

Atlas of the Aquatic Oligochaete Worms

(Phylum Annelida: Class Clitellata: Superorder Microdrili)

**Recorded at the
Old Woman Creek
National Estuarine Research Reserve
and State Nature Preserve, Ohio**

by

**Kenneth A. Krieger and Anne M. Stearns
National Center for Water Quality Research
Heidelberg University
Tiffin, Ohio, USA 44883**

February 2010

Cover Photo

An aggregation of aquatic "oligochaete" worms of the Family Naididae, Subfamily Tubificinae feeds in soft mud with their posterior ends waving in the water above. The worms became active after partly dried mud, collected in August 2008 from an agricultural ditch in Seneca County, Ohio, was flooded with water and was left undisturbed for several days. Their castings are visible in the foreground.

**Atlas of the
Aquatic Oligochaete Worms
(Phylum Annelida: Class Clitellata: Superorder Microdrili)
Recorded at the Old Woman Creek
National Estuarine Research Reserve
and State Nature Preserve, Ohio**

Acknowledgements

The authors are grateful for 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. Dr. Deedee Kathman, Environmental Division, Tennessee Department of Transportation, graciously updated the authors on recent taxonomic developments and suggested numerous improvements to the atlas. This work was funded under contract to Heidelberg University by the Ohio Department of Natural Resources.

This publication was supported in part by Grant Number H50/CCH524266 from the Centers for Disease Control and Prevention. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of Centers for Disease Control and Prevention.

The Old Woman Creek National Estuarine Research Reserve in Ohio is part of the National Estuarine Research Reserve System (NERRS), established by Section 315 of the Coastal Zone Management Act, as amended. Additional information about the system can be obtained from the Estuarine Reserves Division, Office of Ocean and Coastal Resource Management, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, 1305 East West Highway – N/ORM5, Silver Spring, MD 20910. Financial support for this publication was provided by a grant under the Federal Coastal Zone Management Act, administered by the Office of Ocean and Coastal Resource Management, National Oceanic and Atmospheric Administration, Silver Spring, MD.

Copies of this publication are available from the
Ohio Department of Natural Resources - Division of Wildlife
2514 Cleveland Road East
Huron, Ohio 44839

This publication can be downloaded at www.heidelberg.edu/wql/educationoutreach/reports.

Introduction

Trained biologists and amateur naturalists often encounter lists of animals and plants when they read published scientific reports or visit nature centers. Rarely do they have access to photographs for each member of the list. This document constitutes one of several chapters of a comprehensive atlas of the biota of the Old Woman Creek coastal wetland system (OWC) along Lake Erie in Ohio. This chapter provides a detailed photographic record of aquatic segmented worms in OWC belonging to the Class Clitellata, Superorder Microdrili, often known as “oligochaetes”.¹ The worms included here represent three orders: Enchytraeida, which includes family Enchytraeidae; Tubificida, which includes the family Naididae and subfamilies Naidinae and Tubificinae; and Lumbriculida, consisting of the Family Lumbriculidae.

Invertebrates occur in great abundance in freshwater ecosystems, including Great Lakes wetlands such as the marshes, swamps and open water that make up OWC. Many freshwater invertebrates, including most oligochaetes, are so small that special attention must be given to collecting – and seeing – them. Consequently, most oligochaete worms go unnoticed by casual visitors to aquatic habitats. Yet because of their great abundance, they provide an important food resource for fishes and many predatory aquatic invertebrates. They are a very diverse group, comprised of thousands of species worldwide and adapted to a



Styleria lacustris (Linnaeus) – a common oligochaete of Lake Erie

variety of aquatic, semi-aquatic, and terrestrial habitats and ecological conditions. Therefore, the kinds of oligochaetes found in a stream, lake, or wetland can reveal important information about the quality, or “health”, of the ecosystem.

Oligochaete worms range in length from less than 2 mm up to 28 cm, although most are smaller than 3 cm (1.2 inches). Once collected, careful observation of minute structures through a compound microscope at magnifications as high as 400X or even 1000X is required to distinguish one kind of oligochaete from another. Several features can only be seen after “clearing” specimens (making them mostly transparent). Detailed processing methods are described in the references listed below.

This atlas presents photographs and detailed explanations of critical diagnostic features that permit the correct identification of most oligochaete worms found to date at OWC to the level of species.

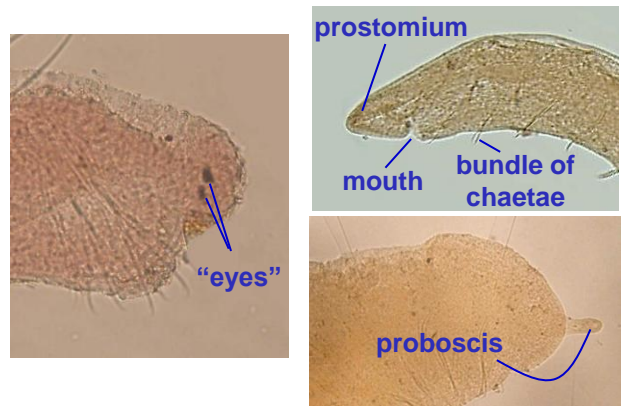
¹For a discussion of the uncertainty of the taxonomic status of the term Oligochaeta, refer to Brinkhurst, R.O., and S.R. Gelder (2001. Ch. 12. Annelida: Oligochaeta, including Branchiobdellidae, pp. 432, 441-444. In: Thorp, J.H., and A.P. Covich. *Ecology and classification of North American freshwater invertebrates*. 2nd Ed. Academic Press).

Characteristics of Oligochaete Worms

Many oligochaete worms begin life as eggs deposited in a cocoon. Worms hatch between eight days and 10 weeks after deposition and superficially resemble adults except being smaller in size. All oligochaete species reproduce sexually, but some, especially those in Subfamily Naidinae, also reproduce asexually by transverse division or budding. Immature individuals may exhibit most or all of the diagnostic features necessary for identification to species. However, some species in Subfamily Tubificinae require mature specimens possessing fully-developed reproductive organs for correct identification. Thus, this atlas illustrates the identifying features for mature individuals of those species.

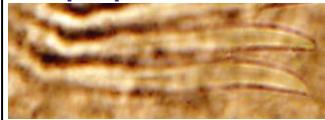
The cylindrical body is characterized by a series of segments. Some species of Naidinae possess a pair of simple “**eyes**” that appear as dark clusters of cells at the anterior end. In all oligochaete worms, the anterior end (first segment) extends beyond the **mouth** as a **prostomium**, which may be elongated into a slender **proboscis**. In general, each subsequent segment contains bristle-like **chaetae** (singular: chaeta) clustered in **bundles**, usually with a ventral pair of bundles and also a dorsal pair, depending on the species and body segment. The outer ends of the chaetae are **simple-pointed**, **bifid** (having two teeth), **oar-shaped**, **pectinate** (having intermediate teeth in addition to the two main teeth), or **palmate** (fan-shaped with many teeth). The dorsal bundles of some species also contain very elongate **hair chaetae**. Paired transparent **penis sheaths** of diagnostic shapes (three examples shown) are visible in segment XI of mature individuals of some species of the Tubificinae. The posterior end of some worms, such as members of the genus *Dero*, feature **gills** and/or **palps**.

Anterior ends of some oligochaete worms

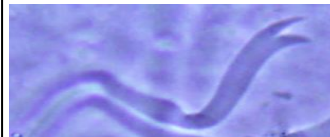


Shapes of Chaetae

simple-pointed



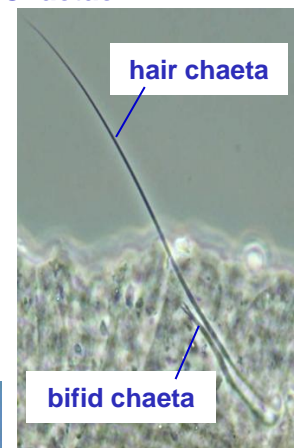
bifid



pectinate



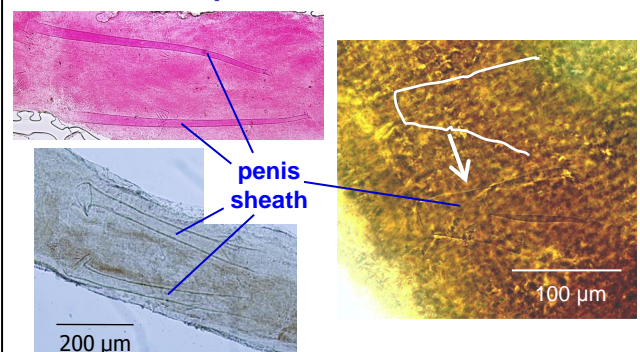
oar-shaped



palmate



Examples of Penis Sheaths



Layout of this Atlas

The following pages are organized alphabetically by Order, Family and Subfamily. The authors have identified 37 species in three families plus Family Enchytraeidae, for which specimens were not identified to genus or species. All photographs are from samples collected by us since 1989 in numerous habitats within the OWC wetland system or from Lake Erie since 1978. The exact specimens photographed are recorded at the bottom of each page. Several species in our Lake Erie collections not yet reported in OWC are not included.

This publication should not be used as the sole source to identify the species of aquatic oligochaete worms of OWC because it is likely that additional, though uncommon, species will be found in new collections. The references cited on this page should be used to obtain definitive identifications.

In general, each species of oligochaete worm is illustrated and described on a single page of this atlas. In instances where similarities between two or three species are great, more than one species is illustrated to allow for easier comparison. Because the identifying features of the family and genus are repeated on each page, the page for each species (or group of similar species) can be used independently without having to refer back to previous pages. Photographs are labeled with letters and lines that point to diagnostic structures.

Beneath the descriptive features, each page lists where within OWC the species

has been found. It is likely that future collections will reveal many of the species in additional habitats. For a few species, special notes about taxonomy, habitat or water quality requirements are included.

All information on each page of this atlas was derived from three references (one primary, and two secondary), which are abbreviated as shown below followed by the page number(s):

Primary –

K&B = Kathman, R. D., and R. O. Brinkhurst. 1999. *Guide to the Freshwater Oligochaetes of North America*. Aquatic Resources Center, College Grove, Tennessee.

Secondary –

H&K = Hiltunen, J. K. and D. J. Klemm. 1980. *A guide to the Naididae (Annelida: Clitellata: Oligochaeta) of North America*. EPA-600/4-80-031. U.S. Environmental Protection Agency, Cincinnati, Ohio.

SK&H = Stimson, K. S., D. J. Klemm, and J. K. Hiltunen. 1982. *A guide to the Freshwater Tubificidae (Annelida: Clitellata: Oligochaeta) of North America*. EPA-600/3-82-033. U.S. Environmental Protection Agency, Cincinnati, Ohio.

Another useful reference is Brinkhurst, R. O., and S. R. Gelder. 2001. Chapter 12. Annelida: Oligochaeta, including Branchiobdellidae. *In: J. H. Thorp and A. P. Covich. Ecology and Classification of North American Freshwater Invertebrates*. 2nd Ed. Academic Press.

Note regarding printing: Satisfactory resolution of most fine structures can be obtained by enlarging photos on the computer screen; inferior resolution is often observed on printed pages, depending on printer and paper quality.

Checklist of Species of Aquatic Oligochaete Worms Reported in the OWC Wetland System

Order Enchytraeida

Family Enchytraeidae

(Members of this family were not identified to genus or species.)

Order Lumbriculida

Family Lumbriculidae

Lumbriculus variegatus
Stylodrilus heringianus

Order Tubificida

Family Naididae

Subfamily Naidinae

Amphichaeta leydigi
*Chaetogaster diaphanus**
Chaetogaster diastrophus
Chaetogaster limnaei
Dero furcata
Dero nivea
Dero obtusa
Dero vaga
Haemonais waldvogeli
*Nais barbata**
Nais communis
Nais elinguis
Nais pardalis
*Nais pseudobtusa**
Nais variabilis

Order Tubificida (continued)

Family Naididae (continued)

Subfamily Naidinae (continued)

Ophidonais serpentina
Pristina acuminata†
Pristina jenkiniae†
Pristina longiseta
Pristina osborni† (= *P. sima*‡)
Vejdovskyella comata
Vejdovskyella intermedia

Subfamily Tubificinae

Aulodrilus limnobius
Aulodrilus pigueti
Aulodrilus pluriseta
Branchiura sowerbyi
Ilyodrilus templetoni
Limnodrilus cervix
Limnodrilus claparedeianus
Limnodrilus hoffmeisteri
Limnodrilus maumeensis
Limnodrilus profundicola
Limnodrilus udekemianus
Quistadrilus multisetosis
*Rhyacodrilus coccineus**

* Species was reported but suitable specimens could not be located.

† Formerly assigned to genus *Pristinella*, which is now considered to be invalid (Collado, R., and R. M. Schmelz. 2000. *Pristina silvicola* and *Pristina terrena* spp. nov., two new soil-dwelling species of Naididae (Oligochaeta, Annelida) from the tropical rain forest near Manaus, Brazil, with comments on the genus *Pristinella*. *J. Zool., Lond.*: 251:509-516.)

‡ Kathman and Brinkhurst (1999, *Guide to the freshwater oligochaetes of North America*, Aquatic Resources Center, College Grove, Tennessee) state that *Pristina sima* is probably a synonym of *P. osborni*.

