

UNITED STATES DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

A GENERIC GUIDE TO THE LARVAE OF THE NEARCTIC TANYTARSINI

By John W. Steiner, Jan Stephen Doughman and Craig R. Moore

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# ERRATA

Please make the following corrections.

## PAGE

- 8- replace the caption with the one attached.
- 12-in the genus Micropsectra, the word "tubercle" should come after the word "antennal" under "Distinctive Characteristics". The word "opposite" should come after the word "petioles" under "Lauterborn organs".
- 16-Stempellina. The second two sentences in the paragraph which describes the mentum refer to the larval mandible.
- 12-the AR of Micropsectra is 1.6-2.3.
- 23-in figure 25, the center tooth of the mentum really is clear.
- 24-2nd half of couplet 4. Delete "larger" and insert "smaller".
- 28-add "on inner shoulder" after "serrations" in paragraph on mandible.
- 30- delete the "u" in the word "many" under "Premandible".
- 32- Nimbocera. 2nd line of "Species" paragraph. Add the word "tubercle" after "antennal". By the way, this is N. pinderi. See also figure 1 and front cover.
- 35- the ARs are not in microns.
- 36- figure 49 is a 3rd instar.
- 37- T.(S.) coffmani. Insert "posterior" before "parapod" in sentence on body. T.(nr.S.) sp. 1. Line 4. Change it to "unicolorous".
- 34.insert "nr." after "I." on line 4.

Figure 3.--Antennae. a,Kimbocera; b,Micropsectra; c,Constempellina; d,Lenziella; e,Stempellina; f,Tanytarsus n. subgenus "A"; g,Zavrelia; h,Paratanytarsus; i,Stempellinella; j,Cladotanytarsus; k,Rheotanytarsus; l,Micropsectra sp. 5.



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A GENERIC GUIDE TO THE LARVAE OF THE NEARCTIC TANYTARSINI  
(CHIRONOMIDAE: DIPTERA).

by

John W. Steiner, Jan Stephen Doughman, and Craig R. Moore

ABSTRACT

Larvae of the tribe Tanytarsini occur in nearly every aquatic habitat in North America where they act as primary consumers in the food chain. This new taxonomic guide overcomes some deficiencies in existing keys to this tribe and the reviewed and updated taxonomy enables identification of the larvae that may be useful as ecological indicators. Over 2,000 specimens from 26 states were examined, identified and measured in this study. The following genera were included: Stempellinella, Zavrelia, Stempellina, Constempellina, Corynocera, Cladotanytarsus, Paratanytarsus, Rheotanytarsus, Micropsectra, Lauterbornia, Nimbocera, Tanytarsus and Neozavrelia. Photographs illustrate mature larvae of these genera with the exception of Zavrelia and Neozavrelia which are not known to exist in North America. The morphological data, which are summarized in a table of distinctive characteristics and the dichotomous key, enable identification to genus. Notes on range, habitat and food preference are included, and species identifications are presented where applicable.

INTRODUCTION

The larvae of the various species of the tribe Tanytarsini occur in nearly every aquatic habitat throughout North America. Tanytarsini are important in profundal zones of lakes at latitudes of 45° - 65°, both north and south. They appear to be most abundant in southern lentic littoral substrates, but our data from Alaska indicate that even cold clear arctic streams can support diverse populations. Micropsectra, Lauterbornia and Tanytarsus species are important in classical lake typology (Saether 1979).

Van der Wulp (1874) erected the genus Tanytarsus which included the now separate genera Endochironomus, Stictochironomus, Phaenopsectra and others. Various authors have since split, lumped, resplit and relumped the many species into a bewildering variety of genera and subgenera. Johannsen (1937) and Roback (1957) provided keys to many of the species in this tribe, but little has appeared since then. The nomenclature in this text will follow that of Coffman (1978) with several additions.

This guide was prepared with the indirect assistance of Geological Survey field biologists from throughout the United States. It was they who collected the benthos samples and provided the habitat data which form the base for this report. Dr. Samuel Mozley of North Carolina State University at Raleigh provided critical review of this manuscript. He made many suggestions and corrections to the original and we are indebted to Dr. Mozley for his patient help. We are grateful to Drs. D. R. Oliver and M. E. Roussel of the Biosystematics Research Institute, Research Branch, Agriculture Canada for providing us with specimens of Corynocera and Lauterbornia. Thanks also go to David Lenat of the North Carolina

Department of Natural Resources for specimens of Micropsectra sp. 5. Drs. W. P. Coffmann, W. M. Beck, J. E. Sublette and S. S. Roback are thanked for their valuable communications. Mr. Broughton A. Caldwell loaned us many of the hard-to-find references. Mr. Rene Garcia identified the gut content algae and Ms Linda Lif collected specimens for us. Mrs. Dolores Stegg patiently typed the manuscript through its many changes.

## SPECIES

The species and species groups of the tribe Tanytarsini are poorly understood and even more poorly described. It is likely that several of the larvae described here do not correspond to adults that carry the same name. In most cases, the species are designated by numbers. An attempt has been made to keep our numerical designations consistent with those of other authors (Oliver and others, 1978, Roback 1957). Some of the "species" may actually be species groups. See table 1 for a listing of probable number of species for each genus. These "probable numbers" are based on literature search, communications with other scientists and on a study of the specimens of the U.S. Geological Survey collection. It should be realized that there may be many described species within a genus based on the adults. However, the larvae of these species may be indistinguishable. A good example is Rheotanytarsus. Coffman (1976) places this genus in category "B" 6-19 species. We have been able to find only two distinct larvae types.

The key to genera uses the traditional separative characters (see Oliver and others, 1978, Johanasen, 1937 and Roback, 1957) to distinguish Micropsectra from Tanytarsus. This distinction may or may not be accurate. There are at least 30 (probably 50 or more) nearctic species of these genera, and the spurs of the antennal tubercles show considerable variation. In Tanytarsus nr. curticornis (fig. 47) the spur is very long and curving. It should be emphasized that the identifications made here are based on existing larval descriptions. These designations will most likely change with future research.

## DISTRIBUTION

The U.S Geological Survey National Water Quality Laboratory in Doraville, Georgia is the receiving site for benthos samples from Survey district offices throughout the United States. Because the various district offices study a wide variety of streams, rivers and lakes, the samples received reflect a similar variety of aquatic habitats. In the calendar year 1979, samples were analyzed from Alaska rivers, Florida canals and Ohio lakes. Stream samples came from Alabama, Utah, North Dakota, Pennsylvania, Arkansas, and even Puerto Rico. It should be emphasized that the vast majority of these samples are collected from lotic habitats. Additional samples from lentic habitats were collected for this project in coastal and piedmont Georgia. We have found that occasionally, a single tanytarsinid genus can make up as much as 75 percent of the total number of organisms in one stream sample. When numerical dominance of this magnitude occurs, the genera Rheotanytarsus, Micropsectra, Tanytarsus and Paratanytarsus are usually the taxa involved.

To date, the USGS National Water Quality Laboratory has processed over 1,000 benthic samples from all over the United States. The genera Nimbocera, Corynocera, Lenziella, Lauterbornia, and Tanytarsus n. subgenus "A" have not been found in any of these samples.

#### METHODS

Tanytarsinid larvae were mounted in CMCP-10<sup>R</sup> according to the method described in Beck (1976). The pictures were taken with a Zeiss<sup>R</sup> Universal Scope and an Olympus<sup>R</sup> temperature corrected 35 mm camera, using Kodak Plus-X Pan<sup>R</sup> film 1/.

1/ Reference to trade names, commercial products, manufacturers, and distributors in this manual does not constitute indorsement by the Geological Survey nor recommendation for use.

## NOTES ON MOUNTING

There are two important considerations when mounting tanytarsinid larvae. If a large number of larvae is available, some should be mounted with the dorsal head surface up. In many of the genera, the antennal tubercle spurs or the fronto-clypeal setae are the most important taxonomic characters. These are most easily observed when the dorsal surface is not obscured by the rest of the head.

Most of our mounted specimens are rather nicely flattened out and the most important characteristics are visible. This was accomplished by using a spring-loaded oil immersion lens as a press. The specimen can be observed as the fine adjustment is cranked down and the pressure can be stopped if the head begins to split. The glass of the lens does not contact the coverslip, and so is not damaged. To date, no coverslips have been cracked by this process. With small specimens, a few second's gentle pressure results in a good permanent mount. With larger heads, as in the Chironomini, several minutes pressure is often required. The measurements and ratios presented here were taken from these very flattened specimens. Figure 1 was drawn from such a specimen and so the relative position of some of the characters is not as it would be in a live larva. Because the mandibles oppose the mentum more than each other, some of the species are difficult to flatten evenly.

## STRUCTURE AND TERMINOLOGY

Color: The larvae from quiet waters are usually red or pink. Those species found in lotic habitats may be white or brown. The head is yellow to dark brown and the posterior is edged in black. Some species have gular areas that are darker than the rest of the head.

Eyespots: Nearly all species have 2 eyespots. The upper is usually larger and directly dorsal to the lower.

Mentum: Most species have 9, 11, or 13 teeth, always an odd number. The center tooth is usually lighter in color than the laterals.

Ventromental plates: In the Tanytarsus group, they are long and curved slightly. They are vertically striate and meet or nearly meet at the midline. In the Zavrelia group the plates are widely separated as in some Chironomini.

Mandibles: Most species have 4 or 5 teeth. The apical is large and dark. There are 2 or 3 dark laterals and at least 1 smaller distadentis which is often lighter in color. In some species, there is also a small internal tooth. Older instars may have worn mandibles that appear to have only 1 tooth (Rheotanytarsus). The subdental seta is long, thin, and extends past the apex of the mandible. There is a mandibular pecten which may have some of the outer filaments produced into clear yellow spines.

Premandibles: These are long and usually clear. They may be bifid, trifid or end in as many as 5 blades.

