as *Chironomus fallax*.

Polypedilum (*Polypedilum*) *illinoense* (Malloch, 1915a).—Illinois: Malloch (1915a: 471–472), as *Chironomus illinoensis* and *Chironomus illinoensis* var. *decoloratus* Malloch, 1915a.

Polypedilum (*Polypedilum*) *nymphaeorum* Maschwitz and Cook, 2000.—Illinois: Maschwitz and Cook (2000: 92–95).

Polypedilum (*Polypedilum*) *trigonum* Townes, 1945.—Illinois: Maschwitz (1975: 103–110).

Polypedilum (*Tripodura*) *apicatum* Townes, 1945.—Illinois: Malloch (1915a: 427), as *Chironomus octopunctatus* Malloch, 1915a. Townes (1945: 39) indicated that Malloch's identification was a misdetermination of *Chironomus octopunctatus* Loew, 1861a. Boesel (1985: 247–252) keyed the Ohioan adults, pupae, and larvae.

Polypedilum (*Tripodura*) *digitifer* Townes, 1945.—Illinois: Townes (1945: 45). Boesel (1985: 255) treated this species as a junior synonym of *P. halterale* but Soptonis & Simpson (1992) revalidated the species.

Polypedilum (*Tripodura*) *griseopunctatum* (Malloch, 1915a).—Illinois: Malloch (1915a: 428–429), as *Chironomus griseopunctatus*. Boesel (1985: 255) treated this species as a junior synonym of *P. halterale* but Soptonis and Simpson (1992) revalidated the species.

Polypedilum (*Tripodura*) *halterale* (Coquillett, 1901b).—Illinois: Malloch (1915a: 467), as *Chironomus halteralis*.

Polypedilum (*Tripodura*) *scalaenum* (Schränk, 1803).—Illinois: Malloch (1915a: 428), as the junior synonym *Chironomus needhamii* Johannsen, 1908 (syn. Townes 1945: 38).

Polypedilum (*Uresipedilum*) *aviceps* Townes, 1945.—Illinois: Maschwitz and Cook (2000: 45–49). Boesel (1985: 247–252) keyed the Ohioan adults, pupae, and larvae,

and Maschwitz and Cook (2000: 25–33) keyed the adults, pupae, and larvae.

Polypedilum (Uresipedilum) flavum (Johannsen, 1905).—Illinois: Malloch (1915a: 474), as *Chironomus flavus*. Many authors treated this species as a junior synonym of the Palearctic *Chironomus convictus* Walker, 1856; however, we follow the treatment of Maschwitz and Cook (2000: 74–78).

Polypedilum (Uresipedilum) obtusum Townes, 1945.—Illinois: Maschwitz and Cook (2000: 96–99). Boesel (1985: 253) treated this species as a junior synonym of *P. convictum*.

Genus *STENOCHIRONOMUS*
Kieffer, 1919a

Subgenus *STENOCHIRONOMUS*
Kieffer, 1919a

Stenochironomus (Stenochironomus) hilaris (Walker, 1848).—Illinois: Malloch (1915a: 430, 429–430), as the junior synonyms *Chironomus taeniapennis* Coquillett, 1901a (syn. Borkent 1984: 69) and *Chironomus nephopterus* Mitchell, 1908 (syn. Johannsen 1926: 276). Borkent (1984: 39–49) keyed the adults, pupae, and larvae.

Stenochironomus (Stenochironomus) poecilopterus (Mitchell, 1908).—Illinois: Malloch (1915a: 429), as *Chironomus pulchripennis* Malloch, 1915a (*nec* Coquillett, 1902a) (syn. Townes 1945: 87).

Genus *STICTOCHIRONOMUS*
Kieffer, 1919a

Stictochironomus devinctus (Say, 1829).—Illinois: Malloch (1915a: 433), as *Chironomus devinctus*. Townes (1945: 78) keyed the Nearctic adults under *Tanytarsus (Stictochironomus)*, and Mason (1985: 43–44) keyed the Nearctic pupae and larvae.

Stictochironomus flavicingula (Walker, 1848).—Illinois: Malloch (1915a: 432–433), as *Chironomus flavicingula*.

Stictochironomus palliatus (Coquillett, 1902a).—Illinois: Malloch (1915a: 441–442), as *Chironomus palliatus*.

Stictochironomus virgatus (Townes, 1945).—Illinois: Oliver et al. (1990: 54).

Genus *TRIBELOS* Townes, 1945

Tribelos fuscicorne (Malloch, 1915a).—Illinois: Malloch (1915a: 466–467), as *Chironomus fuscicornis*. Grodhaus (1987: 173–179) keyed the Nearctic adults, pupae, and larvae.

Tribelos jucundum (Walker, 1848).—Illinois: Malloch (1915a: 464), as the junior synonym *Chironomus dimorphus* Malloch, 1915a (syn. Townes 1945: 70). *Chironomus*

fusciventris Malloch, 1915a also is a junior synonym (syn. Townes 1945: 70).

Genus *XENOCHIRONOMUS*
Kieffer, 1921a

Xenochironomus xenolabis (Kieffer in Thienemann and Kieffer, 1916).—(NEW STATE RECORD). The geographic range given by Oliver et al.'s (1990: 54) indicates that this species was expected for Illinois. Townes (1945: 92) keyed the adults, and Roback (1962: 238–239) keyed the pupae and larvae. **Material examined:** ILLINOIS: Carroll Co., Elkhorn Creek, 5.0 km SE Milledgeville @ Co.-Rd. 2700E (Sunshine Rd.), 4th PM T23N R7E S31 SE, 41.9374 N 89.7280 W, 18 May 2004, R. E. DeWalt, RED-2004-055, CTAP#014901S, det. R. E. DeWalt Aug. 2005, INHS Insect Collection 76191 [2 larvae] (INHS); Kankakee Co., Kankakee River at IL-17, 41.1213N 87.8767W, 19 September 1996, R. E. DeWalt, det. R. E. DeWalt Dec. 2002, INHS Insect Collection 9675 [2 larvae] (INHS); Knox Co., Haw Creek, 6.0 km WSW Maquon, 0.3 km S Co-Rd. 550N, 4th PM T9N R2E S2, 40.7913N 90.2339W, 29 April 2004, R. E. DeWalt, RED-2004-040, CTAP #057401S, det. R. E. DeWalt Aug. 2005, INHS Insect Collection 76240 [3 larvae] (INHS).

Genus *ZAVRELIELLA* Kieffer, 1920

Zavreliella marmorata (Wulp, 1859).—Illinois: Malloch (1915a: 427), as *Chironomus varipennis*. This Holarctic species was previously known in the Nearctic as *Chironomus* or *Lauterborniella varipennis auct.* (*nec* Coquillett, 1902a). Reiss (1990: 89–90) keyed the adults, pupae, and larvae.

Tribe PSEUDOCHIRONOMINI
(1 genus, 4 species)

Genus *PSEUDOCHIRONOMUS*
Malloch, 1915a

Pseudochironomus julia (Curran, 1930).—Illinois: Parkin and Stahl (1981: 122), as the junior synonym *Pseudochironomus aix* Townes, 1945 (syn. Sæther 1977: 62). Sæther (1977: 60–64) keyed some adults, pupae, and larvae.

Pseudochironomus middlekauffi Townes, 1945.—Illinois: Townes (1945: 18).

Pseudochironomus pseudoviridis (Malloch, 1915a).—Illinois: Malloch (1915a: 450–451), as *Chironomus pseudoviridis*.

Pseudochironomus richardsoni Malloch, 1915a.—Illinois: Malloch (1915a: 500–501).

Tribe TANYTARSINI
(4 genera, 16 species)

Genus *MICROPSECTRA*
Kieffer, 1909

Micropsectra nigripilus (Johannsen, 1905).—Illinois: Malloch (1915a: 487), as *Tanytarsus nigripilus*. Oliver and Dillon (1994b) redescribed the species.

Micropsectra polita (Malloch, 1915a).—Illinois: Malloch (1915a: 493–494), as *Tanytarsus politus*. Webb (1981) and Oliver and Dillon (1994b) redescribed the species.

Genus *PARATANYTARSUS*
Thienemann in Bause, 1914

Paratanytarsus dubius (Malloch, 1915a).—Illinois: Malloch (1915a: 496), as *Tanytarsus dubius*. Reiss and Säwedel (1981) keyed the Palearctic adult males and pupae.

Paratanytarsus tenuis (Meigen, 1830).—Illinois: Malloch (1915a: 491), as *Tanytarsus tenuis*.

Genus *RHEOTANYTARSUS*
Thienemann in Bause, 1914

Rheotanytarsus exiguus (Johannsen, 1905).—Illinois: Malloch (1915a: 495–496), as *Tanytarsus exiguus*.

Genus *TANYTARSUS* Wulp, 1874

Tanytarsus acifer Ekrem, Sublette, and Sublette, 2003.—Illinois: Ekrem et al. (2003: 266). Ekrem et al. (2003: 322–326) keyed the adults, pupae, and larvae of several species groups.

Tanytarsus buckleyi Sublette, 1964a.—Illinois: Oliver et al. (1990: 58).

Tanytarsus confusus Malloch, 1915a.—Illinois: Malloch (1915a: 490), as *Tanytarsus confusus*.

Tanytarsus dendyi Sublette, 1964a.—Illinois: Ekrem et al. (2003: 290).

Tanytarsus glabrescens Edwards, 1929.—Illinois: Oliver and Dillon (1994a: 10).

Tanytarsus guerlus (Roback, 1957).—Illinois: Ekrem et al. (2003: 298).

Tanytarsus mendax Kieffer, 1925.—Illinois: Ekrem et al. (2003: 310).

Tanytarsus muticus Johannsen, 1905.—Illinois: Malloch (1915a: 494), as *Tanytarsus muticus*.

Tanytarsus neoflavellus Malloch, 1915a.—Illinois: Malloch (1915a: 489), as *Tanytarsus neoflavellus*.

Tanytarsus pusio (Meigen, 1830).—Illinois: Malloch (1915a: 490–491), as *Tany-*

tarsus pusio. Hauber (1944: 453) tentatively provided a North American record for this species, although Sublette and Sublette (1965) did not include this species in their catalog and Oliver et al. (1990: 59) stated that this species was not found in the Nearctic. Therefore, we are not sure where to refer Malloch's record of this species.

Tanytarsus wirthi Ekrem, Sublette, and Sublette, 2003.—Illinois: Ekrem et al. (2003: 321).

Subfamily DIAMESINAE

(1 genus, 1 species)

Genus *DIAMESA* Meigen in Gistel, 1835

Diamesa sp.—Malloch (1915a: 410–411) reported *Diamesa waltlii* Meigen, 1838 from Illinois, which species has since been treated as a junior synonym of *cinerella* auct., nec Meigen in Gistel, 1835. However, *Diamesa cinerella* Meigen is considered to be a Palearctic species (e.g., Hansen and Cook 1976: 5, 142; Oliver et al. 1990: 16–18). Hansen and Cook (1976: 46–49) keyed the adult males only and indicated (p. 72) that Malloch's (1915a) record probably referred to either their newly described *Diamesa chio-bates* Hansen and Cook, 1976 or *Diamesa heteropus* (Coquillett, 1905). However, this has never been confirmed, to our knowledge. Owing to the lack of keys for immature forms, we simply report the following recently collected material without identifying it to species. **Material examined:** ILLINOIS: Hardin Co., Three Mile Creek, 6.5 km WNW Elizabethtown, 37.4599 -88.3772, 5 April 2005, R. E. DeWalt, RED-2005-022, *Diamesa* sp. det. R. E. DeWalt, 2005, INHS Insect Collection 76742 [1 larva] (INHS); McHenry Co., Richmond, Cowpie Creek @ Keystone Rd, 42.43029N 88.33820W, D-net, 18 July 2019, D. R. Swanson, det. E. E. Bilger 2019, [Project:] ISTHA Macroinvertebrates, INHS Insect Collection 1006001, 1006002 [4 larvae, slide mount (2 per slide)] (INHS); Winnebago Co., Rockford, Aldeen Park at lodge, Keith Creek, 3rd Prin. Mer., T44N R2E S20, 42.2756N 89.0210W, 13 June 1998, Terri Dowel, CTAP/RiverWatch Comparison Rock River Partnership RW # R0112302, Composite 1 of 2, *Diamesa* sp. det. R. E. DeWalt, Jan. 1999, INHS Insect Collection 921361 [7 larvae] (INHS); *idem*, Composite 2 of 2, INHS Insect Collection 921362 [17 larvae] (INHS).

