THE LARVAE OF CHIRONOMIDS

The composition of species in the mountain brook "Oberer Seebach"

Project Ritrodat/Lunz

Peter-Eric SCHMID

A b s t r a c t

Chironomids larvae have been sampled quantitatively in the "Oberer Seebach" in the years 1984 and 1985. Samples of different species and their four larval stages have been subjected to a method establishing and evaluating quantitative morphological characters (SOKAL & SNEATH 1973) of mouthparts.
Regression Analyses and Cluster Analysis aimed to establish correlations and distances of resemblances between species groups and their instars.
According to this methodology, 70 species of larvae were found in the sample period.

K e y w o r d s

Chironomids, larvae, stages; Cluster Analysis , Regression Analyses of quantitative characters in mouthpart morphology; species composition.

I n t r o d u c t i o n

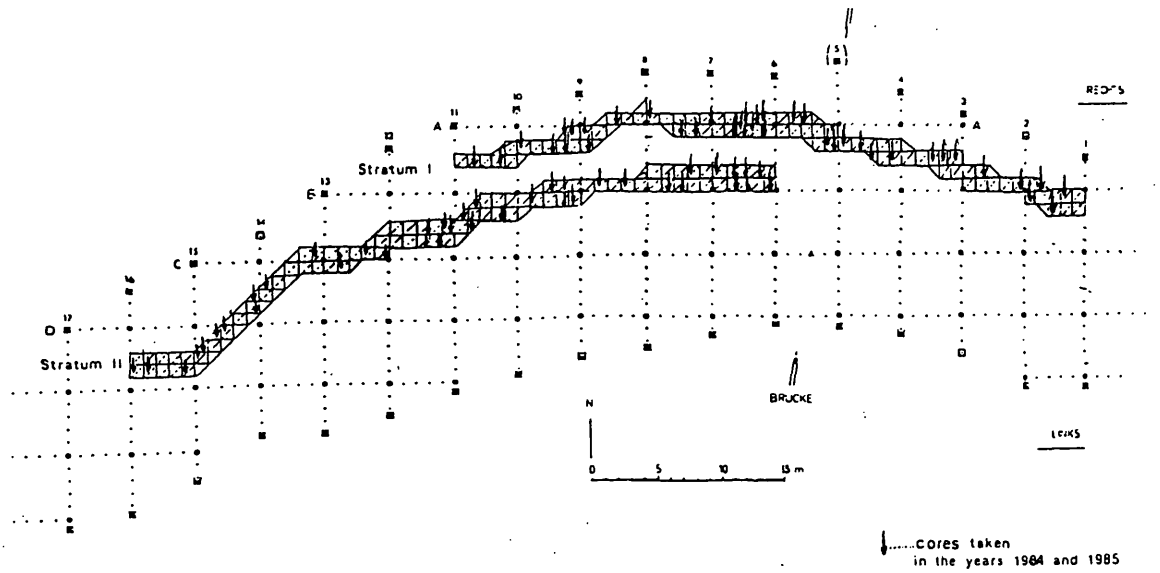
This work presents a contribution to a thesis exploring the niche processes within different species and their instars, their vertical and horizontal distribution in the brook sediment. For operations on species level it was evident to process within the strategy of numerical taxonomy (SOKAL & SNEATH 1963, 1973). The correlations between species and instars were based on log(x+1) transformations with 95 % confidence limits of measurements of seven morphological character units.
Clustering realized the relations in Euklidean distance between eight OTU´s (ordinary taxonomic units) in the 4th instar of Genus Orthocladius.

M e t h o d s

a) sampling

Larvae have been collected with 80 Freezing Cores in connection with high-voltage alternating current (KLEMENS 1982, 1984) stratified randomly within two Strata of the Ritrodat area (fig.:1). Each Core sample consisting of seven sample units

FIG. 1 Altrodat area : STRATUM I & STRATUM II



preserved immediately in 10 % formaldehyde after collection and subsequently carefully washed in a 100 µm sieve. All chironomid larvae from 560 sample units were removed and counted under low power magnification (x25,x50) of a binocular.

b) taxonomy

About 10% of the chironomid larvae were mounted in Euparal for preparation and identification under high magnification (x1000 immersion). From each species and its stages a number of permanent preparations were made for measurements and identification. Every measurement was done to the nearest 0.1 µm.

The head capsule breadth (CB) was measured ventrally from the outermost margin of the posterior part of the caput (fig.:2);

The body length (L) was evaluated as the distance of the postoccipital margin of the head capsule to the claws of the posterior parapods.

The main quantitative morphological characters of the mouthparts have been (fig.3 & 4):

X1: -the distance between the setae submenti (Diamesinae, Orthocladiinae, Chironominae)
-the width of the basal part of the ligula (Tanypodinae)

X2: -the basal width of the median tooth (teeth) (Diamesinae,Orthocladiinae, Chironominae)
-the largest width of the ligula´s teeth (Tanypodinae).

X3: -the distance between the setae submenti and the median tooth (teeth) (Diamesinae, Orthocladiinae, Chironominae)
-the distance between the base of the ligula and its outermost tooth projection (Tanypodinae).

X4: -the length of the first antennal segment (Diamesinae, Orthocladiinae, Chironominae)
-the width of the basal part of the antenna (Tanypodinae).

X5: -the length of the flagellum (Diamesinae, Orthocladiinae, Chironominae)
-the total length of the antenna (Tanypodinae).

X6: -the length of the apical tooth and the inner teeth of the mandible (Diamesinae, Orthocladiinae, Chironominae)
-the distance between the apex of the apical tooth and the basal tooth of the mandible (Tanypodinae).

X7: -the total length of the mandible (Diamesinae, Orthocladinae, Tanypodinae, Chironominae).

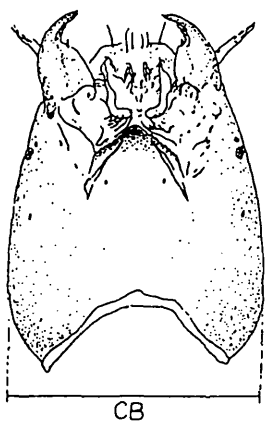


Fig.:2 Head capsule breadth

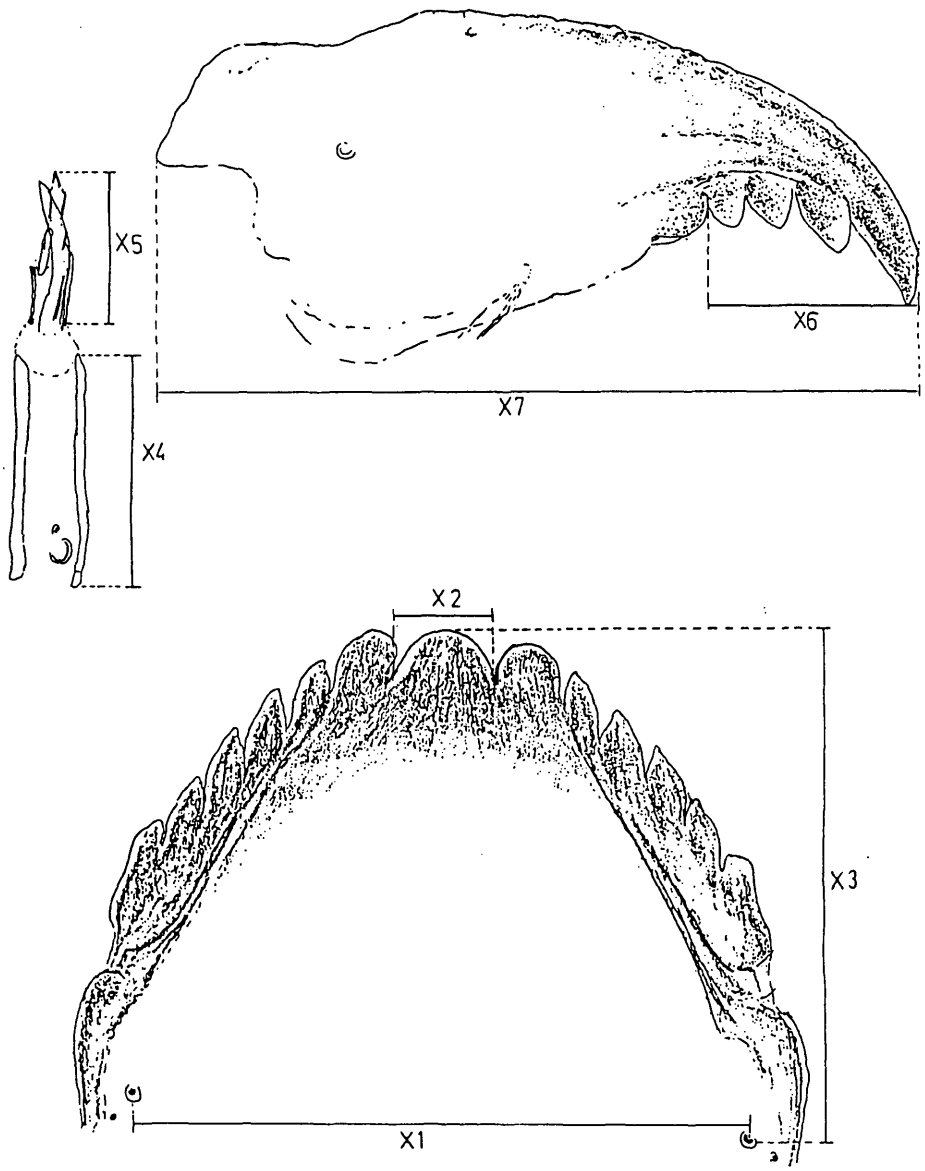


Fig: 3 Quantitative —X_n— characters of the mouthparts of Orthocladiinae (Orthocladius frigidus)
Same relations of measurements in Diamesinae, Chironominae

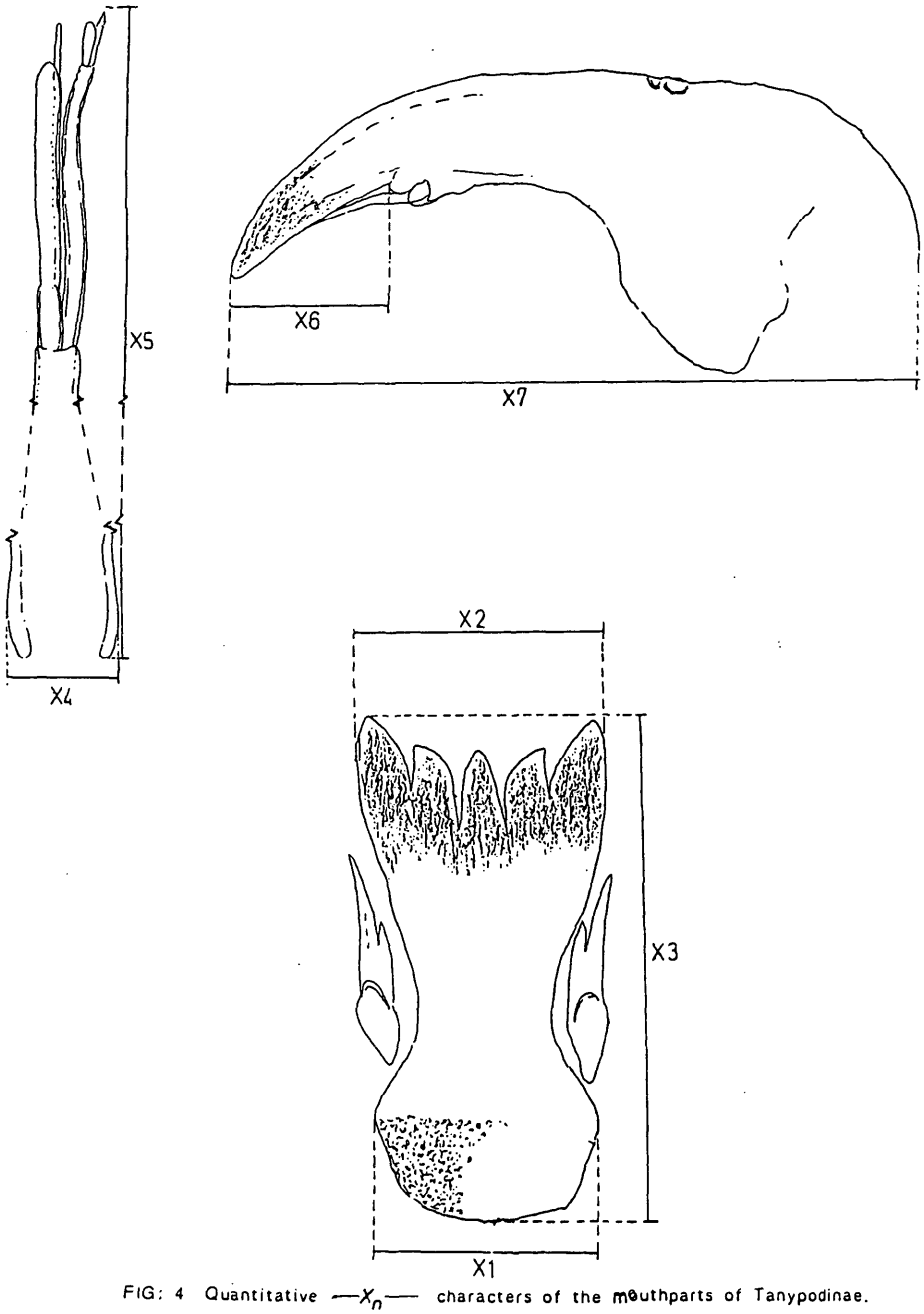


FIG: 4 Quantitative —X_n— characters of the mouthparts of Tanypodinae.

Regression analysis of pairs of characters from most of the ordinary taxonomic units were plotted showing the level of resemblance between the head capsule breadths, the X_n-characters within one species and its successive instars. This method completed the process of larval species identification by means of rearing (SCHMID 1983).

