

Adaptations and extensions to the "Guide to the Identification of Genera of Chironomid Pupal Exuviae occurring in Britain and Ireland" (Wilson & Ruse 2005) for the Central European Fauna and adjacent areas

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With 30 figures

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Schlagwörter: Chironomidae, Diptera, Insecta, Mitteleuropa, Morphologie, Bestimmung, Puppe, Exuvie

Once developed only for the British region, the key "Guide to the Identification of Genera of Chironomid Pupal Exuviae occurring in Britain and Ireland" is extended and adapted for a use in the Central European region and adjacent areas. The text is illustrated by many drawings. Furthermore, a key to subfamilies of chironomid pupal exuviae is included.

1 Introduction

For those who intend to start work with chironomids, the key provided by Wilson & Ruse (2005) for pupal exuviae is a helpful tool. However, the taxa included cover only the fauna of the British Isles. In Germany, for example, 10 % more genera than outlined in the "Guide" are recorded. Thus, using the key for a broader geographical range without restriction requires some extensions and adaptations. Such adaptations are presented here and allow for identification of chironomid pupal exuviae of Central Europe and adjacent areas, comprising the recorded genera of Austria, Belgium, the Czech Republic, France, Germany, Italy, Romania, Slovakia and Switzerland. Checklists were examined from all countries mentioned (see references). It can be assumed that this extension of the key comprises also the chironomid genera of the Netherlands, Luxembourg, Poland and Slovenia, although the checklists were not examined for those countries.

With these "adaptations and extensions", it is not intended to present a new key, but to use the available ones and extend their applicability to a broader area. Thus, these extensions can only be used together with the "Guide" by Wilson & Ruse (2005). For beginners, it may be a useful and motivating tool to start on chironomid identification in Central Europe. However, for more intensive and scientific work and in order to determine the exuviae on species

level, it is necessary to use the standard works by Langton and Visser (2003), Wiederholm (1986), Sæther et al. (2000) and in particular cases, special papers on a certain taxon. As in other systematic groups, the identification of some taxa is easy, while others can be difficult. Thus, it is recommended to use not only a microscope with low power (up to 40x), but also one with higher magnification (up to 400x) in the very beginning, until sufficient experience is obtained. While working with the "Guide", it is also recommended to use Wiederholm (1986) as a reference book in cases where identification is unclear. In addition to these extensions of the "Guide", a key to subfamilies is provided, nearly completely cited from Langton (1991), which also formed a part of Langton and Visser (2003). The figure numbers of this subfamily key refer to the figures in Wilson & Ruse (2005).

In general, the key can be used not only for pupal exuviae, but also for pupae. However, it has to be considered that some characters of pupae (e.g. the arrangement of tergites in *Polypedium* or *Paratendipes*) are difficult to discern in several taxa and some additional experience is necessary. The terminology of the morphological characters follows Wilson & Ruse (2005) and, for the key to subfamilies, Langton (2003).

The pupal exuviae of *Bavarismitia* Sæther, 1995, *Prosmitta* Brundin, 1956 and *Carbochironomus* Reiss & Kirschbaum, 1990 are not known and, therefore, not included. All figures are taken from Wilson & Ruse (2005), Wiederholm (1986) and Langton (1991), with kind permission from the editors, in order to keep the format consistent with the existing literature.

For reference, specimens of all taxa included in these extensions were studied (except for *Chernoverskiia*) using material from the Bavarian State Collection of Zoology (ZSM) in Munich and from the collection of the author.

According to the Fauna Europaea (see references), the names of some taxa given in the "Guide" and specified below are to be updated as follows:

- Macropelopia nebulosa* (Meigen, 1804)
- Guttipelopia guttipennis* (van der Wulp, 1861)
- Syndiamesa edwardsi* (Pagast, 1947)
- Campitocladius stercorarius* (De Geer, 1776)
- Psectrocladius (Allopectrocladius) obivius* (Walker, 1856)
- Corynoneurella paludosa* Brundin, 1949
- Brillia flavifrons* (Johannsen, 1905)
- Brillia bifida* (Kieffer, 1909)
- Eurycnemus crassipes* (Meigen, 1810)
- Synorthocladus semivirens* (Kieffer, 1909)
- Cricotopus (Isocladus) sylvestris* (Fabricius, 1794)
- Tokunagaia tonollii* (Rossaro, 1983)

- Tvetenia discoloripes* (Goetghebuer & Thienemann, 1936)
- Xenochironomus xenolabis* (Kieffer, 1916)
- Parachironomus arcuatus* (Goetghebuer, 1919)
- Chironomus (Lobochironomus) carbonarius* Meigen, 1804
- Zavreliella marmorata* (van der Wulp, 1859)
- Tribelos intextum* (Walker, 1856)
- Kiefferulus tendipediformis* (Goetghebuer, 1921)
- Paracladopelma nigrifulum* (Goetghebuer, 1942)
- Dicrotendipes nervosus* (Staeger, 1839)
- Paratanytarsus tenellulus* (Goetghebuer, 1921).

2 Key to subfamilies

The text follows Langton (1991), the figure numbers refer to Wilson & Ruse (2005).

- 1 II: hook row present (fig. page 26) 7
- . II: hook row absent 2
- 2 Apparently 8 abdominal segments. Anal lobes broadly rounded, fringed with short hairs, without lateral taeniae (= flattened setae) or long apical setae, though dorsal setae may be present (fig. page 39). (Thoracic horn present. Abdominal segments not fringed laterally.) **Telmatogetoninae**
- . 9 abdominal segments. If anal lobes broadly rounded and fringed with short hairs, then 2 lateral taeniae or 3-5 apical setae present, or the posterior or abdominal segments also fringed laterally with short hairs 3
- 3 Thoracic horn with plastron plate (fig. pages 40-43) 4
- . Thoracic horn without plastron plate or absent (fig. pages 45-51) 5
- 4 Segment VII-IX: at least one of the segments either with taeniate setae (= flattened setae; fig. page 68) (but they may be short) or tergite I with mark (figs. pp.41 bottom, 59, 60) 6
- . Segment VII-IX: segments without lateral taeniae and tergite I without mark (figs. page 40) **Podonominae**
- 5 Segments II-VII dorsally with an anterior and posterior lateral pair of strong and curved teeth (the anterior of each pair is the larger) (fig. p. 40 bottom), and ventrally with a similar tooth posteriorly, behind which is a row of about 4 smaller teeth **Buchonomiinae**
Only *Buchonomyia thienemanni* Frittkau, 1955
- . Abdominal pleura II-VII without lateral pairs of curved teeth 6

