

# Photographic Catalogue of north west European *Cricotopus* species (Diptera: Chironomidae: Orthoclaadiinae)

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## 1. Introduction

Chironomidae or non-biting midges are amongst the most diverse and abundant inhabitants of freshwater aquatic habitats, occurring in nearly all regions in the world. Their larvae are known as blood worms and are amongst the most numerous macrofauna species groups, both in number of individuals as well as number of species. The pupae are less known, lacking a vernacular name. After having shed their pupal skin or exuviae, the adult chironomid appears. These adults are known as non-biting midges.

Identification of the larvae of these midges may be important for a number of reasons including their use in ecological monitoring and ecological studies. The authors like to emphasize that identifying chironomid larvae to species level can provide valuable ecological information.

Recently a key was published on the identification of larvae of *Cricotopus* species occurring in north western Europe (Cuppen & Tempelman 2018). This current paper serves as an appendage to this publication. We provide pictures of the species studied, giving still more suggestions for correct identification of species. Also we would like to encourage fellow workers on Chironomidae to share their photos, observations and experiences through the modern portals<sup>1</sup> which have served so well in numerous species groups.

## 2. Morphology

The morphology of Chironomidae larvae is amazingly complicated, especially regarding structures of the head capsule. As for terminology we generally follow Sæther (1980) who produced a glossary of chironomid morphology.

*Cricotopus* larvae have a sclerotized, non-retractile head capsule and a segmented cylindrical body. They bear one pair of not jointed anterior parapods ("prolegs") on the first thoracic segment, one pair of not jointed posterior parapods on the last body segment, which also bears a pair of setae-bearing procerci, and one to two pairs of anal tubules. We introduce a new character for the anterior parapods: the claw index. **Claw index** = ratio distal tooth/subdistal tooth middle long claw of anterior parapod.

The majority of the characters used for larval identification is found in the head. The head capsule is entirely sclerotized in *Cricotopus*, as opposed to the rest of the body, which consists entirely of soft tissues. The best characters are located on the ventral side of the head. They include the spacing of setae submenti, the number of mandibular teeth and width of the central mental tooth. **MR = mentum ratio**: width central mental tooth / 1<sup>st</sup> lateral tooth.

The mandible normally has three inner teeth and one apical tooth. Other structures on the ventral part of the head are the ventromental plate, mentum and labrum.

The labrum possesses several characters which can be important for determination. Particularly the pecten epipharyngis and premandibula are important. The premandibula has one or two distal teeth. Other characters such as labral lamella, chaetulae laterales and chaetulae labrales are of little use. More important is the **S1**. Number and size of hairs are used to separate species.

The dorsal part of the head is made up of several sclerites and bears the antennae.

The antennae of *Cricotopus* are placed in the anterior region of the head. There are no obvious pedestals. The antenna has five segments, all but the fifth one completely sclerotized. **AR = antennal ratio**: basal segment/other segments combined. On the distal end of antenna 2 Lauterborn organs are present in nearly all species.

In *Cricotopus* identification, abdominal hair bundles are very important. Size and number of hairs represent important characters. On segment 7, hairs are often shorter and number less than on segments 1-6.

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<sup>1</sup> Such as Waarneming.nl, Waarnemingen.be and Observation.org.

Morphology of *Cricotopus* larvae: Ventral part of head

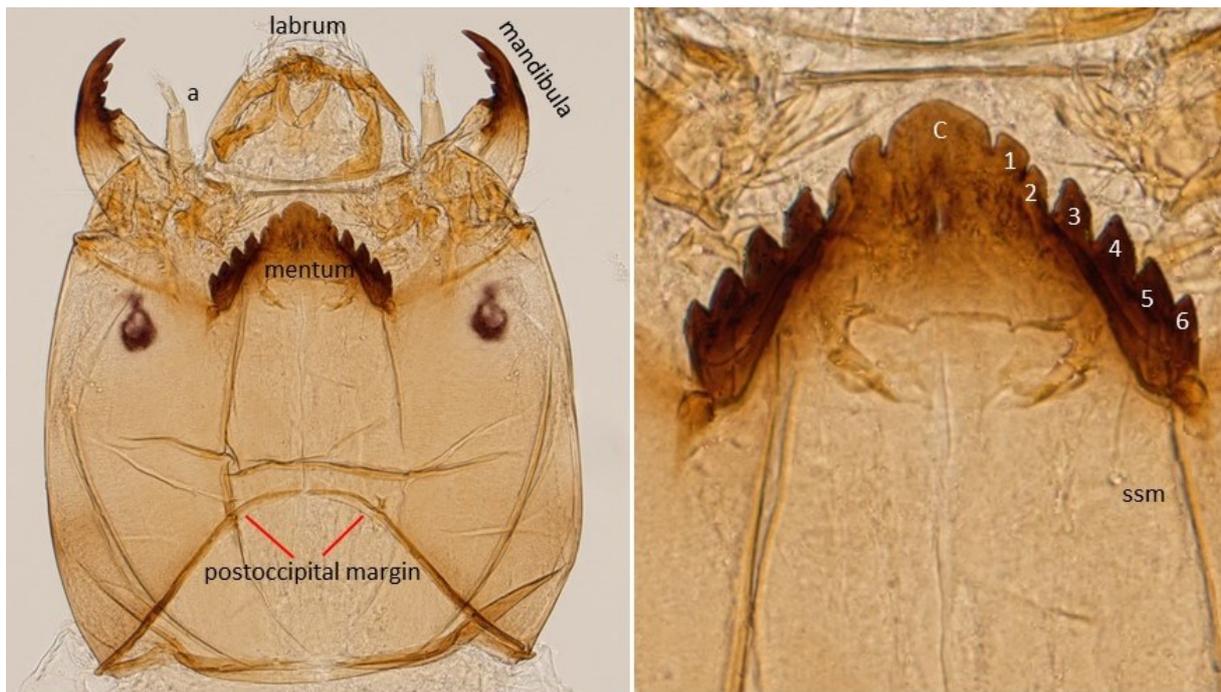


Figure 1. Head ventral of *Cricotopus bicinctus*. a = antenna; C = central mental tooth; 1-6 = lateral mental teeth.

Morphology of *Cricotopus* larvae: antenna and Lauterborn organs.

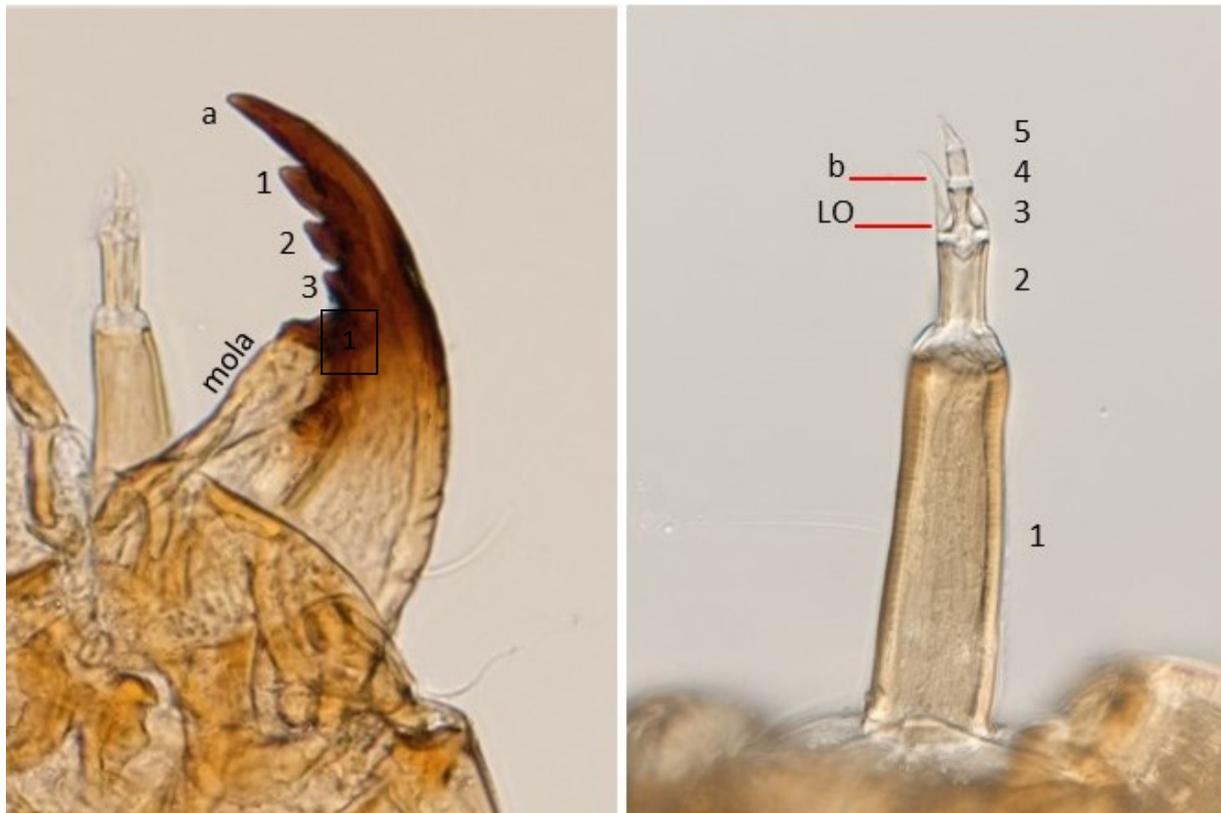


Figure 2. Mandibula of *Cricotopus bicinctus*. a = apical tooth; 1-3 = lateral teeth.

Figure 3. Antenna of *Cricotopus ornatus*. b = antennal blade, LO = Lauterborn organ, 1-5 = segment.

Morphology of *Cricotopus* larvae (continued): claws of the anterior pseudopods.

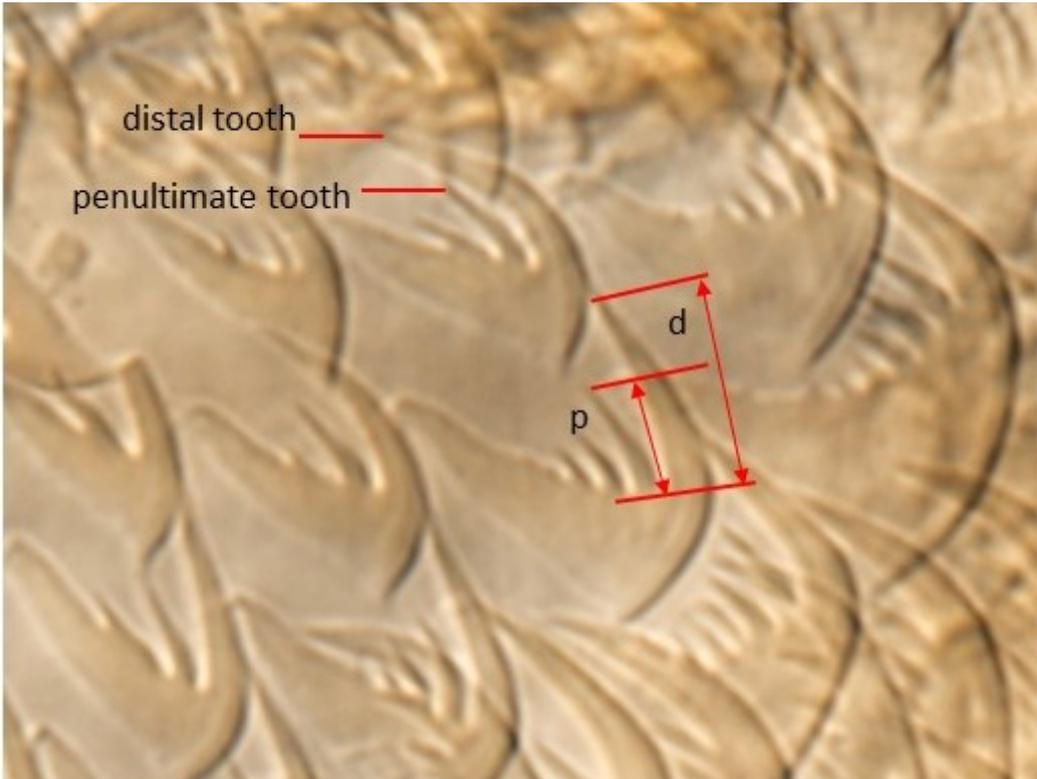


Figure 4. Claws of the anterior pseudopods. Claw index: ratio distal tooth: penultimate tooth, in this example the claw ratio is circa 1.4. (distal tooth is circa 1.4 times larger than penultimate tooth).

### 3. Photographic catalogue

#### *Cricotopus* subgenus *Cricotopus*

*Cricotopus albiforceps* (Kieffer in Thienemann & Kieffer, 1916)

**Body:** body length: 5 mm.

**Head capsule:** yellow; occipital margin yellow; head width: 305  $\mu\text{m}$ .

**Antenna:** 5 segments; antennal blade extends to last segment; length antenna 1: 40 -50  $\mu\text{m}$ ; AR: 1.8.

**Mentum:** 6 lateral teeth and a broad median tooth; 2<sup>nd</sup> lateral tooth slightly reduced; MR: 2.5-3.

**Mandibula:** 3 inner teeth, color apically brown extending to molar area with wide pale base; dorsal margin nearly smooth.

**Premandibula:** simple.

**Labrum:** Bifid S1 with branches of similar size.

**Epipharynx:** pecten epipharyngis composed of 3 scales of equal length.

**Submental setae:** located at the transition of the 4<sup>th</sup> and 5<sup>th</sup> lateral tooth; distance between setae: 78  $\mu\text{m}$  (n = 1).

**Anterior parapods:** mid long claws with fine inner teeth which are half as long as distal tooth; claw index: 1.9 – 2.0.

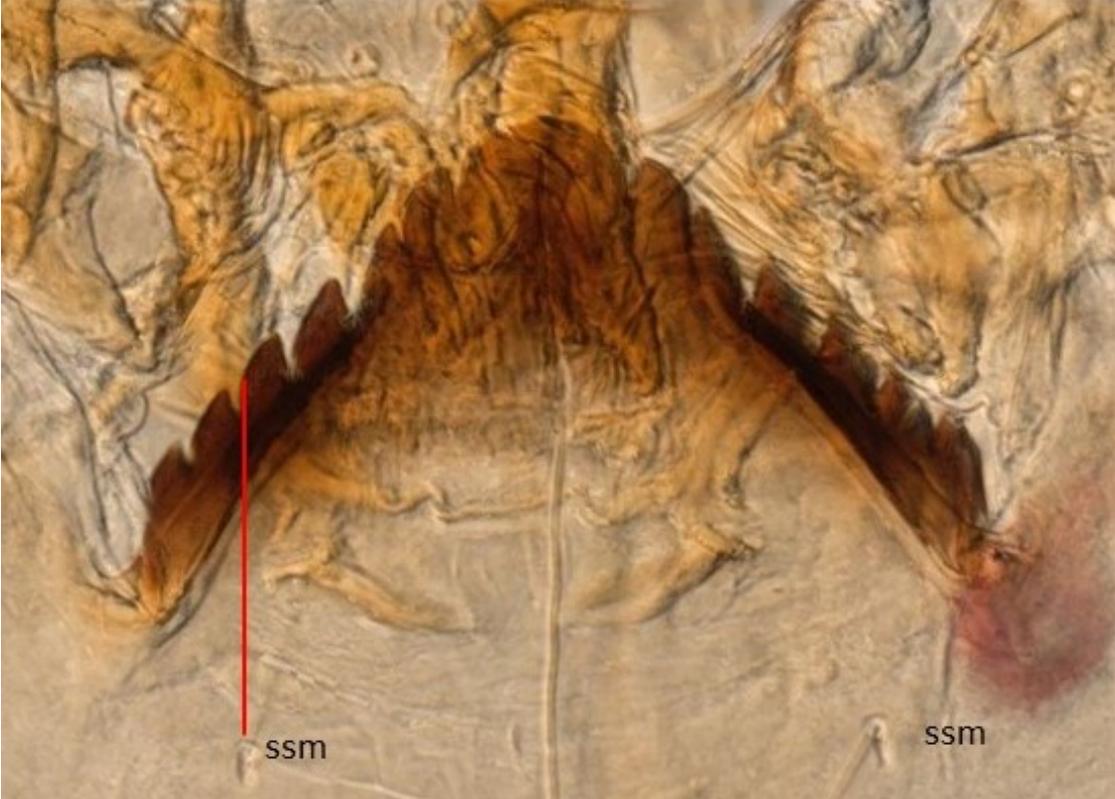
**Abdominal segments:** segments 1 - 6 bear posterolateral setal tufts of 10-20 filaments, which reach 1/4 - 1/3 of the segment length; segment 7 with 1 seta.

**Anal segments:** dorsolateral seta on segment 9 reaches 1/3 of segment length.

*Cricotopus albiforceps*

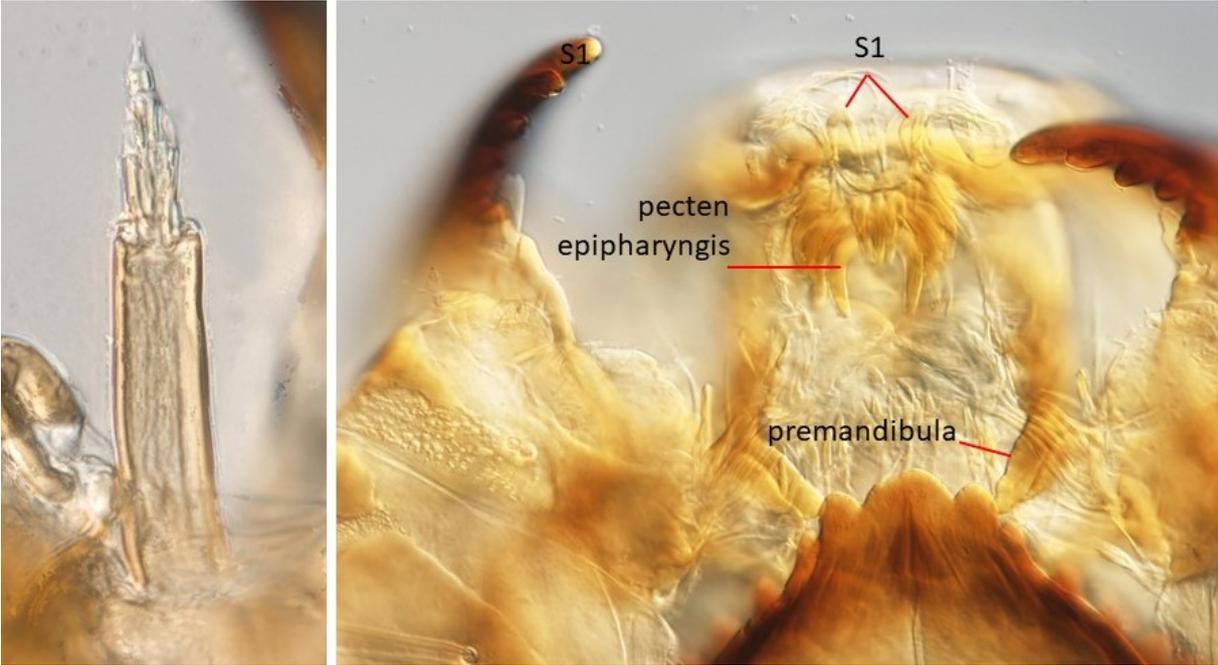


*Cricotopus albiforceps* head ventral Mariaparochie, 28 Apr. 2014 leg. H. Cuppen.

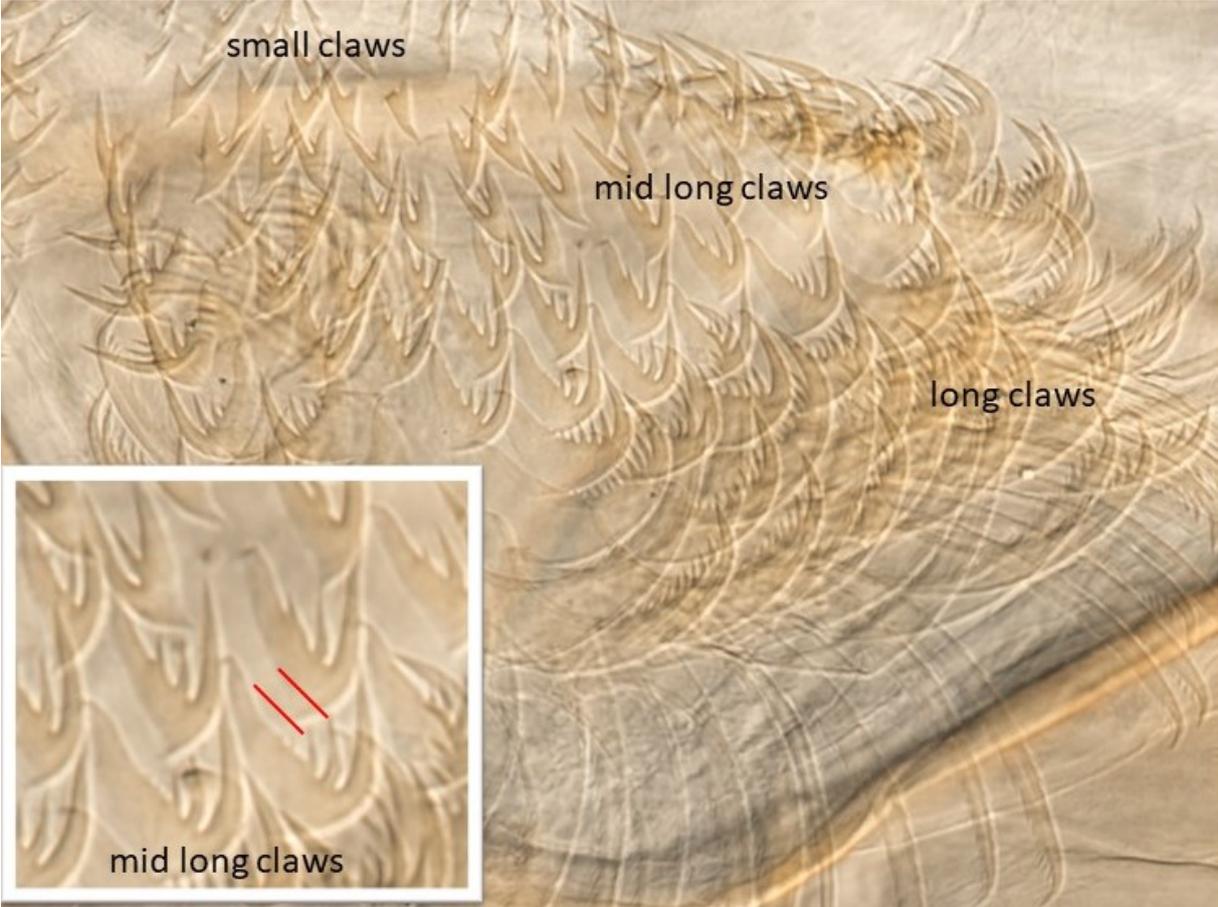


*Cricotopus albiforceps* mentum and submental setae Mariaparochie, 28 Apr. 2014, leg H. Cuppen.  
Arrow: ssm lateral reach.

*Cricotopus albiforceps* continued



*Cricotopus albiforceps* antenna. Mariaparochie, 28 Apr. 2014, leg. H. Cuppen.  
*Cricotopus albiforceps* head ventral: S1 and premandibula. Hagmolenbeek, 10 Apr. 2012, leg. H. Cuppen.



*Cricotopus albiforceps* claws of the anterior prolegs. Mariaparochie, 28 Apr. 2014 leg. H. Cuppen.

*Cricotopus annulator* Goetghebuer, 1927

**Body:** body length: 6.5 – 7.5 mm.

**Head capsule:** yellow, lateral posterior region brown; occipital margin dark brown; head width: 370  $\mu\text{m}$ .

**Antenna:** 5 segments; antennal blade extends to tip of last segment; length antenna 1: 65  $\mu\text{m}$ ; AR: 1.75.

**Mentum:** 6 lateral teeth and a broad median tooth; 2<sup>nd</sup> lateral tooth little reduced; MR: 2.3- 2.6.

**Mandibula:** 3 inner teeth, color apically brown extending to molar area with wide pale base; dorsal margin smooth.

**Premandibula:** simple.

**Labrum:** bifid S1 with branches of similar size.

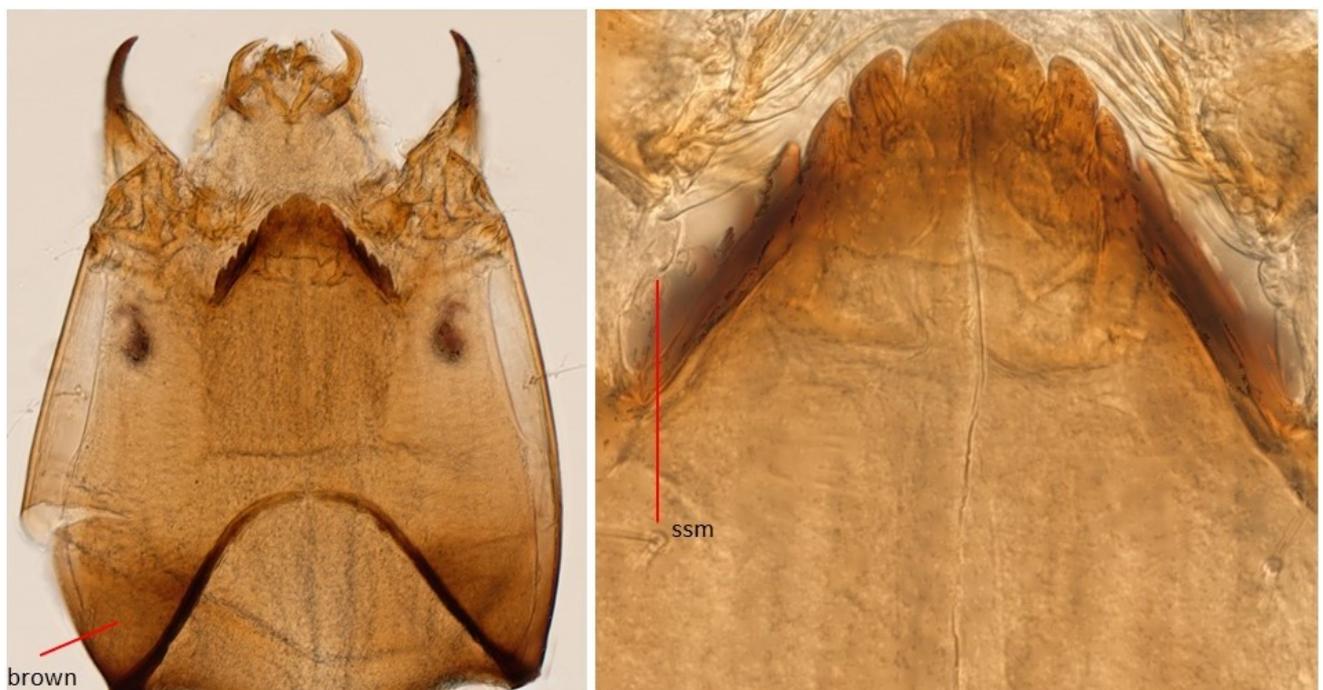
**Epipharynx:** pecten epipharyngis composed of 3 scales of equal length.

**Submental setae:** located at the level of the 6<sup>th</sup> lateral tooth; distance between setae: 102  $\mu\text{m}$  (n = 1).

**Anterior parapods:** mid long claws with fine inner teeth which are two third as long as distal tooth; claw index: 1.4 – 1.6 (n = 2).

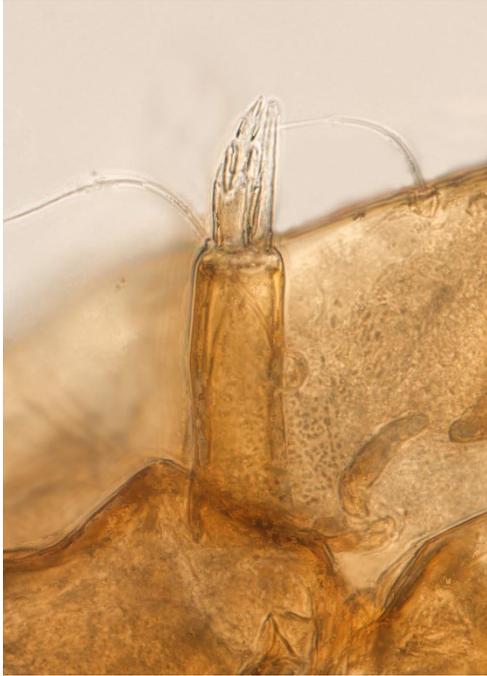
**Abdominal segments:** segments 1 - 6 bear posterolateral setal tufts of 10-15 filaments, which reach 1/4 of the segment length; segment 7 with 1 seta.

**Anal segments:** dorsolateral seta on segment 9 reaches 1/2 of segment length.



*Cricotopus annulator* head ventral en mentum. Gasterensiediep, 14 Apr. 2014, leg. H. Cuppen.

*Cricotopus annulator* continued

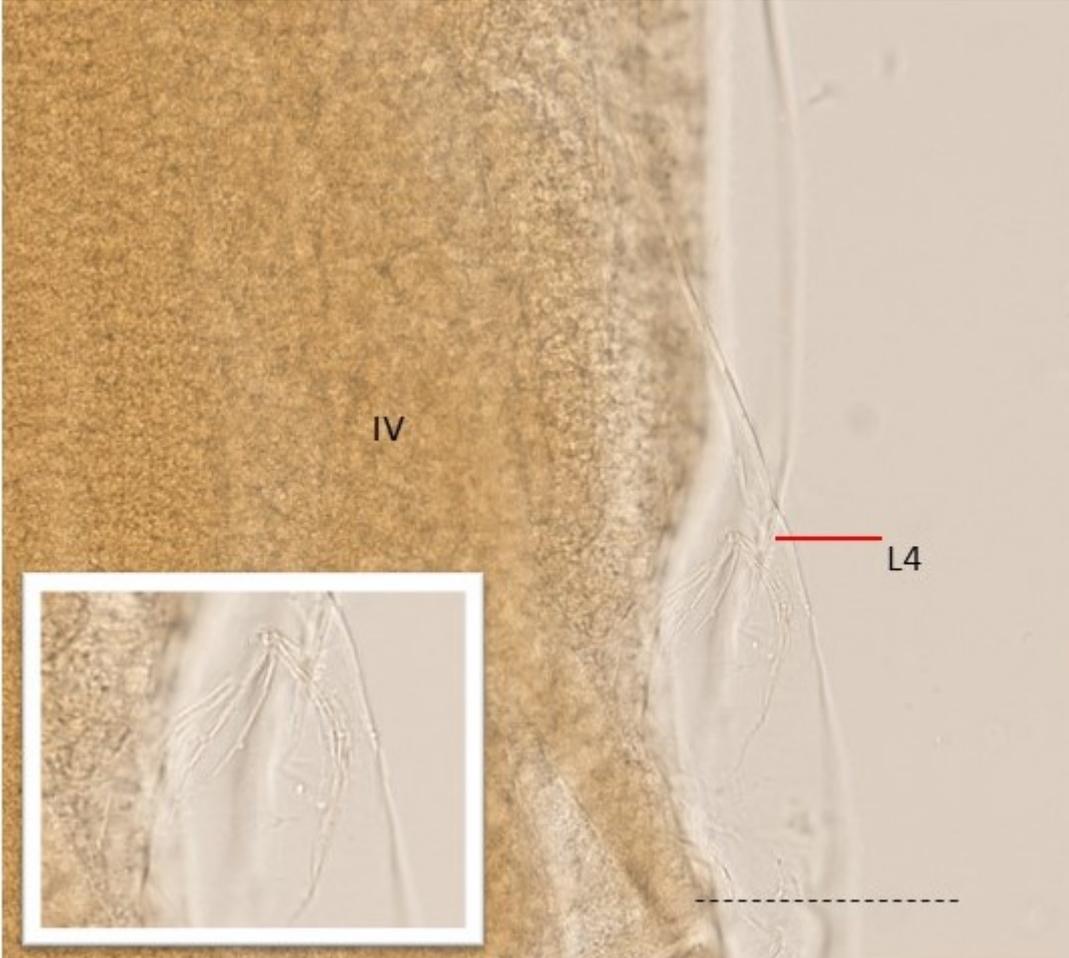


*Cricotopus annulator* antenna Gasterensiediep, 14 Apr. 2014, leg. H. Cuppen.



*Cricotopus annulator*. Claws of anterior parapods. Gasterensiediep, 14 Apr. 2014, leg. H. Cuppen.

*Cricotopus annulator* continued



*Cricotopus annulator*. L4 of segment 4. Gasterensiediep, 14 Apr. 2014, leg. H. Cuppen.

*Cricotopus bicinctus* Meigen, 1818

**Body:** body length: 6-6,5 mm

**Head capsule:** yellow, backside yellow or brownish; occipital margin light to dark brown; head width:  $\pm 400 \mu\text{m}$ .

**Antenna:** 5 segments; antennal blade extends half way fourth segment; length antenna 1:  $64 \mu\text{m}$ ; AR: 1.8-1.9.

**Mentum:** 6 lateral teeth and a broad median tooth; second lateral tooth little reduced; MR: 2.5-4.

**Mandibula:** 3 inner teeth, color apically brown extending to molar area with wide pale base; dorsal margin slightly crenulated; mola terminating in a strong, acute, black hook-like process (Figure, arrow); inner margin of mola with two fine spines.