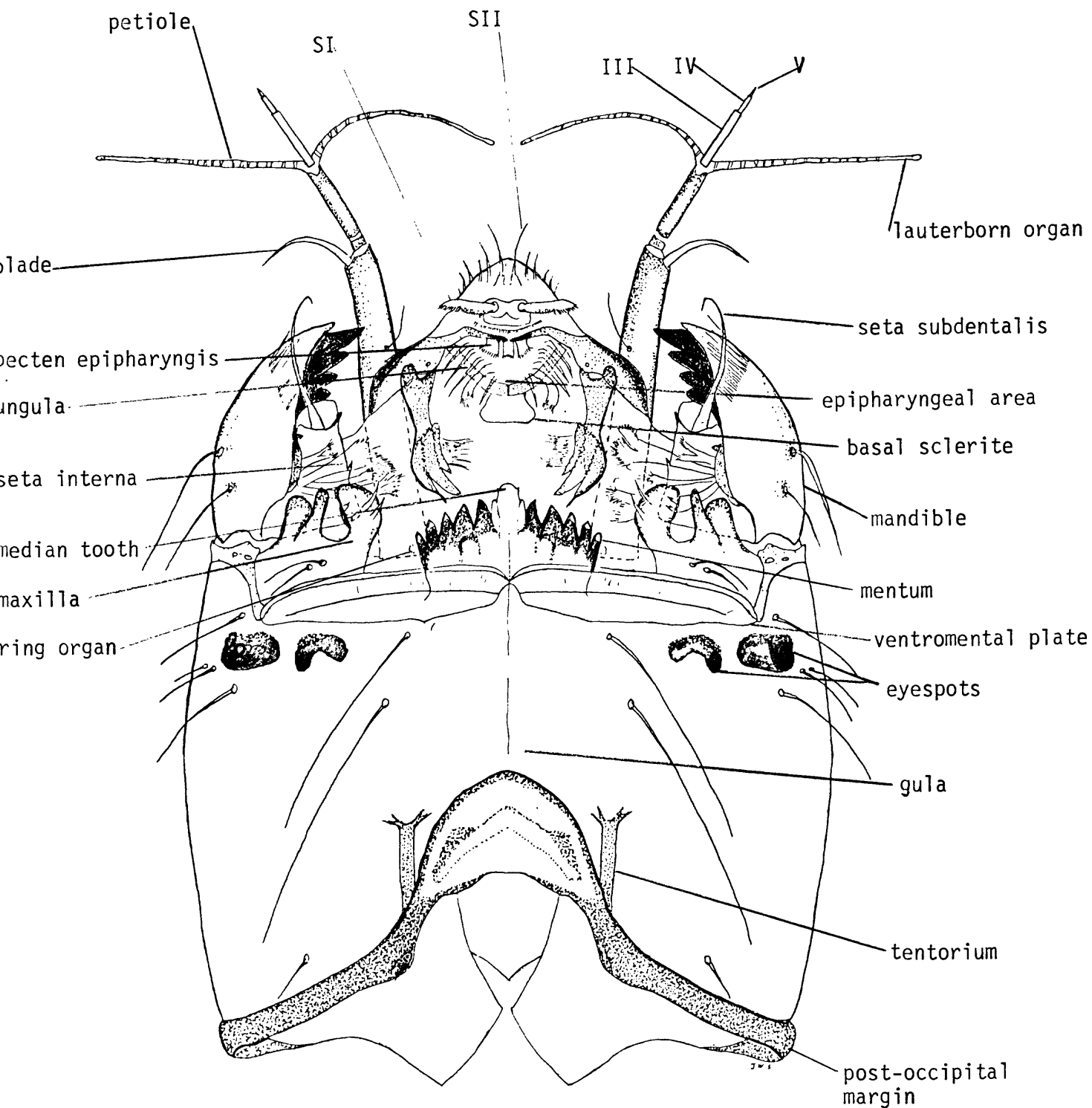


Figure 1.--Structure and terminology. Ventral view of the head capsule of a typical larval tanytarsinid.

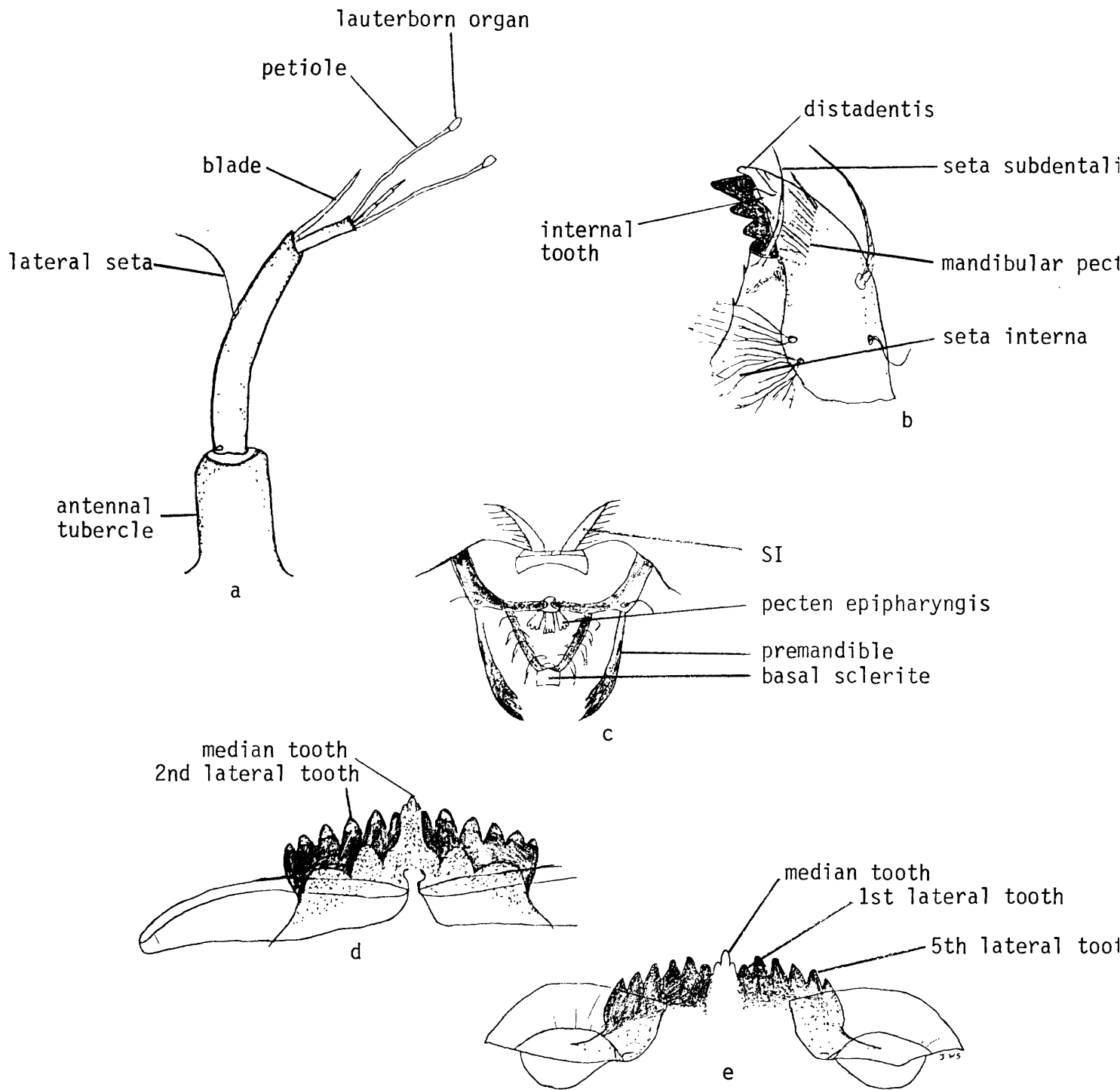


Figure 2.--Structure and terminology. a, Antennae (Corynocera); b, Mandible (Micropsectra); c, Palatal surface of labrum (Cladotanytarsus); d, Mentum (Tanytarsus); and e, Mentum (Stempellinella).

Epipharyngeal area: The pecten epipharyngis may consist of simple, lobed, pectinate or plumose teeth. The SI is long and featherlike.

Antennae: The antennae provide the most important taxonomic character in the tribe. In this text, the basal segment will be designated as I, the second segment as II and so on. Segment I is curved and is usually longer than the other segments combined. There is an antennal seta at about the middle of I, and a blade at the apex. The ring organ is typically at or near the base of I. There is a pair of Lauterborn organs on II. The antennae are mounted on tubercles that are typically longer than wide. In the text, R refers to the ratio of segment lengths. AR is the length of I divided by the combined lengths of II through V. All our specimens have 5 segments except Nimbocera which has a supernumerary segment at the base of II (fig. 3a). Unless otherwise noted, the antennal ratios are expressed as means based on at least 4 specimens. Each unit is equal to 1 micrometer.

Body: Plumose setae are usually present at the posterior lateral angles of segments 2 through 6. The claws of the posterior parapods are arranged in a horseshoe shape. There are 2 pairs of anal tubules and a pair of procerci, each with 6 to 10 setae. The larvae typically construct a case out of silk and plant debris.

Detailed descriptions of characteristics that are unique to the various genera (key characteristics) are given. If there is nothing distinctive about a part of the anatomy, it is not described.

