

**Atlas
of the
Chironomid Midges
(Class Insecta: Order Diptera: Family Chironomidae)
Recorded at the
Old Woman Creek
National Estuarine Research Reserve
& State Nature Preserve, Ohio**

by

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April 2005

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Acknowledgments

The authors are grateful to Mr. Mike Bolton, Ohio EPA, Division of Surface Water, Ecological Assessment Section, for his critical review and suggestions for improving the scientific accuracy of this atlas. We also appreciate the assistance of Dr. David Klarer, Old Woman Creek National Estuarine Research Reserve, for providing funding for this project and for his critical reviews of drafts. This work was funded under contract to Heidelberg College by the Ohio Department of Natural Resources, Division of Natural Areas and Preserves.

Introduction

Both the formal biologist and the amateur naturalist often encounter lists of animals and plants when they visit nature centers and read published scientific reports. Rarely can they readily access drawings or photographs of each member of the list so that they can distinguish one from the other. The purpose of this atlas is to provide a detailed pictorial record of one group of organisms – the midges, a kind of true fly (Order Diptera) comprising the Family Chironomidae – within the Old Woman Creek coastal wetland system (OWC) along Lake Erie in Ohio.

Invertebrates occur in great abundance in freshwater ecosystems, including Great Lakes wetlands such as the marshes and swamps that make up OWC. A few of those invertebrates, such as freshwater mussels, grass shrimps, and giant water bugs, are readily visible because of their large size. Many freshwater invertebrates, however, are so small that special attention must be given to collecting – and seeing – them. Thus, most groups of invertebrates go unnoticed by casual visitors to aquatic habitats. Larval midges of the Family Chironomidae are no exception. They range in length from less than 1 mm to more than 2 centimeters. Once collected, the ability to distinguish one kind of midge from another requires careful observation of minute structures through a compound microscope at magnifications as high as 400X or even 1000X.

This atlas presents detailed photographs of critical diagnostic features that permit the correct identification of most midge larvae found to date at OWC to the level of genus. Visualization of many of the features requires “clearing” of specimens (making them mostly transparent). Detailed



Adult male midge (chironomid). Scale is in centimeters. Photo: David J. Dariano

processing methods are described in several of the references listed below.

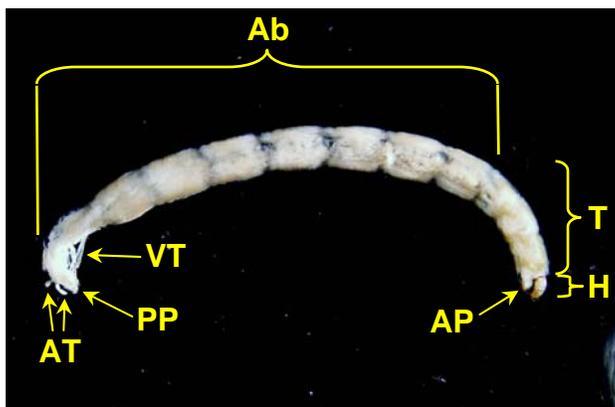
The midges are a very diverse group comprised of thousands of species worldwide. The nonbiting winged adults form highly visible mating swarms and can create a harmless nuisance as they rest in large numbers on objects (and people). Because of their great abundance, both larval and adult midges provide an important food resource for aquatic predators such as fishes, and terrestrial predators ranging from dragonflies to songbirds. Midge larvae are adapted to a variety of different aquatic habitats and ecological conditions; therefore, the kinds of midge larvae found in a stream, lake, or wetland can reveal information about the quality, or “health”, of the ecosystem.

Characteristics of Larval Chironomidae

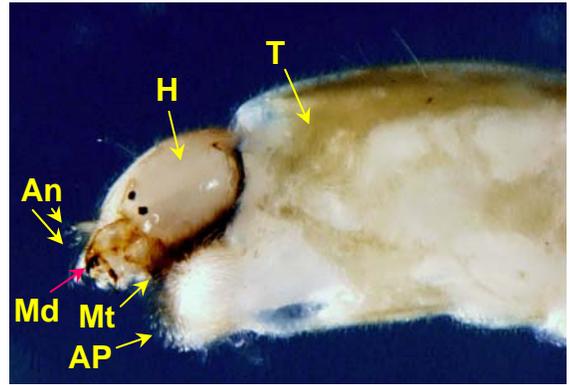
As members of the insect Order Diptera, midges have four life stages: egg, larva, pupa, and adult. In aquatic species, all stages except the adult are aquatic, and the

larval stage is the one most often found in samples. The larva has four intervals, or instars, between hatching from the egg and becoming a pupa, shedding its exoskeleton (molting) at the end of each instar. The largest, fourth instar is the most reliable stage for observing the distinguishing features of the different genera and species. Nevertheless, many times only earlier instars are available in samples for identification.

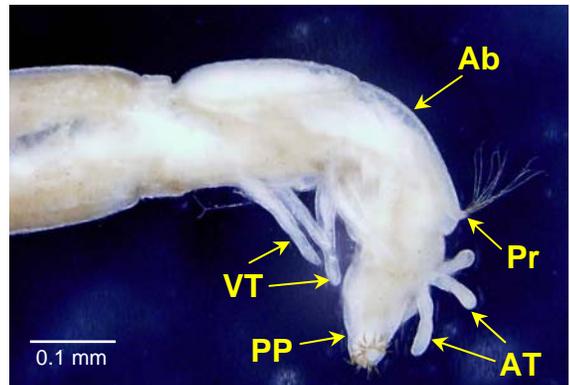
General features of a midge larva are shown in the photographs on this page. The body is divided into three regions: **head (H)**, **thorax (T)** consisting of three segments, and **abdomen (Ab)**. The entire outer covering of the head consists of a hardened (sclerotized) **head capsule** with numerous specialized structures useful for identification. Head structures include, among others, paired **antennae (An)** and **mandibles (Md)**, and a mouth part called the **mentum (Mt)**. Midge larvae lack true legs but do have a pair of **anterior prolegs, or parapods (AP)**, that extend ventrally beneath the head and a pair of **posterior prolegs, or parapods (PP)**, extending from the last abdominal segment. The last segment also typically bears a pair of fleshy **procerci (Pr)** tipped with numerous hair-like setae, and two pairs of **anal tubules (AT)**. The genera *Kiefferulus* and



Chironomid (Chironominae) larva
Length approximately 1.5 centimeters



Anterior end of chironomid larva (*Chironomus* sp.)



Posterior end of chironomid larva (*Chironomus* sp.)
(Specimen from Lake Erie ECC160BP1 May 2004)

Chironomus have one pair or two pairs, respectively, of **ventral tubules (VT)** near the end of the abdomen.

Layout of this Atlas

The following pages are organized alphabetically by subfamily. The authors have identified twenty-one genera of chironomids in three subfamilies (Chironominae, Orthoclaadiinae, and Tanypodinae) in samples collected over the past fifteen years from numerous habitats within the OWC wetland system. The Ohio EPA has reported four more (not included in this atlas). In future editions, we will attempt to incorporate additional subfamilies and genera that appear in Ohio EPA and other collections from OWC.

This publication should not be used as the sole source to identify the genera of larval chironomids of OWC because it is likely that additional genera will be found in new collections. The references cited below should be used to obtain definitive identifications. The species within each genus are not addressed here and the species of some genera cannot be identified.

Each genus of midge larva is illustrated and described on a single page of this atlas. Because the **identifying features** of the Family Chironomidae and the particular subfamily are repeated on each page, the page for each genus can be used independently. Two or more photographs are labeled with arrows that point to diagnostic structures. Most photographs are of specimens collected within OWC, and the exact specimens photographed are recorded at the bottom of the page.

Beneath the descriptive features, each page lists where within OWC the genus has been found (its **habitat**). It is likely that future collections will reveal many of the genera in additional habitats. The general ecology of the genus is briefly summarized, including its **habit** (such as sprawler, tube builder, or burrower), its **functional feeding group** (such as shredder, collector, or predator), and for some genera, special notes about their habitat or water quality requirements.

All information on each page was derived from three or more **references**, which are abbreviated as shown below followed by the page number(s):

E = Epler, J.H. 2001. *Identification manual for the larval Chironomidae (Diptera) of North and South Carolina*. Version 1.0. <http://www.esb.enr.state.nc.us/BAUwww/Chironomid.htm>.

H = Hilsenhoff, W.L. 1992. *Aquatic insects of Wisconsin*. Publication of the Natural History Council, Univ. of Wisconsin-Madison, No. 2. Distributed by Geological & Natural History Survey, Madison, Wisconsin.

C&F = Coffman, W.P., and L.C. Ferrington, Jr. 1996. Chapter 26. Chironomidae, pp. 635-754. In: Merritt, R.W., and K.W. Cummins (Eds.). *An introduction to the aquatic insects of North America*. 3rd Ed. Kendall/Hunt Publ. Co., Dubuque, Iowa.

R = Roback, S. S. 1957. *The immature tendipedids of the Philadelphia area*. Monographs of The Academy of Natural Sciences, No. 9. George W. Carpenter Fund Printing, Philadelphia, Pennsylvania.

S&B = Simpson, K.W., and R.W. Bode. 1980. *Common larvae of Chironomidae (Diptera) from New York State streams and rivers with particular reference to the fauna of artificial substrates*. Bull. No. 439, New York State Museum, Univ. of the State of New York, State Education Dept., Albany, New York.

W = Wiederholm, T. (Ed.). 1983. Chironomidae of the Holarctic region, keys and diagnoses. Part 1 – larvae. *Entomologica scandinavica*. Suppl. 19.

Checklist of Genera of Midge (Chironomidae) Larvae Reported in the OWC Wetland System

Most of the genera of midge larvae listed below have been found by the authors and are illustrated in this atlas. The Ohio Environmental Protection Agency reported several additional genera (indicated with asterisk) in samples collected in August 2001.

Family Chironomidae

Subfamily Chironominae

Chironomus
Cladopelma
Cryptochironomus
**Demeijerea*
Dicrotendipes
Endochironomus
Glyptotendipes
Kiefferulus
Microchironomus
Parachironomus
Paralauterborniella
Paratanytarsus
Polypedilum
Stictochironomus
Tanytarsus
Tribelos

Subfamily Othoclaadiinae

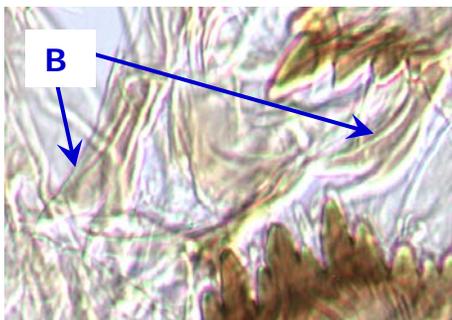
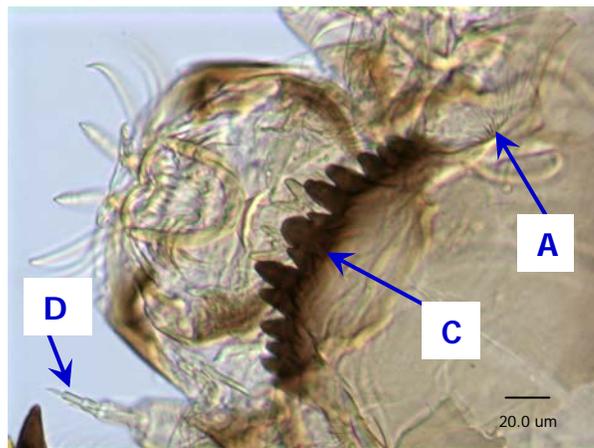
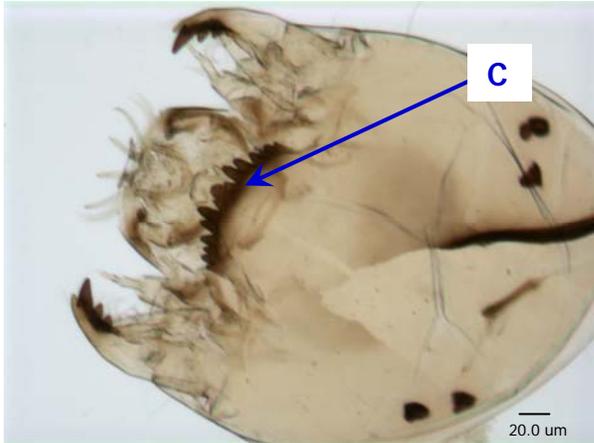
Cricotopus
Hydrobaenus
Paraphaenocladus