**Premandibula:** simple.

**Labrum:** bifid S1 with branches of similar size.

**Epipharynx:** pecten epipharyngis composed of 3 scales of equal length.

**Submental setae:** located at the level of the fourth lateral tooth; distance between setae:  $95 \mu\text{m}$  (n = 1).

**Anterior parapods:** mid long claws with fine inner teeth which are two third as long as distal tooth; claw index: 1,54 (n = 1).

**Abdominal segments:** segments 1 - 6 bear posterolateral setal tufts of 3 - 10 filaments, which reach  $1/5^{\text{th}}$  of the segment length; segment 7 with 1 seta.

**Anal segments:** dorsolateral seta on segment 9 reaches  $1/4$  of segment length.



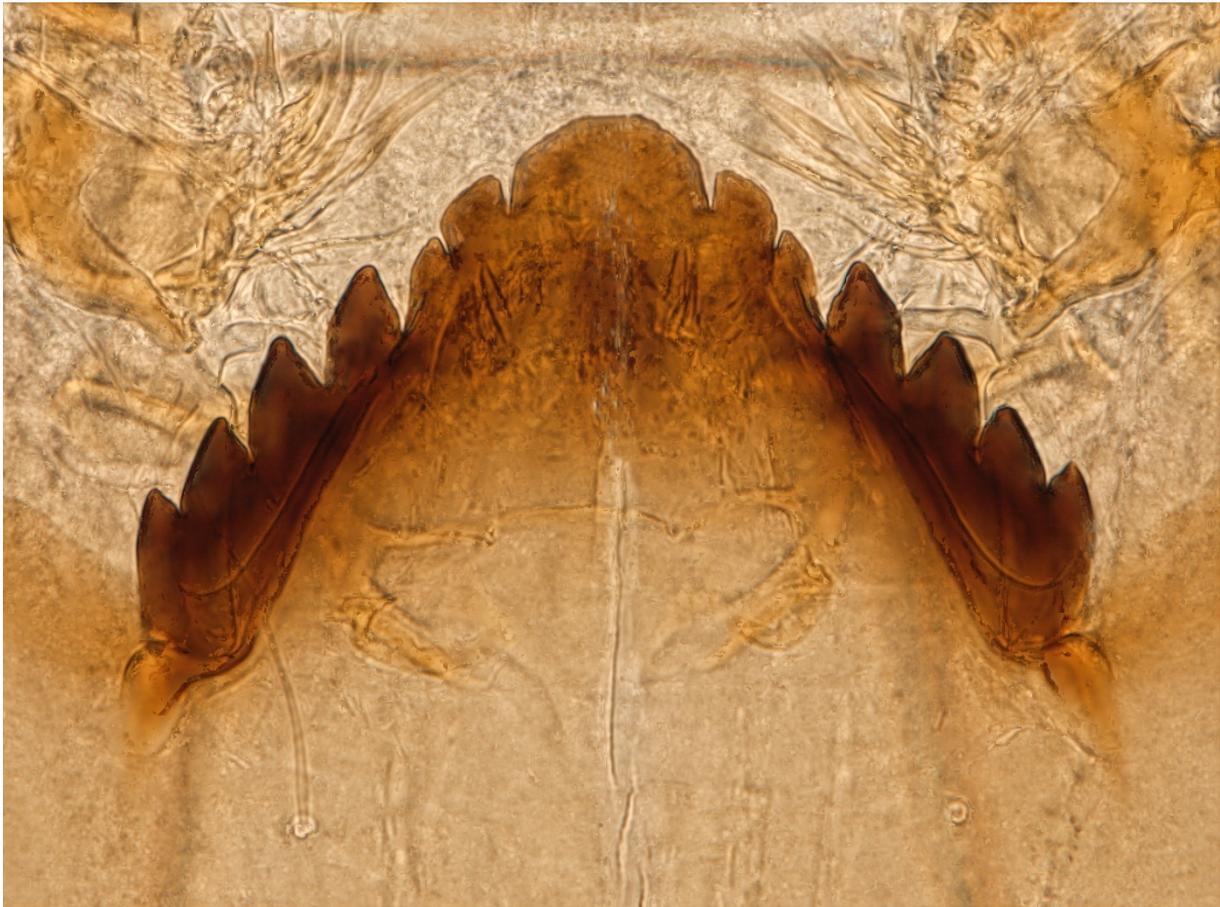
*Cricotopus bicinctus*, anterior part of body lateral. Niers, 408262, leg. J. van Mil.

*Cricotopus bicinctus* continued

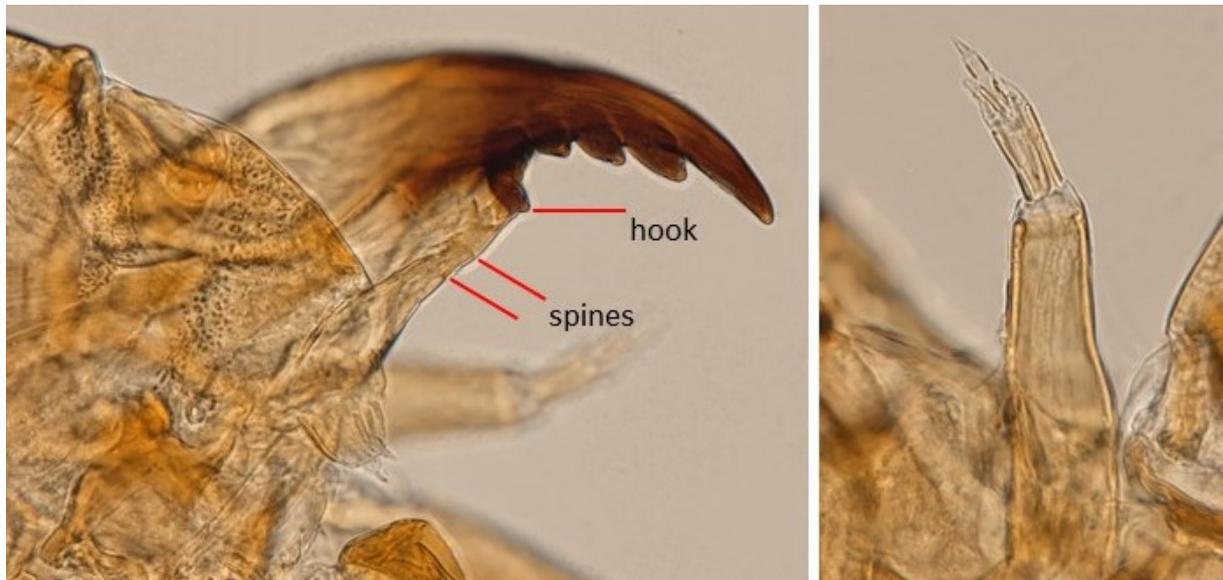


*Cricotopus bicinctus* head, ventral view. Witterdiep Assen, 29 Sep. 2007, leg. H. Cuppen.

*Cricotopus bicinctus* continued



*Cricotopus bicinctus* mentum. Witterdiep Assen, 29 Sep. 2007, leg. H. Cuppen.



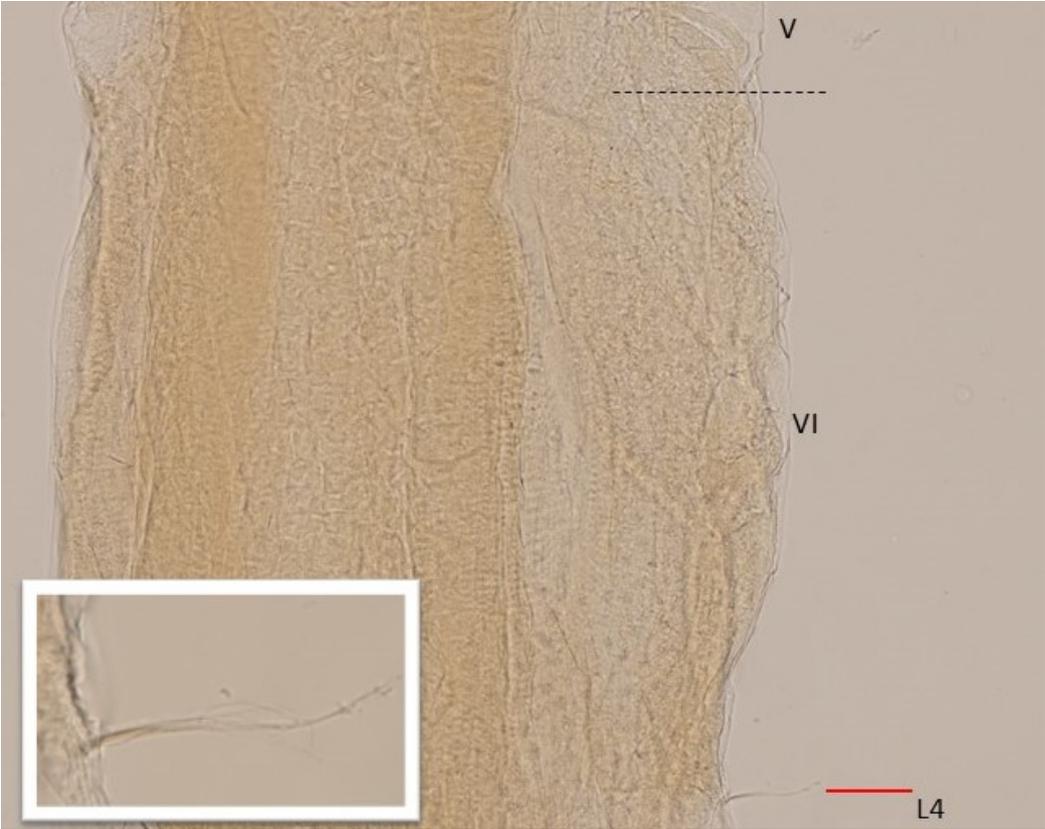
*Cricotopus bicinctus* mandibula. Witterdiep Assen, 29 Sep. 2007, leg. H. Cuppen.

*Cricotopus bicinctus* antenna. Witterdiep Assen, 29 Sep. 2007, leg. H. Cuppen. spines: arrows indicate location on inner side of mola where spines are present; the spines themselves are poorly visible in the photograph.

*Cricotopus bicinctus* continued



*Cricotopus bicinctus* claws of the anterior pseudopods. Witterdiep Assen, 29 Sep. 2007, leg. H. Cuppen.



*Cricotopus bicinctus* segment 6 and L4 setal tuft. Witterdiep Assen, 29 Sep. 2007, leg. H. Cuppen.

*Cricotopus festivellus* (Kieffer, 1906)

**Body:** body length: 5 – 5.5 mm.

**Head capsule:** yellow; occipital margin dark brown; head width: 334 - 344  $\mu\text{m}$  (n = 2).

**Antenna:** 5 segments; antennal blade extends to last segment; length antenna 1: 54 - 60  $\mu\text{m}$ ;  
AR: 1.9-2.1 (n = 3).

**Mentum:** 6 lateral teeth and a broad median tooth; 2<sup>nd</sup> lateral tooth little reduced; MR: 2.7-3.0.

**Mandibula:** 3 inner teeth, color apically brown extending to molar area with wide pale base; dorsal margin smooth.

**Premandibula:** simple.

**Labrum:** bifid S1 with branches of similar size.

**Epipharynx:** pecten epipharyngis composed of 3 scales of equal length.

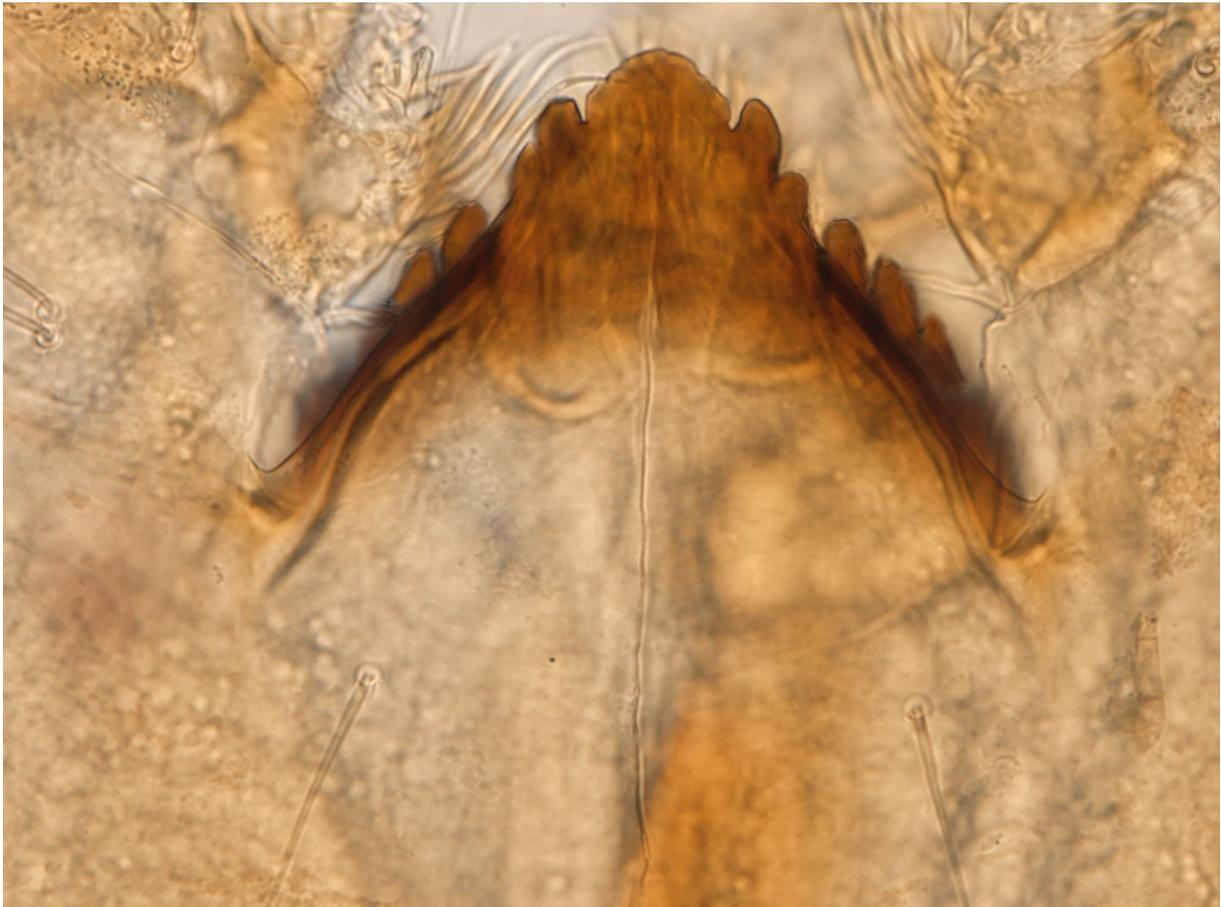
**Submental setae:** located at the level of the 4<sup>th</sup> lateral tooth; distance between setae: 78  $\mu\text{m}$  (n = 1).

**Anterior parapods:** mid long claws with fine inner teeth which are at most half as long as distal tooth; claw index: 1.8 – 1.9 (n = 2).

**Abdominal segments:** segments 1 - 6 bear posterolateral setal tufts of 12-24 filaments, which reach 1/2 – 3/4 of the segment length; segment 7 with 8-10 setae.

**Anal segments:** dorsolateral seta on segment 9 reaches 1/3<sup>rd</sup> of segment length.

*Cricotopus festivellus* continued



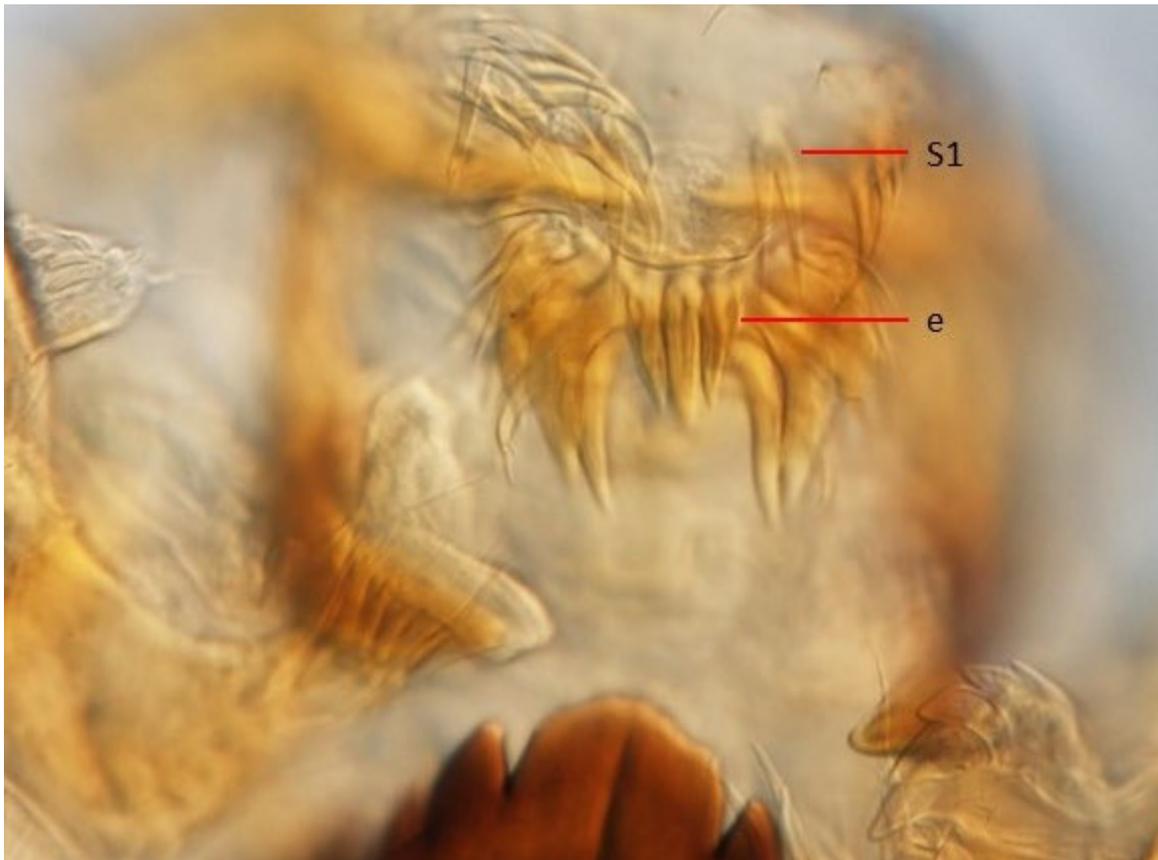
*Cricotopus festivellus* mentum Enschede, Landweerven, 18 May 2009, leg. H. Cuppen.



*Cricotopus festivellus* mandibula and premandibula. Enschede, Landweerven, 18 May 2009, leg. H. Cuppen.

*Cricotopus festivellus* antenna. Enschede, Landweerven, 18 May 2009, leg. H. Cuppen.

*Cricotopus festivellus* continued

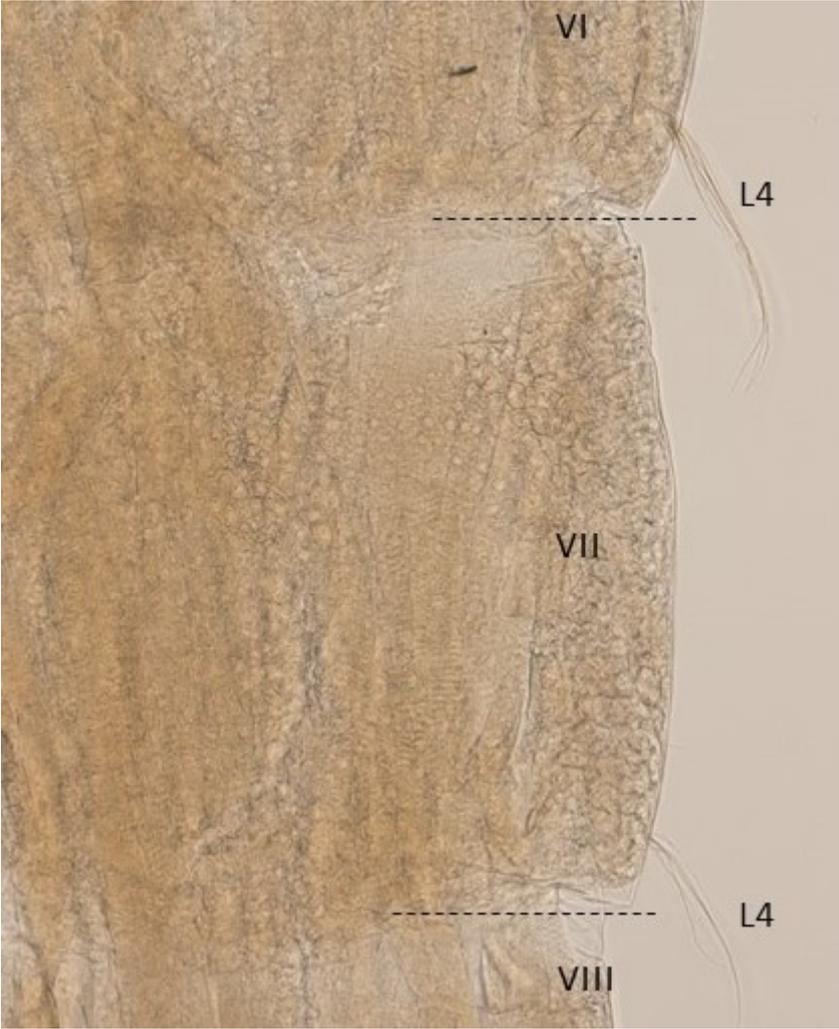


*Cricotopus festivellus*, epipharynx (e) and S1. Veluwerandmeer, 5 Oct. 2016, leg. R. Wiggers.



*Cricotopus festivellus*, claws of the anterior pseudopods. Veluwerandmeer, 5 Oct. 2016, leg. R. Wiggers.

*Cricotopus festivellus* continued



*Cricotopus festivellus*, segments 6 and 7 with L4 setal tufts. Enschede, Landweerven, 18 May 2009, leg. H. Cuppen.

*Cricotopus flavocinctus* (Kieffer, 1924)

**Body:** body length: 4.5 mm.

**Head capsule:** yellow; occipital margin light brown; head width: 320  $\mu\text{m}$  (n = 1).

**Antenna:** 5 segments; antennal blade extends to last segment; length antenna 1: 48  $\mu\text{m}$ ; AR: 1.9 (n = 1).

**Mentum:** 6 lateral teeth and a very broad median tooth; 2<sup>nd</sup> lateral tooth little reduced; MR: 6 (n = 1).

**Mandibula:** 3 inner teeth, color apically brown extending to molar area with wide pale base; dorsal margin slightly crenulated.

**Premandibula:** simple.

**Labrum:** bifid S1 with branches of similar size.

**Epipharynx:** pecten epipharyngis composed of 3 scales of equal length.

**Submental setae:** located at the level of the 6<sup>th</sup> lateral tooth; distance between setae: 99  $\mu\text{m}$  (n = 1).

**Anterior parapods:** Mid long claws with fine inner teeth which are half as long as distal tooth; claw index: 2.0 (n = 2).

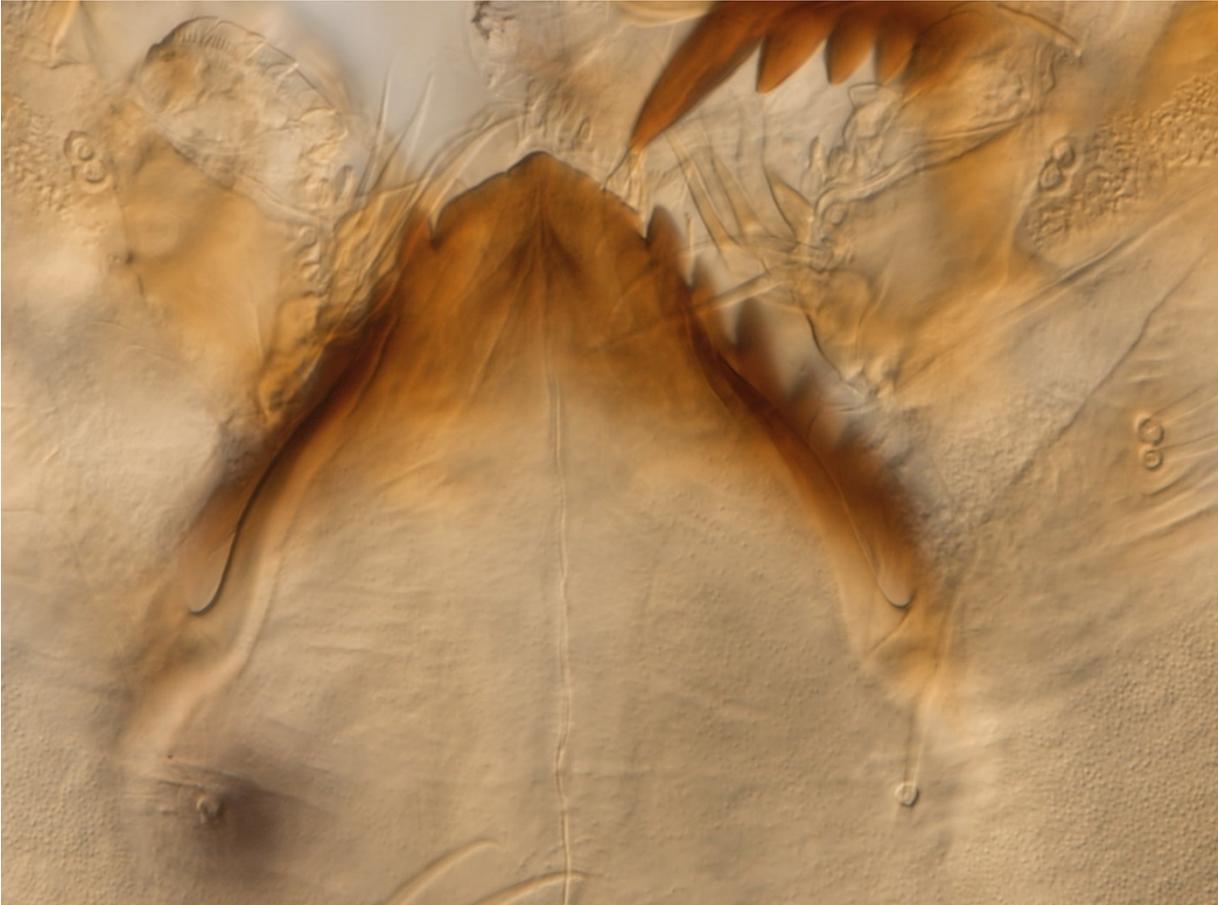
**Abdominal segments:** segments 1 - 6 bear posterolateral setal tufts of 10-12 filaments, which reach 1/2 – 3/4 of the segment length; segment 7 with ? setae.

**Anal segments:** dorsolateral seta on segment 9 reaches 1/3 of segment length.

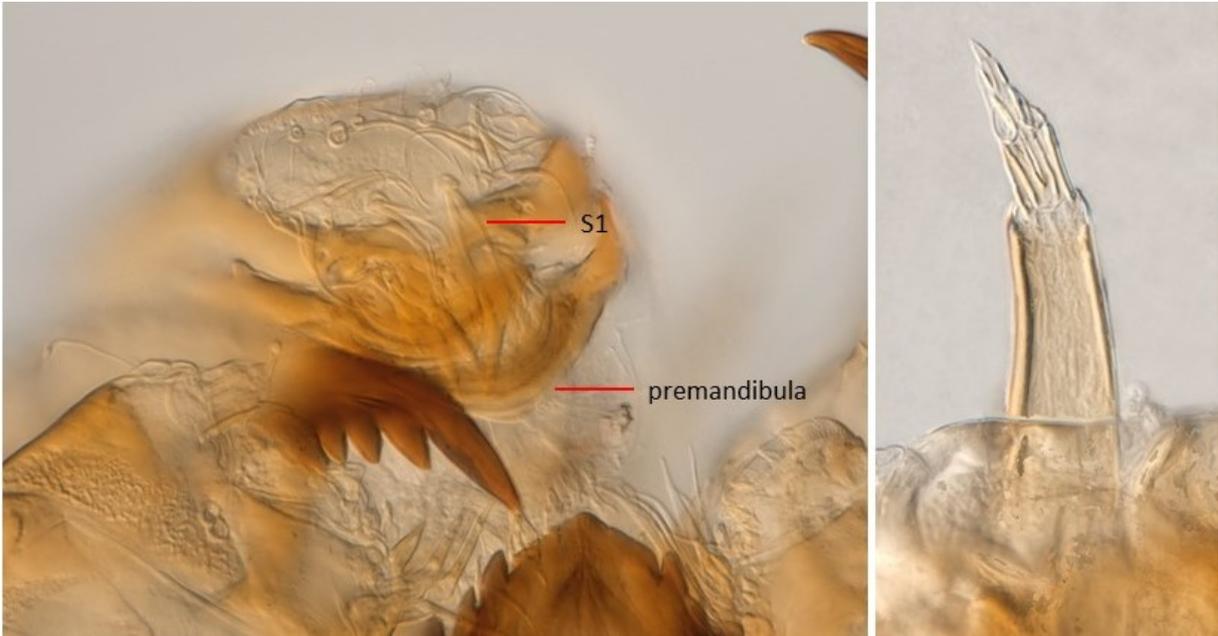


*Cricotopus flavocinctus*, prepupa larva lateral. Tiengemeten freshwater lake, 4 Sep. 2012, leg. D. Tempelman.

*Cricotopus flavocinctus* continued



*Cricotopus flavocinctus*, mentum. Tiengemeten freshwater lake, 4 Sep. 2012, leg. D. Tempelman.



*Cricotopus flavocinctus*, mandibula, premandibula and S1; right: antenna. Tiengemeten freshwater lake, 4 Sep. 2012, leg. D. Tempelman.

*Cricotopus flavocinctus* continued



*Cricotopus flavocinctus*, claws of the anterior pseudopods. Tiengemeten freshwater lake, 4 Sep. 2012, leg. D. Tempelman.



*Cricotopus flavocinctus*, segment 2 and 3 with L4 setal tufts. Tiengemeten freshwater lake, 4 Sep. 2012, leg. D. Tempelman.

*Cricotopus fuscus* (Kieffer, 1909)

**Body:** body length: 6.5 mm. Often with dark blue color.

**Head capsule:** light brown; occipital margin light to dark brown; head width: 457  $\mu\text{m}$  (n = 1).

**Antenna:** 5 segments; antennal blade extends to halfway last segment; length antenna 1: 56  $\mu\text{m}$ ; AR: 1.7 (n = 1).

**Mentum:** 6 lateral teeth and a relatively small median tooth; 2<sup>nd</sup> lateral tooth little reduced; MR: 1.5 (n = 1).

**Mandibula:** 3 inner teeth, color apically brown extending to molar area with wide pale base; dorsal margin crenulated.

**Premandibula:** bifid.

**Labrum:** bifid S1 with outer branch longer than inner branch.

**Epipharynx:** pecten epipharyngis composed of 3 scales of equal length.

**Submental setae:** located at the level of the mentum base; distance between setae: 158  $\mu\text{m}$  (n = 1).

**Anterior parapods:** mid long claws with fine inner teeth which are 2/3<sup>rd</sup> as long as distal tooth; claw index: 1.5 (n = 2).

**Abdominal segments:** segments 1 - 6 bear posterolateral setal tufts of 1-7 filaments, which reach 1/3 of the segment length; segment 7 with 1 seta.

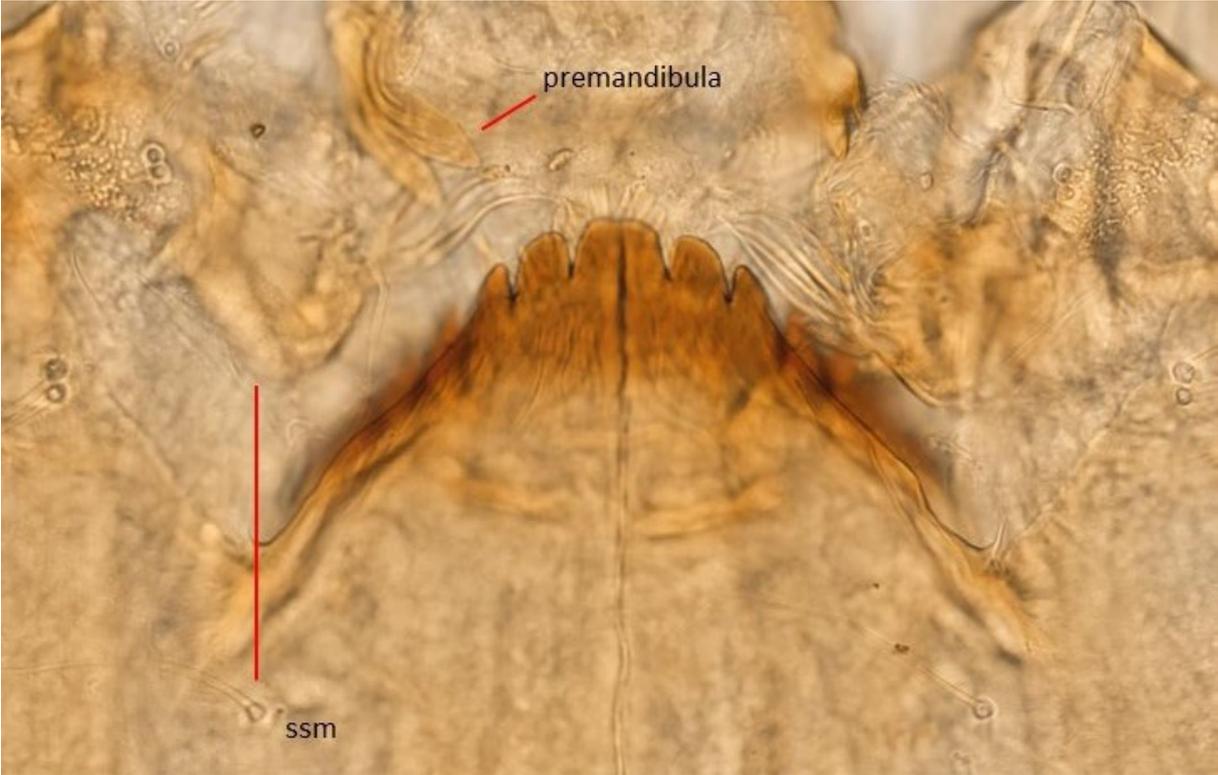
**Anal segments:** dorsolateral seta on segment 9 reaches 1/4 of segment length.