Results and Discussion

a) rearing

Rearing of seven species succeeded in the year 1983: Cricotopus similis, Orthocladius frigidus, Paratrichocladius skirwithensis, Parorthocladius nudipennis, Tvetenia calvescens, Corynoneura lobata, Zavrelimyia signatipennis. The process of rearing to the male adult species (SCHMID 1983) with fourth instar larvae did not agree with the statement of the problem including all chironomid instars found in the core samples.

b) method of measuring morphological characters

According to the fact finding within the samples two or more larval stages of the same species as well as previous larval instar exuviae with the next development stage of the same individual, a method of measuring comparable morphological structures was choosen. The results of regression analyses (within the Key to the Species of Chironomid Larvae) have shown a significant correlation between the diverse X_n-characters of the instars of a species.

c) clustering of eight closely morphologically related OTU's (a-h) of the Genus Orthocladius in the fourth instar

Phenograms resulting from single linkage cluster analysis (SOKAL & SNEATH 1973, FAHRMEIR & HAMERLE 1984) have shown a grouping of resemblance according to Euklidean distances between the OTU's (fig.:5 & 6). The clusters based on the dissimilarity matrices each of seven morphological characters of eight different OTU's in the fourth instar.

1.) In the case of non-transformed data the least dissimilar pairs have been Orthocladius saxosus grp.I (g) , Orthocladius saxosus grp.II (h) at a distance of 4.15 and Orthocladius saxicola I (a), Orthocladius saxicola II (f) at a distance of 4.31. Both pairs have defined a separation from each other at a level which is five times larger than the distance within the pairs itself. More closely related to the pair (a,f) are Orthocladius excavatus (c) and Orthocladius 3b (b) within a between-group distance of 14.32. The least distance within the pair (c,b) has shown the largest distance of 9.18 within pairs itself. High non-linearity between the character units caused the effect of separation of these OTU's (compare log-transformed data below;fig.:6). Orthocladius frigidus I (e) and Orthocladius frigidus II (d) have been related at a distance of 6.28 from each other.

Ranking of probability levels in terms of evaluated Euklidean distances showed the groups (a,f), (e,d) and (g,h) below the level of 50% dissimilarity's probability. The pair (c,b) has to be separated in that analysis into two fairly related species groups.

2.) In the case of log-transformed morphological characters the non-linearity between the seven character units diminished under the transformation. All pair-groups remained below the 50% level of ranked dissimilarities; the relation between groups separated (g,h) clearly from the pair-groups ((a,f),(b,c),(e,d)).

The preliminary conclusions are based on three species groups (e,d),(a,f),(g,h) according to their similarity within pairs, and a separation of the pair (c,b) into two species groups caused through the effects of the original data, showing low homogenity within the pair.

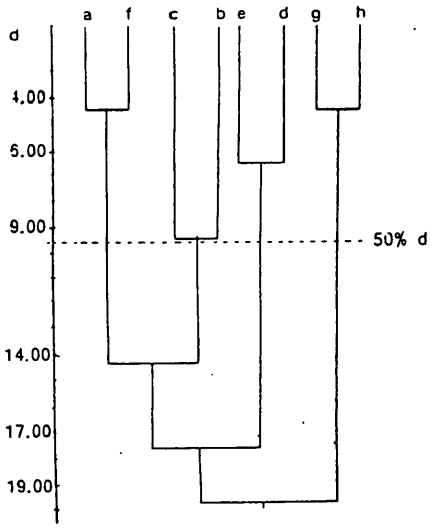


Fig.5: Single linkage cluster analysis: Phenogram based on a matrix of Euklidean distances dirived from 10 OTU's and 7 character units (X1-X7).

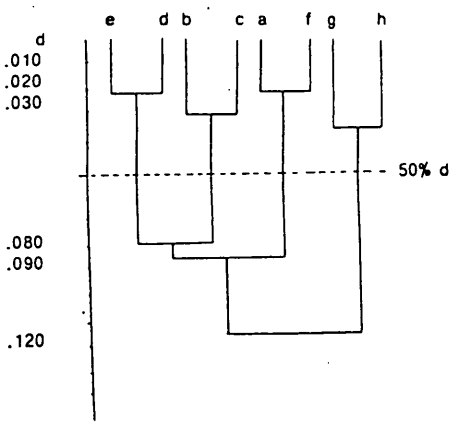


Fig.6: Single linkage cluster analysis: Phenogram based on a matrix of Euklidean distances dirived from 10 OTU's and log-transformed 7 character units (X1 - X7).

d) size frequency of morphological characters (X1-X7), CB and instar analyses

The size frequency distribution of head capsule breadths(CB) and the quantitative morphological characters indicated a significant grouping of the successive four or if even found three larval stages of the corresponding species (supplement of the Key to the Species of Larval Chironomidae).

The measurements of body length showed overlapping, not significant relations within the instars of a species (LADLE et al.1985). The range of head capsule breadths and mouthpart measurements increased lineary from the first instar to the fourth instar. The range itself changed within the sample period. The measurements of the first to the fourth instar are larger in the autumn samples in correlation to the samples evaluated from spring populations; the range of variation is computed within the 95% confidence limits of the geometric mean of the measurements.

e) species composition

70 larval species and their instars were found during the sample period 1984 and 1985; 22 species are new to the species composition of adults found in the emergence traps (SCHMID 1984). 28 species of the emergence traps were missing in the freezing core samples (table 1,1b, 1c).The missing species are signed in the list with O; species present either in the emergence traps or core samples or both are listed with X.

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Freeman, San Fr ancisco

SNEATH, P.H.A. & SOKAL,R. (1973)
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Freeman, San Francisco

Table 1.: Comparative composition of species in emergence traps (as adults) and in Freezing Core Samples (as larvae) - explanation in the text

Species:	Emergence traps (1981)	Freezing Core Samples (1984/1985)
PODONOMINAE		
Paraboreochlus minutissimus (Thiene.)	X	O
TANYPODINAE		
Macropelopia notata (Meigen)	X	X
Conchapelopia pallidula (Meigen)	X	X
Nilotanypus dubius (Meigen)	X	X
Thienemannimyia geijskesi (Goetghe.)	X	X
Thienemannimyia laeta (Meigen)	X	O
Trissopelopia longimana (Staeger)	X	X
Zavrelimyia signatipennis (Kieffer)	X	X
DIAMESINAE		
Diamesa cinerella (Meigen)	X	O
Diamesa hamaticornis (Kieffer)	X	O
Diamesa insignipes (Kieffer)	X	X
Diamesa thienemanni (Kieffer)	X	O
Diamesa sp.2	O	X
Potthastia longimana (Kieffer)	X	X
Potthastia gaedii grp. (Meigen)	X	X
Pseudodiamesa branickii (Nowicki)	X	O
PRODIAMESINAE		
Prodiamesa olivacea (Meigen)	O	X
ORTHOCLADIINAE		
Brillia longifurca (Kieffer)	X	X
Brillia modesta (Meigen)	X	X
Cricotopus annulator (Goetghe.)	X	O
Cricotopus curtus (Hirven.)	X	X
Cricotopus fuscus (Kieffer)	X	O
Cricotopus similis (Goetghe.)	O	X
Cricotopus tremulus (Linne)	X	X
Cricotopus sp.2	O	X
Eukiefferiella brevicalcar (Kieffer)	X	O
Eukiefferiella claripennis grp. (Lundb.)	O	X
Eukiefferiella clypeata (Kieffer)	X	X
Eukiefferiella coerulescens (Kieffer)	X	X
Eukiefferiella devonica (Edwards)	X	O
Eukiefferiella ilkleyensis (Edwards)	X	X
Eukiefferiella lobifera (Goetghe.)	X	O
Eukiefferiella minor (Verrall)	X	X
Eukiefferiella tirolensis (Goetghe.)	X	O
Heterotrissocladius marcidus (Walker)	X	X
Orthocladius excavatus (Brundin)	X	X
Orthocladius frigidus (Zetterst.)	X	X
Orthocladius rivulorum (Kieffer)	X	X
Orthocladius saxicola (Kieffer)	X	X
Orthocladius saxosus grp.1 (Tokun.)	O	X
Orthocladius saxosus grp.2 (Tokun.)	O	X
Orthocladius thienemanni (Kieffer)	X	X
Orthocladius wetterensis (Brundin)	X	O
Orthocladius sp.1	O	X
Orthocladius sp.2	O	X
Orthocladius sp.2/	X	O

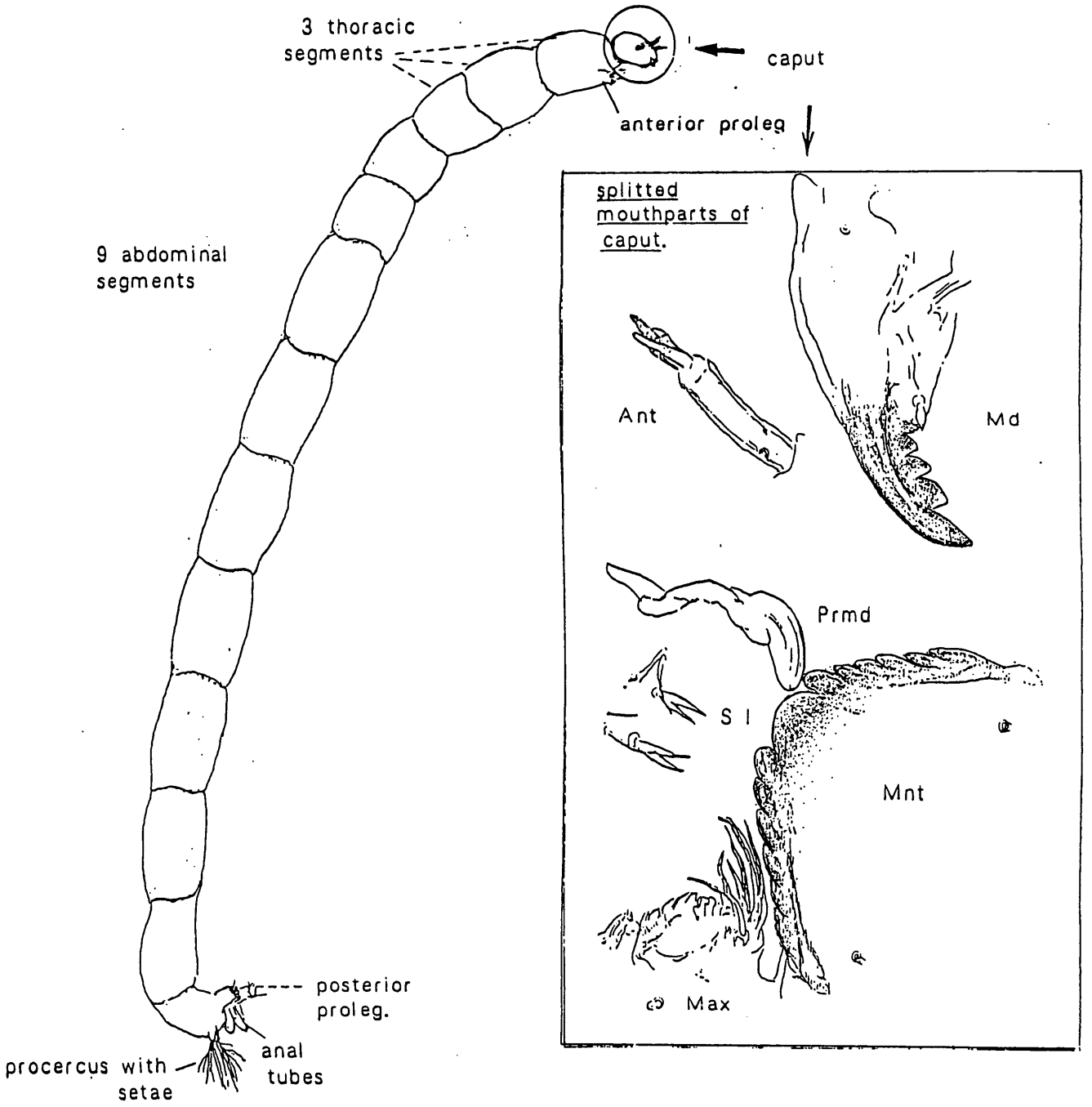
Table:1b

Species:	Emergence traps	Freezing Core Samples
Orthocladius sp.3a	O	X
Orthocladius sp.3b	O	X
Paratrichocladius nivalis (Goetgh.)	O	X
Paratrichocladius rufiventris (Meigen)	X	X
Paratrichocladius skirwithensis (Edw.)	X	X
Paratrichocladius triquetra (Tshernov.)	O	X
Paratrissocladius excerptus (Walker)	X	O
Parorthocladius nudipennis (Kieffer)	X	X
Rheocricotopus effusus (Walker)	X	X
Rheocricotopus fuscipes (Kieffer)	X	X
Rheocricotopus gouini (Goetghe.)	X	O
Symbiocladius rhithrogenae (Kieffer)	O	X
Symposiocladius lignicola (Kieffer)	X	X
Synorthocladius semivirens (Kieffer)	X	X
Tvetenia calvescens (Edwards)	X	X
Tvetenia discoloripes (Zavrel)	O	X
Bryophaenocladius ictericus (Meigen)	X	O
Chaetocladius laminatus (Brundin)	X	X
Corynoneura lobata (Edwards)	X	X
Corynoneura sp.1	X	O
Heleniella ornaticollis (Edwards)	X	X
Krenosmittia boreoalpina (Goetghe.)	X	X
Limnophyes prolongatus (Kieffer)	X	X
Metriocnemus hygropetricus (Kieffer)	X	O
Nanocladius rectinervis (Kieffer)	X	X
Parakiefferiella spinicornis (Brundin)	X	O
Parametriocnemus borealpinus (Gow.)	X	X
Parametriocnemus stylatus (Kieffer)	X	X
Paraphaenocladius impensus (Walker)	X	O
Paraphaenocladius irritus (Walker)	X	O
Paraphaenocladius pseudirritus (Goetgh.)	X	O
Paraphaenocladius sp.1	X	O
Pseudosmittia recta (Edwards)	X	O
Pseudosmittia gracilis (Goetghe.)	X	X
Rheosmittia sp.1 (Brundin)	O	X
Smittia paranudipennis (Brundin)	X	X
Thienemanniella partita (Schlee)	X	X
Thienemanniella morosa (Edwards)	X	O
Trissocladius ? sp.1	X	O
CHIRONOMINAE		
Tanytarsini		
Micropsectra atrofasciata (Kieffer)	X	O
Micropsectra attenuata (Reiss)	X	O
Micropsectra notescens (Walker)	X	X
Micropsectra sp.1	O	X
Neozavrelia sp.1	O	X
Rheotanytarsus nigricauda (Fittkau)	X	X
Stempellina bausei (Kieffer)	O	X
Stempellinella brevis (Edwards)	X	X
Tanytarsus gibbosiceps (Kieffer)	X	O
Tanytarsus palettaris (Verneaux)	X	X
Chironomini		
Cryptocladopelma lateralis (Goetghe.)	X	O
Microtendipes pedellus grp. (Kieffer)	O	X
Paracladopelma camtolabis grp.(Harnisch)	O	X
Polypedilum albicorne (Meigen)	X	X
Polypedilum apfelbecki (Strobl)	X	O
Polypedilum sp.1	O	X
Phaenopsectra flavipes (Meigen)	X	X

A KEY TO THE GENERA OF LARVAL CHIRONOMIDAE OF "OBERER SEEBACH" LUNZ PROJECT RITRODAT

Peter-Eric SCHMID

[1984]



LARVA of CHIRONOMIDAE

Alphabetical generic index see p. 241 !