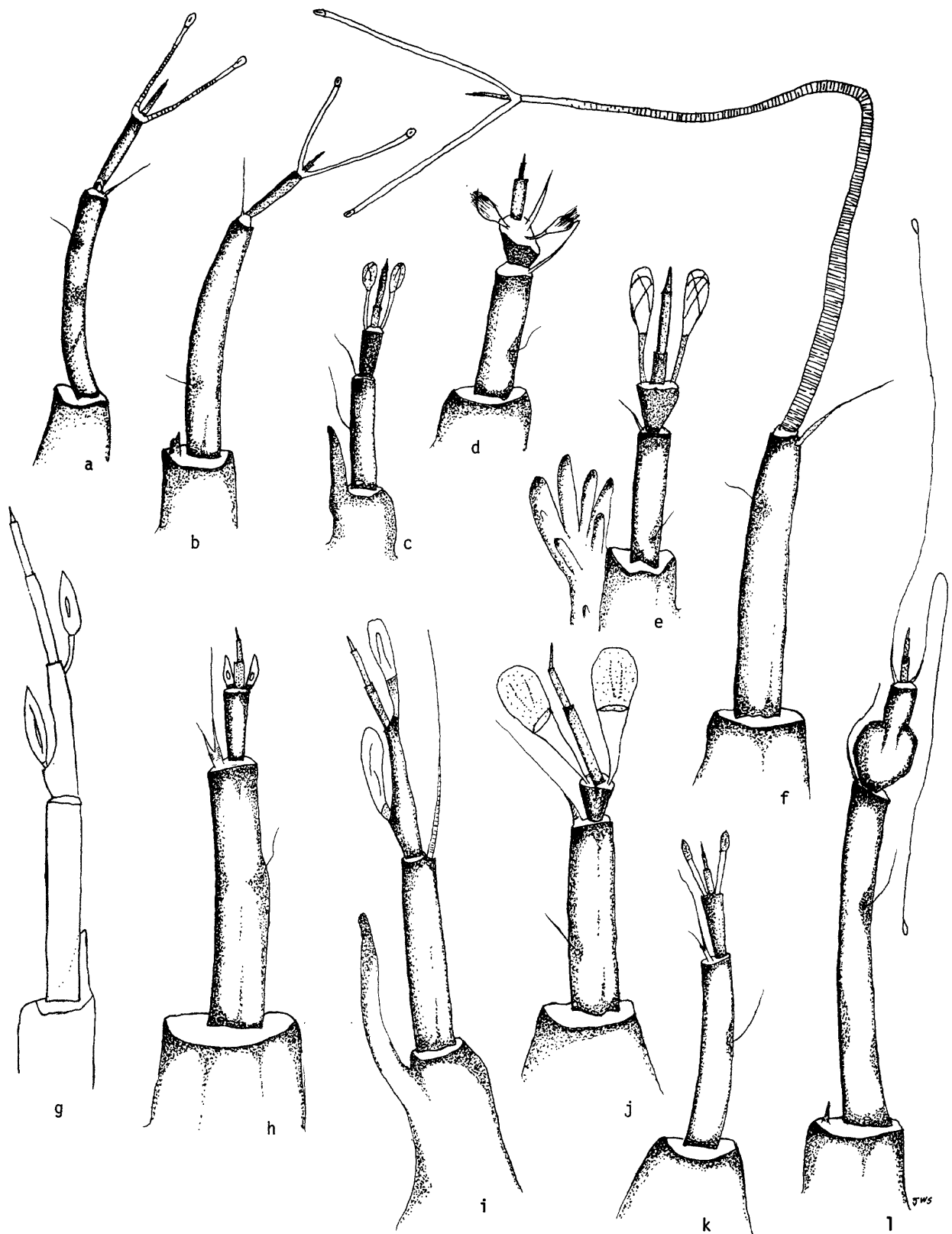


Figure 3.--Antennae. a, Nimbocera; b, Micropsectra; c, Constempellina; d, Lenziella; e, Stempellina; f, Tanytarsus; n, subgenus "A"; g, Zavrelia; h, Paratanytarsus; 8, Stempellinella; j, Cladotanytarsus; k, Rheotanytarsus; and i, Micropsectra sp.5.



# KEY TO THE GENERA OF LARVAL TANYTARSINI

1. Ventromental plates touch or nearly touch at midline (fig. 2d).....  
     Group Tanytarsus..... 5  
     - Ventromental plates widely separated (fig. 2e).Group Zavrelia... 2
2. (1) Lauterborn organs alternate at base and apex of segment II (fig. 3g).3  
     - Lauterborn organs opposite at apex of segment II (fig. 3c)..... 4
3. (2) Distal Lauterborn organ inserted supapically on segment II (fig. 3g).  
     II about equal to III + IV..... Zavrelia  
     - Distal Lauterborn organ inserted at apex of segment II (fig. 3i).II  
     longer than III + IV..... Stempellinella
4. (2) Apical projection of antennal tubercle simple (fig. 3c) Constempellina  
     - Apical projection of antennal tubercle palmate (fig. 3e).. Stempellina
5. (1) Mentum with 3 broad teeth (fig. 13)..... Corynocera  
     - Mentum with at least 7 teeth (fig. 15).....6
6. (6) Petiole of Lauterborn organ shorter than combined length of the  
     last 3 antennal segments or absent (figs. 3h, 3k).....7  
     - Petiole of Lauterborn organ much longer than the combined length  
     of the last 3 antennal segments (fig. 3b).....9
7. (6) Petiole of Lauterborn at least 1.5 times the length of the tiny  
     lauterborn organ. Ventromental plates usually sharply downturned  
     distally (figs. 3k, 17).....11  
     - Petiole of Lauterborn organ equal to or shorter than  
     lauterborn organ (figs. 3h, 3j).....8
8. (7) Lauterborn organs large, leaflike and about as long as their petioles  
     (fig. 21). Teeth of pecten epipharyngis pectinate (fig. 2c) .....  
     ..... Cladotanytarsus\*  
     - Lauterborn organs smaller, rounded and sessile or nearly so. (fig. 3h)  
     Teeth of pecten epipharyngis simple (fig. 25)..... Paratanytarsus
9. (6) Antennal tubercle with a spurlike apical projection (fig. 3b).....  
     ..... Micropsectra\*\*  
     - Antennal tubercle apically blunt (fig. 2a) or with a long curving  
     projection (fig. 47) .....10
- 10.(9) Petiole of lauterborn organ annulated (fig. 3a) ..... Nimbocera  
     - Petiole of lauterborn organ smooth (fig. 2a)..... Tanytarsus

- 11.(7) Center tooth of mentum nearly even with first laterals (fig. 49).  
Pecten epipharyngis composed of three separate teeth.....  
..... Tanytarsus (Sublettea)  
- Center tooth of mentum higher than first laterals (fig. 15). Pecten  
epipharyngis composed of a single pectinate comb..... Rheotanytarsus

\* Lenziella will key here

\*\* Lauterbornia will key here.

Modified from Oliver and others  
(1978), Roback (1957) and  
Chernovskii (1949).

Table 1. Important morphological characteristics

Genus (Number of species)	Mentum	Ventromental plates	Premandible	Antennae R -AR	Lauterborn organs	Distinctive Characteristics
<u>Zavrelia</u> (1)	13 sharp teeth, pointed.	Separate, radially striate, medially pointed.			Large alternate. Distal inserted subapically.	II $\approx$ III + IV.
<u>Stempellinella</u> (2)	13 sharp teeth.	Separate, radially striate, medially pointed.	Trifid	70:37:12:10:3 0.7 - 1.0	Large alternate. Distal organ is apical on II.	II>III + IV. Long curved spur from side of antennal tubercle.
<u>Constempellina</u> (3)	11-13 teeth, trifid center, low arch.	Separate, more vertically striate.		23:4:6:11:5 0.72	Large opposite.	Simple spur on tubercle.
<u>Stempellina</u> (5)	13 teeth, center 3 light, depressed arc.	Separate, more vertically striate.	4 blades	Variable 0:63 - 0:88	Large opposite.	Palmate projection on antennal tubercle.
<u>Corynocera</u> (2)	3 broad teeth	Contiguous, shallow arc.	5 blades fragile	150:35:18:10:5 2.2	Small on long petioles, opposite.	Mandible with no teeth.
<u>Rheotanytarsus</u> (2+)	11 teeth, center notched, even arc.	Nearly contiguous, strong lateral arc, 2 ranks of stria.	Bifid	100:23:10:6:4 2.3	Very small, short petioles, opposite.	Continuous comblike pecten epipharyngis.
<u>Cladotanytarsus</u> (10+)	9-11 teeth, center notched/ trifid.	Nearly contiguous	4 blades palmate	Variable 2.3 III longer than II.	Large on stout petioles, opposite.	Some claws on posterior parapods with serrate inner margin.

Table 1. Important morphological characteristics (continued)

Genus (Number of species)	Mentum	Ventromental plates	Premandible	Antennae R -AR	Lauterborn organs	Distinctive Characteristics
<u>Lenziella</u> (1) (data from Saether, 1971)	11 teeth, trifid center, small 2nd laterals.	Nearly contiguous.		59:16:16:7:5 1.48	Large on short II	II $\approx$ III. petioles, opposite.
<u>Paratanytarsus</u> (8+)	11 teeth, even arc.	Nearly contiguous, gentle lateral arc.	Bifid	Variable 2.0 II longer than III	Small rounded and nearly sessile, opposite.	3, 4, or 5 simple teeth on pecten epipharyngis.
<u>Micropectra</u> (10+)	11 teeth, center notched/ trifid and light.	Nearly contiguous.	Variable, 2, 3 or 4 blades.	170:50:10:5:3 11.6-2.3	Small on long petioles, tubercle.	Short or long spur from apex of antennal
<u>Nimbocera</u> (1)	11 teeth even arc, center trifid light.	Nearly contiguous,	3 blades	220:92:30:10:5 1.61	small on long annulated petioles, opposite.	Gula with dark sclerotized plate. Supernumerary segment at base of II.
<u>Tanytarsus</u> (20+)	11 teeth even arc, light pentifid center.	Nearly contiguous.	Variable, 2, 3 or 4 blades.	Highly variable	Small on long petioles, opposite.	
<u>Tanytarsus</u> n. subgenus "A" (1)	11 teeth, even arc, center trifid, light.	Nearly contiguous.	4 blades, palmate.	151:365:20:12:3 0.37	Long unequal petioles, opposite.	II $\gg$ I.