Annelida: Oligochaeta
Enchytraeida: Enchytraeidae
Enchytraeid Worms



Features of Family Enchytraeidae

- No hair chaetae (A)
- Only simple-pointed chaetae (B) in dorsal and ventral bundles
- Two or more chaetae in each bundle of chaetae

Where Recorded at Old Woman Creek

Sediment in sedge (*Carex* sp.) meadow

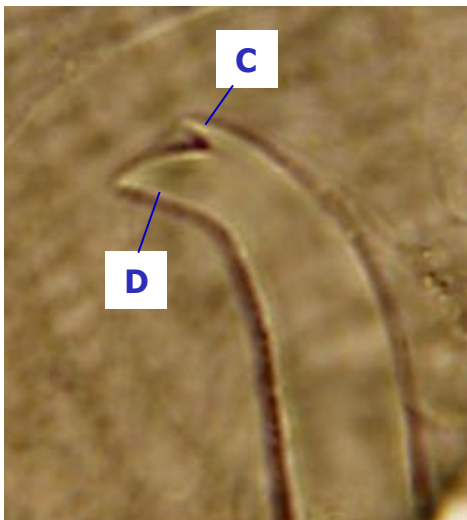
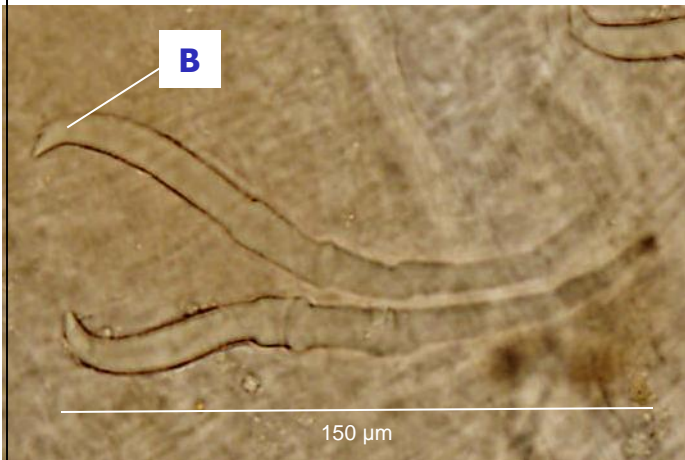
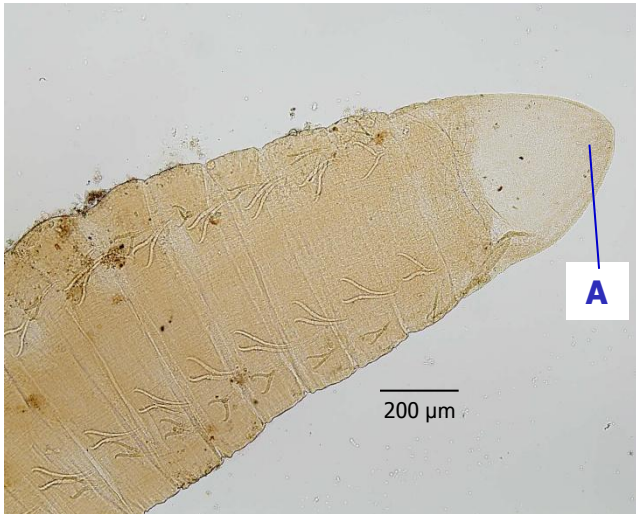
References: K&B 32-47

Photographs: Sample OWC Olig. N. Sedge
May 20, 1992

Full view photographed at 100X, anterior view
(A) at 400X, chaetae close-up (B) at 1000X



Annelida: Oligochaeta
Lumbriculida: Lumbriculidae: *Lumbriculus variegatus*
Aquatic Earthworm



Features of Family Lumbriculidae

Adult length up to 100 mm; worms large compared to Naididae and Tubificidae
Two chaetae per bundle (8 per segment)
Chaetae S-shaped (B)
No hair chaetae

Features of Genus Lumbriculus

No proboscis on prostomium (A)
Chaetae bifid (B), upper tooth (C) much smaller than lower tooth (D)
Mature specimens without permanently everted penes in segment X
Living specimens dark red, often with green tinge toward anterior end
Body elongate, cylindrical, fragments easily; length to 100 mm or more

Features of Species *L. variegatus* (Müller)

Chaetae 150-200 μm (up to 0.20 mm) long

Where Recorded at Old Woman Creek

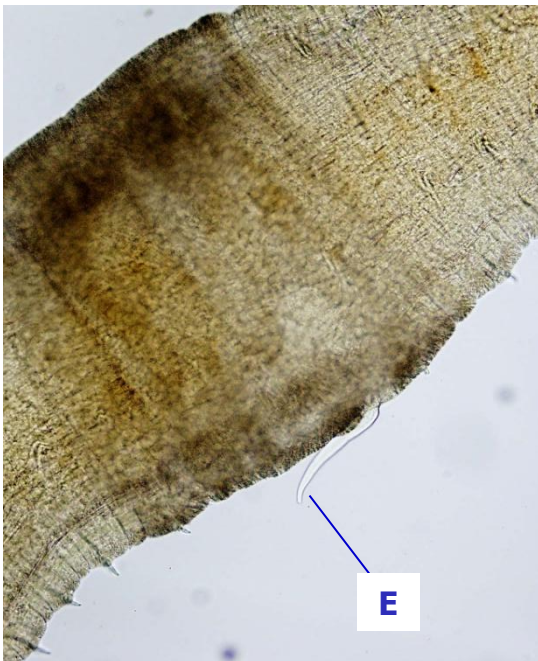
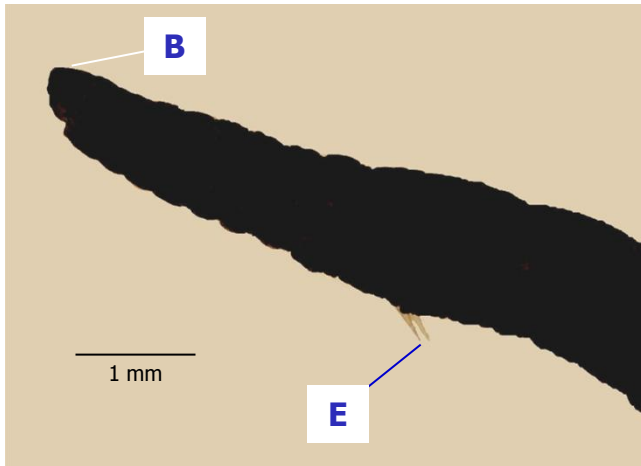
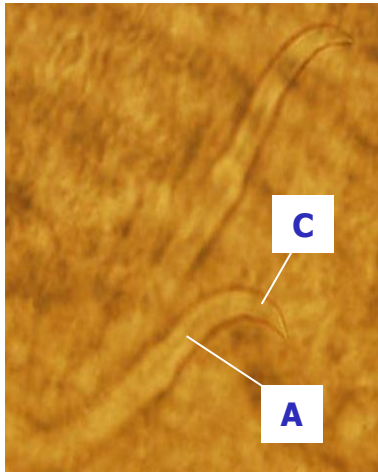
Sediments in sedge (*Carex* sp.) meadow and swamp forest

References: K&B 203-210, 226

Photographs: OWC N. sedge meadow May 20, 1992

Anterior view photographed at 100X, pair of chaeta at 400X, single chaeta at 1000X

Annelida: Oligochaeta
Lumbriculida: Lumbriculidae: *Stylodrilus heringianus*
Aquatic Earthworm



Features of Family Lumbriculidae

Adult length up to 100 mm; worms large compared to Naididae and Tubificidae
 Two chaetae per bundle (8 per segment)
 Chaetae S-shaped (A)
 No hair chaetae

Features of Genus *Stylodrilus*

No proboscis on prostomium (B)
 Chaetae bifid

Features of Species *S. heringianus* Claparède

Chaetae simple pointed (C), or bifid with very short upper teeth (D)
 Mature specimens with two permanently everted long, tapering penes on segment X (E)
 Living specimens pale in color
 Body more like that of Tubificidae, tapering; does not fragment readily; length 25-40 mm

Where Recorded at Old Woman Creek

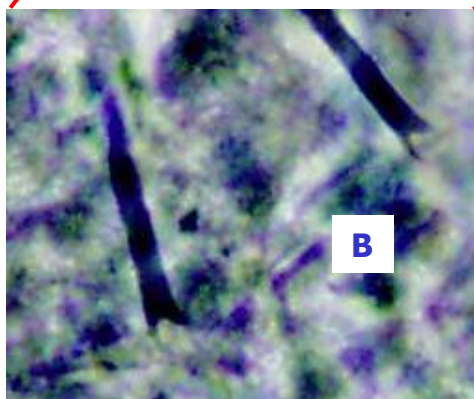
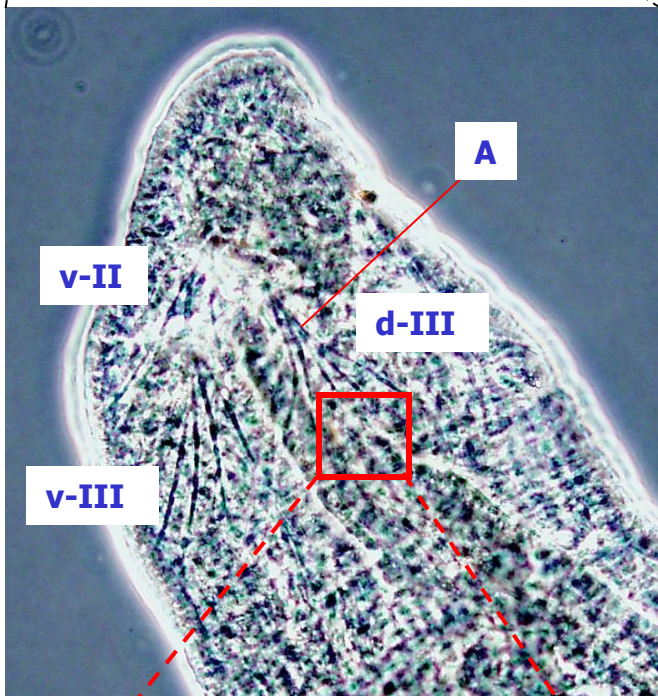
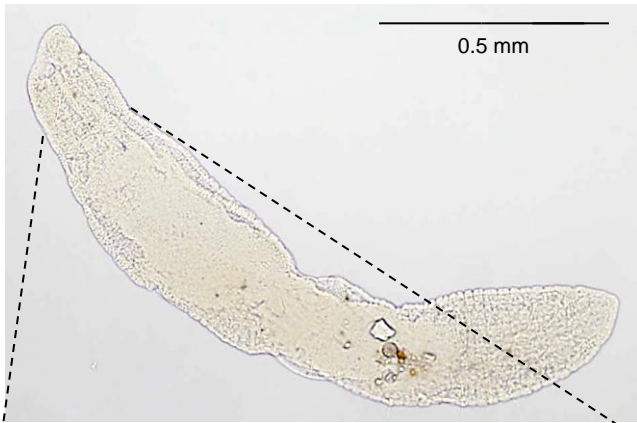
Unknown. Specimens have been collected from Lake Erie.

References: K&B 203-210, 232

Photographs: ECC4 057 BP1 June 16, 2004 (Lake Erie)

Anterior end photographed at 40X, close-up of penes at 100X, chaetae at 400X

Annelida: Oligochaeta
Tubificida: Naididae: Naidinae: *Amphichaeta leydigi*
Naidid Worms



Features of Subfamily Naidinae

- More than 2 chaetae per bundle in some segments
- Segments II through V without dorsal chaetae in some species
- Ventral chaetae of II through V may differ from chaetae in more-posterior segments
- Chaetae never all simple-pointed
- "Eyes" present or absent
- Adult length 2-10 mm

Features of Genus Amphichaeta

- No hair chaetae
- Dorsal chaetae begin in segment III (**A**)
- Gap (extra length) between dorsal bundles of III and IV so that dorsal bundle III (**d-III**) is grouped with ventral bundles II (**v-II**) and III (**v-III**)
- Prostomium without proboscis

Features of Species *A. leydigi* Tauber

- Usually 5 chaetae in dorsal bundle of III (**A**), fewer in more-posterior segments
- Upper and lower teeth on chaetae similar in length (**B**)
- Anterior dorsal chaetae with one thin tooth and one thicker tooth (**B**)

Where Recorded at Old Woman Creek

Sediments of open water, lotus (*Nelumbo lutea*) beds, and barrier beach

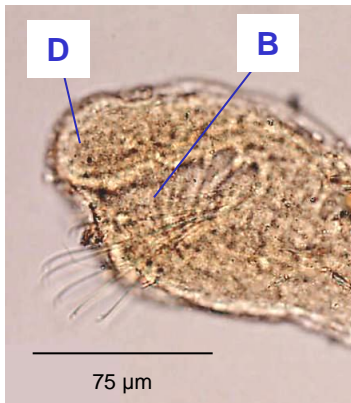
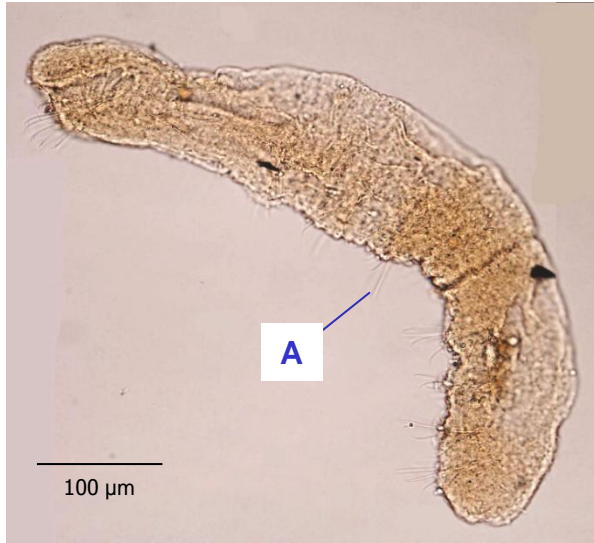
References: K&B 32-47; H&K 10-15

