



# What's the Buzz?: A Closer Look at the Chironomid Diversity of Pigeon Lake



Prepared for the 2024 ALMS Annual Conference  
in Hinton, AB

Cheryl Tebby  
Alberta Biodiversity Monitoring Institute  
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# The Back Story:

May 2021

Hi Dr. Sperling,

Jordan Omstead here from CBC Edmonton. I hope you're well! Sorry to bother on a weekend.

I'm hoping to do a brief story about Mayfly in Alberta and was hoping to speak with you today to get a better understanding of what these short-lived but high-impact insects are all about. If this isn't really your specialty, perhaps you could suggest someone else?

Thanks for your time!

All the best,  
Jordan



## 'You can't even go outside': Alberta's Pigeon Lake overrun with midges

Swarms expected to die off in the coming days, entomologist says

CBC News - Posted: May 30, 2021 10:29 AM MDT | Last Updated: May 30, 2021



Non-biting midges have amassed in huge numbers around Alberta's Pigeon Lake. (Submitted by Janet Sperling)

**“What are these? Why is this happening? What does it mean?”**




 The Globe and Mail

### Bugging out: Canadians swat at spring swarm of midges

The chironomid is attracted to light, so light traps are an effective countermeasure: They draw the bugs in and zap them. Otherwise, homeowners...

May 7, 2014



 The Boston Globe

### Billions of bugs swarm New Orleans

"Chironomid midges are a gigantic part of the food web," DeLisi said ... in front of us," said Red Sox chief baseball officer Chaim Bloom.

Jun 19, 2019



 CBC

### 'You can't even go outside': Alberta's Pigeon Lake overrun with midges

In Alberta's Pigeon Lake, cabins and cars are blanketed in quivering clumps. The midges have taken over in swarms of almost biblical...

May 30, 2021



MLB

### The Night the Bugs Came for Joba Chamberlain

When the rookie phenom took the mound in Game 2 of the 2007 ALDS, he seemed poised to deliver the Yankees a victory. Then the midges reappeared—and created one of the most indelible moments in baseball history.

By Jake Kring-Schwehler | May 11, 2012, 6:30am EDT





Me, kayaking for the first time amongst a chironomid mass emergence at Hastings Lake, 2015.  
Photo: C. Scragg





# What Trout Eat: CHIRONOMIDS

For More Information: [www.aift.org/what-trout-eat](http://www.aift.org/what-trout-eat)

### THE TROUT'S STAPLE DIET

Trout living in lakes or rivers often begin their diet with chironomids. They are easy for trout to catch, are rich in calories, and there's lots of them!

Spring and summer are prime times for fishing situations of the discolorated larva, pupa, emerger and adult.

### THE EMERGER:

The stage of the chironomid's life lasts less than a minute. After emerging through the surface film, the pupa lay fly. In the adult form of the chironomid emerges. It's an easy target for trout feeding to come to the surface.

### FISHING TIPS:

Fish emerge patterns the same way or you would an adult chironomid but cast towards rising trout and let the fly sit at a slack, change surface reacting.

### THE LARVAE:

• slim, worm like, with a segmented body and short legs  
 • colored brown/orange because their hemoglobin allows them to breathe  
 • can live up to 60 m deep even in oxygen poor water  
 • grow up to 1.5 cm long  
 • live in tubes they build on the lake bottom, although some never leave they  
 • generally live a few months but year or longer, sometimes migrating from deep water to shallow in the spring and back to deep in the fall

### FISHING TIPS:

Depth is the key. Fish larvae patterns close to the lake bottom using a floating line with either indicator or casting indicator. Start with the fly a foot or two from the lake bottom. A weighted fly or weight on the line helps on the fly down. If fishing flies, changing the depth of the fly up or down to meet 6 inches can make a difference. You can also use a sinking line and the counterbalance method (floating one one thousand... ) as the fly sinks. A long hand will retrieve and the movement of the retrieval attracts.