Table 1. Important morphological characteristics (continued)

Genus (Number of species)	Mentum	Ventromental plates	Premandible	Antennae R -AR	Lauterborn organs	Distinctive Characteristics
<u>Tanytarsus</u> ( <u>Sublettea</u> ) <u>coffmani</u> (1)	11 teeth, high arc,	Nearly contiguous, relatively narrow.	Bifid	63:22:13:10:5 1:25	Small on medium petioles.	3 simple teeth on pecten epipharyngis.
<u>Lauterbornia</u> <u>sedna</u> (1)	11 teeth, light trifid center.	Nearly contiguous,	Bifid	68:25:5:5:3 1.79	Small on long petioles, opposite.	Rounded spur from apex of antennal tubercle.
<u>Neozavrelia</u> (1) (data from Thienemann 1942, (not in microns)	9 teeth, high arc	Nearly contiguous.		17:8:5:3:2 1.0	Small on medium petioles.	Poorly developed antennal tubercle.

## GENERIC DESCRIPTIONS

### Stempellinella (Brundin)

A common European genus, Stempellinella is fairly unusual in United States Waters. In temperate regions, the larvae are most likely to be found in creeks and rivers. In arctic lakes, they are often abundant. We have specimens from Alabama, Arkansas, Colorado, Missouri and New Jersey.

Mentum: 13 sharp teeth with the center slightly lighter in color. First laterals slightly adpressed to center.

Ventromental plates: Widely separate and crescent shaped. Striae radiate, not reaching anterior edge. Pointed medially.

Mandible: All teeth brown. Not distinctive.

Premandible: Thin, clear and trifid.

Frontoclypeus: With 2 robust setae that are simple or bifid.

Pecten epipharyngis: Our specimens appear to have 5 blades. The center 3 are simple while the outer pair are pectinate.

Antennae R: sp. 1: 70:37:12:10:3 AR: 0.9-1.0  
sp. 2: 55:40:10:10:5 0.7-0.9

Blade at apex of curved segment I is as long as II through V combined.

III and IV are about equal. Lauterborn organs are large, alternate at base and apex of II. Petiole of distal organ is inserted at the apex of II and is as large as the organ. Petiole of lower organ is much shorter. The tubercles are apically diagonal and originate near the rear of the dorsal surface of the head.

Procercus: 4 large and 2 short anal setae, all light colored.

Similar genus: Zavrelia

Ecology: Creeks and rivers, construct sand/detritus cases. Achnanthes, sediment diatoms and detritus found in guts.

### KEY TO THE GENERA OF LARVAL STEMPELLINELLA

1. Frontoclypeal setae bifid (fig. 5)..... S.sp.1
- Frontoclypeal setae simple (fig. 4)..... S.sp.2

S. sp.1 corresponds to Stempellinella sp.1 in Oliver and others (1978) and is apparently unnamed. The antennal tubercle is large and has a long, curving projection that originates posterior to the apex. S. sp.2 corresponds closely to Stempellinella minor (Edw.) as described by Brundin (1948).



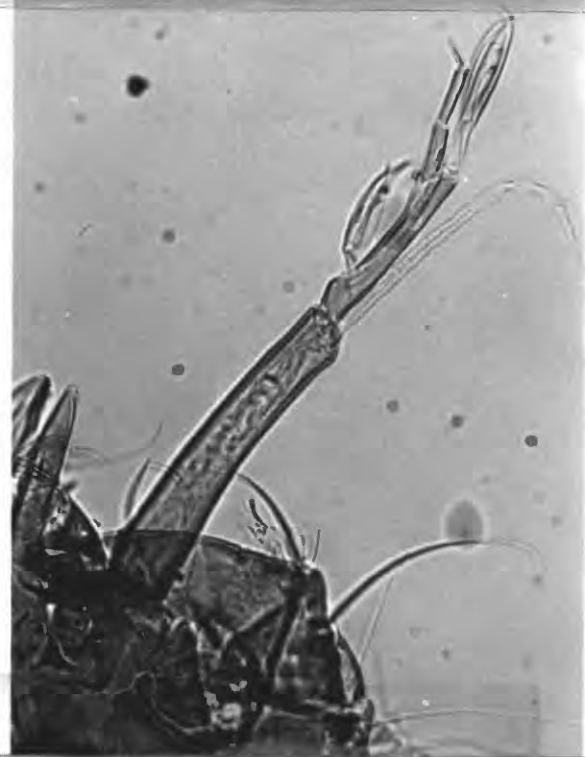
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Figure 4.--*Stempellinella*. sp.2. Delaware River near Trenton, New Jersey. Note the separated ventromental plates and the rounded projection from the left antennal tubercle. Segment II is 50  $\mu$ m long.

Figure 5.--*Stempellinella*. sp.1. Current River near Powder Mill, Missouri. Note long projections from the antennal tubercles and the bifid frontoclypeal setae. Segment I is 57  $\mu$ m long.

Figure 6.--*Stempellinella*. sp.1. North Sylamore Creek, Arkansas. Mentum. Note the clear trifid center tooth. The distance between the tips of the last lateral teeth is 54  $\mu$ m.

Figure 7.--*Stempellinella*. sp.1. Yellow Creek near Northport, Alabama. Antenna. Segments I and II are 78  $\mu$ m and 41  $\mu$ m long respectively.

### Zavrelia (Kieffer)

The larvae of this genus are very similar to those of Stempellinella. They differ in that the distal lauterborn organs are inserted subapically on segment II (apical in Stempellinella), and segment II is about equal to the combined lengths of III and IV (II is longer than III + IV in Stempellinella) (Brundin 1948). Roback (1957) described two tentative species of Zavrelia, however his Zavrelia sp. (Savannah River, Georgia and North Fork Holston River, Virginia may be a species of Stempellinella. Figure 2d is a Zavrelia sp. antenna redrawn from Roback, showing the subapical insertion of the distal Lauterborn organ as described by Brundin.

### Constempellina (Brundin)

The larvae of this genus are comparatively rare and we have found only one specimen from a north Alabama stream sample.

Mentum: 11 teeth with a trifid center. Unicolorous low arch.

Ventromental plates: Widely separate.

Mandible: Distadentis, apical tooth and lateral teeth are all comparatively small.

Antennae: R: 23:9:6:11:5 AR: 0.72. The antennae are similar in appearance to those of Cladotanytarsus. The Lauterborn organs are large, opposite and about as long as their petioles. There is a simple apicomeresal projection from the antennal tubercle.

Frontoclypeus: With 2 large plumose setae.

Similar genera: Stempellina.

Ecology: Primarily lotic.

Species: The specimen pictured is Constempellina sp. 2 (Oliver and others 1978). Species 1 (also from Oliver) has stout linear setae on the frontoclypeus and may correspond to Stempellina septentrionalis (Chrernovskii 1949), Constempellina brevicosta (Brundin 1948), or Zavrelia brevicosta (Edw.) which is keyed in Roback (1957). Wiens and others (1975) reported 3 species. Our single specimen is probably an early instar.

### Stempellina (Bause)

This genus is most common in boreal and mountain creeks. The various species seem to prefer swift, cold streams rather than lentic habitats. We have recorded specimens from Alabama, Alaska, New York and Wyoming.

Mentum: 13 teeth in a flat convex arc. The center 3 teeth are lighter in color than the laterals. The teeth are often broken and worn in older instars. The subdental seta is very long and extends well beyond the apex of the mandible.

Premandibles: Light colored and hard to see. With 4 large, clear blades.





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Figure 8.--Constempellina. Yellow Creek near Northport, Alabama. The separated vertically striate ventromental plates and the large opposite lauterborn organs identify this genus. Segment I is 23 um long.



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Figure 9.--Stempellina. sp.3 Bear Creek, Alabama. Procerci and posterior claws. The body is 200 um wide at the posterior claws.

Figure 10.--Stempellina. sp.1 Yellow Creek near Northport, Alabama. Antenna with tubercle. Segment I is 35 um long.

Figure 11.--Stempellina. sp.2. Unknown location, Wyoming. Note the projections on the frontoclypeus from which the setae arise. Segment I is 62 um long.

Pectin epipharyngis: S. sp.2 has 3 clear teeth similar to those of Paratanytarsus. S. sp.3 has fringed teeth similar to those of Cladotanytarsus.

Antennae: R: sp.1. 35:10:15:7:5 AR: 0.88  
sp.2. 60:13:8:11:6 0.83  
sp.3. 38:12:15:20:10 0.63

Blade at apex of I is about as long as the other segments combined. Segment II is short and flared as in Cladotanytarsus. The lauterborn organs are large and about as long as their petioles. The antennal tubercles are distinctive in that they have a palmate projection with 3 to 9 finger-like lobes.

Head: Prominent tubercles over the rear portion give the head a pebbled appearance.

Body characteristics: The procercus of S. sp.3 is enlarged and has many coarse porjections. The anal setae of S. sp.2 and 3 are often split.

Similar genus: Constempellina.

#### KEY TO SPECIES OF LARVAL STEMPELLINA (Oliver and others, 1978)

1. Rear of larvae with procerci produced into coarse, brown projections (fig. 9)..... S. sp.3
  - Rear of larvae "normal" .....2
2. Projection of antennal tubercle with 4 or 5 long lobes (fig. 10).....
  - ..... S. sp.1
  - Projection of antennal tubercle with 3 or 4 short points (fig. 11)...  
..... S. sp.2

All the species correspond to the species numbers in Oliver and others, (1978). S. sp. 1 is very near Stempelina bausei (Kieffer) as illustrated in Chernovskii (1949). Wiens and others, (1975) reported 5 species. S. sp.3 corresponds closely to S. subglabripennis (Brundin 1948).

#### Corynocera (Zetterstedt)

This is a rare circumpolar genus that is found primarily in high arctic lakes. Specimens have been reported from Northern Europe, Alaska, Wyoming and Northwest Territory, Canada.

Mentum: 3 large rounded yellow teeth and a low shoulder on each side.

Ventromental plate: Wide and very thin. Each plate is about twice as wide as the mentum.

Mandible: Short and rounded. No teeth.

Premandible: Dark with 5 thin, fragile blades.