Abbreviations
Ant..... antenna
Md.....mandible
Prmd.....premandible
S I .....labral seta I
Mnt.....mentum
Max.....maxilla

Key to the subfamilies of Chironomidae

1. Antenna (fig.A1/a) retractile into caput. Ligula (fig.A1/b) strongly developed. Mentum (fig.A1/c) weakly developed.....

..... T a n y p o d i n a e (p.86)

- Antenna not retractile. Ligula variably developed, but never as in Tanypodinae. Mentum (fig.A2/3/4) always strongly developed..... 2

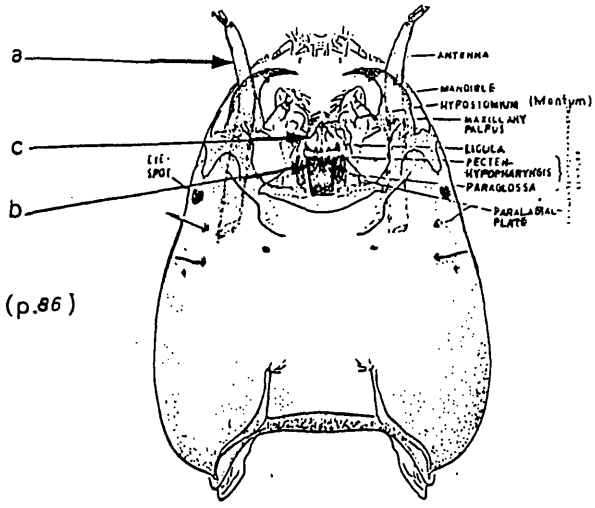


fig.A1/a-c : TANYPODINAE

2. Premandibles absent.Procerci (fig.D1/a) 8 -10 x as high as wide.....

..... P o d o n o m i n a e (p.85)

- Premandibles.(fig.A2/b) present.Procerci rarely more than 4x as high as wide...3

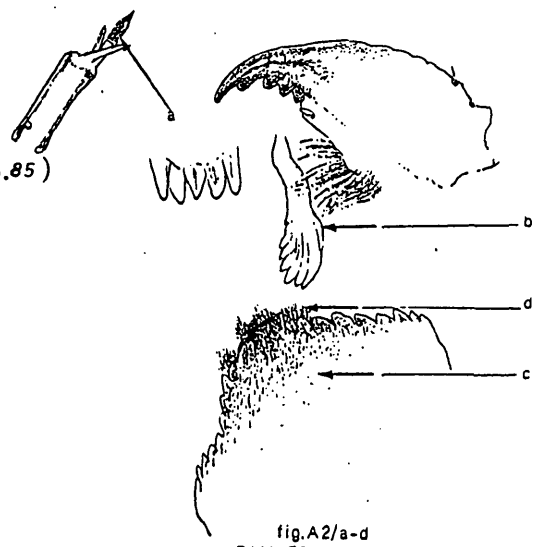


fig.A2/a-d
DIAMESINAE (D. insignipes)

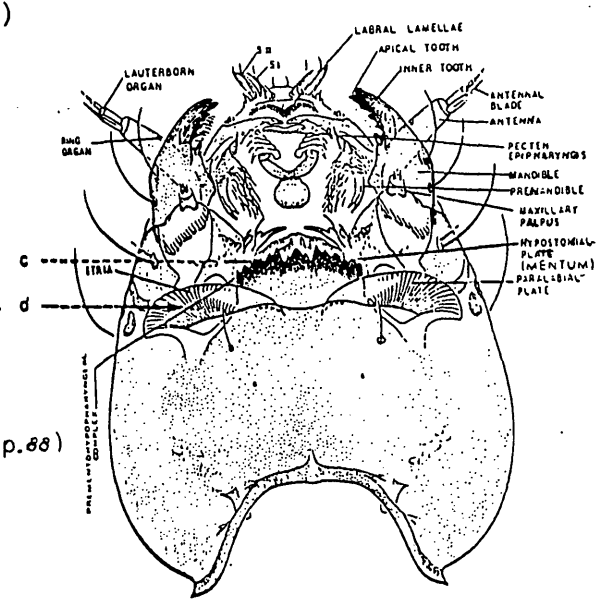
3. Antennal segment 3 annulate (fig.A2/a). Hypopharynx bearing apically (fig A2/d) 1 dorsal median group and 2 lateral ventral setae. .....

..... D i a m e s i n a e (p.85)

- Antennal segment 3 not annulate. Hypopharynx bearing fewer and shorter sensillae..... 4

4. Ventral part of the mentum (fig.A3/d) expanded laterally to form ventromental plates which are usually striated.....

..... C h i r o n o m i n a e (p.88)



- Ventral part of mentum never (fig.A2/4/5 d) as strongly expanded and never striated as in Chironominae 5

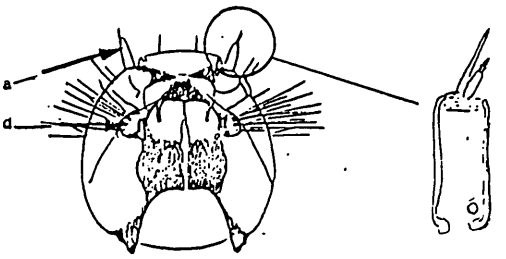


fig.A4/a,d
PRODIAMESINAE (Prodiamesa olivacea)

5. Ventromental plates (fig.A4d) relativly strong expanded, with beard beneath.
Antenna 4-segmented (fig.A4/a).....

..... P r o d i a m e s i n a e ..(p.179)

- Ventromental plates smaller.(fig.A5/d)
Antenna usually with more than 4 segments;(fig.A5/a) if the Antenna is short, the number of segments is less distinct (fig.B /a).
Mostly freswater species.....

..... O r t h o c l a d i i n a e (p.78)

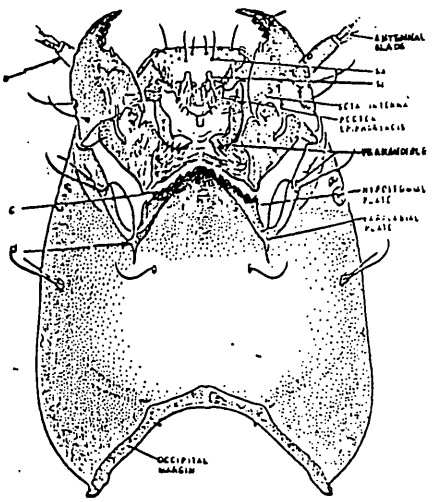


fig.A5/a-d
ORTHOCLADIINAE

Subfamily ORTHOCLADIINAE

Key to the Genera of Orthocladiinae

fig.B1/a

1. Anal end without procercus(fig.:B1/a) Anterior parapods nearly fully fused 2

- Procercus always present. Anterior parapods separated (fig.B2/a,b)..... 6

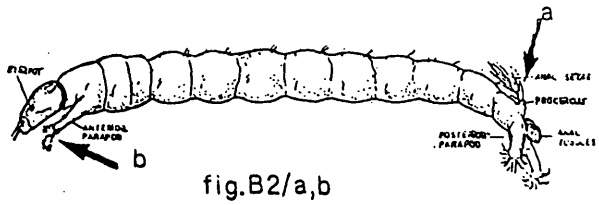


fig.B2/a,b

2. Tuft of very short anal setae present..... ..... Symbiocladius ..... (p.155)

- No tuft of anal setae present, only 1 anal seta or none..... 3

3. S I and S II (fig.B3/a,b) both bifid..... 4

- S II never bifid..... 5

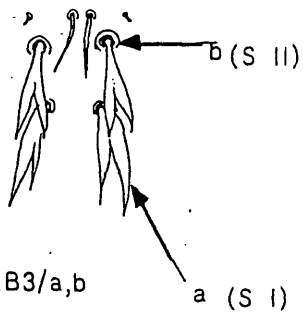


fig.B3/a,b

4. Posterior parapods present; if absent then terminal antennal segment is at least 3x length of preceeding segment..... ..... Pseudosmittia ..... (p.148)

5. Anterior parapods fused.Posterior parapods present. Anal tubules short. antennal segment 2 at least as long as segment 1..... ..... Smittia..... (p.154)

6. Antenna at least 1/2 length of caput, often more..... 7

- Antenna shorter than 1/2 length of caput..... 9

7. Second antennal segment unevently sclerotized and with alternate Lauterborn organs(figB4/a) No basiventral spine (figB5/a) on posterior parapods.....
..... Rheosmittia ..... (p.153)

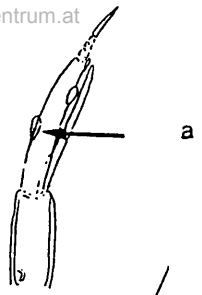


fig.B4/a

- Second antennal segment(fig.B5/b) evenly sclerotized.Lauterborn organs weak or absent. Basiventral spine on posterior parapods..... 8

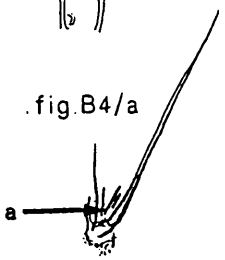


fig.B5/a

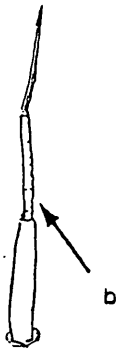


fig.B5/b

8. Antenna 4-segmented (fig.B5/b) longer than caput.....
..... Corynoneura ..... (p.97)

- Antenna 5-segmented, shorter than head.....
..... Thienemanniella ..... (p.160,161)

9. One anal seta as long as 1/4 body length..... 10

- No anal seta as long as 1/4 body length..... 11

10. Mentum with 6 pairs of narrow needle-like lateral teeth.Anal setae of procercus directed dorsally (fig.B6/a).....
..... Krenosmittia..... (p.118)

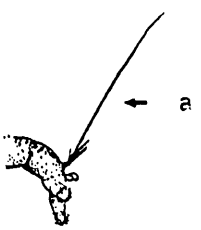
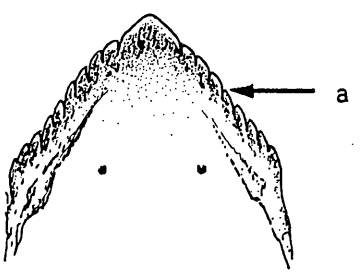


fig.B6/a

11. Mentum with at least 16 teeth (fig.B7/a)..... 12

- Mentum with no more than 15 teeth..... 13



12. S I bifid .8-9 pairs of lateral mental teeth present (fig.B7/a).....
..... Orthocladius ..... (p.125-126) fig.B7/a

13. Preanal segment extending backwards over anal segment such that anal setae are directed posteriorly. (fig.B8/a).....
..... Paraphaenocladius

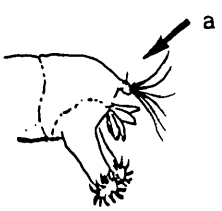


fig.B8/a

- Posterior segments normal..... 14

14, Ventromental plates conspicuous and extending lateral to outher teeth of flattened mentum. S I never bifid..... 15

- Ventromental plates weak or vestigial; if large then beard present, or S I bifid or both..... 20

15. All S setae simple.Ventromental plate arrow and elongate (fig.B9/a).....
..... Nanocladius ..... (p. 119)

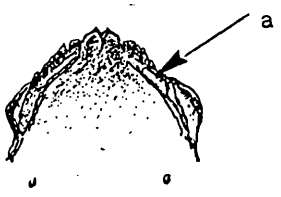


fig.B9/a

- S I never simple.Ventromental plate broader and less elongate..... 16

16. Distinct to weak, paired labral lamellae (fig.B10/a) present between the bases or below S I setae. Premandible with brush (fig.B10/b).....
..... Chaetocladius ..... (p. 94-96)

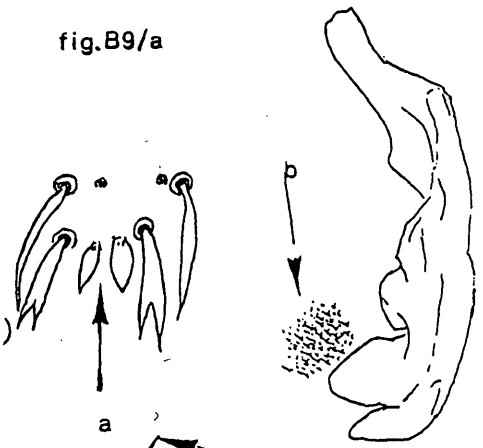


fig.B10/b

- Labral lamellae usually not present or not visible, Premandible without brush..... 17

17. Antenna 7-segmented, segment 7 vestigial (fig.B11/a) 18

- Antenna at most 6-segmented, segment 6 vestigal 19

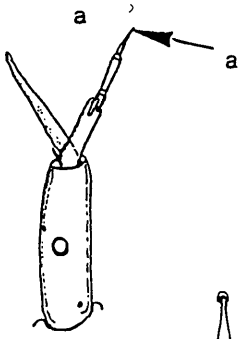


fig.B11/a

18. Mentum with 4-pair of lateral teeth.Premandible simple.Pecten epipharyngis consisting of 3 dark spines (fig.B12/a).....
.....Paratrissocladius

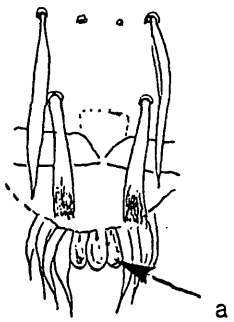


fig.B12/a

- Mentum with 5-pairs of lateral teeth.Premandible bifid (fig.B13/a)Pecten epipharyngis consisting of 3 pale, weakly sclerotized scales.....
..... Heterotrissocladius ...(p. 114,115)

19. S I frequently with 3-4 branches.Premandible with one apical tooth.....
..... Parakiefferiella

fig.B13/a

20. Beard present beneath ventromental plates, when weak, either anal tubules absent or median mental tooth broad, single, rounded and paler than lateral teeth..... 21

- Beard absent, or very weak,anal tubules present and median mental tooth not paler than lateral teeth..... 25

21. S I seta simple..... 22

- S I seta bifide,plumose or palmate..... 24

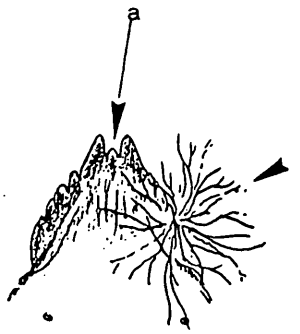


fig.B14/a

22. Median mental teeth small, much shorter than first pair of lateral teeth. (figB14/a)

..... Parorthocladius
(p. *146,147*)

- Median mental teeth much longer than the first pair of lateral teeth..... 23

23. Abdominal segments7-10 each with alternating simple and plumose setae, 2 of each setal type on each side of each segment. (fig.B15/a).....