Subfamily ORTHOCLADIINAE
(24 genera, 47 species)

Genus *ACRICOTOPUS* Kieffer, 1921b

Acricotopus nitidellus (Malloch, 1915a).—Illinois: Malloch (1915a: 515–516), as *Trichocladus nitidellus*.

Genus *BRILLIA* Kieffer, 1913c

Brillia flavifrons (Johannsen, 1905).—**(NEW STATE RECORD)**. The geographic range given by Oliver et al.'s (1990: 21) indicates that this species was expected for Illinois. Oliver & Roussel (1983: 261–262) keyed the adults, pupae, and larvae. **Material examined:** ILLINOIS: Lee Co., Fivemile Branch, 2.5 km NW Harmon, 41.7369 -89.5743, 3 June 2005, R. E. DeWalt, RED-2005-063, *Brillia* sp. det. R. E. DeWalt, 2005, *Brillia flavifrons* det. E. E. Bilger 2019, INHS Insect Collection 76843 [3 larvae] (INHS); McHenry Co., Richmond, N. Br. Nippersink R. @ N. Br. Nippersink Conservation Area, 42.48657N, 88.32229W, 18 July 2019, D. R. Swanson, *Brillia flavifrons* det. E. E. Bilger 2019, [Project:] ISTHA Macroinvertebrates, INHS Insect Collection 1500721 [1 larva, vial] (INHS).

Genus *BRYOPHAENOCLADIUS*

Thienemann, 1934

Bryophaenocladus flavoscutellatus (Malloch, 1915a).—Illinois: Malloch (1915a: 523–524), as *Orthocladus flavoscutellatus*.

Bryophaenocladus pleuralis (Malloch, 1915a).—Illinois: Malloch (1915a: 527–528), as *Dactylocladius pleuralis*.

Bryophaenocladus subparallelus (Malloch, 1915a).—Illinois: Malloch (1915a: 522), as *Orthocladus subparallelus*.

Genus *CAMPTOCLADIUS* Wulp, 1874

Camptocladus stercorarius (De Geer, 1776).—Illinois: Malloch (1915a: 509–510), as *Camptocladus byssinus*. Ashe and Cranston (1990: 163) synonymized *Tipula byssina* Schrank, 1803 with De Geer's species. This genus is currently monotypic.

Genus *CARDIOCLADIUS* Kieffer, 1912

Cardiocladius fulvus (Johannsen, 1908).—Illinois: Malloch (1915a: 412), as *Thalassomyia fulva*.

Cardiocladius obscurus (Johannsen, 1903).—Illinois: Malloch (1915a: 411–412), as *Thalassomyia obscura*.

Genus *CHASMATONOTUS* Loew, 1864

Chasmatonotus atripes Rempel, 1937.—Illinois: Sublette and Sublette (1965: 159). Rempel (1937: 251, 253) keyed the adults.

Chasmatonotus bimaculatus Osten Sacken, 1877.—Illinois: Malloch (1915a: 499).

Genus *CORYNONEURA* Winnertz, 1846

Corynoneura celeripes Winnertz, 1852.—Illinois: Malloch (1915a: 413). Epler (2001: 7.45) indicated that this species name

has been “grossly misused” and that the Nearctic *Corynoneura* are greatly in need of taxonomic revision. Boesel and Winner (1980: 506–507) keyed the adults, and Fu & Sæther (2012: 51–53) keyed the adults, pupae, and larvae.

Genus *CRICOTOPUS* Wulp, 1874

Subgenera *CRICOTOPUS* Wulp, 1874;

ISOCLADIUS Kieffer, 1909;

and *PARATRICHOCLADIUS*

Santos Abreu, 1918

Cricotopus (Cricotopus) bicinctus (Meigen, 1818).—Illinois: Malloch (1915a: 505). Hirvenoja (1973: 136–138) keyed the adults, pupae, and larvae of the genus.

Cricotopus (Cricotopus) infuscatus (Malloch, 1915a).—Illinois: Malloch (1915a: 517), as *Trichocladus infuscatus*.

Cricotopus (Cricotopus) politus (Coquillett, 1902a).—Illinois: Malloch (1915a: 516–517), as *Trichocladus politus*.

Cricotopus (Cricotopus) slossonae Malloch, 1915a.—Illinois: Malloch (1915a: 506–507).

Cricotopus (Isocladius) flavibasis (Malloch, 1915a).—Illinois: Malloch (1915a: 502–503).

Cricotopus (Isocladius) sylvestris (Fabricius, 1794).—Illinois: Malloch (1915a: 505–506).

Cricotopus (Isocladius) tricinctus (Meigen, 1818).—Illinois: Brigham et al. (1985: 9A-17).

Cricotopus (Isocladius) trifasciatus (Meigen in Panzer, 1810).—Illinois: Malloch (1915a: 503–504).

Cricotopus (Paratrichocladus) nitidus (Malloch, 1915a).—Illinois: Malloch (1915a: 515), as *Trichocladus nitidus*. Cranston and Krosch (2015) supported the subordination of *Paratrichocladus* under *Cricotopus* with molecular evidence.

Genus *EPOICOCCLADIUS*

Zavrel in Šulc and Zavrel, 1924

Epoicocladus flavens (Malloch, 1915a).—Illinois: Malloch (1915a: 511), as *Camptocladus flavens*. Jacobsen (1992: 154) keyed the larvae.

Genus *EUKIEFFERIELLA*

Thienemann, 1926

Eukiefferiella brevinervis (Malloch, 1915a).—Illinois: Malloch (1915a: 526–527), as *Dactylocladius brevinervis*. Lehmann (1972: 353–357) keyed the adult males and pupae, and Bode (1983) keyed the larval species groups.

Genus *HETEROTRISOCLADIUS*

Spärck, 1923

Heterotrissocladius aequalis (Johannsen, 1934).—Illinois: Johannsen (1934: 348–349). Sæther (1975: 5–10) keyed the adults, pupae, and larvae.

Heterotrissocladius changi Sæther, 1975.—Illinois: Sæther (1975: 47–51).

Genus *HYDROBAENUS* Fries, 1830

Hydrobaenus nivoriundus (Johannsen, 1905).—Illinois: Sæther (1976: 138–144), as *Hydrobaenus johannseni*. Sæther (1976) treated this species as *Hydrobaenus johannseni* (Sublette, 1967), with *Orthocladus domus* Sublette, 1966 as a junior synonym, despite the latter having priority over the former. This is not *Orthocladus nivoriundus* Malloch, 1915a (*nec* Fitch, 1847) (see Johannsen 1934: 348, Sublette 1967: 504, Ashe and O'Connor 2012), and we have been unable to place that record. Sæther (1976: 70–79) keyed the adults, pupae, and larvae.

Hydrobaenus pilipes (Malloch, 1915a).—Illinois: Malloch (1915a: 522–523), as *Orthocladus pilipes*.

Genus *LOPESCLADIUS* Oliveira, 1967Subgenus *LOPESCLADIUS*
Oliveira, 1967

Lopescladius (Lopescladius) verruculosus Sæther, 1983.—Illinois: Sæther (1983: 289). Sæther (1983: 286–287) keyed the adult males and pupae.

Genus *MESOSMITTIA* Brundin, 1956

Mesosmittia prolixa Sæther, 1985a.—Illinois: Oliver et al. (1990: 29). Sæther (1985a: 40) keyed the adult males.

Genus *METRIOCNEMUS* Wulp, 1874

Metriocnemus knabi Coquillett, 1904.—Illinois: Sublette and Sublette (1965: 161). Colloquially called the pitcher plant midge, the larvae of this species restrict their development to the fluids of the northern pitcher plant, *Sarracenia purpurea* L. (Epler 2001), a state-endangered plant that is naturally found only in a few northeastern counties in Illinois. Sæther (1995: 38–41) keyed some of the adults.

Genus *NANOCLADIUS* Kieffer, 1913aSubgenus *NANOCLADIUS*
Kieffer, 1913a

Nanocladus (Nanocladus) anderseni Sæther, 1977.—Illinois: Oliver et al. (1990: 30). Sæther (1977: 6–11) keyed the adults, pupae, and larvae.

Nanocladus (Nanocladus) distinctus (Malloch, 1915a).—Illinois: Malloch (1915a:

518–519), as *Trichocladus distinctus* and *T. d. var. basalis*.

Nanocladus (Nanocladus) mallochi Sublette, 1970.—Illinois: Malloch (1915a: 519), as *Orthocladus distinctus* var. *bicolor*. Sublette (1970: 70) erected a new name for *Nanocladus bicolor* Malloch, 1915a, *nec* Zetterstedt, 1838.

Genus *ORTHOCLADIUS* Wulp, 1874Subgenus *ORTHOCLADIUS* Wulp, 1874

Orthocladus (Orthocladus) clarkei Soptonis, 1977.—Illinois: Soptonis (1977: 37–41). Soptonis (1977: 20–23) keyed the Nearctic adults, pupae, and larvae.

Orthocladus (Orthocladus) mallochi Kieffer, 1919b.—Illinois: Malloch (1915a: 524), as *Orthocladus lacteipennis* Malloch, 1915a (*nec* Johannsen, 1908).

ORTHOCLADIUS incerti subgeneris

Orthocladus albidohalteralis Malloch, 1915a.—Illinois: Malloch (1915a: 528), as *Dactylocladius albidohalteralis*. Ashe and O'Connor (2012) listed this species as a *nomen dubium*.

Orthocladus bifasciatus Malloch, 1918.—Illinois: Malloch (1918: 42). Ashe and O'Connor (2012) listed this species as a *nomen dubium*.

Genus *PARAKIEFFERIELLA*

Thienemann, 1936

Parakiefferiella subaterrima (Malloch, 1915a).—Illinois: Malloch (1915a: 512), as *Camptocladus subaterrimus*.

Genus *PARAMETRIOCNEMUS*

Goetghebuer, 1932

Parametriocnemus lundbeckii (Johannsen, 1905).—Illinois: Malloch (1915a: 498), as *Metriocnemus lundbecki*. Sæther (1969: 115) redescribed the species.

Genus *PARAPHAENOCLADIUS*Thienemann in Spärck and
Thienemann, 1924

Paraphaenocladus exagitans exagitans (Johannsen, 1905).—Illinois: Malloch (1915a: 498–499), as the junior synonym *Metriocnemus brachyneura* Malloch, 1915a (syn. Johannsen 1934: 350). Sæther and Wang (1995) keyed the adults and pupae of the genus.