Subfamily Tanypodinae

**Ablabesmyia*
**Clinotanypus*
Coelotanypus
**Larsia*
Procladius
Tanypus

Insecta:Diptera (True Flies):Chironomidae:*Chironomus* sp. Chironomid (Midge) Larva

Ventral views of Chironomus head



Features of Family Chironomidae

Thorax without segmented legs

Pair of anterior prolegs on first thoracic segment; pair of posterior prolegs on last abdominal segment *

Head capsule sclerotized (hardened) throughout and fully visible

Mandibles opposed and moving horizontally

Features of Subfamily Chironominae

Ventromental plates well developed with striations throughout (A)

Conspicuous premandibles present (B)

Mentum usually entirely toothed (C)

Features of Genus Chironomus

Median tooth of the mentum trifid; outermost teeth decreasing in size giving a convex appearance (C)

Mentum containing an odd number of teeth (C)

Premandibles bifid (B)

Antenna five-segmented (D)

Pecten epipharyngis with strong teeth in one row (E)

Where Recorded at Old Woman Creek

Within sediment consisting of sand and/or mud, in and on bark of submerged logs, and on miscellaneous aquatic plants including lotus (*Nelumbo lutea*), duckweed (*Lemna* spp.), common reed (*Phragmites communis*), arrowhead (*Sagittaria* sp.), and filamentous algae

General Ecology

Burrowers or tube builders

Functional feeding group: collectors/gatherers or shredders/herbivores

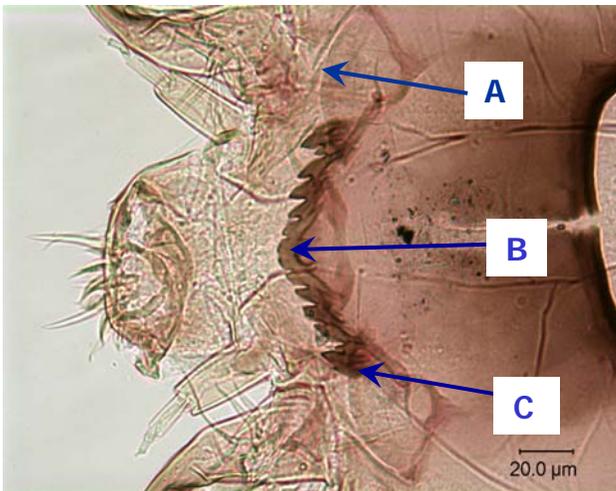
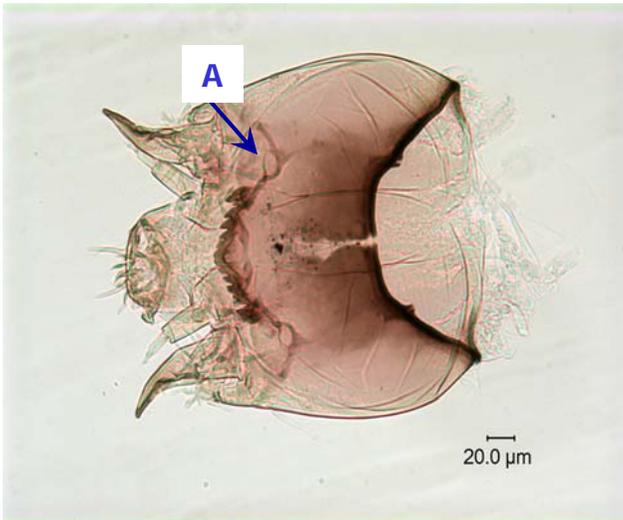
High tolerance of adverse water quality conditions

References: E 8.39; C&F 661-668, 751; S&B 63; H 2, 52; W 304, 357

Photographs: (Upper) Slide Y dipnet 3:3 OWCI 2002. Viewed at 100X. (Upper Center) Viewed at 200X. (Lower Center) Slide H 1:4 OWCI 2002. Viewed at 400X. (Lower) Slide Y 3:3 OWCI 2002. Viewed at 400X.

Insecta: Diptera (True Flies): Chironomidae: *Cladopelma* sp.
Chironomid (Midge) Larva

Ventral views of *Cladopelma* head



Features of Family Chironomidae

- Thorax without segmented legs
- Pair of anterior prolegs on first thoracic segment; pair of posterior prolegs on last abdominal segment
- Head capsule sclerotized (hardened) throughout and fully visible
- Mandibles opposed and moving horizontally

Features of Subfamily Chironominae

- Ventromental plates well developed with striations throughout (A)
- Conspicuous premandibles present (not visible)
- Mentum usually entirely toothed (B)

Features of Genus *Cladopelma*

- Median tooth of mentum medially notched (B)
- Two outermost lateral teeth of mentum distinctly enlarged (C)
- Pecten epipharyngis a simple plate (D)
- Antenna with five segments; fifth segment appearing as seta (E)

Where Recorded at Old Woman Creek

- Within sediment consisting of mud and/or sand in open water, channels, and water lily (*Nymphaea* sp.) beds

General Ecology

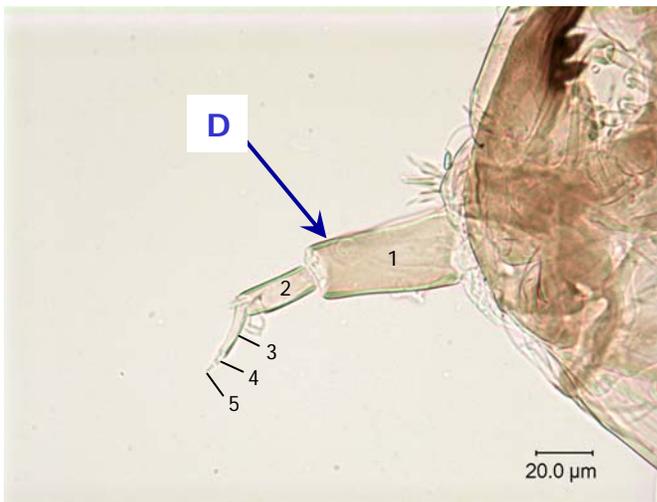
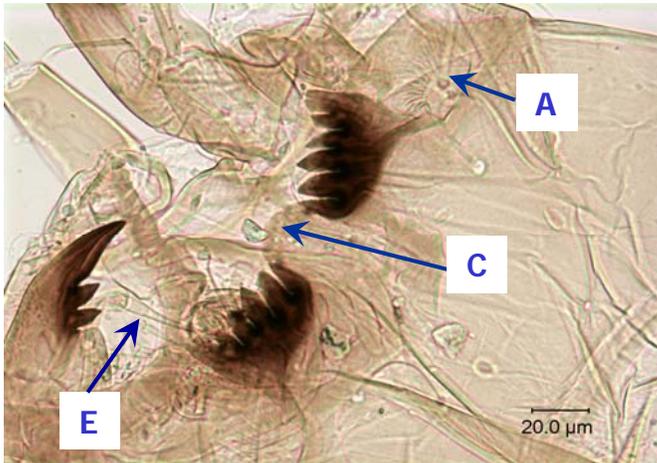
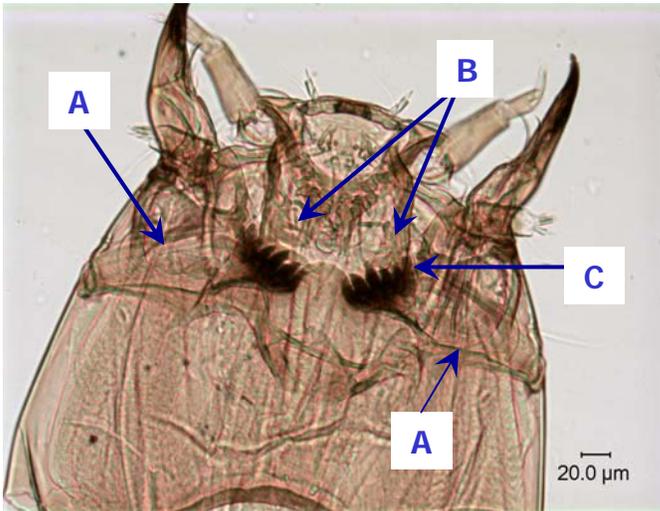
- Burrowers
- Functional feeding group: collectors/gatherers
- Some species tolerant of low oxygen conditions

References: E 8.45; C&F 661-663,751; H 2, 52; W 305, 358

Photographs: (Upper) Slide Z dipnet 2:11 OWCI 2002. Viewed at 100X. (Middle) Slide Z dipnet 2:11 OWCI 2002. Viewed at 200X. (Lower) Slide Dar1 1:4 OWCI 2002. Viewed at 200X.

Insecta: Diptera (True Flies): Chironomidae: *Cryptochironomus* sp. Chironomid (Midge) Larva

Ventral views of *Cryptochironomus* head



Features of Family Chironomidae

- Thorax without segmented legs
- Pair of anterior prolegs on first thoracic segment; pair of posterior prolegs on last abdominal segment
- Head capsule sclerotized (hardened) throughout and fully visible
- Mandibles opposed and moving horizontally

Features of Subfamily Chironominae

- Ventromental plates well developed with striations throughout (A)
- Conspicuous premandibles present (B)
- Mentum usually entirely toothed (C)

Features of Genus *Cryptochironomus*

- Mentum with rounded median tooth flanked by five dark, pointed lateral teeth giving an overall concave appearance (C)
- Wide, laterally tapered ventromental plates (A)
- Antennae five-segmented (D)
- Well developed SI seta (E)

Where Recorded at Old Woman Creek

- Within sediment consisting of sand and/or mud in open water, in water lily (*Nymphaea* sp.) beds, in creek channels, along beds of invasive common reed (*Phragmites communis*), in stands of cattail (*Typha* spp.), and in the lowermost pool of the creek

General Ecology

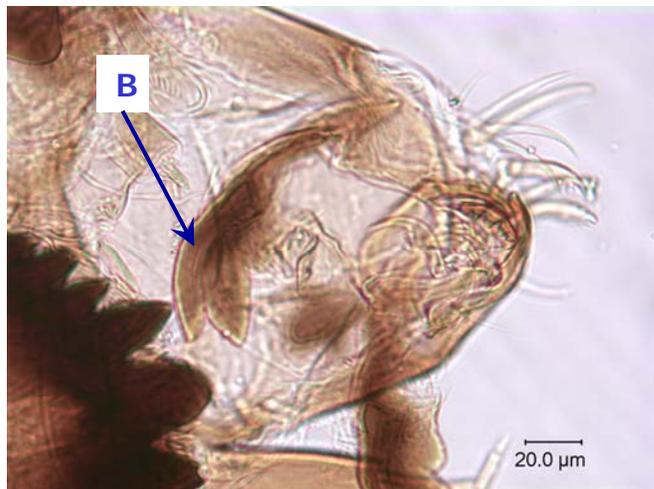
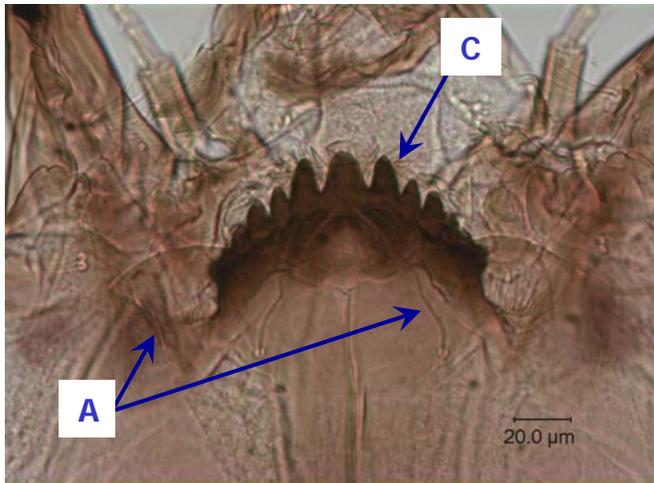
- Sprawlers and burrowers
- Functional feeding group: Predators (small chironomid larvae, microcrustacea, and worms)
- Prefer sandy substrata
- Intolerant of heavily polluted conditions

References: E 8.52; C&F 661,751; S&B 65; R 56-57; H 2, 52; W 308, 362

Photographs: (Upper) Slide L2AI 1:1 OWC 1989, viewed at 100X. (Center) Slide Dar2 1:2 OWCI 2002, viewed at 200X. (Lower) Slide Dar2 1:2 OWCI 2002, viewed at 200X.