6 With 1 or more of the following characters: thoracic horn with plastron plate (figs. pp. 41-43), thorax comb present (figs. pp. 26, 68), tergite I with a mark (fig. page 41 bottom, pp. 59, 60), tergites II-VIII with a dense mat of imbricating simple or forked spinules (figs. pp. 70, 72), anal lobes with 2 lateral taeniae, with or without a setal fringe (figs. pp. 41-43)

Tanypodinae
 Thoracic horn without a plastron plate (figs. pp. 44-51) or horn absent. Tergite I without thorax comb and mark. Tergites II-VIII without a dense mat of spinules. Anal lobes very rarely with 2 lateral taeniae and then without an additional fringe (figs. pp. 44-50)

7 Thoracic horn branched or simple (figs. pp. 49, 51) or absent. Anal lobes without anal macrosetae, usually with a taeniate fringe (figs. pp. 49, 50); if fringe absent, either thoracic horn branched (fig. p. 49 center), or wing sheaths with nose (figs. p. 147) and tergite II with hook row (fig. p. 26). Hook row usually present; if absent, thoracic horn branched (fig. p. 49)

9 (Chironominae)
 Thoracic horn simple (figs. pp. 44, 45, 47) or absent. Anal lobes fringed or not fringed; if anal lobes fringed, usually also with setaceous or taeniate anal macrosetae (figs. pp. 45, 47); if additional macrosetae absent (figs. pp. 44, 47), hook row II absent (figs. pp. 96, 97, 105 top) and/or lateral margins of at least segments V and VI densely fringed with small setae. (Hook row II present or absent)

8 (Diamesinae, Prodiamesinae, Orthoclaudiinae)

8 Fore and mid leg sheaths with tarsal sections extended straight along midline between wing sheaths (resembling Tipulidae fig. p. 35 bottom), hind legs recurved under wing sheaths

Diamesinae
 Anal lobes with lateral fringe, thoracic horn present and large (figs. p. 45). Abdominal terga without spines (except male tergum IX in *Odontomesa* (figs. p. 45 bottom). Macrosetae on anal lobe (figs. p. 45 top) either absent and 2 pairs of dorsal setae present, or 3 or 5 macrosetae and 2 pairs of weak dorsal setae present, or 4-5 macrosetae and dorsal setae absent

Prodiamesinae

No combination of the characters mentioned for Prodiamesinae (figs. p. 47, compare with figs. p. 45)

Orthoclaudiinae

9 Thoracic horn unbranched (figs. p. 51; smooth, setulated or with long setae), or absent. Tergites (II)III-VI (figs. p. 51) in general with a pair of ante-ro-median patches of points, spines or spinules which may be extended

posteriorly to produce longitudinal bands on each side of the mid-line; anteriorly the patches may be joined to produce a transverse band. Wing sheaths (= wing lobes) usually with nose and/or pearl row (figs. p. 147)

Chironominae: Tribus Tanytarsini
 Thoracic horn with 2 to many branches (figs. p. 49). Tergites II-VI in general with an anterior and posterior transverse point band and a median patch of points (note: each developed to varying degrees; absent on some segments in some species, completely fused and covering the tergites in others). Wing sheaths (= wing lobes) without pearl row and nose (except in *Paralauterborniella*) **10 (Chironomini and Pseudochironomini)**

10 Thoracic horn (fig. p. 137, middle) with 2 short, plump, apically rounded branches

Chironominae: Tribus Pseudochironomini
 Only *Pseudochironomus prasinatus* (Széget, 1839)

Thoracic horn (fig. pp. 117-119) with more than 2 slender, apically pointed branches. If only 2 apically pointed branches, then II-VI with distinct pair of rectangular fields of short points (fig. p. 127 top)

Chironominae: Tribus Chironomini

3 Adaptations and extensions to the "Guide to the Identification of Genera of Chironomid Pupal Exuviae occurring in Britain and Ireland" by R. S. Wilson & L. P. Ruse (2005) for the Central European Fauna

p. 60: add

5c. L up to 11 mm

TH similar to 5b

Mark 1 semi-quadratic

AL broadly rounded and expanded medially, fringed with coarse hairs, with a terminal point

Fig. 1 *Derotanypus sibiricus* (Kruglova & Chernovskii, 1940)

p. 84: add

1j). L up to 5.5 mm, light brown

THx pointed brown spur on the inner margin of the antennal sheath

Tergites segment I very broad; the following posterior segments diminishing in width to narrow segment VIII

II-VI with very fine anteromedian shagreen and posterior transverse band of strong shagreen

AL very weak developed, with 2 small setae on dorsal apical surface

Fig. 2 *Symbiocladius rhibrogenae* (Zavrel, 1924)