### THE PUPAE:

• are comma shaped critters with distinct white gills at their head and sometimes at the end of their tail  
 • body colors vary widely, depending on species and environment  
 • the hemoglobin from their larval stage often leaves them with a red tint  
 • range from just 2 mm to 2.5 mm, the larger ones are often called "barbers"  
 • spend just a few days in the pupal stage, rising and falling near the lake bottom  
 • trapped gas beneath their skin helps them rise to the surface when they begin vertically for a while before emerging.

### FISHING TIPS:

Use the same methods as for emerger and use a grass pattern, with an indicator like the Red Dart. Buzzer, or aggressive such as the C-Queen. Cast for drifter water only and measure the depth, lower the same length of sinking line below the float, then use a slow hand back retrieve. Trout will often follow the pupa up and strike it just before it leaves the trout's comfort zone. Sinking can be aggressive trout will often head straight back down to safety.

### THE ADULT:

Adult chironomids resemble mayflies but, unfortunately, they don't float. They lay for just a few days, many more than 24. They mate in swarms, often making a buzzing sound that gives them their nickname, "buzzers". After in the case of the evening or morning, the females drift across the water creating a small wake as they lay their eggs. The egg and a gonymer male that sinks to the lake bottom where they take one to two days to hatch into larvae.

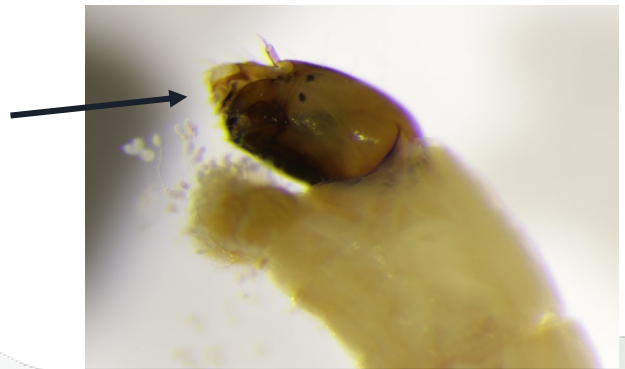
### FISHING TIPS:

For rising adults, use a floating line and long leader with a dry fly (such as the Griffith's Gnat or Buzzer) or any type of bobber with a piece of paper to keep the fly in the air. When the female drifts across the water creating a small wake as they lay their eggs. The egg and a gonymer male that sinks to the lake bottom where they take one to two days to hatch into larvae.

### CHIRONOMID LIFECYCLE



Sclerotized ("crunchy") head capsule





*Chironomus* sp.



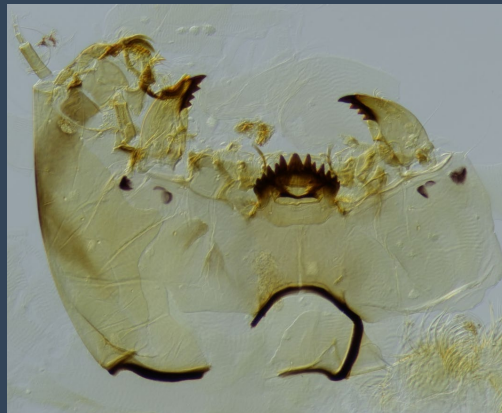
Scanning Electron Microscope image of *Dicotendipes crypticus*  
(John Epler 1987) (Photo: J. Sublette)



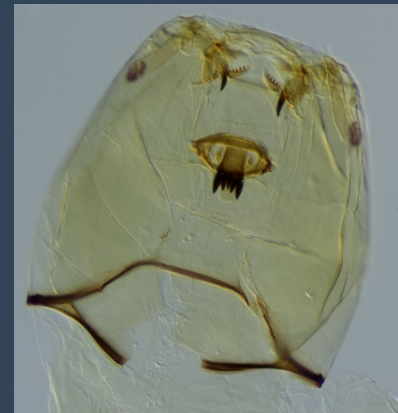
*Chironomus* sp.



*Cryptochironomus* sp.