Insecta: Diptera (True Flies): Chironomidae: *Dicrotendipes* sp.
Chironomid (Midge) Larva

Ventral views of Dicrotendipes head



Features of Family Chironomidae

- Thorax without segmented legs
- Pair of anterior prolegs on first thoracic segment; pair of posterior prolegs on last abdominal segment
- Head capsule sclerotized (hardened) throughout and fully visible
- Mandibles opposed and moving horizontally

Features of Subfamily Chironominae

- Ventromental plates well developed with striations throughout (A)
- Conspicuous premandibles present (B)
- Mentum usually entirely toothed (C)

Features of Genus *Dicrotendipes*

- Mentum convex with an odd number of teeth (C)
- Median tooth and first lateral teeth pointed and enlarged (C)
- Ventromental plate width less than width of mentum (A)

Where Recorded at Old Woman Creek

Within sediment in and around lotus (*Nelumbo lutea*) beds, in the lowermost pool of the upland creek, in and on bark of submerged logs and on miscellaneous aquatic plants including cattails (*Typha* spp.), lotus (*Nelumbo lutea*), and water lily (*Nymphaea* sp.)

General Ecology

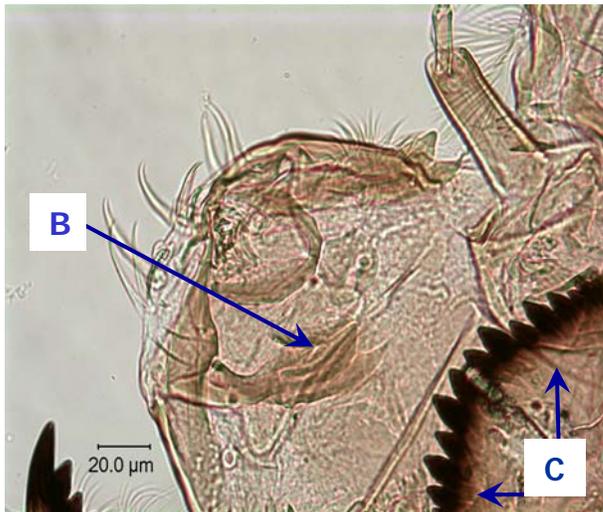
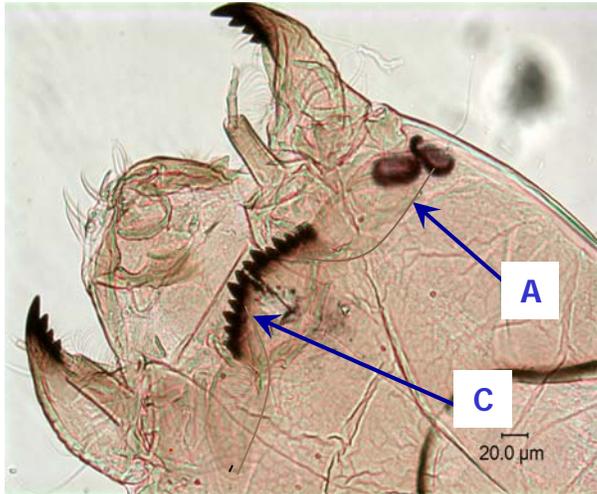
- Can be found in sediments; more commonly encountered on vegetation
- Functional feeding group: collectors (gatherers and filterers)
- Live in a wide range of water quality
- When abundant, often accompanied by high numbers of *Glyptotendipes* sp.

References: E 8.58; C&F 661-668,751; S&B 66-68; H 2, 52; W 311, 368-370

Photographs: (Upper) Slide G 3:8 OWCI 2002, viewed at 100X. (Center) Slide L2C1 2:2 OWC 1990, viewed at 200X. (Lower) Slide Z 10:11 OWCI 2002, viewed at 200X.

Insecta: Diptera (True Flies): Chironomidae: *Endochironomus* sp. Chironomid (Midge) Larva

Ventral views of Endochironomus head



Features of Family Chironomidae

Thorax without segmented legs

Pair of anterior prolegs on first thoracic segment; pair of posterior prolegs on last abdominal segment

Head capsule sclerotized (hardened) throughout and fully visible

Mandibles opposed and moving horizontally

Features of Subfamily Chironominae

Ventromental plates well developed with striations throughout (A)

Conspicuous premandibles present (B)

Mentum usually entirely toothed (C)

Features of Genus *Endochironomus*

Mentum with four median teeth separated from the lateral portion of the mentum by a distinctive line (C)

Ventromental plates with margins parallel for most of their length and three to four times wider than their length (A)

Oral margin of the cardo tuberculate (not shown)

Pecten epipharyngis consists of one to three plates with two or more teeth on each plate (E)

SI setae with serrations on only one side (not visible in photo)

Where Recorded at Old Woman Creek

Within sediment in water lily (*Nymphaea* sp.) beds, in and on bark of submerged logs, in lotus (*Nelumbo lutea*) beds and in open water

General Ecology

Clingers (tube builders)

Functional feeding group: shredders (herbivores) or collectors (filterers and gatherers)

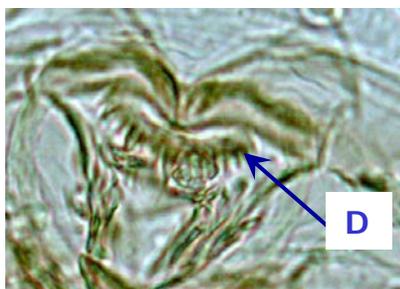
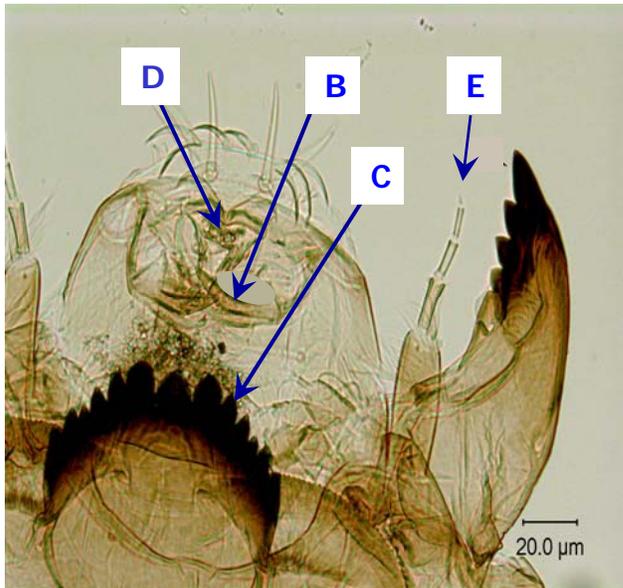
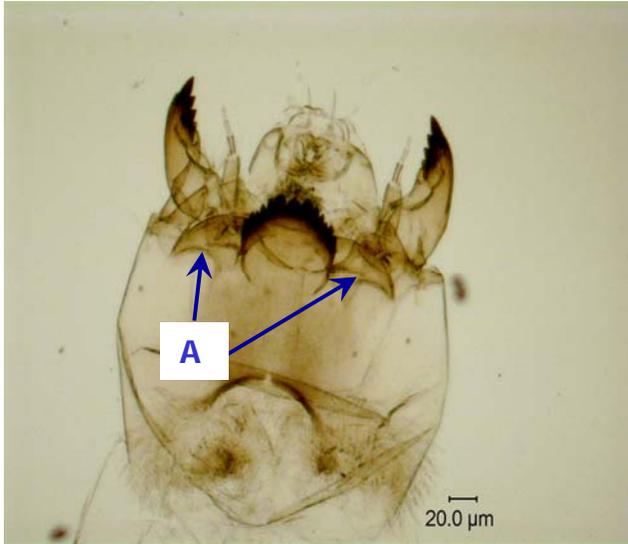
Often associated with moderately eutrophic conditions

References: E 8.68; C&F 661-668,752; S&B 69-70; H 2, 52; W 312, 375-377

Photographs: (Upper) Slide L1B2 1:3 OWC 1989, viewed at 100X. (Upper Center) Slide L2B1 1:3 OWC 1989, viewed at 200X. (Lower Center) Slide L2B1 1:3 OWC 1989, viewed at 200X. (Lower) Slide 11 dipnet 2:3 OWCI 2002, viewed at 400X.

**Insecta: Diptera (True Flies): Chironomidae: *Glyptotendipes* sp.
Chironomid (Midge) Larva**

Ventral views of *Glyptotendipes* head



Features of Family Chironomidae

Thorax without segmented legs

Pair of anterior prolegs on first thoracic segment; pair of posterior prolegs on last abdominal segment

Head capsule sclerotized (hardened) throughout and fully visible

Mandibles opposed and moving horizontally

Features of Subfamily Chironominae

Ventromental plates well developed with striations throughout (A)

Conspicuous premandibles present (B)

Mentum usually entirely toothed (C)

Features of Genus *Glyptotendipes*

Thirteen teeth on mentum with the median tooth being simple (C)

Ventromental plates at least twice as wide as long (A)

Premandibles bifid (B)

Pecten epipharyngis consisting of 15 teeth (D)

Antennae five-segmented (E)

Where Recorded at Old Woman Creek

Within sediment consisting of sand and/or mud, in and on bark of submerged logs, and on miscellaneous aquatic plants including cattails (*Typha* spp.), lotus (*Nelumbo lutea*), water lily (*Nymphaea* sp.), and filamentous algae.

General Ecology

Burrowers, tube builders, clingers, or net spinners

Functional feeding group: shredder (herbivore) or collector (filterer and gatherer)

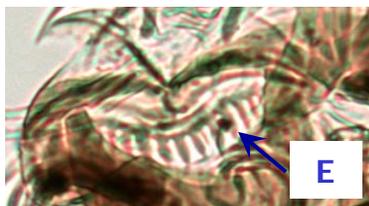
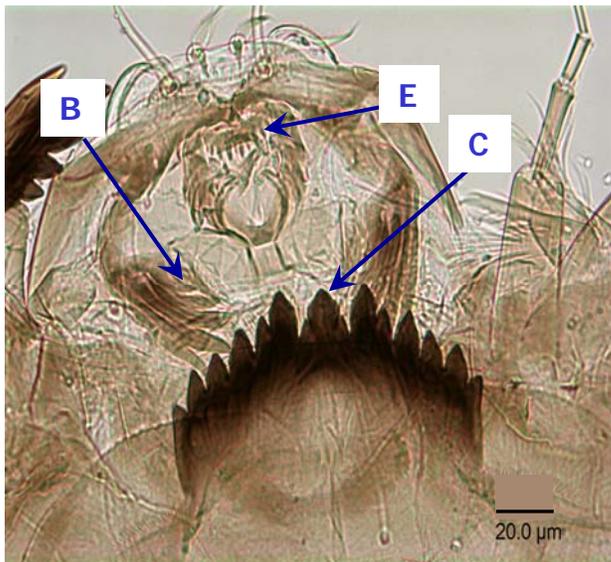
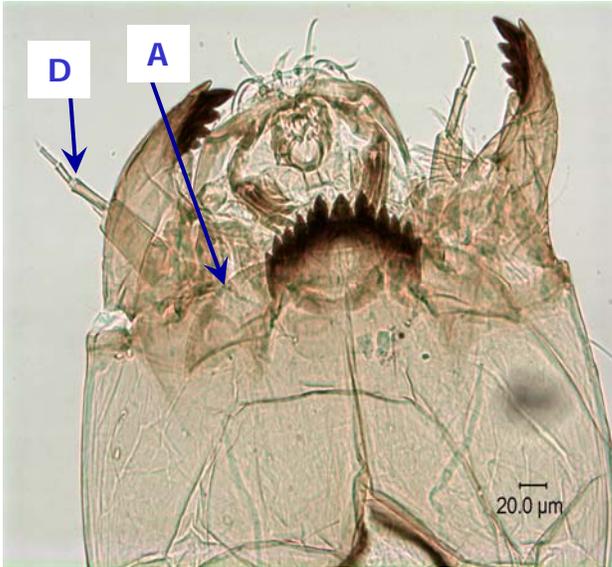
When abundant, often accompanied by high numbers of *Dicrotendipes* sp.