Photographs: ECC 127 BP1 May 20, 2004
 Full view photographed at 100X, anterior view at 400X, chaetae close-up at 1000X

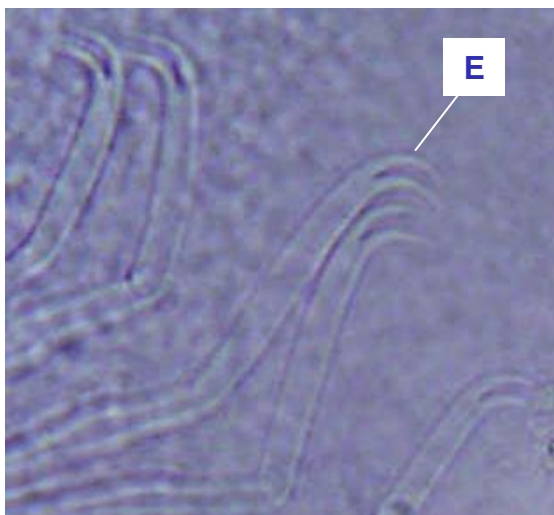
Annelida: Oligochaeta

Tubificida : Naididae: Naidinae: *Chaetogaster diaphanus*, *Chaetogaster diastrophus*, and *Chaetogaster limnaei* Naidid Worms

C. diastrophus



C. limnaei



Features of Subfamily Naidinae

More than 2 chaetae per bundle in some segments
Segments II through V without dorsal chaetae in some species

Ventral chaetae of II through V may differ from chaetae in more-posterior segments

Chaetae never all simple-pointed

"Eyes" present or absent

Adult length 2-10 mm

Features of Genus Chaetogaster

No dorsal chaetae

Ventral chaetae present (A)

Enlarged pharynx (B)

Features of Species *C. diaphanus* (Gruithuisen)

Prostomium inconspicuous, truncated

Ventral chaetae bifid with upper tooth longer than lower tooth

Ventral chaetae in segment II 145-350 μm long; 6-13 ventral chaetae per bundle in II, 4-10 per bundle from VI posteriorly

(No specimens available)

Features of Species *C. diastrophus* (Gruithuisen)

Prostomium (D) obvious, rounded

Ventral chaetae bifid with upper tooth (C) longer than lower tooth

Ventral chaetae in segment II 70-110 μm long; 4-8 ventral chaetae per bundle in II, 3-7 per bundle from VI posteriorly

Features of Species *C. limnaei* von Baer

Prostomium short, vestigial

Ventral chaetae bifid with teeth strongly curved, upper tooth (E) shorter than lower tooth; up to 20 chaetae per ventral bundle

Where Recorded at Old Woman Creek

Sediments of barrier beach and lotus (*Nelumbo lutea*) beds

References: K&B 32, 42; H&K 10-11

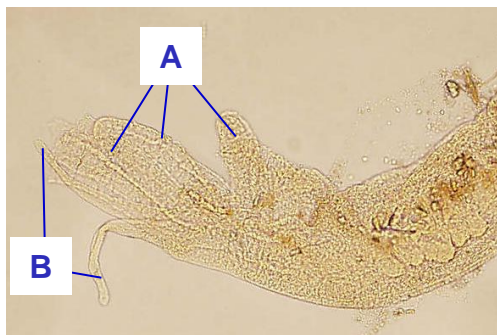
Photographs: OWC L1C1 March 12, 1992; OWC sediment and logs near *Nymphaea* October 12, 1990

Full view (A) photographed at 100X, anterior view (B) at 400X, chaetae close-ups at 1000X

Annelida: Oligochaeta

Tubificida: Naididae: Naidinae: *Dero (Aulophorus) furcata* Naidid Worms

Dero furcata



Features of Subfamily Naidinae

More than 2 chaetae per bundle in some segments
Segments II through V without dorsal chaetae in some species
Ventral chaetae of II through V may differ from chaetae in more-posterior segments
Chaetae never all simple-pointed
“Eyes” present or absent
Adult length 2-10 mm

Features of Genus *Dero*

No proboscis
Dorsal chaetae begin in segment IV, V or VI, with 1-2 hair chaetae and 1-2 bifid or pectinate chaetae
Gills and/or palps on posterior end

Features of Species *Dero (Aulophorus) furcata* (Müller)

Dorsal bundles begin in segment V, each with 1 hair chaeta and 1 bifid chaeta
Dorsal bifid chaetae with short upper teeth
3-4 pairs of gills (A) and a pair of palps (B) on posterior end
Ventral chaetae of segments II-V with upper tooth longer than lower (C); those of more-posterior segments with subequal teeth (D)

Where Recorded at Old Woman Creek

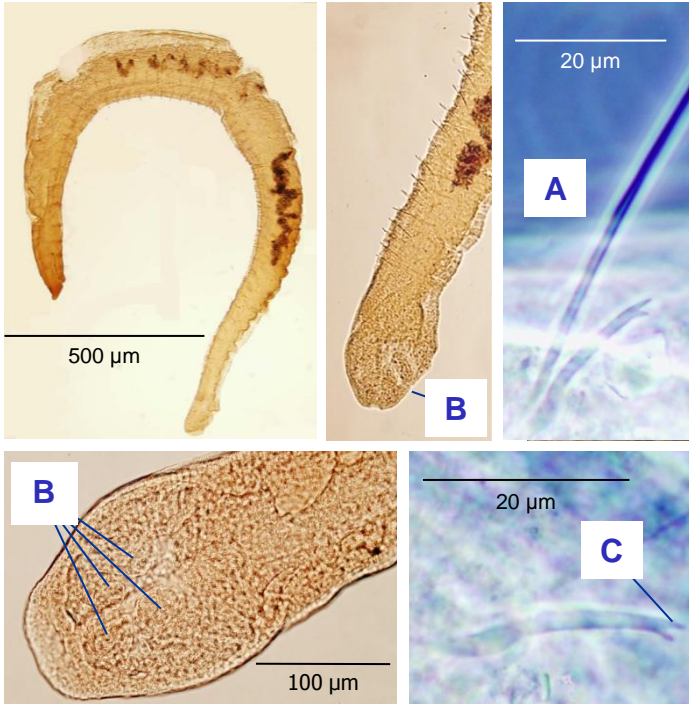
Sediment near shore

References: K&B 32, 36, 66, 70, 72, 74; H&K 10-18

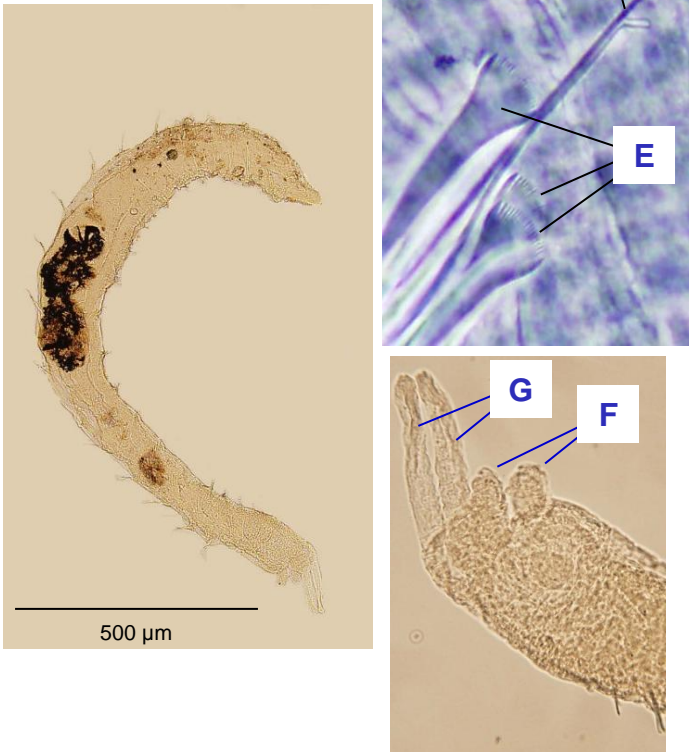
Photographs: OWC Ash – 1 July 17, 2002
Full view photographed at 100X, anterior view at 400X, chaetae close-up at 1000X

Annelida: Oligochaeta
Tubificida: Naididae: Naidinae: *Dero (Dero) nivea* and
Dero (Aulophorus) vaga
Naidid Worms

Dero (Dero) nivea



Dero (Aulophorus) vaga



Features of Subfamily Naidinae

More than 2 chaetae per bundle in some segments
 Segments II through V without dorsal chaetae in some species
 Ventral chaetae of II through V may differ from chaetae in more-posterior segments
 Chaetae never all simple-pointed
 “Eyes” present or absent
 Adult length 2-10 mm

Features of Genus *Dero*

No proboscis
 Dorsal chaetae begin in segment IV, V or VI, with 1-2 hair chaetae and 1-2 bifid or pectinate chaetae
 Gills and/or palps on posterior end

Features of Species *Dero (Dero) nivea Aiyer*

Dorsal bundles begin in segment VI, each with 1 hair chaeta and 1 bifid chaeta (A)
 Three pairs of gills on posterior end (B) (usually only 2 pairs seen – 3rd is reduced)
 Teeth on dorsal chaetae of equal length (C)

Features of Species *Dero (Aulophorus) vaga (Leidy)*

Dorsal bundles begin in segment VI, each with 1-3 hair chaetae (D) and 1-3 palmate chaetae (E)
 1-2 pairs of gills (F) and a pair of palps (G) on posterior end

Where Recorded at Old Woman Creek

D. nivea – Sediments of open water, lotus (*Nelumbo lutea*) beds, sedge (*Carex* sp.) meadow, barrier beach; epiphytic on lotus
D. vaga – sediment of swamp pond

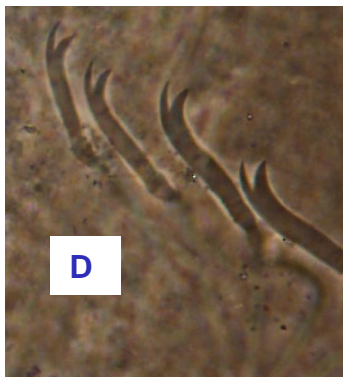
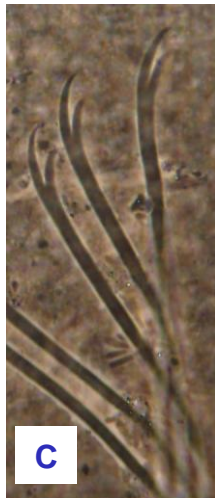
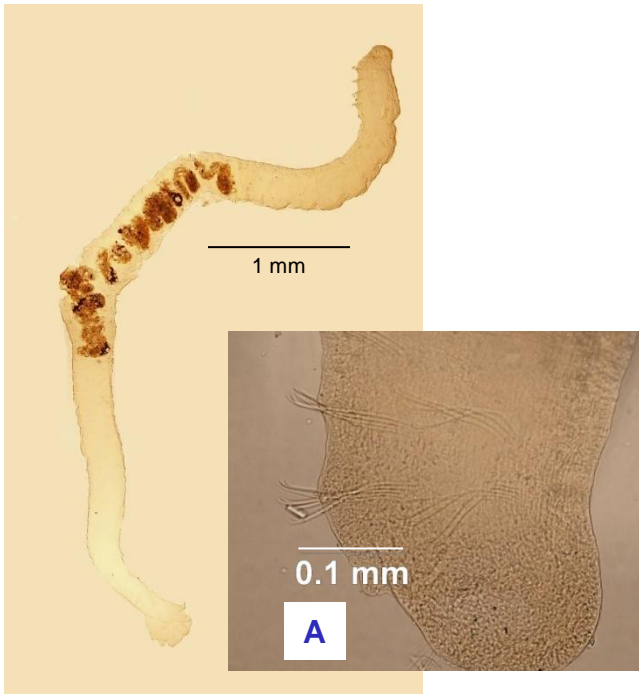
References: K&B 32, 36, 66, 72, 74, H&K 10-18

Photographs: OWC Swamp Pond October 5, 1992; OWC Dar -2 October 2, 2002; OWC A53-1 April 18, 2002

Full view photographed at 100X, anterior view at 400X, chaetae close-ups at 1000X

Annelida: Oligochaeta
Tubificida: Naididae: Naidinae: *Dero* (*Dero*) *obtusa*
Naidid Worms

Dero (*Dero*) *obtusa*



Features of Subfamily Naidinae

More than 2 chaetae per bundle in some segments
 Segments II through V without dorsal chaetae in some species
 Ventral chaetae of II through V may differ from chaetae in more-posterior segments
 Chaetae never all simple-pointed
 "Eyes" present or absent
 Adult length 2-10 mm

Features of Genus *Dero*

No proboscis
 Dorsal chaetae begin in segment IV, V or VI, with 1-2 hair chaetae and 1-2 bifid or pectinate chaetae
 Gills and/or palps on posterior end