*Cricotopus fuscus* continued

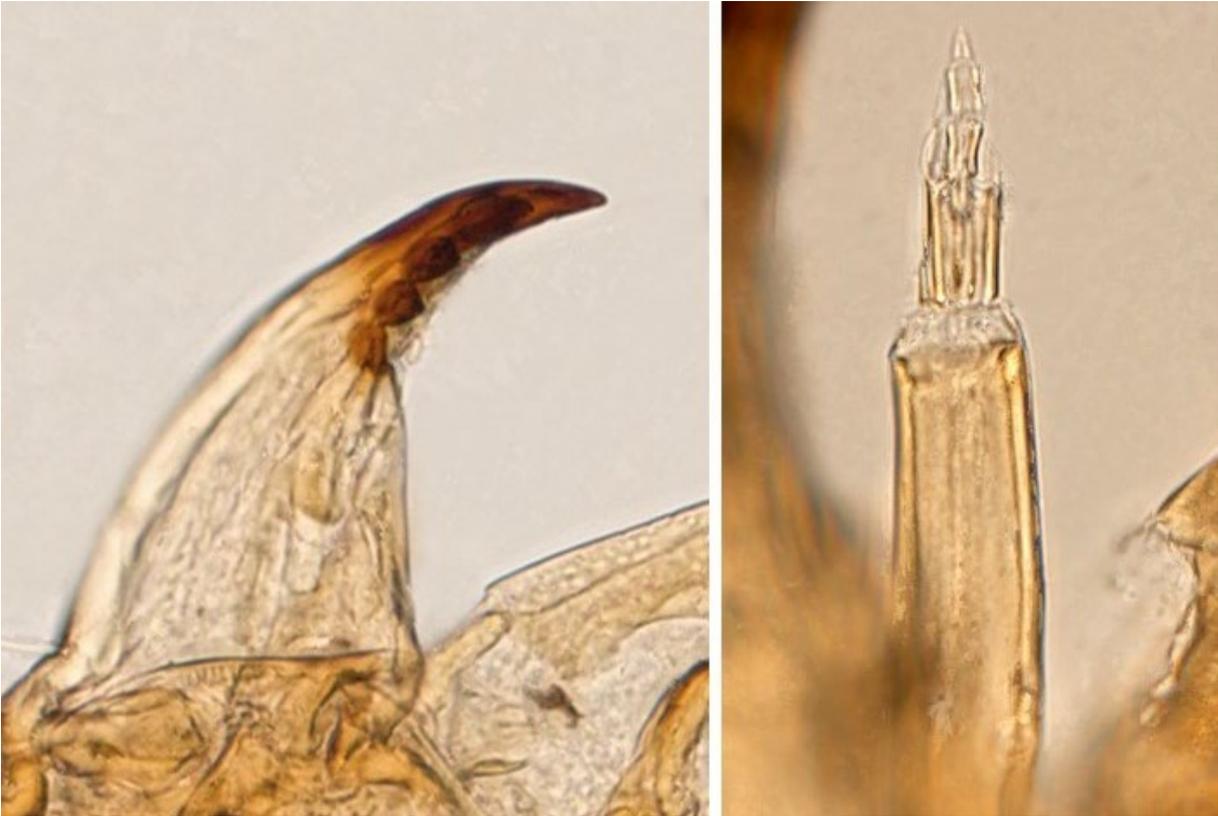


*Cricotopus fuscus*, head ventral. Scheumerbeek, 8 May 2000, leg. H. Cuppen.

*Cricotopus fuscus* continued



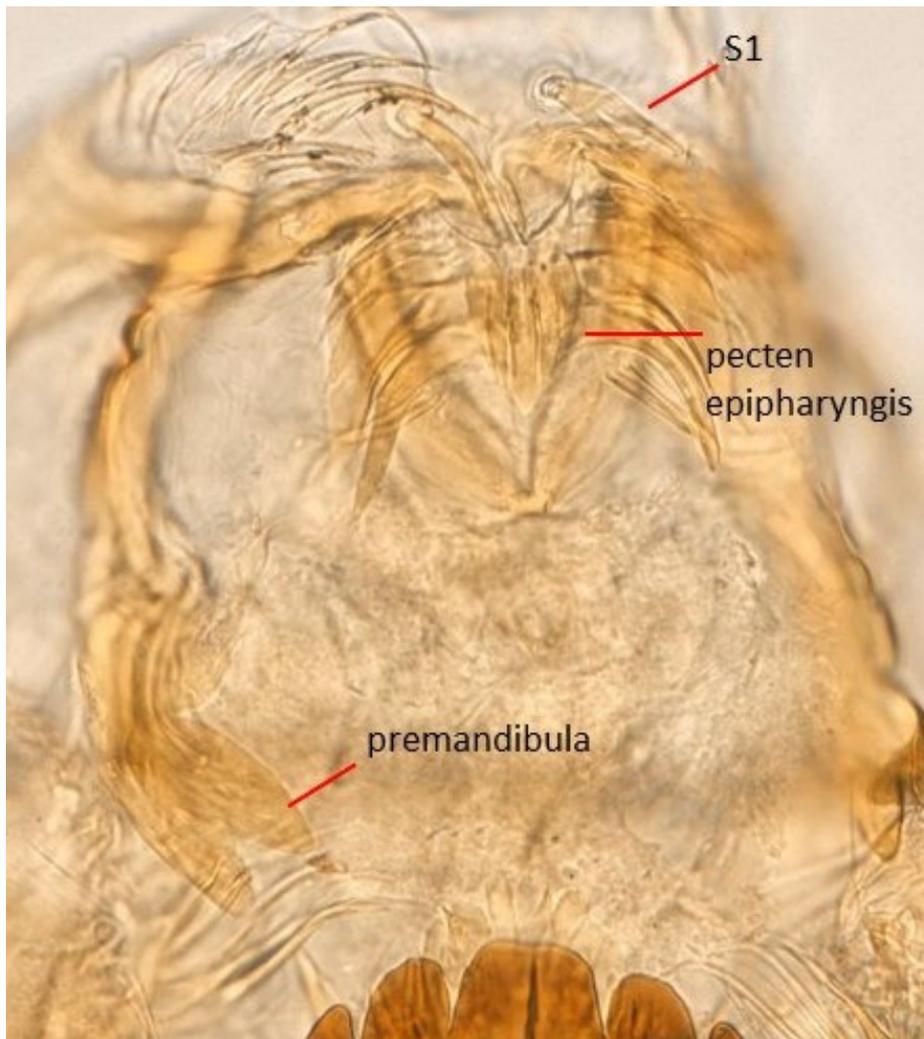
*Cricotopus fuscus*, mentum. Scheumerbeek, 8 May 2000, leg. H. Cuppen.



*Cricotopus fuscus*, mandibula. Scheumerbeek, 8 May 2000, leg. H. Cuppen.

*Cricotopus fuscus*, antenna. Scheumerbeek, 8 May 2000, leg. H. Cuppen.

*Cricotopus fuscus* continued



*Cricotopus fuscus*, distal region of head ventral. Scheumerbeek, 8 May 2000, leg. H. Cuppen.



*Cricotopus fuscus*, claws of anterior parapods. Scheumerbeek, 8 May 2000, leg. H. Cuppen.



*Cricotopus fuscus*, L4 segment 3. Twente, leg. B. Klutman.

*Cricotopus pilosellus* Brundin, 1956

**Body:** body length: 7.5 mm.

**Head capsule:** yellow; occipital margin dark brown; head width: 428  $\mu\text{m}$  (n = 1)

**Antenna:** 5 segments; antennal blade extends to last segment; length antenna 1: 72  $\mu\text{m}$ ; AR: 2.0 (n = 1).

**Mentum:** 6 lateral teeth and very broad median tooth; without strong squashing of slide-mounted material, only the 1<sup>st</sup> lateral tooth is distinctly visible, the other lateral teeth 2-6 normally hidden under a rather wide paralabial plate; MR: 4.5 (n = 1)

**Mandibula:** 4 inner teeth, color apically brown extending to molar area with wide pale base; dorsal margin very slightly crenulated.

**Premandibula:** simple.

**Labrum:** trifold S1 with broad flat base.

**Epipharynx:** pecten epipharyngis composed of 3 broad scales of equal length.

**Submental setae:** located at the level of the 4<sup>th</sup> lateral teeth; distance between setae: 82  $\mu\text{m}$  (n = 1).

**Anterior parapods:** mid long claws with fine inner teeth which are 2/3<sup>rd</sup> as long as distal tooth; claw index: 1.5 (n = 2).

**Abdominal segments:** segments 1 - 6 bear posterolateral setal tufts of 10 - 15 filaments, which reach 1/3 – 1/2 of the segment length; segment 7 with 1 seta.

**Anal segments:** dorsolateral seta on segment 9 reaches 1/3<sup>rd</sup> of segment length.

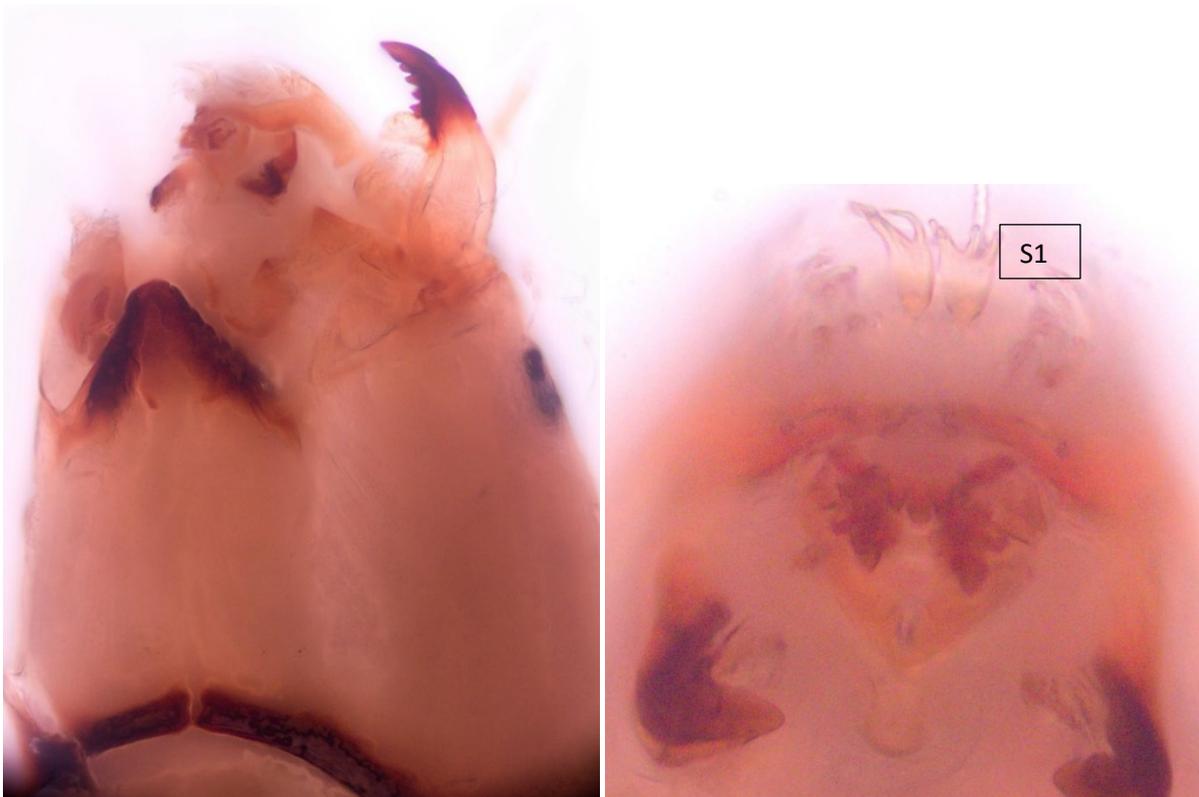
*Cricotopus pilosellus* continued



*Cricotopus pilosellus*, mentum. Lateral teeth 2-6 obscured by paralabial plate. Markermeer near Warder, 10 Oct. 2016, leg. R. Wiggers.

*Cricotopus pilosellus*, mentum strongly squashed, showing lateral teeth 2 – 6. Laachersee, 26 April 2013, leg. A. Dettinger-Klemm.

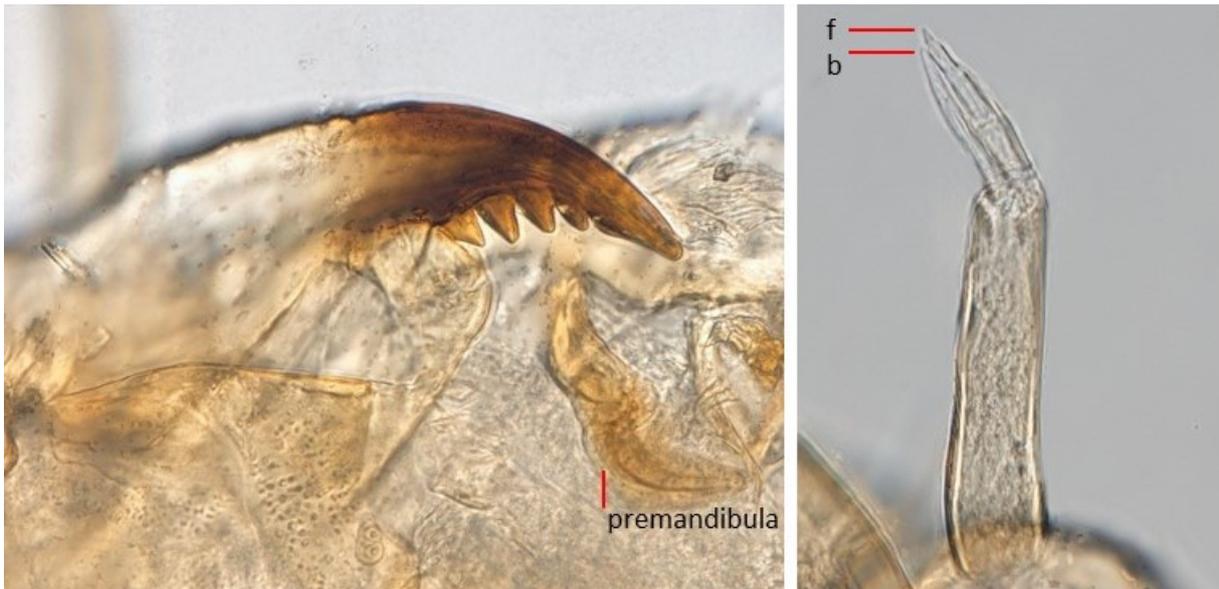
p = paralabial plate.



*Cricotopus pilosellus*, head ventral. Marknesse, canal; 2014. Leg. and picture O. Duijts.

*Cricotopus pilosellus*, S1 and premandibula. Marknesse, canal; 2014. Leg. and picture O. Duijts.

*Cricotopus pilosellus* continued



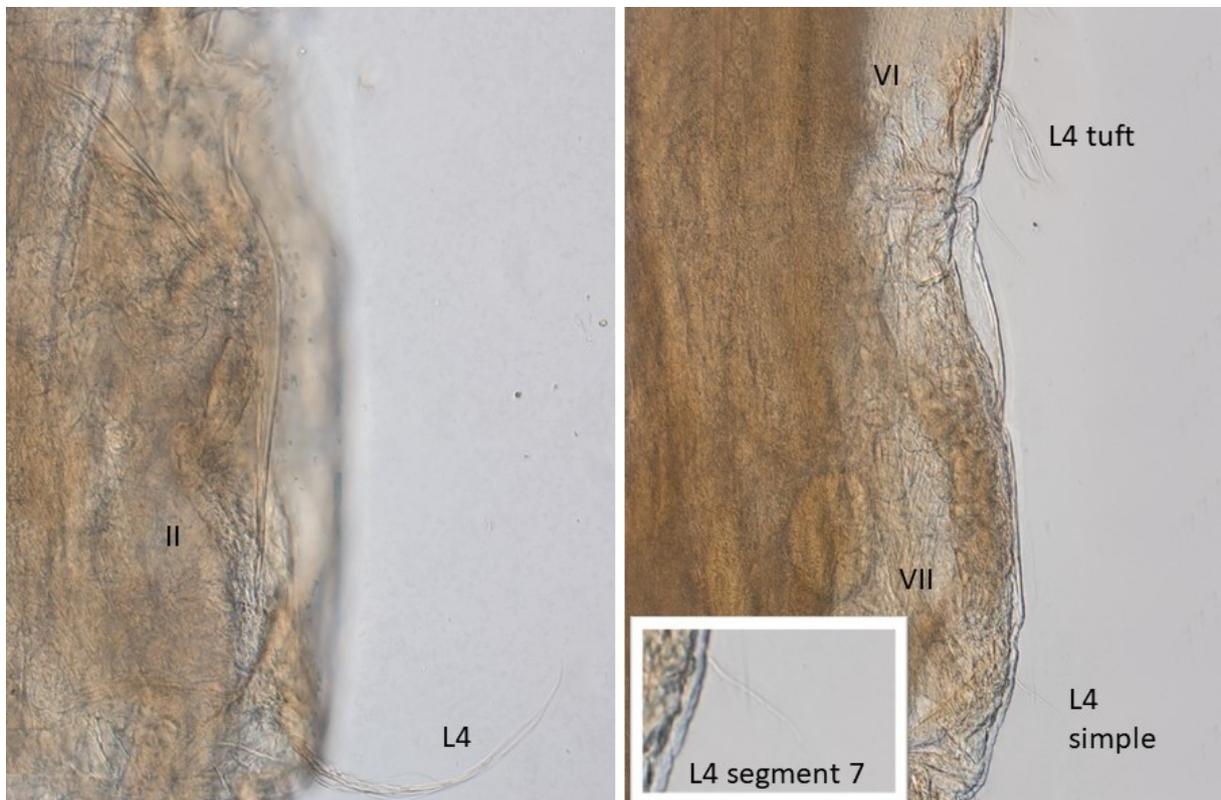
*Cricotopus pilosellus*, mandibula and premandibula. Warder Markermeer, 10 Oct. 2016, leg. R. Wiggers. f = tip of antennal flagellum; b = tip of antennal blade.  
*Cricotopus pilosellus*, antenna (same specimen).



*Cricotopus pilosellus*, epipharynx. Marknesse canal, 2014. Leg. and picture O. Duijts.



*Cricotopus pilosellus*, small and long claws anterior parapods. Markermeer near Warder, 10 Oct. 2016, leg. R. Wiggers.



*Cricotopus pilosellus*, segment 2 and setae. Markermeer near Warder, 10 Oct. 2016, leg. R. Wiggers.  
*Cricotopus pilosellus*, segment 6-7 and setae (same specimen).

*Cricotopus tibialis* (Meigen, 1804)

**Body:** body length: 6 - 8 mm.

**Head capsule:** light brown; occipital margin light to dark brown; head width: 482 - 544  $\mu\text{m}$  (n = 2).

**Antenna:** 5 segments; antennal blade extends to 3/4 of 4<sup>th</sup> segment; length antenna 1: 68  $\mu\text{m}$ ; AR: 2.0 (n = 1).

**Mentum:** 6 lateral teeth and a relatively small median tooth; MR: 1.5 (n = 1).

**Mandibula:** 3 inner teeth, color apically brown extending to molar area with wide pale base; dorsal margin crenulated.

**Premandibula:** bifid.

**Labrum:** bifid S1 with outer branch longer than inner branch.

**Epipharynx:** pecten epipharyngis composed of 3 scales of equal length.

**Submental setae:** located at the level of the 4<sup>th</sup> or 5<sup>th</sup> lateral teeth; distance between setae: 93 - 114  $\mu\text{m}$  (n = 2).

**Anterior parapods:** Mid long claws with fine inner teeth which are half as long as distal tooth; claw index: 1.7 - 2.0 (n = 2).

**Abdominal segments:** 1 - 6 bear posterolateral setal tufts of 10-20 filaments, which reach 1/2 - 3/4 of the segment length; segment 7 with 10 setae.

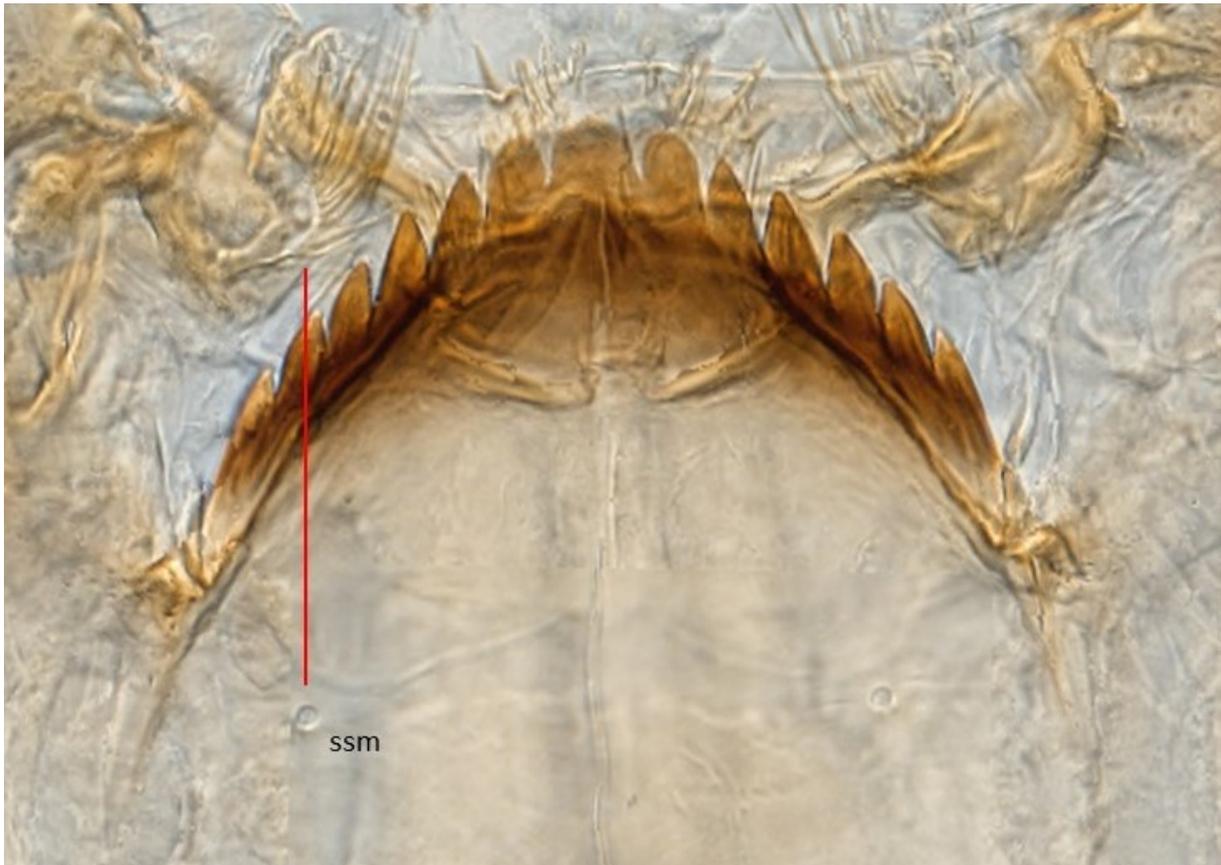
**Anal segments:** dorsolateral seta on segment 9 reaches 1/3<sup>rd</sup> of segment length.

*Cricotopus tibialis* continued



*Cricotopus tibialis*, head ventral. Boven Slinge, Bekendelle, 12 Oct. 2012. Leg. B. Klutman.

*Cricotopus tibialis* continued



*Cricotopus tibialis*, mentum. Boven Slinge, Bekendelle, 12 Oct. 2012. Leg. B. Klutman.



*Cricotopus tibialis*, mandibula and premandibula. Boven Slinge, Bekendelle, 12 Oct. 2012. Leg. B. Klutman.

*Cricotopus tibialis*, antenna. Miltenberg, Brunnen Filter, 12 July 2012. Leg. C. Schiffels.

*Cricotopus tibialis* continued

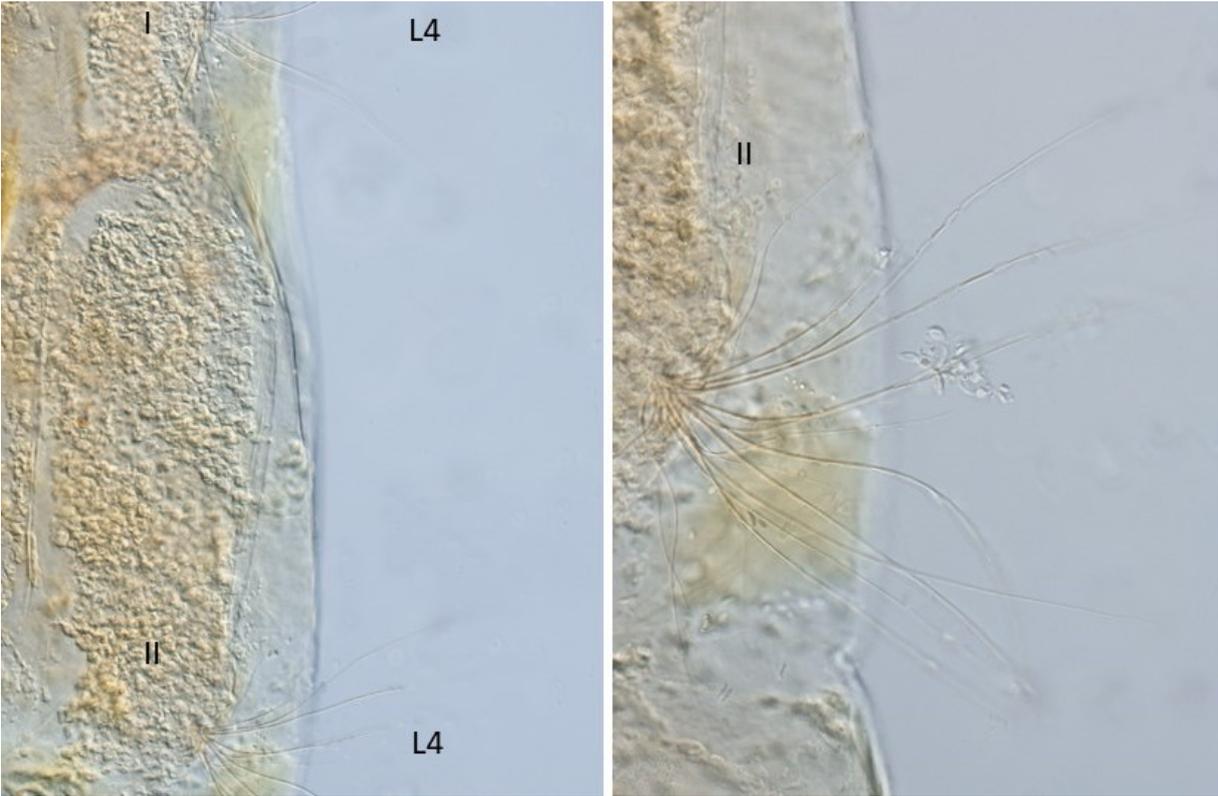


*Cricotopus tibialis*, claws anterior parapods. Boven Slinge, Bekendelle, 12 Oct. 2012. Leg. B. Klutman.



*Cricotopus tibialis*, claws anterior parapods detail. Boven Slinge, Bekendelle, 12 Oct. 2012. Leg. B. Klutman.

*Cricotopus tibialis* continued



*Cricotopus tibialis*, segments 1 and 2. Miltenberg, Brunnen Filter, 12 July 2012. Leg. C. Schiffels.

*Cricotopus tremulus*

**Body:** body length: 6.5 mm.

**Head capsule:** brown; occipital margin dark brown; head width: 305  $\mu\text{m}$  (n = 2).

**Antenna:** 5 segments; antennal blade extends to end of fifth segment; length antenna 1: 48  $\mu\text{m}$ ; AR: 1.6 (n = 1).

**Mentum:** 6 lateral teeth and a relatively small median tooth; 1<sup>st</sup> lateral teeth subequal in height with median tooth; 2<sup>nd</sup> lateral tooth reduced and partly fused with 1<sup>st</sup> lateral tooth; MR: 1.6 (n = 1).

**Mandibula:** 3 inner teeth, color mandibula distal part dark brown, basal part brown; dorsal margin slightly crenulated.

**Premandibula:** simple.

**Labrum:** bifid S1 with outer branch longer than inner branch.

**Epipharynx:** pecten epipharyngis composed of 3 scales of equal length.

**Submental setae:** located at the level of the fifth/sixth lateral teeth; distance between setae: 129  $\mu\text{m}$  (n = 1).

**Anterior parapods:** Mid long claws with coarse inner teeth which are 3/4 as long as distal tooth; claw index: 1.4 (n = 1).

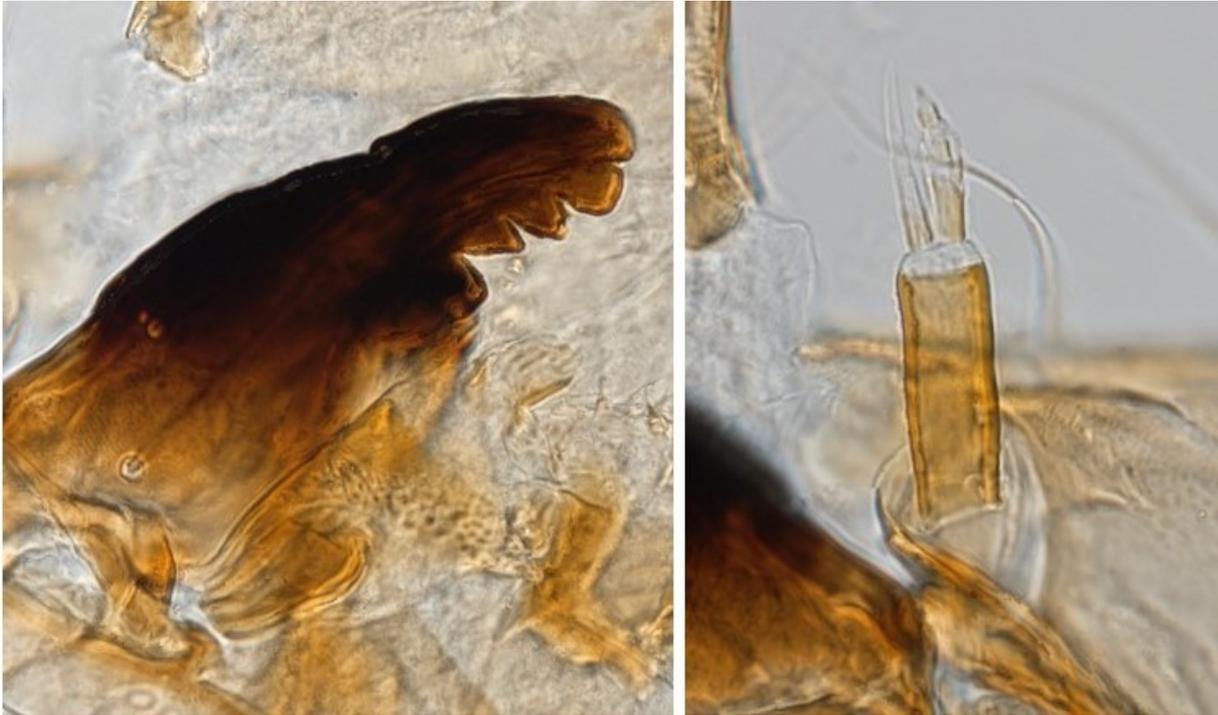
**Abdominal segments:** 1 - 6 bear posterolateral setal tufts of 1 filament, which reach 1/4 - 1/3 of the segment length; segment 7 with 1 seta.

**Anal segments:** dorsolateral seta on segment 9 reaches 1/2 of segment length.

*Cricotopus tremulus* continued



*Cricotopus tremulus*, mentum, central mental tooth slightly worn. Beverbach Aachen, leg. C. Schiffels.