Genus *PSECTROCLADIUS*

Kieffer, 1906a

Subgenera *ALLOPSECTROCLADIUS*Wülker, 1956; and *PSECTROCLADIUS*

Kieffer, 1906a

Psectrocladius (*Allopsectrocladius*) *flavus* (Johannsen, 1905).—Illinois: Oliver et al. (1990: 35).

Psectrocladius (*Psectrocladius*) *vernalis* (Malloch, 1915a).—Illinois: Malloch (1915a: 520–521), as *Orthocladius* (*Psectrocladius*) *vernalis*.

Genus *RHEOCRICOTOPUS*

Thienemann and Harnisch, 1932

Subgenus *RHEOCRICOTOPUS*

Thienemann and Harnisch, 1932

Rheocricotopus (*Rheocricotopus*) *efusus* (Walker, 1856).—Illinois: Malloch (1915a: 517–518), as the junior synonym *Orthocladius* (*Trichocladius*) *striatus* Malloch, 1915a (syn. Sæther 1985b: 103). Sæther (1985b: 69–72) keyed the adult males, pupae, and larvae.

Genus *SMITTIA* Holmgren, 1869

Smittia aterrima (Meigen, 1818).—Illinois: Malloch (1915a: 510), as *Camptocladius aterrimus*.

Smittia lasiophthalma (Malloch, 1915a).—Illinois: Malloch (1915a: 509), as *Camptocladius lasiophthalmus*.

Smittia lasiops (Malloch, 1915a).—Illinois: Malloch (1915a: 508), as *Camptocladius lasiops*. Webb (1982) redescribed the adult and described the larva and pupa.

Genus *THIENEMANNIELLA*

Kieffer, 1911c

Thienemanniella similis (Malloch, 1915a).—Illinois: Malloch (1915a: 413–414), as *Corynoneura similis*. Hestenes and Sæther (2000: 104–106) keyed the Nearctic adults, pupae, and larvae.

Thienemanniella xena (Roback, 1957).—Illinois: Oliver et al. (1990: 39).

Subfamily PRODIAMESINAE

(3 genera, 3 species)

Genus *MONODIAMESA* Kieffer, 1922

Monodiamesa bathyphila Kieffer, 1918c.—Illinois: Oliver et al. (1990: 19).

Genus *ODONTOMESA* Pagast, 1947

Odontomesa fulva (Kieffer, 1919c).—Illinois: Oliver et al. (1990: 19).

Genus *PRODIAMESA* Kieffer, 1906b

Prodiamesa olivacea (Meigen, 1818).—(NEW STATE RECORD). Oliver et al. (1990: 20) characterized the range as “Widespread N[earctic]”; thus, the species was expected for Illinois. *Tanypus occidentalis* (Coquillett, 1902a) is a junior synonym (syn. Johannsen 1952: 13). **Material examined:** ILLINOIS: McHenry Co., Johnsburg, Dutch Creek near McCullom Lake Rd, 42.36938N 88.28109W, D-net, 17 July 2019, D. R. Swanson, det. E. E. Bilger 2019, [Project:] ISTHA Macroinvertebrates, INHS Insect Collection 1500722 [1 larva, vial] (INHS); Richmond, Cowpie Creek @ Keystone Rd, 42.43029N 88.33820W, D-net, 18 July 2019, D. R. Swanson, det. E. E. Bilger 2019, [Project:] ISTHA Macroinvertebrates, INHS Insect Collection 1006003 [1 larva, slide mount] (INHS).

Subfamily TANYPODINAE

(16 genera, 33 species)

Tribe CLINOTANYPODINI

(2 genera, 5 species)

Genus *CLINOTANYPUS* Kieffer, 1913d

Clinotanypus pinguis (Loew, 1861b).—Illinois: Malloch (1915a: 391–392), as the junior synonym *Procladius thoracicus* (Loew, 1866) (syn. Roback 1971: 17). Roback (1971: 16) keyed the adults.

Genus *COELOTANYPUS*

Kieffer, 1913d

Coelotanypus atus Roback, 1971.—Illinois: Parkin and Stahl (1981: 122). Roback (1971: 28) keyed the adults of the genus.

Coelotanypus concinnus (Coquillett, 1895).—Illinois: Malloch (1915a: 394–395), as *Procladius concinnus*.

Coelotanypus scapularis (Loew, 1866).—Illinois: Malloch (1915a: 393), as *Procladius scapularis*.

Coelotanypus tricolor (Loew, 1861b).—Illinois: Malloch (1915a: 396–397).

Tribe MACROPELOPIINI

(1 genus, 1 species)

Genus *PSECTROTANYPUS*

Kieffer, 1909

Psectrotanypus dyari (Coquillett, 1902b).—Illinois: Malloch (1915a: 379–380), as *Tanypus dyari*. Roback (1971: 86–87) keyed the adults of the genus.

Tribe NATARSIINI

(1 genus, 1 species)

Genus *NATARSIA* Fittkau, 1962

Natarsia baltimoreus (Macquart, 1855).—Illinois: Malloch (1915a: 367–368),

as *Tanypus hirtipennis* Malloch, 1915a (*nec* Loew, 1866) (syn. Roback 1971: 109). Roback (1971: 86–87) keyed the adults of the genus.

Tribe PENTANEURINI
(10 genera, 19 species)

Genus *ABLABESMYIA* Johannsen, 1905

Subgenera *ABLABESMYIA* Johannsen, 1905; *ASAYIA* Roback, 1985; and *KARELIA* Roback, 1971

Ablabesmyia (Ablabesmyia) johannseni (Roback, 1959).—Illinois: Roback (1959: 131), as *Pentaneura (Ablabesmyia) johannseni*. Roback (1971: 356–357) keyed the adult males of the genus.

Ablabesmyia (Ablabesmyia) mallochi (Walley, 1925).—Illinois: Roback (1971: 365–367).

Ablabesmyia (Ablabesmyia) monilis (Linnaeus, 1758).—Illinois: Johannsen (1905: 142–144).

Ablabesmyia (Asayia) annulata (Say, 1823).—Illinois: Roback (1971: 378–379), as *Ablabesmyia (Ablabesmyia) annulata*.

Ablabesmyia (Karelia) illinoensis (Malloch, 1915a).—Illinois: Malloch (1915a: 376–377), as *Tanypus illinoensis*.

Ablabesmyia (Karelia) peleensis (Walley, 1926b).—Illinois: Brigham et al. (1985: 9A-17).

Genus *CONCHAPELOPIA* Fittkau, 1957

Subgenus *CONCHAPELOPIA*
Fittkau, 1957

Conchapelopia (Conchapelopia) rurika (Roback, 1957).—Illinois: Malloch (1915a: 369), as *Tanypus melanops* Malloch, 1915a, in part (*nec* Meigen, 1818) (syn. Roback 1971: 248). See also *Thienemannimyia senata*. Roback (1971: 244–245) keyed the adult males of the genus.

Conchapelopia (Conchapelopia) telema Roback, 1971. —Illinois: Roback (1971: 247–248).

Genus *GUTTIPELOPIA* Fittkau, 1962

Guttipelopia guttipennis (Wulp, 1861).—Illinois: Roback (1971: 257–258). Roback (1971: 257) keyed the adult males of the genus.

Genus *LABRUNDINIA* Fittkau, 1962

Labrundinia pilosella (Loew, 1866).—Illinois: Malloch (1915a: 372–373), as *Tanypus pilosellus*. Silva et al. (2014: 6–10) keyed the adults, pupae, and larvae.

Genus *LARSIA* Fittkau, 1962

Larsia decolorata (Malloch, 1915a).—Illinois: Malloch (1915a: 370–371), as *Tanypus decoloratus*. Roback (1971: 259–260) keyed the adult males of the genus.

Larsia marginella (Malloch, 1915a).—Illinois: Malloch (1915a: 374–375), as *Tanypus marginellus*.

Genus *MONOPELOPIA* Fittkau, 1962

Monopelopia gesta (Roback, 1971).—Illinois: Roback (1971: 270–271), as *Cantopelopia gesta*. Cranston and Epler (2013) transferred this species into the present genus. Roback (1971: 280) keyed the adult males of the genus.

Genus *PENTANEURA* Philippi, 1865

Pentaneura inconspicua (Malloch, 1915a).—Illinois: Malloch (1915a: 371–372), as *Tanypus inconspicuus*. Roback (1971: 269) keyed the adult males of the genus.

Pentaneura inyoensis Sublette, 1964b. —Illinois: Roback (1971: 269).

Genus *RHEOPELOPIA* Fittkau, 1962

Rheopelopia paramaculipennis (Roback, 1971).—Illinois: Malloch (1915a: 381), as *Tanypus johnsoni* Malloch, 1915a (*nec* Coquillett, 1901a) (syn. Roback 1971: 243).

Genus *THIENEMANNIMYIA*
Fittkau, 1957

Subgenera *HAYESOMYIA* Murray and Fittkau, 1985; and *THIENEMANNIMYIA* Fittkau, 1957

Thienemannimyia (Hayesomyia) senata (Walley, 1925).—Illinois: Malloch (1915a: 369), as *Tanypus melanops* Malloch, 1915a, in part (*nec* Meigen, 1818) (syn. Roback 1971: 239). See also *Conchapelopia rurika*.

Thienemannimyia (Thienemannimyia) norena (Roback, 1957) var. *quadrata* Roback, 1971. —Illinois: Roback (1971: 242). Roback (1971: 237, 239) keyed the adult males of the genus.

Genus *ZAVRELIMYIA* Fittkau, 1962

Subgenus *ZAVRELIMYIA* Fittkau, 1962

Zavrelimyia (Zavrelimyia) sinuosa (Coquillett, 1905).—Illinois: Malloch (1915a: 378–379), as *Tanypus carneus*. See also Malloch (1915b: 317). In the Nearctic, this species has often been treated under *Tanypus carneus auct. (nec* Fabricius, 1805). Roback (1971: 264) keyed the adult males of the genus.

Tribe PROCLADIINI
(1 genus, 4 species)

Genus *PROCLADIUS* Skuse, 1889

Subgenera *HOLOTANYPUS* Roback, 1982;
and *PSILOTANYPUS* Kieffer, 1906c

Procladius (Holotanypus) culiciformis (Linnaeus, 1767).—Illinois: Malloch (1915a: 387–388), as the junior synonym *Protenthes claripennis* Malloch, 1915a (syn. Roback 1971: 175). Roback (1971: 150–152) keyed the adult males of the genus.

Procladius (Holotanypus) sublettei Roback, 1971.—Illinois: Malloch (1915a: 385–386), as *Protenthes culiciformis* Malloch, 1915a (*nec* Linnaeus, 1767) (syn. Roback 1971: 191).

Procladius (Psilotanypus) bellus (Loew, 1866).—Illinois: Malloch (1915a: 388–389), as *Protenthes bellus*.

Procladius (Psilotanypus) riparius (Malloch, 1915a).—Illinois: Malloch (1915a: 389–390), as *Protenthes riparius*.

Tribe TANYPODINI
(1 genus, 3 species)

Genus *TANYPUS* Meigen, 1803

Subgenera *APELOPIA* Roback, 1971;
and *TANYPUS* Meigen, 1803

Tanypus (Apelopia) neopunctipennis Sublette, 1964b.—Illinois: Malloch (1915a: 383–384), as *Protenthes punctipennis* Malloch, 1915a (*nec* Meigen, 1818) (syn. Sublette 1964b: 118). Roback (1971: 54–55) keyed the adults of the genus.