Features of Species *Dero* (*Dero*) *obtusa* d'Udekem

Very similar in appearance to *D. nivea* but often larger (body length up to 17 mm)
 Dorsal bundles begin in segment VI, each with 1 hair chaeta and 1 bifid chaeta
 Anterior ventral chaetae 95-120 μ m in length (A) (as opposed to 65-84 μ m in *D. nivea*)
 3 pairs of gills on posterior end (B)
 Ventral chaetae of segments II-V with upper tooth longer than lower (C); those of more-posterior segments with subequal teeth (D)

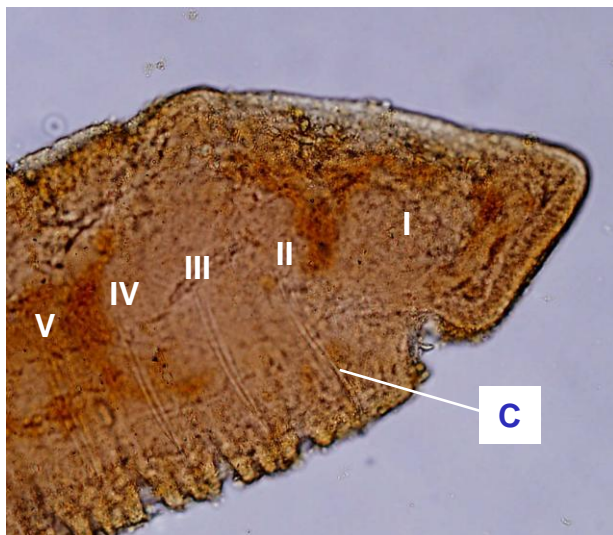
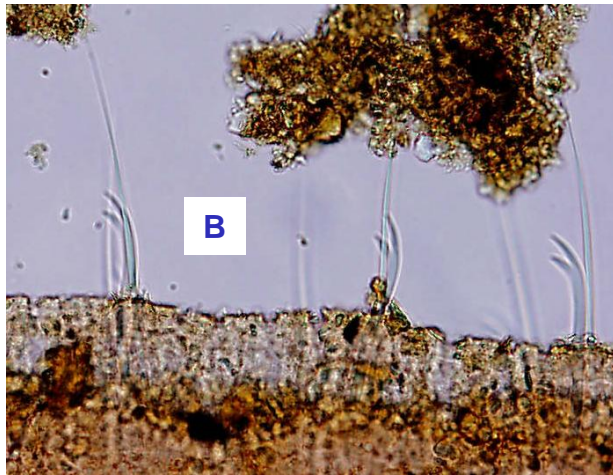
Where Recorded at Old Woman Creek

In lotus (*Nelumbo lutea*) beds

References: K&B 32, 36, 66, 72, 74;
 H&K 10-18

Photographs: OWC BL-1 September 25, 2002
 Full view photographed at 40X, anterior view at 400X, chaetae close-ups at 1000X

Annelida: Oligochaeta
Tubificida: Naididae: Naidinae: *Haemonais waldvogeli*
Naidid Worms



Features of Subfamily Naidinae

More than 2 chaetae per bundle in some segments
 Segments II through V without dorsal chaetae in some species
 Ventral chaetae of II through V may differ from chaetae in more-posterior segments
 Chaetae never all simple-pointed
 "Eyes" present or absent
 Adult length 2-10 mm

Features of Genus *Haemonais*

No proboscis
 Dorsal chaetae begin posterior to segment XVIII (A), although present in segment II in some specimens
 Hair chaetae present

Features of Species *Haemonais waldvogeli* Bretscher

(There is only one species in this genus.)
 Dorsal bundles with 1 hair chaeta and 1 curved bifid chaeta, upper tooth of which is longer than lower tooth (B)
 Ventral chaetae begin in segment II (C)

Where Recorded at Old Woman Creek

Sediment in sedge (*Carex* sp.) meadow

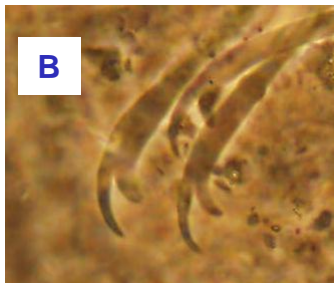
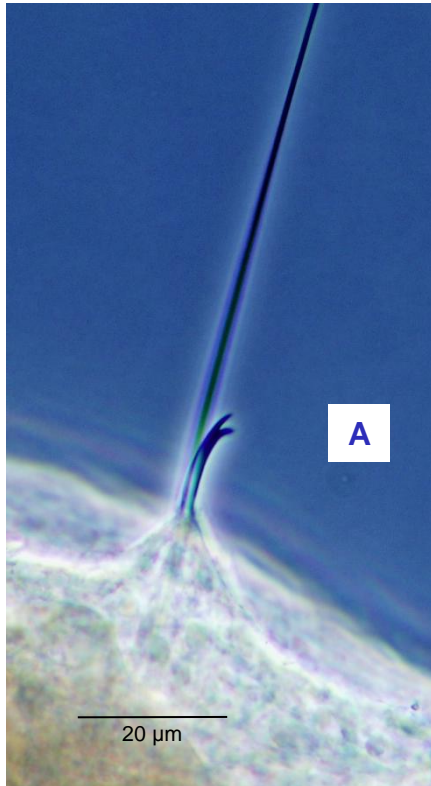
References: K&B 32, 36, 64; H&K 10-16

Photographs: OWC Olig N. Sedge 1 April 9, 1992

Full view photographed at 100X, anterior view at 400X, chaetae close-up at 400X

Annelida: Oligochaeta
Tubificida: Naididae: Naidinae: *Nais communis*
Naidid Worms

Nais communis



Features of Subfamily Naidinae

More than 2 chaetae per bundle in some segments
Segments II through V without dorsal chaetae in some species
Ventral chaetae of II through V may differ from chaetae in more-posterior segments
Chaetae never all simple-pointed
“Eyes” present or absent
Adult length 2-10 mm

Features of Genus *Nais*

No proboscis
Dorsal chaetae begin in segment VI
1-3 hair chaetae per dorsal bundle (5 in *N. barbata*)
Ventral chaetae of segments II-V differ from those in remaining segments

Features of Species *Nais communis* Piquet

Dorsal bundles with 1-2 bifid chaetae that have short, divergent teeth and 1-2 hair chaetae (A)
Ventral chaetae in segments II-V only slightly different from those more posteriorly (B)

Where Recorded at Old Woman Creek

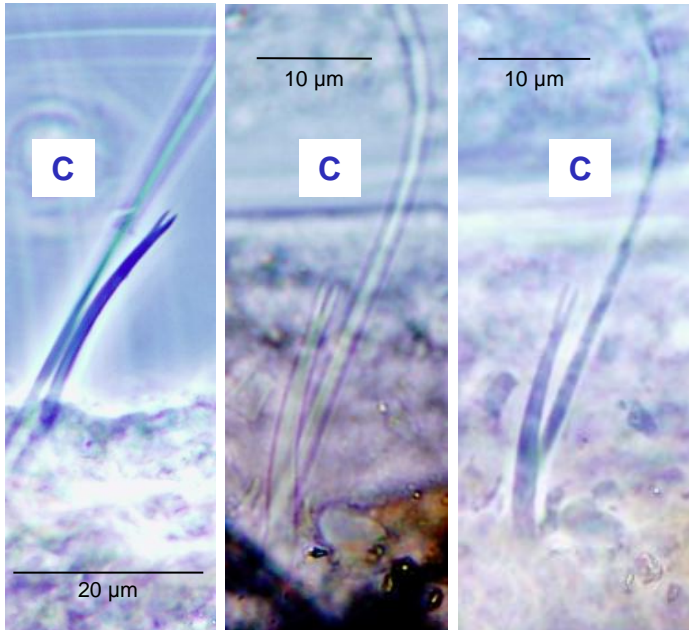
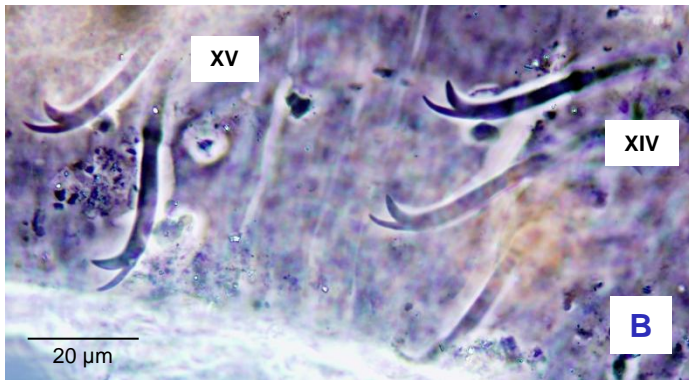
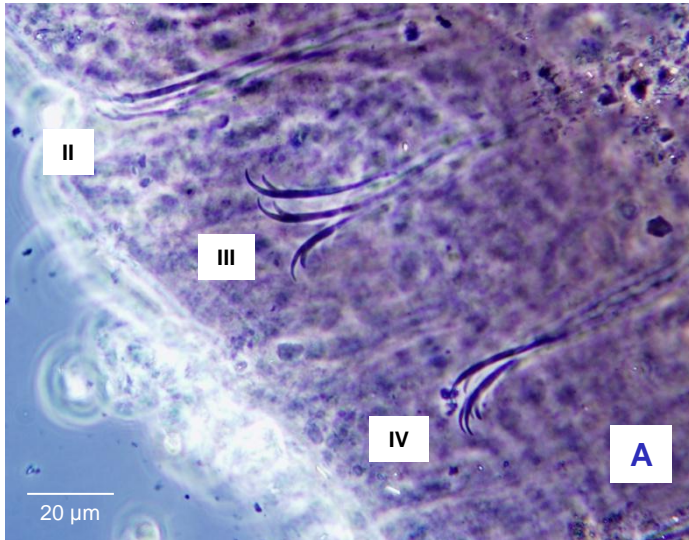
Sediment of lotus (*Nelumbo lutea*) beds and epiphytic on lotus and arrowhead (*Sagittaria*) bed

References: K&B 32-41, 80-81, 88-89; H&K 10, 12, 16, 19-22

Photographs: OWC Dar -1 October 2, 2002 (chaetae close-up, B); Lake Erie ECC4 028 BP1 21-24 Jun 04 1.9 (A). Photographed at 1000X.

Annelida: Oligochaeta
Tubificida: Naididae: Naidinae: *Nais elinguis*
Naidid Worms

Nais elinguis



Features of Subfamily Naidinae

More than 2 chaetae per bundle in some segments
 Segments II through V without dorsal chaetae in some species
 Ventral chaetae of II through V may differ from chaetae in more-posterior segments
 Chaetae never all simple-pointed
 “Eyes” present or absent
 Adult length 2-10 mm

Features of Genus *Nais*

No proboscis
 Dorsal chaetae begin in segment VI
 1-3 hair chaetae per dorsal bundle (5 in *N. barbata*)
 Ventral chaetae of segments II-V (A) differ from those in remaining segments (B)

Features of Species *Nais elinguis* Müller

Ventral chaetae in segments II-V (A) only slightly different from those more posteriorly (B)
 Dorsal bundles with 1-3 bifid chaetae that have long, parallel teeth and 1-3 hair chaetae (C)

Where Recorded at Old Woman Creek

Sediment of lotus (*Nelumbo lutea*) beds and epiphytic on lotus

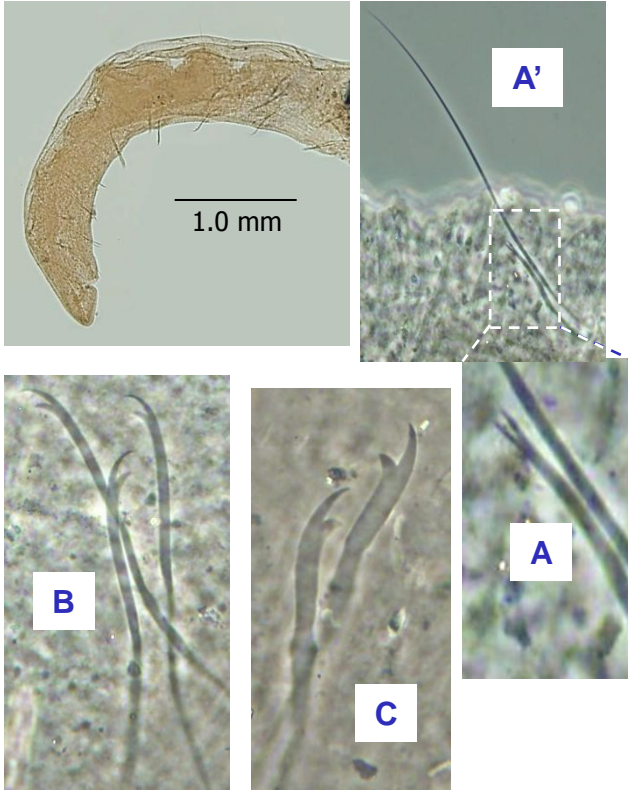
References: K&B 32-41, 80-81, 88-89; H&K 10, 12, 16, 19-22

Photographs: Lake Erie 63R 780616

Annelida: Oligochaeta

Tubificida: Naididae: Naidinae: *Nais pardalis* and *Nais variabilis* Naidid Worms

Nais pardalis



Features of Subfamily Naidinae

More than 2 chaetae per bundle in some segments
Segments II through V without dorsal chaetae in some species

Ventral chaetae of II through V may differ from chaetae in more-posterior segments

Chaetae never all simple-pointed

“Eyes” present or absent

Adult length 2-10 mm

Features of Genus *Nais*

No proboscis

Dorsal chaetae begin in segment VI

1-3 hair chaetae per dorsal bundle (5 in *N. barbata*)