..... Synorthocladius
(p.*158,159*)

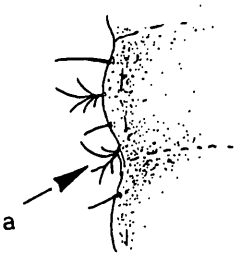


fig.B15/a

24. S I bifid.Mentum with 2 median teeth and 5 pairs of lateral teeth.Beard distinct.....

..... Rheocricotopus..... (p. *149-152*)

25. S I simple, or with very weak apical bifurcation Labral lamellae absent.When body setae more than half as long as corresponding body segment than mentum with first pair of lateral teeth higher than second..... 26

- S I clearly bifid, or if simple then either labral lamellae present or body with some simple setae at least as long as half corresponding body segment length and first pair of lateral mental teeth not conspicuously higher than second (Tvetenia) 27

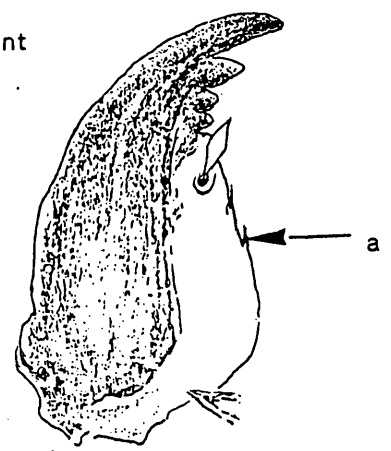


fig.B16/a

26. Inner margin of mandible with spines (fig.16/a)

..... Eukiefferiella (p.*104-111*)

- inner margin of Mandible without spines. Abdominal segments with long setae ortufts (fig.B17/a) of setae.Mentum with elongate broad median tooth and 2pairs of lateral teeth.....

.....Symposiocladius.... (p. *156,157*)

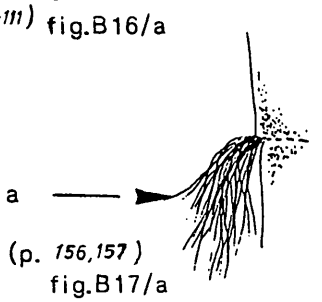


fig.B17/a

27. S I bifid.lateral lamellae absent..... 28
- S I palmate,pectinate or simple;labral lamellae present or absent..... 33

28. Some body segments with tufts of setae.....
..... Cricotopus ..... (p. 98-103)

- Body segments wth only simple setae.. 29

29. Mentum with at most 6 pairs of lateral teeth..... 3o

3o. Antenna usually with 5 segments,if with 4 segments and weak Lauterborn organs, then the lateral mental teeth decrease evenly in size..... 31

31. Caput brown to dark-brown.....
..... Orthocladius 1...(p. 122-124,130-131, 134-135,)
- Caput lighter brown..... 32
..... Orthocladius 2 ..(p. 120-121, 128-129, 132-133,166-169)

32. First lateral mental tooth bulbous, broader at middle of tooth than at base.....
..... Paratrichocladius I.... (p. 139-143)
- First lateral mental tooth not bulbous, covered by the extensions of a huge pale triangular median tooth.....
..... Paratrichocladius II ..... (p. 144-145)

33. Labral lamellae present as long pectinate lobes lying nearly contiguously between the bases of S I (fig.B18/a) and pecten epipharyngis.....
..... Brillia ..... (p. 91-93)

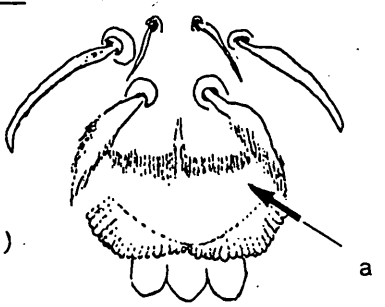


fig.B18/a

- Labral lamellae, if present, either simple or if pectinate, not contiguous and never elongate and lying between the bases of the S I setae..... 34

34. Some setae on the abdomen at least 1/2 as long as the segments bearing them.... 35

- No abdominal setae as long as this..... 36

35. Premandible with one apical tooth... ..... Tvetenia ..... (p. 162-165)

- Premandible with more than one apical tooth..... 36

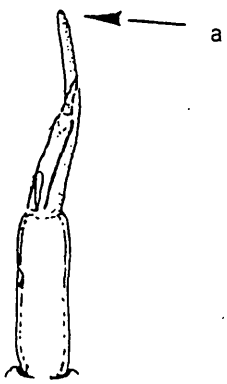


fig.B19/a

36. Antennal blade extending beyond terminal antennal segment by the same length again. (fig.B19/a) Two median teeth divided by a U-shaped notch..... ..... Heleniella ..... (p. 112-113)

- Antenna normal or reduced;when normal blade not extending beyond terminal antennal segment.Median teeth divided by a more V-shaped notch..... 37

37. Premandible without brush, with 2-6 teeth. Labral lamellae absent or weak..... 38

- Premandible with brush,and 2-4 teeth. Labral lamellae when present, distinct and paired, separate or fused at base..... 39

38. Distinct tooth at base of mentum.Labral lamellae absent. ..... Limnophyes ... (p. 116-117)

- Without distinct tooth at the base of mentum.Antenna 4-6segmented.Labral lamellae present but weak.S.l.plumose..... ..... Parametriocnemus .. (p. 136-138)

39. Supraanal setae short. Labral lamellae consisting of bellshaped structures. Antenna strongly reduced.....
..... Metriocnemus

- Supraanal setae long. Labral lamellae paired, with separate bases. Antenna never reduced.
..... 40

40. Ventromental plates distinct, extending laterally to outer mental tooth. Labral lamellae present. Pecten galearis present.....
..... Chaetocladius..... (p. 94-96)

Subfamily DIAMESINAE

1. Mentum toothless. Premandible with 15 or more small, pointed teeth..... ..... Potthastia I ..... (p. 174-175)

- Mentum toothed. Premandible with 13 or less teeth; teeth not pointed..... 2

2. Median tooth of mentum triangular, separated (fig.:D2/a) from first lateral teeth by deep V-shaped notches. Pecten epipharyngis consisting of 7 scales..... Pseudodiamesa.... (p. 178)

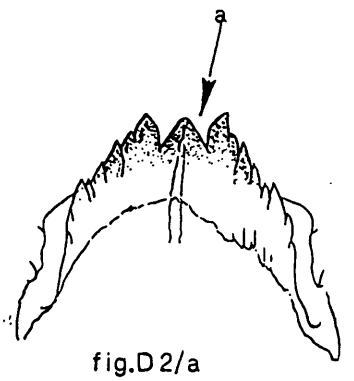


fig.D2/a

- Median tooth or area of mentum more rounded Pecten epipharyngis consisting of 3 or 5 scales 3

3. Median mental tooth narrow with V-shaped notch..... Diamesa I ..... (p. 170-172)

- Median mental tooth broader..... 4

4. Median mental tooth fairly divided 2 times Premandible with 4 apical teeth..... ..... Diamesa II.....(p. 173)
- Median mental tooth not divided. Premandible with 1 apical tooth..... ..... Potthastia II .... (p. 176-177)

Subfamily PRODIAMESINAE

Species: Prodiamesa olivacea ..... (p. 179)

Ventromental plate broad (fig.D4/a); beard strong. Two small median mental teeth present, and 12-14 lateral teeth.

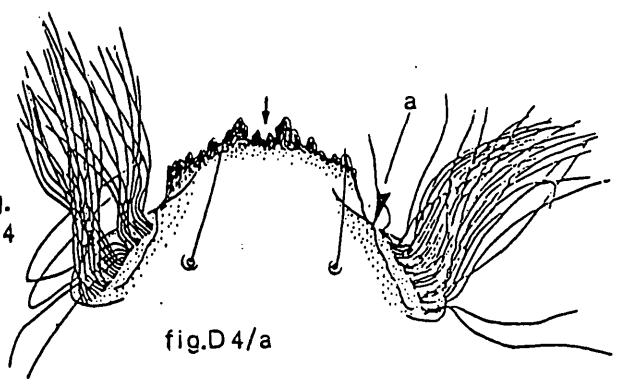
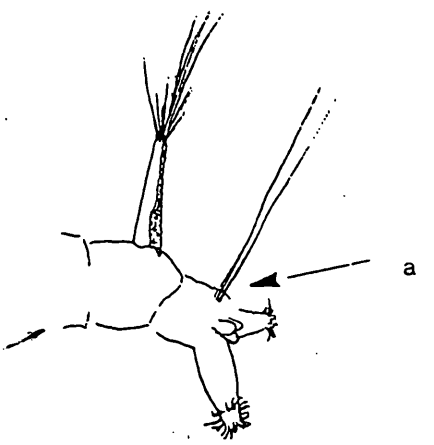


fig.D4/a

Subfamily PODONOMINAE

Species: Paraboreochlus minutissimus

Procercus hyaline anteriorly, blackish posteriorly from base to apex; with 8 setae.
Mentum with 7 pairs of lateral teeth.
Two long, black setae (fig.D1/a) situated before the anal tubules.



Subfamily TANYPODINAE

Key to the Genera of Tanypodinae

1. Head rounded to oval (fig.C1).Cephalic index (ratio of width:length) 0.65-1.0. Dorsomentum (fig.C2/a) with row of teeth;Analtubes at most 2x as long as wide..... 2

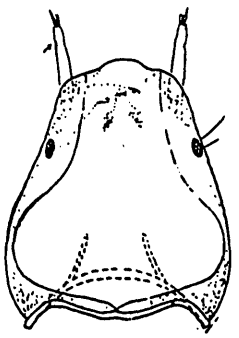


fig.C1

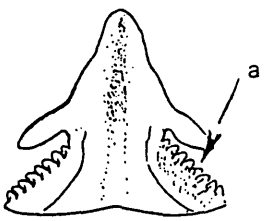


fig.C2/a

- Head longish oval to narrow (fig.C3). Cephalic index .40-0.67. Without row of teeth in aera of mentum..... 3

2. Cephalic index about.080.Mandible with basal tooth and small second point on dorsolateral margin. Toothrow of ligula deeply concave, inner tooth slightly curved toward outer tooth.Dorsomentum with 6-8 large inner teeth and very small outer tooth..... ..... Macropelopia (p.192)

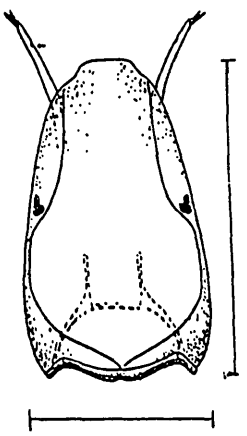


fig.C3

3. Inner tooth of ligula smaller and shorter than middle tooth: middle tooth larger than, or as large as outer tooth. Ring organ (fig.C4/a) situated at base of apical 1/3 of basal segment. Anal tubes longer than posterior parapods..... ..... Nilotanypus (p.190-191)

fig.C4/a

- Inner tooth of ligula larger or more or less equal in length to middle tooth. Lauterborn organs small, at most 1/2 as long as antennal segment 3..... 4

4. Mandible with large basal tooth..... 5

- Mandible with small basal tooth.Point of inner tooth of ligula always curved outwards;middle tooth strongly recessed... 6

5. Teeth of ligula ending more or less in straight line.ligul a narrowed in basal 1/2,.....
..... Zavrelimyia (p. 188-189)

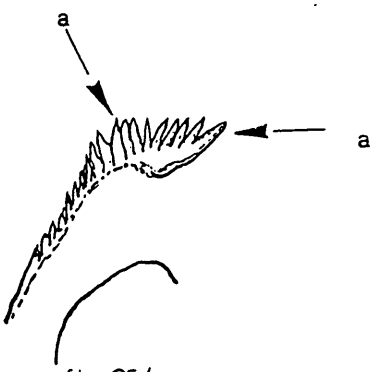


fig.C5/a

6. Ring organ of palp situated in middle 1/3 of basal segment, slightly proximal or distal to middle of segment.Pecten hypopharyngis (fig.C5/a) with large corner tooth and long teeth in the middle of the row..,..... 7

- Ring organ of palp situated in distal 1/3 of basal segment.Pecten hypopharyngis without a strong corner tooth or particularly strong teeth in middle of row..... 8