Tanypus (Tanypus) punctipennis Meigen, 1818.—Illinois: Roback (1971: 64–68).

Tanypus (Tanypus) stellatus Coquillett, 1902a.—Illinois: Malloch (1915a: 383), as *Protenthes stellatus*.

Discussion

As mentioned, the updated list yields an approximate 407% increase in genera and 46% increase in species for the state of Illinois. The great increase in the number of genera can be partially accounted for by the phenomenon of taxonomic inflation (e.g., Isaac et al. 2004, Padial and de la Riva 2006). The species increase is largely accounted for in species named or described after 1915, which includes 62 species on the present list. This seems an initial discrepancy, given an increase of only 57 species between Malloch's (1915a) list and the present study; however, 11 of the species described by Malloch from Illinois have been synonymized.

Even with this update, the component of known chironomid fauna in Illinois is

indisputably underrepresented. In perusing Oliver et al.'s (1990) catalog, an additional 156 species and 35 genera could be characterized as “expected” for Illinois, being known from states either both north and south or both west and east or widespread in the eastern United States. Were each of these species confirmed, this would nearly double (approx. 86% increase) the number of species known from the state. This notably excludes some taxa that are (1) known from Lake Michigan and could easily occur in the northeastern part of the state or (2) known from localities in other Midwestern states with analogous habitat present in Illinois. Also excluded were approximately 60 novel taxa collected in Illinois and referenced in reports compiled by the Illinois Environmental Protection Agency (e.g., IEPA 2006). Overlapping in part with the “expected” set of species mentioned above, these IEPA records were excluded from this treatment, as we were unable to access the specimens to verify identities. And even with a conservative estimate, the total for Illinois would still fall markedly behind the number of species known from other Great Lakes states: Michigan: 305 species (+ additional 247 expected) (Bright 2020); Minnesota: 327 species (Ferrington, pers. comm. Dec. 2020); Ohio: 510 species (Bolton 2012); Wisconsin: 252 species (Egan and Ferrington 2019). Thus, further collection and study of non-biting midges in Illinois will undoubtedly lead to new discovery and a better understanding of the fauna of the state.

Acknowledgments

We thank Thomas McElrath (INHS) for providing access to specimens in the Illinois Natural History Survey Collection under his care. We are grateful to Jodi Vandermyde and Anna Belyaeva of the Illinois Environmental Protection Agency (IEPA) for providing sundry IEPA reports and for correspondence concerning taxa and data therein. This manuscript greatly benefited from the expertise and comments of the late Leonard C. Ferrington, Jr., and we are inspired by his legacy toward a much greater appreciation for the midges of the Great Lakes Region. This project received support from the Illinois State Toll Highway Authority. We also thank three anonymous reviewers for their helpful comments which improved the manuscript.

Literature Cited

Armitage, P., P. S. Cranston, and L. C. V. Pinder. 1995. The Chironomidae. The Biology and Ecology of Non-Biting Midges. Chapman & Hall, Andover. 572 pp.

- Ashe, P. 1983.** A catalogue of chironomid genera and subgenera of the world including synonyms (Diptera: Chironomidae). *Entomologica Scandinavica*, Supplement No. 17: 1–68.
- Ashe, P., and P. S. Cranston. 1990.** Family Chironomidae, pp. 113–355. *In* A. Soós, and L. Papp (eds.), *Catalogue of Palaearctic Diptera. Vol. 2: Psychodidae–Chironomidae*. Akadémiai Kiadó, Budapest. 499 pp.
- Ashe, P., and J. P. O’Connor. 2012.** A World Catalogue of Chironomidae (Diptera). Part 2. Orthoclaadiinae. Irish Biogeographical Society & National Museum of Ireland, Dublin. xvi + 968 pp.
- Bause, E. 1914.** Die Metamorphose der Gattung *Tanytarsus* und einiger verwandter Tendipedidenarten. Ein Beitrag zur Systematik der Tendipediden, pp. 1–128. *In* Archiv für Hydrobiologie, Supplement-Band II. Vortarbeiten für eine Monographie der Chironomiden-Metamorphose. E. Schweizerbart’sche Verlagsbuchhandlung, Stuttgart. 850 pp.
- Beck, E. C., and W. M. Beck, Jr. 1969.** Chironomidae (Diptera of Florida III. The *Harnischia* complex (Chironominae). *Bulletin of the Florida State Museum, Biological Sciences* 13: 277–313.
- Beck, W. M., Jr., and E. C. Beck. 1964.** New Chironomidae from Florida (Diptera). *The Florida Entomologist* 47(3): 201–207.
- Bentley, T. 2010.** “*Paratendipes albimanus* [forum post].” BugGuide.net, Iowa State University, Department of Entomology, Ames. Available from <https://bugguide.net/node/view/394447> <accessed 25 August 2020>.
- Bode, R. W. 1983.** Larvae of North American *Eukiefferiella* and *Tvetenia* (Diptera: Chironomidae). *New York State Museum Bulletin* No. 452. 40 pp.
- Boesel, M. W. 1985.** A brief review of the genus *Polypedilum* in Ohio, with keys to known stages of species occurring in northeastern United States (Diptera, Chironomidae). *The Ohio Journal of Science* 85(5): 245–262.
- Boesel, M. W., and R. W. Winner. 1980.** Corynoneurinae of northeastern United States, with a key to adults and observations on their occurrence in Ohio (Diptera: Chironomidae). *Journal of the Kansas Entomological Society* 53(3): 501–508.
- Bolton, M. J. 2012.** Ohio EPA Supplemental Keys to the Larval Chironomidae (Diptera) of Ohio and Ohio Chironomidae Checklist. Ohio Environmental Protection Agency, Columbus. 111 pp.
- Borkent, A. 1984.** The systematics and phylogeny of the *Stenochironomus* complex (*Xestochironomus*, *Harrisius*, and *Stenochironomus*) (Diptera: Chironomidae). *The Memoirs of the Entomological Society of Canada* 116, Supplement 128: 1–269.
- Brigham, A. R., L. M. Page, J. D. Unzicker, M. J. Wetzel, W. U. Brigham, D. W. Webb, and L. Suloway. 1985.** Chapter 9: Aquatic Macroinvertebrates, Section A: Aquatic Macroinvertebrates (exclusive of mosquitoes). Illinois Natural History Survey, Section of Faunistic Surveys and Insect Identification Technical Report 1985(6): 1–27. [unpublished report].
- Bright, E. 2020.** “Chironomidae Newman, 1834: 379–Non-biting midges”. *Aquatic Insects of Michigan*. Available from http://www.aquaticinsects.org/sp/Diptera/sp_dom_chir.html <accessed 26 August 2020>. [page created 1 December 2002, last updated: 10 April 2020].
- Brundin, L. 1956.** Zur Systematik der Orthoclaadiinae (Dipt. Chironomidae). Report of the Institute of Freshwater Research, Drottningholm 37: 5–185.
- Coquillett, D. W. 1895.** Descriptions of new genera and species, pp. 307–319. *In* C. W. Johnson, *Diptera of Florida*. Proceedings of the Academy of Natural Sciences of Philadelphia 47: 303–340.
- Coquillett, D. W. 1900.** Papers from the Harriman Alaska Expedition. IX. Entomological results (3): Diptera. *Proceedings of the Washington Academy of Sciences* 2: 389–464.
- Coquillett, D. W. 1901a.** New Diptera in the U.S. National Museum. *Proceedings of the United States National Museum* 23(1225): 593–618.
- Coquillett, D. W. 1901b.** Three new species of Diptera. *Entomological News* 12: 16–18.
- Coquillett, D. W. 1902a.** New Diptera from North America. *Proceedings of the United States National Museum* 25(1280): 83–126. [date of publication for Coquillett’s paper is 12 Sept. 1902, despite date of publication for Vol. 25 being 1903].
- Coquillett, D. W. 1902b.** Three new species of nematocerous Diptera. *Entomological News* 13: 84–85.
- Coquillett, D. W. 1904.** Several new Diptera from North America. *The Canadian Entomologist* 36(1): 10–12.
- Coquillett, D. W. 1905.** New nematocerous Diptera from North America. *Journal of the New York Entomological Society* 13(2): 56–69.
- Cranston, P. S., and J. H. Epler. 2013.** 5. The larvae of Tanytopodinae (Diptera: Chironomidae) of the Holarctic region—keys and diagnoses, pp. 39–136. *In* T. Andersen, P. S. Cranston, and J. H. Epler (eds.), *The larvae of Chironomidae (Diptera) of the Holarctic region—keys and diagnoses*. *Insect Systematics & Evolution*, Supplement 66: 1–571.

- Cranston, P. S., and M. N. Krosch. 2015.** DNA sequences and austral taxa indicate generic synonymy of *Paratrichocladius* Santos-Abreu with *Cricotopus* Wulp (Diptera: Chironomidae). *Systematic Entomology* 40(4): 719–732.
- Curran, C. H. 1930.** Report on the Diptera collected at the station for the study of insects, Harriman Interstate Park, N. Y. *Bulletin of the American Museum of Natural History* 61: 21–115.
- Curtis, R. 2009.** “*Hyporhygma quadripunctatum* [forum post].” BugGuide.net, Iowa State University, Department of Entomology, Ames. Available from <https://bugguide.net/node/view/275672/bgimage> <accessed 25 August 2020>.
- De Geer, C. 1776.** Mémoires pour servir à l’histoire des insectes. Tome Sixième. Pierre Hesselberg, Stockholm. 522 pp.
- Dendy, J. S., and J. E. Sublette. 1959.** The Chironomidae (=Tendipedidae: Diptera) of Alabama with descriptions of six new species. *Annals of the Entomological Society of America* 52(5): 506–519.
- Dmitriev, D. 2015.** Illinois Natural History Survey Insect Collection. Illinois Natural History Survey. Occurrence dataset. Available from GBIF.org (accessed on 18 December 2020). <https://doi.org/10.15468/eol0pe>
- Dorris, T. C. 1958.** Limnology of the Middle Mississippi River and adjacent waters. Lakes on the leveed floodplain. *The American Midland Naturalist* 59(1): 82–110.
- Edwards, F. W. 1929.** British non-biting midges (Diptera, Chironomidae). *Transactions of the Royal Entomological Society of London* 77(2): 279–430.
- Egan, A. T., and L. C. Ferrington, Jr. 2019.** Chironomidae of the Upper Saint Croix River, Wisconsin. *Transactions of the American Entomological Society* 145(3): 353–384. Available from <https://doi.org/10.3157/061.145.0307>
- Ekrem, T., M. F. Sublette, and J. E. Sublette. 2003.** North American *Tanytarsus* I. Descriptions and keys to species in the *eminulus*, *gregarius*, *lugens* and *mendax* species groups (Diptera: Chironomidae). *Annals of the Entomological Society of America* 96(3): 265–328.
- Epler, J. H. 1987.** Revision of the Nearctic *Dicrotendipes* Kieffer, 1913 (Diptera: Chironomidae). *Evolutionary Monographs* 9: 1–102.
- Epler, J. H. 2001.** Identification manual for the larval Chironomidae (Diptera) of North and South Carolina. Special Publication SJ2001-SP13. North Carolina Department of Environment and Natural Resources, Raleigh. 526 pp.
- Epler, J. H., T. Ekrem, and P. S. Cranston. 2013.** 10. The larvae of Chironominae (Diptera: Chironomidae) of the Holarctic region—keys and diagnoses, pp. 387–556. In T. Andersen, P. S. Cranston, and J. H. Epler (eds.), *The larvae of Chironomidae (Diptera) of the Holarctic region—keys and diagnoses*. *Insect Systematics & Evolution, Supplement* 66: 1–571.
- Evenhuis, N.L. 1997.** *Litteratura Taxonomica Dipteroorum (1758–1930)* being a selected list of the books and prints of Diptera taxonomy from the beginning of Linnaean nomenclature to the end of the year 1930; containing information on the biographies, bibliographies, types, collections, and patronymic genera of the authors listed in this work; including detailed information on publication dates, original and subsequent editions, and other ancillary data concerning the publications listed herein. 2 vols. Backhuys Publishers, Leiden. x + 871 pp.
- Fabricius, J. C. 1794.** *Entomologia systematica emendata et aucta secundum classes, ordines, genera, species adjectis synonymis, locis, observationibus, descriptionibus*. C. G. Proft Fil. Et Soc., Hafniae. 472 pp.
- Fabricius, J. C. 1805.** *Systema antliatorum secundum ordines, genera, species, adiectis synonymis, locis, observationibus, descriptionibus*. Carolus Reichard, Brunsvigae. 372 + 30 pp.
- Faila, A. J., A. A. Vasquez, M. Fujimoto, and J. L. Ram. 2015.** The ecological, economic and public health impacts of nuisance chironomids and their potential as aquatic invaders. *Aquatic Invasions* 10(1): 1–15. Available from <https://doi.org/10.3391/ai.2015.10.1.01>
- Ferrington, L. C., Jr. 1992.** Habitat and sediment preferences of *Axarus festivus* larvae. *Netherlands Journal of Aquatic Ecology* 26: 347–354.
- Ferrington, L. C., Jr., and M. B. Berg. 2019.** Chapter 27 Chironomidae, pp. 1119–1274. In R. W. Merritt, K. W. Cummins, and M. B. Berg (eds.), *An Introduction to the Aquatic Insects of North America*, Fifth Edition. Kendall Hunt Publishing Company, Dubuque. 1480 pp.
- Fitch, A. 1847.** Winter insects of eastern New York. *American Journal of Agriculture and Science* 5: 274–284.
- Fittkau, E. 1957.** *Thienemannimyia* und *Conchapelopia*, zwei neue Gattungen innerhalb der *Ablabesmyia-Costalis*-Gruppe (Diptera, Chironomidae). *Chironomidenstudien* VII. *Archiv für Hydrobiologie* 53(3): 313–322.
- Fittkau, E. J. 1962.** Die Tanypodinae (Diptera: Chironomidae). (Die Tribus Anatópyniini, Macropelopiini und Pentaneurini). *Abhandlungen zur Larvalsystematik der Insekten* 6: 1–453.
- Freeman, P., and P. S. Cranston. 1980.** Family Chironomidae, pp. 175–202. In R. W.