Ventral chaetae of segments II-V (B) differ from those in remaining segments (C)

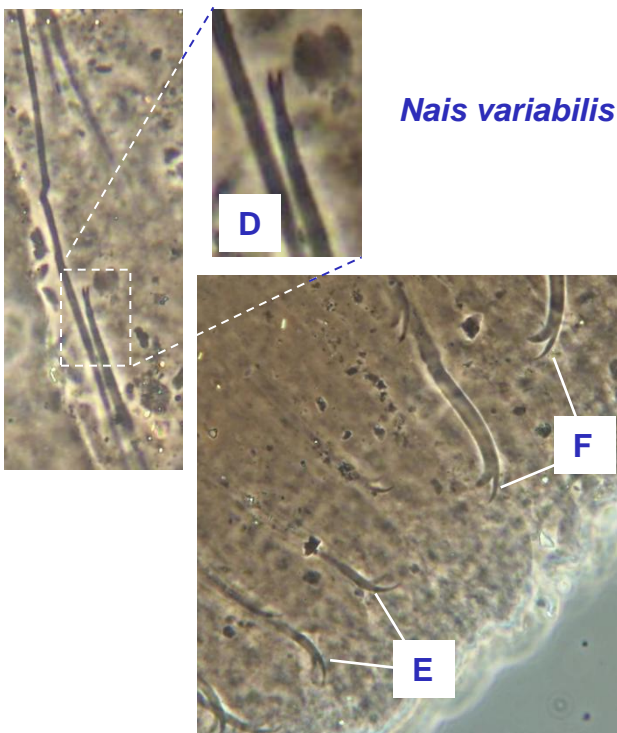
Features of Species *Nais pardalis* Piquet

Dorsal bundle with 1-2 bifid chaetae having short, parallel teeth (A) and 1-2 hair chaetae (A')

Ventral chaetae of segments II-V with upper teeth longer than lower (B)

Ventral chaetae of segments VI and posteriorly of normal size and teeth of variable length, or enlarged with upper tooth 2-3 times the length of lower tooth (C)

Nais variabilis



Features of Species *Nais variabilis* Piquet

“Eyes” present on some specimens

Dorsal bundle with 1-2 bifid chaetae having short, parallel teeth and 1-2 hair chaetae (D)

Anterior ventral chaetae with upper tooth longer than lower (E); posteriorly of segment V, upper teeth and thicker lower teeth of similar length (F)

Where Recorded at Old Woman Creek

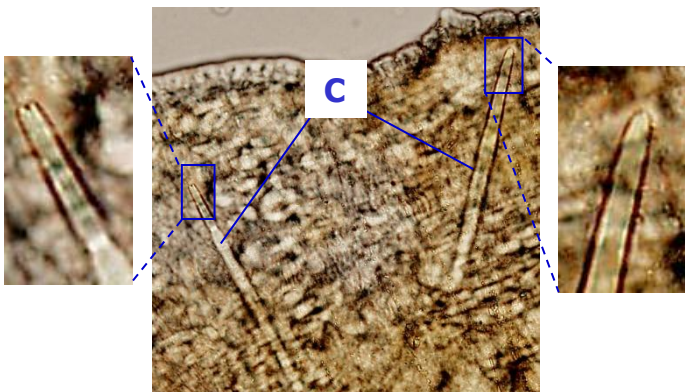
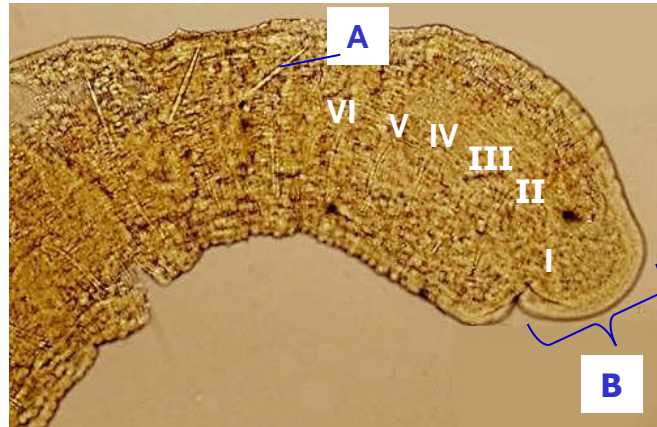
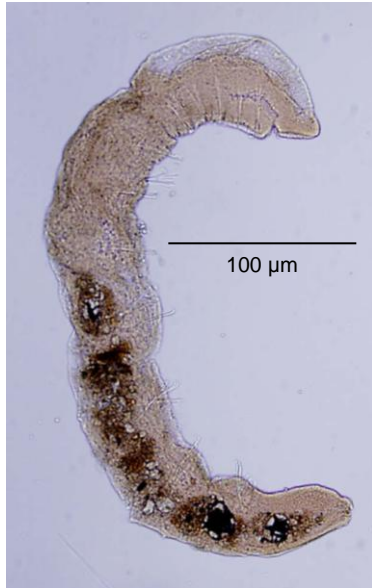
Sediments in open water, swamp pond and lotus (*Nelumbo lutea*) beds; epiphytic on lotus and giant bur-reed (*Sparganium eurycarpum*)

References: K&B 40, 80, 96, 98; H&K 10-24

Photographs: OWC L1C1 #30 October 28, 1989 4 of 4;
OWC L2B1 #30 October 28, 1989 2 of 3

Anterior view photographed at 100X; chaetae close-ups at 1000X

Annelida: Oligochaeta
Tubificida: Naididae: Naidinae: *Ophidonais serpentina*
Naidid Worms



Features of Subfamily Naidinae

More than 2 chaetae per bundle in some segments
 Segments II through V without dorsal chaetae in some species
 Ventral chaetae of II through V may differ from chaetae in more-posterior segments
 Chaetae never all simple-pointed
 "Eyes" present or absent
 Adult length 2-10 mm

Features of Genus *Ophidonais*

Dorsal chaetae (A) begin in segment VI or further posteriorly (VII in photo)
 Note: Some individuals may have shed dorsal chaetae and have none
 No proboscis or hair chaetae

Features of Species *Ophidonais serpentina* (Müller)

Prostomium short, often upturned (B)
 Dorsal chaetae very straight (C), tips blunt or slightly toothed
 (This is the only North American species of *Ophidonais*.)

Where Recorded at Old Woman Creek

Sediment of open water

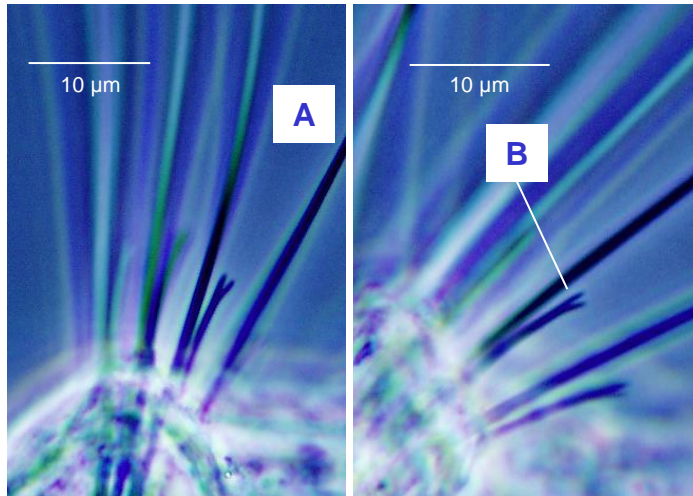
References: K&B 32-47; H&K 10

Photographs: Sample OWC L2A1 #30 May 31, 1990

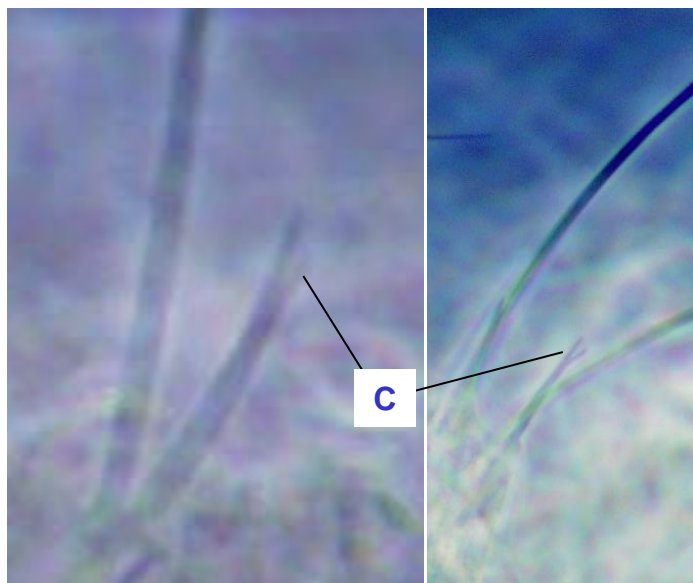
Full view photographed at 100X, anterior view at 400X, chaetae close-ups at 1000X

Annelida: Oligochaeta
Tubificida: Naididae: Naidinae:
Pristina acuminata and *Pristina jenkiniae*
Naidid Worms

Pristina acuminata



Pristina jenkiniae



Features of Subfamily Naidinae

More than 2 chaetae per bundle in some segments
 Segments II through V without dorsal chaetae in some species
 Ventral chaetae of II through V may differ from chaetae in more-posterior segments
 Chaetae never all simple-pointed
 "Eyes" present or absent
 Adult length 2-10 mm

Features of Genus Pristina

Hair chaetae present
 Dorsal and ventral chaetae begin in segment II

Features of Species Pristina acuminata (Liang)¹

No proboscis
 Dorsal bundle (A) with 2-5 hair chaetae and 2-5 bifid chaetae that have slightly divergent teeth, one longer than the other (B)
Note: K&B suggest that specimens with long parallel teeth on the bifid chaetae (as shown) may be *Pristina breviseta* that lack a proboscis.

Features of Species Pristina jenkiniae (Stephenson)¹

No proboscis
 Dorsal bundle with 1-2 hair chaetae and 1-2 bifid chaetae with long parallel teeth (C), often one tooth shorter and thinner than the other

Where Recorded at Old Woman Creek

Sediments of lotus (*Nelumbo lutea*) beds and sedge (*Carex* sp.) meadow

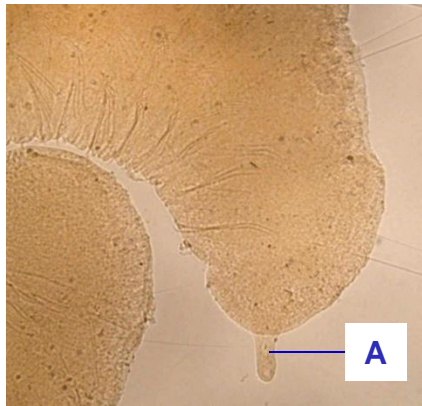
References: K&B 56, 58, 96, 98; H&K 10-12, 26-29

Photographs: *P. acuminata* – OWC Olig. L1C1 2 of 2 March 12, 1992, N. Sedge 1 May 20, 1992 (whole specimen); Lake Erie ECC 277 BP2 (chaetae); *P. jenkiniae* – OWC L1C1 2.15 3-12-92

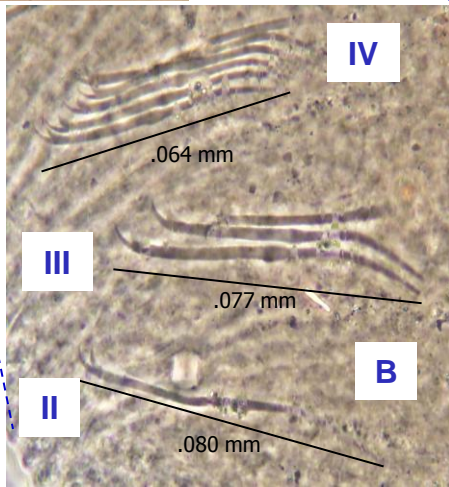
All chaetae photographed at 1000X

¹ Formerly assigned to genus *Pristinella*. See Collado, R., and R.M. Schmelz. 2000. *J. Zool., London* 251:509-516.

Annelida: Oligochaeta
Tubificida: Naididae: Naidinae:
Pristina longiseta and *Pristina osborni*
Naidid Worms



Pristina longiseta



Pristina osborni or
Pristina sima



Ventral chaetae

Features of Subfamily Naidinae

More than 2 chaetae per bundle in some segments
 Segments II through V without dorsal chaetae in some species
 Ventral chaetae of II through V may differ from chaetae in more-posterior segments
 Chaetae never all simple-pointed
 "Eyes" present or absent
 Adult length 2-10 mm

Features of Genus Pristina

Hair chaetae present
 Dorsal and ventral chaetae begin in segment II

Features of Species Pristina longiseta Ehrenberg

Proboscis present (A)
 Ventral chaetae of segments II and III longer than in other segments
 Ventral chaetae of segment II thinner, those of segment III thicker than in other segments (B)

Features of Species P. osborni (Walton)¹ or P. sima (Marcus)¹

No proboscis
 Dorsal bundle (C) with 1 hair chaeta and 1 bifid or pectinate chaeta; if bifid (D), teeth short and widely divergent (In some keys, *P. osborni* has bifid only, *P. sima* has pectinate only; may be one species – see K&B 96.)