7. Caput yellow.Mandible weakly curved, slender strongly narrowed in distal 1/2.....
.....Trissopelopia (p.186-187)

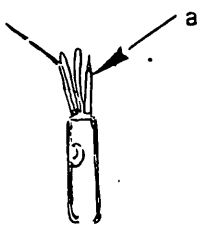


fig.C6/a

8. Maxillary palp with b-setae 2 segmented (fig.C6/a)
.....9

- Maxillary palp with b-setae 3 segmented.....10

9. Pecten hypopharyngis with 20-22 teeth.Ratio of basal segment of antenna to mandible more than 1.8.....
..... Thienemannimyia (p. 183-185)

10.Basal tooth and accessory tooth of mandible insignificant but clearly distinguishable.
..... Conchapelopia (p. 180-182)

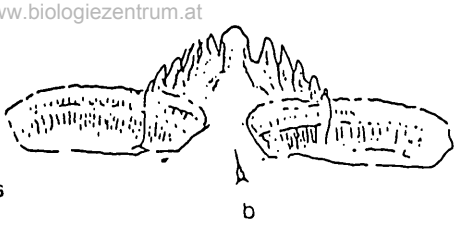


fig.E1/b

1. Base of S I fused; Antenna 5-segmented with Lauterborn organs usually arising distally on segment 2 (fig.:E5/a) often placed on long pedicels. Ventromental plates always present; median separation between ventromental plates variable often less than the width of median mental tooth (fig.:E1/b) ..... Tribe: Tanytarsini 3


fig.E2/a

- Bases of S I separated; Antenna 5 or 6-segmented, with Lauterborn organs never placed on long pedicels. Ventromental plates always present and widly separated. (fig.:E2/a) ..... Tribe: Chironomini 2

2. Bases of S I separated. S I simple, S II blade-like; labral lamella absent. Dorsal tooth of mandible absent..... ..... Tribe: Chironomini I ... 13

- Bases of S I separated. S I, S II plumose Labral lamella present. Dorsal tooth of mandible present..... ..... Tribe: Chironomini II ... 14

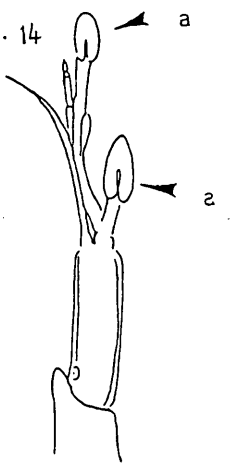


fig.E3/a

3. Ventromental plates separated medially by at least width of 3 median mental teeth... 4

- Ventromental plates almost in contact medially, separated by less than the width of median mental tooth..... 7

4. One Lauterborn organ arising in proximal 1/2 of segment 2 (fig.E3/a) other apically on same segment..... 5

- Both Lauterborn organs arising distally on segment 2..... 6

5. Pecten epipharyngis consisting of 3 slender lobes. Premandible with 2 teeth distally..... ..... Stempellinella (p.200)

6. Lauterborn organs situated on distinct pedicels with conspicuous palmate process mesally..... ..... Stempellina (p. 199)

7. Premandible with 3-5 teeth..... 8

- Premandible with 2 teeth..... 9

8. Mentum with 5 lateral pairs of teeth. Lauterborn organs small and situated on distinct pedicels.
..... Tanytarsus (p.201)

9. Pecten epipharyngis consisting of 3 separate, distally serrated scales. (fig.E4/a)
Lauterborn organs situated on pedicels which are at least 2x as long as segments 3-5 combined....
..... Micropsectra (p.193-195)

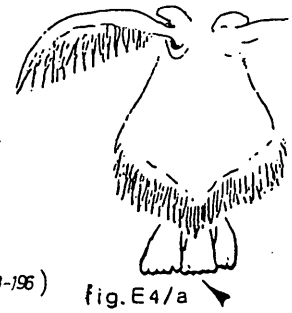


fig.E4/a

- Lauterborn organs situated on pedicels which are no more than 1.5x as long as segment 3-5 combined..... 10

10. Antennal segment 2 longer than more distal segments (fig.E5/a).....
..... Rheotanytarsus (p. 198)

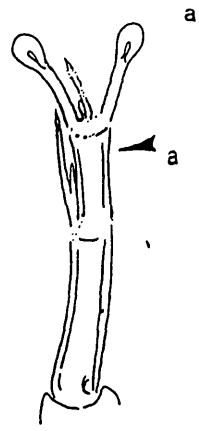


fig.E5/a

- Antennal segment 2 distinctly smaller than the more distal segments .....
..... Neozavrelia (p.197)

11. Antenna 6-segmented. Mentum with 3 pale median teeth. Lauterborn organs alternate on segment2 and 3.....
..... Microtendipes (p.202-203)

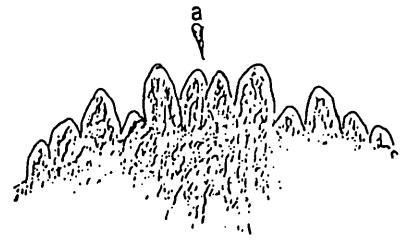


fig.E6/a

- Antenna 5-segmented. Mentum with 4 darkened median teeth.....
..... 12

12. The cental pair of median teeth shorter than than outer pair. (fig. E6/a).....
..... Phaenopsectra (p. 205)

- The central pair of median teeth equal in size or higher than the outer pair.....
..... Polypedilum (p.206-208)

13. Antenna 5-segmented. Mentum with 2 paler median teeth.....
..... Paracladopelma (p.204)

A KEY TO THE SPECIES OF THE LARVAE OF CHIRONOMIDAE AND THEIR INSTARS:

Completed through Regression Analyses of morphological characters between instars.

Peter-Eric SCHMID
sc. ed.
1986

ABBREVIATIONS

n .... number of individuals taken for all measurements
nc .. no count: no measurement possible caused by the effect of preparation

The head capsule breadth (CB) was measured ventrally from the outermost margin of the posterior part of the caput (fig.:2, page 68 Method)

The body length (L) was evaluated as the distance of the postoccipital margin of the head capsule to the claws of the posterior parapods.

The main quantitative morphological characters of the mouthparts have been (fig.:3 & 4, page 68 & 69 Method)

X1: -the distance between the setae submenti (Diamesinae, Orthocladiinae, Chironominae)
-the width of the basal part of the ligula (Tanypodinae)

X2: -the basal width of the median tooth (teeth) (Diamesinae, Orthocladiinae, Chironominae)
-the largest width of the ligula's teeth (Tanypodinae).

X3: -the distance between the setae submenti and the median tooth (teeth) (Diamesinae, Orthocladiinae, Chironominae)
-the distance between the base of the ligula and its outermost tooth projection (Tanypodinae).

X4: -the length of the first antennal segment (Diamesinae, Orthocladiinae, Chironominae)
-the width of the basal part of the antenna (Tanypodinae).

X5: -the length of the flagellum (Diamesinae, Orthocladiinae, Chironominae)
-the total length of the antenna (Tanypodinae).

X6: -the length of the apical tooth and the inner teeth of the mandible (Diamesinae, Orthocladiinae, Chironominae)
-the distance between the apex of the apical tooth and the basal tooth of the mandible (Tanypodinae).

X7: -the total length of the mandible (Diamesinae, Orthocladiinae, Tanypodinae, Chironominae).

DRAWINGS:

with a drawing mirrow (WILD/Heerbrugg) 1.25x
and its magnification of -2.5 (95% of objects)
-1.5 (5% of objects)
under high power magnification of Wild-Fluotar (HI 100/1.30)

BRILLIA modesta

4th instar

Diagnosis:
Caput yellow; occipital margin black. Ant.4-segmented; 2nd segment divided into 2 parts. Lauterborn organ distinct. S I plumose. Labral lamellae with 2 broad lobes.
Mentum with two long median and one small median tooth. 5 pairs of lateral teeth.
Mandible with long seta subdentalis.
Gula darkened.

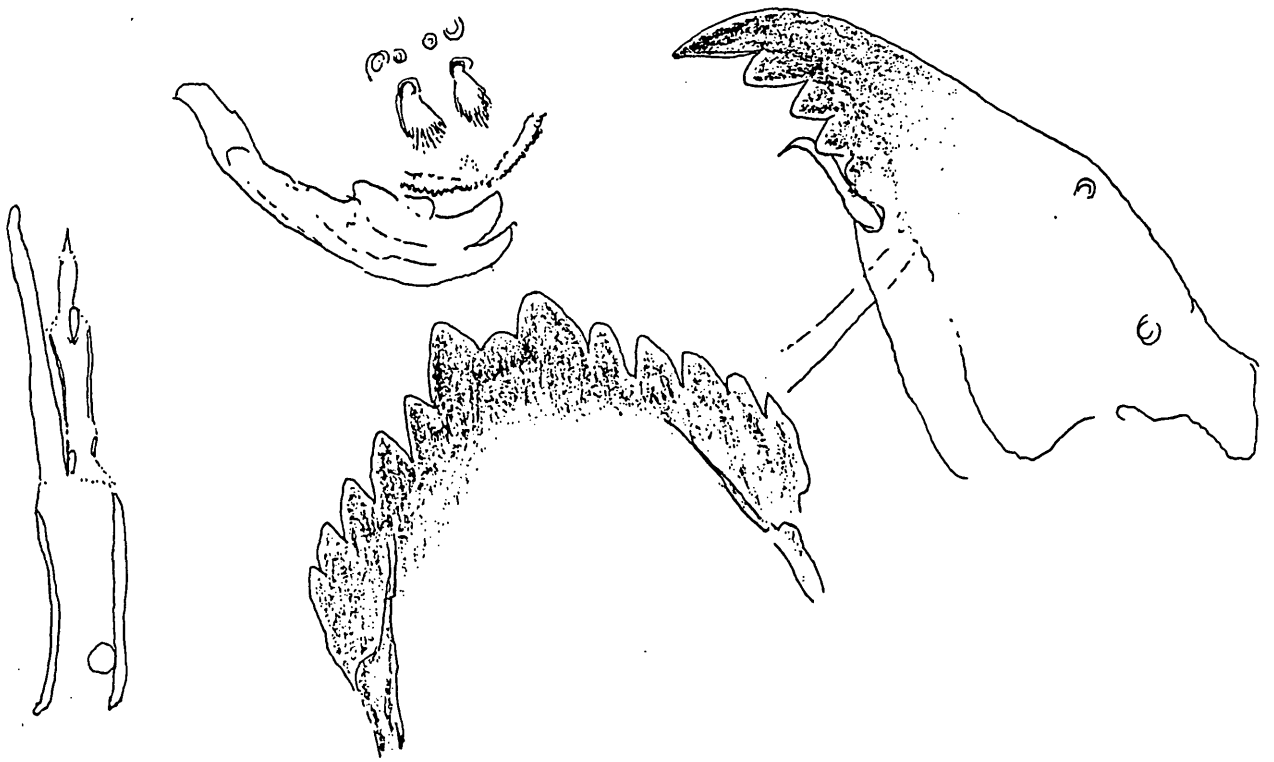
Measurements (n=1)
CB: 530.0 µm
L : 6.00 mm
X1: 187.2 µm
X2: 047.3 µm
X3: 308.5 µm
X4: 089.3 µm
X5: 079.8 µm
X6: 074.5 µm
X7: 239.4 µm

BRILLIA modesta

3rd instar

mag:1000x

Measurements (n=1)
CB: 450.0 µm
L: 3.25 mm
X1: 127.7 µm
X2: 027.7 µm
X3: 186.2 µm
X4: 053.2 µm
X5: 055.3 µm
X6: 040.4 µm
X7: 140.4 µm



BRILLIA modesta

2nd instar

mag: 1000x

Measurements (n=1)
CB: .190.0 µm
L : 1.85 mm
X1: 063.8 µm
X2: 014.9 µm
X3: 111.7 µm
X4: 026.1 µm
X5: 035.1 µm
X6: 022.9 µm
X7: 071.8 µm

BRILLIA modesta

1st instar

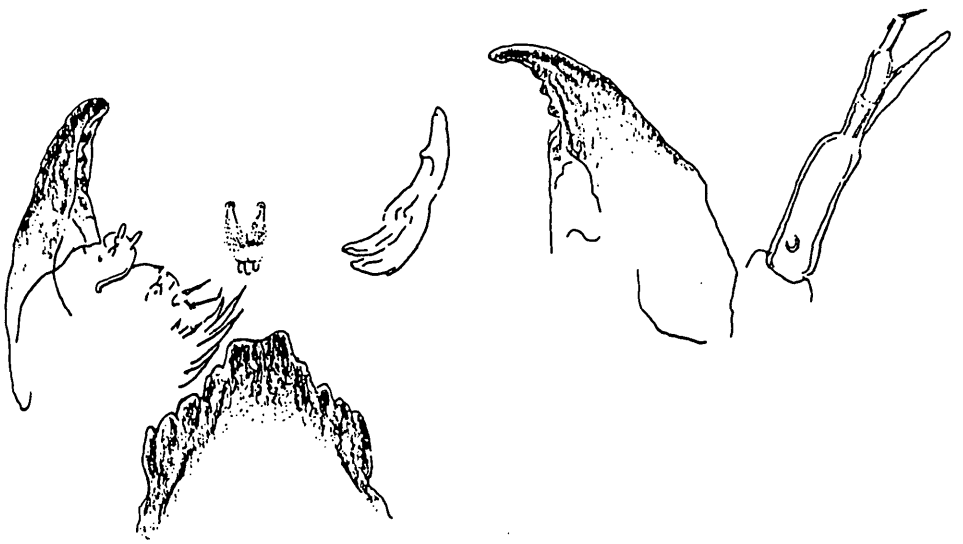
mag:1000x

Measurements (n=1)
CB: 090.0 µm
L : 0.50 mm
X1: 026.1 µm
X2: 009.0 µm
X3: 050.0 µm
X4: 009.6 µm
X5: 023.4 µm
X6: 012.2 µm
X7: 048.4 µm

BRILLIA longifurca 3rd instar mag:1000x

Diagnosis:
Caput yellow; postoccipial margin black. Gula yellow.
Ant.4-segmented; segment 2 divided into 2 parts.
S I plumose. Labral lamellae with 2 pectinate lobes.
Mentum with 2 median teeth and 5 pairs of lateral teeth.