p. 85: change

4a. Intersegmental membranes with bands of points

4aa. THx with numerous spinules on the anterior area

Terrestrial

Parasmittia Strenzke, 1950

4ab. THx without numerous spinules on the anterior area

Terrestrial, semiterrestrial and aquatic

Pseudosmittia Edwards, 1932

4b. Intersegmental membranes without bands of points

Terrestrial

Smittia Holmgren 1869

Pseudosmittia simplex Strenzke & Thienemann, 1942

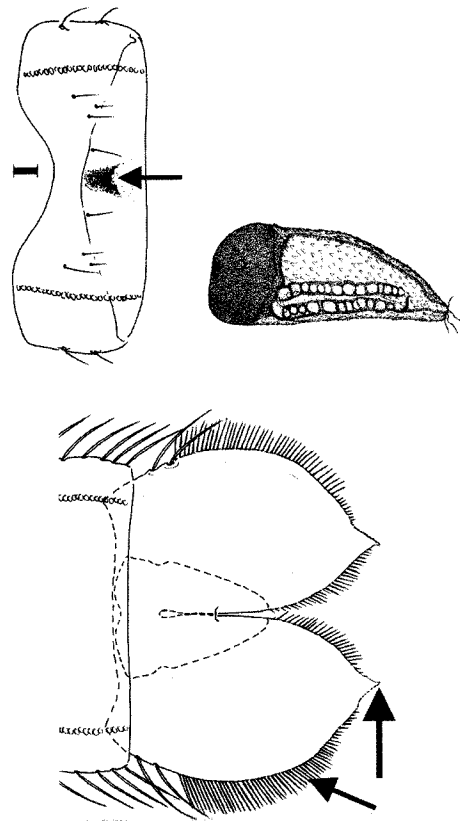


Fig. 1: *Derotanypus* sp. Anal lobes, mark on 1st tergite, thoracic horn

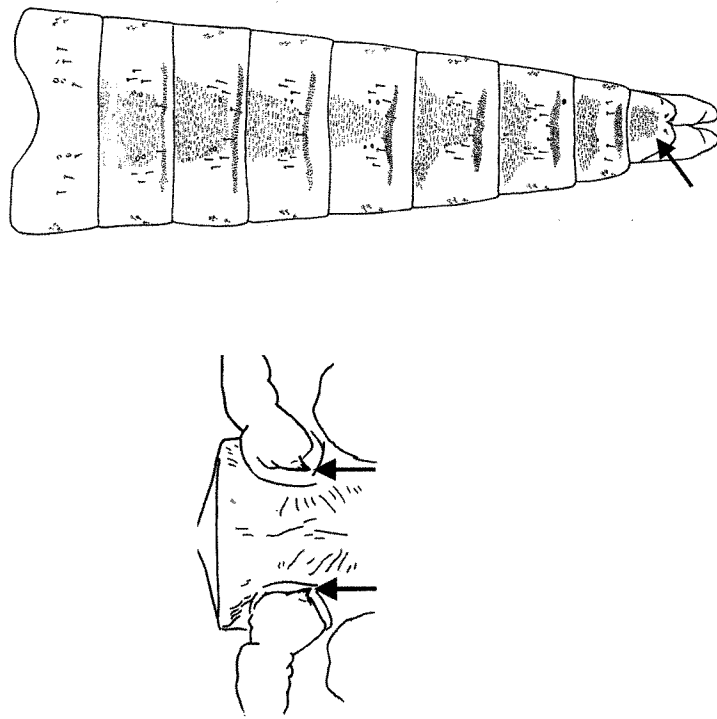


Fig. 2: *Symbiocladius* sp. Frontal apotome on cephalothorax, abdomen

p. 92: change

9c. L 3-6 mm, brown or pale

TH cylindrical, spiny or toothed or forked rarely

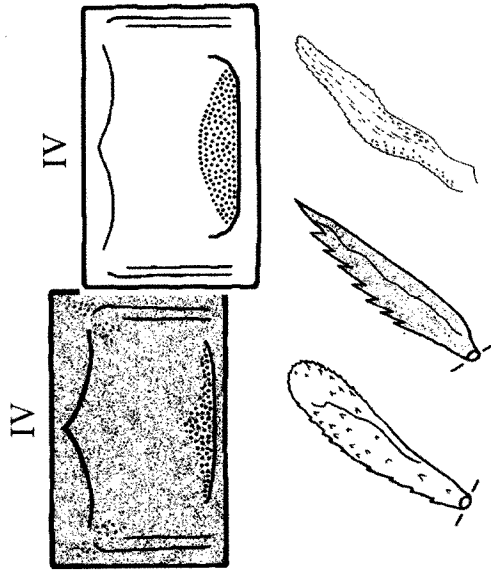
II with at most a small patch of spines posteriorly, without a row of hooks

Tergites posteriorly with either a row of spines or a broad band of points

AL 3 strong MS, often apically hooked

Figs. 3, 6

12



p. 92: add

9d. L up to 8 mm

TH flattened, apex slightly bifid or irregular, spiny; horns bent and angled towards each other

Tergites covered with shagreen, posteriorly coarser

AL 7 MS

Fig. 4

Propsilocerus Kieffer, 1923

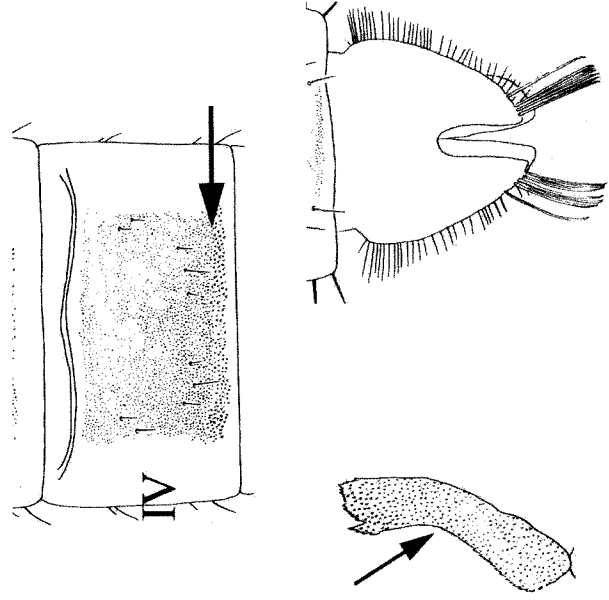
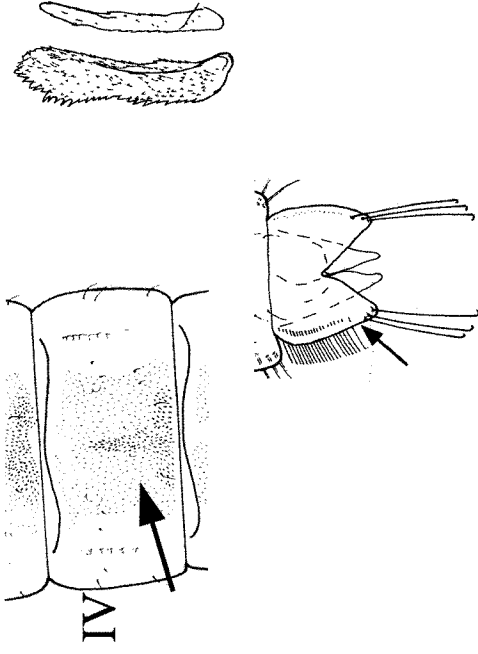


Fig. 3: *Heterotanytarsus*, *Paracladius*, *Euryhapsis*. Tergite IV, thoracic horns

Fig. 4: *Propsilocerus* sp. Tergite IV, thoracic horn, anal lobes

- 9e. L 3-7 mm
 TH long, sparsely to densely covered with spinules
 Tergites evenly shagreen
 AL 3 MS, fringe of short setae, often not reaching apex
Hydrobaenus Fries, 1830
 Fig. 5



- p. 97: add
 14c. (difficult to see)

L up to 5.5 mm
 TH elongate, coarsely toothed on the margins and finely toothed between
 Tergites with a band of dark brown spines
 Sternites VIII with a posterior row of stout blunt spines, median divided
 (female) or only with a small gap (male)
Eurybapsis Oliver, 1981
 Fig. 6