References: E 8.72; C&F 661-668,752; S&B 71; R 123; H 2, 52; W 315, 380-382

Photographs: Slide Z dipnet 2:11 OWCI 2002. (Upper) Viewed at 100X. (Center) Viewed at 200X. (Lower) Viewed at 400X.

Insecta:Diptera (True Flies):Chironomidae:*Kiefferulus* sp.
Chironomid (Midge) Larva

Ventral views of *Kiefferulus* head



Features of Family Chironomidae

Thorax without segmented legs

Pair of anterior prolegs on first thoracic segment; pair of posterior prolegs on last abdominal segment *

Head capsule sclerotized (hardened) throughout and fully visible

Mandibles opposed and moving horizontally

Features of Subfamily Chironominae

Ventromental plates well developed with striations throughout (A)

Conspicuous premandibles present (B)

Mentum usually entirely toothed (C)

Features of Genus *Kiefferulus*

Median tooth of the mentum trifid; outermost teeth decreasing in size giving a convex appearance (C)

Mentum containing an odd number of teeth (C)

Premandible with three or more teeth (B)

Antenna five-segmented (D)

Pecten epipharyngis with strong teeth in one row (E)

Where Recorded at Old Woman Creek

Within sediment consisting of sand and/or mud, in and on bark of submerged logs, and on miscellaneous aquatic plants including lotus (*Nelumbo lutea*), duckweed (*Lemna* spp.), common reed (*Phragmites communis*), arrowhead (*Sagittaria* sp.), and filamentous algae

General Ecology

Burrowers

Functional feeding group: collectors/gatherers

High tolerance of adverse water quality conditions such as low dissolved oxygen

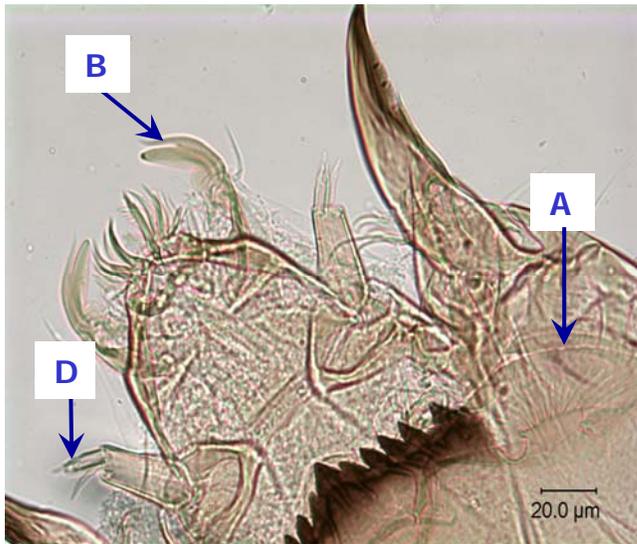
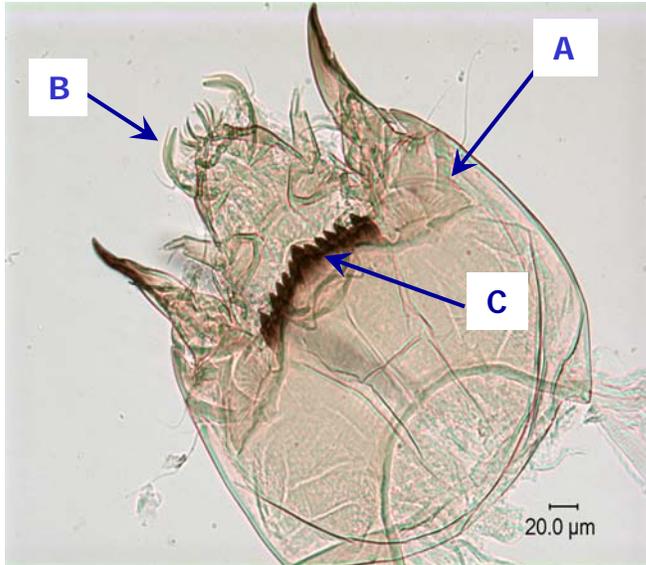
References: E 8.85; C&F 661-668,752; H 2, 57; W 318-319, 387

Photographs: Slide Ash-2 #30 OWCI 2002. (Upper) Viewed at 100X. (Middle) Viewed at 200X and 400X. (Lower)

Insecta: Diptera (True Flies): Chironomidae: *Microchironomus* sp.

Chironomid (Midge) Larva

Ventral views of Microchironomus head



Features of Family Chironomidae

- Thorax without segmented legs
- Pair of anterior prolegs on first thoracic segment; pair of posterior prolegs on last abdominal segment
- Head capsule sclerotized (hardened) throughout and fully visible
- Mandibles opposed and moving horizontally

Features of Subfamily Chironominae

- Ventromental plates well developed with striations throughout (A)
- Conspicuous premandibles present (B)
- Mentum usually entirely toothed (C)

Features of Genus *Microchironomus*

- Linear mentum with two outer teeth enlarged; trifid median tooth (C)
- Bifid premandible (B)
- Antennal segment one longer than the combined lengths of segments two through five (D)
- Pecten epipharyngis either a simple plate or with 3 lobes (not visible)

Where Recorded at Old Woman Creek

- Within sediment consisting of mud and/or sand in open water and in the creek channel

General Ecology

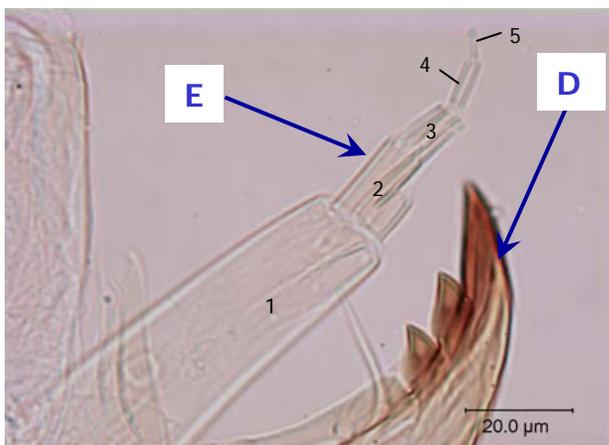
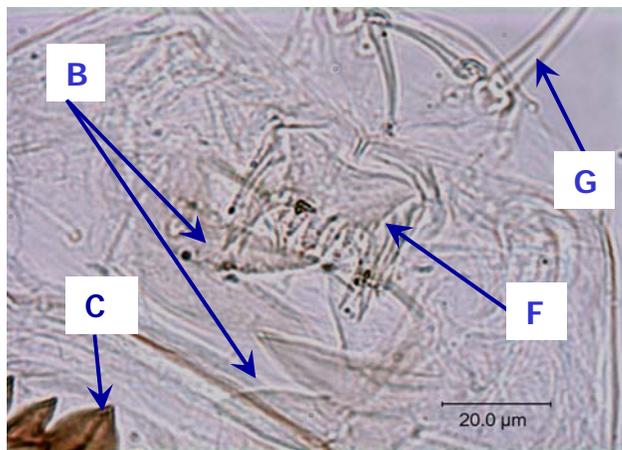
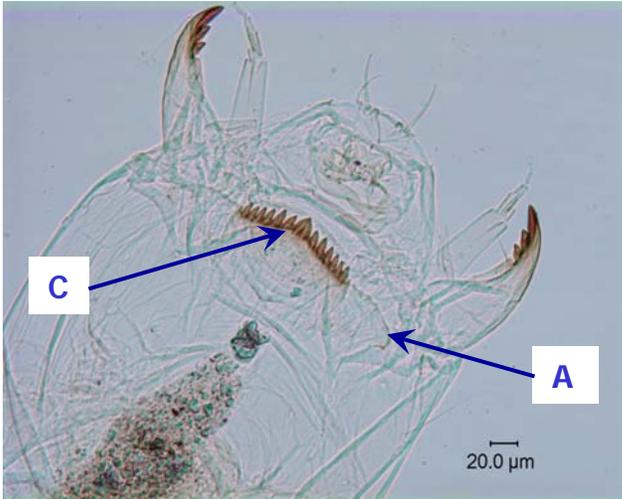
- Burrowers
- Functional feeding group: collectors/gatherers
- Little known of ecology

References: E 8.92; C&F 661-663,752; H 2, 52;
W 322, 392

Photographs: Slide Darrow-1 #30 1:4 OWCI 2002. (Upper)
Viewed at 100X. (Lower) Viewed at 200X.

**Insecta: Diptera (True Flies): Chironomidae: *Parachironomus* sp.
Chironomid (Midge) Larva**

Ventral views of Parachironomus head



Features of Family Chironomidae

- Thorax without segmented legs
- Pair of anterior prolegs on first thoracic segment; pair of posterior prolegs on last abdominal segment
- Head capsule sclerotized (hardened) throughout and fully visible
- Mandibles opposed and moving horizontally

Features of Subfamily Chironominae

- Ventromental plates well developed with striations throughout (A)
- Conspicuous premandibles present (B)
- Mentum usually entirely toothed (C)

Features of Genus *Parachironomus*

- Median pair of mental teeth partially fused or completely fused (as in photo) and distinctly wider than each of the remaining lateral teeth; mentum with an even number of teeth (C)
- Ventromental plates deeply scalloped (A)
- Mandible without a dorsal tooth (D)
- Five-segmented antenna (E)
- Pecten epipharyngis one wide plate with 3-9 teeth (F)
- Simple SI seta (G)

Where Recorded at Old Woman Creek

- Within sediment consisting of mud and/or sand in open water, in water lily (*Nymphaea* sp.) beds, and under lotus (*Nelumbo lutea*) leaves

General Ecology

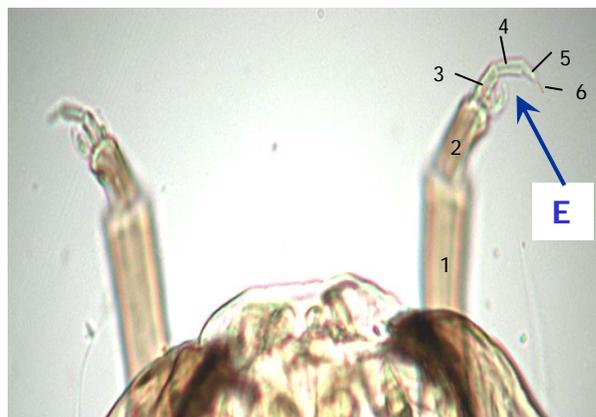
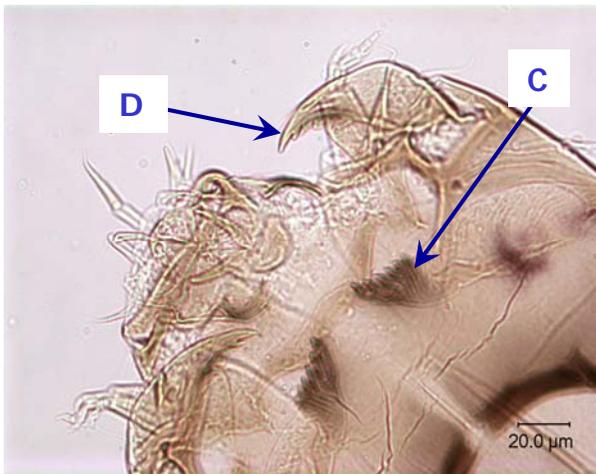
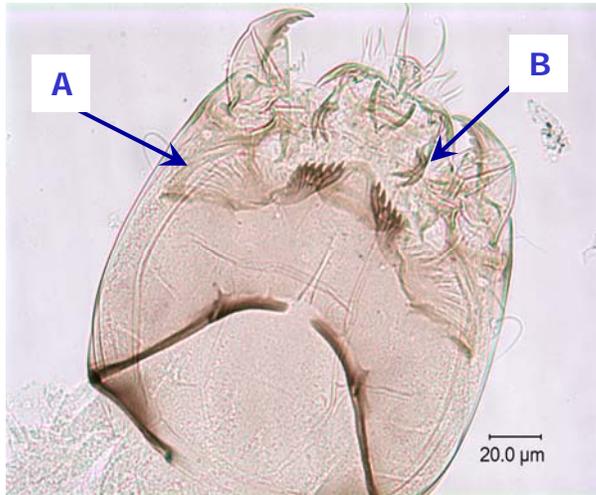
- Sprawlers; some species ectoparasitic on invertebrates
- Functional feeding group: predators, collectors, or gatherers
- Tolerant of most toxic and organic wastes

References: E 8.105; C&F 661-666,752; S&B 75-76; H 2, 52; W 328, 402

Photographs: Slide WW dipnet 5:6 OWCI 2002. (Upper) Viewed at 100X. (Center) Viewed at 400X. (Lower) Viewed at 400X.