*Cricotopus tremulus*, mandibula and antenna. Beverbach Aachen, leg. C. Schiffels.

*Cricotopus tremulus* continued

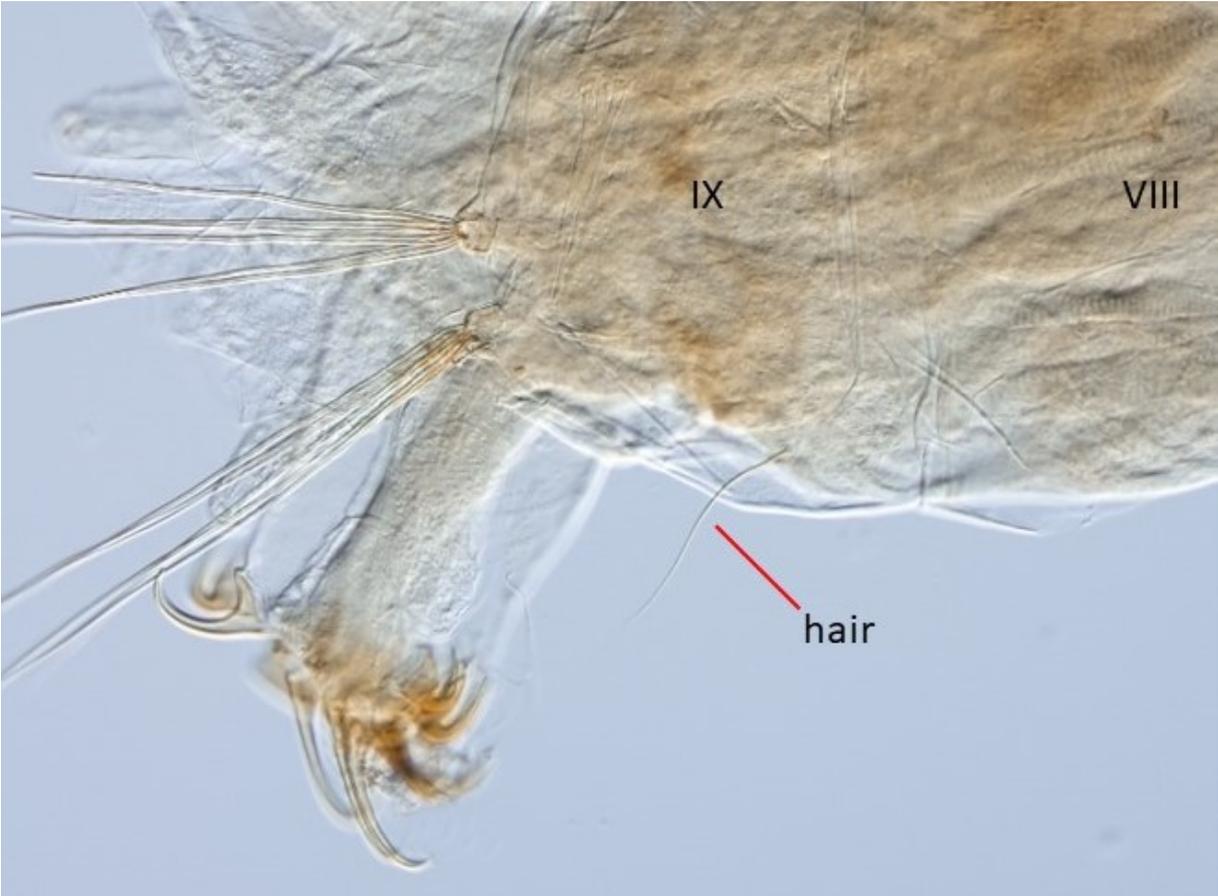


*Cricotopus tremulus*, claws anterior parapods. Beverbach Aachen, leg. C. Schiffels.



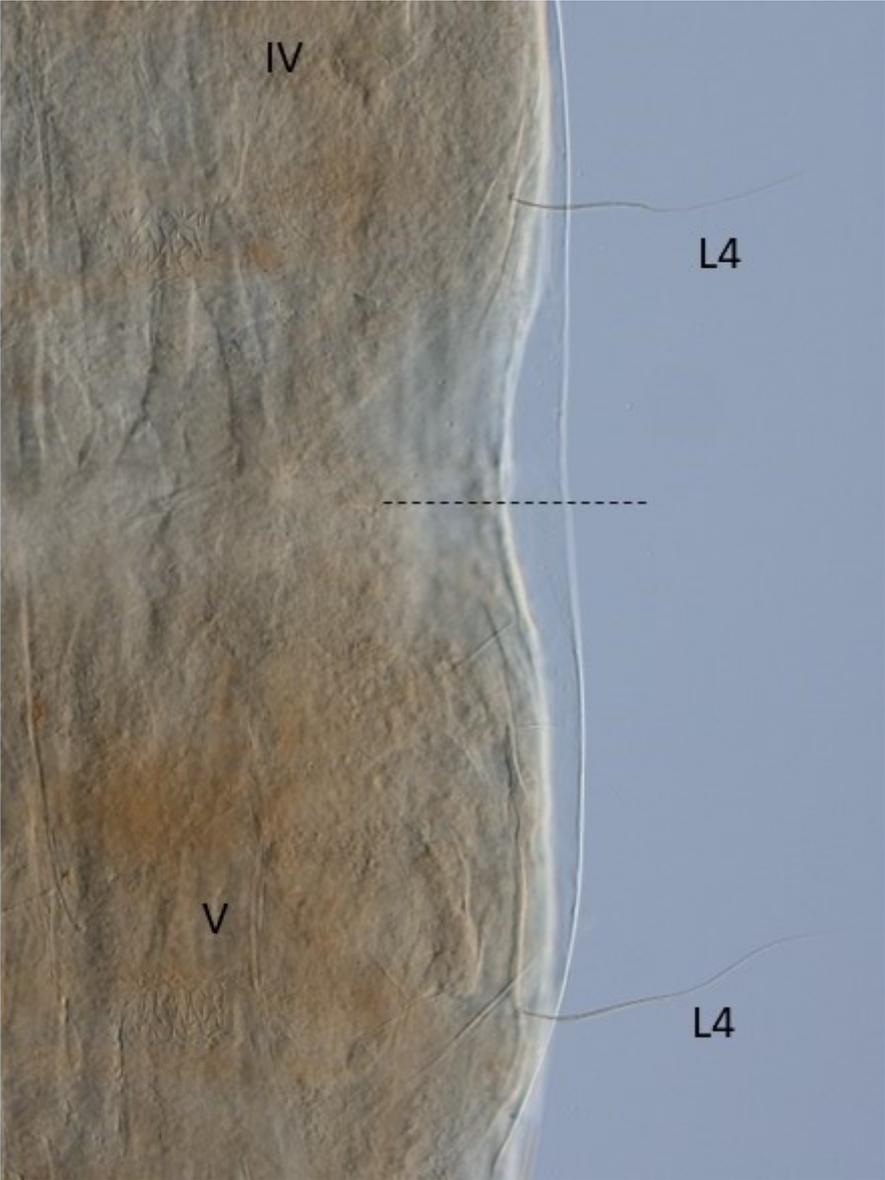
*Cricotopus tremulus*, premandibula. Beverbach Aachen, leg. C. Schiffels.

*Cricotopus tremulus* continued



*Cricotopus tremulus*, anal segments and dorsolateral hair of segment 9. Beverbach Aachen, leg. C. Schiffels.

*Cricotopus tremulus* continued



*Cricotopus tremulus*, L4 segment 4 and 5 . Leg. C. Schiffels.

*Cricotopus triannulatus* (Macquart, 1826)

**Body:** body length: 5 mm.

**Head capsule:** light brown; occipital margin brown; head width: 394  $\mu\text{m}$ .

**Antenna:** 5 segments; antennal blade extends to end fourth segment; length antenna 1: 50  $\mu\text{m}$ ;  
AR: 1.7.

**Mentum:** 6 lateral teeth and a broad median tooth; second lateral tooth little reduced; MR: 2 – 2.5.

**Mandibula:** 3 inner teeth, color apically dark brown extending halfway molar area with wide pale base, so distal 2/3 part dark brown; dorsal margin crenulated.

**Premandibula:** simple.

**Labrum:** bifid S1 with branches of similar size; between the a S1 setae a row of small spines.

**Epipharynx:** pecten epipharyngis composed of 3 scales of equal length.

**Submental setae:** located at the level of the 6<sup>th</sup> lateral tooth; distance between setae: 102  $\mu\text{m}$  (n = 1).

**Anterior parapods:** mid long claws with fine inner teeth which are 3/5 as long as distal tooth; claw index: 1.6.

**Abdominal segments:** 1 - 6 bear posterolateral setal tufts of 10-20 filaments, which reach 1/4 - 1/3 of the segment length; segment 7 with ? setae.

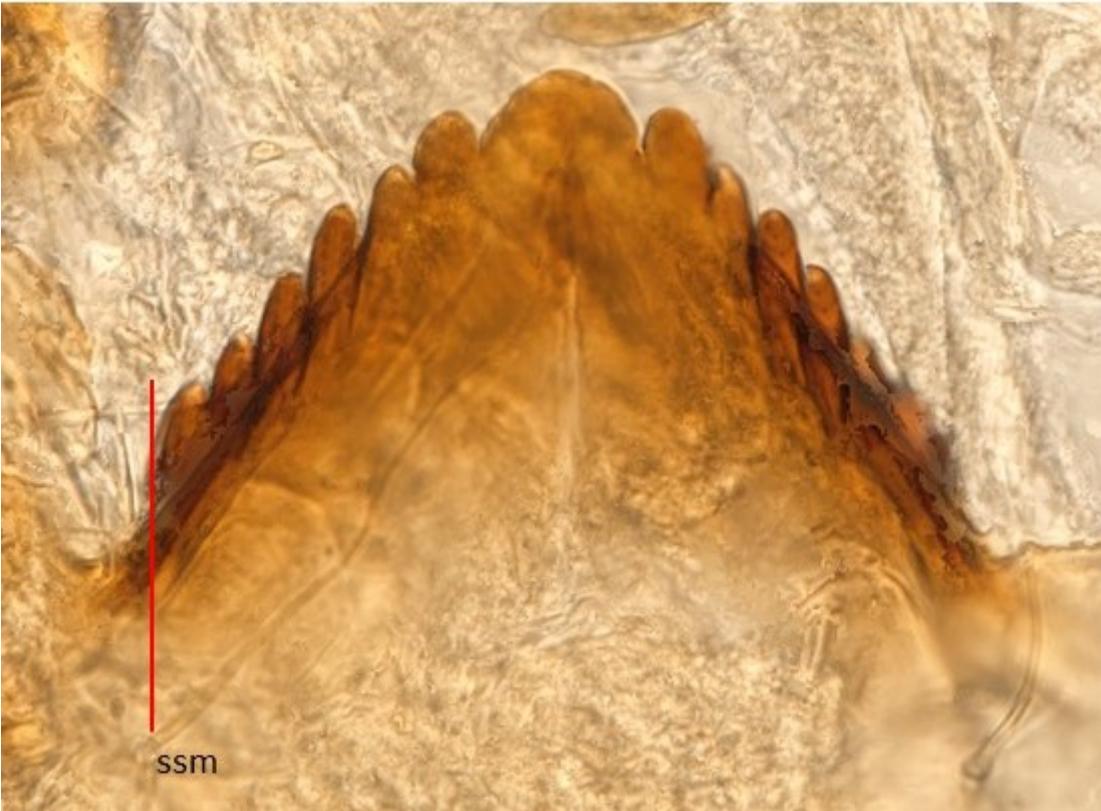
**Anal segments:** dorsolateral seta on segment 9 reaches 1/3<sup>rd</sup> of segment length.

*Cricotopus triannulatus* continued

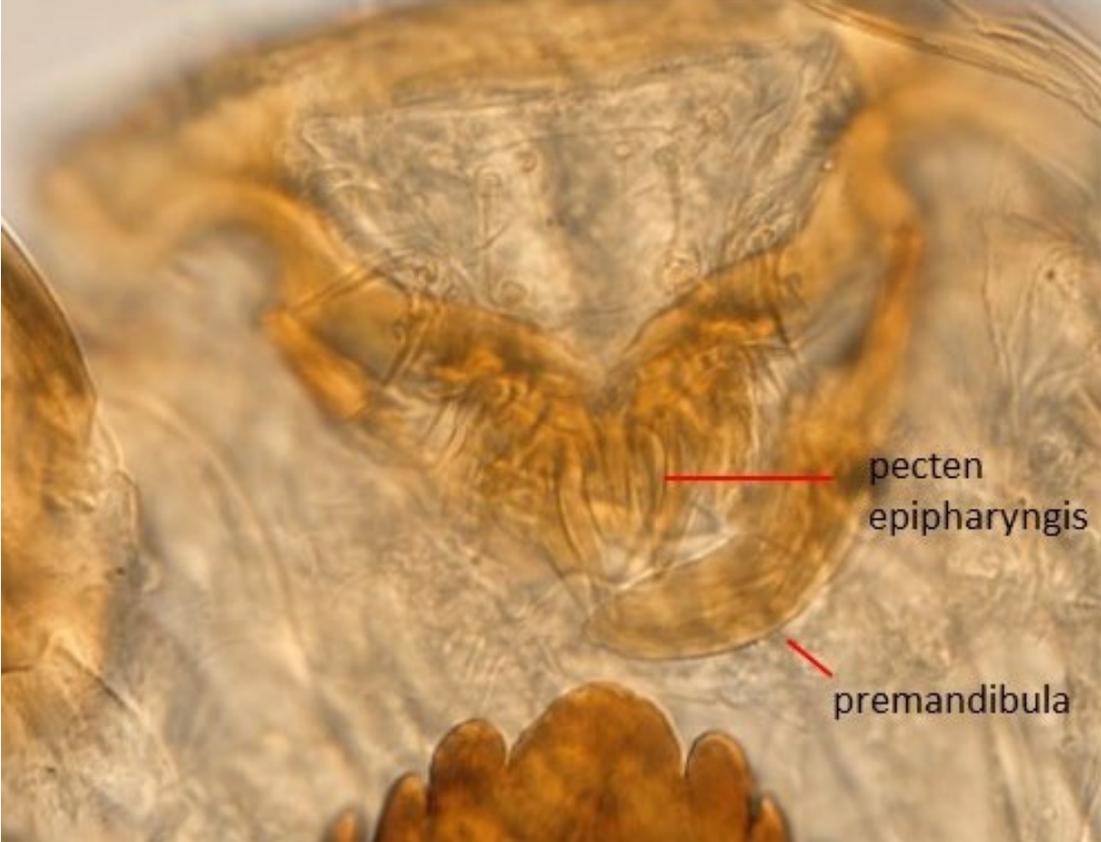


*Cricotopus triannulatus*, head ventral. Vuren, Waal, 4 Oct. 1988. leg. H. Cuppen.

*Cricotopus triannulatus* continued

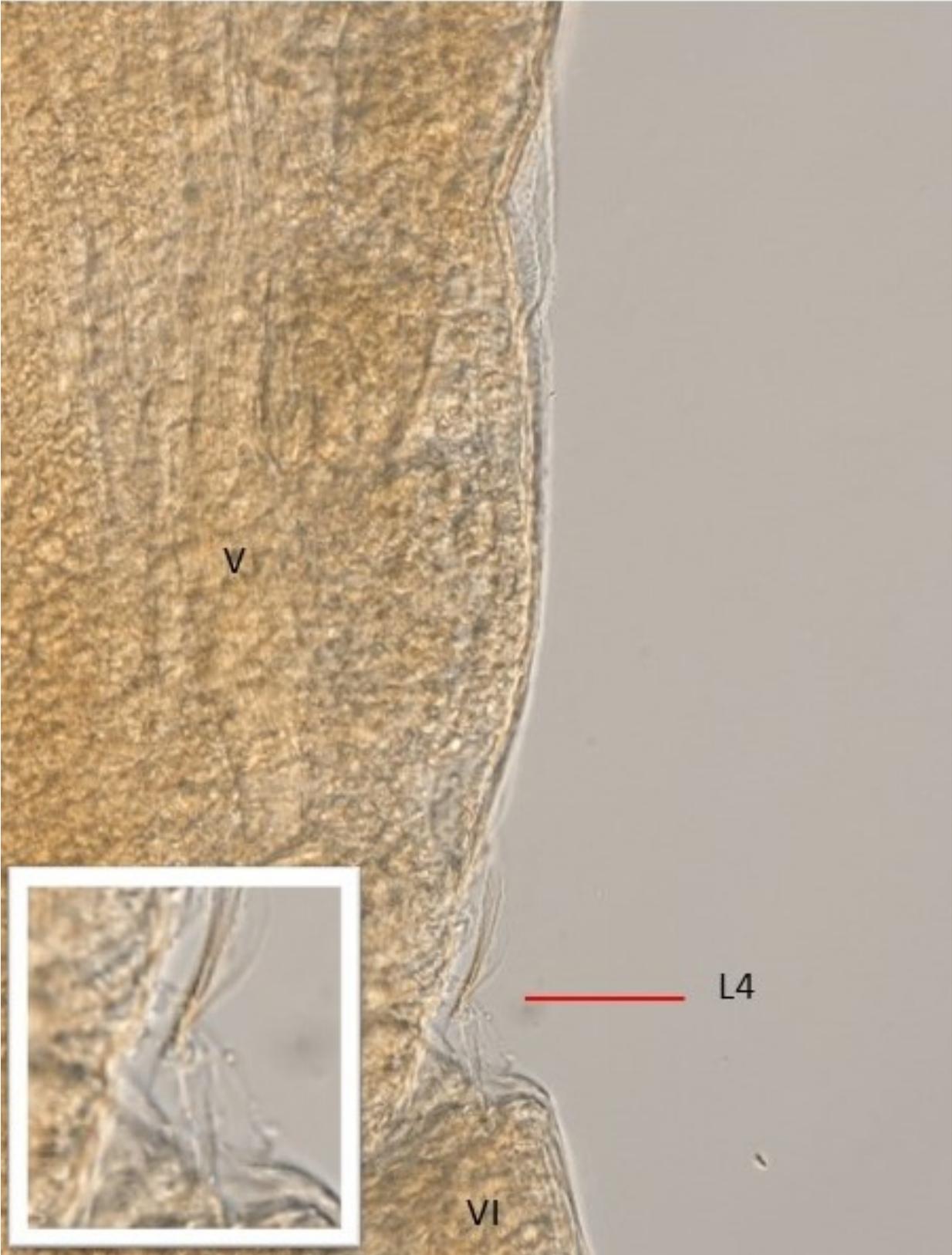


*Cricotopus triannulatus*, mentum . Vuren, Waal, 4 Oct. 1988. leg. H. Cuppen.



*Cricotopus triannulatus*, details of head ventral. Vuren, Waal, 4 Oct. 1988. leg. H. Cuppen.

*Cricotopus triannulatus* continued



*Cricotopus triannulatus*, L4 segment 5 . Vuren, Waal, 4 Oct. 1988. leg. H. Cuppen.

*Cricotopus trifascia* Edwards, 1929

**Body:** body length: 6 mm.

**Head capsule:** yellow posterior part light brown; occipital margin dark brown; head width: 487  $\mu$ m.

**Antenna:** 5 segments; antennal blade extends halfway 4<sup>th</sup> segment; length antenna 1: 78  $\mu$ m; AR: 1.7 – 1.8.

**Mentum:** 6 lateral teeth and a broad median tooth; 1<sup>st</sup>, 2<sup>nd</sup> and 6<sup>th</sup> lateral tooth strongly reduced; MR: 3.8 – 4.8.

**Mandibula:** 3 inner teeth, color apically brown extending to molar area with wide pale base; dorsal margin slightly crenulated.

**Premandibula:** simple.

**Labrum:** bifid S1 with outer branch longer than inner branch.

**Epipharynx:** pecten epipharyngis composed of 3 scales of equal length.

**Submental setae:** located at the level of the sixth lateral tooth; distance between setae: 131  $\mu$ m (n = 1).

**Anterior parapods:** mid long claws with coarse inner teeth which are nearly as long as distal tooth; claw index: 1.1.

**Abdominal segments:** segments 3-5 bear posterolateral setal tufts of 10 filaments, which reach 1/6 of the segment length; segment 6 and 7 with 1 seta.

**Anal segments:** dorsolateral seta on segment 9 reaches 1/5 of segment length; ventral seta at base posterior parapods relatively big; anal papillae well developed and equal in length as posterior parapods; dorsal pair longer than ventral pair.



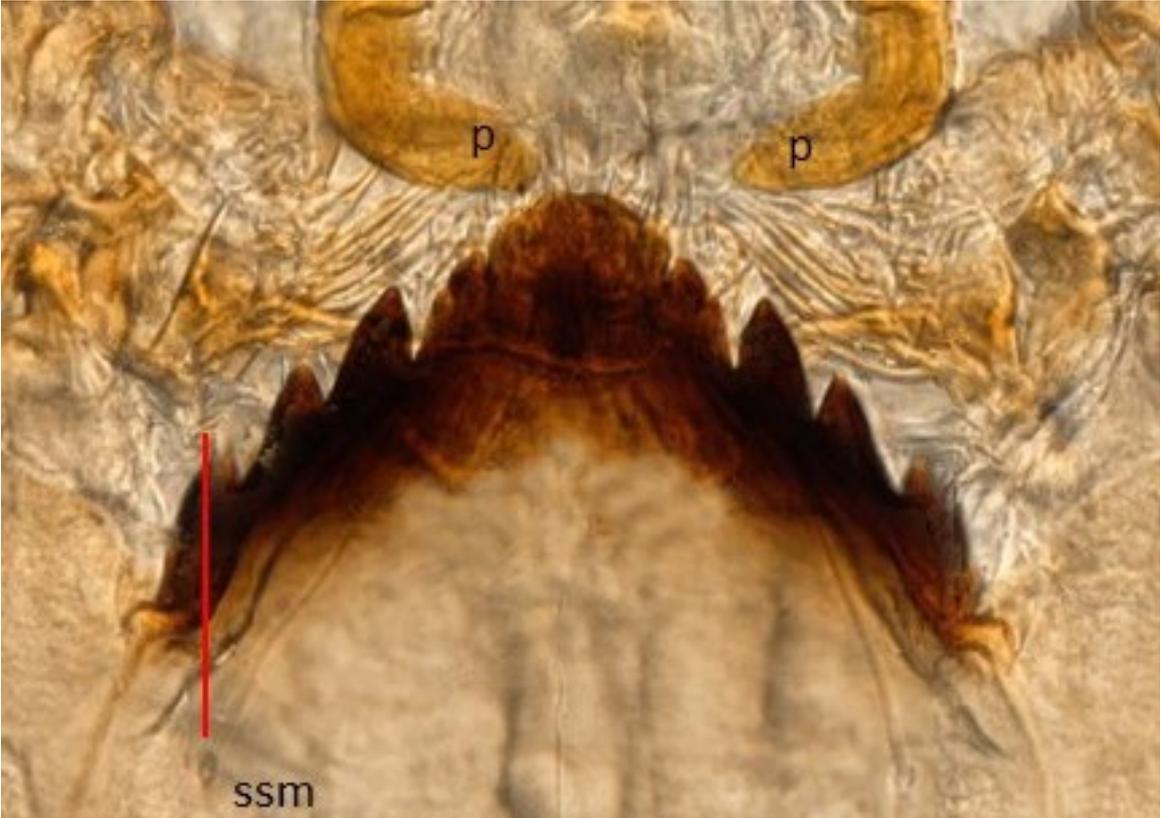
*Cricotopus trifascia*, anterior part of body lateral. Niers, 408262, leg. J. van Mil.

*Cricotopus trifascia* continued



*Cricotopus trifascia*, head ventral. Gulp Euverem, 27 March 2007, leg. H. Cuppen.

*Cricotopus trifascia* continued



*Cricotopus trifascia*, mentum. Gulp Euverem, 27 March 2007, leg. H. Cuppen.

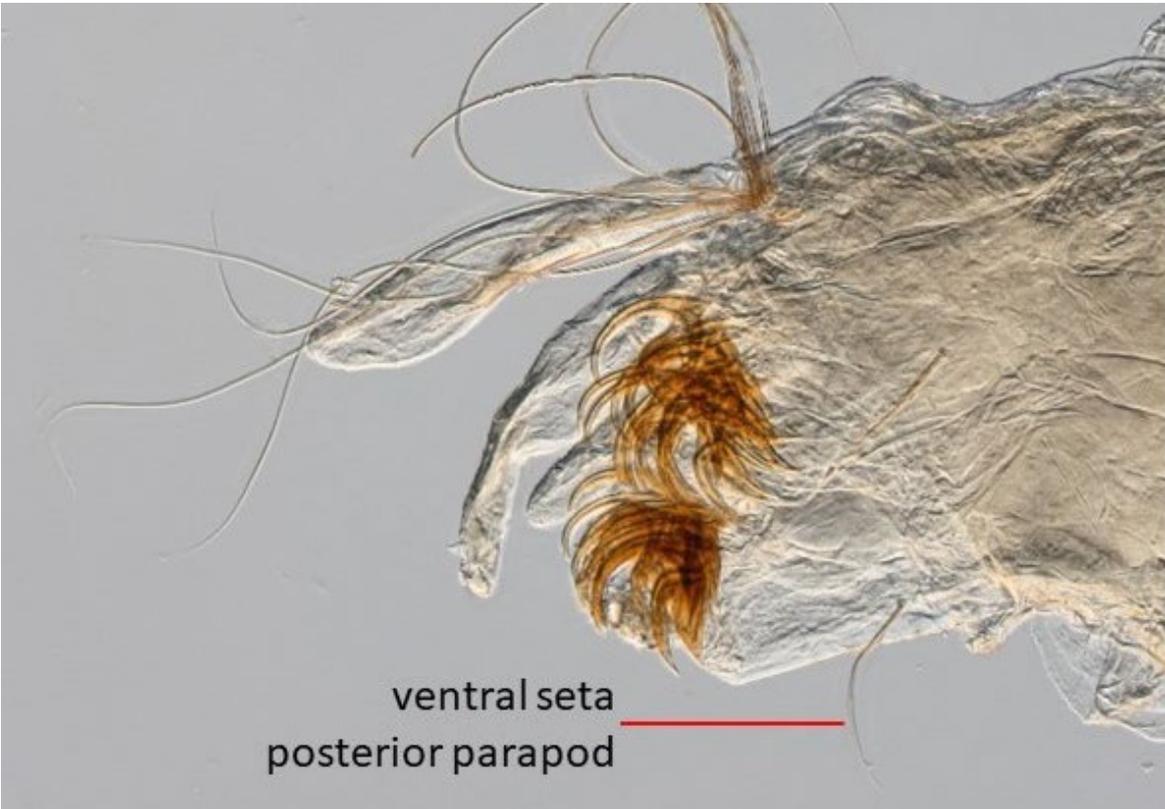


*Cricotopus trifascia*, premandibula and epipharynx. Gulp Euverem, 27 March 2007, leg. H. Cuppen.

*Cricotopus trifascia* continued



*Cricotopus trifascia*, claws anterior parapods. Gulp Euverem, 27 March 2007, leg. H. Cuppen.



*Cricotopus trifascia*, anal segments. Gulp Euverem, 27 March 2007, leg. H. Cuppen.

*Cricotopus* spec. Laachersee

**Body:** body length: 6.5 mm.

**Head capsule:** yellow posterior part light brown; occipital margin dark brown; head width: ?  $\mu\text{m}$  (n = 1).

**Antenna:** 5 segments; antennal blade extends to 3/4 of 4<sup>th</sup> segment; length antenna 1: 56  $\mu\text{m}$ ; AR: 1.6 (n = 1).

**Mentum:** 6 lateral teeth and a relatively small median tooth; MR: 1.5 (n = 1).

**Mandibula:** 3 inner teeth, color apically brown extending to molar area with wide pale base; dorsal margin smooth.

**Premandibula:** simple.

**Labrum:** bifid S1 with branches of similar size.

**Epipharynx:** pecten epipharyngis composed of 3 scales of equal length.

**Submental setae:** located at the level of the 4<sup>th</sup> lateral teeth; distance between setae: ?  $\mu\text{m}$  (n = 1).

**Anterior parapods:** mid long claws with fine inner teeth which are half as long as distal tooth; claw index: 1.8 – 2.0 (n = 2).

**Abdominal segments:** 1 - 6 bear posterolateral setal tufts of 12-16 filaments, which reach 1/2 of the segment length; segment 7 with 6 setae.

**Anal segments:** dorsolateral seta on segment 9 reaches ? of segment length.

*Cricotopus* spec. Laachersee continued



*Cricotopus* spec. Laachersee head ventral. Gleys Laachersee, 26 Apr. 2013, leg. A. Dettinger-Klemm.

*Cricotopus* spec. Laachersee continued



*Cricotopus* spec. Laachersee mentum. Glees Laachersee, 26 Apr. 2013, leg. A. Dettinger-Klemm.



*Cricotopus* spec. Laachersee mandibula. Glees Laachersee, 26 Apr. 2013, leg. A. Dettinger-Klemm.

*Cricotopus* spec. Laachersee continued

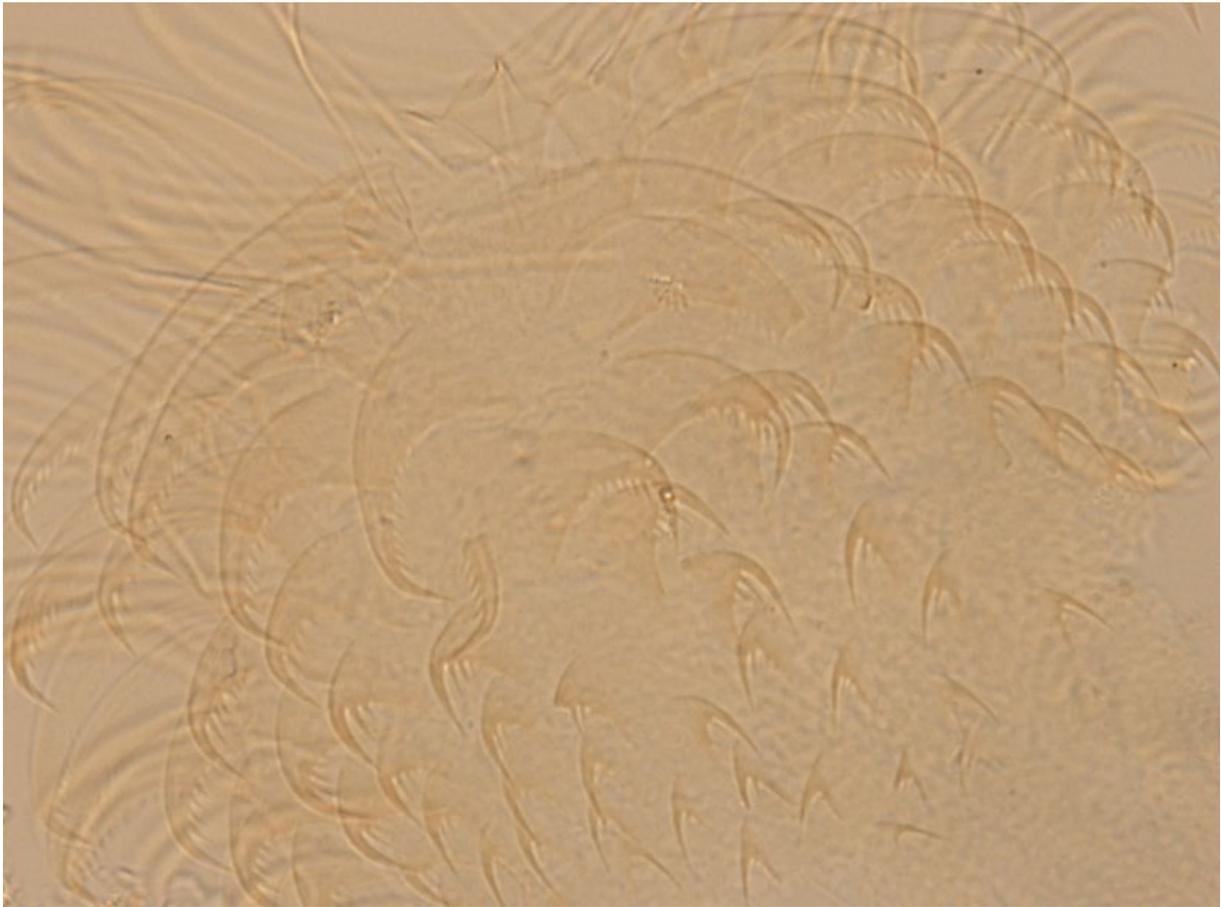


*Cricotopus* spec. Laachersee premandibula and epipharynx. Glees Laachersee, 26 Apr. 2013, leg. A. Dettinger-Klemm.



*Cricotopus* spec. Laachersee antenna. Glees Laachersee, 26 Apr. 2013, leg. A. Dettinger-Klemm.

*Cricotopus* spec. Laachersee continued



*Cricotopus* spec. Laachersee claws anterior parapods. Glees Laachersee, 26 Apr. 2013, leg. A. Dettinger-Klemm.

*Cricotopus* spec. Laachersee continued



*Cricotopus* spec. Laachersee L4 segment 7. Glees Laachersee, 26 Apr. 2013, leg. A. Dettinger-Klemm.  
*Cricotopus* spec. Laachersee L4 segment 7 (same specimen).