Where Recorded at Old Woman Creek

P. longiseta – sediment near *Nymphaea*
P. osborni or *P. sima* – sediment in open water and lotus (*Nelumbo lutea*) beds

References: K&B 56, 58, 96, 98; H&K 10-13

Photographs: Samples OWC Olig. L1C1 2 of 2
 March 12, 1992, N. Sedge 1 May 20, 1992
 Chaetae close-ups photographed at 1000X

¹ Formerly assigned to genus *Pristinella*. See Collado, R., and R.M. Schmelz. 2000. *J. Zool., London* 251:509-516.

Annelida: Oligochaeta
Tubificida: Naididae: Naidinae:
Vejdovskyella comata and ***Vejdovskyella intermedia***
Naidid Worms

Vejdovskyella comata



Vejdoskyella intermedia



Features of Subfamily Naidinae

More than 2 chaetae per bundle in some segments
 Segments II through V without dorsal chaetae in some species
 Ventral chaetae of II through V may differ from chaetae in more-posterior segments
 Chaetae never all simple-pointed
 "Eyes" present or absent
 Adult length 2-10 mm

Features of Genus *Vejdoskyella*

No proboscis
 Thick, long hair chaetae in dorsal bundles
 Dorsal chaetae simple pointed, begin in segment VI
 Ventral chaetae strongly curved at teeth (B)

Features of Species *Vejdoskyella comata* (Vejdovský)

"Eyes" (A) present in most specimens
 Ventral chaetae of segments II, III, and IV progressively shorter; no chaetae in V and sometimes IV
 2-3 chaetae per ventral bundle beginning at segment VI
 Giant ventral chaetae, in segment VI and posteriorly if present, with one thin upper tooth

Features of Species *Vejdoskyella intermedia* (Bretscher)

No "eyes"
 Ventral chaetae of segments II through V progressively smaller
 One ventral chaeta per bundle beginning at segment VI
 Giant ventral chaetae, if present in segments VI-VIII, with replicated upper teeth (B)

Where Recorded at Old Woman Creek

Sediment of lotus (*Nelumbo lutea*) beds and open water

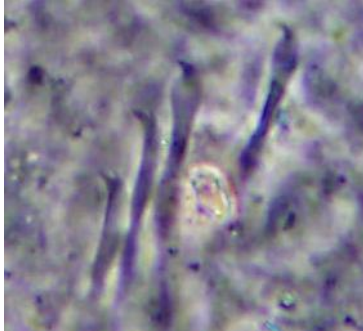
References: K&B 32, 36, 38, 78; H&K 10-25

Photographs: OWC W1A1 1 of 2 and L1B1 #30 May 31, 1990

Full view photographed at 100X, anterior view at 400X, chaetae close-up at 1000X

Annelida: Oligochaeta

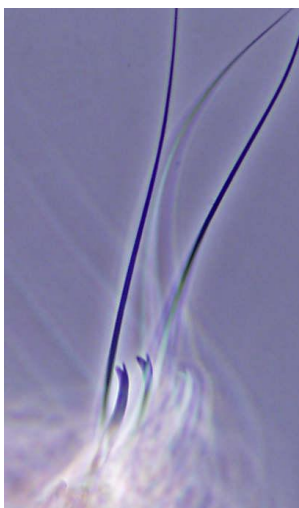
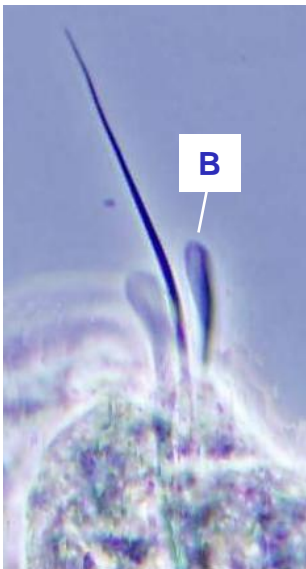
Tubificida: Naididae: Tubificinae: *Aulodrilus limnobius*, *Aulodrilus pigueti*, and *Aulodrilus pluriset* Tubificid Worms



A. limnobius



A. pigueti



A. pluriset



Features of Subfamily Tubificinae

Dorsal chaetae bifid, pectinate, palmate or simple-pointed
Dorsal chaetae always present in segment II
Ventral chaetae usually similar on all segments
Adult length usually 10-30 mm

Features of Genus Aulodrilus

No penis sheaths
Chaetae bifid with upper tooth shorter and thinner than lower tooth
Hair chaetae present in two species

Features of Species Aulodrilus limnobius Bretscher

No hair chaetae
Beyond anterior end, teeth flattened laterally; spoon-shaped in frontal view with small teeth (A) at apex

Features of Species Aulodrilus pigueti Kowalewski

Hair chaetae present
Some or all dorsal bundles of segments II-IV or VII may lack all chaetae or lack hair chaetae
Bifid dorsal chaetae replaced by oar-shaped chaetae (B) beyond approximately segment VII

Features of Species Aulodrilus pluriset (Piquet)

Hair chaetae present
Dorsal chaetae bifid (C), some with replicated upper teeth

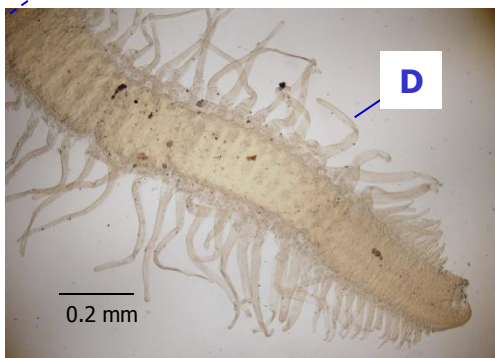
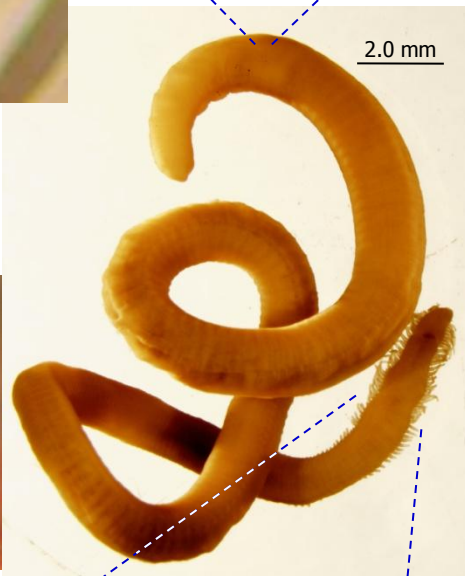
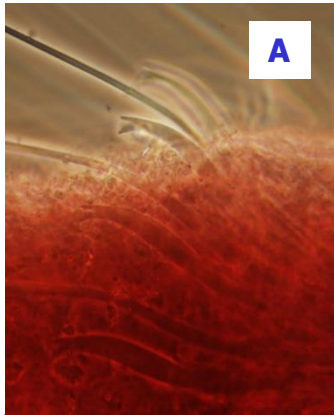
Where Recorded at Old Woman Creek

A. limnobius – sediment of open water
A. pigueti – sediment of open water, lotus (*Nelumbo lutea*) beds, sedge (*Carex* sp.) meadow and barrier beach
A. pluriset – sediment in creek channel

References: K&B 102, 122, 128, 184-187; SK&H 12-30

Photographs: OWC W1A3 #30 October 30, 1989;
OWC W2D1 #30 October 28, 1989; Lake Erie Fairport 40' Rep. 1 August 19, 1987
Chaetae photographed at 1000X

Annelida: Oligochaeta
Tubificida: Naididae: Tubificinae: *Branchiura sowerbyi*
Tubificid Worms



Features of Subfamily Tubificinae

Dorsal chaetae bifid, pectinate, palmate or simple-pointed
 Dorsal chaetae always present in segment II
 Ventral chaetae usually similar on all segments
 Adult length usually 10-30 mm

Features of Species *Branchiura sowerbyi* Beddard

Dorsal bundles (A) with 1-6 short hair chaetae and 7-12 bifid chaetae or bifid chaetae possessing replicate upper teeth (B)
 Ventral chaetae simple pointed or bifid with small upper tooth (C)
 One dorsal gill and one ventral gill extending from each posterior segment (D); the only North American oligochaete with this feature
 (There is only one species in this genus.)

Where Recorded at Old Woman Creek

Sediments in lotus (*Nelumbo lutea*) beds, open water, sedge (*Carex* sp.) meadow and near-shore areas

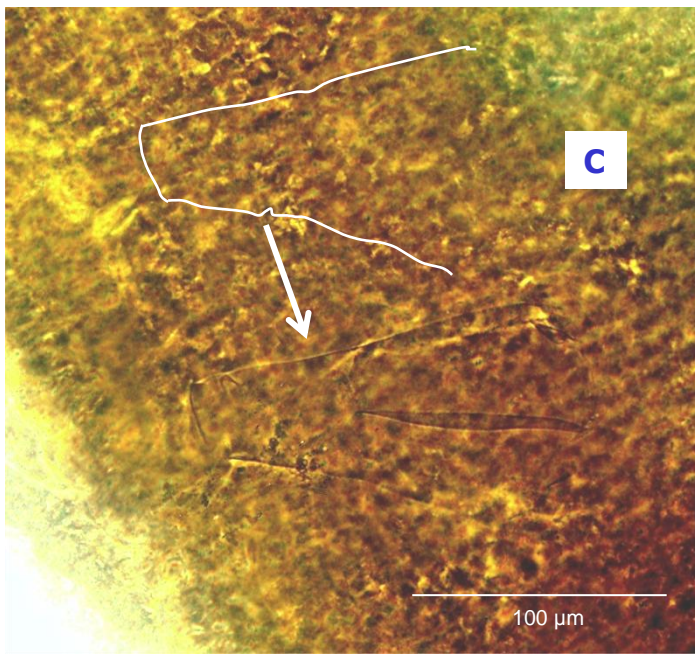
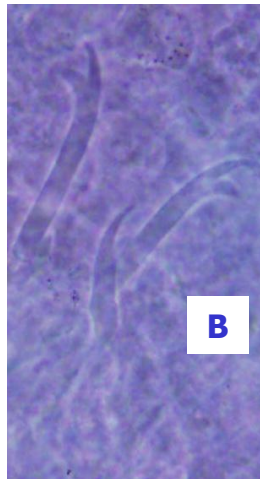
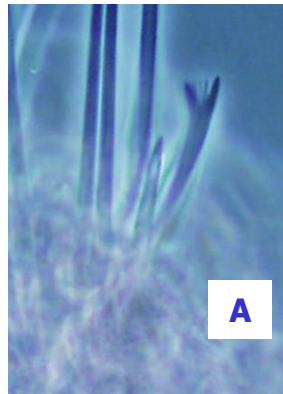
Ecological Note

Introduced into North America; now widespread in Lake Erie and its Ohio tributaries. Larger than native tubificids.

References: K&B 102, 122, 198; SK&H 12-17

Photographs: Lake Erie 8/20/87 Cleveland 40' Rep. 1, 3 of 8; whole specimen: ECC4 BP2 #18 & #35 >0.5 mm May 13, 2004 (L. Erie).
 Chaetae (A, B, C) photographed at 1000X

Annelida: Oligochaeta
Tubificida: Naididae: Tubificinae: *Ilyodrilus templetoni*
Tubificid Worms



Features of Subfamily Tubificinae

Dorsal chaetae bifid, pectinate, palmate or simple-pointed
 Dorsal chaetae always present in segment II
 Ventral chaetae usually similar on all segments
 Adult length usually 10-30 mm

Features of Genus *Ilyodrilus*

Dorsal bundles consisting of hair and pectinate or bifid chaetae
 Body wall without papillae
 Adults have two penis sheaths in segment XI but no specialized reproductive (genital) chaetae

Features of Species *I. templetoni* (Southern)

Dorsal bundles (A) with 1-4 hair chaetae and 3-4 pectinate chaetae
 Upper tooth of anterior ventral chaetae (B) thinner and longer than lower tooth; both teeth of about equal length from segment IV or V
 Penis sheaths conical, longer than broad, and membranous (C)

Where Recorded at Old Woman Creek

Sediments of open water

References: K&B 102-103, 106-107, 110-111, 114-115, 164-165; SK&H 12-24, 27-28

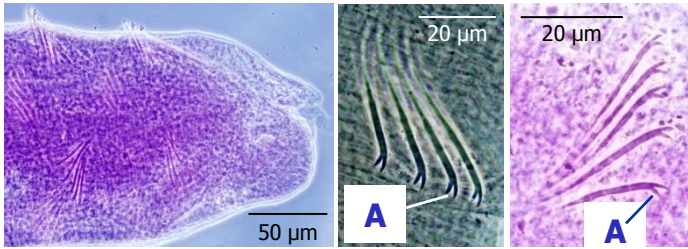
Photographs: Lake Erie ECC4 256 BP3 May 12, 2004 (chaetae, photographed at 1000X); Fairport 30'Rep2 3.28 6-24-87 (penis sheath)