Insecta: Diptera (True Flies): Chironomidae: *Paralauterborniella* sp.
Chironomid (Midge) Larva

Ventral views of *Paralauterborniella* head



Features of Family Chironomidae

Thorax without segmented legs

Pair of anterior prolegs on first thoracic segment; pair of posterior prolegs on last abdominal segment

Head capsule sclerotized (hardened) throughout and fully visible

Mandibles opposed and moving horizontally

Features of Subfamily Chironominae

Ventromental plates well developed with striations throughout (A)

Conspicuous premandibles present (B)

Mentum usually entirely toothed (C)

Features of Genus *Paralauterborniella*

Mentum with broad pale median tooth; six darkly pigmented lateral teeth on each side (C)

Wide ventromental plates with coarse striate (A)

Mandible without a dorsal tooth, short and robust (D)

Six-segmented antennae with alternate Lauterborn organs on segments two and three (E)

Where Recorded at Old Woman Creek

Within the sediment of the creek channel

General Ecology

Clingers (tube builders on plants)

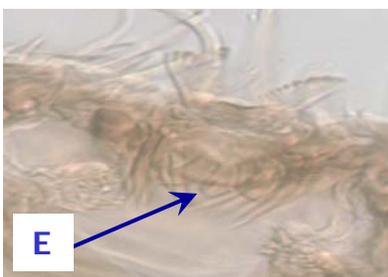
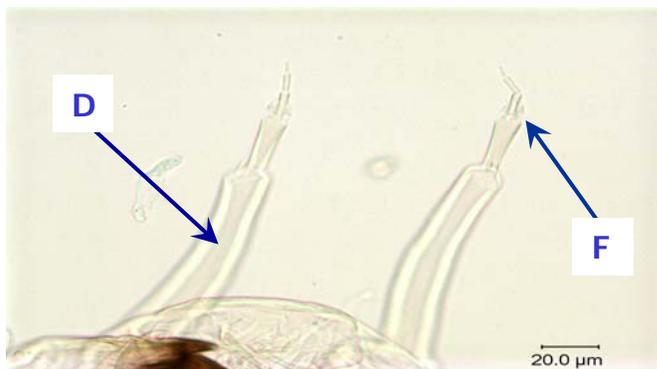
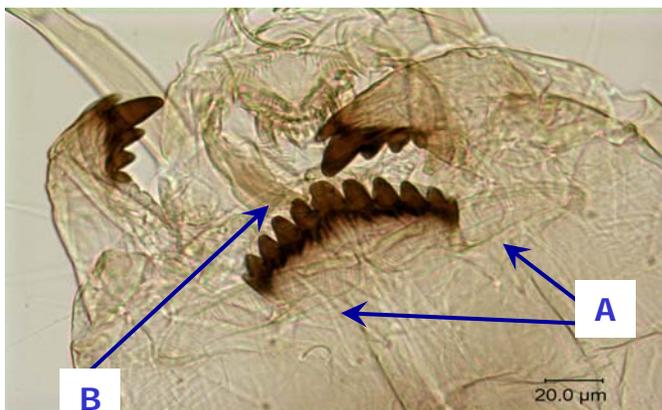
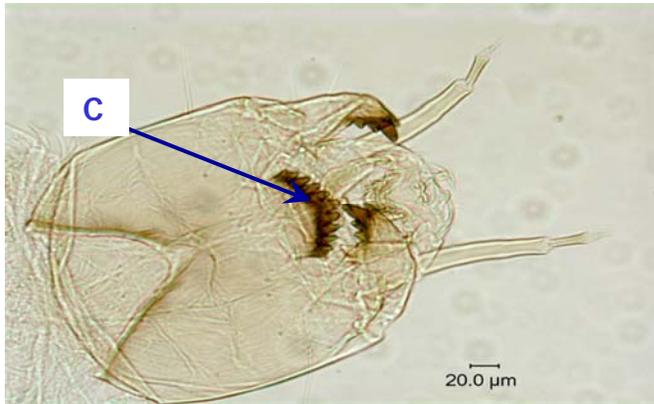
Functional feeding group: collectors/gatherers

References: E 8.116; C&F 661-668,752; H 2, 52;
W 330, 404

Photographs: (Upper) Slide Darrow-1 #30 1:4 OWC 1990, viewed at 100X. (Center) Slide Darrow-1 #30 1:4 OWC 1990, viewed at 200X. (Lower) Slide MM 1994, viewed at 400X.

**Insecta: Diptera (True Flies): Chironomidae: *Paratanytarsus* sp.
Chironomid (Midge) Larva**

Ventral views of *Paratanytarsus* head



Features of Family Chironomidae

- Thorax without segmented legs
- Pair of anterior prolegs on first thoracic segment; pair of posterior prolegs on last abdominal segment
- Head capsule sclerotized (hardened) throughout and fully visible
- Mandibles opposed and moving horizontally

Features of Subfamily Chironominae

- Ventromental plates well developed with striations throughout (A)
- Conspicuous premandibles present (B)
- Mentum usually entirely toothed (C)

Features of Genus *Paratanytarsus*

- Ventromental plates almost meeting at ventral midline of head capsule (A)
- Bifid pre-mandibles (B)
- First antennal segment much longer than the combined lengths of the remaining segments (D)
- Lauterborn organs as long or longer than the length of their stalk (F: hard to see in photo)
- Pecten epipharyngis consisting of three to five scale-like lobes without apical dissections (E)

Where Recorded at Old Woman Creek

- Found within water lily (*Nymphaea* sp.) beds, in creek channels, in mats of filamentous algae, and within the sediments on the landward side of the barrier beach

General Ecology

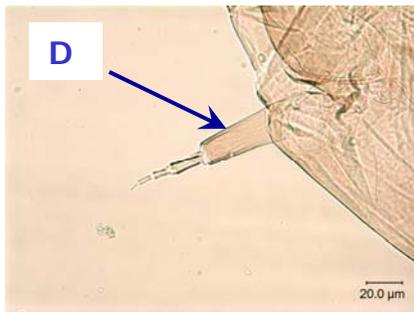
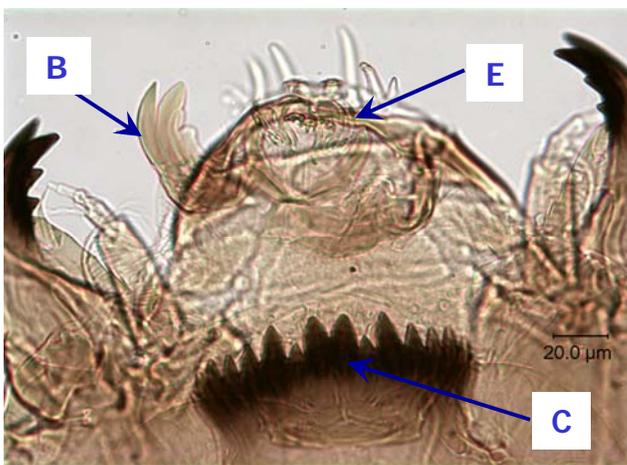
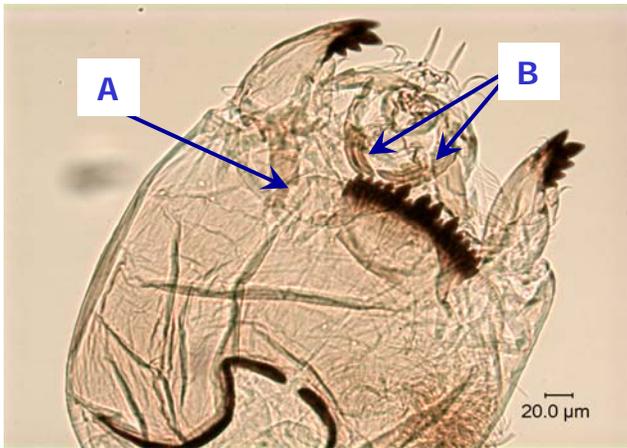
- Sprawlers
- Functional feeding group: probably collectors (filterers or gatherers)

References: E 8.118; C&F 653-658, 754; H 2, 52; W 332, 406

Photographs: (Upper) Slide O 1:1 OWCI 2002, viewed at 100X. (Upper Center) Slide Z dipnet 2:11, viewed at 200X. (Lower Center) Slide O 1:1 OWCI 2002, viewed at 200X. (Lower) Slide MM 1994, viewed at 400X.

Insecta: Diptera (True Flies): Chironomidae: *Polypedilum* sp. Chironomid (Midge) Larva

Ventral views of Polypedilum head



Features of Family Chironomidae

- Thorax without segmented legs
- Pair of anterior prolegs on first thoracic segment; pair of posterior prolegs on last abdominal segment
- Head capsule sclerotized (hardened) throughout and fully visible
- Mandibles opposed and moving horizontally

Features of Subfamily Chironominae

- Ventromental plates well developed with striations throughout (A)
- Conspicuous premandibles present (B)
- Mentum usually entirely toothed (C)

Features of Genus Polypedilum

- Mentum with median and second lateral teeth longer than the first lateral teeth (C)
- Five-segmented antennae (D)
- Pecten epipharyngis consisting of one to three plates each with two or more teeth (E)

Where Recorded at Old Woman Creek

Within sediment consisting of mud and/or sand in open water and lotus (*Nelumbo lutea*) beds, in and around water lily (*Nymphaea* sp.) beds, sedge (*Scirpus fluviatilis*), meadows and cattail (*Typha* spp.), in and on bark of submerged logs, in mats of filamentous algae and in the sandy sediment of the creek channel and within the sediments on the landward side of the barrier beach