*Cricotopus* spec. Laachersee L4 anal segments. Glees Laachersee, 26 Apr. 2013, leg. A. Dettinger-Klemm.

***Cricotopus* subgenus *Isocladius***

*Cricotopus* cf. *arcuatus*

**Body:** body length: 4.0 mm.

**Head capsule:** yellow; occipital margin brown; wide head: 492  $\mu\text{m}$  (n = 1).

**Antenna:** 5 segments; antennal blade extends to the end of 4<sup>th</sup> segment; length antenna 1: 51  $\mu\text{m}$ ; AR: 1.7 (n = 1).

**Mentum:** 6 lateral teeth and a relatively small median tooth; 2<sup>nd</sup> lateral tooth strongly reduced; MR: 1.7 (n = 1).

**Mandibula:** 3 inner teeth, color apically brown extending to molar area with wide pale base; dorsal margin serrated.

**Premandibula:** bifid.

**Labrum:** bifid S1 with outer branch much longer than inner branch.

**Epipharynx:** pecten epipharyngis consisting of one conical scale and two strongly reduced toothlets joined proximally with the conical scale.

**Submental setae:** located at the level of the 6<sup>th</sup> lateral teeth; distance between setae: 132  $\mu\text{m}$  (n = 1).

**Anterior parapods:** mid long claws with relatively coarse inner teeth which are 1/3<sup>rd</sup> as long as distal tooth; claw index: 3 (n = 1).

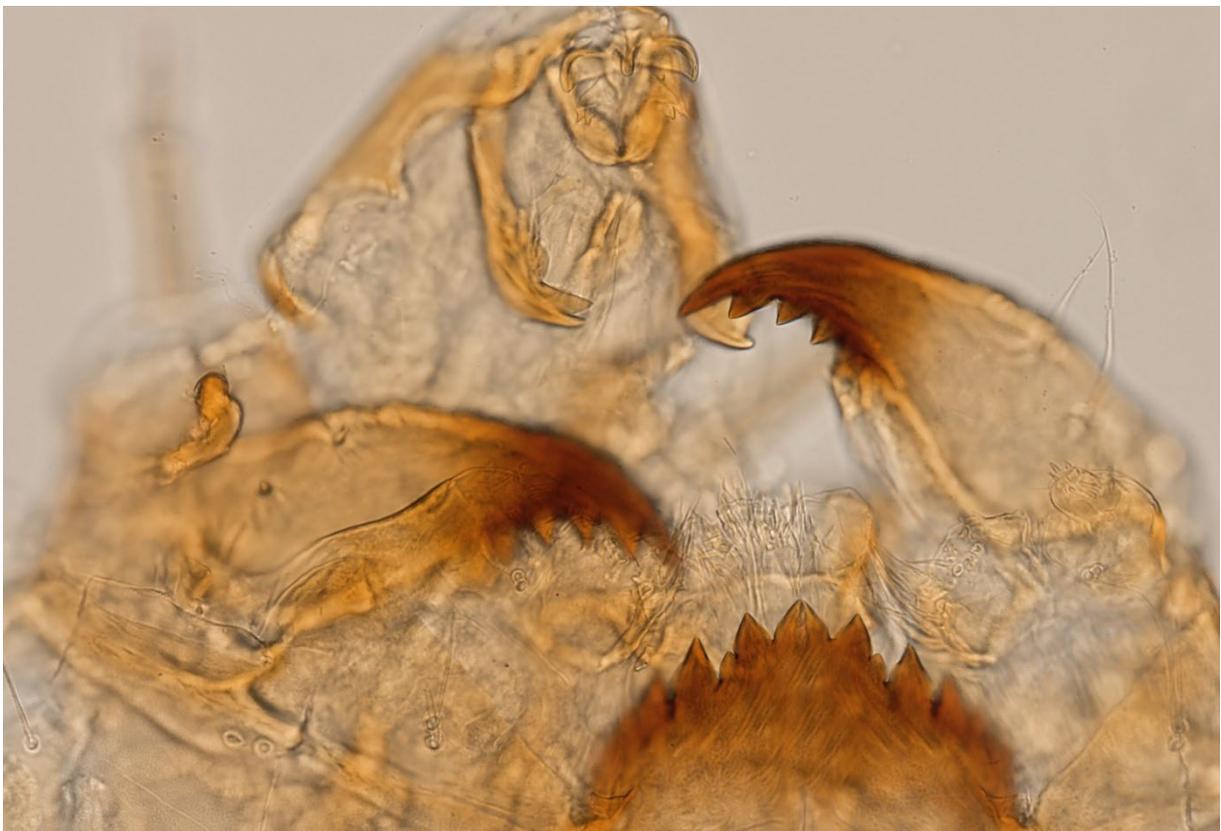
**Abdominal segments:** segments 1 - 6 bear posterolateral setal tufts of 10-15 filaments, which length is equal to the segment length; segment 7 with 7 – 11 setae (n = 4).

**Anal segments:** dorsolateral seta on segment 9 reaches 1/3<sup>rd</sup> of segment length; ratio supra-anal seta/anal papilla: 3.0 – 3.5 (n = 3).

*Cricotopus* cf. *arcuatus* continued



*Cricotopus* cf. *arcuatus*, mentum. Bergschenhoek, vaart, leg. H. Cuppen.



*Cricotopus* cf. *arcuatus*, mandibula and premandibula. Bergschenhoek, vaart, leg. H. Cuppen.

*Cricotopus* cf. *arcuatus* continued

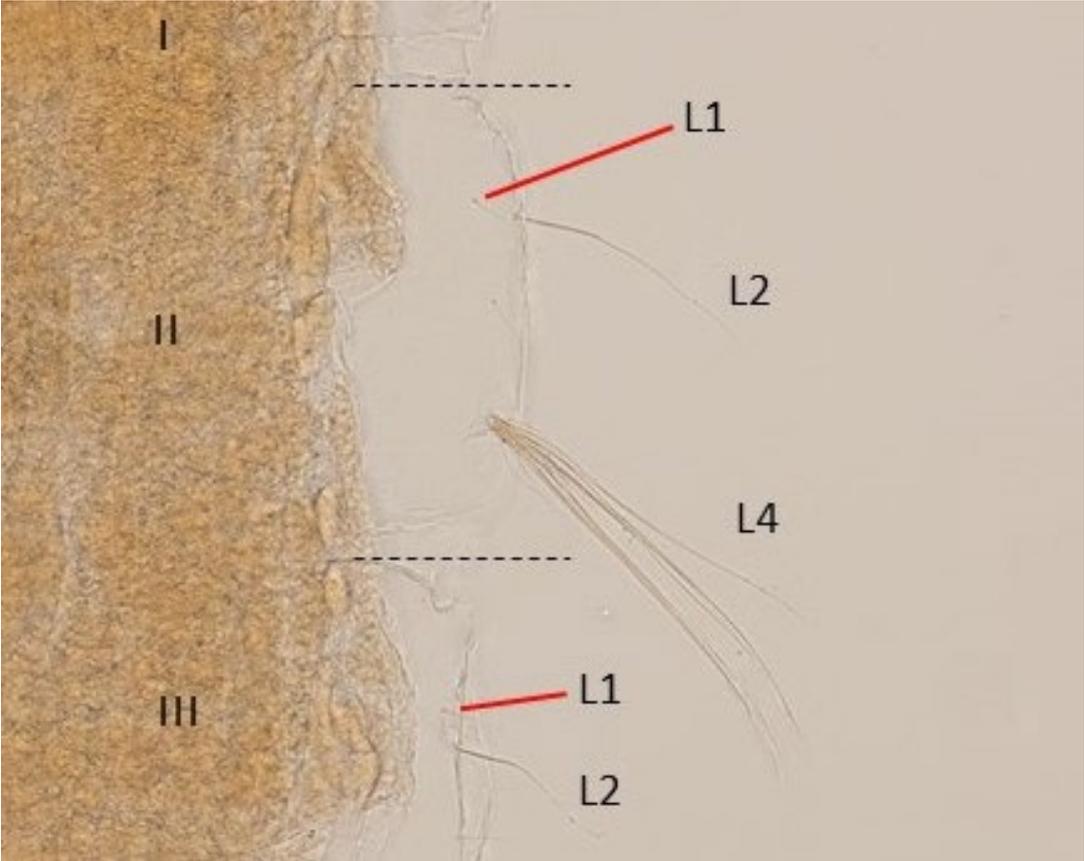


*Cricotopus* cf. *arcuatus*, antenna. Bergschenhoek vaart leg. H. Cuppen.



*Cricotopus* cf. *arcuatus*, claws anterior parapods. Bergschenhoek vaart leg. H. Cuppen.

*Cricotopus cf. arcuatus* continued



*Cricotopus cf. arcuatus*, segment 1-3. Bergschenhoek vaart, leg. H. Cuppen.



*Cricotopus cf. arcuatus*, segment 6 and 7. Bergschenhoek vaart, leg. H. Cuppen.

*Cricotopus cf. arcuatus* continued



*Cricotopus cf. arcuatus*, anal segment. Bergschenhoek vaart, leg. H. Cuppen. s.a.-seta = supra-anal seta.

*Cricotopus brevipalpis*

**Body:** body length: 6 mm.

**Head capsule:** brown; occipital margin dark brown; wide head: 220  $\mu\text{m}$  (n = 1).

**Antenna:** 5 segments; antennal blade extends halfway 4<sup>th</sup> segment; length antenna 1: 20  $\mu\text{m}$ ; AR: 0.7 – 0.8 (n = 2).

**Mentum:** 6 lateral teeth and a relatively small median tooth; 2<sup>nd</sup> and 6<sup>th</sup> lateral teeth very strongly reduced; MR: 1.7 (n = 1).

**Mandibula:** 3 inner teeth, color apically dark brown extending to molar area with wide brown base; dorsal margin nearly smooth.

**Premandibula:** simple.

**Labrum:** S1 simple.

**Epipharynx:** pecten epipharyngis consisting of 5 short broad teeth.

**Submental setae:** located at the level of the 1<sup>st</sup> lateral tooth; distance between setae: 30  $\mu\text{m}$  (n = 1).

**Anterior parapods:** mid long claws with relatively coarse inner teeth which are two third as long as distal tooth; claw index: 1.5 (n = 1).

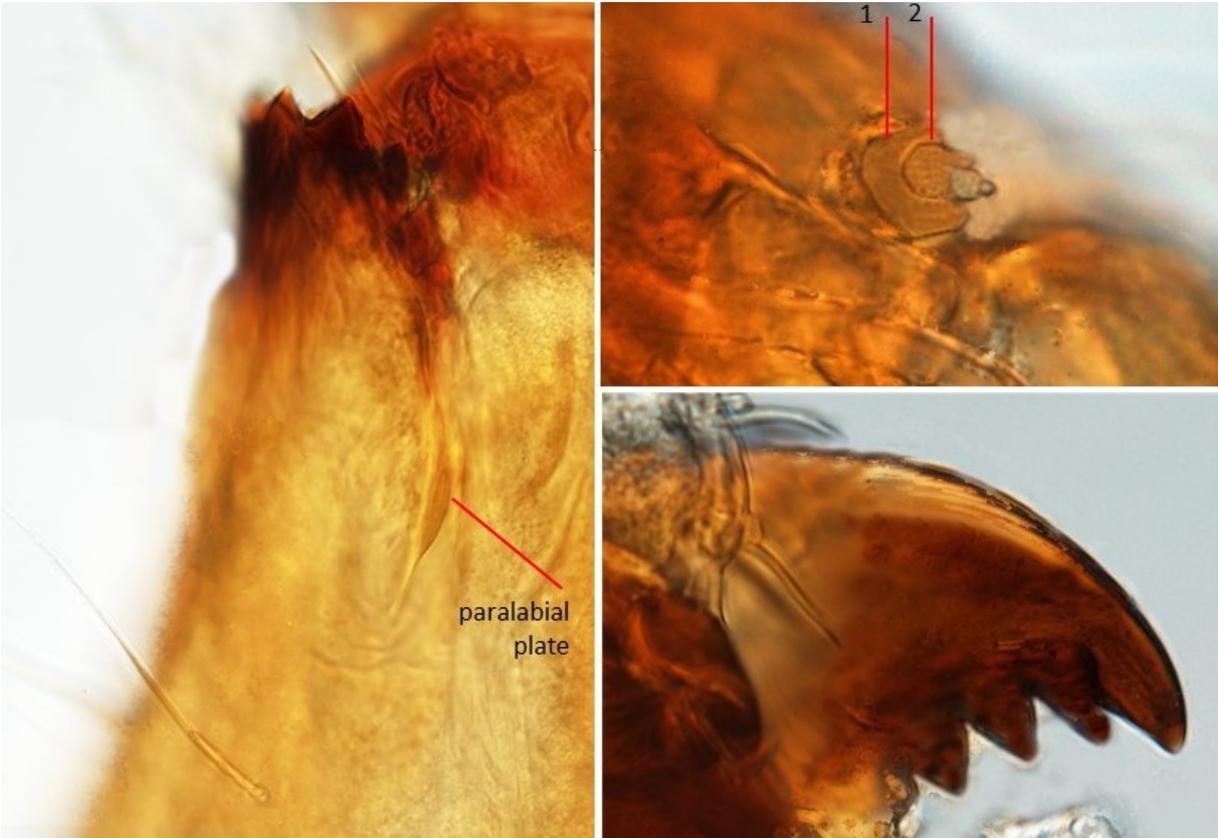
**Abdominal segments:** segments 1 - 6 bear posterolateral setal tufts of 5 - 7 filaments, which reach  $\frac{3}{4}$  of the segment length; segment 7 with 5 setae (n = 1).

**Anal segments:** dorsolateral seta on segment 9 reaches  $\frac{1}{3}$ <sup>rd</sup> of segment length; ratio supra-anal seta/anal papilla: 2.2-3.0 (n = 2).

*Cricotopus brevivalpis* continued



*Cricotopus brevivalpis*, head lateral. Terheijden, binnenpolder, ditch, 13 October 1989, leg. H. Cuppen.



*Cricotopus brevivalpis*, head lateral, details of mentum and parolabial plate; antenna; mandibula. Terheijden, binnenpolder, ditch, 13 October 1989, leg. H. Cuppen.

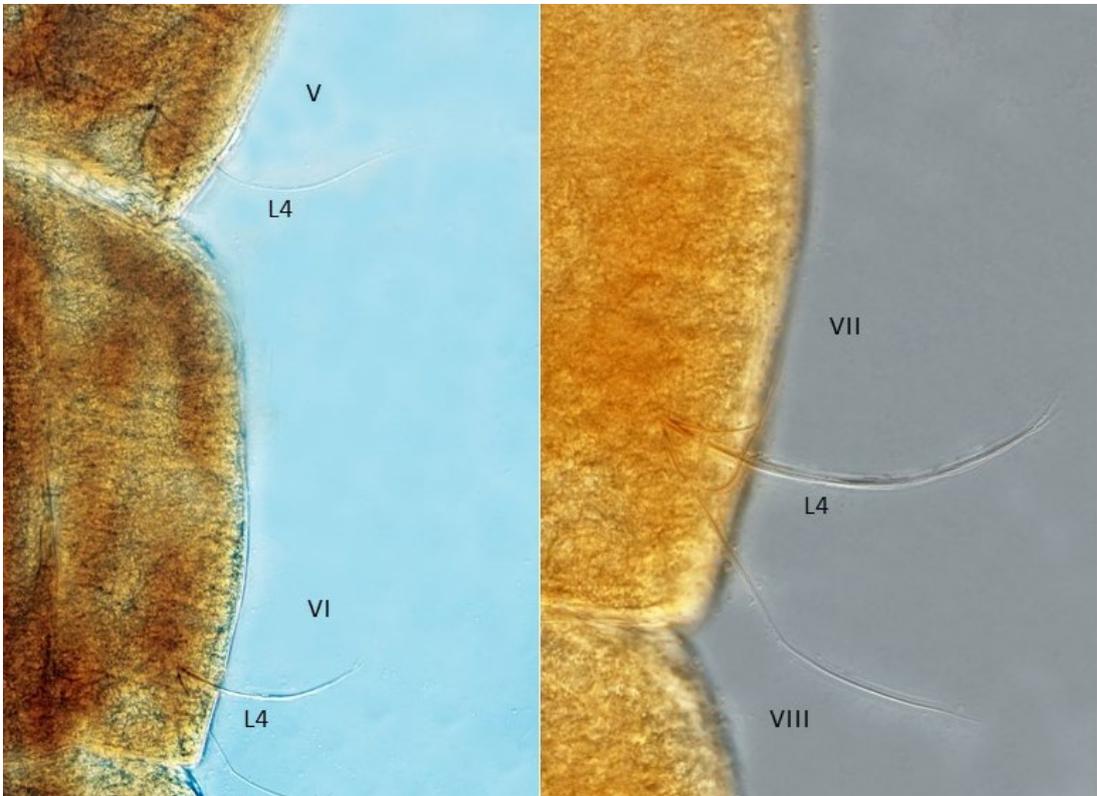
*Cricotopus brevivalpis* continued



*Cricotopus brevivalpis*, head ventral. Picture Erik Bostrom, Vitenskapsmuseet.



*Cricotopus brevipalpis*, claws of the anterior pseudopods. Terheijden, binnenpolder, ditch, 13 October 1989, leg. H. Cuppen.



*Cricotopus brevipalpis*, left: segment 5-6 and right: segment 7. Terheijden, binnenpolder, ditch, 13 October 1989, leg. H. Cuppen.



*Cricotopus brevipalpis* larval mines in *Potamogeton natans*, Tilburg, de Kaaistoep; © Paul van Wielink.

*Cricotopus intersectus* (Stæger, 1839)

**Body:** body length: 4.5 – 5.0 mm.

**Head capsule:** light brown, basal part often darker brown; occipital margin brown; wide head: 374  $\mu\text{m}$  (n = 2).

**Antenna:** 5 segments; antennal blade extends to the end fourth segment; length antenna 1: 50  $\mu\text{m}$ ; AR: 1.4 (n = 2).

**Mentum:** 6 lateral teeth and a relatively broad median tooth; second lateral tooth strongly reduced; MR: 2.7 (n = 1).

**Mandibula:** 3 inner teeth, color apically brown extending to molar area with wide pale base; dorsal margin serrated.

**Premandibula:** simple.

**Labrum:** bifid S1 with outer branch much longer than inner branch.

**Epipharynx:** pecten epipharyngis consists of one conical scale and two strongly reduced toothlets joined proximally with the conical scale.

**Submental setae:** located at the level of the transition of the 4<sup>th</sup> and 5<sup>th</sup> lateral teeth; distance between setae: 95  $\mu\text{m}$  (n = 3).

**Anterior parapods:** middle long claws with relatively coarse inner teeth which are half as long as distal tooth; claw index: 2.0 (n = 1).

**Abdominal segments:** segments 1 - 6 bear posterolateral setal tufts of 20-40 filaments, which reach  $\frac{3}{4}$  - 1 of the segment length; segment 7 with 10 - 20 setae.

**Anal segments:** dorsolateral seta on segment 9 reaches 1/2 of segment length; ratio supra-anal seta/anal papilla: 0.98 – 1.1 (n = 3).

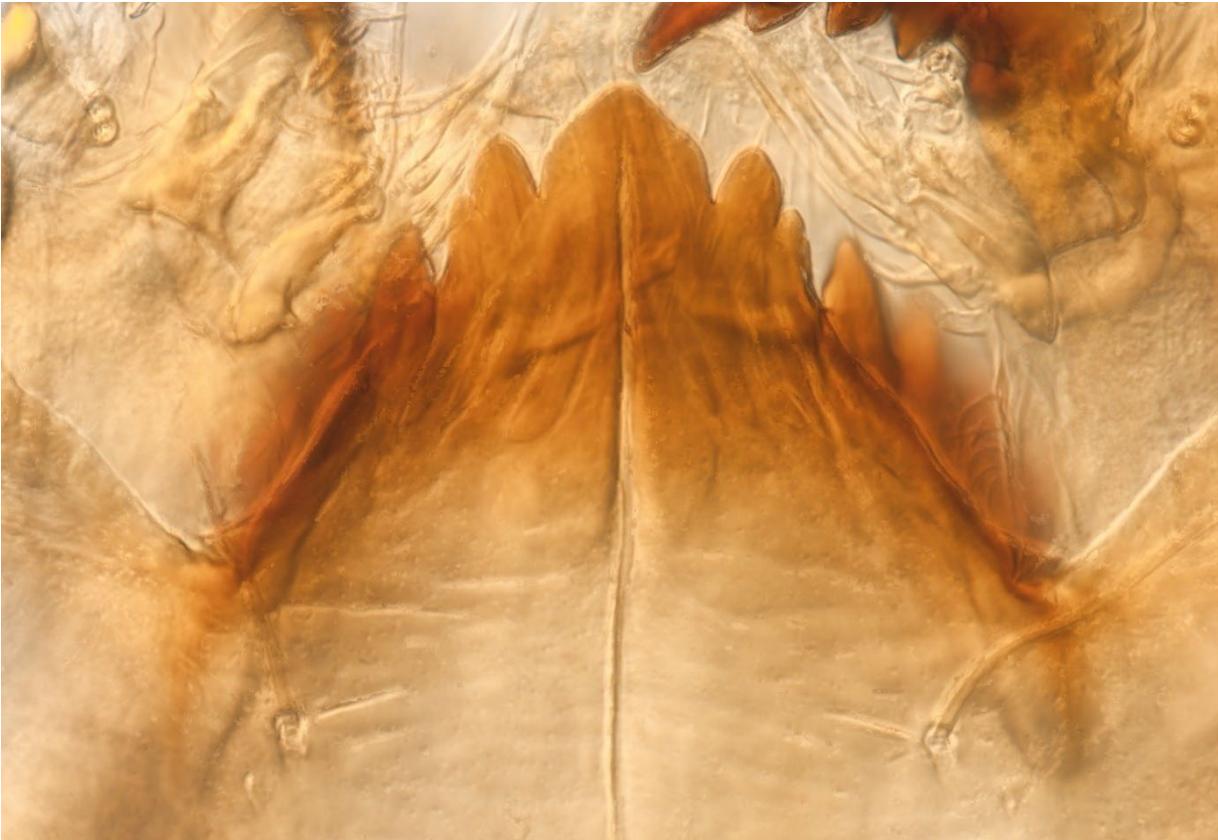


*Cricotopus intersectus*. Honswijk, 421456 leg. D. Tempelman.

*Cricotopus intersectus* continued



*Cricotopus intersectus* head ventral. Wiel Hedel, 31 Aug. 1988, leg. H. Cuppen.

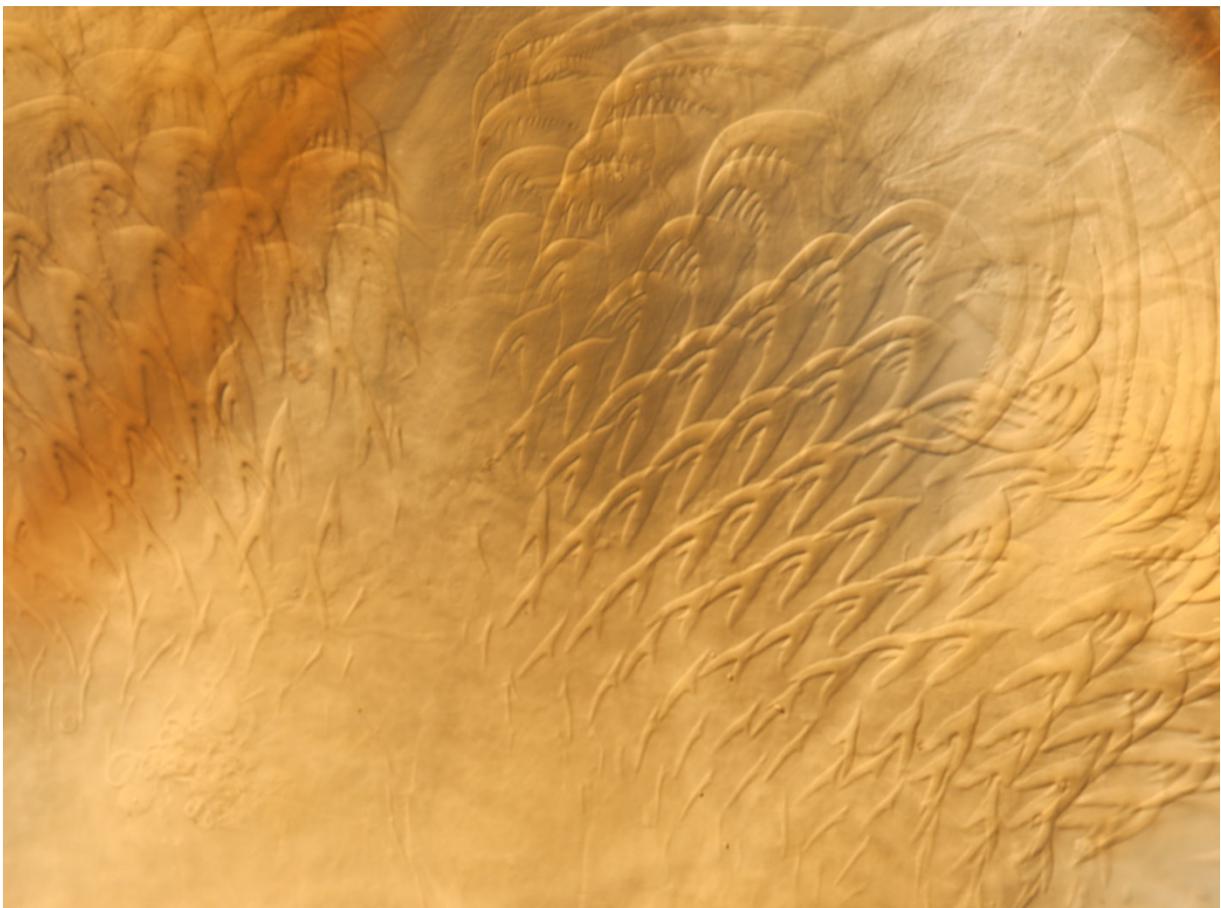


*Cricotopus intersectus*, mentum. Wiel Hedel, 31 Aug. 1988, leg. H. Cuppen.

*Cricotopus intersectus* continued

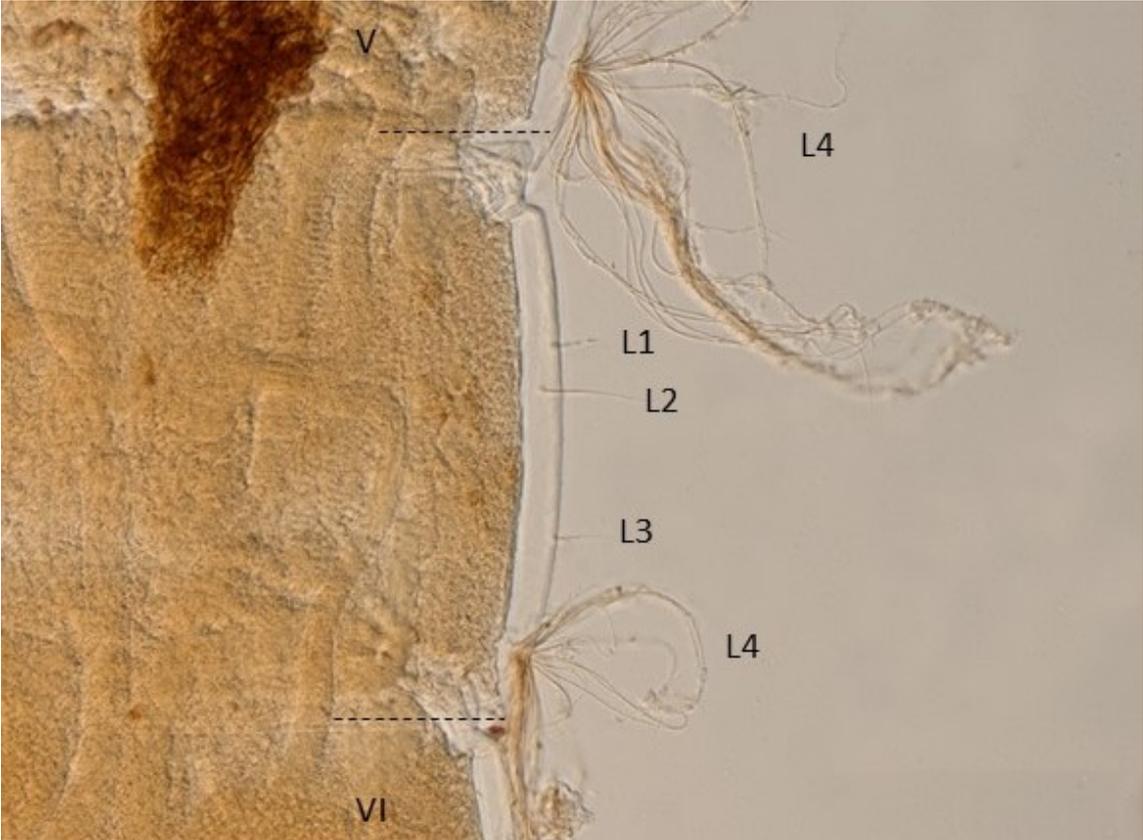


*Cricotopus intersectus*, antenna. Boezemkanaal Rotterdam, 11 Aug. 2002, leg. H. Cuppen.



*Cricotopus intersectus*, claws anterior parapods. Wiel Hedel, 31 Aug. 1988, leg. H. Cuppen.

*Cricotopus intersectus* continued



*Cricotopus intersectus*, L4 segment 5 and 6. Wiel Hedel, 31 Aug. 1988, leg. H. Cuppen.



*Cricotopus intersectus*, L4 segment 6 and 7. Wiel Hedel, 31 Aug. 1988, leg. H. Cuppen.

*Cricotopus obnixus* agg.

**Body:** body length: 3.5 – 4.5 mm.

**Head capsule:** brown; occipital margin brown; wide head: 295- 394 (n = 2).

**Antenna:** 5 segments; antennal blade extends to the end of 3<sup>rd</sup> segment; length antenna 1: 25 µm; AR: 1.0 – 1.2 (n = 2).

**Mentum:** 6 lateral teeth and a relatively small median tooth; 2<sup>nd</sup> and 6<sup>th</sup> lateral teeth very strongly reduced; 1<sup>st</sup> and 3<sup>rd</sup> lateral teeth subequal in size; MR: 1.3 – 1.4 (n =2).

**Mandible:** 3 inner teeth, color apically dark brown extending to molar area with wide brown base; dorsal margin nearly smooth.

**Premandibula:** simple.

**Labrum:** S1 simple.

**Epipharynx:** pecten epipharyngis consisting of five short broad teeth.

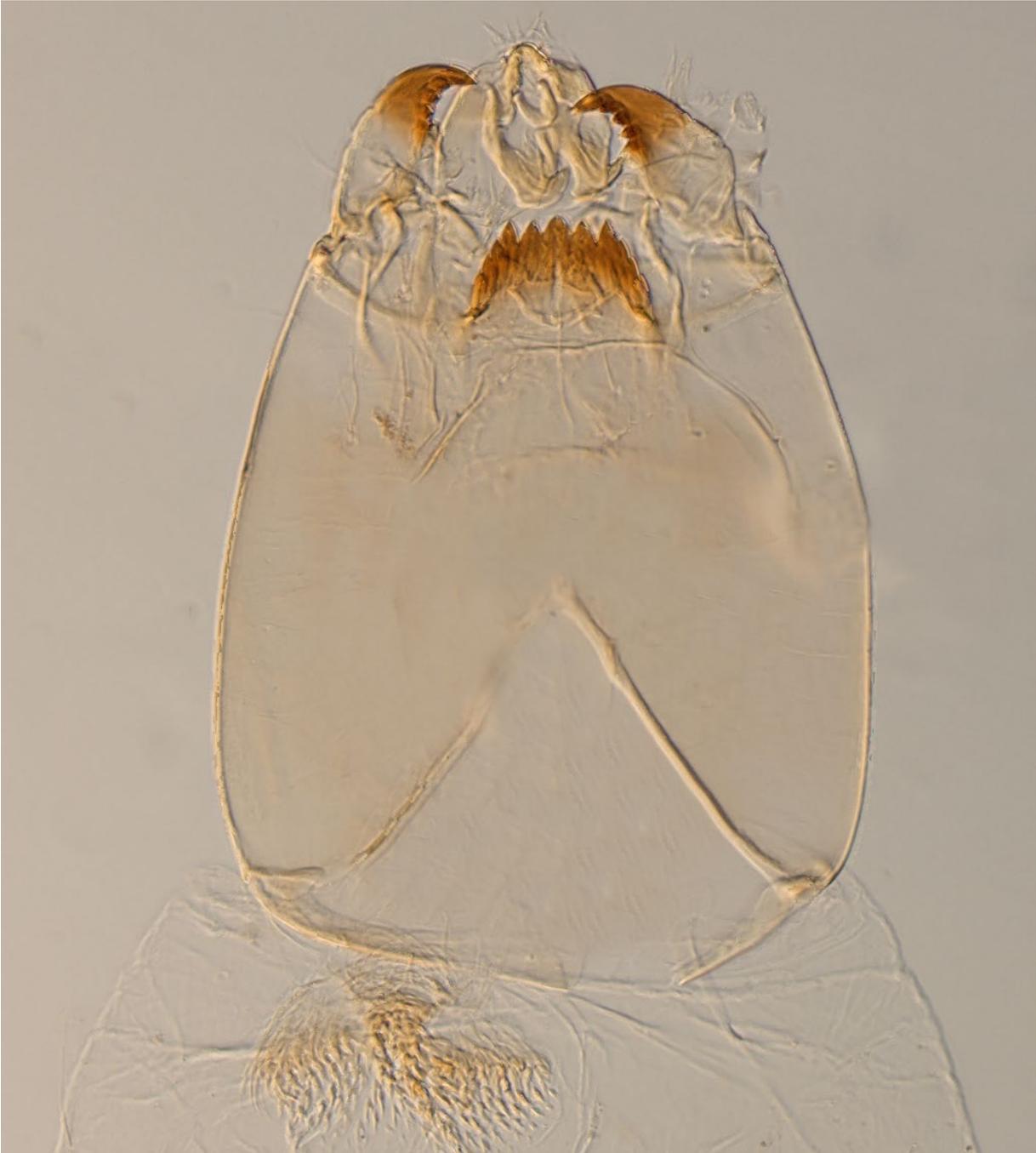
**Submental setae:** located at the level of the transition of the third and fourth lateral teeth; distance between setae: 68 µm (n = 1).