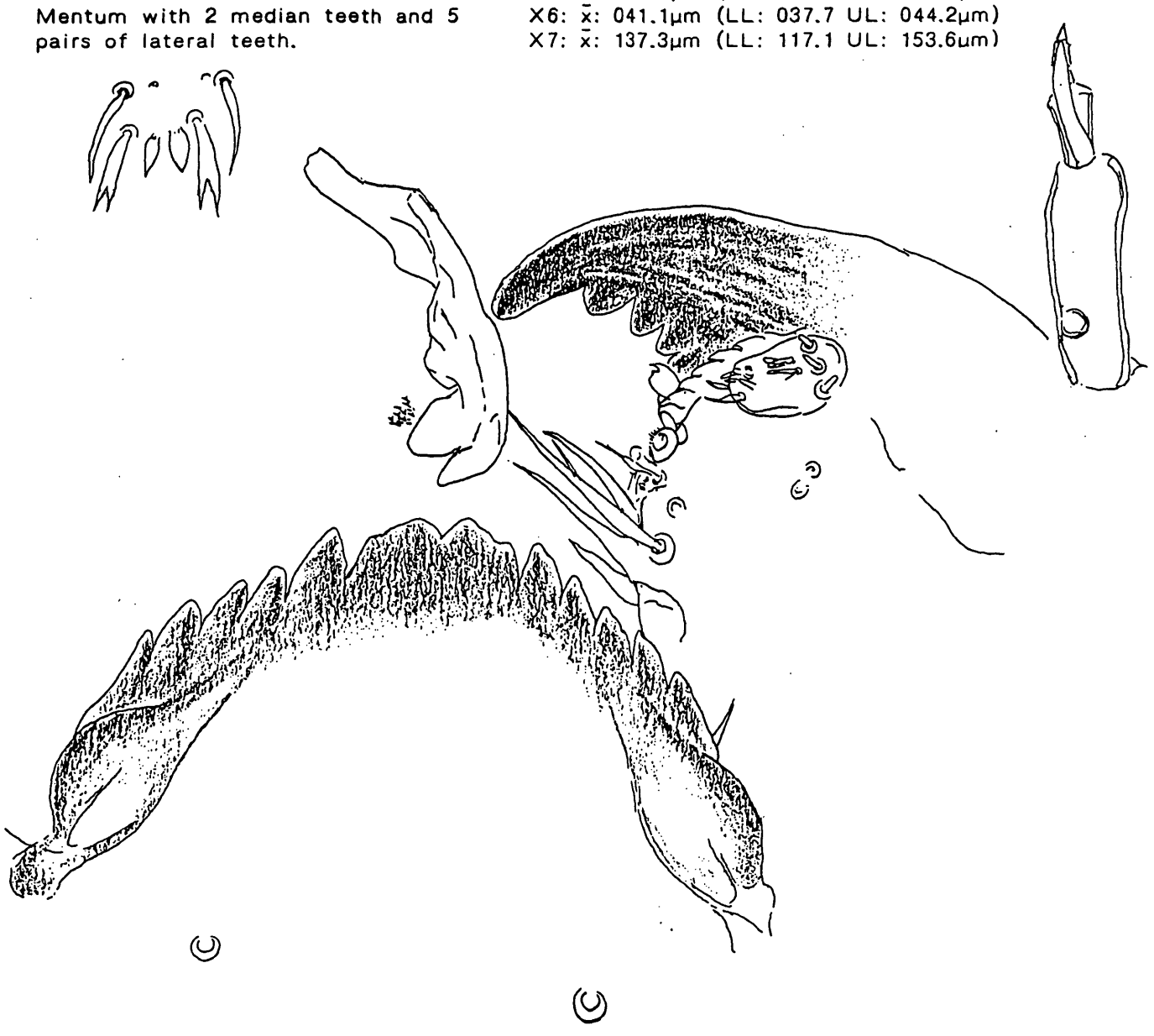
Measurements: (n=1)
CB: 230.0 µm
L : 3.05 mm
X1: 086.4 µm
X2: 026.9 µm
X3: 115.2 µm
X4: 047.5 µm
X5: 046.1 µm
X6: 033.6 µm
X7: 120.0 µm



CHAETOCLADIUS laminatus 4th instar mag:1000x

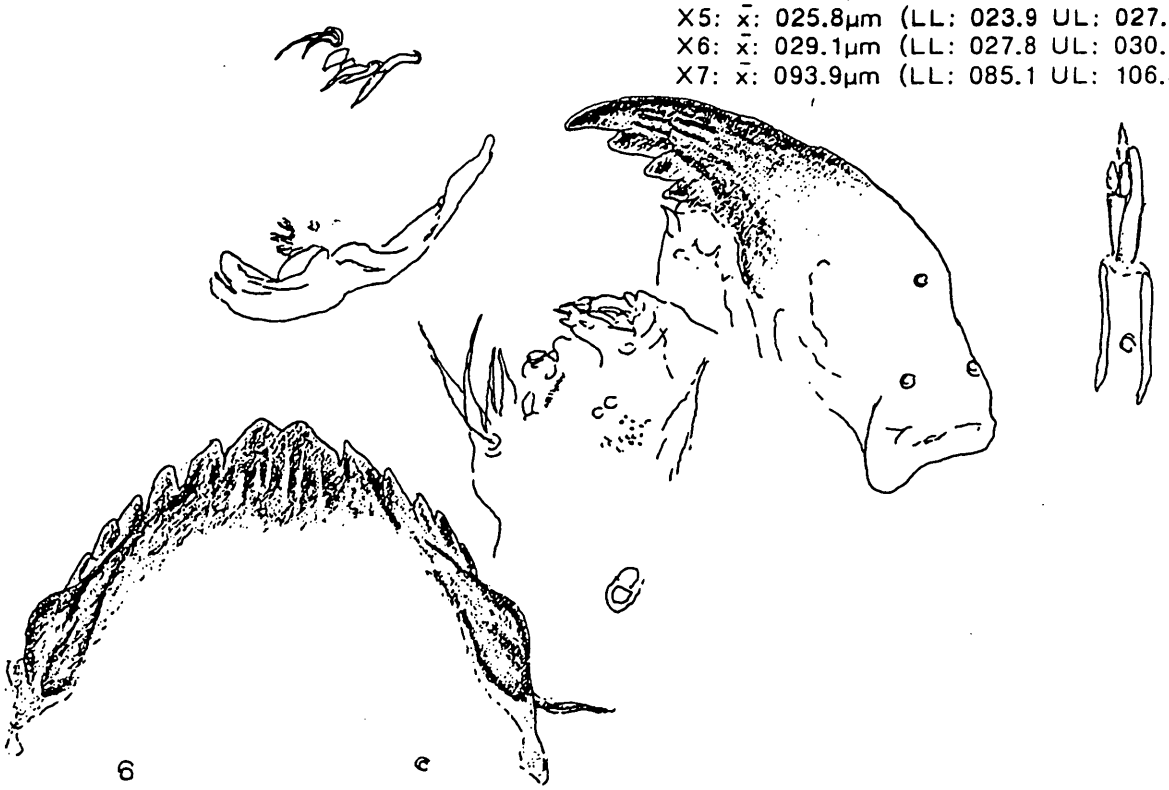
Diagnosis:
Caput light-grey; postoccipital margin black. Ant.5-segmented; blade not reaching the apex. Lauterborn organ distinct. S I bifid only in the distal third. Premandible with 2 apical teeth and 1 blunt, inner tooth; weak brush present. Mentum with 2 median teeth and 5 pairs of lateral teeth.

Measurements: (n=4)
CB: $\bar{x}$: 283.3µm (LL: 260.0 UL: 330µm)
L : $\bar{x}$: 4.767mm (LL: 4.200 UL 5.900mm)
X1: $\bar{x}$: 072.2µm (LL: 065.8 UL: 078.7µm)
X2: $\bar{x}$: 030.4µm (LL: 025.9 UL: 032.6µm)
X3: $\bar{x}$: 087.5µm (LL: 078.7 UL: 095.0µm)
X4: $\bar{x}$: 042.1µm (LL: 041.3 UL: 043.2µm)
X5: $\bar{x}$: 028.1µm (LL: 025.9 UL: 030.7µm)
X6: $\bar{x}$: 041.1µm (LL: 037.7 UL: 044.2µm)
X7: $\bar{x}$: 137.3µm (LL: 117.1 UL: 153.6µm)



CHAETOCLADIUS laminatus 3rd instar mag: 1000x

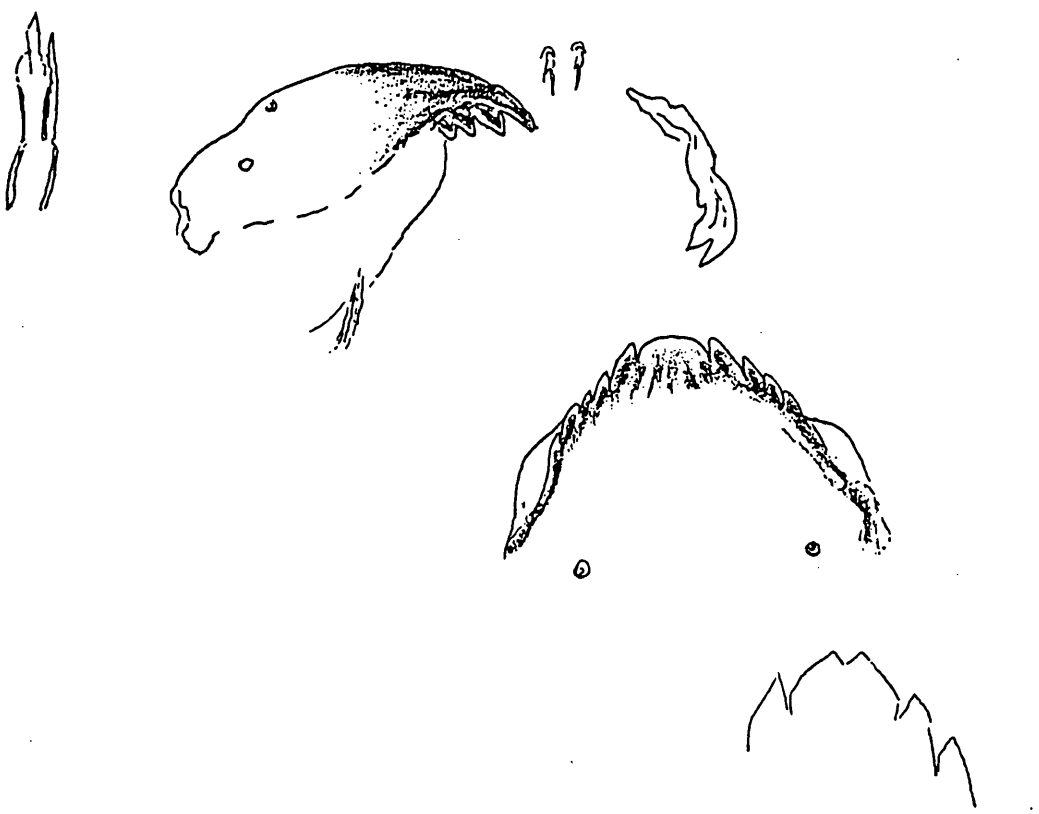
Measurements: (n=3)
CB:: x̄: 210.0µm (LL: 200.0 UL: 220.0µm)
L : x̄: 2.033mm (LL: 1.800 UL: 2.500mm)
X1: x̄: 057.1µm (LL: 053.2 UL: 062.2µm)
X2: x̄: 019.8µm (LL: 019.1 UL: 020.2µm)
X3: x̄: 063.1µm (LL: 060.1 UL: 065.4µm)
X4: x̄: 022.1µm (LL: 021.3 UL: 022.9µm)
X5: x̄: 025.8µm (LL: 023.9 UL: 027.7µm)
X6: x̄: 029.1µm (LL: 027.8 UL: 030.9µm)
X7: x̄: 093.9µm (LL: 085.1 UL: 106.3µm)



CHAETOCLADIUS laminatus 2nd instar mag:1000x

Diagnosis:
Mentum with one rounded median tooth!

Measurements: (n=3)
CB: $\bar{x}$: 160.0µm
L : $\bar{x}$: 1.567mm (LL: 1.300 UL: 1.800mm)
X1: $\bar{x}$: 034.7µm (LL: 034.0 UL: 036.1µm)
X2: $\bar{x}$: 011.5µm (LL: 010.6 UL: 012.8µm)
X3: $\bar{x}$: 041.0µm (LL: 039.4 UL: 042.6µm)
X4: $\bar{x}$: 009.6µm (LL: 008.5 UL: 010.6µm)
X5: $\bar{x}$: 016.9µm (LL: 011.2 UL: 021.3µm)
X6: $\bar{x}$: 018.4µm (LL: 018.1 UL: 019.1µm)
X7: $\bar{x}$: 064.2µm (LL: 058.5 UL: 067.0µm)



CHAETOCLADIUS laminatus 1st instar mag:1000x

Diagnosis:
Mentum with one dome-shaped median tooth and 5 pair of lateral teeth.

Measurements: (n=1)
CB: 100.0µm
L : 0.900mm
X1: 019.1µm
X2: 004.3µm
X3: 025.5µm
X4: 003.3µm
X5: 017.0µm
X6: 012.8µm
X7: 043.6µm

CORYNONEURA lobata

Diagnosis:
Caput lightbrown; postoccipital margin darkened. Ant.4-segmented, longer than caput.
S I simple and strongly developed; Mentum triangular with 3 median teeth, the middle one smaller; and 5 pairs of lateral teeth. First lateral very small.
Apical mandibular tooth ending dorsally of the 4 inner teeth.