General Ecology

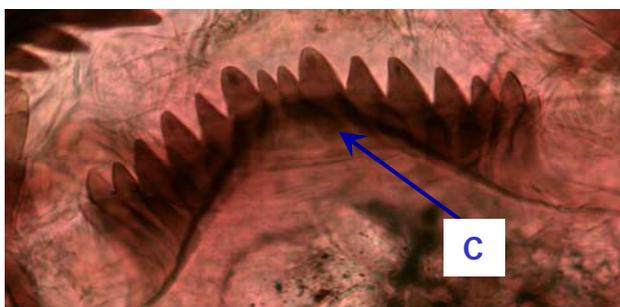
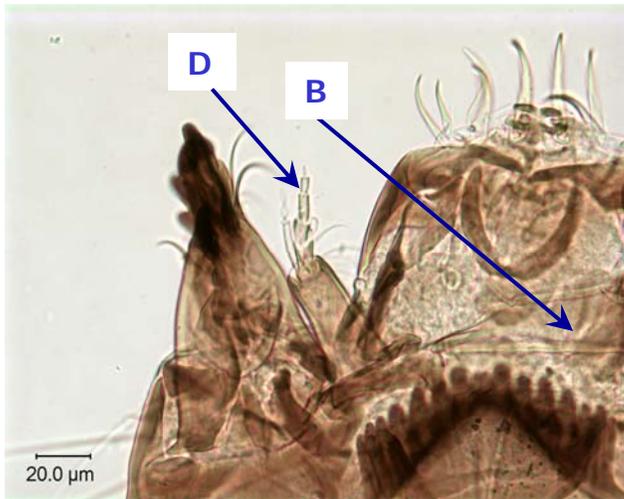
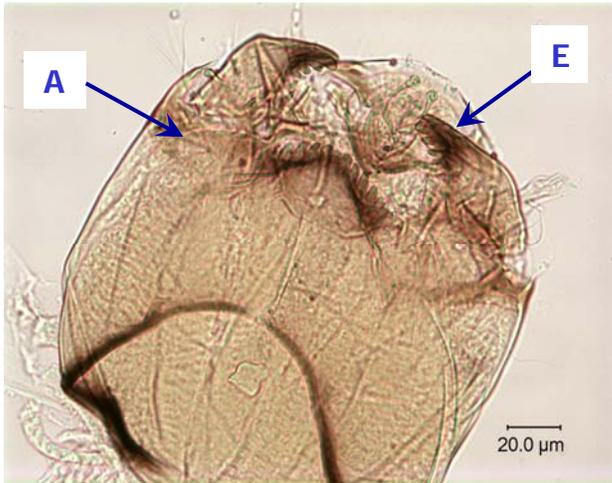
- Clingers and climbers
- Functional feeding group: shredders (herbivores), collectors/gatherers, and predators
- Live in a variety of aquatic conditions including high quality to heavily degraded

References: E 8.125; C&F 661-666, 753; S&B 80-83 R 98-99,114; H 2, 52; W 334, 410-414

Photographs: (Upper) Slide12 dipnet 4:6 OWCI 2002, viewed at 100X. (Upper Center) Slide NR Creola, OH CTY163 1986, viewed at 100X. (Lower Center) Slide 12 dipnet 4:6 OWCI 2002, viewed at 200X. (Lower) Slide F.Sen 1989, viewed at 200X.

**Insecta: Diptera (True Flies): Chironomidae: *Stictochironomus* sp.
Chironomid (Midge) Larva**

Ventral views of Stictochironomus head



Features of Family Chironomidae

Thorax without segmented legs

Pair of anterior prolegs on first thoracic segment; pair of posterior prolegs on last abdominal segment

Head capsule sclerotized (hardened) throughout and fully visible

Mandibles opposed and moving horizontally

Features of Subfamily Chironominae

Ventromental plates well developed with striations throughout (A)

Conspicuous premandibles present (B)

Mentum usually entirely toothed (C)

Features of Genus *Stictochironomus*

First lateral teeth of mentum much longer than median or second lateral teeth (C)

Mandible with either two dark inner teeth and dark dorsal tooth or with three inner teeth and no dorsal tooth (E)

Antennae six-segmented with alternate Lauterborn organs at the apex of segments two and three (D)

Where Recorded at Old Woman Creek

Within sandy sediment in the creek channel and lowermost pool of the upland creek

General Ecology

Burrowers (tube makers)

Functional feeding group: collectors/gatherers or shredders (herbivores)

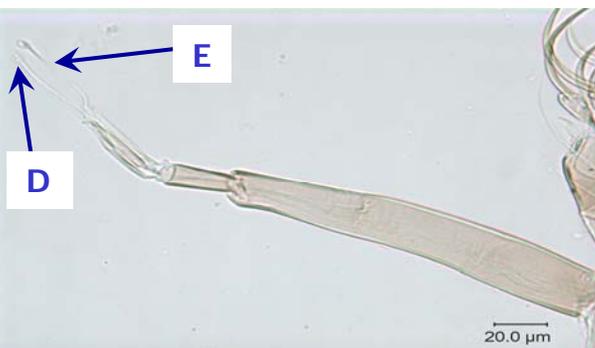
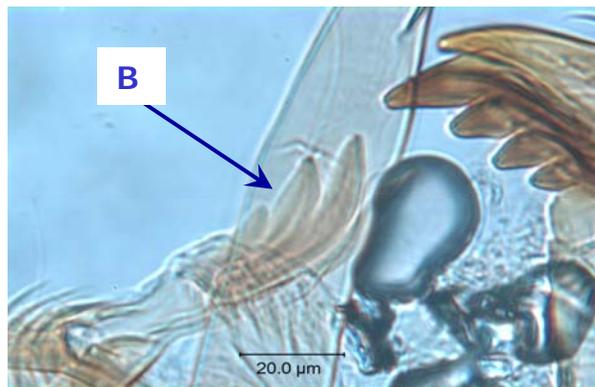
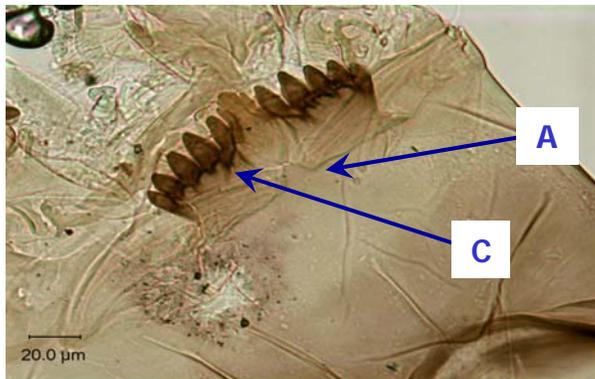
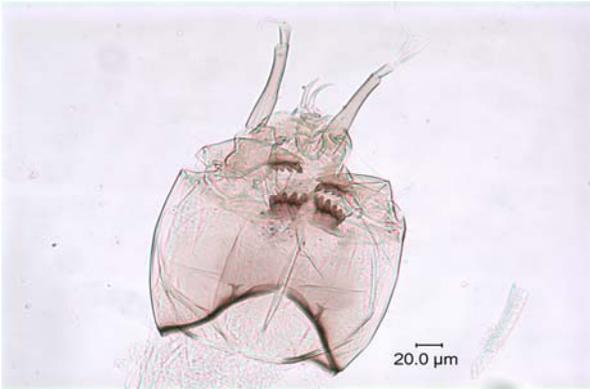
Can be found in sandy sediments; mouthparts can be abraded by such sediments

References: E 8.152; C&F 661,753; H 2, 52; W 343, 425

Photographs: (Upper) Slide Berlin 1 #30 2:2 OWC 1986. Viewed at 100X. (Center) Slide Berlin 1 #30 2:2 OWC 1986. Viewed at 200X. (Lower) Slide Berlin 1 #30 2:2 OWC, viewed at 200X.

Insecta: Diptera (True Flies): Chironomidae: *Tanytarsus* sp.
Chironomid (Midge) Larva

Ventral views of Tanytarsus head



Features of Family Chironomidae

Thorax without segmented legs

Pair of anterior prolegs on first thoracic segment; pair of posterior prolegs on last abdominal segment

Head capsule sclerotized (hardened) throughout and fully visible

Mandibles opposed and moving horizontally

Features of Subfamily Chironominae

Ventromental plates well developed with striations throughout (A)

Conspicuous premandibles present (B)

Mentum usually entirely toothed (C)

Features of Genus Tanytarsus

Ventromental plates almost meeting at ventral midline of head capsule (A)

Premandible with three to four slender, pointed teeth (B)

Lauterborn organs (D) of antennae less than one-fifth as long as their petioles (stalks) (E)

Where Recorded at Old Woman Creek

Within sediment consisting of mud and/or sand in open water, water lily (*Nymphaea* sp.) beds, channels, and arrowhead (*Sagittaria* sp.) beds

General Ecology

Climbers, clingers, and net spinners

Functional feeding group: collectors (filterers and gatherers)

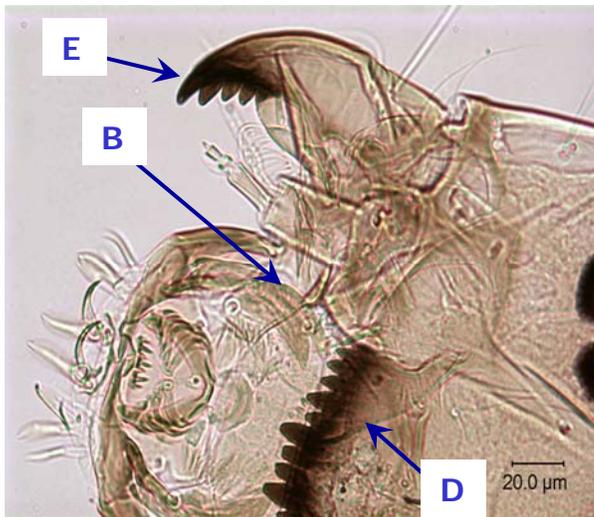
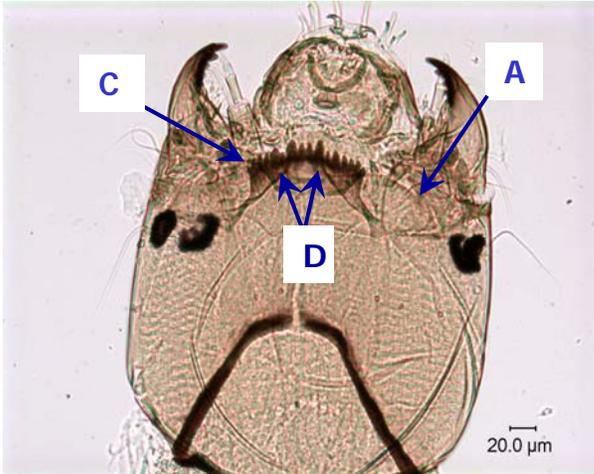
Species range from highly tolerant of polluted conditions to extremely intolerant

References: E 8.154; C&F 653-661,754; S&B 91-93; R 98-99,118; H 2, 52; W 344, 427

Photographs: SlideDarrow-1 #30 OWC 1990. (Upper) Viewed at 100X. (Upper Center) Viewed at 200X. (Lower Center) Viewed at 400X. (Lower) Viewed at 200X.

Insecta: Diptera (True Flies): Chironomidae: *Tribelos* sp.
Chironomid (Midge) Larva

Ventral views of Tribelos head



Features of Family Chironomidae

Thorax without segmented legs
 Pair of anterior prolegs on first thoracic segment; pair of posterior prolegs on last abdominal segment
 Head capsule sclerotized (hardened) throughout and fully visible
 Mandibles opposed and moving horizontally

Features of Subfamily Chironominae

Ventromental plates well developed with striations throughout (A)
 Conspicuous premandibles present (B)
 Mentum usually entirely toothed (C)

Features of Genus *Tribelos*

Second lateral teeth of mentum recessed and smaller in size than the first and third lateral teeth (C)
 Median and first lateral teeth of mentum separated from other lateral teeth by a line running posteriorly to median corner of ventromental plates (D)
 Mandible with apical tooth and three dark inner teeth (E)
 Ventromental plates not more than three times as wide as their maximum length (A)
 The SI setae with serrations on both sides (not visible in photo)