**Anterior parapods:** Mid long claws with relatively coarse inner teeth which are one third as long as distal tooth; claw index: 2.9 (n = 1).

**Abdominal segments:** segments 1 - 6 bear posterolateral setal tufts of 8 - 15 filaments, their length equal to the segment length; segment 7 with 5 - 8 setae (n = 5); L2 seta very long, equaling the segment length.

**Anal segments:** dorsolateral seta on segment 9 reaches ? of segment length; ratio supra-anal seta/anal papilla: 2.3 (n = 1)

*Cricotopus obnixus* agg. continued



*Cricotopus obnixus* agg., head ventral. Zandgat trabr, 23 Aug. 1976, leg. H. Moller.

*Cricotopus obnixus* agg. continued

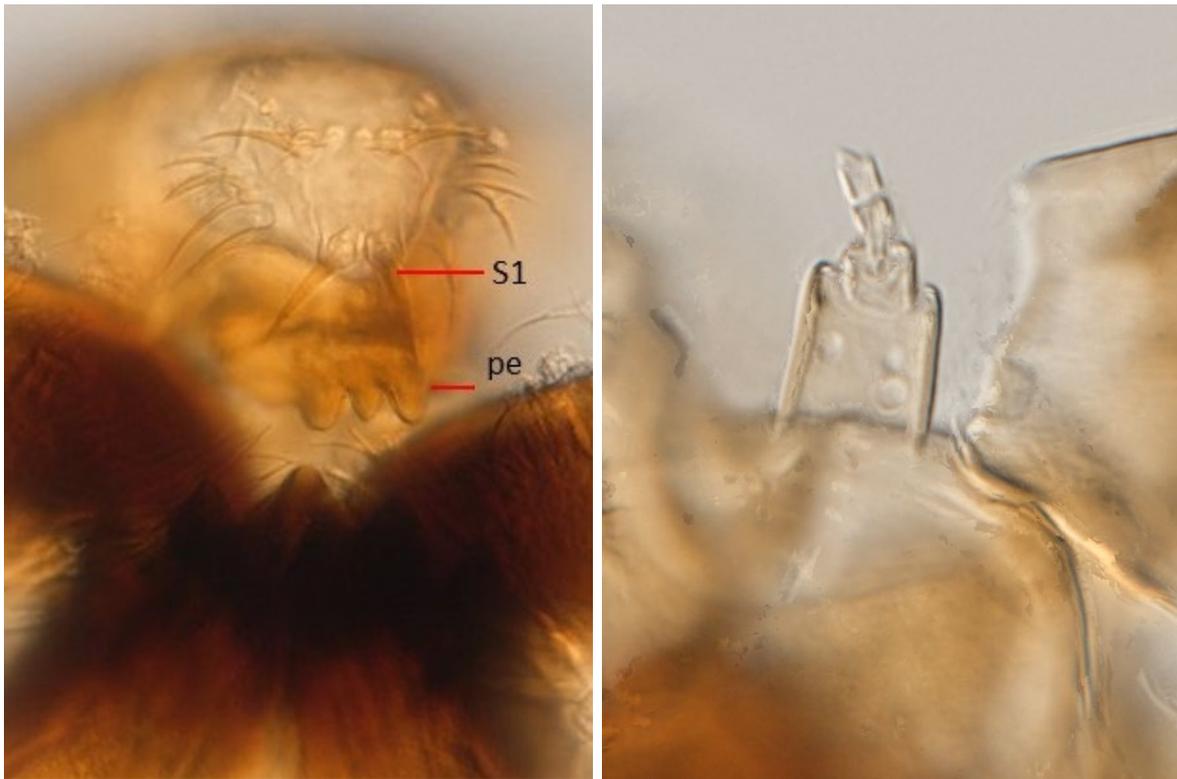


*Cricotopus obnixus* agg., mentum. Zandgat trabr, 23 Aug. 1976, leg. H. Moller.



*Cricotopus obnixus* agg., mandibula and premandibula. Zandgat trabr, 23 Aug. 1976, leg. H. Moller.

*Cricotopus obnixus* agg. continued



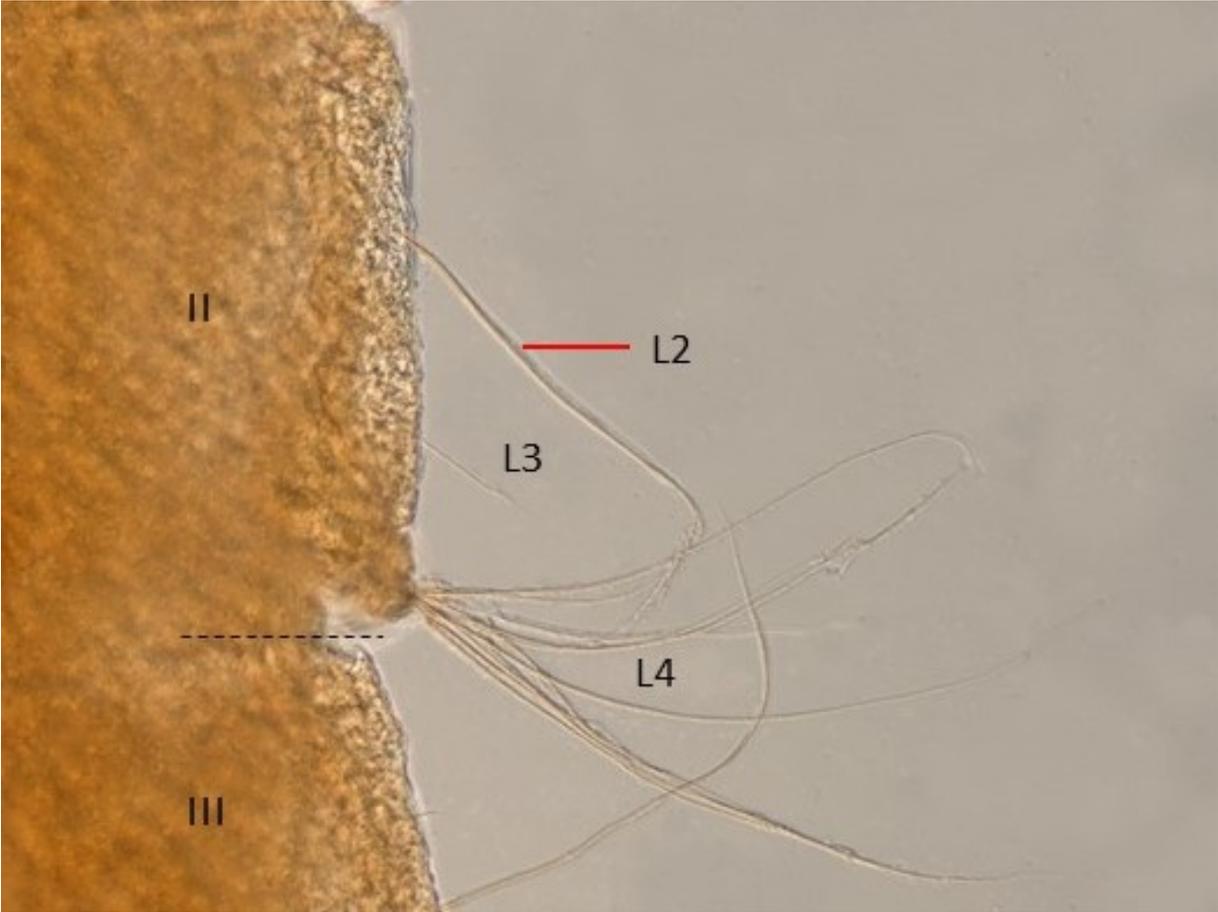
*Cricotopus obnixus* agg., S1 and hypopharynx. Loenen, Albaplas 22 Aug. 2006, leg. H. Cuppen.

*Cricotopus obnixus* agg., antenna. Zandgat trabr, 23 Aug. 1976, leg. H. Moller.



*Cricotopus obnixus* agg., claws anterior parapods. Zandgat trabr, 23 Aug. 1976, leg. H. Moller.

*Cricotopus obnixus* agg. continued



*Cricotopus obnixus*, L2 and L4 segment 2. Loenen, Albaplas, 22 Aug. 2006, leg. H. Cuppen.

*Cricotopus* near *obnixus*

**Body:** body length: 4.0 mm.

**Head capsule:** brown; occipital margin dark brown; head width: ?

**Antenna:** 5 segments; antennal blade extends to the end of 3<sup>rd</sup> segment; length antenna 1: ?  $\mu\text{m}$ ;  
AR: 1.3 (n = 1).

**Mentum:** 6 lateral teeth and a relatively small median tooth; second lateral tooth very strongly reduced; MR: 1.5 (n = 1).

**Mandible:** 3 inner teeth, color apically dark brown extending to molar area with wide yellow base; dorsal margin nearly smooth.

**Premandibula:** bifid.

**Labrum:** S1 simple.

**Epipharynx:** ?

**Submental setae:** located at the level of the transition of the fourth and fifth lateral teeth; distance between setae: ?  $\mu\text{m}$  (n = 1).

**Anterior parapods:** ?

**Abdominal segments:** segments 1 - 6 bear posterolateral setal tufts of 10 - 15 filaments, equal to the segment length; segment 7 with 6 setae (n = 1); seta L2 relatively short, equal with 1/7 of segment length.

**Anal segments:** ?

*Cricotopus* near *obnixus* continued

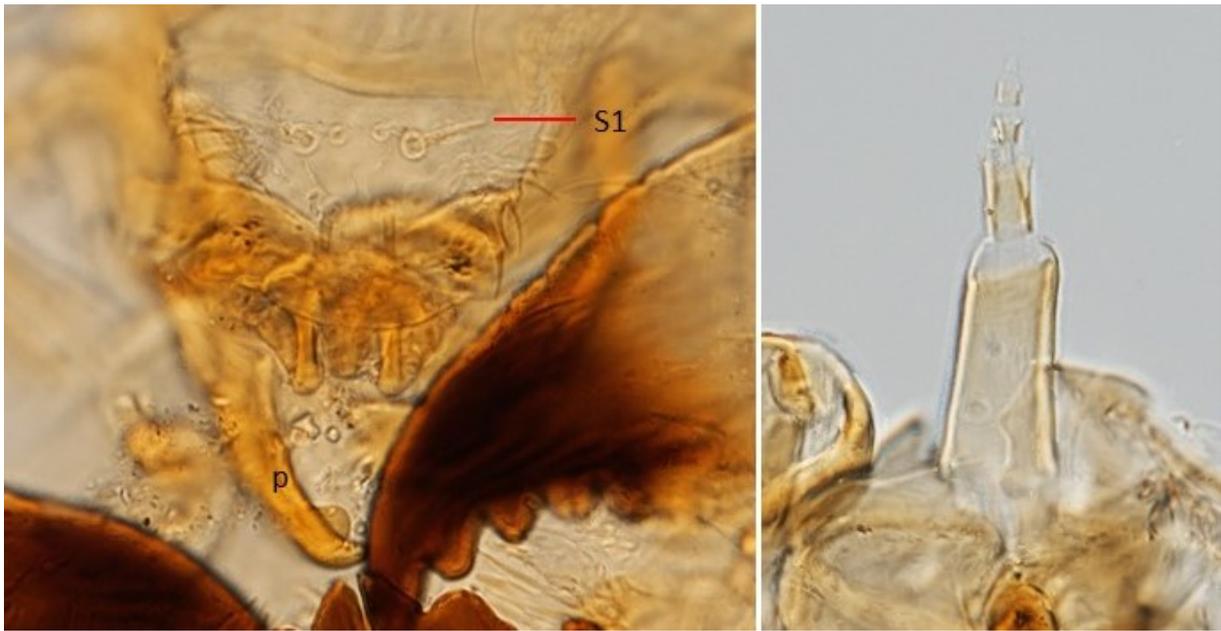


*Cricotopus* near *obnixus*, head ventral. Angelhofer Altrhein, 19 July 2013, leg. A. Dettinger-Klemm.



*Cricotopus* near *obnixus*, mentum. Angelhofer Altrhein, 19 July 2013, leg. A. Dettinger-Klemm.

*Cricotopus* near *obnixus* continued



*Cricotopus* near *obnixus*, premandibula and antenna. Angelhofer Altrhein, 19 July 2013, leg. A. Dettinger-Klemm.



*Cricotopus* near *obnixus*, L2 and L4 segment 2. Angelhofer Altrhein, 19 July 2013, leg. A. Dettinger-Klemm.

*Cricotopus* near *obnixus*, L4 segment 7. Angelhofer Altrhein, 19 July 2013, leg. A. Dettinger-Klemm.

*Cricotopus ornatus* (Meigen, 1818)

**Body:** body length: 6.5- 8.5 mm.

**Head capsule:** yellow to light brown, near backside often darker; occipital margin yellow to brown; wide head: 389 - 443  $\mu\text{m}$  (n = 3).

**Antenna:** 5 segments; antennal blade extends to the end 4<sup>th</sup> segment; length antenna 1: 49 – 71  $\mu\text{m}$ ; AR: 1.8 – 2.2 (n = 2).

**Mentum:** 6 lateral teeth and a relatively small median tooth; 2<sup>nd</sup> lateral tooth strongly reduced; MR: 1.8 – 2.0 (n = 2).

**Mandibula:** 3 inner teeth, color apically brown extending to molar area with wide pale base; dorsal margin serrated.

**Premandibula:** bifid.

**Labrum:** bifid S1 with outer branch much longer than inner branch.

**Epipharynx:** pecten epipharyngis consisting of one conical scale and two strongly reduced toothlets joined proximally with the conical scale.

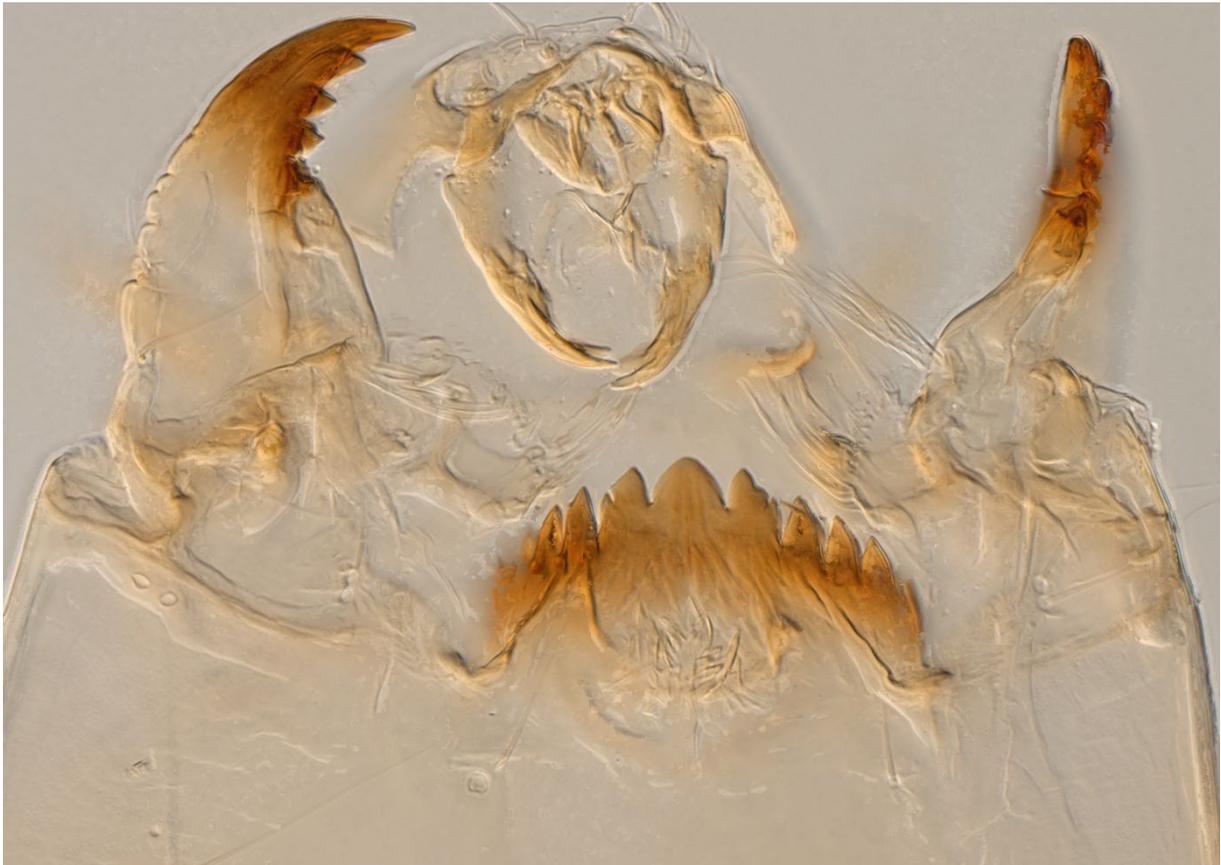
**Submental setae:** located at the level of transition of the 5<sup>th</sup> and 6<sup>th</sup> lateral teeth; distance between setae: 115-124  $\mu\text{m}$  (n = 2).

**Anterior parapods:** mid long claws with relatively coarse inner teeth which are nearly half as long as distal tooth; claw index: 1.7 – 1.9 (n = 2).

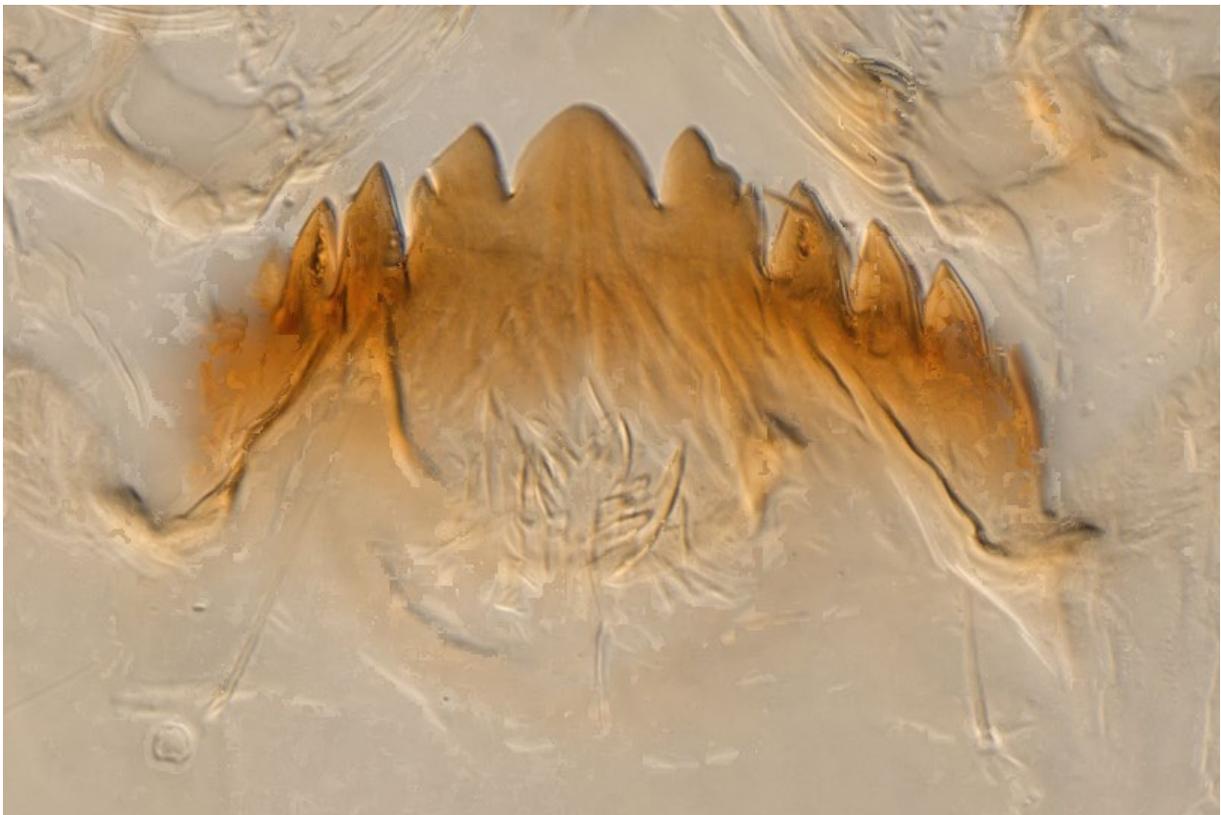
**Abdominal segments:** segments 1 - 6 bear posterolateral setal tufts of 10-15 filaments, which reach  $\frac{1}{2}$  -  $\frac{3}{4}$  of the segment length; segment 7 with 3-5 setae, rarely 6-10.

**Anal segments:** dorsolateral seta on segment 9 reaches  $\frac{1}{4}$  of segment length; ratio supra-anal seta/anal papilla: 2.6 – 3.0 (n = 4).

*Cricotopus ornatus* continued



*Cricotopus ornatus*, head ventral. Weel Sint-Maartensdijk, 11 Aug. 1976, leg. H. Moller.



*Cricotopus ornatus* mentum. Weel Sint-Maartensdijk, 11 Aug. 1976, leg. H. Moller.

*Cricotopus ornatus* continued



*Cricotopus ornatus*, mandibula and premandibula (pm). Weel Sint-Maartensdijk, 11 Aug. 1976, leg. H. Moller. Circle: area with pecten epipharyngis.



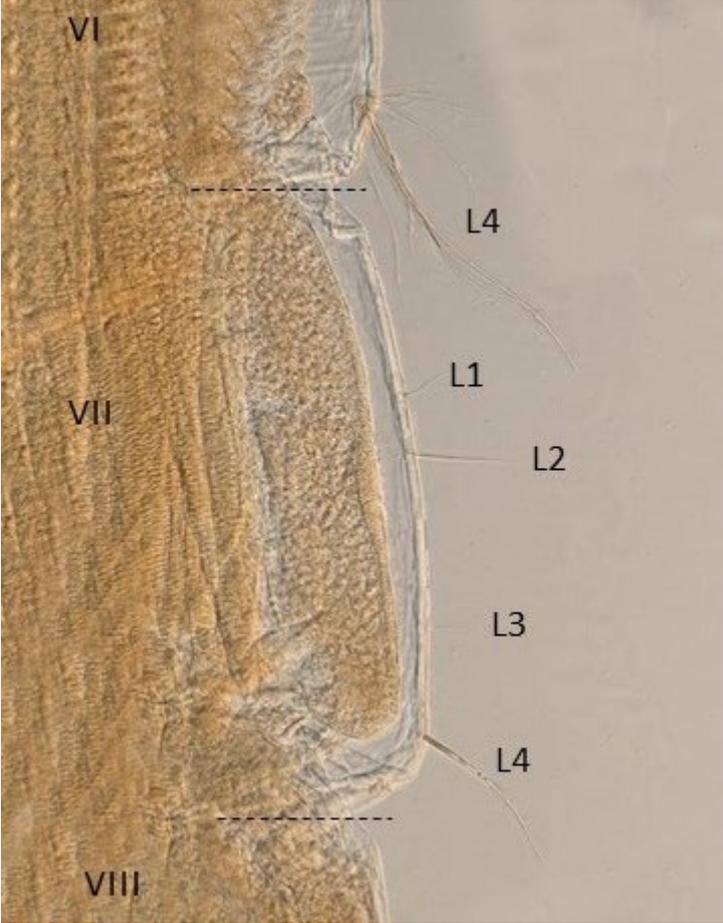
*Cricotopus ornatus* S1 and epipharynx. Weel Sint-Maartensdijk, 11 Aug. 1976, leg. H. Moller.

*Cricotopus ornatus* continued



*Cricotopus ornatus*, antenna. Polder Terschelling, 19 Aug. 1977, leg. H. Moller.

*Cricotopus ornatus* claws anterior parapods. Polder Terschelling, 19 Aug. 1977, leg. H. Moller.



*Cricotopus ornatus* L4 segment 6 and 7. Polder Terschelling, 19 Aug. 1977, leg. H. Moller.

*Cricotopus ornatus* continued



*Cricotopus ornatus* anal segments. Polder Terschelling, 19 Aug. 1977, leg. H. Moller.

*Cricotopus pilitarsis* (Zetterstedt, 1850)

**Body:** body length: 5.5- 6.5 mm.

**Head capsule:** yellow to light brown; occipital margin yellow; wide head: 564  $\mu\text{m}$  (n = 1).

**Antenna:** 5 segments; antennal blade extends to the end fourth segment; length antenna 1: 78  $\mu\text{m}$ ; AR: 1.9 – 2.1 (n = 2).

**Mentum:** 6 lateral teeth and a relatively small median tooth; 1<sup>st</sup> and 2<sup>nd</sup> lateral teeth reduced, 3<sup>rd</sup> lateral teeth strongly enlarged; MR: 1.8 (n = 2).

**Mandibula:** 3 inner teeth, color apically brown extending to molar area with wide pale base; dorsal margin serrated.

**Premandibula:** bifid.

**Labrum:** bifid S1 with outer branch much longer than inner branch.

**Epipharynx:** pecten epipharyngis consisting of one conical scale and two strongly reduced toothlets joined proximally with the conical scale.

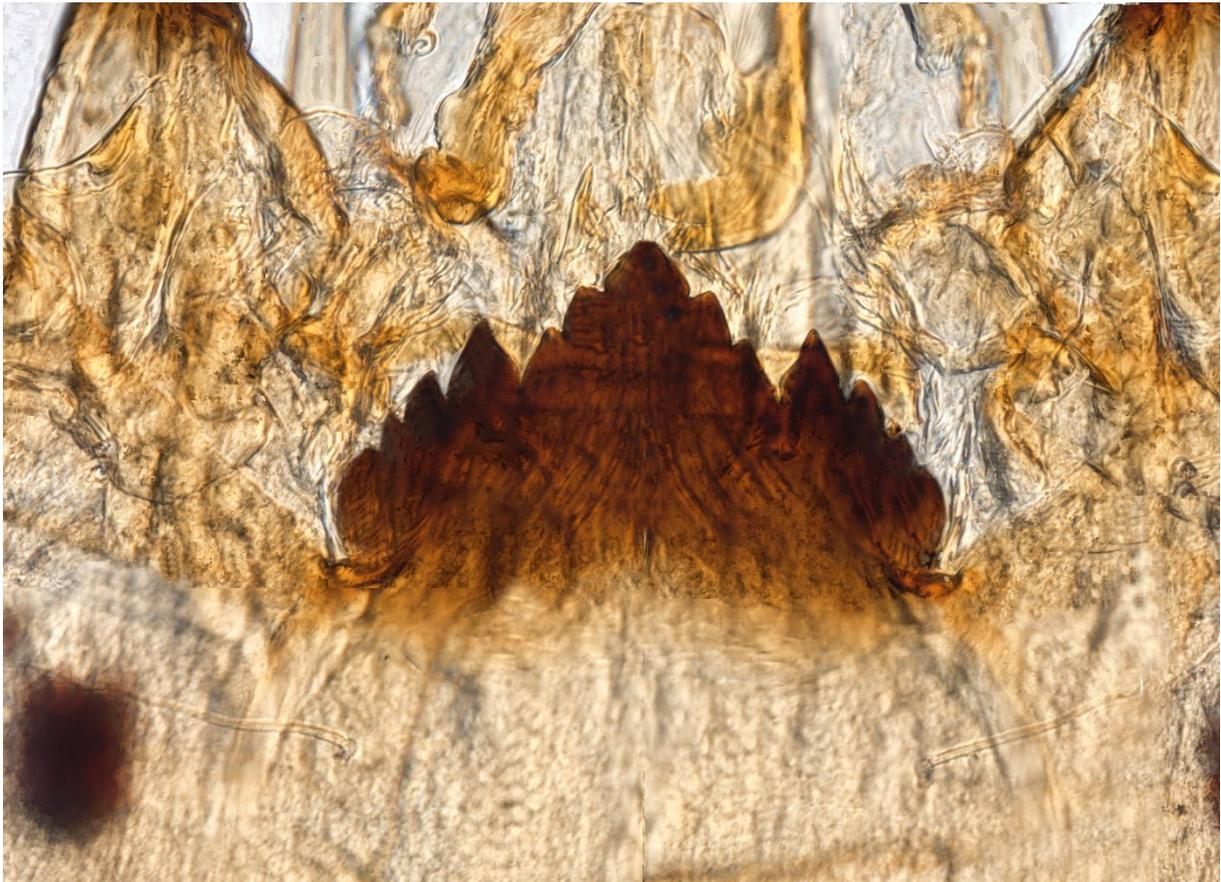
**Submental setae:** located at the level of the 6<sup>th</sup> lateral teeth; distance between setae: 158-166  $\mu\text{m}$  (n = 2).

**Anterior parapods:** mid long claws with relatively coarse inner teeth which are one third as long as distal tooth; claw index: 2.8 -3.0 (n = 2).

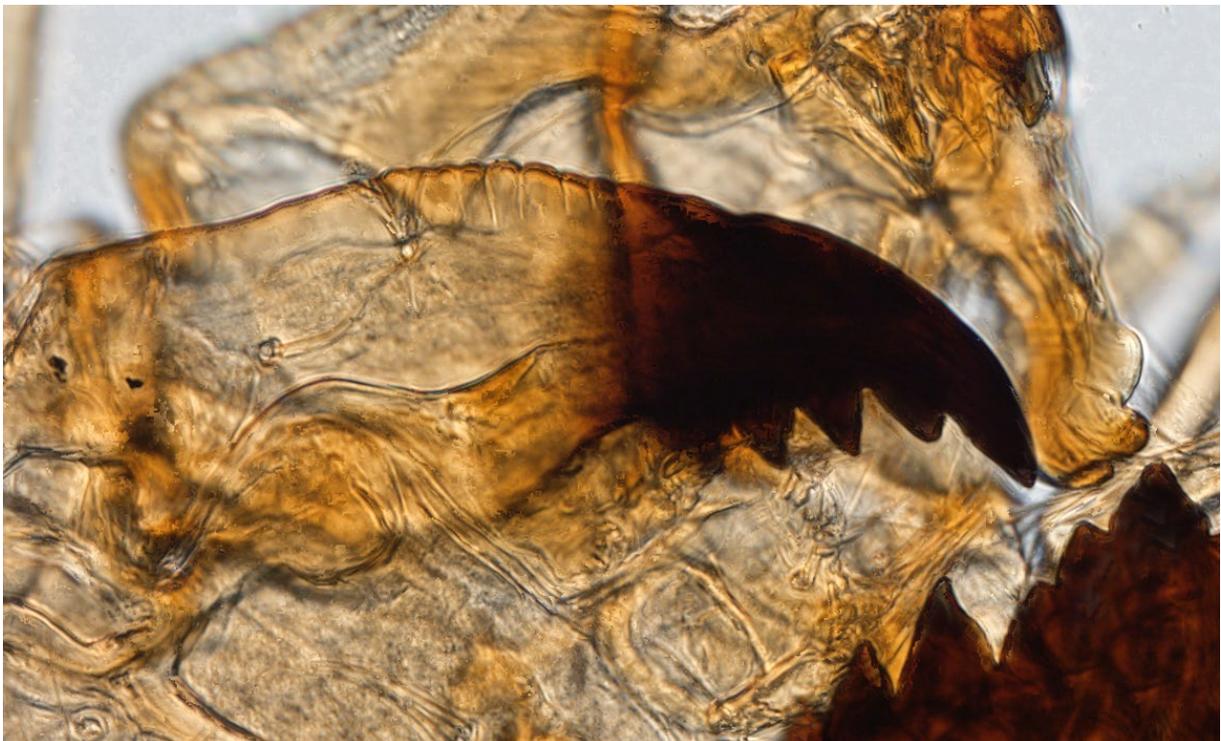
**Abdominal segments:** segments 1 - 6 bear posterolateral setal tufts of 6-12 filaments, length equal to the segment length; segment 7 with 10 setae; seta L2 long, reaching half the segment length.

**Anal segments:** dorsolateral seta on segment 9 reaches 1/2 of segment length; ratio supra-anal seta/anal papilla: 1.4 (n = 1).