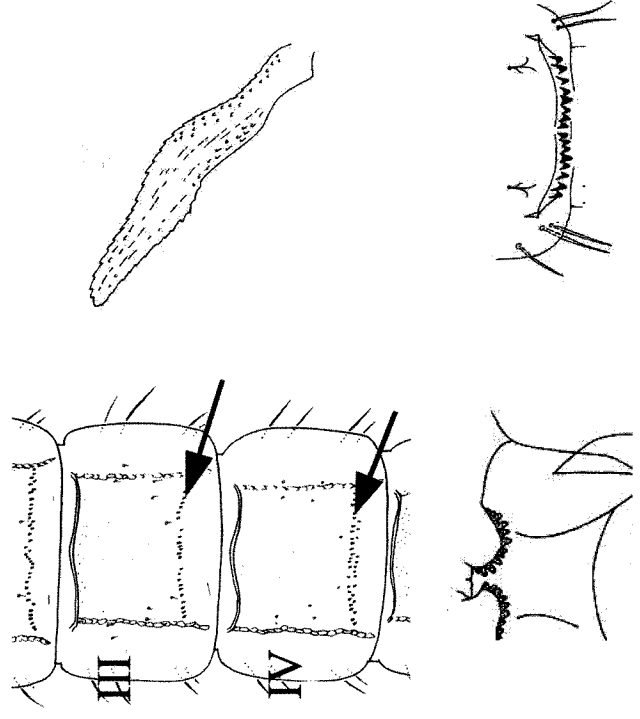


Fig. 6: *Eurybapsis* sp. Tergites III-IV, thoracic horn, female and male sternite VIII

p. 97: change

1aa. Diagnosis of *Eurycnemus crassipes* as given

1ab. L 8-9 mm

TH with a swollen base and a narrow apical part

II-VII with extensive uniform shagreen and a row of posterior spines (not hooklets!)

Wing-lobes with pearl row

Dratnalia potamophylaxi (Fittkau & Lellak, 1971)

Fig. 7

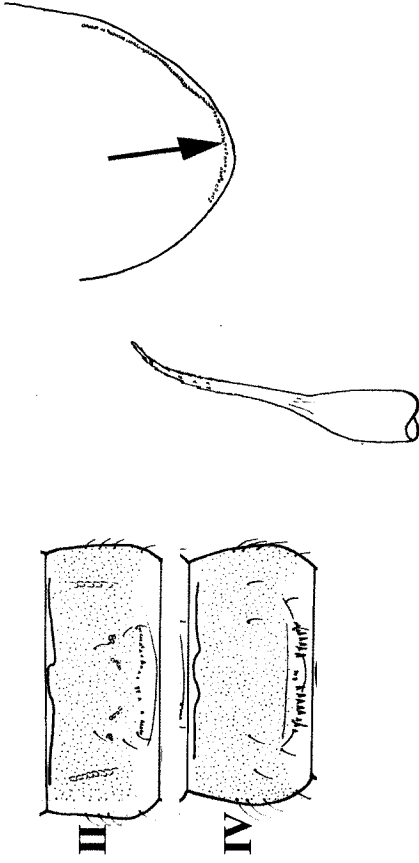


Fig. 7: *Dratnalia potamophylaxi*. Tergites II and IV, thoracic horn, wing sheath

p. 99: change

1ga. Diagnosis of *Diplocladius* as given

1gb. (to be examined carefully)

L 2-4 mm

TH cylindrical, with a blunt rounded apex, with several to numerous rounded protuberances with acute apex

II-VIII with spinules over most the tergites, PSB well developed

AL with a low and broad apical projection (sometimes difficult to see)

Stilocladius montanus Rossaro, 1979

Fig. 8

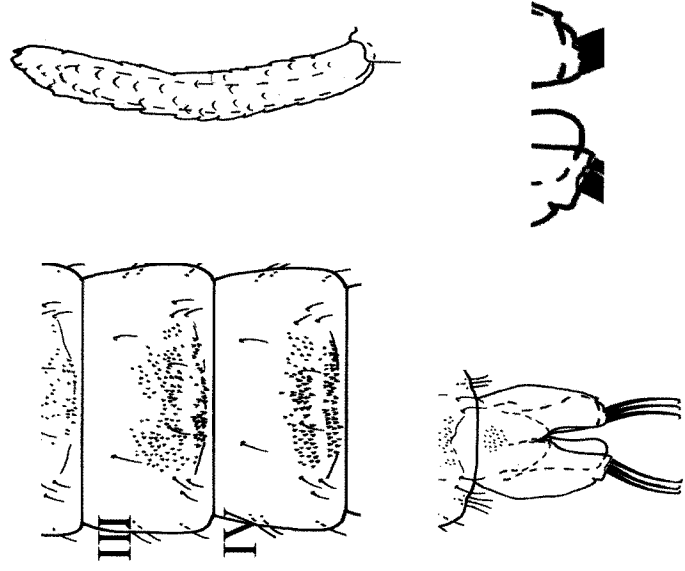


Fig. 8: *Stilocladius* sp. Tergites III-IV, thoracic horn, anal lobes and apex of anal lobe

p. 104: change

1t. L up to 6 mm

TH absent

II-VIII with a posterior row of strong, sharp points

Fig. 9a

1u

1ua. L 2-3 mm

II-VIII anterior row of smaller points, linked to shagreen

AL with 2 rows of 7-8 strong teeth, diverging posteriorly

Fig. 9b left

Pseudorthocladius Goetghebuer, 1932

1ub. L up to 6 mm

II-VIII no anterior row of points

AL without strong diverging teeth

Fig. 9b right

Parachaetocladius Wülker, 1959

p. 119: change and add

1b. L 2.5-6 mm

TH with a tuft of fine filaments

HR II with a wide or narrow central gap

Figs. 10, 11, 12

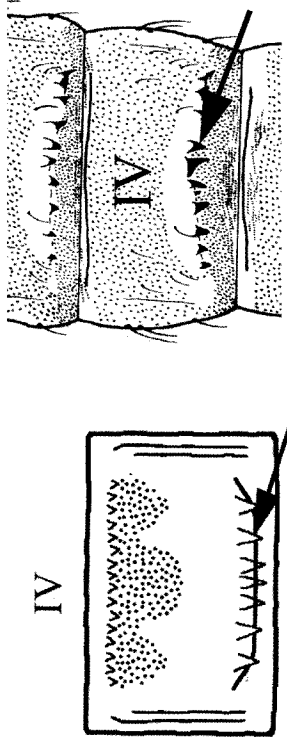


Fig. 9a: *Pseudorthocladius* sp. Tergite IV (left), *Parachaetocladius* sp. Tergite IV (right)

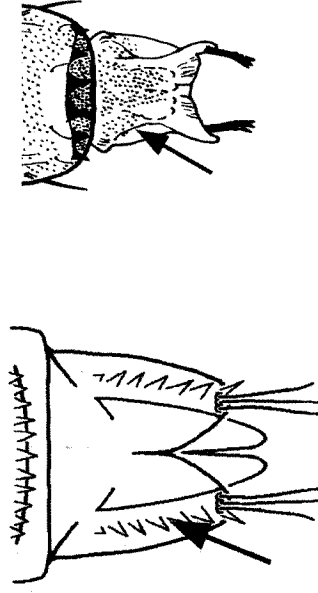


Fig. 9b: *Pseudorthocladius* sp. (left), *Parachaetocladius* sp. (right), Tergite IV
Bildunterschrift falsch