Where Recorded at Old Woman Creek

Within sandy sediment in the creek channel

General Ecology

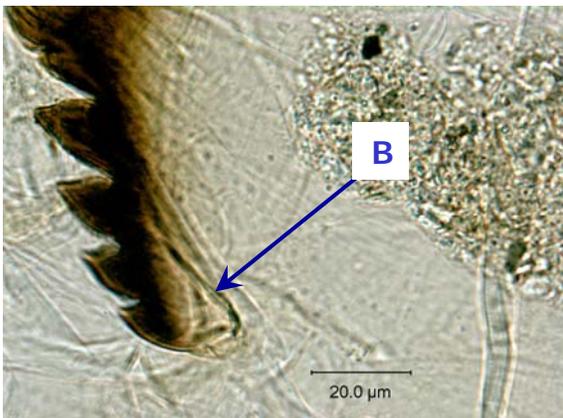
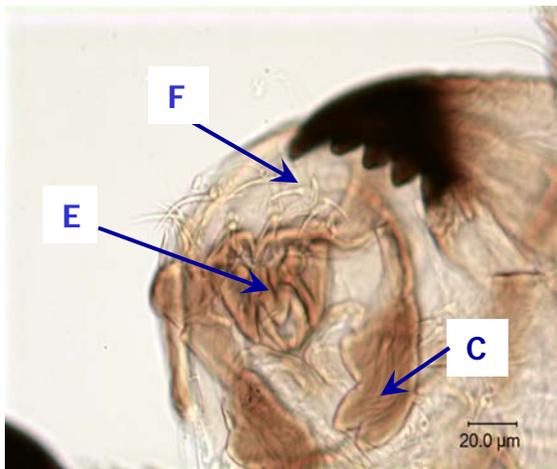
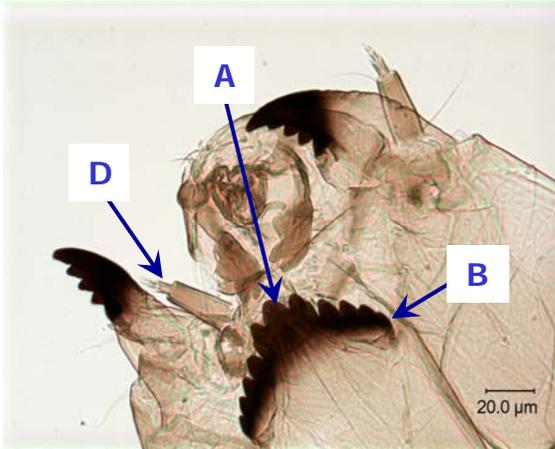
Burrowers (wood miners)
 Functional feeding group: collectors/gatherers
 Tolerant of moderately degraded conditions
 Occur on vegetation and on marginal sediments

References: E 8.164; C&F 661-666, 753; S&B 85; H 2, 52; W 346, 429

Photographs: (Upper) Slide NRadcliff USGS 1990, viewed at 100X. (Lower) Slide TY163 Raccoon Creek, viewed at 200X.

Insecta: Diptera (True Flies): Chironomidae: *Cricotopus* sp. Chironomid (Midge) Larva

Ventral views of head of *Cricotopus sylvestris* group



Features of Family Chironomidae

Thorax without segmented legs

Pair of anterior prolegs on first thoracic segment; pair of posterior prolegs on last abdominal segment

Head capsule sclerotized (hardened) throughout and fully visible

Mandibles opposed and moving horizontally

Features of Subfamily Orthocladiinae

Mentum usually entirely toothed (A)

Ventromental plates vestigial to well developed, never with striations (B)

Premandibles present; typically well developed (C)

Features of Genus *Cricotopus*

Mentum with an odd number of teeth (A)

Weakly developed ventromental plates (B)

Premandible usually simple (bifid in specimen shown) (C)

Antenna four or five-segmented (D)

Pecten epipharyngis a simple scale (E) or with three scales

SI seta most often bifid but rarely simple (F)

Difficult to distinguish from *Orthocladus* sp.

Where Recorded at Old Woman Creek

Within sediment in water lily (*Nymphaea* sp.) beds and open water, in sandy sediment of the landward side of the barrier beach, underside of louts (*Nelumbo lutea*) leaves, in beds of common reed (*Phragmites communis*), in mats of filamentous algae, and in stands of cattail (*Typha* spp.)

General Ecology

Functional feeding group: shredders (herbivores) or collectors (gatherers of detritus and algae)

Exists in a wide range of dissolved oxygen conditions

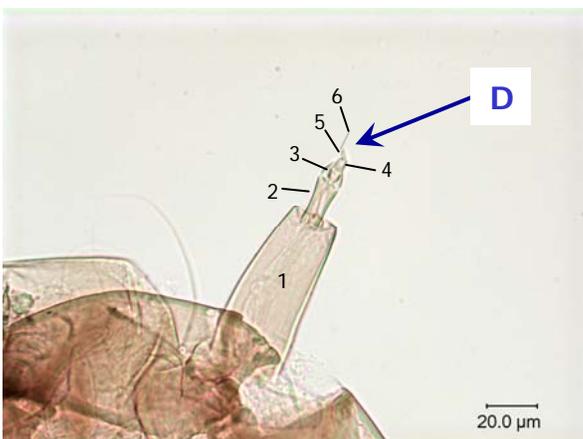
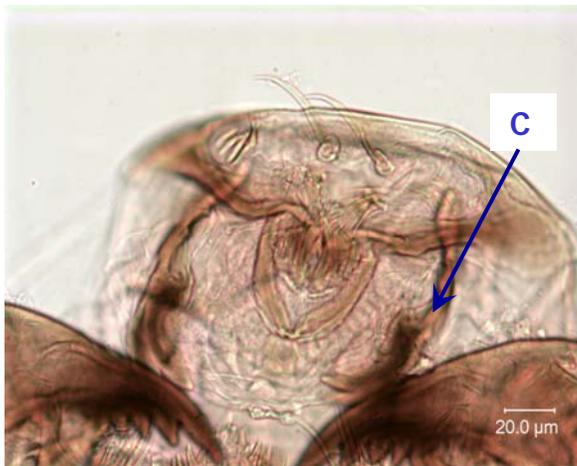
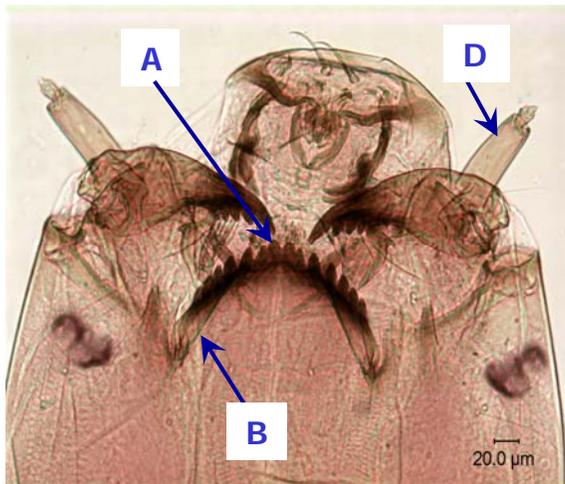
Typically occupies areas of high vegetation where food supply is abundant

References: E 7.50; C&F 673-678,748; S&B 37-40; R 68; H 2, 52; W 164, 222-223

Photographs: (Upper) Slide K dipnet 2:11 OWCI 2002, Viewed at 100X. (Center) Slide 8 dipnet 5:5 OWCI 2002, Viewed at 200X. (Lower) Slide K dipnet 2:4 OWCI 2002, viewed at 400X.

Insecta: Diptera (True Flies): Chironomidae: *Hydrobaenus* sp.
Chironomid (Midge) Larva

Ventral views of Hydrobaenus head



Features of Family Chironomidae

Thorax without segmented legs

Pair of anterior prolegs on first thoracic segment; pair of posterior prolegs on last abdominal segment

Head capsule sclerotized (hardened) throughout and fully visible

Mandibles opposed and moving horizontally

Features of Subfamily Orthoclaudiinae

Mentum usually entirely toothed (A)

Ventromental plates vestigial to well developed, never with striations (B)

Premandibles present; typically well developed (C)

Features of Genus *Hydrobaenus*

Mentum with a single or double median tooth (A)

Bifid premandible, without brush (C)

Antennae six-segmented with sixth segment appearing as seta (D)

Where Recorded at Old Woman Creek

Within sediment consisting of mud and/or sand in open water, in water lily (*Nymphaea* sp.) beds and sedge (*Scirpus fluviatilis*) meadows, and in sediment of the creek channel

General Ecology

Sprawlers

Functional feeding group: scrapers, collectors, or gatherers

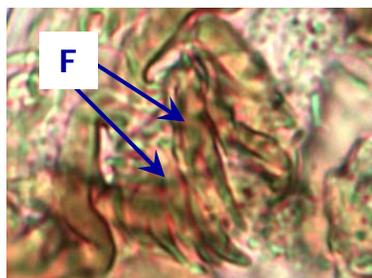
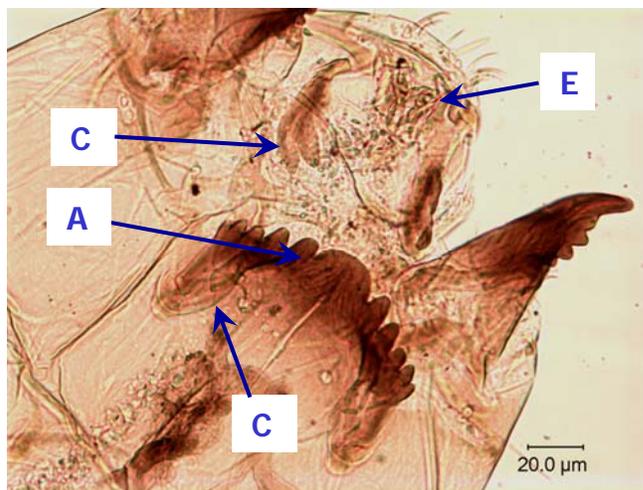
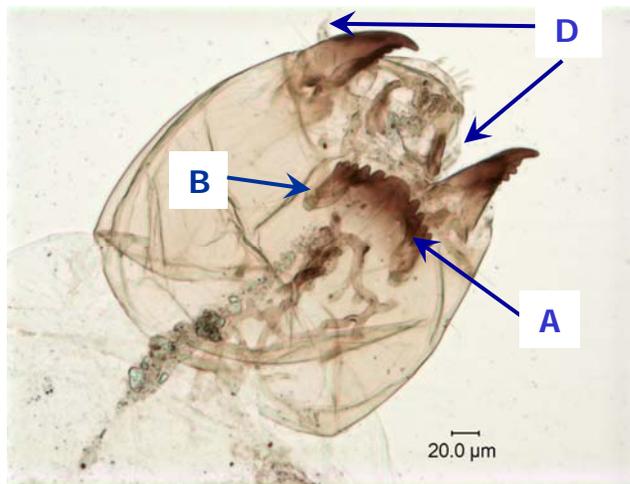
Found most often in late winter and early spring as larvae

References: E 7.80; C&F 673-678,749; R 75; H 2, 52; W 175, 242

Photographs: Slide Darrow-2 #30 2:4, OWCI 2002.
(Upper) Viewed at 100X. (Center) Viewed at 200X.
(Lower) Viewed at 200X.