*Cricotopus pilitarsis* continued



*Cricotopus pilitarsis*, mentum. Apeldoorn, poel Woudhuis, 27 April 2007, leg. H. Cuppen.



*Cricotopus pilitarsis*, mandibula and premandibula. Apeldoorn, poel Woudhuis, 27 April 2007, leg. H. Cuppen.

*Cricotopus pilitarsis* continued

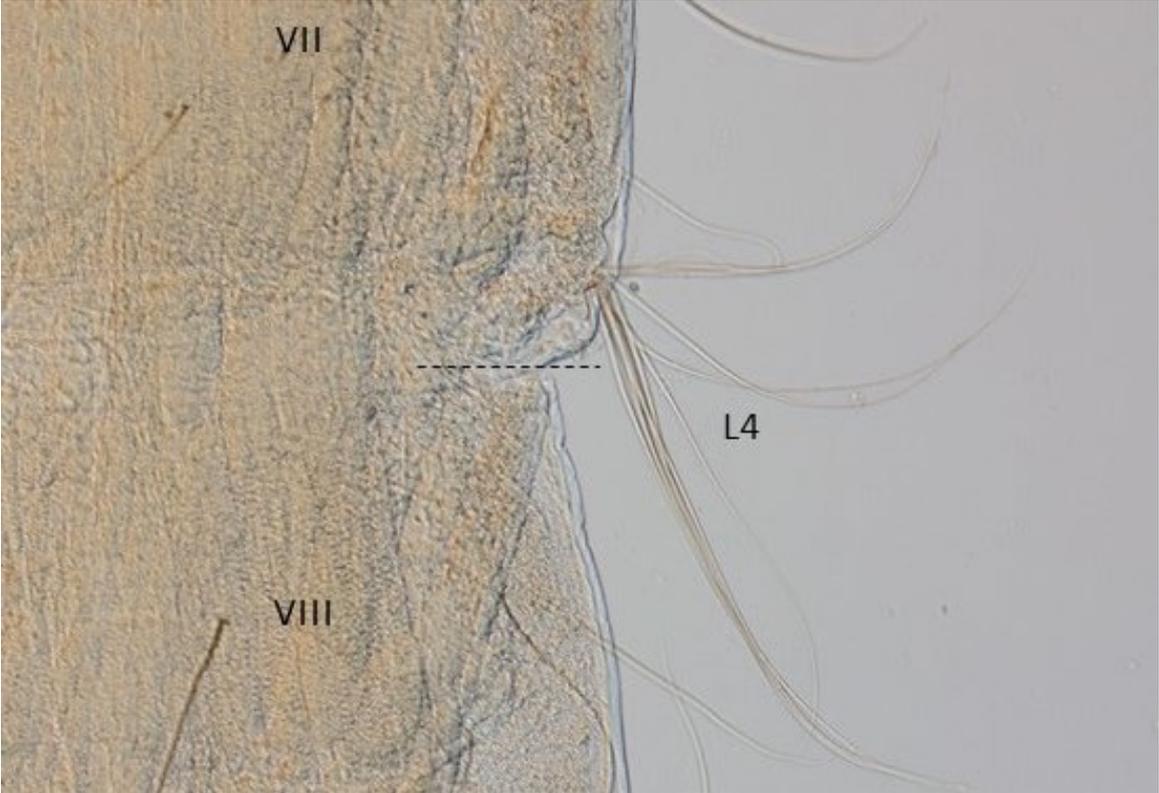


*Cricotopus pilitarsis*, antenna. Apeldoorn, poel Woudhuis, 27 April 2007, leg. H. Cuppen.

*Cricotopus pilitarsis* continued



*Cricotopus pilitarsis*, segment 1 and 2. Apeldoorn, poel Woudhuis, 27 April 2007, leg. H. Cuppen.



*Cricotopus pilitarsis*, L4 segment 7. Apeldoorn, poel Woudhuis, 27 April 2007, leg. H. Cuppen.

*Cricotopus reversus* Hirvenoja, 1973

**Body:** body length: 4.5 – 5.5 mm.

**Head capsule:** brown, basal part often darker brown; occipital margin brown to dark brown; wide head: 359 - 369  $\mu\text{m}$  (n = 2).

**Antenna:** 5 segments; antennal blade extends to the end of the 5<sup>th</sup> segment; length antenna 1: 41 -56  $\mu\text{m}$ ; AR: 1.4 – 1.6 (n = 2).

**Mentum:** 6 lateral teeth and a relatively broad median tooth; second lateral tooth strongly reduced; MR: 2.7 – 3.6 (n =2).

**Mandibula:** 3 inner teeth, color apically brown extending to molar area with wide pale base; dorsal margin crenulated.

**Premandibula:** simple.

**Labrum:** bifid S1 with outer branch much longer than inner branch.

**Epipharynx:** pecten epipharyngis consists of one conical scale and two strongly reduced toothlets joined proximally with the conical scale.

**Submental setae:** located at the level of the transition of the 6<sup>th</sup> lateral tooth and the most lateral reach of the mentum; distance between setae: 101 - 116  $\mu\text{m}$  (n = 2).

**Anterior parapods:** middle long claws with relatively coarse inner teeth which are half as long as distal tooth; claw index: 2.0 (n = 1).

**Abdominal segments:** segment 1 bears posterolateral setal tufts of 20-40 filaments, segments II – VII with 40 - 60 setae which reach  $\frac{3}{4}$  - 1 of the segment length .

**Anal segments:** dorsolateral seta on segment 9 reaches  $\frac{1}{3}^{\text{rd}}$  of segment length; ratio supra-anal seta/anal papilla: 1 – 1.1 (n =2).

*Cricotopus reversus* continued



*Cricotopus reversus*, head ventral. Zijdewind ditch, 3 April 2019. Leg. W. Langbroek.



*Cricotopus reversus*, mentum. Zijdewind ditch, 3 April 2019. Leg. W. Langbroek.

*Cricotopus reversus* continued



*Cricotopus reversus*, antenna. Zijdewind ditch, 3 April 2019. Leg. W. Langbroek.



*Cricotopus reversus*, claws of the anterior pseudopods. Zijdewind ditch, 3 April 2019. Leg. W. Langbroek.

*Cricotopus reversus* continued



*Cricotopus reversus*, left: segments 5-7, right: segment 7 detail. Zijdewind ditch, 3 April 2019. Leg. W. Langbroek.



*Cricotopus reversus*, supra-anal seta. Zijdewind ditch, 3 April 2019. Leg. W. Langbroek.

*Cricotopus sylvestris* (Fabricius, 1794)

**Body:** body length: 7.0- 8.0 mm.

**Head capsule:** yellow to light brown; occipital margin yellow; head width: 403 - 447  $\mu\text{m}$  (n = 4).

**Antenna:** 5 segments; antennal blade extends to the end of 4<sup>th</sup> segment; length antenna 1: 63 – 71  $\mu\text{m}$  (n = 3); AR: 1.5 – 1.9 (n = 4).

**Mentum:** 6 lateral teeth and a relatively small median tooth; second lateral tooth strongly reduced; MR: 1.5 – 2.0 (n = 3).

**Mandibula:** 3 inner teeth, color apically brown extending to molar area with wide pale base; dorsal margin crenulated.

**Premandibula:** bifid

**Labrum:** bifid S1 with outer branch much longer than inner branch.

**Epipharynx:** pecten epipharyngis consisting of one conical scale and two strongly reduced toothlets joined proximally with the conical scale.

**Submental setae:** located at the level of the 5<sup>th</sup> lateral teeth; distance between setae: 102 - 124  $\mu\text{m}$  (n = 3).

**Anterior parapods:** Mid long claws with fine inner teeth which are 1/3<sup>rd</sup> as long as distal tooth; claw index: 2.8 - 3 (n = 2).

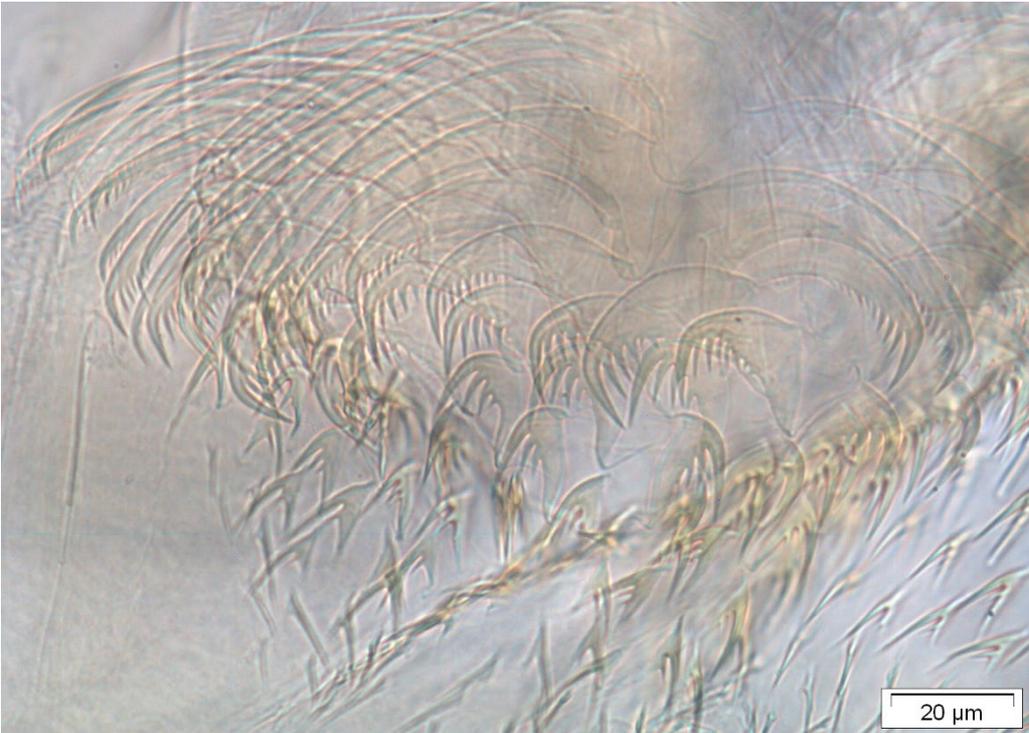
**Abdominal segments:** segments 1 - 6 bear posterolateral setal tufts of 8-18 filaments, which reach 1/2 - 3/4 of the segment length; segment 7 with 1 – 2 setae, rarely 3 – 5.

**Anal segments:** dorsolateral seta on segment 9 reaches 1/3-1/4 of segment length; ratio supra-anal seta/anal papilla: 1.0 – 1.3 (n = 6).

*Cricotopus sylvestris* continued



*Cricotopus sylvestris* head ventral. Itteren Julianakanaal, 22 June 2001, leg. H. Cuppen. pr = premandibula.



*Cricotopus sylvestris* claws of the anterior parapods. Groesbeekse Beek GROO0054 404438.

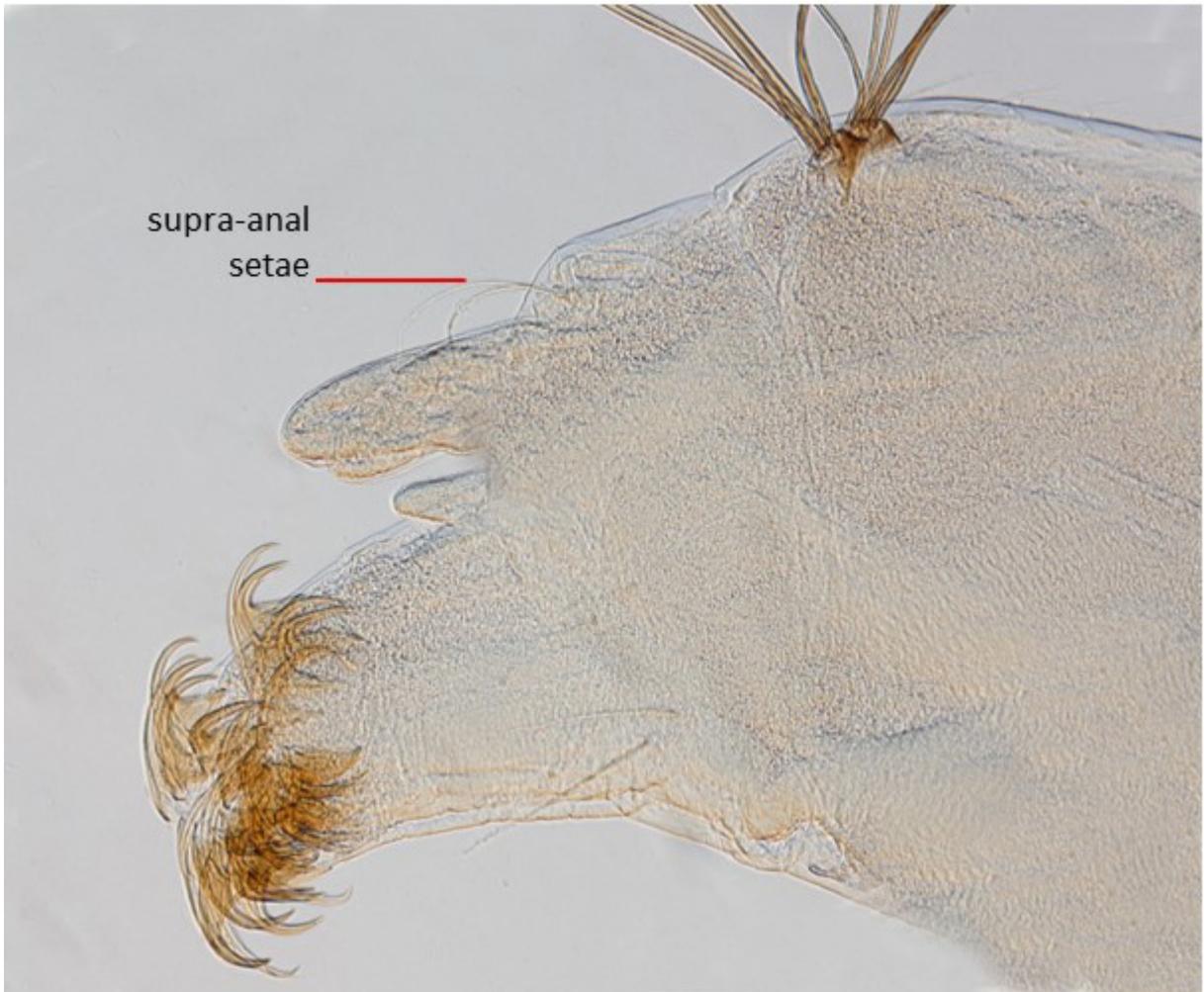
*Cricotopus sylvestris* continued



*Cricotopus sylvestris* segment 2, L1 and L2. Coevorden, Oude Drosterdiep, 23 Apr. 2014, leg. H. Cuppen.



*Cricotopus sylvestris* segment 6, 7, L2 and L4. Coevorden, Oude Drosterdiep, 23 Apr. 2014, leg. H. Cuppen.



*Cricotopus sylvestris* tail end. Coevorden, Oude Drosterdiep, 23 Apr. 2014, leg. H. Cuppen.

*Cricotopus tricinctus* (Meigen, 1818)

**Body:** body length: 5.0- 7.0 mm (n = 6).

**Head capsule:** light brown; occipital margin light brown; wide head: 408 - 418  $\mu\text{m}$  (n = 4).

**Antenna:** 5 segments; antennal blade extends halfway fourth segment; length antenna 1: 36 – 41  $\mu\text{m}$  (n = 3); AR: 1.3 – 1.6 (n = 4).

**Mentum:** 6 lateral teeth and a relatively small median tooth; 2<sup>nd</sup> lateral tooth strongly reduced; MR: 1.6 (n = 1).

**Mandibula:** 3 inner teeth, color apically brown extending to molar area with wide pale base; dorsal margin crenulated.

**Premandibula:** bifid.

**Labrum:** bifid S1, with outer branch much longer than inner branch.

**Epipharynx:** pecten epipharyngis consisting of one conical scale and two strongly reduced toothlets joined proximally with the conical scale.

**Submental setae:** located at the level of the transition of the 5<sup>th</sup> and 6<sup>th</sup> lateral teeth; distance between setae: 102 - 122  $\mu\text{m}$  (n = 3).

**Anterior parapods:** mid long claws with relatively coarse inner teeth which are one third as long as distal tooth; claw index: 3 – 3.6 (n = 2).

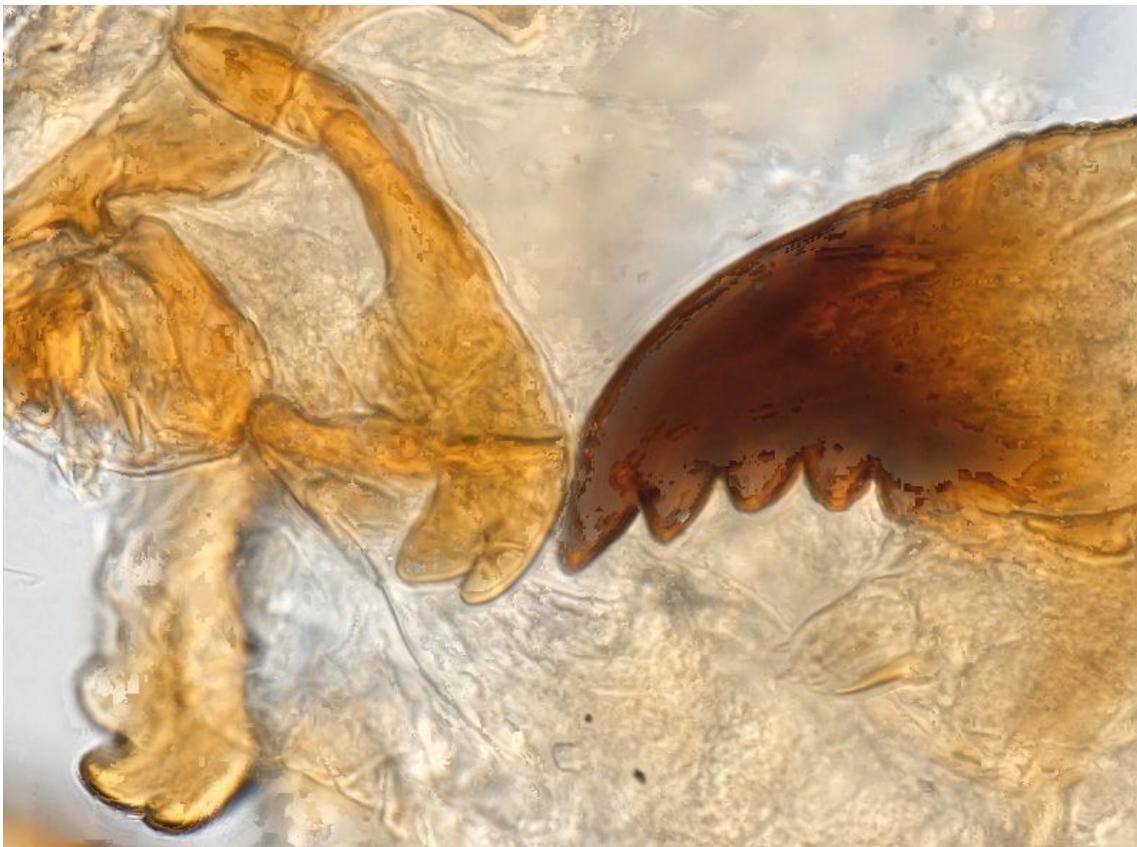
**Abdominal segments:** 1 - 6 bear posterolateral setal tufts of 10 - 20 filaments, which reach 3/4 of the segment length; segment 7 with 5 - 8 setae.

**Anal segments:** dorsolateral seta on segment 9 reaches 1/3<sup>rd</sup> of segment length; ratio supra-anal seta/anal papilla: 0.9 – 1.4 (n = 2).

*Cricotopus tricinctus* continued



*Cricotopus tricinctus* mentum. Wiel Hedel, 31 Aug. 1988, leg. F. v.d. Brink.



*Cricotopus tricinctus* mandibula and premandibula. Wiel Hedel, 31 Aug. 1988, leg. F. v.d. Brink.

*Cricotopus tricinctus* continued

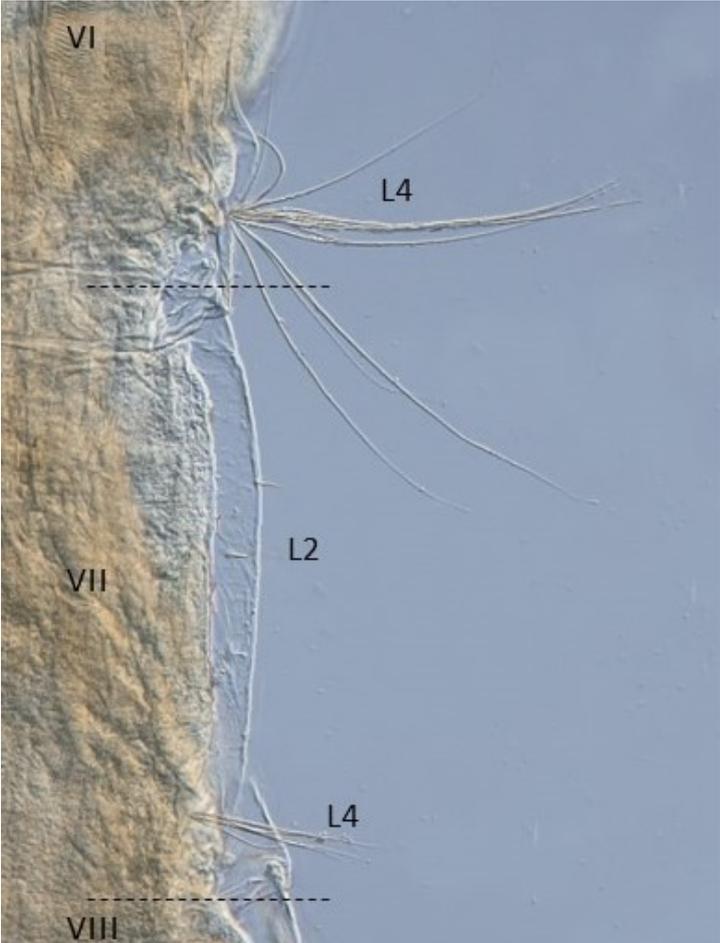


*Cricotopus tricinctus* antenna. Wiel Hedel, 31 Aug. 1988, leg. F. v.d. Brink.



*Cricotopus tricinctus*, claws of the anterior parapods. Rolderdiep, 21 Sep. 2007, leg. H. Cuppen.

*Cricotopus tricinctus* continued



*Cricotopus tricinctus* L4 segment 6 and 7. Rolderdiep, 21 Sep. 2007, leg. H. Cuppen.



*Cricotopus tricinctus* anal segment and supra-anal seta. Rolderdiep, 21 Sep. 2007, leg. H. Cuppen.

*Cricotopus trifasciatus* (Meigen in Panzer, 1813)

**Body:** body length: 7.0- 8.0 mm.

**Head capsule:** yellow to light brown; occipital margin yellow; head width: 505  $\mu\text{m}$  (n = 1).

**Antenna:** 5 segments; antennal blade extends to the end of 4<sup>th</sup> segment; length antenna 1: 55 – 63  $\mu\text{m}$ ; AR: 1.9 – 2.0 (n = 4).

**Mentum:** 6 lateral teeth and a relatively small median tooth; 2<sup>nd</sup> lateral tooth strongly reduced; MR: 1.6 – 1.9 (n = 3).

**Mandibula:** 3 inner teeth, color apically brown extending to molar area with wide pale base; dorsal margin crenulated.

**Premandibula:** bifid.

**Labrum:** bifid S1 with outer branch much longer than inner branch.

**Epipharynx:** pecten epipharyngis consisting of one conical scale and two strongly reduced toothlets joined proximally with the conical scale.

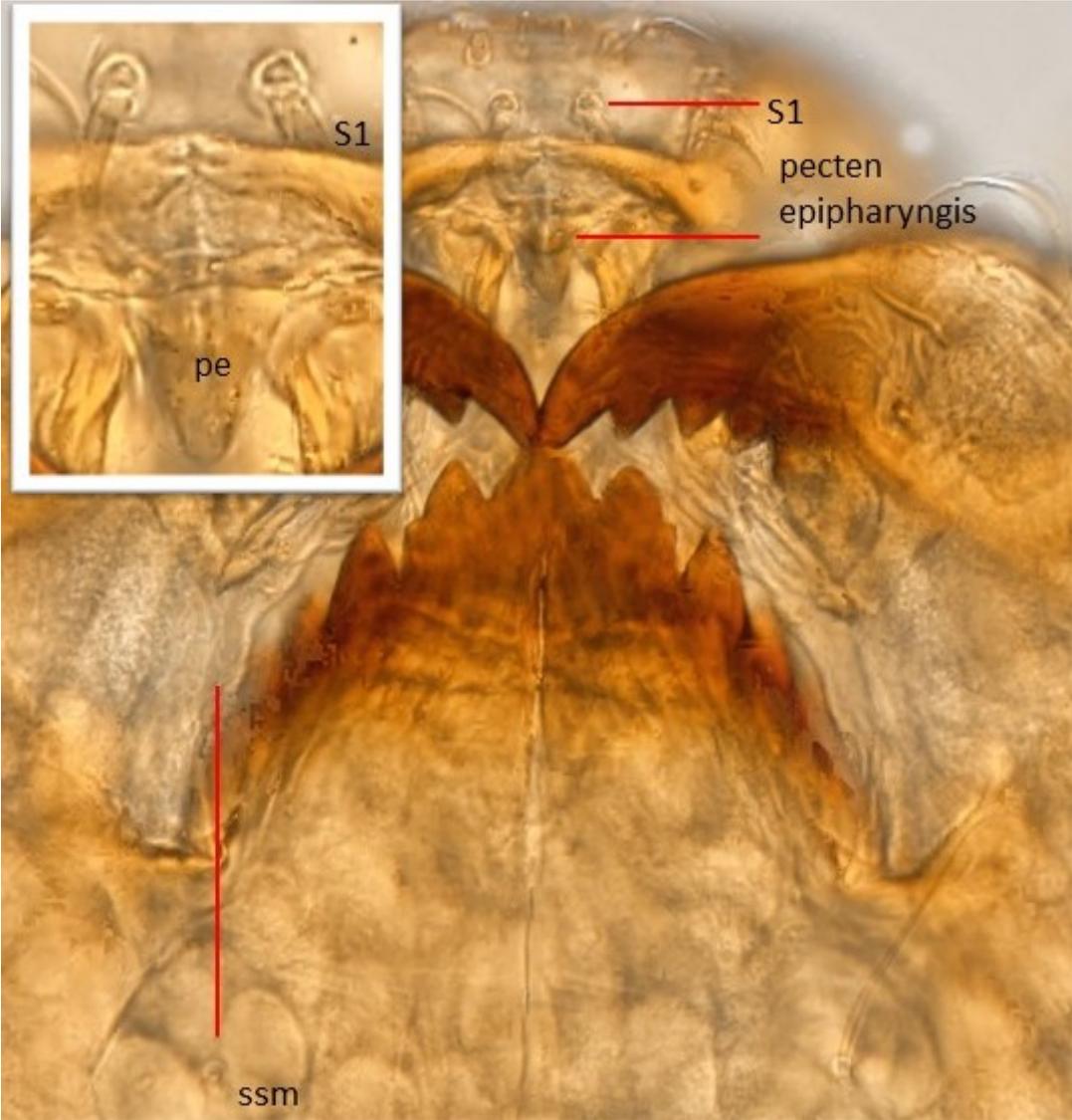
**Submental setae:** located at the level of the 6<sup>th</sup> lateral teeth; distance between setae: 124-129  $\mu\text{m}$  (n = 2).

**Anterior parapods:** mid long claws with relatively coarse inner teeth which are one third in length as distal tooth; claw index: 2.8 - 3 (n = 2).

**Abdominal segments:** 1 - 6 bear posterolateral setal tufts of 6-11 filaments, which reach  $\frac{1}{2}$  -  $\frac{3}{4}$  of the segment length; segment 7 with 1 – 2 setae, rarely 3 – 5.

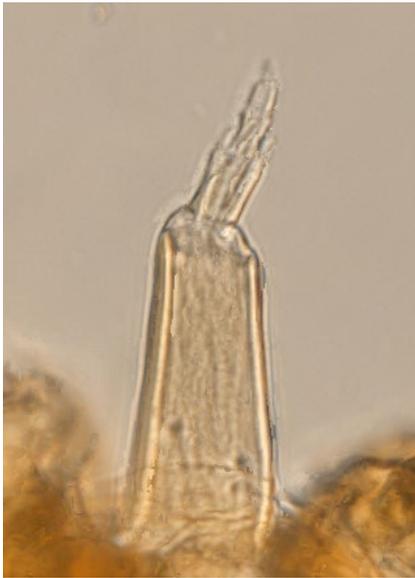
**Anal segments:** dorsolateral seta on segment 9 reaches  $\frac{1}{3}$  of segment length; ratio supra-anal seta/anal papilla: 0.7 – 1.2 (n = 10).

*Cricotopus trifasciatus* continued



*Cricotopus trifasciatus* epipharynx and S1. Oude Waal Nijmegen, 10 Sep. 1979, leg. Van der Velde, det. H. Moller. pe = pecten epipharyngis.

*Cricotopus trifasciatus* continued

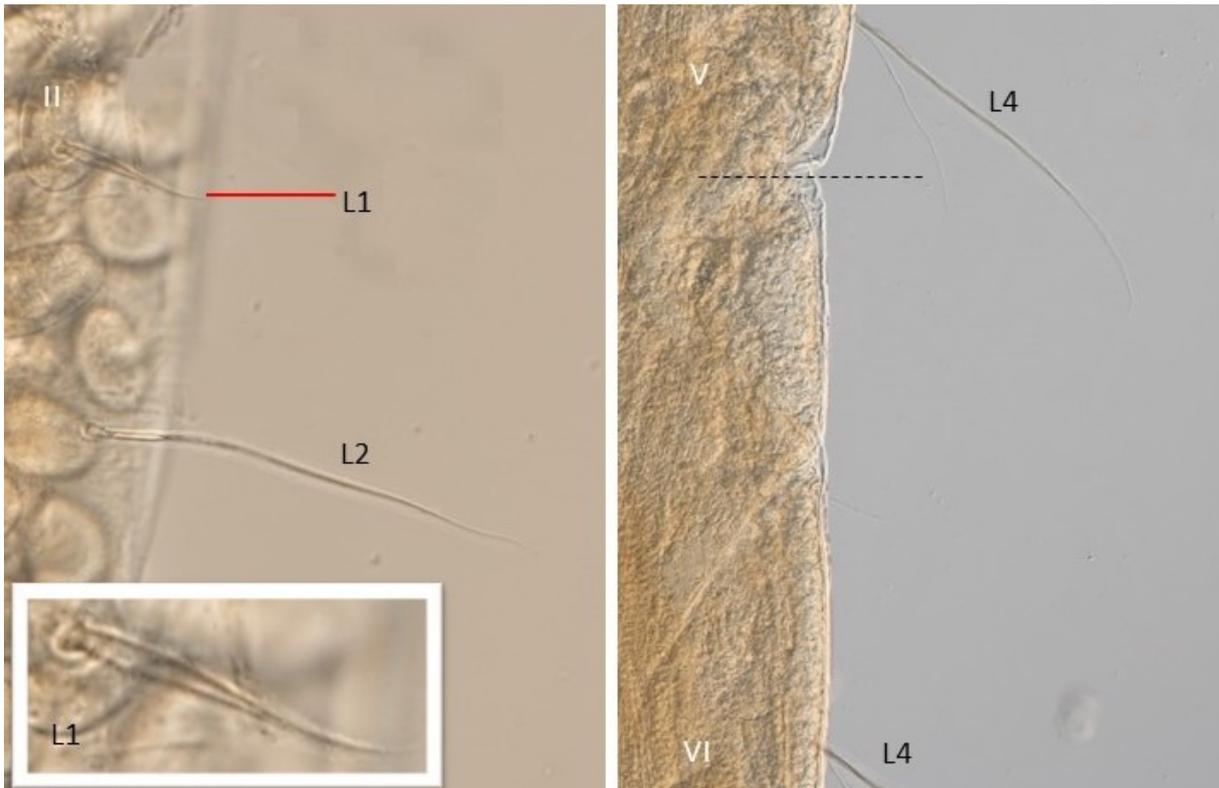


*Cricotopus trifasciatus* antenna. Oude Waal Nijmegen, 10 Sep. 1979, leg. Van der Velde, det. H. Moller.