*Dicrotendipes* sp.



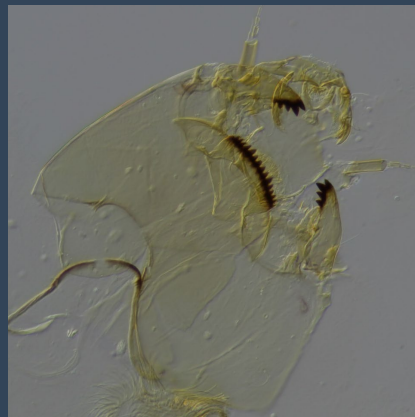
*Procladius* sp.



*Ablabesmyia* sp.



*Tanytarsus* sp.



*Polypedilum* sp.



*Cricotopus* sp.





# “What are these?” Why is this happening? What does it mean?”

## **'You can't even go outside': Alberta's Pigeon Lake overrun with midges**

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# The plan:

## 2 seasons (summer and winter)

- Summer sampling in August 2021 and 2022
- Summer sampling using Ekman grab off of boat
- Winter sampling in February 2022 and 2023
- Winter sampling using Ekman grab through ice
- Winter sampling largely confined to Grandview

## 3 sampling points

- Deepest point to shallow
- Summer: 10-11m; 8.5m; 7m
- Winter: 8m, 4m, 1.5m deep
- Limitations in winter: cannot travel as far!

## Additional shoreline samples

- Samples taken near to shore primarily in summer; net sweeps off of deck near Itaska beach