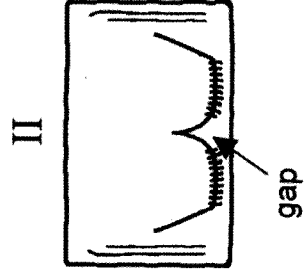


Fig. 10: Tergite II. Hook row

- 1ca. **HRII** with a narrow central gap
Fig. 11
- 1cb. **HRII** with a wide central gap
Fig. 12
- 1da. **VIII** posterolateral with a set of separated teeth, for the most part distally rounded
Fig. 13
- 1db. **VIII** posterolateral with only 1 (-2) pale spur(s)
Fig. 14

Cyphomella cornea Sæther, 1977

2

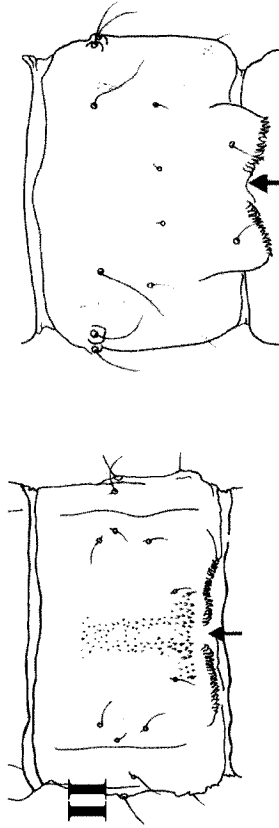


Fig. 11: *Cyphomella* sp., *Cladopelma* sp. Tergite II

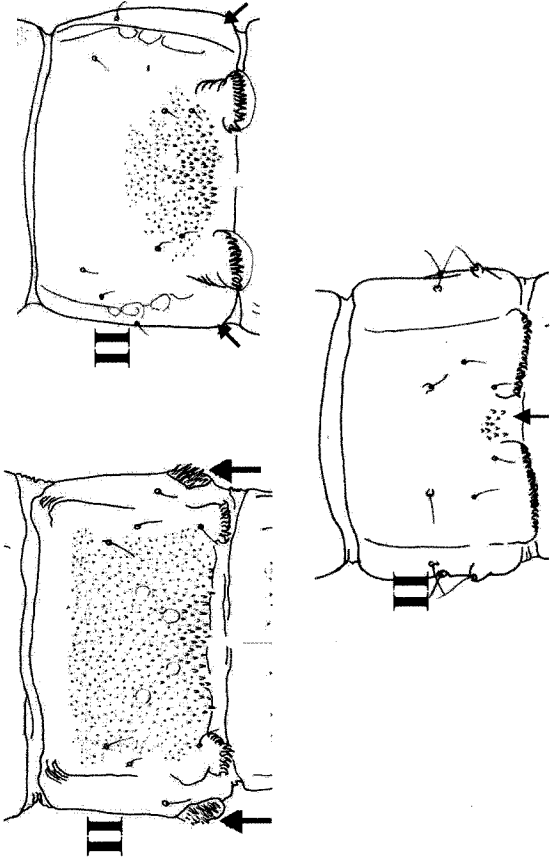


Fig. 12: *Beckidia* sp., *Chernovskiiia* sp., *Harmischia* sp. Tergite II

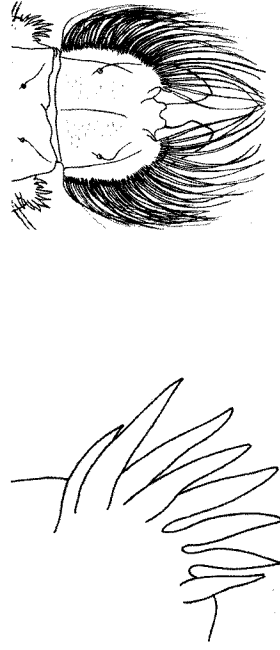


Fig. 13: *Cyphomella* sp. Posterolateral comb at tergite VIII, anal lobe



Fig. 14: *Microchironomus* sp. Posterolateral spur at tergite VIII

- 1ea. II PSB present, with spines
THx no CT on frontal apotome
Fig. 15
- 1eb. II PSB absent
THx CT elongate, conical or curved
Fig. 16
- 1ec. L 3-3.5 mm
II PSB absent
THx small, rounded

Beckidia Saether, 1979

Harnischia Kieffer, 1921

1ed

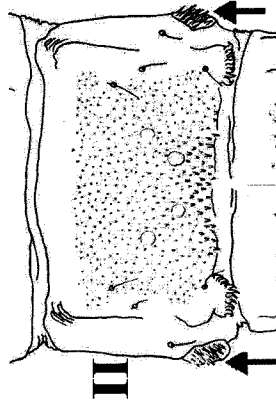
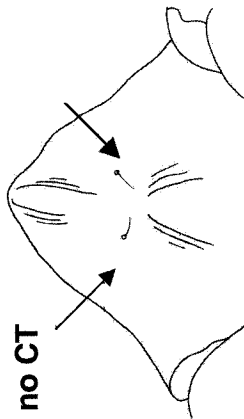


Fig. 15: *Beckidia* sp. Frontal apotome, postrolateral pedes spurii B on tergite II

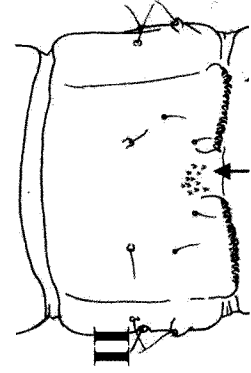
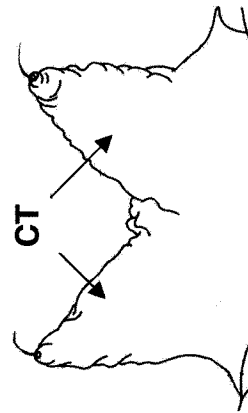


Fig. 16: *Harnischia* sp. Cephalic tubercles (CT) on frontal apotome, tergite II

- 1eda. L 3-3.5 mm
II-IV in the medio-posterior part with long spines, on IV less in number
TH ending in tufts of filaments
Fig. 17
- 1edb. L 4.5-6 mm
II-IV in the medio-posterior part without long spines
Fig. 18
No specimen seen

Kloosia pusilla (Linnaeus, 1767)