- Crosskey (ed.), Catalogue of the Diptera of the Afrotropical Region. British Museum (Natural History), London. 1,437 pp.
- Fries, B. F. 1830.** Beskrifning öfver et nytt slägte, *Hydrobaenus*, hörande till Tipulariae. Kongliga Vetenskaps-Akademiens Handlingar för 1829: 176–187.
- Fu, Y., and O. A. Sæther. 2012.** *Corynoneura* Winnertz and *Thienemanniella* Kieffer from the Nearctic region (Diptera: Chironomidae: Orthocladiinae). *Zootaxa* 3536: 1–61.
- Furey, P. C., R. L. Lowe, M. E. Power, and A. M. Campbell-Craven. 2012.** Midges, *Cladophora*, and epiphytes: shifting interactions through succession. *Freshwater Science* 31(1): 93–107.
- Gistel, J. 1835.** Neue Arten von Dipteren aus der Umgegend von München. *Faunus, Zeitschrift für Zoologie und vergleichende Anatomie* 2: 66–72.
- Goetghebuer, M. 1922.** Nouveaux matériaux pour l'étude de la faune des Chironomides de Belgique. *Annales de Biologie Lacustre* 11(1): 38–62.
- Goetghebuer, M. 1923.** Nouveaux matériaux pour l'étude de la faune des Chironomides de Belgique. *Annales de Biologie Lacustre* 12: 103–120.
- Goetghebuer, M. 1932.** Faune de France 23. Diptères Chironomidae IV (Orthocladiinae, Corynoneurinae, Clunioninae, Diamesinae). Paul Lechevalier, Paris. 204 pp.
- Goetghebuer, M. 1948.** Note synonymique. *Bulletin et Annales de la Société Entomologique de Belgique* 84: 15.
- Grodhaus, G. 1987.** *Endochironomus* Kieffer, *Tribelos* Townes, *Synendotendipes*, n. gen., and *Endotribelos*, n. gen. (Diptera: Chironomidae) of the Nearctic Region. *Journal of the Kansas Entomological Society* 60(2): 167–247.
- Hansen, D. C., and E. F. Cook. 1976.** The systematics and morphology of the Nearctic species of *Diamesa* Meigen, 1835 (Diptera: Chironomidae). *Memoirs of the American Entomological Society* 30: 1–203.
- Harnisch, O. 1923.** Metamorphose und System der Gattung *Cryptochironomus* K. s. l., Ein Beitrag zum Problem der Differenzierung der Entwicklungsstände der Chironomiden. *Zoologisches Jahrbücher, Abteilung für Systematik, Geographie und Biologie der Tiere* 47(1–3): 271–308. [date of publication for Heft 1–3 is 3 November 1923].
- Harris, M. A., B. C. Scudder, F. A. Fitzpatrick, and T. L. Arnold. 2005.** Physical, chemical, and biological responses to urbanization in the Fox and Des Plaines River Basins of northeastern Illinois and southeastern Wisconsin. U.S. Geological Survey, Scientific Investigations Report 2005–5218. 72 pp.
- Hauber, U. A. 1944.** Life histories and ecology of Iowa midges (Tendipedidae). I. The genus *Tanytarsus*. *Proceedings of the Iowa Academy of Science* 51: 451–461.
- Hayford, B. L. 1998.** A systematic revision of *Paratendipes* (Diptera: Chironomidae) with special emphasis on the evolution of thermophily. Unpublished Ph.D. dissertation, University of Kansas. 548 pp.
- Hestenes, T. C., and O. A. Sæther. 2000.** Three new Nearctic *Thienemanniella* Kieffer species with a review of the Nearctic species, pp. 103–127. *In* O. Hoffrichter (ed.), *Late 20th Century Research on Chironomidae: an Anthology from the 13th International Symposium on Chironomidae*. Shaker Verlag, Aachen. 661 pp.
- Heyn, M. W. 1992.** A review of the systematic position of the North American species of the genus *Glyptotendipes*. *Netherlands Journal of Aquatic Ecology* 26(2–4): 129–137.
- Hirabayashi, K., and R. S. Wootton. 1998.** Organic matter processing by chironomid larva (Diptera: Chironomidae). *Hydrobiologia* 382: 151–159.
- Hirvenoja, M. 1973.** Revision der Gattung *Cricotopus* van der Wulp und ihrer Verwandten (Diptera, Chironomidae). *Annales Zoologici Fennici* 10(1): 1–363. [English translation in Simpson et al. 1982].
- Holmgren, A. E. 1869.** Bidrag till kändedomen om beeren Eilands och Spetsbergens Insekt-Fauna. *Kongliga Svenska Vetenskaps-Akademiens Handlingar* 8(5): 1–56.
- Hupfer, M., S. Jordan, C. Herzog, C. Eberling, R. Ladwig, M. Rothe, and J. Lewandowski. 2019.** Chironomid larvae enhance phosphorus burial in lake sediments: insights from long-term and short-term experiments. *Science of the Total Environment* 663: 254–264.
- IEPA [Illinois Environmental Protection Agency]. 2006.** Rock River Basin Assessment, An Overview of the Rock River Watershed in Illinois. State of Illinois Environmental Protection Agency, Bureau of Water, Springfield. 113 pp. + app. [Non-peer-reviewed technical report].
- Isaac, N. J. B., J. Mallet, and G. M. Mace. 2004.** Taxonomic inflation: its influence on macroecology and conservation. *TRENDS in Ecology and Evolution* 19(9): 464–469.
- Jackson, G. A. 1977.** Nearctic and Palaearctic *Paracladopolma* Harnisch and *Saetheria* n.gen. (Diptera: Chironomidae). *Bulletin of the Fisheries Research Board of Canada* 34: 1321–1359.

- Jacobsen, R. E. 1992.** Descriptions of the larvae of four Nearctic species of *Epoicocladius* (Diptera: Chironomidae) with a redescription of *Epoicocladius ephemerae* (Kieffer). Netherlands Journal of Aquatic Ecology 26(2–4): 145–155.
- Johannsen, O. A. 1903.** Part 6. Aquatic nematoceros Diptera, pp. 328–441. In J. G. Needham, A. D. MacGillivray, O. A. Johannsen, and K. C. Davis (eds.), Aquatic insects in New York State. New York State Museum Bulletin 68 (Entomology 18). University of the State of New York, Albany. 517 pp.
- Johannsen, O. A. 1905.** Aquatic nematoceros Diptera II. Chironomidae, pp. 76–315. In J. G. Needham, K. J. Morton, and O. A. Johannsen (eds.), May flies and midges of New York. Third report on aquatic insects. New York State Museum Bulletin 86 (Entomology 23). New York State Education Department, Albany. 352 pp.
- Johannsen, O. A. 1907.** Appendix. Some new species of Kansas Chironomidae, pp. 109–112. In E. S. Tucker, Some results of desultory collecting of insects in Kansas and Colorado. Kansas University Science Bulletin 4(2): 51–112.
- Johannsen, O. A. 1908.** New North American Chironomidae, pp. 264–285. In E. P. Felt (ed.), 23rd report of the state entomologist on injurious and other insects of the State of New York, 1907. New York State Museum Bulletin 124. University of the State of New York, Albany. 541 pp.
- Johannsen, O. A. 1926.** Notes on the synonymy of some New York State Chironomidae. Journal of the New York Entomological Society 34(3): 273–277.
- Johannsen, O. A. 1934.** New species of North American Ceratopogonidae and Chironomidae. Journal of the New York Entomological Society 42(3): 343–352.
- Johannsen, O. A. 1937.** Aquatic Diptera. Part IV. Chironomidae: Subfamily Chironominae. Memoirs of the Cornell University Agriculture Experiment Station 210: 3–56.
- Johannsen, O. A. 1952.** Family Tendipedidae (=Chironomidae) except Tendipedini, pp. 3–26. In Guide to the Insects of Connecticut Part VI: The Diptera or True Flies of Connecticut. Fifth Fascicle: Midges and Gnats. State of Connecticut Geological and Natural History Survey Bulletin No. 80. 255 p., 34 pl.
- Kieffer, J. J. 1906a.** Description d'un genre nouveau et de quelques espèces nouvelles Diptères de l'Amérique du Sud. Annales de la Société scientifique de Bruxelles 30(3–4): 349–358.
- Kieffer, J. J. 1906b.** 42. Diptera. Fam. Chironomidae, pp. 1–78. In P. Wytsman (ed.), Genera Insectorum. V. Verteneuil & L. Desmet, Bruxelles.
- Kieffer, J. J. 1906c.** Description de nouveaux Diptères nématocères d'Europe. Annales de la Société scientifique de Bruxelles 30(3–4): 311–348.
- Kieffer, J. J. 1909.** Diagnoses de nouveaux Chironomides d'Allemagne. Bulletin de la Société d'Histoire Naturelle de Metz 26: 37–56.
- Kieffer, J. J. 1911a.** Description d'un Chironomide d'Amérique format un genre nouveau. Bulletin de la Société d'Histoire Naturelle de Metz 27: 103–105.
- Kieffer, J. J. 1911b.** Nouvelles descriptions de Chironomides obtenus d'éclosion. Bulletin de la Société d'Histoire Naturelle de Metz 27: 1–60.
- Kieffer, J. J. 1911c.** Nouveaux Tendipédides du groupe *Orthocladus* [Dipt.]. (2me note). Bulletin de la Société entomologique de France 1911(9): 199–202.
- Kieffer, J. J. 1912.** Nouveaux Chironomides (Tendipedidae) de Ceylan. Spolia Zeylanica 8: 1–24.
- Kieffer, J. J. 1913a.** Insectes Diptères. I. Chironomidae et Cecidomyiidae. Résultats scientifiques de Voyage de Ch. Alluaud et R. Jeannel en Afrique Orientale (1911–1912). Albert Schulz, Paris. 43 pp.
- Kieffer, J. J. 1913b.** *Dasyhelea halophila* n. sp., eine neue halophile Zuckmücke, pp. 255–256. In J. J. Kieffer, and C. Douwe, Zur Flora und Fauna der Strandtümpel von Rovigno (in Istrien). Biologisches Centralblatt 33(5): 254–258.
- Kieffer, J. J. 1913c.** Nouveaux Chironomides (Tendipédides) d'Allemagne. Bulletin de la Société d'Histoire Naturelle de Metz 28: 7–35.
- Kieffer, J. J. 1913d.** Nouvelle étude sur les Chironomides de l'Indian Museum de Calcutta. Records of the Indian Museum 9: 119–197.
- Kieffer, J. J. 1915.** Neue Chironomiden aus Mitteleuropa. Brotéria, Revista Luso-Brazileira, Série Zoológica 13: 65–87.
- Kieffer, J. J. 1918a.** Beschreibung neuer, auf Lazaretschiffen des östlichen Kriegsschauplatzes und bei Ignalino in Litauen von Dr. W. Horn gessammelter Chironomiden, mit Uebersichtstabellen einer Gruppen von paläarktischen Arten (Dipt.). Entomologische Mittheilungen 7(1–3): 35–53.
- Kieffer, J. J. 1918b.** Chironomides d'Afrique et d'Asie conservés au Museum National Hongrois de Budapest. Annales Historico-Naturales Musei Nationalis Hungarici 16: 31–139.
- Kieffer, J. J. 1918c.** Beschreibung neuer, auf Lazaretschiffen des östlichen Kriegsschauplatzes und bei Ignalino in Litauen von Dr.