4^{th} instar mag: 1000x

Measurements: (n=5)
CB: $\bar{x}$: 124.0µm (LL: 117.2 UL: 130.8µm)
L : $\bar{x}$: 1.273mm (LL: 1.043 UL: 1.529 mm)
X1: $\bar{x}$: 046.6µm (LL: 044.4 UL: 048.7µm)
X2: $\bar{x}$: 004.9µm (LL: 004.4 UL: 005.3µm)
X3: $\bar{x}$: 049.5µm (LL: 046.8 UL: 052.1µm)
X4: $\bar{x}$: 078.7µm (LL: 070.7 UL: 086.8µm)
X5: $\bar{x}$: 111.3µm (LL: 101.2 UL: 121.4µm)
X6: $\bar{x}$: 009.5µm (LL: 009.4 UL: 009.6µm)
X7: $\bar{x}$: 043.8µm (LL: 041.9 UL: 045.7µm)

CORYNONEURA lobata

3^{rd} instar mag: 1000x

Measurements: (n=5)
CB: $\bar{x}$: 090.0µm (LL: 080.0 UL: 100.0µm)
L : $\bar{x}$: 0.813mm (LL: 0.899 UL: 0.989mm)
X1: $\bar{x}$: 031.1µm (LL: 028.0 UL: 034.1µm)
X2: $\bar{x}$: 003.1µm (LL: 003.0 UL: 003.3µm)
X3: $\bar{x}$: 034.8µm (LL: 032.2 UL: 037.4µm)
X4: $\bar{x}$: 041.5µm (LL: 036.8 UL: 046.2µm)
X5: $\bar{x}$: 070.2µm (LL: 062.2 UL: 078.2µm)
X6: $\bar{x}$: 006.1µm (LL: 005.6 UL: 006.7µm)
X7: $\bar{x}$: 030.0µm (LL: 028.8 UL: 031.2µm)

CORYNONEURA lobata

2^{nd} instar

Measurements: (n=1)
CB: 060.0 µm
L : 0.50 mm
X1: 016.0 µm
X2: 001.6 µm
X3: 025.0 µm
X4: 022.3 µm
X5: 038.3 µm
X6: 003.7 µm
X7: 019.7 µm

CRICOTOPUS curtus

4th instar

mag:1000x

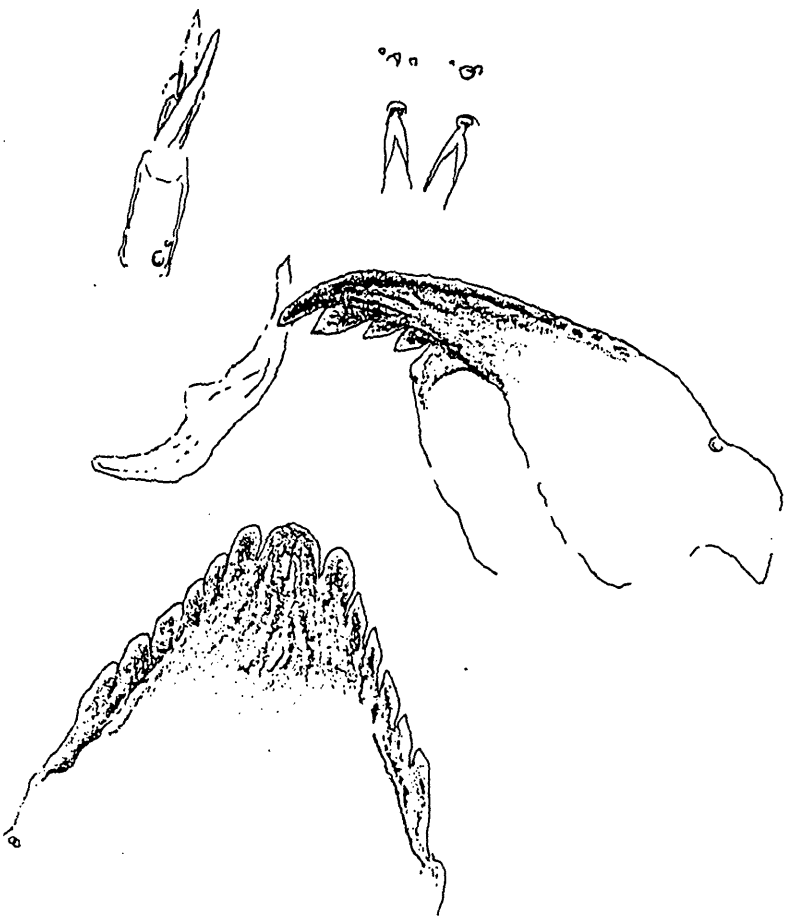
Measurements: (n=4)
CB: x̄: 324.8µm (LL: 283.18 UL: 367.8µm)
L : x̄: 3.366mm (LL. 3.090 UL: 3.660mm)
X1: x̄: 127.3µm (LL: 107.9 UL: 147.1µm)
X2: x̄: 020.1µm (LL: 017.9 UL: 022.3µm)
X3: x̄: 108.3µm (LL: 095.6 UL: 121.9µm)
X4: x̄: 046.1µm (LL: 040.7 UL: 051.5µm)
X5: x̄: 032.5µm (LL: 031.1 UL: 033.8µm)
X6: x̄: 047.4µm (LL: 046.3 UL: 048.5µm)
X7: x̄: 155.1µm (LL: 148.1 UL: 162.2µm)

Diagnosis:

Caput yellow; occipital margin light.
Ant. 5-segmented. Lauterborn organ distinct.
Labrum S I bifid. Premandible with 1 apical tooth.
Mentum with one median and six pairsof lateral teeth.
Mandible dorsally crenulate.

CRICOTOPUS curtus 3rd instar mag:1000x

Measurements: (n=6)
CB: x̄: 191.5µm (LL: 179.4 UL: 204.0µm)
L : x: 2.770mm (LL: 2.418 UL: 3.157mm)
X1: x: 072.1µm (LL: 065.6 UL: 078.7µm)
X2: x: 011.2µm (LL: 010.5 UL: 011.9µm)
X3: x: 066.0µm (LL: 062.8 UL: 069.1µm)
X4: x: 019.2µm (LL: 017.0 UL: 021.4µm)
X5: x: 026.2µm (LL: 025.4 UL: 026.9µm)
X6: x: 026.0µm (LL: 023.6 UL: 028.2µm)
X7: x: 098.6µm (LL: 092.0 UL: 105.3µm)



CRICOTOPUS curtus

2nd instar mag:1000x

Measurements: (n=6)
CB: x: 136.7µm (LL: 131.2 UL: 142.1µm)
L : x: 1.266mm (LL: 1.212 UL: 1.321mm)
X1: x: 040.6µm (LL: 038.5 UL: 042.6µm)
X2: x: 007.6µm (LL: 006.9 UL: 008.2µm)
X3: x: 041.9µm (LL: 038.5 UL: 045.3µm)
X4: x: 007.4µm (LL: 006.3 UL: 008.5µm)
X5: x: 020.0µm (LL: 019.1 UL: 020.8µm)
X6: x: 014.8µm (LL: 012.6 UL: 017.0µm)
X7: x: 056.3µm (LL: 054.1 UL: 058.5µm)

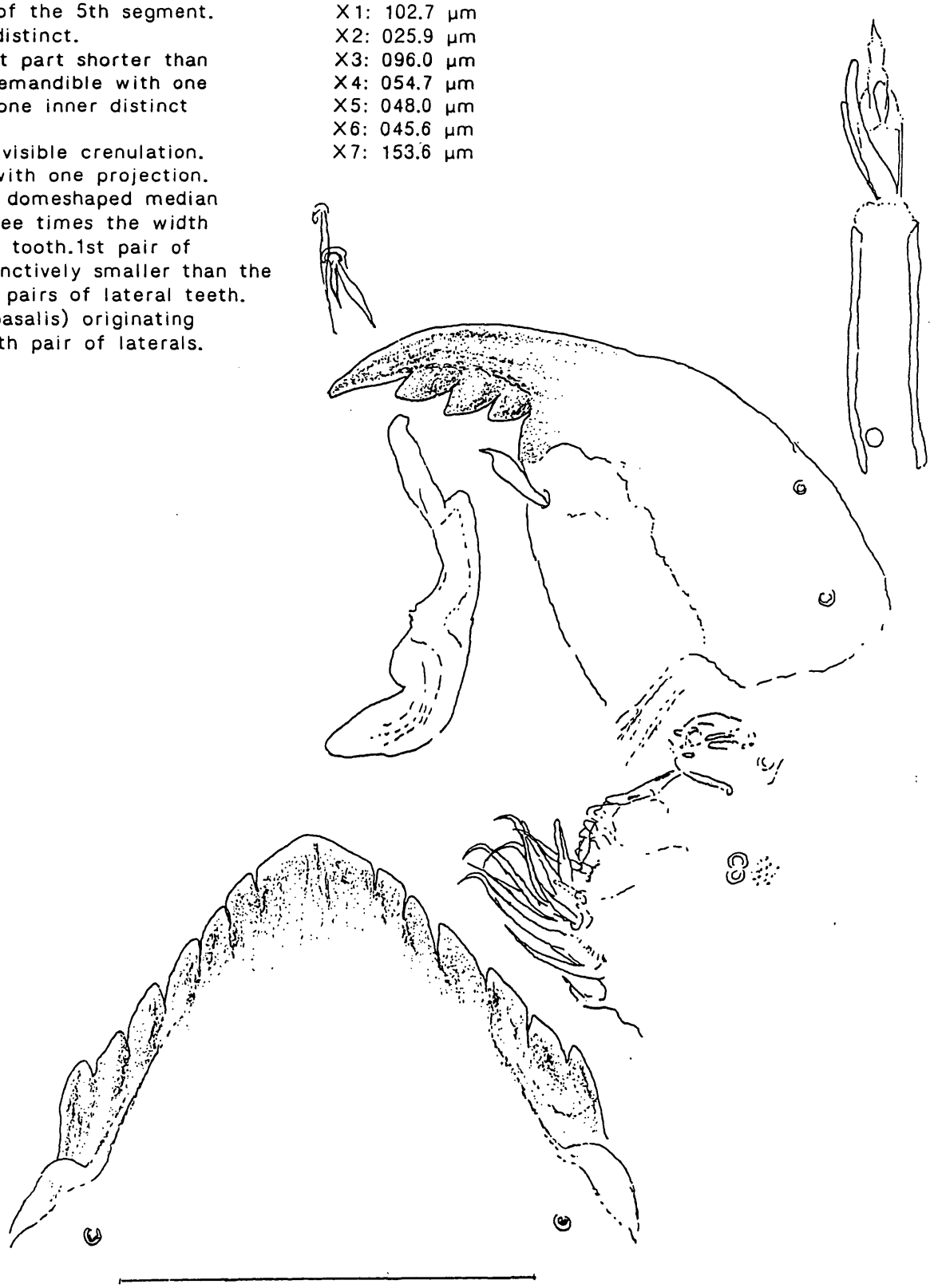
CRICOTOPUS similis

4th instar

mag:1000x

Diagnosis:
Caput yellow; darkbrown postoccipital margin. Ant.5-segmented; blade not reaching the tip of the 5th segment. Lauterbornorgan distinct.
SI bifid; innermost part shorter than outermost part.Premandible with one apical tooth and one inner distinct roundness.
Mandible without visible crenulation.
Seta subdentalis with one projection.
Mentum with one domeshaped median tooth at least three times the width of one 1st lateral tooth.1st pair of lateral teeth distinctively smaller than the following pairs. 6 pairs of lateral teeth.
Setae submenti (basalis) originating beneath the 5th,6th pair of laterals.

Measurements: (n=1)
CB: 310.5 µm
L : nc
X1: 102.7 µm
X2: 025.9 µm
X3: 096.0 µm
X4: 054.7 µm
X5: 048.0 µm
X6: 045.6 µm
X7: 153.6 µm



CRICOTOPUS ? sp.2

Diagnosis:
Caput brown; postoccipital margin dark. Ant.5-segmented; blade not reaching the apex.Lauterborn organ distinct.
S I bifid.Premandible with one tooth. Mandible with long seta subdentalis. and slightly crenulated.
Mentum with one median tooth and 6 pairs of lateral teeth.Ventromental plates distinct.

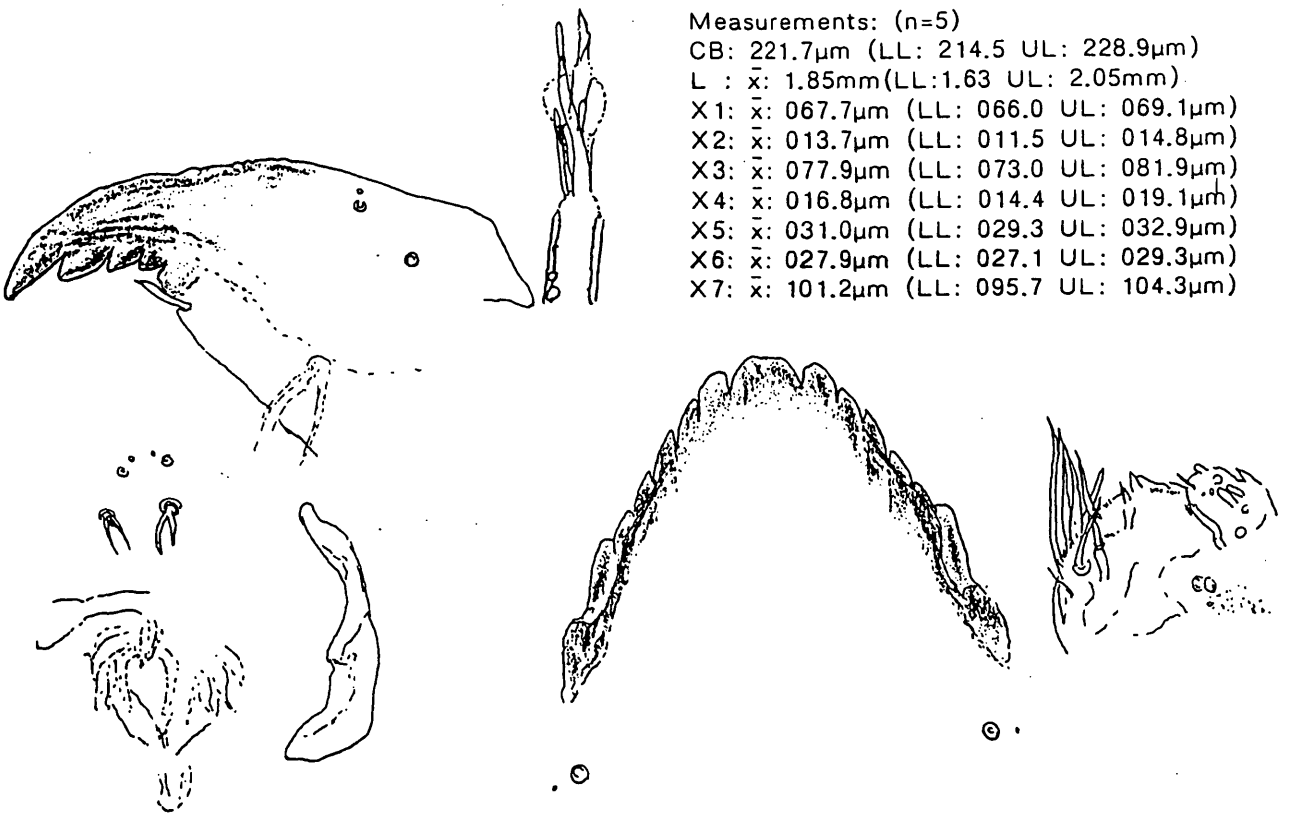
4th instar mag:1000x

Measurements: (n=4)
CB: 274.8µm (LL: 237.5 UL: 313.3µm)
L : $\bar{x}$: 3.40mm (LL: 3.20 UL: 3.60mm)
X1: $\bar{x}$: 105.4 µm (LL: 091.3 UL: 119.5µm)
X2: $\bar{x}$: 019.5µm (LL: 016.1 UL: 023.0µm)
X3: $\bar{x}$: 120.2µm (LL: 114.4 UL: 126.0µm)
X4: $\bar{x}$: 042.1µm (LL: 039.6 UL: 044.6µm)
X5: $\bar{x}$: 035.0µm (LL: 032.7 UL: 037.2µm)
X6: $\bar{x}$: 047.6µm (LL: 043.9 UL: 051.3µm)
X7: $\bar{x}$: 157.7µm (LL: 144.0 UL: 171.6µm)