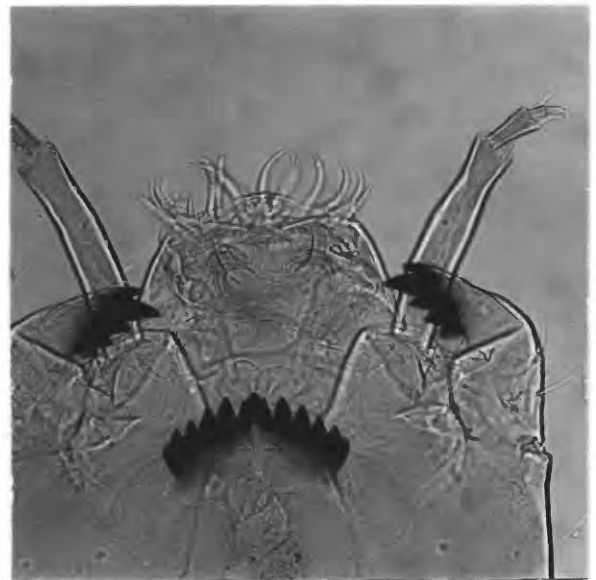
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Figure 12.--*Stempellina*. sp.3. Yellow Creek near Northport, Alabama. There are about 8 projections from the "Moosehorn" plus a bladeliike lateral projection. Segment IV is 20  $\mu$ m long.

Figure 13.--*Corynocera*. Northwest Territory, Canada. Mentum, ventromental plates, premandibles, and antennal tubercle. The antennal tubercle is 60  $\mu$ m wide.

Figure 14.--*Corynocera*. Northwest Territory, Canada. Antenna and mandible. Segment I is 150  $\mu$ m long.

Figure 15.--*Rheotanytarsus*. Snake Creek near Whitesburg, Georgia. Segment I is 110  $\mu$ m long.

Antennae: R: 150:35:18:10:5 AR: 2.2

I is very long and curved. The large antennal seta is at 0.5. The Lauterborn organs and their petioles are similar to those of Tanytarsus.

Body: Each procercus has 7 dark setae.

Species: The larvae of this genus were first discovered in prehistoric sediments and were designated as Dryadotanytarsus edentulus (Anderson) and D. duffi (Deevey) (Hirvenoja 1961). Dr. M. E. Roussel provided us with two specimens from the Northwest Territory, which probably correspond to C. ambigua (Zett.) as described by Hirvenoja (1961). Adults of Corynocera oliveri have been collected in Alaska arctic lakes, but the larva is unknown. Tanytarsus pedicelliferus (Chernovskii 1949) may be identical to the pictured species.

Rheotanytarsus (Bause)

Species type exiguus (joh.)

This is a common genus found in a wide variety of aquatic habitats, though most often in riffles. Widespread.

Mentum: 11 brown teeth in an even convex arc. Center tooth is notched/trifid.

Ventromental plates: Arcing laterally. There are 2 ranks of short regular striae. The plates are considerably downturned distally.

Mandible: All teeth are brown apically.

Premandible: bifid.

Pecten epipharyngis: Wide comb of 14-20 continuous fringelike teeth.

Antennae: R: 100:23:10:5:4 AR: 2.3

I is strongly curved. II is flared. The bifid blade at the apex of I extends past the apex. The Lauterborn organs are tiny, budlike and mounted on short petioles, which do not extend past the antenna apex. The tubercles are apically truncate. There is a pair of simple frontoclypeal spines between the tubercles. At low power (20x - 40x) the antennae are not particularly noticeable as they are in some other Tanytarsini.

Body: More robust than other genera of this tribe. Posterior is blunt.

Similar genus: Paratanytarsus.

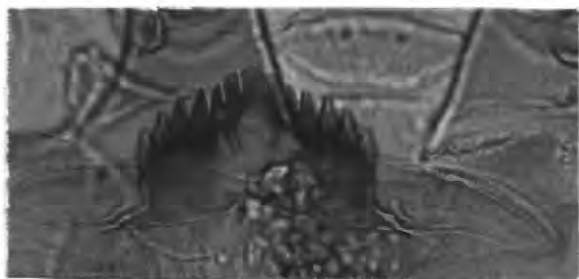
Ecology: Found usually in riffles where they build distinctive sand and detritus covered silk cases to which a net is spun to filter out drift. The case is attached to the substrate along its side or from a stalk. Melosira, Cocconeis and Cymbella cells found in guts, which indicates a periphyton diet.



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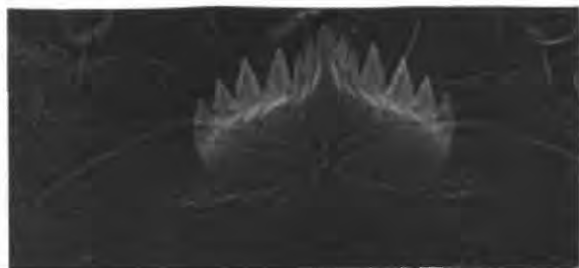
Figure 16.--*Rheotanytarsus*. Chester County, Pennsylvania. Pecten epipharyngis is 26 um wide.

Figure 17.--*Rheotanytarsus*. Sacramento River, California. Mentum is 98 um wide.

Figure 18.--*Cladotanytarsus*. sp. 1. Yellow Creek near Northport, Alabama. The center five teeth might be considered as one pentifid tooth as in sp. 3. The ventromental plate is 95 um wide.



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Figure 19.--*Cladotanytarsus*. sp.2. L-3 Reservoir, Ohio. The ventromental plate is 95 um wide.

Figure 20.--*Cladotanytarsus*. sp.3. Blue Creek, Alabama. The ventromental plate is 131 um wide.

Figure 21.--*Cladotanytarsus*. sp.4. Pond near Lithonia, Georgia. Segment III is 27 um long.



Species: Although specimens of Rheotanytarsus are nearly ubiquitous in our samples, there appears to be remarkably little morphological variation. We have a single specimen from Alaska that has only 10 teeth in the pecten epipharyngis and it may represent a separate species. Our others correspond roughly to R. exiguus (Joh.) and R. distinctissimus. Dr. Beck (White and others, 1980) identified four larval species that were phoretic on snails and macrobenthos in North Carolina streams. R. distinctissimus differs from the R. exiguus larvae illustrated in that segment II is dark colored and the mental teeth are more forward projecting.

#### Cladotanytarsus (Kieffer)

This genus is very common in many lakes and small ponds. Specimens are rare in our stream samples although they are often present in slow creeks and rivers. Widespread.

Mentum: Variable, 9 to 13 teeth. Center tooth may be simple, notched, trifid or pentifid. In most species, the center tooth is lighter in color than the laterals.

Ventromental plates: Long, thin, and barshaped. Not distinctive.

Mandible: 4 dark teeth and a light, short distal dentis.

Premandible: All of our specimens have palmate premandibles that end in 4 blades.

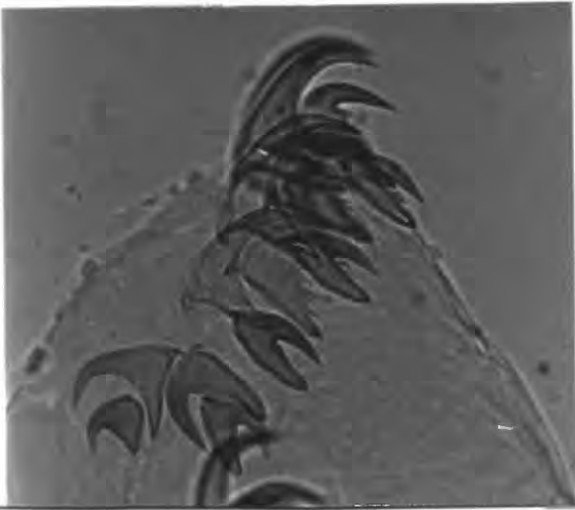
Pecten epipharyngis: 3 triangular apically fringed teeth.

Antennae: R:	sp. 1.	63:10:25:10:3	AR:	1.13
	sp. 2.	55:5:22:12:3		1.22
	sp. 3.	63:12:30:12:5		1.02
	sp. 4.	63:8:27:12:5		1.21
	sp. 5.	80:16:23:12:5		1.45

Segment I is curved and about as long as the mandible. Length to width ratio is about 4:1. There is a thin blade at its apex. II is short, trapezoidal and usually dark. The Lauterborn organs are very large and about as long as their petioles. The tubercles are apically truncate.

Body characteristics: About 14 light colored claws on posterior parapods, several of which are toothed on the inner edge (fig. 22). In C. sp. 5 the claw teeth are very small.

Ecology: Diatoma, Synedra, Navicula and Cyclotella cells found in guts.



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Figure 22.--*Cladotanytarsus*. sp. 3. Blue Creek, Alabama. Serrated claws of posterior parapods. The base of the small claw at left is 14  $\mu$ m wide.

Figure 23.--*Cladotanytarsus*. sp. 5. Unknown location, Wyoming. The mentum is 70  $\mu$ m wide.

Figure 24.--*Paratanytarsus*. sp. 1. Little Tonsina River, Alaska. The three teeth of the pecten epipharyngis are at the top of the specimen. Segment I is 118  $\mu$ m long. Note the long lauterborn organs.

Figure 25.--*Paratanytarsus*. sp. 4. Pond near Lithonia, Georgia. Note the clear center tooth of the mentum and the bifid premandibles. The ventromental plates are 115  $\mu$ m wide.

Figure 26.--*Paratanytarsus*. sp. 5. Sacramento River, California. Segment I is 95  $\mu$ m long.