- W. Horn gessammelter Chironomiden, mit Uebersichtstabellen einer Gruppen von paläarktischen Arten (Dipt.). Entomologische Mitteilungen 7(4–6): 94–110.
- Kieffer, J. J. 1919a.** Chironomiden der nördlichen Polarregion, pp. 40–48. In J. J. Kieffer, and A. Thienemann. Chironomiden, gesammelt von Dr. A. Koch (Münster i. W.) auf den Lofoten, der Bäreninsel und Spitzbergen (Dipt.). Entomologische Mitteilungen 8(1–3): 38–48.
- Kieffer, J. J. 1919b.** Observations sur les Chironomides [Dipt.] décrits par J.R. Malloch. Bulletin de la Société entomologique de France 1919(10): 191–194.
- Kieffer, J. J. 1919c.** Chironomides d'Europe conservés au Musée National Hongrois de Budapest. Annales Historico-Naturales Musei Nationalis Hungarici 17: 1–160.
- Kieffer, J. J. 1920.** Un nouveau genre de Chironomide [Dipt.]. Bulletin de la Société entomologique de France 1919(18): 333–334.
- Kieffer, J. J. 1921a.** Synopse de la tribu des Chironomariae (Diptères). Annales de la Société scientifique de Bruxelles 40: 269–277.
- Kieffer, J. J. 1921b.** Chironomides nouveaux ou peu connus de la région paléarctique. Bulletin de la Société d'Histoire Naturelle de la Moselle 29: 51–109.
- Kieffer, J. J. 1922.** Diagnose de nouveaux genres et espèces de Chironomidae [Dipt.]. Bulletin de la Société entomologique de France 1921: 287–289.
- Kieffer, J. J. 1925.** Nouveaux représentants du groupe *Tanytarsus* (Diptères Chironomides) de l'Europe centrale. Annales de la Société scientifique de Bruxelles 44: 218–230.
- Kruseman, Jr., G. 1933.** Tendipedidae Neerlandicae. Pars I. Genus *Tendipes* cum generibus finitimis. Tijdschrift voor Entomologie 76: 119–216.
- Lehmann, J. 1972.** Revision der europäischen Arten (Puppen ♂♂ und Imagines ♂♂) der Gattung *Eukiefferiella* Thienemann. Beiträge zur Entomologie 22: 347–405.
- Lenz, F. 1921.** Chironomidenpuppen und -larven. Bestimmungstabellen. Deutsche Entomologische Zeitschrift 1921(4): 148–162.
- Lenz, F. 1941a.** Die Metamorphose der Chironomidengattung *Cryptochironomus*. Zoologischer Anzeiger 133(1–2): 29–41.
- Lenz, F. 1941b.** Die Jugendstadien der Sectio Chironomariae (Tendipedini) connectentes (Subf. Chironominae = Tendipedinae). Zusammenfassung und Revision. Archiv für Hydrobiologie 38(1): 1–69.
- Linnaeus, C. 1758.** Systema Naturae per regna tria naturae, secundum classes, ordines, genera, species cum characteribus, differentiis, synonymis, locis. Tomus I. Editio decima, reformata. Laurentii Salvii, Homiae. 823 pp.
- Linnaeus, C. 1767.** Systema Naturae per regna tria naturae, secundum classes, ordines, genera, species cum characteribus, differentiis, synonymis, locis. Tomus I. Pars. II. Editio duodecima, reformata. Laurentii Salvii, Homiae. 1327 pp.
- Lipina, N. N. 1939.** Novye formy molodykh stadia Chironomidae podopitnykh ozer sapropelovoi stansii v Zaluchie [= New forms of the young stages of Chironomidae found in the lakes of the Zaluchiye Sapropel Station]. Trudy Laboratoriyi Genezysa Sapropelia Otlozh Akademiya Nauk SSSR 1: 89–107. [in Russian, English summary].
- Loew, H. 1861a.** Diptera aliquot in insula Cuba collecta. Wiener Entomologische Monatschrift 5(2): 33–43.
- Loew, H. 1861b.** Diptera Americae septentrionalis indigena. Centuria prima. Berliner Entomologische Zeitschrift 5: 307–359.
- Loew, H. 1864.** Diptera Americae septentrionalis indigena. Centuria quinta. Berliner Entomologische Zeitschrift 8: 49–104.
- Loew, H. 1866.** Diptera Americae septentrionalis indigena. Centuria septima. Berliner Entomologische Zeitschrift 10: 1–54.
- Lundbeck, W. 1898.** Diptera groenlandica. Videnskabelige Meddelelser fra den naturhistoriske Forening i Kjøbenhavn 1898: 236–314.
- Macquart, P.-J.-M. 1834.** Histoire Naturelle des Insectes. Diptères. Tome Premier. Librairie Encyclopédique de Roret, Paris. 578 pp.
- Macquart, [P.-J.-M.]. 1855.** Diptères exotiques nouveaux ou peu connus. Fifth Supplément. Mémoires de la Société des Sciences, de l'Agriculture et des Arts de Lille 1: 25–156.
- Malloch, J. R. 1915a.** The Chironomidae, or midges, of Illinois, with particular reference to the species occurring in the Illinois River. Bulletin of the Illinois State Laboratory of Natural History 10(6): 275–543.
- Malloch, J. R. 1915b.** Some additional records of Chironomidae for Illinois and notes on other Illinois Diptera. Bulletin of the Illinois State Laboratory of Natural History 11(4): 305–363.
- Malloch, J. R. 1918.** A new species of *Orthocladus* (Chironomidae, Diptera). Bulletin of the Brooklyn Entomological Society 13(2): 42.
- Martin, J., M. G. Butler, N. A. Shobanov, and I. I. Kiknadze. 2011.** On the validization of the name *Chironomus* (*Camptochironomus*) *pallidivittatus* sensu Edwards, 1929 and elimination of the name *Chironomus pallidivittatus* Malloch, 1915. Entomological Review 91(9): 1224–1225 [see also Zoologicheskii Zhurnal, 90(10): 1275–1276; in Russian].