Annelida: Oligochaeta

Tubificida: Naididae: Tubificinae: *Limnodrilus cervix*

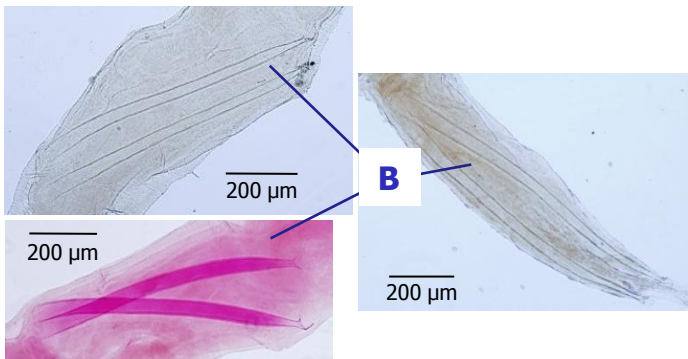
Tubificid Worms

Anterior end of *L. cervix*

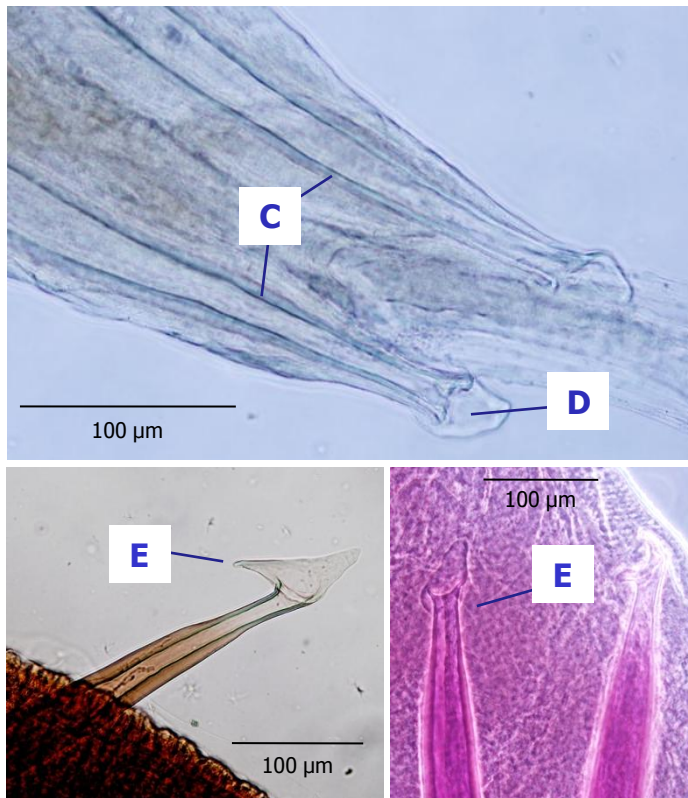


Examples of Variations of Penis Sheaths of *L. cervix*

Entire Penis Sheaths Viewed at 100X



Anterior End of Penis Sheaths Viewed at 400X



Features of Subfamily Tubificinae

Dorsal chaetae bifid, pectinate, palmate or simple-pointed
 Dorsal chaetae always present in segment II
 Ventral chaetae usually similar on all segments
 Adult length usually 10-30 mm

Features of Genus *Limnodrilus*

No hair chaetae or pectinate chaetae; all chaetae bifid with upper tooth equal to or longer than lower tooth (A)
 Two penis sheaths (B) in segment XI of adults but no specialized reproductive (genital) chaetae

Features of Species *Limnodrilus cervix*

Brinkhurst

Upper and lower teeth of anterior chaetae approximately same size (A)
 Wall of penis sheath (B) thick except behind head of sheath, distinctly two-layered (C) in some specimens; 1000 µm to 1500 µm in length
 Penis sheath more or less straight without strong bend behind head
 Head of penis sheath (D) somewhat triangular and longer than broad, with a digitate lobe (E) near the base visible in some specimens

Note: Specimens with thickness of the wall and shape of the head of the penis sheath intermediate between *L. cervix* and *L. claparedeianus* are occasionally found. Such specimens are called "*L. cervix-claparedeianus* intermediate".

Where Recorded at Old Woman Creek

Sediments of open water, lotus (*Nelumbo lutea*) beds, and creek channel

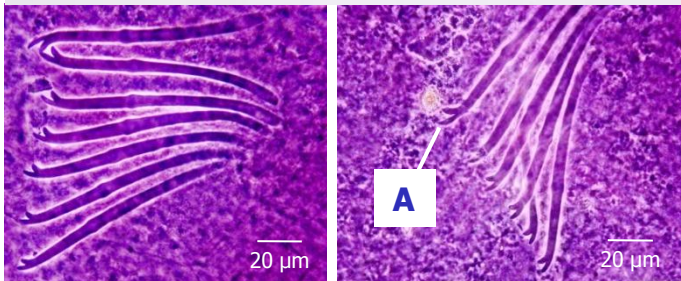
References: K&B 102, 134, 154, 160-161; SK&H 12-39

Photographs: OWC A53-2 #30 Sept. 18, 2002. Lake Erie: 90A 881019 5.3, 90A 881019 6.8, W5A 881020 5.6, 93A 881020 8.8, Fairport 30' Rep2 3.28 6-24-87

Annelida: Oligochaeta

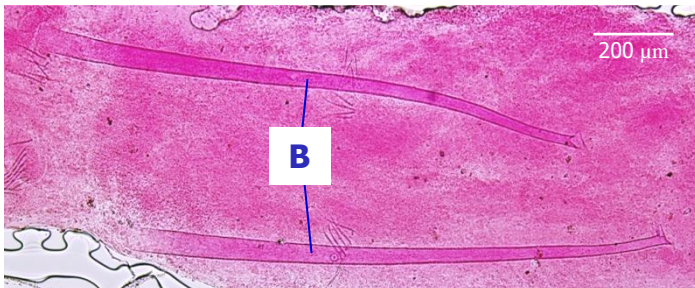
Tubificida: Naididae: Tubificinae: *Limnodrilus claparedeianus* Tubificid Worms

Anterior end of *L. claparedeianus*

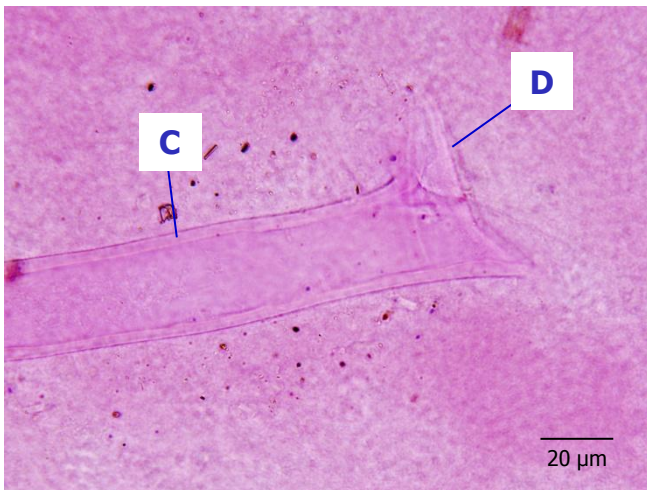


Penis Sheaths of *L. claparedeianus*

Entire Penis Sheaths Viewed at 40X



Anterior End of Penis Sheath Viewed at 1000X



Features of Subfamily Tubificinae

- Dorsal chaetae bifid, pectinate, palmate or simple-pointed
- Dorsal chaetae always present in segment II
- Ventral chaetae usually similar on all segments
- Adult length usually 10-30 mm

Features of Genus *Limnodrilus*

- No hair chaetae or pectinate chaetae; all chaetae bifid with upper tooth equal to or longer than lower tooth (A)
- Two penis sheaths (B) in segment XI of adults but no specialized reproductive (genital) chaetae

Features of Species *L. claparedeianus* Ratzel

- Upper tooth of some anterior chaetae longer than lower tooth (A)
- Wall of penis sheath thin throughout (B, C), not thicker behind head of sheath (compare to *L. cervix*), 800 µm to 1300 µm in length
- Penis sheath more or less straight without strong bend behind head
- Head of penis sheath (D) small, somewhat rounded to triangular, never with a digitate lobe near the base

Note: Specimens with thickness of the wall and shape of the head of the penis sheath intermediate between *L. cervix* and *L. claparedeianus* are occasionally found. Such specimens are called "*L. cervix-claparedeianus* intermediate".

Where Recorded at Old Woman Creek

Sediments of open water, lotus (*Nelumbo lutea*) beds, sedge meadow, and landward side of barrier beach

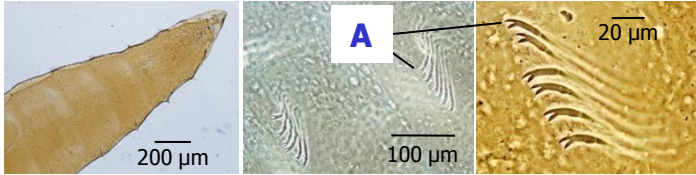
References: K&B 102, 134, 154, 160-161; SK&H 12-39

Photographs: CLEV AOC 80A 890509 2.2 (Red or purple color of specimen resulted from staining with Rose Bengal or Phloxine B.)

Annelida: Oligochaeta

Tubificida: Naididae: Tubificinae: *Limnodrilus hoffmeisteri* Tubificid Worms

Anterior end of *L. hoffmeisteri*

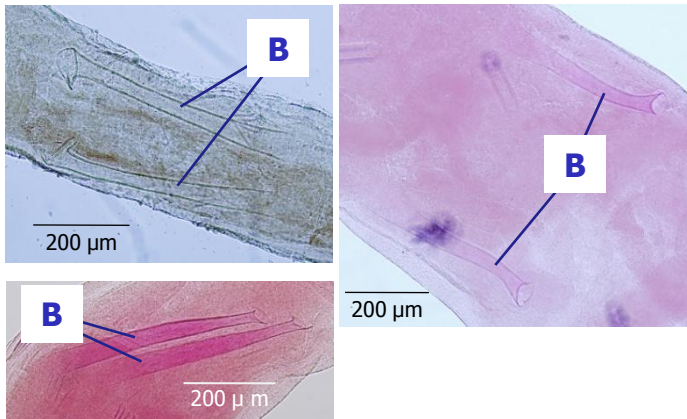


Features of Subfamily Tubificinae

- Dorsal chaetae bifid, pectinate, palmate or simple-pointed
- Dorsal chaetae always present in segment II
- Ventral chaetae usually similar on all segments
- Adult length usually 10-30 mm

Examples of Variations of Penis Sheaths of *L. hoffmeisteri*

Entire Penis Sheaths Viewed at 100X



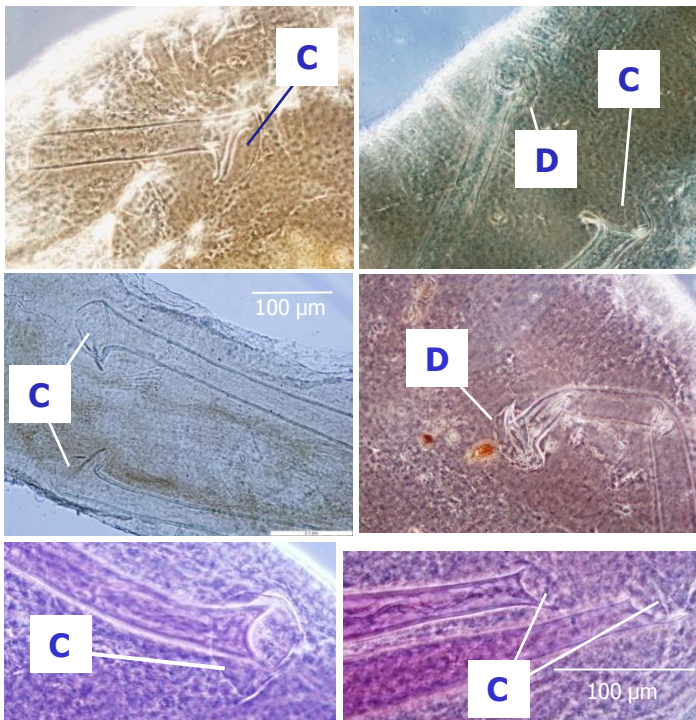
Features of Genus *Limnodrilus*

- No hair chaetae or pectinate chaetae; all chaetae bifid with upper tooth equal to or longer than lower tooth (A)
- Two penis sheaths (B) in segment XI of adults but no specialized reproductive (genital) chaetae

Features of Species *L. hoffmeisteri* Claparède

- Upper and lower teeth of anterior chaetae approximately same size (A)
- Penis sheaths (B) 300-700 mm (rarely to 1000 mm) in length, slightly flared in posterior third, strongly flared behind head in some specimens
- Head of penis sheath forming a hood (C) of variable shape, edges scalloped in some specimens (D)

Anterior End of Penis Sheaths Viewed at 400X



Where Recorded at Old Woman Creek

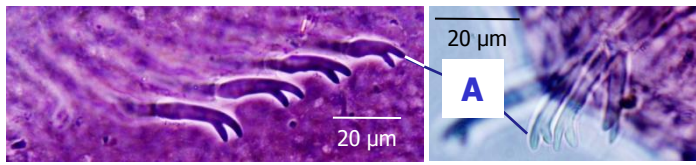
- In open water, lotus (*Nelumbo lutea*) beds, sedge (*Carex* sp.) meadow, and barrier beach

References: K&B 102, 134, 154-157; SK&H 12-39

Photographs: (all L. Erie) 93A 881020 2.5, ACE B18A 052799, ACE B18B 052799, ACE D3B 051799 2 of 4, ACE W4A 881020 2.5, ACE W5A 881020 5.2, ACE W5A 881020 5.25, ACE B2B 051799 1.14