Yellow dots = summer sampling

White stars = winter sampling

A - C, deepest to shallower

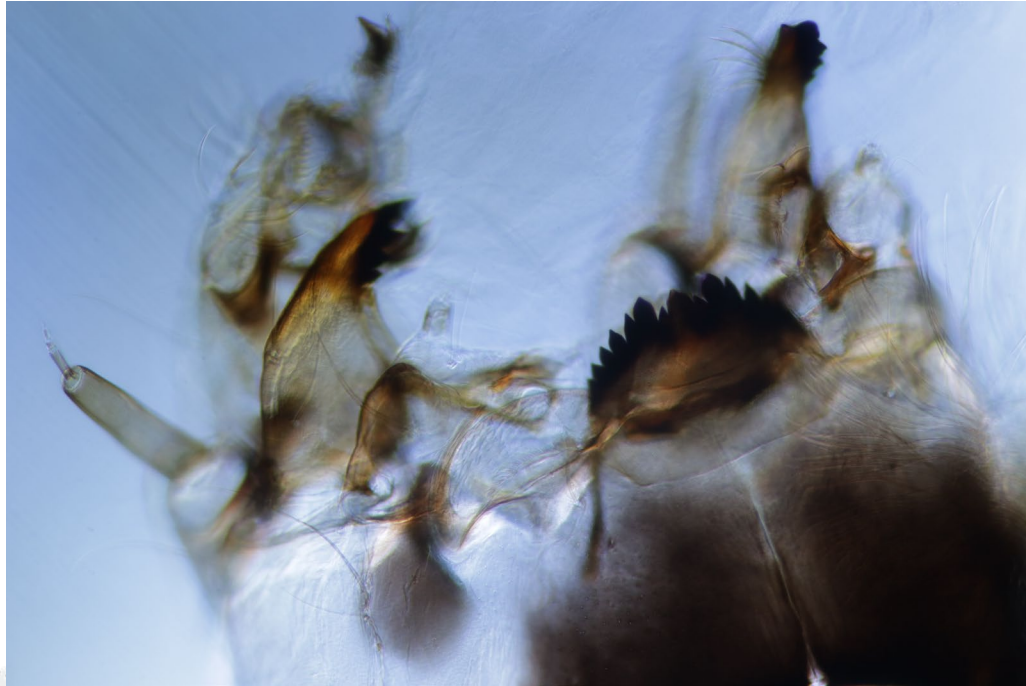
X = shoreline sample



# Field collection



# What we found (so far):



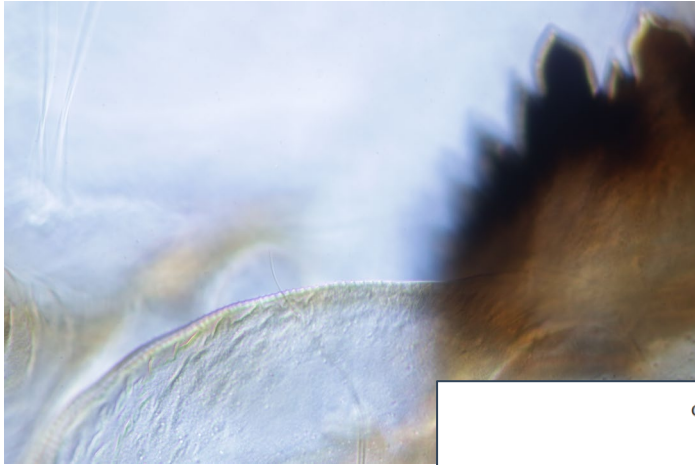
## *Chironomus plumosus*

- Found in deep water (10-11m, 7m)
- Diagnostic “teeth” along edge of VM plate (Epler, 2001)
- Reported as being a “nuisance swarmer” in Denmark (Lindgaard and Jonsson, 1987); Table 13.1 from “The Chironomidae” by Armitage, Cranston and Pinder





# What we found (so far):



HUGE!



PLA [10-11m]  
53.0172222; -114.0561390  
Coll.: 27-Aug-2021  
*Chironomus plumosus*  
Coll./Det.: C. Tibbo  
P. Sean Lake, AB

CHIRONOMINAE		8.41
5(4)	Anteromedial margin of ventromedial plate with fine teeth ..... 6	
5'	Anteromedian margin of ventromedial plate smooth (minute teeth may be present beneath plate, but margin is smooth; or outer (lateral) margin of plate may be faintly crenulate) ..... 8	
6(5)	Mandible with 3 dark inner teeth ..... <i>Ch. plumosus</i>	

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# What we found (so far):

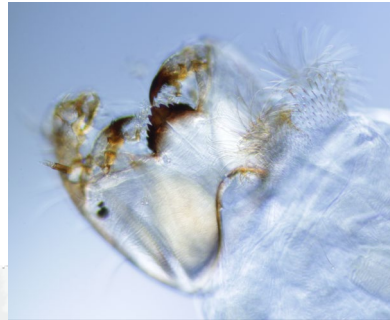


## Other deep water taxa:

- *Chironomus* sp. (morphospecies)
- *Tanytarsus* sp. (morphospecies)
- *Procladius* sp. (morphospecies)



# What we found (so far):



## Shoreline taxa (2021 only):

***Cryptochironomus* sp.** (unidentifiable to species, Epler 2001)

***Endochironomus* sp.** (morphospecies)

***Glyptotendipes* sp.** (morphospecies)

***Corynoneura* sp.** (morphospecies)

***Cricotopus* sp.** (morphospecies)

***Nanocladius* sp.** (morphospecies)



*Species Table of Shoreline Specimens*  
COMING SOON!







# Thank You!

## References

→ Armitage, Patrick D., L. C. Pinder, and P. S. Cranston, eds. *The Chironomidae: biology and ecology of non-biting midges*. Springer Science & Business Media, 2012.

→ Epler, J. "Identification manual for the larval Chironomidae (Diptera) of North and South Carolina: a guide to the midges of the southeastern United States including Florida". 2001. Version 1.0.

**Available online through John Epler's personal website:**  
[johneppler.com](http://johneppler.com)

→ Lindegaard, C., and E. Jónsson. "Abundance, population dynamics and high production of Chironomidae (Diptera) in Hjarbæk Fjord, Denmark, during a period of eutrophication." *Entomologica Scandinavica Supplement* 29 (1987): 293-302.

Unless otherwise noted, all photos by C. Tebby

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