- Maschwitz, D. E. 1975.** Revision of the Nearctic species of the subgenus *Polypedilum*, (Chironomidae: Diptera). Ph.D. dissertation, University of Minnesota. 325 pp.
- Maschwitz, D. E., and E. F. Cook. 2000.** Revision of the Nearctic species of the genus *Polypedilum* Kieffer (Diptera: Chironomidae) in the subgenera *P.* (*Polypedilum*) Kieffer and *P.* (*Uresipedilum*) Oyewo and Sæther. Bulletin of the Ohio Biological Survey, New Series 12(3): 1–135.
- Mason, P. G. 1985.** The larvae and pupae of *Stictochironomus marmoratus* and *S. quagga* (Diptera: Chironomidae). The Canadian Entomologist 117(1): 43–48.
- Meigen, J. W. 1803.** Versuch einer neuen Gattungs Einteilung der europäischen zweiflügeligen Insekten, pp. 259–281. In K. Illiger (ed.), Magazin für Insektenkunde. Zweiter Band. Karl Reichard, Braunschweig. 298 pp.
- Meigen, J. W. 1804.** Klassifikation und Beschreibung der europäischen zweiflügeligen Insekten. (Diptera Linn.). Erster Band, erste Abtheilung. Karl Reichard, Braunschweig. 152 pp.
- Meigen, J. W. 1818.** Systematische Beschreibung der bekannten europäischen zweiflügeligen Insekten. Erster Theil. Friedrich Wilhelm Forstmann, Aachen. 332 pp.
- Meigen, J. W. 1830.** Systematische Beschreibung der bekannten europäischen zweiflügeligen Insekten. Sechster Theil. Schulzische Buchhandlung, Hamm. 401 pp.
- Meigen, J. W. 1838.** Systematische Beschreibung der bekannten europäischen zweiflügeligen Insekten. Siebenter Theil oder Supplementband. Schulzische Buchhandlung, Hamm. 434 pp.
- Mitchell, E. G. 1908.** Descriptions of nine new species of gnats. Journal of the New York Entomological Society 16(1): 7–14.
- Morris, D. L., and M. P. Brooker. 1980.** An assessment of the importance of the Chironomidae (Diptera) in biological surveillance, pp. 195–202. In D. A. Murray (ed.), Chironomidae, Ecology Systematics Cytology and Physiology. Pergamon Press, Oxford. 374 pp. Available from <https://doi.org/10.1016/C2013-0-03374-9>
- Murray, D. A., and E. J. Fittkau. 1985.** *Hayesomyia* a new genus of Tanypodinae from the Holarctic (Diptera, Chironomidae). Spixiana, Supplement 11: 195–207.
- Nicacio, G., and L. Juen. 2015.** Chironomids as indicators in freshwater ecosystems: an assessment of the literature. Insect Conservation and Diversity 8(5): 393–403. Available from <https://doi.org/10.1111/icad.12123>
- Oliveira, S. J. de. 1967.** Novo gênero de Chironomidae da Amazônia (Insecta, Diptera). Atas do Simpósio sobre a Biota Amazônica 5 (Zoologia): 417–419.
- Oliver, D. R. 1981.** Chapter 29, Chironomidae, pp. 423–458. In J. F. McAlpine, B. V. Peterson, G. E. Shewell, H. J. Teskey, J. R. Vockeroth, and D. M. Wood (eds.), Manual of Nearctic Diptera, Volume 1. Research Branch, Agriculture Canada, Monograph No. 27, Ottawa, Canada. 674 pp.
- Oliver, D. R., and M. E. Dillon. 1994a.** Corrections and additions to “A catalog of Nearctic Chironomidae.” Proceedings of the Entomological Society of Washington 96(1): 8–10.
- Oliver, D. R., and M. E. Dillon. 1994b.** Systematics of some species of *Microssetra* (Diptera: Chironomidae) living in low-order streams in southern Ontario, Canada. The Canadian Entomologist 126(2): 199–217.
- Oliver, D. R., M. E. Dillon, and P. S. Cranston. 1990.** A catalog of Nearctic Chironomidae. Agriculture Canada, Ottawa. 89 pp.
- Oliver, D. R., and M. E. Roussel. 1983.** Redescription of *Brillia* Kieffer (Diptera: Chironomidae) with descriptions of Nearctic species. The Canadian Entomologist 115(3): 257–279.
- Osten Sacken, C. R. 1877.** Western Diptera: descriptions of new genera and species of Diptera from the region west of the Mississippi and especially from California. Bulletin of the United States Geological and Geographical Survey of the Territories 3(2): 189–354.
- Oyewo, E. A., and O. A. Sæther. 1998.** Revision of Afrotropical *Polypedilum* Kieffer subgenus *Uresipedilum* Sasa et Kikuchi, 1995 (Diptera: Chironomidae), with a review of the subgenus. Annals of Limnology 34(3): 315–362.
- Özkan, N., and S. Akiska. 2017.** A new larval record of *Demicyptochironomus* Lenz, 1941 (Diptera, Chironomidae) for the Turkish fauna. Turkish Journal of Zoology 41 181–184. Available from <https://doi.org/10.3906/zoo-1511-38>
- Padial, J. M., and I. de la Riva. 2006.** Taxonomic inflation and the stability of species lists: the perils of ostrich’s behavior. Systematic Biology 55(5): 859–867.
- Pagast, F. 1931.** Chironomiden aus der Bodenfauna des Usma-Sees in Kurland. Folia Zoologica et Hydrobiologica 3: 199–248.
- Pagast, F. 1947.** Systematik und Verbreitung der um die Gattung *Diamesa* gruppierten Chironomiden. Archiv für Hydrobiologie 41: 435–596.
- Paloumpis, A. A., and W. C. Starrett. 1960.** An ecological study of benthic organisms in three Illinois River flood plain lakes. The American Midland Naturalist 64(2): 406–435.
- Panzer, G. W. F. 1810.** Faunae insectorum germanicae initiae oder Deutschlands Insekten.

- Heft 109. Felssecker, Nürnberg. 24 pl. [date from Evenhuis (1997)].
- Parkin, R. B., and J. B. Stahl. 1981.** Chironomidae (Diptera) of Baldwin Lake, Illinois, a cooling reservoir. *Hydrobiologia* 76(1–2): 119–128.
- Philippi, R. A. 1865.** Aufzählung der chilenischen Dipteren. Verhandlungen der Kaiserlich-Königlichen Zoologisch-Botanischen Gesellschaft in Wien 15: 595–782.
- Pinder, L. C. V. 1986.** Biology of freshwater Chironomidae. *Annual Review of Entomology* 31: 1–23.
- Pinder, L. C. V., and F. Reiss. 1983.** Chapter 10. The larvae of Chironominae (Diptera: Chironomidae) of the Holarctic regions—keys and diagnoses, pp. 293–435. *In* T. Wiederholm (ed.), Chironomidae of the Holarctic Region. Keys and diagnoses. Part 1. Larvae. *Entomologica Scandinavica*, Supplement 19: 1–457.
- Porinchu, D. F., and G. M. MacDonald. 2003.** The use and application of freshwater midges (Chironomidae: Insecta: Diptera) in geographical research. *Progress in Physical Geography: Earth and Environment* 27(3): 378–422.
- Post, S. L. 1991.** Appendix one: Native Illinois species and related bibliography, pp. 463–475. *In* L. M. Page, and M. R. Jeffords (eds.), Our living heritage: the biological resources of Illinois. *Illinois Natural History Survey Bulletin* 34(4): 1–477.
- Puchalski, M., and W. Gilka. 2017.** *Cladotanytarsus* Kieffer (Diptera: Chironomidae): several distinctive species reviewed on the basis of records from Canada and USA. *Zootaxa* 4242(2): 344–358. Available from <https://doi.org/10.11646/zootaxa.4242.2.7>
- Raunio, J., J. Heino, and L. Paasivirta. 2011.** Non-biting midges in biodiversity conservation and environmental assessment: findings from boreal freshwater ecosystems. *Ecological Indicators* 11: 1057–1064. Available from <https://doi.org/10.1016/j.ecolind.2010.12.002>
- Reiss, F. 1982.** *Hyporhygma* n. gen. und *Stelochomyia* n. gen. aus Nordamerika (Diptera, Chironomidae). *Spixiana* 5(3): 289–302.
- Reiss, F. 1988.** *Irmakia*, ein neues Subgenus von *Demicryptochironomus* Lenz, 1941, mit der Beschreibung von vier neuen Arten. *Spixiana* 11(1): 1–12.
- Reiss, F. 1990.** Revision der Gattung *Zavreliella* Kieffer, 190 (Diptera, Chironomidae). *Spixiana* 13(1): 83–115.
- Reiss, F., and L. Säwedal. 1981.** Keyes to males and pupae of the Palaearctic (excl. Japan) *Paratanytarsus* Thienemann & Bause, 1913, n. comb., with descriptions of three new species (Diptera: Chironomidae). *Entomologica Scandinavica*, Supplement 15: 73–104.
- Rempel, J. G. 1937.** Notes on the genus *Chasmatonotus* with descriptions of three new species (Diptera: Chironomidae). *The Canadian Entomologist* 69(11): 250–255.
- Roback, S. S. 1957.** The immature tendipedids of the Philadelphia area (Diptera: Tendipedidae). *Monographs of the Academy of Natural Sciences of Philadelphia* 9: 1–152.
- Roback, S. S. 1959.** The subgenus *Ablabesmyia* of *Pentaneura* (Diptera; Tendipedidae; Pelopiinae). *Transactions of the American Entomological Society* 85(2): 113–135.
- Roback, S. S. 1962.** The genus *Xenochironomus* (Diptera: Tendipedidae) Kieffer, taxonomy and immature stages. *Transactions of the American Entomological Society* 88(4): 235–245.
- Roback, S. S. 1971.** The adults of the subfamily Tanypodinae (= Pelopiinae) in North America (Diptera: Chironomidae). *Monographs of the Academy of Natural Sciences of Philadelphia* 17: 1–410.
- Roback, S. S. 1980.** New name for *Anceus* Roback *nec* *Anceus* Risso. *Entomological News* 91(1): 32.
- Roback, S. S. 1982.** The Tanypodinae (Diptera: Chironomidae) of Australia II. *Proceedings of the Academy of Natural Sciences of Philadelphia* 134: 80–112.
- Roback, S. S. 1985.** The immature chironomids of the eastern United States VI. *Pentaneurini*—Genus *Ablabesmyia*. *Proceedings of the Academy of Natural Sciences of Philadelphia* 137(2): 153–212.
- Rosenberg, D. M., and V. H. Resh. 1993.** Freshwater biomonitoring and benthic macroinvertebrates. Chapman and Hall, New York, NY. 488 pp.
- Ryser, H. M., W. Wülker, and A. Scholl. 1985.** Revision der Gattung *Chironomus* Meigen (Diptera). X. *Lobochironomus* n. subg. (*C. montuosus* n. sp., *C. storai* Goetgh., *C. mendax* Storå). *Revue Suisse de Zoologie* 92(2): 385–404.
- Sæther, O. A. 1969.** Some Nearctic Podonominae, Diamesinae, and Orthoclaadiinae (Diptera: Chironomidae). *Bulletin of the Fisheries Research Board of Canada* 170: 1–154.
- Sæther, O. A. 1971.** Nomenclature and phylogeny of the genus *Harnischia* (Diptera: Chironomidae). *The Canadian Entomologist* 103(3): 347–362.
- Sæther, O. A. 1975.** Nearctic and Palaearctic *Heterotrissocladius* (Diptera: Chironomidae). *Bulletin of the Fisheries Research Board of Canada* 193: 1–67.
- Sæther, O. A. 1976.** Revision of *Hydrobaenus*, *Trissocladius*, *Zalutschia*, *Paratrissocladius*, and some related genera (Diptera: Chirono-