Chernovskiiia Saether, 1977

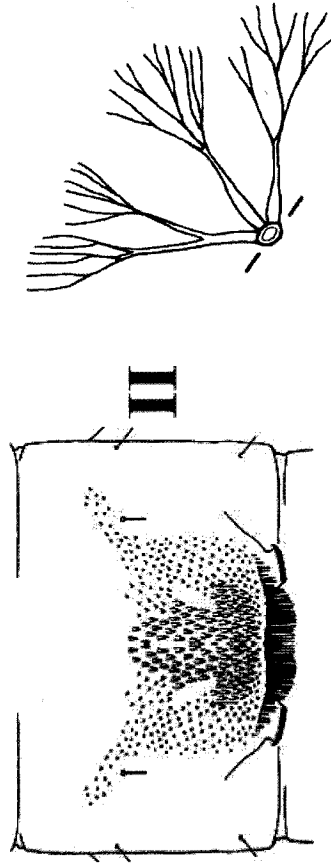


Fig. 17: *Kloosia* sp. Tergite II, thoracic horn

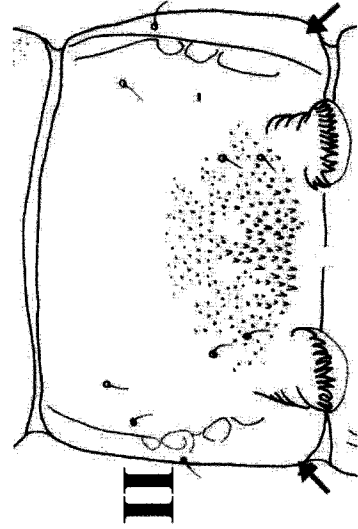


Fig. 18: *Chernovskiiia* sp. Tergite II

p. 124: change

3e. L 3-5 or 8-10 mm

Tergites without posteriorly increasing shagreen (but may increase from posterior to anterior) and without larger brown spines

VIII without spines post-laterally

Fig. 19

3f

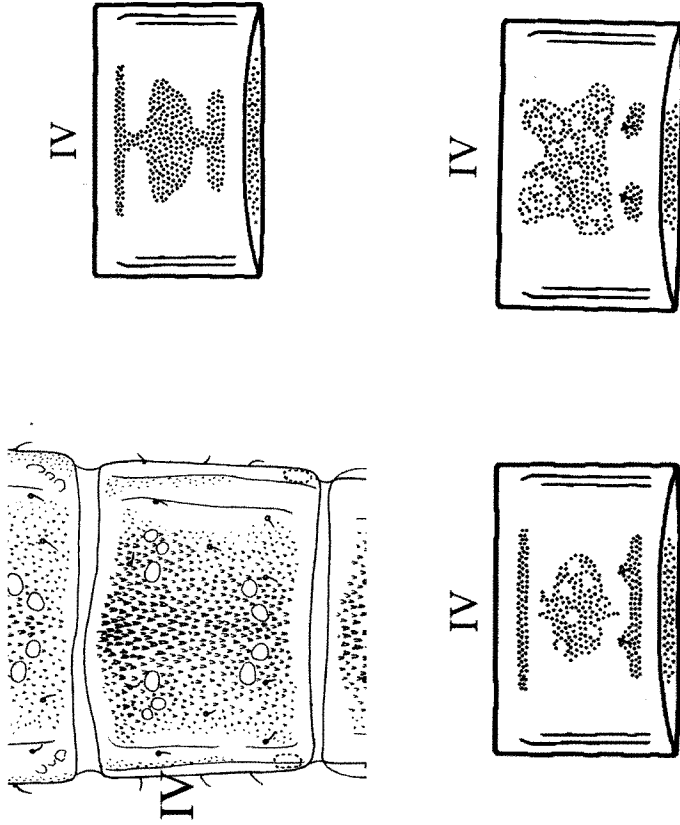


Fig. 19: Tergite IV of several Chironomini, tergites with uniform or posteriorly not increasing shagreen

3fa. L 3-5 mm, dark brown

THx no cephalic tubercles (CT)

III-V strong, extensive shagreen, evenly distributed over the tergite

VII-VIII fine reticulation

Fig. 20

Robackia Saether, 1977

3fb. L 6-10 mm, light brown

THx long cephalic tubercles (CT) present

III-V shagreen not continuous, or restricted to median part of tergite

Fig. 21

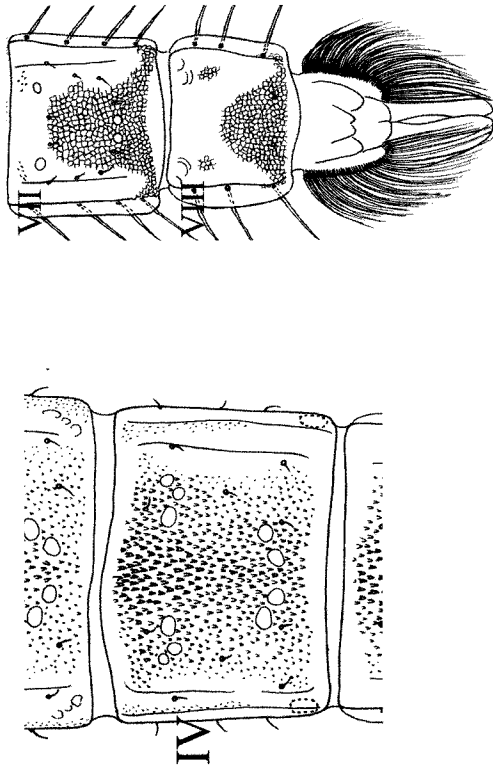


Fig. 20: *Robackia demejerea*. Tergites IV and VIII

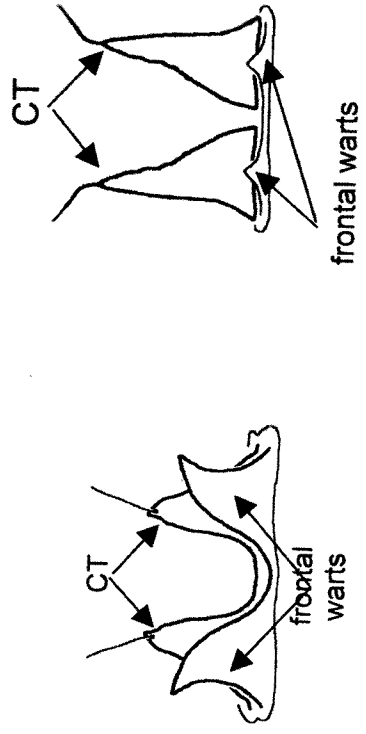


Fig. 21: Cephalic tubercles (CT) on frontal apotome

p. 141: add

1d. I ca. 2.5 mm

Tergites all lateral setae weakly developed

II somewhat transversely arranged point patches in posterior half; anterior band of small points