**Insecta: Diptera (True Flies): Chironomidae: *Paraphaenocladus* sp.
Chironomid (Midge) Larva**

Ventral views of *Paraphaenocladus* head



Features of Family Chironomidae

- Thorax without segmented legs
- Pair of anterior prolegs on first thoracic segment; pair of posterior prolegs on last abdominal segment
- Head capsule sclerotized (hardened) throughout and fully visible
- Mandibles opposed and moving horizontally

Features of Subfamily Orthoclaadiinae

- Mentum usually entirely toothed (A)
- Ventromental plates vestigial to well developed, never with striations (B)
- Premandibles present; typically well developed (C)

Features of Genus *Paraphaenocladus*

- Mentum with a single broad, median tooth and ten lateral teeth (A)
- Ventromental plates large, extend beyond mentum (B)
- Premandible bearing three teeth (C)
- Antenna five-segmented (D)
- Pecten epipharyngis with three weak scales (E)
- SI typically plumose (F)
- Procerci bearing short anal setae (not pictured)

Where Recorded at Old Woman Creek

Within sediment in lotus (*Nelumbo lutea*) beds, in the sandy sediment of the landward side of the barrier beach, on the underside of louts leaves, and near invasive common reed (*Phragmites communis*) stalks

General Ecology

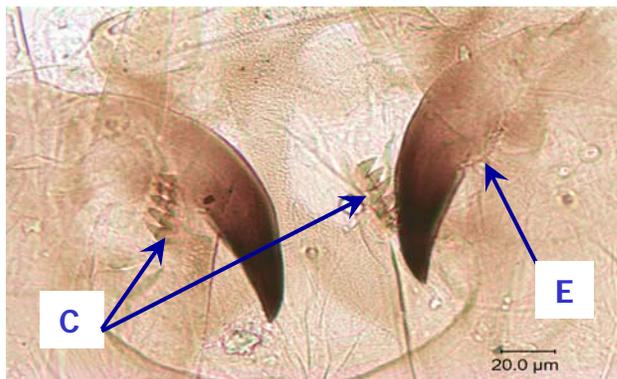
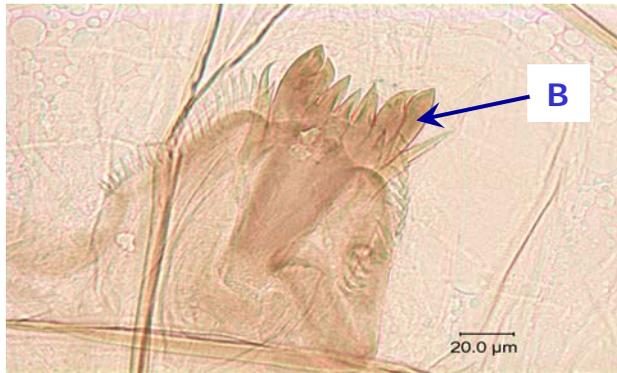
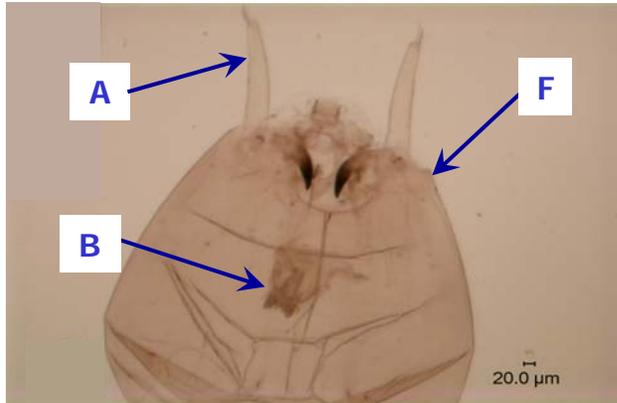
- Sprawlers
- Functional feeding group: collectors/gatherers
- Food quantity (diatoms, detritus, algae) plays an important role in the abundance

References: E 7.118; C&F 673-682,750; H 2, 52; W 188, 262

Photographs: Slide Ashore-1 1:1 OWCI 2002. (Upper) Viewed at 100X. (Center) Viewed at 200X. (Lower) Viewed at 400X.

Insecta: Diptera (True Flies): Chironomidae: *Coelotanypus* sp. Chironomid (Midge) Larva

Ventral views of Coelotanypus head and abdomen



Features of Family Chironomidae

- Thorax without segmented legs
- Pair of anterior prolegs on first thoracic segment; pair of posterior prolegs on last abdominal segment
- Head capsule sclerotized (hardened) throughout and fully visible
- Mandibles opposed and moving horizontally

Features of Subfamily Tanypodinae

- Antennae (A) retractile into head
- Ligula with 4-8 teeth (B)
- Mentum almost entirely membranous or with dorsomesal teeth arranged in obvious plates or longitudinal rows (C)

Features of Genus Coelotanypus

- Ligula usually with seven teeth (B)
- Dorsomesal teeth in longitudinal rows (C)
- Well developed lateral fringe of setae on abdomen (D)
- Head capsule with a pronounced taper (F)
- Mandible with smoothly curved apical tooth with low, rounded basal tooth (E). Note: mandibles are bent over dorsomesal teeth in photo

Where Recorded at Old Woman Creek

- Within sediment consisting of mud and/or sand in open water and in water lily (*Nymphaea* sp.) beds

General Ecology

- Burrowers
- Functional feeding group: Predators (worms, Cladocera, and chironomid larvae)

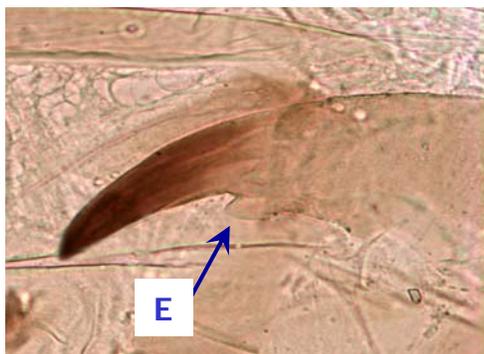
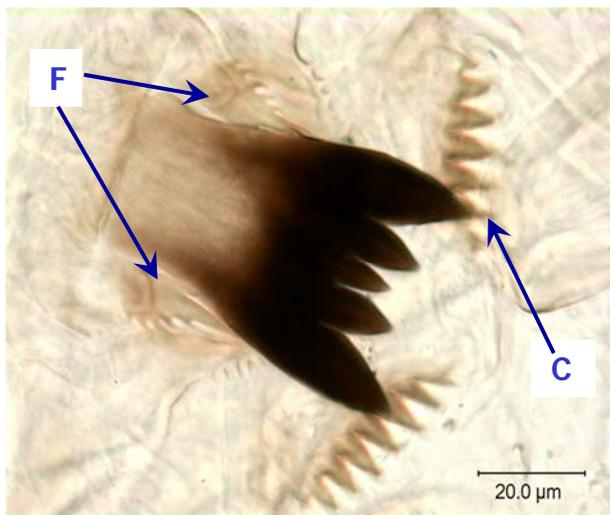
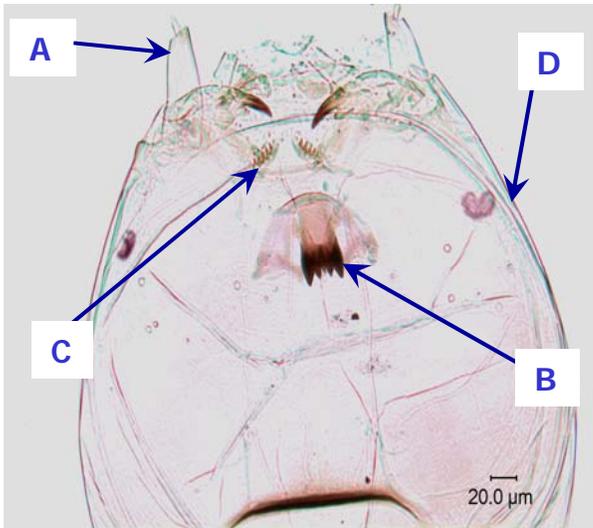
References: E 4.33; C&F 664, 744; R 27; H 2, 52; W 46, 81

Photographs: Slide B40-2 #30 1:1, OWCI 2002. (Upper) Viewed at 40X. (Center) Both viewed at 200X. (Lower) Viewed at 100X.

Insecta: Diptera (True Flies): Chironomidae: *Procladius* sp.

Chironomid (Midge) Larva

Ventral views of Procladius head



Features of Family Chironomidae

- Thorax without segmented legs
- Pair of anterior prolegs on first thoracic segment; pair of posterior prolegs on last abdominal segment
- Head capsule sclerotized (hardened) throughout and fully visible
- Mandibles opposed and moving horizontally

Features of Subfamily Tanypodinae

- Antennae (A) retractile into head
- Ligula with 4-8 teeth (B)
- Mentum almost entirely membranous or with dorsomental teeth arranged in obvious plates or longitudinal row (C)

Features of Genus Procladius

- Black/dark ligula with five teeth forming a concave arch (B)
- Well developed dorsomental plates (C)
- Rotund head capsule (D)
- Mandible with large, blunt basal tooth (E)
- Paraglossae with one main tooth and one to seven accessory teeth on each side (F)

Where Recorded at Old Woman Creek

- Within sediment consisting of mud and/or sand in open water and in and near lotus (*Nelumbo lutea*) beds

General Ecology

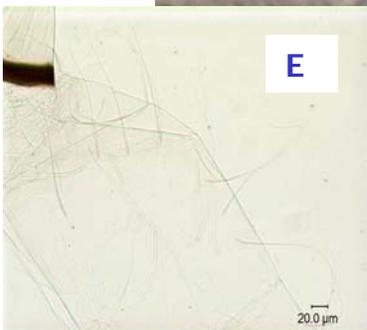
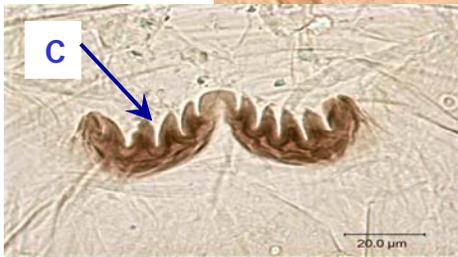
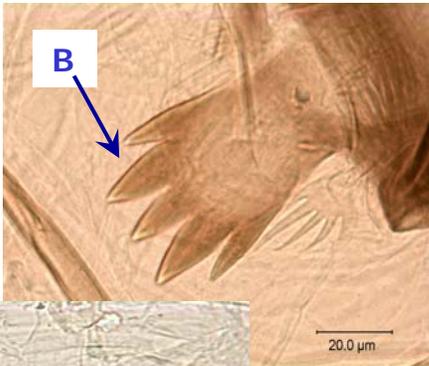
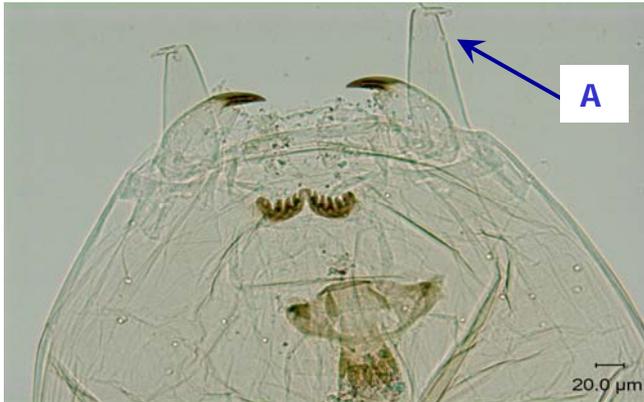
- Sprawlers
- Functional feeding group: predators (mayflies, microcrustacea, Protozoa) or collectors/gatherers
- Can be found in heavily degraded conditions

References: E 4.63; C&F 644-646,745; S&B 26; R 27; H 2, 52; W 64, 100

Photographs: (Upper) Slide WIAI #30 OWC 1990, viewed at 200X. (Lower) Slide A52-2 2:3 #30 OWC 2002, viewed at 400X. (Lower) Slide MM 2:3 1986, viewed at 200X.

Insecta: Diptera (True Flies): Chironomidae: *Tanypus* sp. Chironomid (Midge) Larva

Ventral views of *Tanypus* head and abdomen



Features of Family Chironomidae

- Thorax without segmented legs
- Pair of anterior prolegs on first thoracic segment; pair of posterior prolegs on last abdominal segment
- Head capsule sclerotized (hardened) throughout and fully visible
- Mandibles opposed and moving horizontally

Features of Subfamily Tanypodinae

- Antennae (A) retractile into head
- Ligula with 4-8 teeth (B)
- Mentum almost entirely membranous or with dorsomental teeth arranged in obvious plates or longitudinal row (C)

Features of Genus *Tanypus*

- Well developed dorsomental teeth; more than three conspicuous teeth on the dorsomental plates (C)
- Ligula with five pale teeth forming a convex arch (B)
- Stout mandible with the lateral teeth appearing small compared to the rest of the mandible (D)
- Well developed lateral fringe of setae on abdomen (E)

Where Recorded at Old Woman Creek

- Within sediment consisting of mud and/or sand in open water, in water lily (*Nymphaea* sp.) beds, creek channels, and on the underside of the surface of lotus (*Nelumbo lutea*) leaves

General Ecology

- Sprawlers
- Functional feeding group: predators (worms and larval chironomids) or collectors/gatherers (diatoms and plant parts)

References: E 4.71; C&F 644,746; H 2, 52; W 67, 103-104

Photographs: Slide H dipnet 2:3 OWCI 2002. (Upper) Viewed at 100X. (Upper Center) Viewed at 400 X. (Center) Viewed at 100X. (Lower Center) Viewed at 200X. (Lower) Viewed at 100X.