# KEY TO SPECIES OF LARVAL CLADOTANYTARSUS

1. Center mental tooth distinctly pentifid and much wider than any of the lateral teeth (fig. 19.).....2
  - Center mental tooth single or trifid and more narrow.....4 (figs. 18, 23).....4
2. (1) Mentum with four pairs of lateral teeth (fig. 20) ..... C. sp.3
  - Mentum with five pairs of lateral teeth.....3
3. (2) Second lateral mental teeth very small, recessed (fig. 19).... C. sp.2
  - Second lateral mental teeth not much smaller than 3rd lateral teeth (fig. 21) ..... C. sp.4
4. (1) First lateral mental teeth larger than 2nd and truncate (fig. 18).... C. sp.1
  - First lateral mental teeth larger than 2nd and sharp, adpressed to center tooth (fig. 23) ..... C. sp.5

Species 1, 2 and 3 correspond to species 1, 2 and 3 in Oliver and others (1978).

Species 1 is near Calopsectra conversus (Joh.) as keyed in Roback (1975).

Species 2 is very near Tanytarsus mancus (Van der Wulp) as illustrated in Chernovskii (1949). Sp.5 is very near Tanytarsus sexdentatus (Chernovskii).

## Lenziella (Kieffer)

Saether (1971) described L. cruscula based on two specimens, both males, one with a larval exuvia and one with a pupal exuvia. Saether stated that Kieffer's description of the genus was "incomplete" and that "...it cannot be considered quite certain that the new species described here is a Lenziella". Saether also stated that Lenziella might be considered a subgenus of Cladotanytarsus once the immatures of both genera are described. However, he recommended that generic status be reserved for both taxa until a revision of Cladotanytarsus is prepared. Lenziella was not included in Coffman's (1978) compilation.

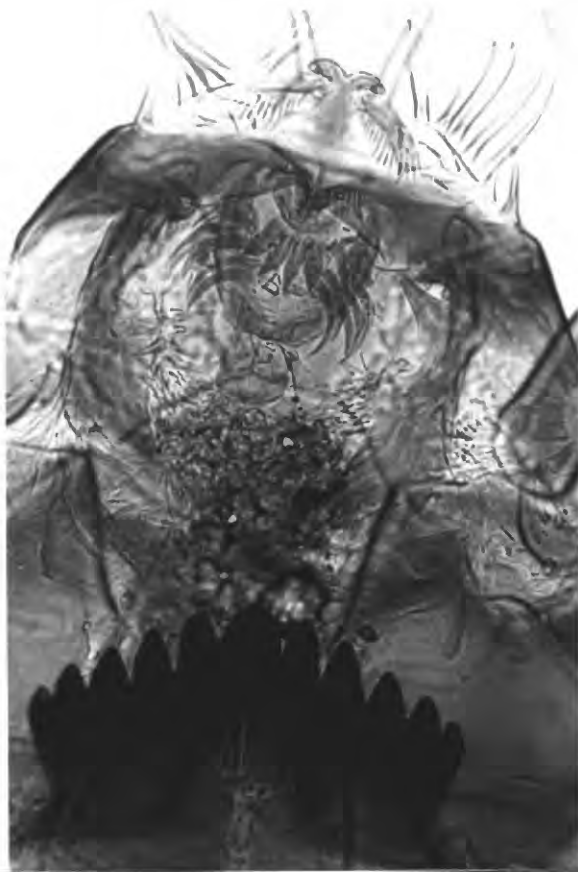
L. cruscula differs from our specimens of Cladotanytarsus in that antennal segments II and III are equal in length and the large Lauterborn organs have petioles that are about a third as long as the organs, not equal to them.

The mentum, ventromental plates and mandible of L. cruscula resemble those of Cladotanytarsus sp.2 (fig. 19).

Antennae: R: 59:16:7.5:5 AR: 1.48

The presence or absence of serrate claws on the posterior parapods (fig. 22) was not mentioned by Saether.





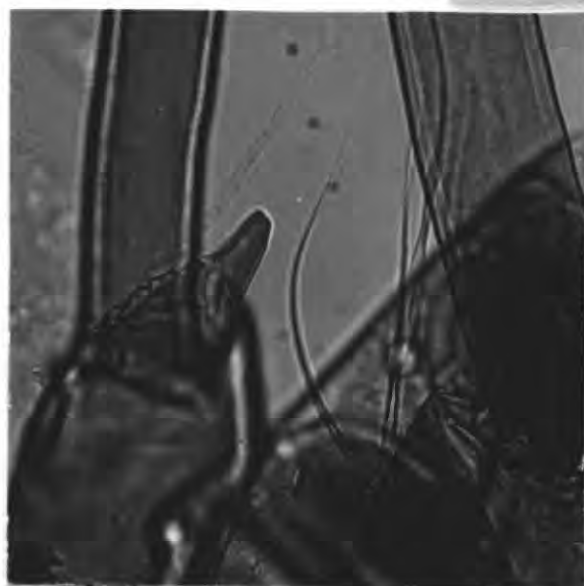
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Figure 27.--*Paratanytarsus*. sp.3. Little Tonsina River, Alaska. The four teeth of the pecten epipharyngis are clearly visible above the center of the mentum which is 125  $\mu$ m wide.

Figure 28.-- *Paratanytarsus*. sp.2. Canadian River, Oklahoma. The five teeth of the pecten epipharyngis are just to the right of the apex of segment I of the left antenna. Segment I is 123  $\mu$ m long.

Figure 29.--*Paratanytarsus*. sp.6. Pond near Brevard, North Carolina. The three teeth of the pecten epipharyngis are barely visible between the premandibles. The ventromental plates are 93  $\mu$ m wide.

Figure 30.--*Micropsectra*. Big Sandy Reservoir, Wyoming. Segment I is 23  $\mu$ m wide.

### Paratanytarsus (Kieffer)

This genus is common in lake and pond samples, and occasional in streams. Most often found in aquatic vegetation. Widespread.

Mentum: 11 teeth in an even convex arc. Center tooth may be lighter in color than laterals. Fifth laterals are much reduced.

Ventromental plates: Long, thin and bar-shaped. Slightly downturned distally.

Mandible: The distadentis, the apical tooth and the 2 lateral teeth are all dark brown. The ultimate filaments of the mandibular pecten are produced into long spines.

Premandible: Always bifid.

Pecten epipharyngis: With 3 to 5 simple teeth.

Antennae: R:	sp.1.	118:30:10:10:5	AR:	2.04
	sp.2.	123:25:10:7:5		2.33
	sp.3.	138:30:15:10:8		2.03
	sp.4.	123:38:15:10:7		1.75
	sp.5.	95:23:13:7:3		2.07
	sp.6.	108:28:12:8:5		2.04

I is stout and curved. II is darker than I and widened distally. III, IV and V taper evenly to the apex. The Lauterborn organs are round or pointed and nearly sessile. The antennal tubercles are short, stout and about as wide as long. The blade at the apex of I is unequally bifid. Similar genus: Rheotanytarsus.

Ecology: Tabellaria, Stauroneis, Gomphonema, Cymbella, Cyclotella, Synedra, Cosmarium, Navicula, Pinnularia and Eunotia cells found in guts.

#### KEY TO SPECIES OF LARVAL PARATANYTARSUS

1. Pecten epipharyngis with 3 teeth (fig. 24) ..... 2  
- Pecten epipharyngis with 4 or 5 teeth ..... 3
2. (1) Center mental tooth lighter than laterals (fig. 25) ..... P. sp.4  
- Mental teeth unicolorous (fig. 26) ..... 4
3. (1) Pecten epipharyngis with 4 teeth (fig. 27) ..... P. sp.3  
- Pecten epipharyngis with 5 teeth (fig. 28) ..... P. sp.2
4. (2) Center mental tooth notched/trifid. Ventromental plates somewhat separated (fig. 26) ..... P. sp.5  
- Center tooth entire. Ventromental plates nearly touch (fig. 29).. 5
5. (4) Mentum with dark colored, contrasting anterior margin and light colored center. Lauterborn organs extending to apex of III (fig. 29) ..... P. sp.6



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Figure 31.--*Micropsectra*. sp.3. L-3 Reservoir, Ohio. The ventromental plate is 72  $\mu$ m wide.

Figure 32.--*Micropsectra*. sp.4. Ditch on Hog Island, Bon Secour, Alabama. Segment I is 158  $\mu$ m long. There is an extra dorsal tooth on the mandible.

Figure 33.--*Micropsectra*. sp.1. Jim River at Bettles, Alaska. Segment I is 147  $\mu$ m long.

Figure 34.--*Micropsectra* sp. 2. Unknown location, Wyoming. Segment I is 179  $\mu$ m long.



33



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- Entire mentum dark and evenly shaded. Lauterborn organs larger, extending to apex of IV (fig. 24) ..... P. sp.1

P. spp. 1 and 2 correspond to spp. 1 and 2 in Oliver and others, (1978). Johannsen (1937) separated his Paratanytarsus species by using the ratio of antennal segments I and II. By this criterion, all of our specimens fall in the Tanytarsus dissimilis (Johannsen) and T. boeimicus (Kieffer) group.

#### Micropsectra (Kieffer)

This is a very common genus found in nearly all aquatic habitats. Specimens are especially abundant in littoral substrates. Widespread.

Mentum: 11 teeth in an even convex arc. The center tooth is always notched, trifid or pentifid (unless worn) and usually lighter in color than the laterals.

Ventromental plates: Bar like, nearly meeting at midline.

Mandible: M. sp.3 has one or two internal teeth. The mandibles of most species have 1 or 2 sharp serrations.

Pecten epipharyngis: 3 teeth each with 3 to 5 short, terminal lobes.

Premandible: Usually bifid.

Antennae:	R:	sp.1.	145:63:12:10:7	AR:	1.58
		sp.2.	248:75:10:8:5		2.34
		sp.3.	138:50:20:7:3		1.62
		sp.4.	153:75:25:8:5		1.35
		sp.5.	180:50:15:8:5		2.31

Segment I is very long and curved. The Lauterborn organs are mounted on extremely long slender petioles. The antennal tubercles have short, apical dorso-mesal spurs.

Similar genera: Tanytarsus, Lauterbornia.

Ecology: Synedra, Fragilaria, Melosira, Navicula, Eunotia, Cyclotella, Cocconeis, Gomphonema, and Charaoiopsis cells found in guts. Larvae construct simple silk sacks.