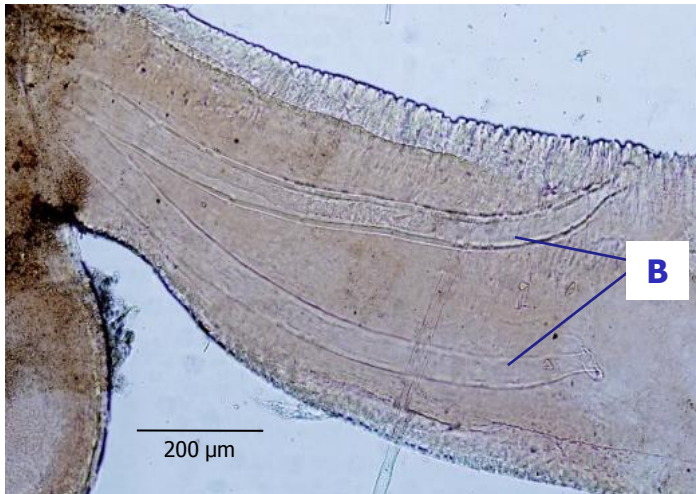
Annelida: Oligochaeta

Tubificida: Naididae: Tubificinae: *Limnodrilus maumeensis* Tubificid Worms

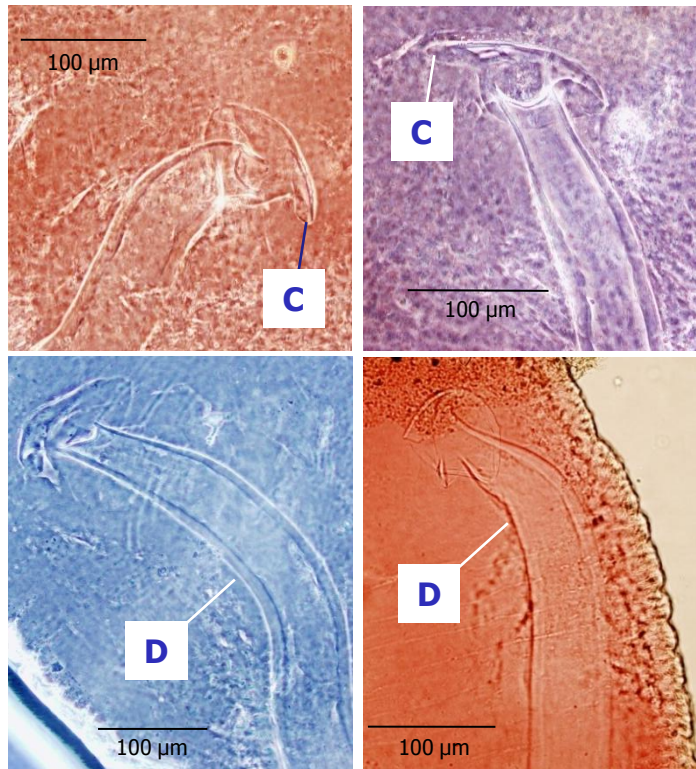


Examples of Variations of Penis Sheaths of *L. maumeensis*

Entire Penis Sheaths Viewed at 100X



Anterior End of Penis Sheaths Viewed at 400X



Features of Subfamily Tubificinae

- Dorsal chaetae bifid, pectinate, palmate or simple-pointed
- Dorsal chaetae always present in segment II
- Ventral chaetae usually similar on all segments
- Adult length usually 10-30 mm

Features of Genus *Limnodrilus*

- No hair chaetae or pectinate chaetae; all chaetae bifid with upper tooth equal to or longer than lower tooth (A)
- Two penis sheaths (B) in segment XI of adults but no specialized reproductive (genital) chaetae

Features of Species *L. maumeensis* Brinkhurst and Cook

- Upper and lower teeth of anterior chaetae approximately same size (A)
- Penis sheaths generally 1000 µm to 1500 µm in length (B)
- Head of penis sheath more or less triangular with asymmetrically curved tip (C)
- Wall of penis sheath thick except thin behind head, and sheath bent a short distance behind head (D)

Where Recorded at Old Woman Creek

In sediments of open water and lotus beds

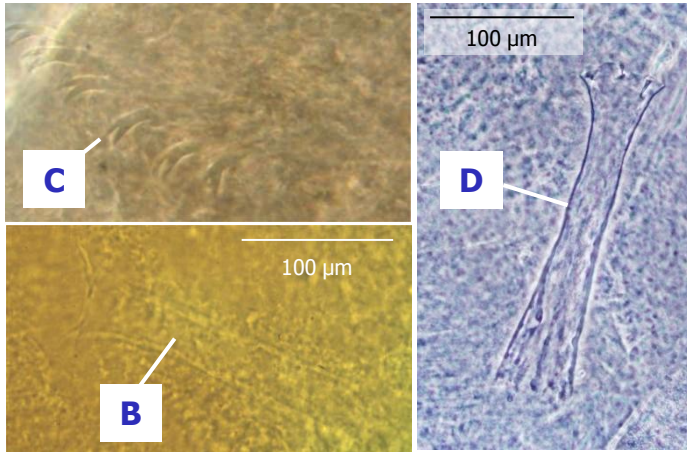
References: K&B 102, 134, 154, 160-163;
SK&H 12, 29-39

Photographs: (All Lake Erie) ACE RF2A 052799 2.12, ACE RF2A 052799 2.14, ACE RF2A 052799 1 of 3, ACE RF2A 052799 2 of 3, ACE RF3A 052799 1 of 2, ACE RF3A 052799 2 of 2

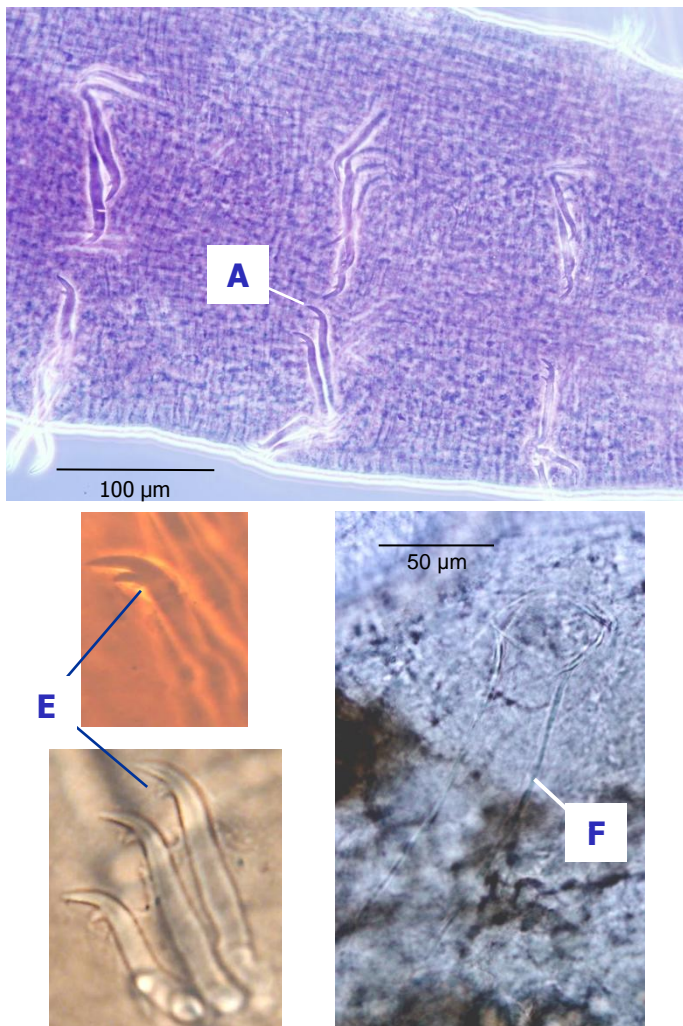
Annelida: Oligochaeta

Tubificida: Naididae: Tubificinae: *Limnodrilus profundicola* and *Limnodrilus udekemianus* Tubificid Worms

L. profundicola



L. udekemianus



Features of Subfamily Tubificinae

Dorsal chaetae bifid, pectinate, palmate or simple-pointed

Dorsal chaetae always present in segment II

Ventral chaetae usually similar on all segments

Adult length usually 10-30 mm

Features of Genus *Limnodrilus*

No hair chaetae or pectinate chaetae; all chaetae bifid with upper tooth equal to or longer than lower tooth (A)

Two penis sheaths (B) in segment XI of adults but no specialized reproductive (genital) chaetae

Features of Species *L. profundicola* (Verrill)

Upper tooth of anterior chaetae thinner and sometimes longer than lower tooth (C)

Penis sheath with thin wall and 194-300 µm in length (D)

Features of Species *L. udekemianus* Claparède

Upper tooth of anterior chaetae thicker and longer than lower tooth, and lower tooth at sharp angle to long axis of chaeta (E)

Penis sheath 160-200 mm in length; shaft with thin wall (F)

Where Recorded at Old Woman Creek

L. profundicola: Reported in sediments of open water. However, K&B and SK&H report that this species is restricted to cold oligotrophic (clear water) habitats including parts of the St. Lawrence Great Lakes. Though specimens from Lake Erie have been confirmed, it seems probable that specimens from Old Woman Creek identified as *L. profundicola* are *L. hoffmeisteri* in which the penis sheaths have not developed fully.

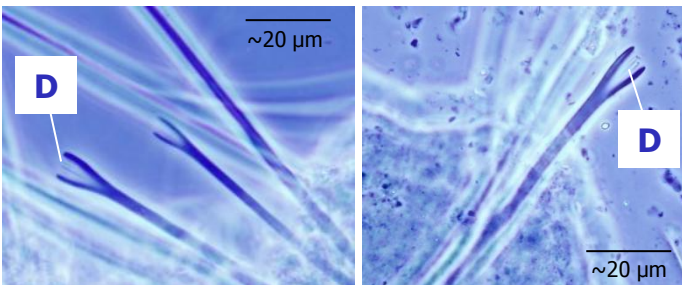
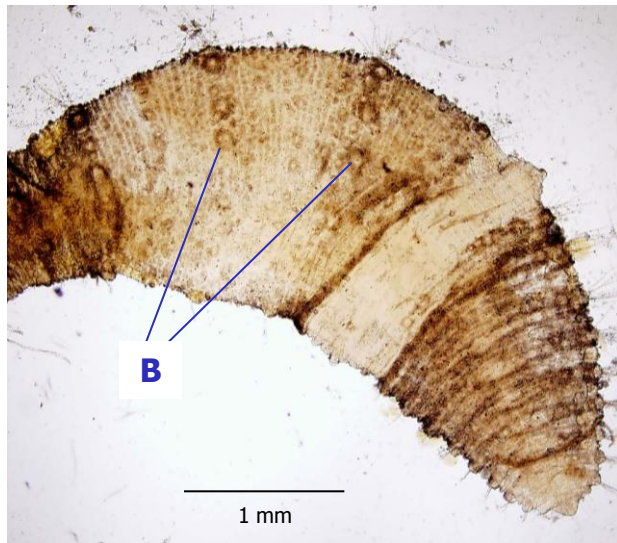
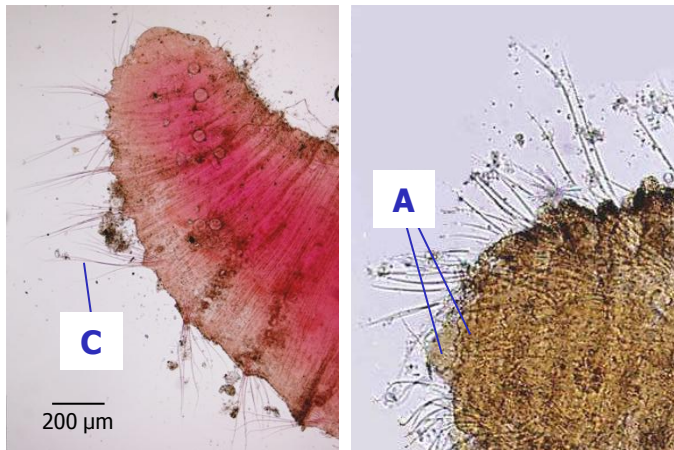
L. udekemianus: In sediments of open water, lotus (*Nelumbo lutea*) beds, and sedge (*Carex* sp.) meadow

References: K&B 102, 134, 154, 157-159; SK&H 12-39

Photographs: OWC A53-2 #30 September 18, 2002; Lake Erie: 90A 881019 2.1, ACE D3A 051799, W1A890509 2.2. Chaetae close-ups photographed at 1000X.

Annelida: Oligochaeta

Tubificida: Naididae: Tubificinae: *Quistadrilus multisetosis* Tubificid Worms



Features of Subfamily Tubificinae

- Dorsal chaetae bifid, pectinate, palmate or simple-pointed
- Dorsal chaetae always present in segment II
- Ventral chaetae usually similar on all segments
- Adult length usually 10-30 mm

Note: There is only one species of North American *Quistadrilus*.

Features of Species *Quistadrilus multisetosis* (Smith)

- Prostomium and segment I not retractile (A)
- Body wall papillate; largest papillae in line with chaetae (B)
- As many as 14 hair chaetae (C) in each dorsal bundle of chaetae
- Pectinate chaetae (D) in dorsal bundles
- Posterior ventral chaetae (E) with strongly recurved lower tooth and shorter, thinner upper tooth (In Old Woman Creek and most Lake Erie specimens encountered by us, but posterior chaetae not as described above in some specimens from Lake Erie and elsewhere)
- No penis sheaths or specialized reproductive chaetae

Where Recorded at Old Woman Creek

Sediments in sedge meadow and swamp pond

References: K&B 102, 106-109, 182-183; SK&H 12-14

Photographs: OWC Swamp pond October 5, 1992; Lake Erie: 91A 881019 4.3, 91A 881019 10.14