VIII comb or spur absent

AL no setae

Fig. 22

Lithotanytarsus Thienemann, 1933

p. 144: change

1a. VIII spur of 1-4 spines

Fig. 23

Stempellinella, *Zavrelia*, *Neostempellina* 2

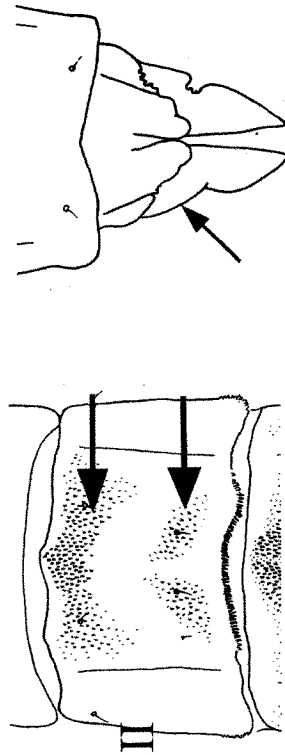


Fig. 22: *Lithotanytarsus* sp. Tergite II, anal segment

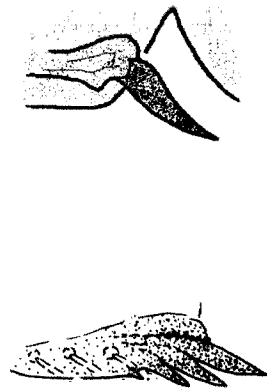


Fig. 23: *Neostempellina* sp. (left). Tergite VIII, posterolateral comb. *Stempellinella* (right). Tergite VIII, posterolateral spur

p. 145: change and add

1d. III-(V)VI with paired point patches only, without long spines; patches normally round/oval, but may be elongated longitudinally and set distant from the mid-line; or strongly shagreened with undistinct patches

VIII spur comb-like or claw-like, or a toothed spike

AL fringe of setae confined to posterior margin or complete

Fig. 24 *Parapsectra*, *Krenopsectra*, *Tanytarsus* (part 3) 5

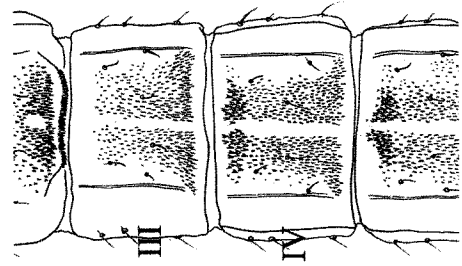
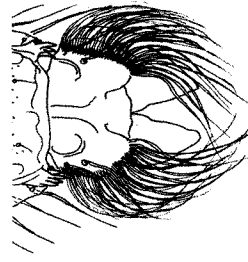
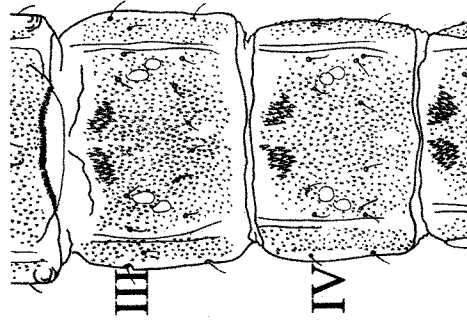


Fig. 24: *Parapsectra* sp. (above). Tergites III-IV, anal lobe. *Krenopsectra* sp. (bottom). Tergites III-IV, anal lobe

- 1f. L ca. 4.5 mm
- II-V no paired point patches
- VIII comb (or spur) absent
- AL group of 10-15 short setae confined to posterior margin
- Thienemanni ploenensis* Kieffer, 1921
- Fig. 25

- p. 146: change and add
- 2a. L 2-3 mm, lateral margins brown
- II shagreen patches much smaller than on III
- VIII 1 robust spur
- Fig. 26
- 2b. L 2-3 mm, lateral margins brown
- TH elongated, tapered apical half or less covered with small spines
- II shagreen patches similar to those on III
- VIII 1(-2) robust spur(s)
- Fig. 27
- L 3 mm
- TH elongate, tapering in the distal half to pointed apex, lateral fringe of long chaetae
- II shagreen patches similar to those on III, more or less rectangular
- VIII 3-4 robust spurs
- Fig. 28
- Neostempellina thienemanni* Reiss, 1984

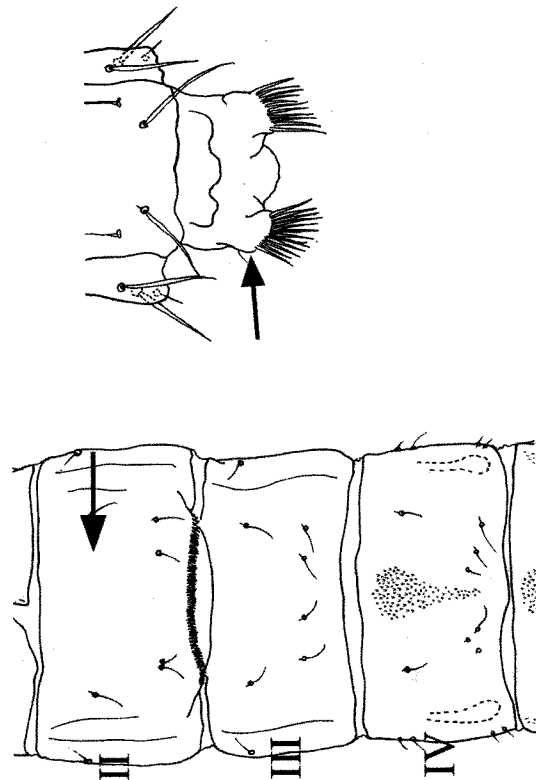


Fig. 25: *Thienemanni ploenensis*. Tergites II-IV, anal lobe

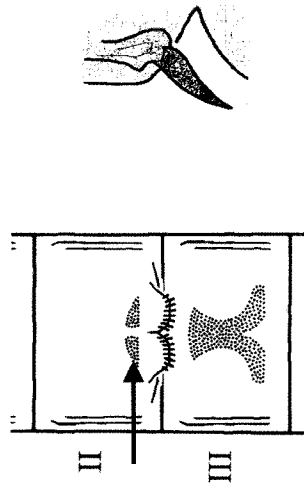


Fig. 26: *Stempellinella* sp. Tergites II-III, posterolateral comb of tergite VIII