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Figure 35.--Micropsectra. sp.5. Unnamed head-water stream in Coweta National Forest, North Carolina. Segment I is 180  $\mu$ m long.

Figure 36.--Lauterbornia sedna. Char Lake, Northwest Territory, Canada. Segment I is 68  $\mu$ m long.

Figure 37.--Lauterbornia sedna. Char Lake, Northwest Territory, Canada.

Figure 38.--Nimbocera. Tidal ditch in Savannah National Wildlife Refuge, South Carolina. Note the similarities to Tanytarsus. Segment I is 195  $\mu$ m long.



# KEY TO SPECIES OF LARVAL MICROPSECTRA

1. First lateral teeth adpressed to center tooth (fig. 31)..... M. sp.3  
 - First lateral teeth separated from center tooth (fig. 32) ..... 2
2. (1) Premandibles with 3 or 4 blades (fig. 32) ..... M. sp.4  
 - Premandibles bifid (fig. 34) ..... 3
3. (2) Segment I short, about as long as mandible and stout, about 4 times longer than wide (fig. 33) ..... M. sp.1  
 - Segment I longer than mandible and about 6 times longer than wide (fig. 34) ..... 4
4. (3) Segment II expanded proximally and bottle shaped (fig. 35) ... M. sp.5  
 - Segment II normal ..... M. sp.2

M. sp.3 is similar to Calopsectra sp.7 (Roback 1957). M. sp.2 agrees with Chevnovskii's (1949) limited description of M. praecox.

## Lauterbornia sedna (Oliver)

This species was described by Oliver (1976) from Char Lake, Northwest Territory, Canada, and is parthenogenetic. The specimen pictured is a paratype specimen.

Mentum: 11 teeth. The center tooth is trifid.

Ventromental Plates: Similar to many Tanytarsus and Micropsectra species.

Mandible: 3 lateral teeth.

Premandible: Similar to many Micropsectra species.

Antennae: R:68:25:5:5:3 AR: 1.71

Segment I is not much longer than the mandible.

Similar genera: Tanytarsus, Micropsectra.

Chernovskii (1949) described this genus as having an AR (his antennary index) of 2.2-2.5. His specimens were very long (10 mm) and blood red. L. coracina (Kieffer) is a bisexual species. As stated by Oliver (1976), "The population of L. sedna living on Char Lake is composed entirely of females (Welch 1973, pers. obs.). Moreover, it is a triploid with two sets of similar chromosomes and one set of dissimilar chromosomes, and probably of hybrid origin (J. Martin, pers. comm.). Therefore, it is different from either bisexual or diploid parent, of which L. coracina may be one." The larvae are not safely separable from those of Micropsectra. Lauterbornia was not included in Coffman's (1978) compilation.



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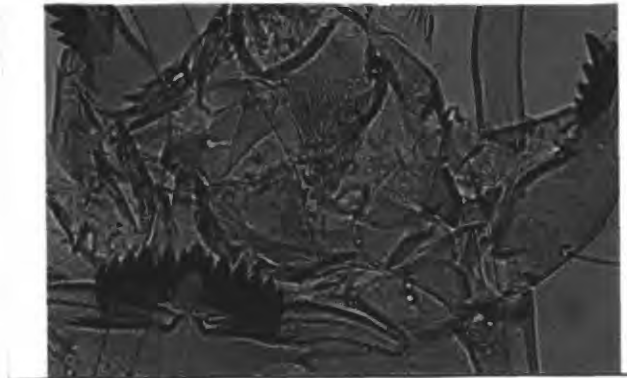
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Figure 39.--*Tanytarsus*. sp.5. Pond in Savannah National Wildlife Refuge, South Carolina. Segment I is 160 um long.

Figure 40.--*Tanytarsus*. sp.7. Unnamed stream west of Smith Bay Lake, Alaska. Segment I is 72 um long.



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Figure 41.--*Tanytarsus*. sp.2. Ditch near Sabine Pass, Texas. Mentum is 98 um wide.

Figure 42.--*Tanytarsus*. sp.1. Unknown Location, North Alabama. Note the brush-like fronto-clypeal setae. Segment I is 175 um long.

Figure 43.--*Tanytarsus*. sp. ? Ditch near Newington, Georgia. The lower mentum is 105 um wide.

### Nimbocera (Reiss)

Nimbocera is primarily a neotropical genus, and the range in North America is limited to the southern United States.

Mentum: Eleven teeth in an even convex arc. The center tooth is light yellow and trifid.

Ventromental plates: Long, thin and bar shaped.

Mandible: Similar to many Tanytarsus species.

Premandible: 3 long blades.

Pecten epipharyngis: 3 teeth each with 5-7 short lobes.

Antennae: R: 195:75:28:10:5 AR: 1.65. Segment I is strongly curved, otherwise the antennal segments resemble those of Tanytarsus. The Lauterborn organ petioles are about 0.7 times as long as segment I and bear  $\pm$  20 sclerotized annulations. The antenna tubercles are short and oblique at their apices. There is a short supernumerary segment at the base of II.

Ecology: Found mostly in coastal swamps. Melosira, Cyclotella, Fragilaria, and Eunotia cells found in guts.

Species: Reiss (1972) described Nimbocera patagonica from Chile.

Our specimens differ in that they lack the spur on the antennal Antennal measurements (in microns) are compared below. There is probably only one species found in the United States.

	Segment Ratio	Petiole	AR
sp.1:	195:75:28:10:5	138	1.65
<u>patagonica</u> :	187:66:19:12:6	163	1.82

Nimbocera was not included in Coffman's (1978) compilation.

### Tanytarsus (Van der Wulp)

Probably the most common genus of this tribe and easily the most diverse. Specimens are common in samples from throughout the United States.

Mentum: 11 teeth. Center tooth is pentifid or worn to trifid. The center is usually light colored medially. The laterals are reduced evenly, except the last lateral may be much reduced.

Ventromental plates: Curved laterally in a gentle arc.

Premandibles: 3 or 4 teeth. When the fourth tooth is present, it is extremely small.

Mandible: Highly variable in number of lateral and internal teeth and not distinctive.





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Figure 44.--*Tanytarsus*, sp.6. Puddle near Lithonia, Georgia. Segment I is 180 um long.

Figure 45.--*Tanytarsus*, sp.3. Pond near Brevard, North Carolina. Segment I is 175 um long.

Figure 46.--*Tanytarsus*, sp.4. Ditch on beach near Sea Rim, Texas. Segment I is 113 um long.

Figure 47.--*Tanytarsus* nr. *curticornis*. Yellow Creek near Northport, Alabama. The mandible is 82 um long. A very similar larvae was reared by Mothes (1968) who identified the adults as *T. curticornis*. *Micropectra curvicornis* (Chernovskii, 1949) is a synonym for *T. curticornis*.

Antennae: R: Extremely variable. AR: 2-3. Lauterborn organs are small as in Micropsectra, with long slender petioles. The blade at the apex of I reaches the apex of II. The antennal seta is variable. The antennal tubercle is truncate with no apicomesal projection except in T. curticornis (fig. 47).

Similar genus: Micropsectra.

Ecology: Most specimens have gut contents made up of grit and diatoms. Some construct nets and filter for food.

Species: This genus is best identified by characters that are lacking rather than by those that are present. The antennal segments descend evenly in length. There are no annulations on the antennal segments or lauterborn organ petioles. The genus is not restricted much by geography or habitat.

#### KEY TO SOME SPECIES OF LARVAL TANYTARSUS

1. Lauterborn organ petiole about 3 times as long as segments III, IV and V together (fig. 45) ..... 2
  - Lauterborn organ petiole about twice (or less) the length of segments III, IV and V together (fig. 46) ..... 6
2. (1) Mentum unicolorous (fig. 41) ..... T. sp.2
  - Mentum with center light (fig. 45) ..... 3
3. (2) Antennal seta of segment I at 0.5 or above (fig. 39) ..... 4
  - Antennal seta of I near 0.4 or below (fig. 40) ..... 5
4. (3) Fronto-clypeal setae brush-like (fig. 42) ..... T. sp.1
  - Fronto-clypeal setae simple ..... T. sp.3
5. (3) Premandible with 4 teeth. Antennal seta at 0.3 (fig. 40) .. T. sp.7
  - Premandible with 3 teeth. Antennal seta at 0.4 (fig. 44) .. T. sp.6
- 6.(1) Segment II greater than twice as long as III (fig. 46)..... T. sp.4
  - Segment II less than twice as long as III (fig. 39)..... T. sp.5

Not keyed: T. nr. curticornis (Kieffer) (fig. 47) and T. n. subgenus "A" (fig. 48).

The variation is nearly continuous in this genus and the species are difficult to differentiate. Sp.1 may be distantly related to T. lobatifrons (Kieffer) as described in Chernovskii (1949).

Tanytarsus n. subgenus "A"

This is not intended to be a formal description of a new subgenus and species. To do so on the basis of two larvae would be unwarranted. The sobriquet n. subgenus "A" is offered as a common name to be used only until the adults are identified and described. This larva is very similar to Calopsectra species 13 as described by Roback (1966). His specimens were collected in South America and the distribution of n. subgenus "A" appears to be sub-tropical United States. This larva probably represents a subgenus of Tanytarsus. Roback's specimen had an antenna with segment II only slightly longer than segment I. Subgenus "A" has a second segment at least twice as long as the first. Other differences are presented in Table 2, below:

Table 2.--Comparison of Calopsectra sp. 13 and subgenus "A"

	Species 13	subgenus "A"
Length	3.5	5.5 mm
Antennal tubercle	0.044mm	0.052 mm
Antennal ratio	40:42:1.5:1.5:1	50:122:7:4:1
Antennal seta	63 from base of 1	.64 from base of I
Lauterborn organ	11 x last 3 segments	4 x last 3 segments
Petiole		
Premandibles	trifid	4 blades (4th very small)
Mentum	teeth even, short	teeth large, center light
Procerci	7 setae	8-9 setae

Mandible: Length: 102 Width at base: 50

The distadentis is short, yellow. 2 brown lateral teeth with a long, thin, clear subdental seta. There is 1 serration of the inner shoulder. 4 plumose internal setae. 2 long setae on outer shoulder.