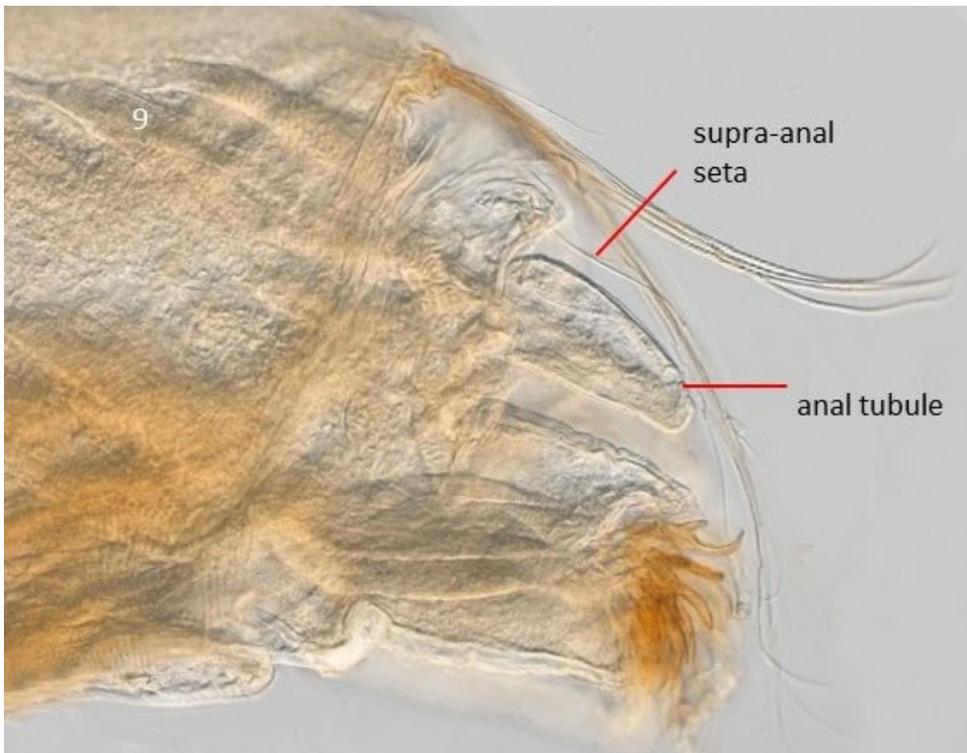
*Cricotopus trifasciatus* claws of anterior parapods. Oude Waal Nijmegen, 10 Sep. 1979, leg. Van der Velde, det. H. Moller.

*Cricotopus trifasciatus* continued



*Cricotopus trifasciatus* L1 and L2 segment 2. Oude Waal Nijmegen, 10 Sep. 1979, leg. Van der Velde, det. H. Moller.

*Cricotopus trifasciatus* L4 segment 5. Oude Waal Nijmegen, 10 Sep. 1979, leg. Van der Velde, det. H. Moller.



*Cricotopus trifasciatus* anal segments. Oude Waal Nijmegen, 10 Sep. 1979, leg. Van der Velde, det. H. Moller.

*Cricotopus* spec. Ronde Hoep

**Body:** body length: 4.0- 5.0 mm; color in alcohol blueish.

**Head capsule:** yellow, backside light brown; occipital margin light brown; wide head: 389 - 398  $\mu\text{m}$  (n = 3).

**Antenna:** 5 segments; antennal blade reaching to the end of 4<sup>th</sup> segment; length antenna 1: 54 – 56  $\mu\text{m}$ ; AR: 1.5 – 1.6 (n = 2).

**Mentum:** 6 lateral teeth and a relatively small median tooth; second lateral tooth strongly reduced; MR: 1.5 – 1.6 (n = 2).

**Mandibula:** 3 inner teeth, color apically brown extending to molar area with wide pale base; dorsal margin crenulated.

**Premandibula:** bifid.

**Labrum:** bifid S1 with outer branch much longer than inner branch.

**Epipharynx:** pecten epipharyngis consisting of one conical scale and two strongly reduced toothlets joined proximally with the conical scale.

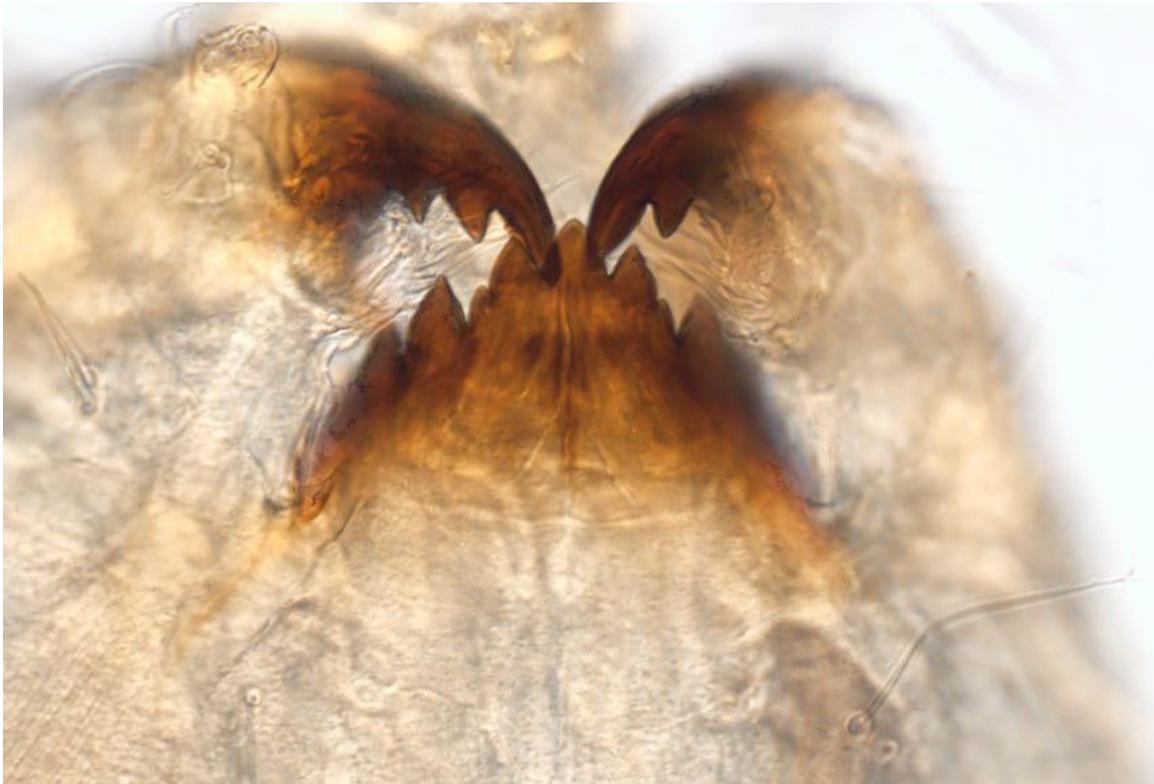
**Submental setae:** located at the level of the mentum curve, further laterally than all other species of *C. sylvestris* species group; distance between setae: 102-122  $\mu\text{m}$  (n = 2).

**Anterior parapods:** Mid long claws with relatively coarse inner teeth which are one third as long as distal tooth; claw index: 3 (n = 1).

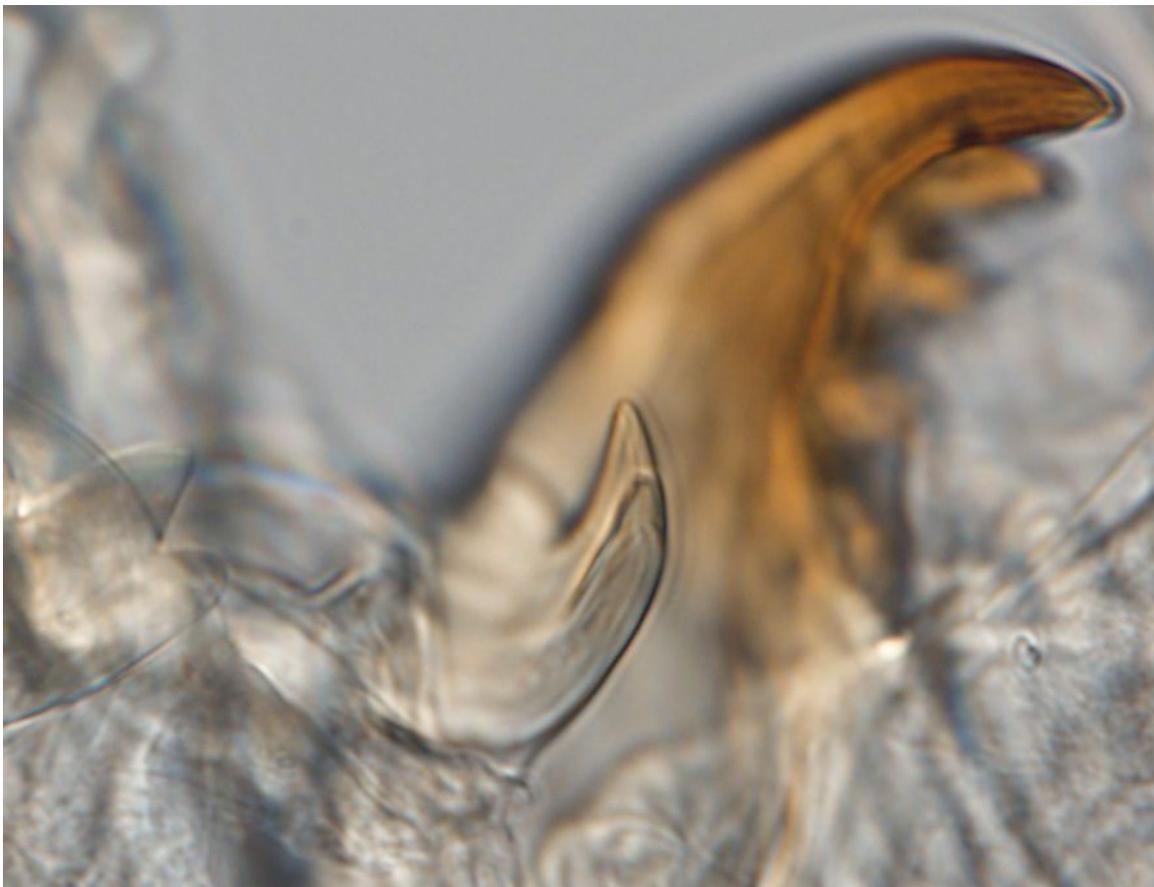
**Abdominal segments:** 1 - 6 bear posterolateral setal tufts of 10-15 filaments, which length is equal to the segment length; segment 7 with 5 setae.

**Anal segments:** dorsolateral seta on segment 9 reaches 1/2 of segment length; ratio supra-anal seta/anal papilla: 2.7 (n = 1).

*Cricotopus* spec. Ronde Hoep continued



*Cricotopus* spec. Ronde Hoep, mentum. Ronde Hoep, ditch, 31 Aug. 2006, leg. T. van Haaren.

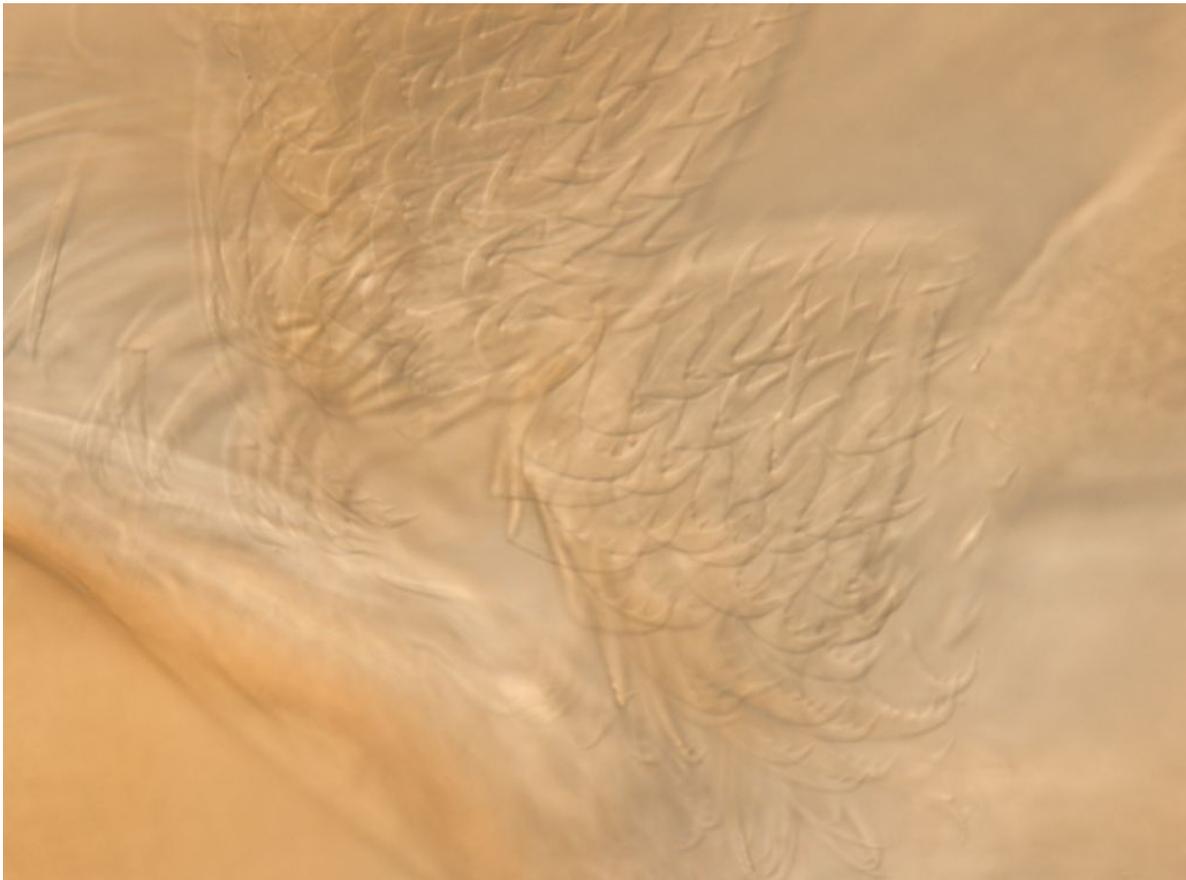


*Cricotopus* spec. Ronde Hoep, premandibula. Ronde Hoep, ditch, 31 Aug. 2006, leg. T. van Haaren.

*Cricotopus* spec. Ronde Hoep continued

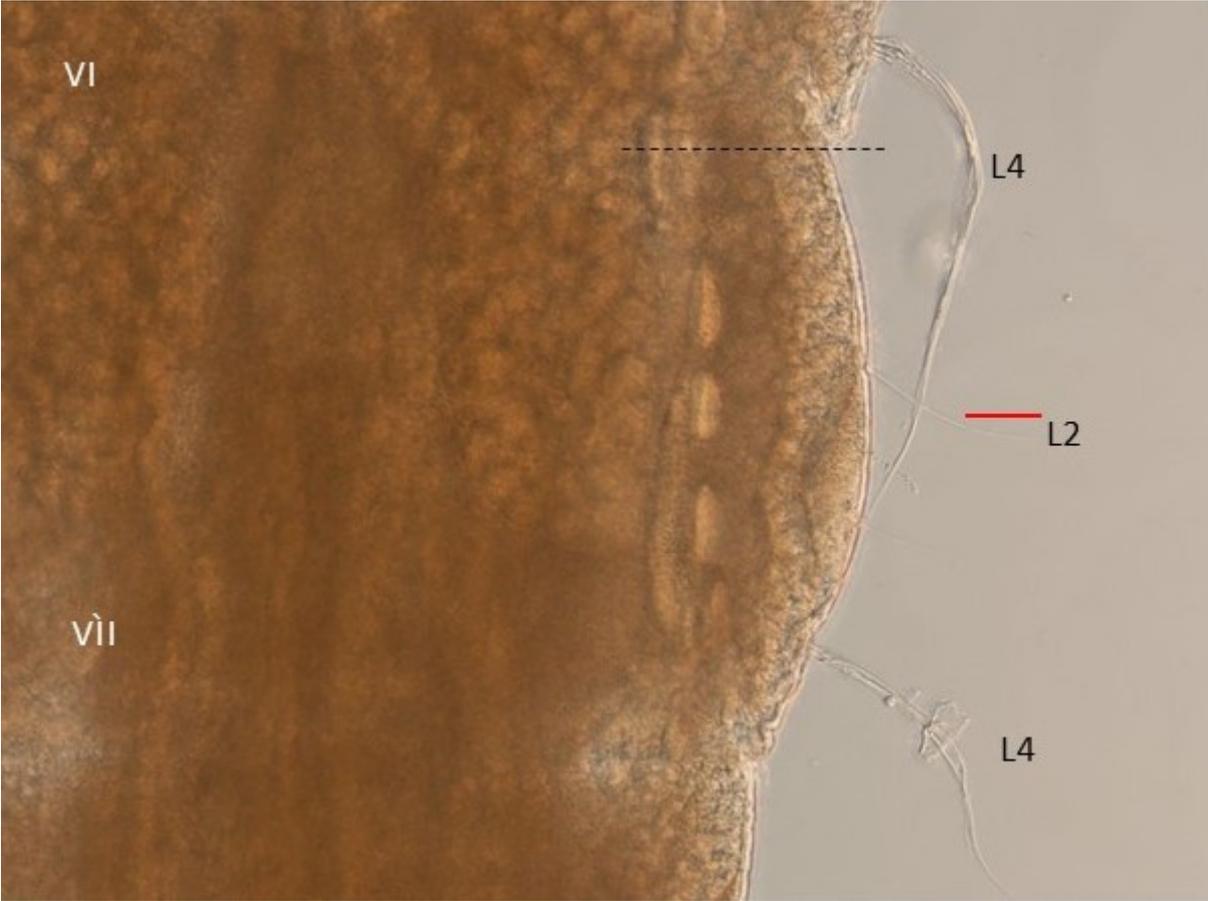


*Cricotopus* spec. Ronde Hoep, antenna. Ronde Hoep, ditch, 31 Aug. 2006, leg. T. van Haaren.



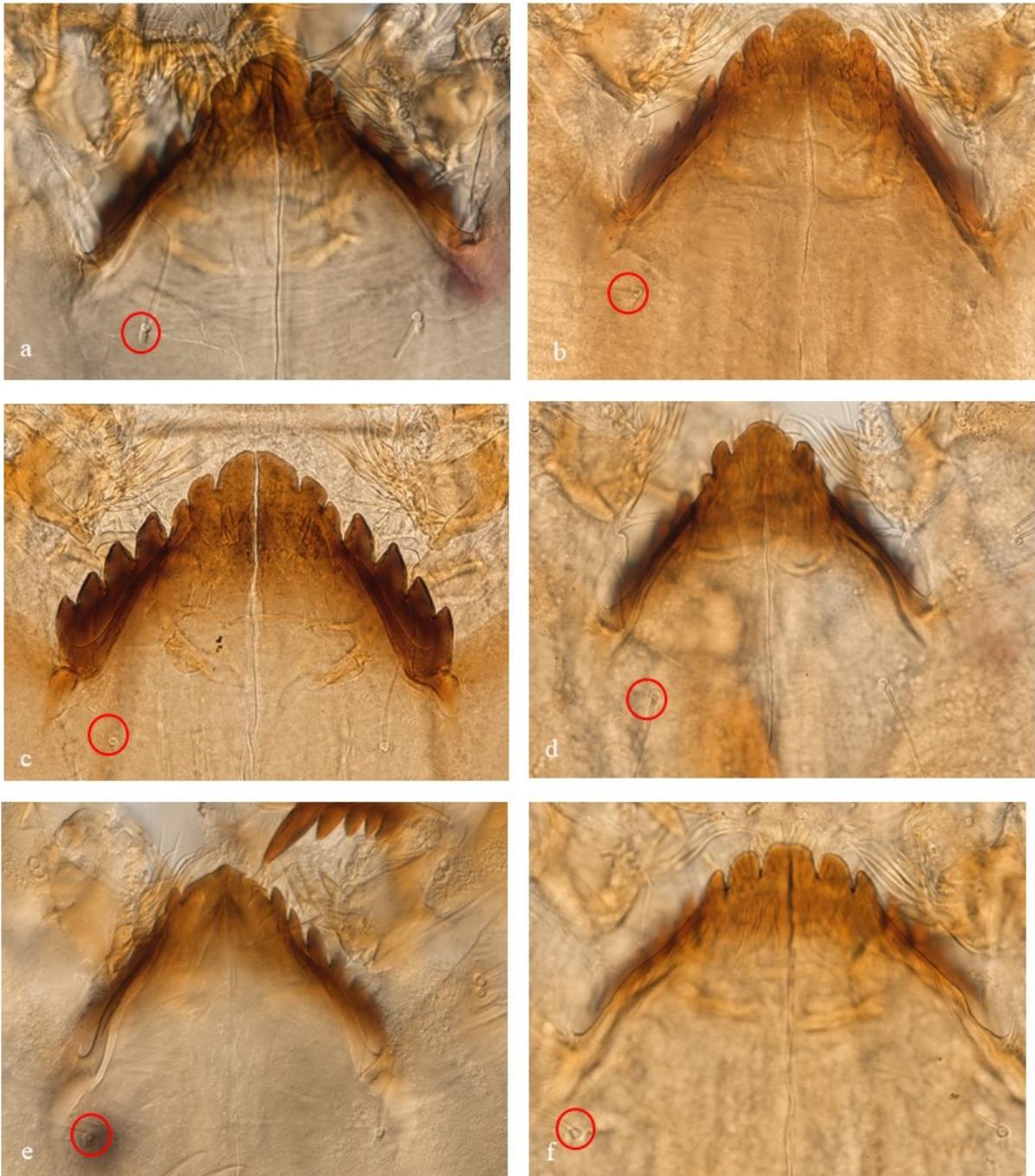
*Cricotopus* spec. Ronde Hoep, claws anterior parapods. Utrecht, utab56, 25 Aug. 2014, leg. T. van Haaren.

*Cricotopus* spec. Ronde Hoep continued



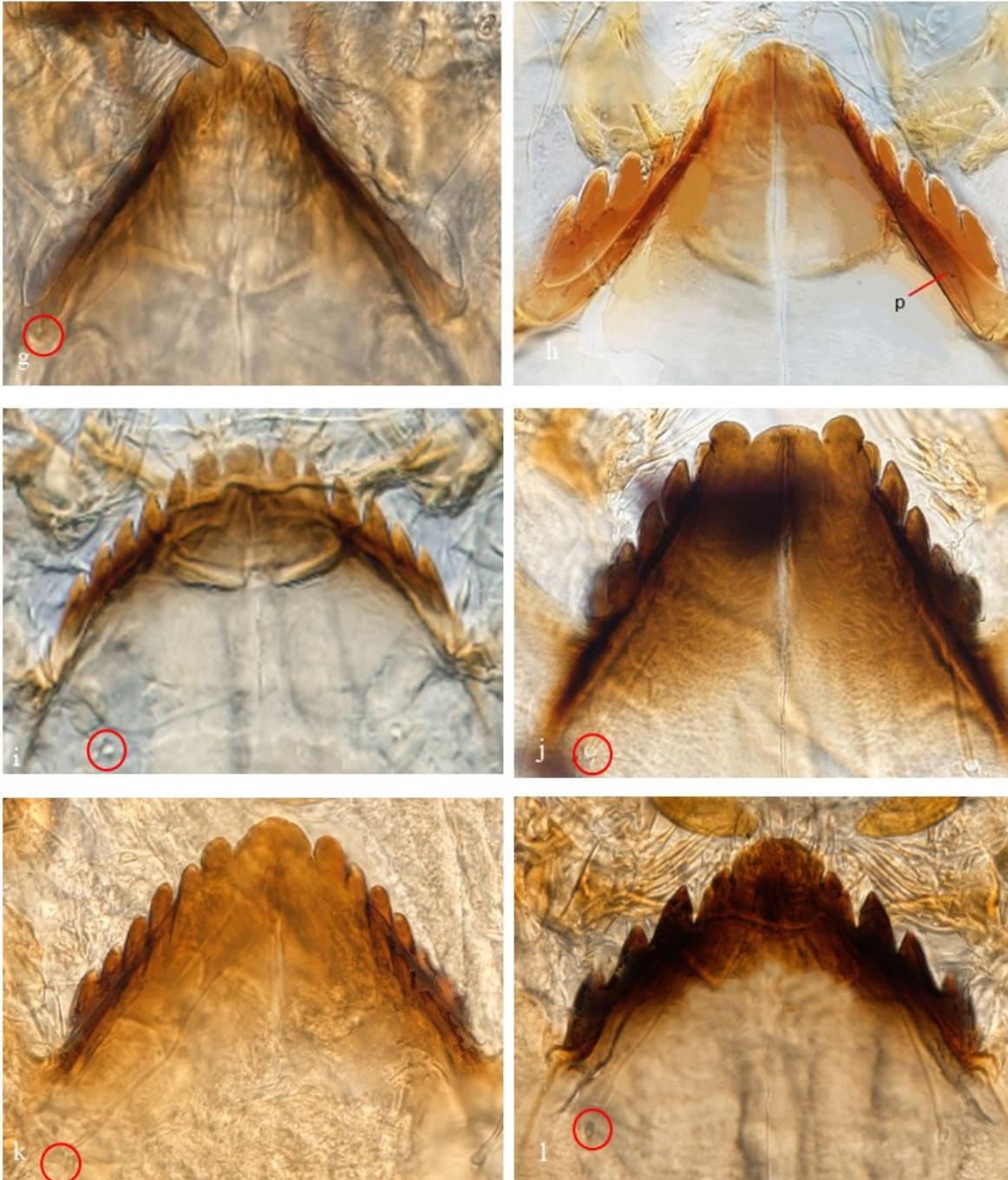
*Cricotopus* spec. Ronde Hoep, segment 6 and 7. utap31, ditch, 15 Aug. 2014, leg. T. van Haaren.

4. Plates: *Cricotopus* (*Cricotopus*), mentum I



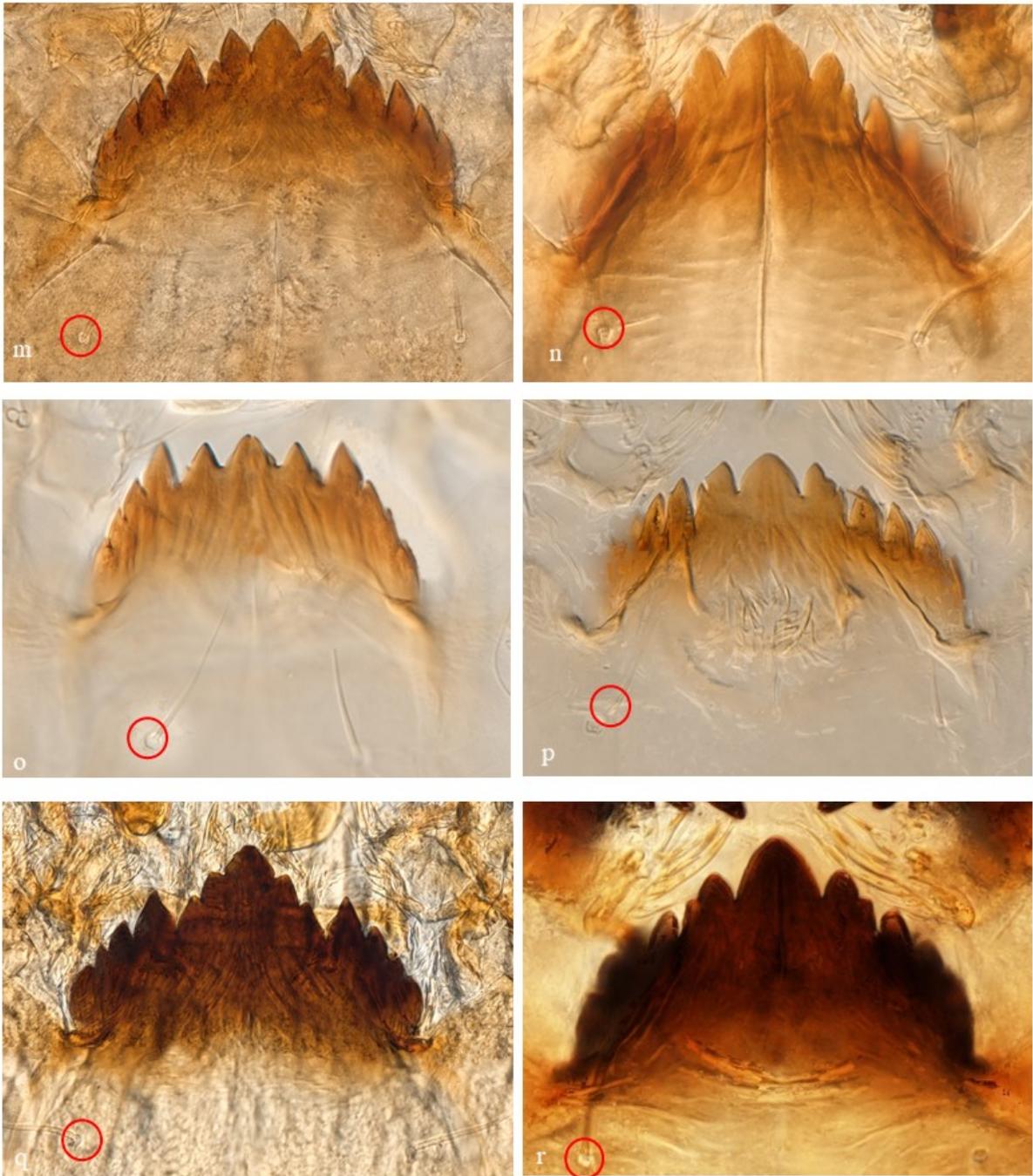
**Mentum** *Cricotopus* subgenus *Cricotopus* I. a) *C. albiforceps*, b) *C. amulator*, c) *C. bicinctus*, d) *C. cf. festivellus*, e) *C. flavocinctus*, f) *C. fuscus*.  
Red circles: left seta submenti.

4. Plates *Cricotopus* (*Cricotopus*), mentum 2



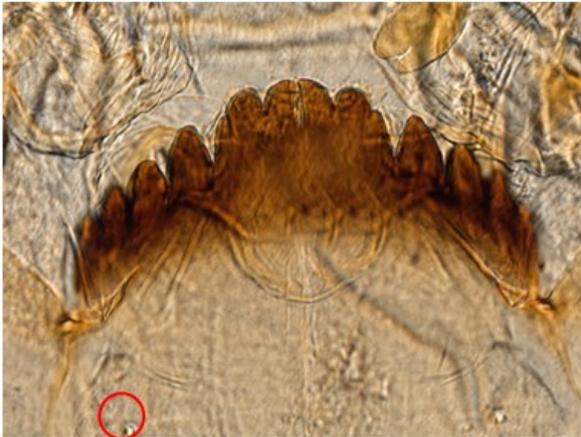
**Mentum** *Cricotopus* subgenus *Cricotopus* (2). **g, h)** *C. pilosellus*, **i)** *C. tibialis*, **j)** *C. tremulus*, **k)** *C. triannulatus*, **l)** *C. trifascia*.  
Red circles: left seta submenti.

4. Plates: *Cricotopus* (*Isocladius*), mentum I



**Mentum** *Cricotopus* subgenus *Isocladius* I. **m)** *C.* cf. *arcuatus*, **n)** *C.* *intersectus*, **o)** *C.* *obnixus* agg., **p)** *C.* *ornatus*, **q)** *C.* *pilitarsis*, **r)** *C.* *reversus*.  
Red circles: left seta submenti.

4. Plates: *Cricotopus (Isocladius)*, mentum 2



**Mentum** *Cricotopus* subgenus *Isocladius* (2). **s)** *C. sylvestris*, **t)** *C. tricinctus*, **u)** *C. trifasciatus*. Red circles: left seta submenti.

## 5. Locations 1



**Locations and species found** a) Overijssels Kanaal, 22 June 2018, *C. albiforceps* b) Gasterensche Diep 24 July 2014, *C. annulator*, c) IJsselmonde, 1 Aug. 2016, *C. cf. arcuatus*, d) Esvelderbeek 25 Apr. 2014, *C. bicinctus*, e) Tiengemeten 25 July 2002, location for *C. flavocinctus*, f) Afleidingskanaal Dokterskuul 20 May 2019, location for *C. fuscus*.

## 5. Locations 2



**Locations** and species found **g)** Amstelmeer 17 Apr. 2019, *C. intersectus*, **h)** Minkewaal Texel, 26 Sep. 2018, *C. ornatus*, **i)** Poel Woudhuis Apeldoorn, *C. pilitarsis* **j)** Ditch near Lutjewinkel, 3 Apr. 2019 *C. sylvestris*, **k)** Geul at border, *C. tremulus*, **l)** Beverbach Aachen (D.), *C. tremulus*.

## 5. Locations 3



**Locations** and species found **m**) Laacher See (D.), *C. spec.* Laachersee, **n**) Angelhofer Altrhein (D.), *C. near obnixus*.

## 6. Acknowledgments

The authors are grateful for the friendly co-operation with the following researchers: Andreas Dettinger-Klemm for information and material of *Cricotopus* spec. Laachersee, Dr. W. Frey (Landesamt für Umwelt Rheinland-Pfalz) for permission to use photos of the Laachersee, Hans Hop for providing photos of locations of several species, Wim Langbroek for providing photos of several locations, Jeroen van Mil for providing photos of several locations, Rijkswaterstaat Lelystad for providing facilities for taking photos and Sabine Schiffels for providing material of *C tremulus* and photos of the location.

## 7. Photography

All photographs of larvae by the authors, unless otherwise stated.

## 8. Literature

H.P.J.J. Cuppen & D. Tempelman 2018. Identification key for the 4th stage larvae of north west European species of *Cricotopus* (Diptera: Chironomidae: Orthocladiinae). *Lauterbornia* 85: 69-90.

O. Sæther 1980 - Glossary of chironomid morphology terminology (Diptera: Chironomidae). - *Entomologica Scandinavica, Supplement*, 14: 1-51.