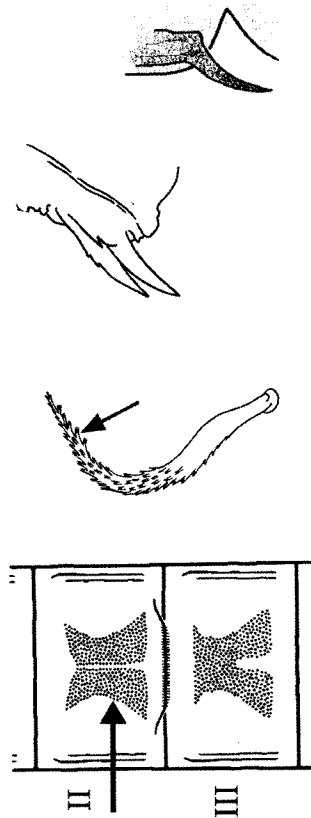


Fig. 27: *Zavrelia pentatoma*. Tergites II-III, thoracic horn, posterolateral spur of tergite VIII

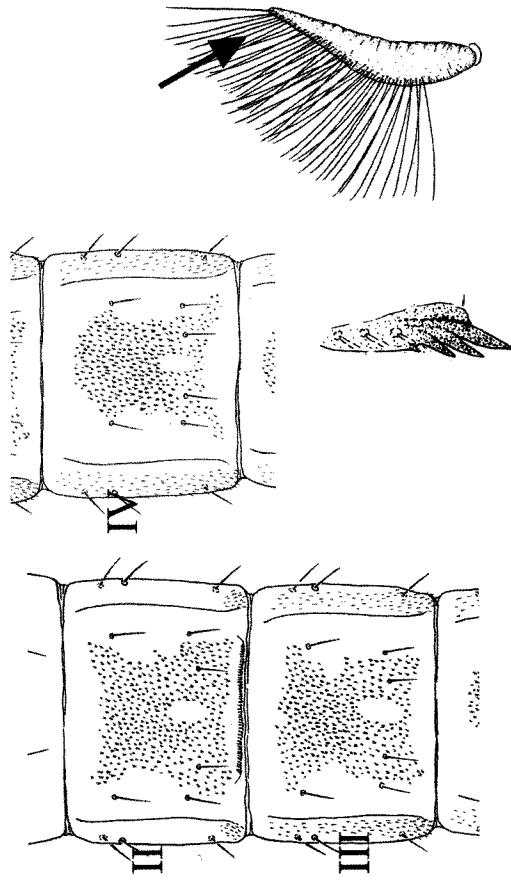


Fig. 28: *Neostempellina thienemanni*. Tergites II-III, IV, thoracic horn, posterolateral comb of tergite VIII

p. 148 change and add

5a. L 3-5 mm

TH narrow, tapered, fringed or elongate bare and rounded at apex

THx cephalic tubercles absent

III-V with paired point patches set in an area of uniform shagreen

AL fringed over the whole length of margin

Fig. 29

Parapsectra Reiss, 1969

5b. As given

5c. L 3-5 mm

TH broad basally, tapered to apex

THx cephalic tubercles (CT) broad conical with a distinct apex

III-V with paired point patches, not strongly distinct from the surrounding shagreen

AL fringed only in the posterior half

Fig. 30

Krenopsectra Reiss, 1969

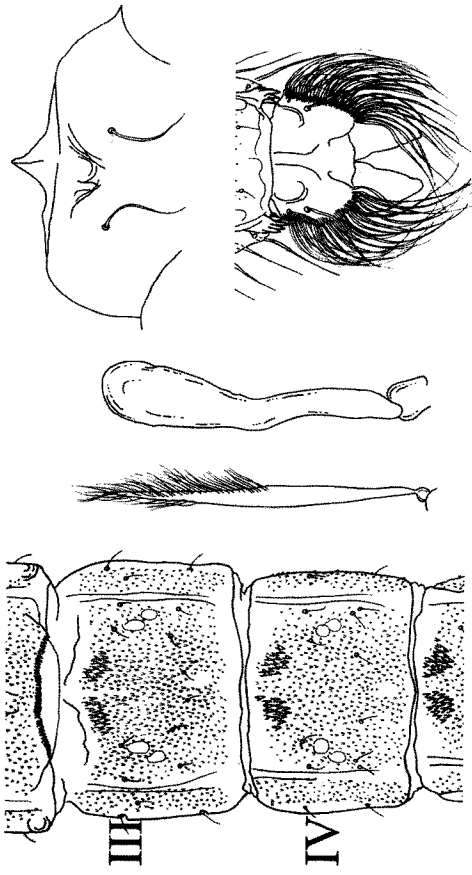


Fig. 29. *Parapsectra* sp. Tergites III-IV, thoracic horn, cephalic tubercles, posterolateral comb of tergite VIII

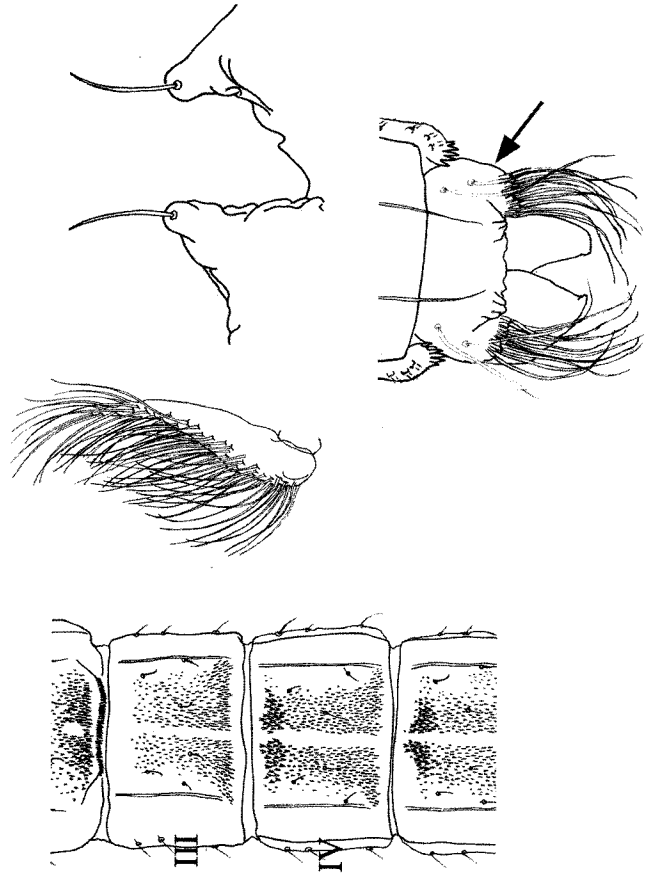


Fig. 30. *Krenopsectra* sp. Tergites III-IV, thoracic horn, cephalic tubercles, posterolateral comb of tergite VIII

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