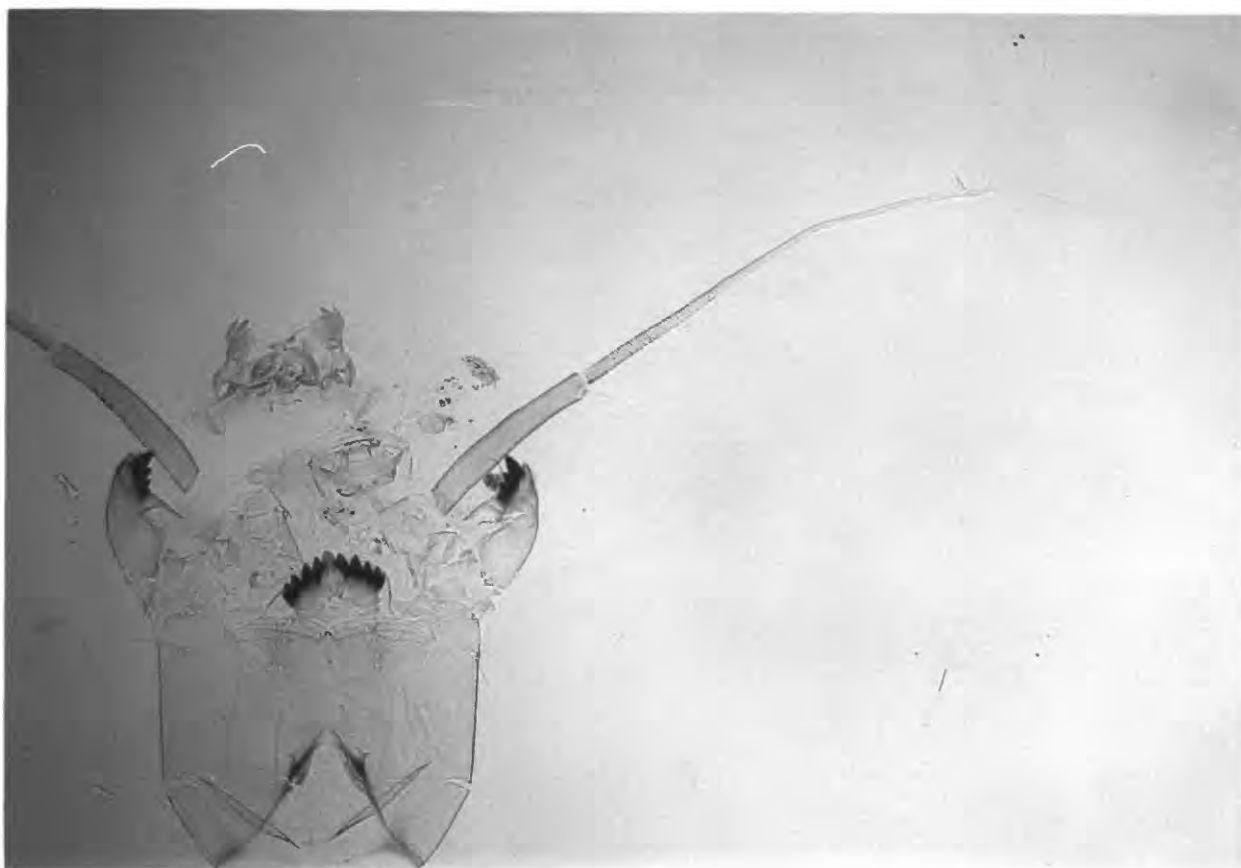
Mentum: 11 teeth. Center tooth light yellow and notched/trifid. Lateral teeth brown. Mentum width is 82.

Ventromental plates: Width: 91. Length 26.

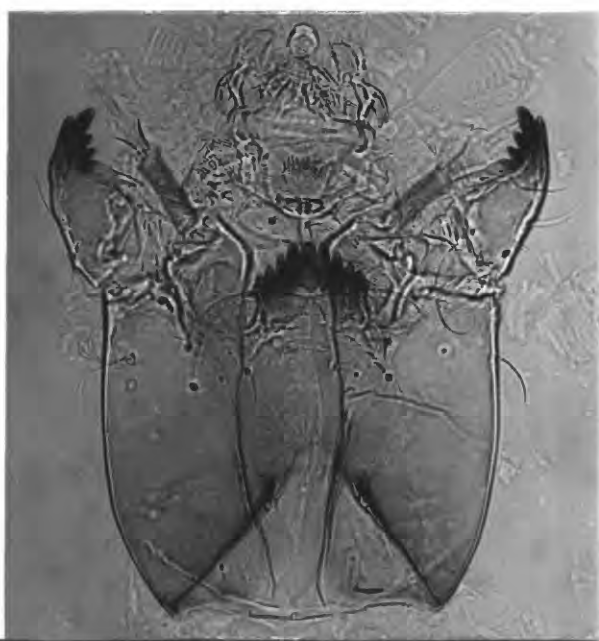
Pectin epipharyngis: 3 teeth, the outer two are divided into 4 long lobes, the inner tooth has 3 long lobes.

Premandibles: Palmate with 4 blades.

Body: 5 to 6 mm long with setae scattered along entire length. Posterior parapods with 11 claws. 4 blunt anal tubules. Each procercus has 8 to 9 dark brown setae. No larval cases were found.



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Figure 48.--*Tanytarsus* n. subgenus "A". Ditch near Newington, Georgia. Segment II is 365  $\mu$ m long.

Figure 49.--*Tanytarsus* (Sublettea) *coffmani*. Ridley Creek near Dutton Mill, Pennsylvania. Segment I is 38  $\mu$ m long.

Tanytarsus (Sublettea) coffmani (Roback)

This species is rare in Northeastern North America. Roback reported specimens from Pennsylvania and Vermont in the United States, and New Brunswick in Canada.

Mentum: 11 teeth in a high arc. First laterals are as large as and nearly even with the center tooth.

Ventromental plates: Somewhat square medially as in Rheotanytarsus.

Mandible: Not distinctive.

Premandible: Unequally bifid.

Antenna: R: 63:22:13:10:5 AR: 1.25

Segment I is about 4 times as long as wide. The antennal seta is at about 0.5. II is flared apically and is similar to that of Rheotanytarsus. III, IV and V taper evenly to the apex. The Lauterborn organs are small on medium petioles. The blade at the apex of I extends to the apex.

Pecten epipharyngis: 3 clear simple teeth as in Paratanytarsus.

Body: Each parapod has about 40 simple claws.

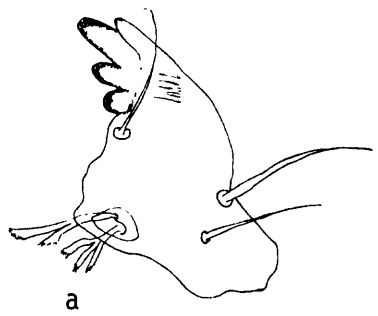
We have a single 4th instar larva from Missouri and 5 3rd instar specimens from a Pennsylvania stream sample. Dr. Roback (1975) named this species as a subgenus of Tanytarsus based on adult, larval and pupal characteristics. We agree with Dr. Roback that "this species merits at least the subgeneric rank it is here accorded." T. (S.) coffmani is remarkably similar to Neozavrelia luteola as described and illustrated by Thienemann (1942) (Fig. 50), and future research may reveal a closer relationship between these species.

Tanytarsus (nr. Sublettea) sp.1

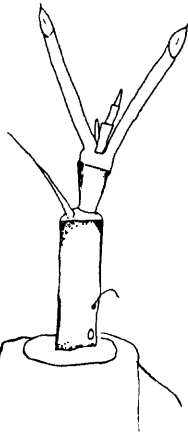
A probable second species of Sublettea was keyed as Tanytarsus sp.3 by Oliver and others, (1978). The mentum, antenna and mandible of our single specimen strongly resemble those illustrated and pictured by Dr Roback in his original (1975) description. The larva is small (2 mm) with a unicolorous brown head. It superficially resembles the Stempellina sp.2 larvae which were found at the same collection site. T. (nr. Sublettea) sp.1 has a pectinate pecten epipharyngis and longer Lauterborn organ petioles (fig. 50) than T. (S.) coffmani. The antennal tubercles are very short and thus the larvae would not key to the tribe Tanytarsini in most keys.

Neozavrelia (Goetghbuer and Theinemann)

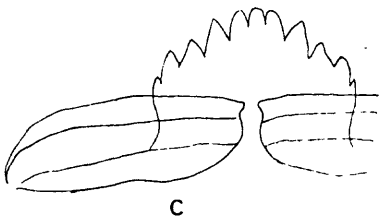
A Neozavrelia species has been collected in Pennsylvania as pupae and adults (Coffman, 1978), but no larva has been associated with these life stages. Thienemann's larval description (1942) is very similar to subgenus Sublettea (Roback 1975). It may be that one of the common undescribed Tanytarsinid larvae is "masking" the identify of Neozavrelia.



a



b



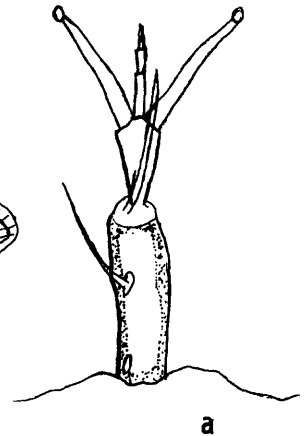
c

50



b

51



a

Figure 50.--*Tanytarsus* (nr. *Sublettea*) sp.1 Prospect Creek at Alaska pipeline. a, mandible; b, antenna; and c, mentum. The mentum is 42  $\mu$ m wide.

Figure 51.--*Neozavrelia luteola*. a, antennae; and b, mentum and ventromental plates. (Redrawn from Thienemann 1942).



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