- midae). Bulletin of the Fisheries Research Board of Canada 195: 1–287.
- Sæther, O. A. 1977.** Taxonomic studies on Chironomidae: *Nanocladius*, *Pseudochironomus*, and the *Harnischia* complex. Bulletin of the Fisheries Research Board of Canada 196: 1–143.
- Sæther, O. A. 1979.** Chironomid communities as water quality indicators. *Ecography* 2(2): 65–74. Available from <https://doi.org/10.1111/j.1600-0587.1979.tb00683.x>
- Sæther, O. A. 1983.** Three new species of *Lopescladius* Oliveira, 1967 (syn. “*Cordites*” Brundin, 1966, n. syn.), with a phylogeny of the *Parakiefferiella* group. *Memoirs of the American Entomological Society* 34: 279–298.
- Sæther, O. A. 1985a.** The imagines of *Mesosmittia* Brundin, 1956, with description of seven new species (Diptera, Chironomidae). *Spixiana*, Supplement 11: 37–54.
- Sæther, O. A. 1985b.** A review of the genus *Rheocricotopus* Thienemann & Harnisch, 1932, with the description of three new species. *Spixiana*, Supplement 11: 59–108.
- Sæther, O. A. 1995.** *Metricnemus* van der Wulp: seven new species, revision of species, and new records (Diptera: Chironomidae). *Annals of Limnology* 31(1): 35–64.
- Sæther, O. A. 2009.** *Cryptochironomus* Kieffer from Lake Winnipeg, Canada, with a review of Nearctic species (Diptera: Chironomidae). *Zootaxa* 2208: 1–24.
- Sæther, O. A., and A. Sundal. 1998.** *Cerobregma*, a new subgenus of *Polypedilum* Kieffer, with a tentative phylogeny of subgenera and species groups within *Polypedilum* (Diptera: Chironomidae). *Journal of the Kansas Entomological Society* 71(3): 315–382.
- Sæther, O. A., and X. Wang. 1995.** Revision of the genus *Paraphaenocladus* Thienemann, 1924 of the world (Diptera: Chironomidae, Orthocladiinae). *Entomologica Scandinavica*, Supplement 48: 3–69.
- Santos Abreu, E. 1918.** Ensayo de una monografía de los tendipedidos de las Islas Canarias. *Memorias de la Real Academia de Ciencias y Artes de Barcelona* 14(2): 159–326.
- Say, T. 1823.** Descriptions of dipterous insects of the United States. *Journal of the Academy of Natural Sciences of Philadelphia* 3(1): 9–54.
- Say, T. 1829.** Descriptions of North American dipterous insects. *Journal of the Academy of Natural Sciences of Philadelphia* 6: 149–178.
- Schiner, J. R. 1866.** Diptera. In B. von Wüllerstorff-Urbair, *Reise der österreichischen Fregatte Novara um die Erde in den Jahren 1857, 1858, 1859. Zoologischer Theil. Zweiter Band. I. Abtheilung.* B. Karl Gerold’s Sohn, Wien. 388 pp.
- Schrank, F. von P. 1803.** *Fauna Boica. Durchgedachte Geschichte der in Baiern einheimischen und zahmen Thiere. Dritten und letzten Bandes, erste Abtheilung.* Philipp Krüll, Universitätsbuchhändler, Landshut. 272 pp.
- Shobanov, N. A., I. I. Kiknadze, and M. G. Butler. 1999.** Palearctic and Nearctic *Chironomus* (*Camptochironomus*) *tentans* (Fabricius) are different species (Diptera, Chironomidae). *Entomologica Scandinavica* 30: 311–322.
- Silva, F. L. da, A. A. Fonseca-Gessner, and T. Ekrem. 2014.** A taxonomic revision of genus *Labrundinia* Fittkau, 1962 (Diptera: Chironomidae: Tanypodinae). *Zootaxa* 3769(1): 1–185. Available from <https://doi.org/10.11646/zootaxa.3769.1.1>
- Simpson, K. W., R. W. Bode, and P. Albu. 1982.** Keys for the genus *Cricotopus* adapted from “Revision der Gattung *Cricotopus* van der Wulp und ihrer Verwandten (Diptera, Chironomidae)” by M. Hirvennoja. *Bulletin of the New York State Museum* 450: 1–133.
- Skuse, F. A. A. 1889.** Diptera of Australia. Part VI.—The Chironomidae. *Proceedings of the Linnean Society of New South Wales, Second Series* 4(2): 215–311.
- Soponis, A. R. 1977.** A revision of the Nearctic species of *Orthocladus* (*Orthocladus*) van der Wulp (Diptera: Chironomidae). *Memoirs of the Entomological Society of Canada* 109, Supplement S102: 1–187.
- Soponis, A. R., and K. W. Simpson. 1992.** *Polypedilum digitifer* Townes and *Polypedilum griseopunctatum* (Malloch) (Diptera, Chironomidae): redescription of adult males with a description and separation of the immature stages. *Netherlands Journal of Aquatic Ecology* 26: 203–213.
- Spärck, R. 1923.** Beiträge zur Kenntnis der Chironomidenmetamorphose I–IV. *Entomologische Meddelelser* 14(2–3): 49–109.
- Spärck, R., and A. Thienemann. 1924.** „*Metricnemus*“ *ampullaceus* var. *austriacus*. *Verhandlungen der Internationalen Vereinigung für theoretische und angewandte Limnologie* 2: 222–223.
- Spies, M. 2000.** A contribution to the knowledge of Holarctic *Parachironomus* Lenz (Diptera: Chironomidae), with two new species and a provisional key to Nearctic adult males. *Tijdschrift voor Entomologie* 143(1): 125–143.
- Spies, M., and O. A. Sæther. 2004.** Notes and recommendations on taxonomy and nomenclature of Chironomidae (Diptera). *Zootaxa* 752: 1–90.
- Staeger, C. 1839.** Systematisk fortegnelse over de i Danmark hidtil fundne Diptera. *Naturhistorisk Tidsskrift* 2(6): 549–600.

- Stahl, J. B. 1986.** A six-year study of abundance and voltinism of Chironomidae (Diptera) in an Illinois cooling reservoir. *Hydrobiologia* 134(1): 67–79.
- Sublette, J. E. 1964a.** Chironomidae (Diptera) of Louisiana. I. Systematics and immature stages of some lentic chironomids of west-central Louisiana. *Tulane Studies in Zoology* 11: 109–150.
- Sublette, J. E. 1964b.** Chironomid midges of California. II. Tanypodinae, Podonominae, and Diamesinae. *Proceedings of the United States National Museum* 115(3481): 85–135.
- Sublette, J. E. 1966.** Type specimens of Chironomidae (Diptera) in the U.S. National Museum. *Journal of the Kansas Entomological Society* 39(4): 580–607.
- Sublette, J. E. 1967.** Type specimens of Chironomidae (Diptera) in the Cornell University Collection. *Journal of the Kansas Entomological Society* 40(4): 477–564.
- Sublette, J. E. 1970.** Type specimens of Chironomidae (Diptera) in the Illinois Natural History Survey Collection, Urbana. *Journal of the Kansas Entomological Society* 43(1): 44–95.
- Sublette, J.E., and M. S. Sublette. 1965.** Family Chironomidae (Tendipedidae), pp. 142–181. *In* A. Stone, C. W. Sabrosky, W. W. Wirth, R. H. Foote, and J. R. Coulson (eds.), *A Catalog of the Diptera of America North of Mexico*. Agriculture Handbook No. 267. United States Department of Agriculture, Agricultural Research Service, Washington, D.C. 1,696 pp.
- Sublette, J. S., and M. F. Sublette. 1973.** The morphology of *Glyptotendipes barbipes* (Staeger) (Diptera: Chironomidae). *Studies in Natural Sciences* 1(6): 1–80.
- Šulc, K., and J. Zavrel. 1924.** O epoikických a parazitických larvách Chironomidů. Über epoikische und parasitische Chironomid-Enlarven. *Práce Moravské přírodovědecké společnosti [Acta Societatis Scientiarum Naturalium Moraviae]* 1(9): 353–391.
- Tang, H., Q. Cheng, W. Han, and P. S. Cranston. 2021.** Integrative taxonomy: molecular phylogenetics of *Polypedilum* (*Cerobregma*) and revisited morphology of *Yaethauma* and *Collartomyia* (Diptera: Chironomidae) reveals synonymy and supports new classification. *Zoological Journal of the Linnean Society*. [Early view: zlaa187, <https://doi.org/eres.qnl.qa/10.1093/zoolinlean/zlaa187>].
- Theissinger, K., A. Kästel, V. Elbrecht, J. Makkonen, S. Michiels, S. I. Schmidt, S. Allgeier, F. Leese, and C. A. Brühl. 2018.** Using DNA metabarcoding for assessing chironomid diversity and community change in mosquito controlled temporary wetlands. *Metabarcoding and Metagenomics* 2: e21060. Available from <https://doi.org/10.3897/mbm.2.21060>
- Thienemann, A. 1926.** Hydrobiologische Untersuchungen an den kalten Quellen und Bächen der Halbinsel Jasmund auf Rügen. *Archiv für Hydrobiologie* 17: 221–336.
- Thienemann, A. 1934.** Chironomiden—Metamorphosen. VIII. «*Phaenocladius*». *Encyclopedia Entomologique. Séries B, Mémoires et notes: Diptera: recueil d'études biologiques et systématiques sur les Diptères du globe* 7: 29–46.
- Thienemann, A. 1936.** Alpine Chironomiden. (Ergebnisse von Untersuchungen in der Gegend von Garmisch-Partenkirchen, Oberbayern.) *Archiv für Hydrobiologie* 30: 167–262.
- Thienemann, A., and O. Harnisch. 1932.** Chironomiden-Metamorphosen. IV. Die Gattung *Cricotopus* v.d.W. *Zoologischer Anzeiger* 99(5–6): 135–143.
- Thienemann, A., and J. J. Kieffer. 1916.** Schwedische Chironomiden, pp. 483–554. *In* *Archiv für Hydrobiologie, Supplement-Band II. Vorarbeiten für eine Monographie der Chironomiden-Metamorphose*. E. Schweizerbart'sche Verlagsbuchhandlung, Stuttgart. 850 pp.
- Townes, H. K. 1945.** The Nearctic species of Tendipedini [Diptera, Tendipedidae (= Chironomidae)]. *The American Midland Naturalist* 34(1): 1–206.
- Walker, F. 1848.** List of the specimens of dipterous insects in the collection of the British Museum. Part 1. Printed by order of the Trustees, London. 229 pp.
- Walker, F. 1856.** *Insecta Britannica*. Diptera. Vol. III. Lovell Reeve, London. 352 pp.
- Walley, G. S. 1925.** New Canadian Chironomidae of the genus *Tanypus* (Dipt.). *The Canadian Entomologist* 57(11): 271–278.
- Walley, G. S. 1926a.** Four new Canadian Chironomidae. *The Canadian Entomologist* 58(8): 205–207.
- Walley, G. S. 1926b.** New Canadian Chironomidae. *The Canadian Entomologist* 58(3): 64–65.
- Walther, D. A., M. R. Whiles, M. B. Flinn, and D. W. Butler. 2006.** Assemblage-level estimation of nontanypodine chironomid growth and production in a southern Illinois stream. *Journal of the North American Benthological Society* 25(2): 444–452.
- Webb, D. W. 1981.** The benthic macroinvertebrates from the cooling lake of a coal-fired electric generating station, pp. 358–377. *In* R. W. Larimore, and J. A. Tranquilli (eds.), *The Lake Sangchris study: case history of an Illinois cooling lake*. Illinois Natural History Survey Bulletin 32(4): 1–737.
- Webb, D. W. 1982.** *Smittia lasiops* (Malloch): a redescription of the adults with a description

- of the immature stages (Diptera: Chironomidae). *Proceedings of the Entomological Society of Washington* 84(3): 468–474.
- Winnertz, J. 1846.** Beschreibung einiger neuen Gattungen aus der Ordnung der Zweiflügler. *Entomologische Zeitung* 7(1): 11–20.
- Winnertz, J. 1852.** Dipterologisches. *Entomologische Zeitung* 13(2): 49–58.
- Wülker, W. 1956.** Zur Kenntnis der Gattung *Psectrocladius* Kieff. (Dipt., Chironom.). Individuelle Variabilität, Grenzen und Möglichkeiten der Artentrennung, Ökologie und Verbreitung. *Archiv für Hydrobiologie, Supplement* 24(1): 1–66.
- Wülker, W., J. E. Sublette, and J. Martin. 1991.** *Chironomus utahensis* Malloch and *Chironomus harpi* new species and their karyosystematic relationships to other species in the *decorus*-group of *Chironomus*. *Spixiana* 14(1): 71–94.
- Wulp, F. M. van der. 1859.** Beschrijving van eenige nieuwe of twijfelachtige soorten van Diptera uit de familie der Nemocera. *Tijdschrift voor Entomologie* 2: 159–185.
- Wulp, F. M. van der. 1861.** Over nieuwe soorten van Diptera. *Tijdschrift voor Entomologie* 4: 16–20.
- Wulp, F. M. van der. 1874.** Dipterologische aantekeningen. No. 4. *Tijdschrift voor Entomologie* 17: 109–148.
- Yan, C., H. Tang, and X. Wang. 2005.** *Demicryptochironomus* Lenz from China (Diptera: Chironomidae). *Zootaxa* 910: 1–31.
- Zetterstedt, J. W. 1838.** Sectio Tertia. Diptera. *Dipterologis Scandinaviae*, pp. 477–868. *In* *Insecta Lapponica*. Leopold Voss, Leipzig. 1140 pp.
- Zetterstedt, J. W. 1850.** Diptera Scandinaviae. Tomus Nonus. *Officina Lundbergiana, Lund*. 344 pp. [3367–3710].
- Zullo, S. J., and J. B. Stahl. 1988.** Abundance, distribution and life cycles of midges (Chironomidae: Diptera) in an acid strip-mine lake in southern Illinois. *The American Midland Naturalist* 119(2): 353–365.