CRICOTOPUS ? sp.2

3rd instar

mag:1000x



Measurements: (n=5)
CB: 221.7µm (LL: 214.5 UL: 228.9µm)
L : x̄: 1.85mm(LL:1.63 UL: 2.05mm)
X1: x̄: 067.7µm (LL: 066.0 UL: 069.1µm)
X2: x̄: 013.7µm (LL: 011.5 UL: 014.8µm)
X3: x̄: 077.9µm (LL: 073.0 UL: 081.9µm)
X4: x̄: 016.8µm (LL: 014.4 UL: 019.1µm)
X5: x̄: 031.0µm (LL: 029.3 UL: 032.9µm)
X6: x̄: 027.9µm (LL: 027.1 UL: 029.3µm)
X7: x̄: 101.2µm (LL: 095.7 UL: 104.3µm)

CRICOTOPUS ? sp.2

2nd instar

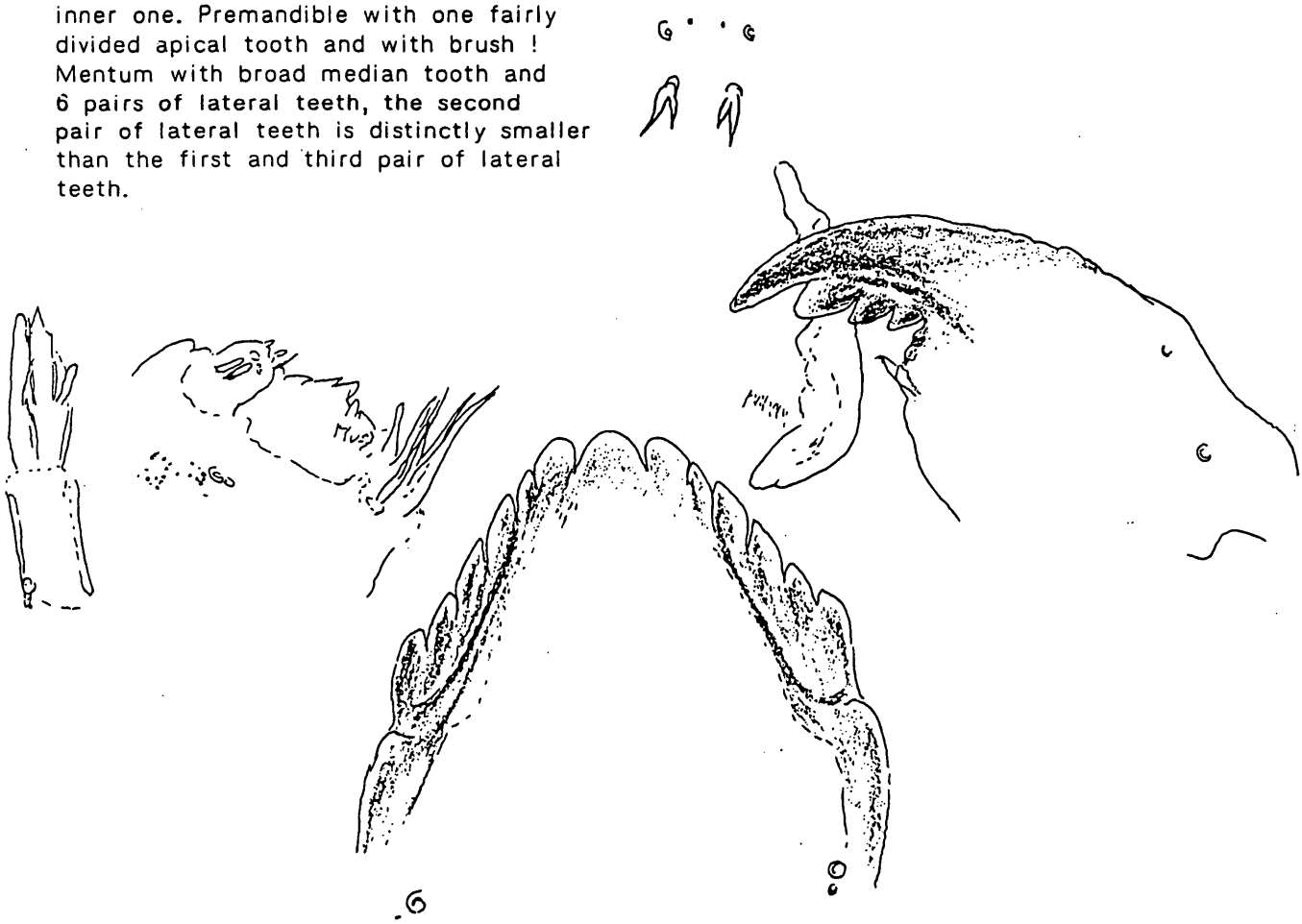
mag:1000x

Measurements: (n=5)
CB: x̄: 154.0µm (LL: 147.2 UL: 160.8µm)
L : x̄: 1.275mm (LL: 0.865 UL: 1.745 mm)
X1: x̄: 044.7µm (LL: 043.1 UL: 046.3µm)
X2: x̄: 009.4µm (LL: 007.8 UL: 011.1µm)
X3: x̄: 048.6µm (LL: 042.1 UL: 055.0µm)
X4: x̄: 008.9µm (LL: 008.1 UL: 009.6µm)
X5: x̄: 022.4µm (LL: 021.3 UL: 023.5µm)
X6: x̄: 018.2µm (LL: 015.8 UL: 020.5µm)
X7: x̄: 064.4µm (LL: 061.8 UL: 066.9µm)

CRICOTOPUS tremulus grp. 3rd instar mag:1000

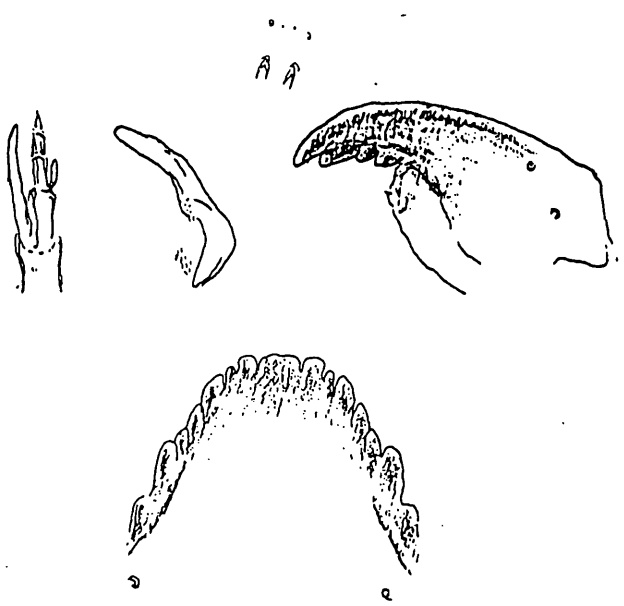
Diagnosis:
Caput light-brown, with dark postoccipital margin; Ant.5-segmented, blade reaching the apex.
S I bifid,outer part of setae longer than inner one. Premandible with one fairly divided apical tooth and with brush ! Mentum with broad median tooth and 6 pairs of lateral teeth, the second pair of lateral teeth is distinctly smaller than the first and third pair of lateral teeth.

Measurements: (n=1)
CB: 220 µm
L : 2.90 mm
X1-X7: nc



CRICOTOPUS tremulus grp. 2nd instar mag:1000x

Measurements: (n=1)
CB: 145.5 µm
L : 1.500 mm,
X1: 047.8 µm
X2: 007.7 µm
X3: 047.9 µm
X4: 009.1 µm
X5: 022.4 µm
X6: 019.1 µm
X7: 068.4 µm



EUKIEFFERIELLA claripennis grp. 3rd?instar mag:1000x

Diagnosis:
Caput brown; with dark postoccipital margin.Ant.4-segmented; blade not reaching the 3rd segment.
S I, S III simple.Praemandible with one slender apical tooth.
Mandible with 2 spines at the inner margin.
Mentum with 2 median teeth and 5 pairs of lateral teeth.

Measurements: (n=3)
CB: $\bar{x}$: 149.9µm (LL: 132.6 UL: 167.6µm)
L : $\bar{x}$: 1.350mm (LL: 1.200 UL: 1.500mm)
X1: $\bar{x}$: 030.5µm (LL: 029.1 UL: 032.0µm)
X2: $\bar{x}$: 007.7µm (LL: 006.1 UL: 009.4µm)
X3: $\bar{x}$: 045.7µm (LL: 041.3 UL: 050.1µm)
X4: $\bar{x}$: 022.5µm (LL: 011.2 UL: 033.9µm)
X5: $\bar{x}$: 023.3µm (LL: 018.1 UL: 028.6µm)
X6: $\bar{x}$: 015.0µm (LL: 013.3 UL: 016.6µm)
X7: $\bar{x}$: 060.7µm (LL: 054.7 UL: 066.9µm)

EUKIEFFERIELLA claripennis grp. 2nd?instar mag:1000x

Measurements: (n=1)
CB: 090.0 µm
L : 0.800 mm
X1: 019.1 µm
X2: 004.8 µm
X3: 031.9 µm
X4: 010.6 µm
X5: 017.0 µm
X6: 010.0 µm
X7: 035.1 µm

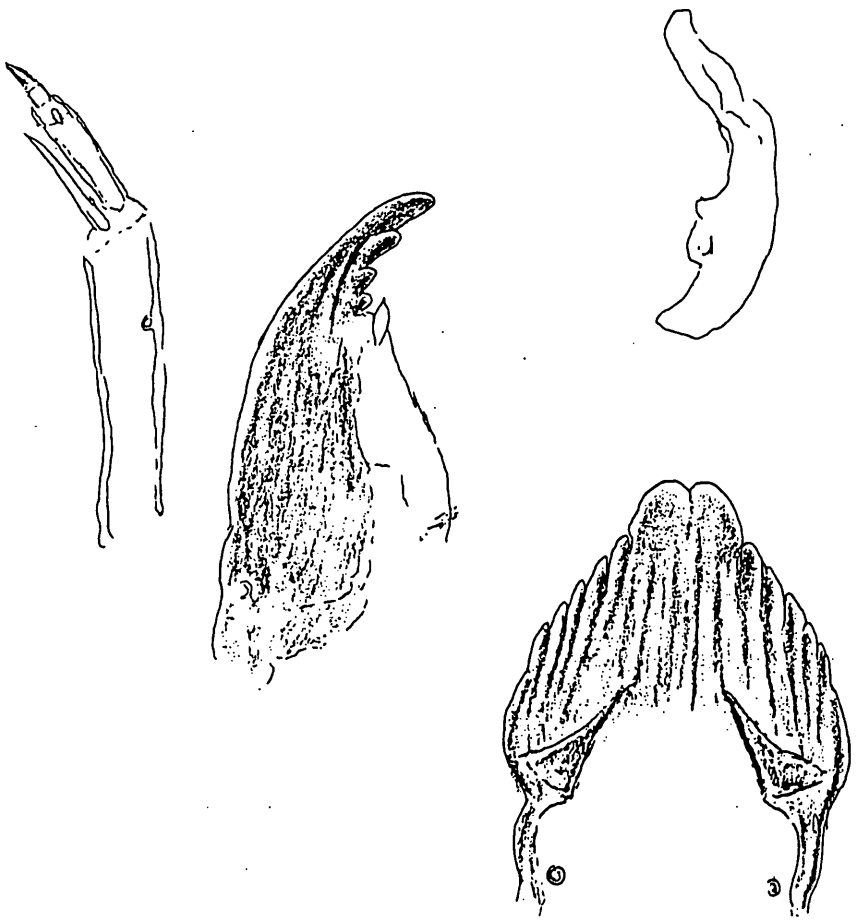
EUKIEFFERIELLA clypeata

4th instar

mag:1000x

Diagnosis:
Caput dark.-brown; postoccipital margin black. Ant: 4-segmented;blade not longer than the 2nd segment.
S I , S III simple; praemandible with one apical tooth;
Mandible with 2 spines at the inner margin.
Mentum with 1 divided median mental bulbous tooth and 5 pairs of lateral teeth.

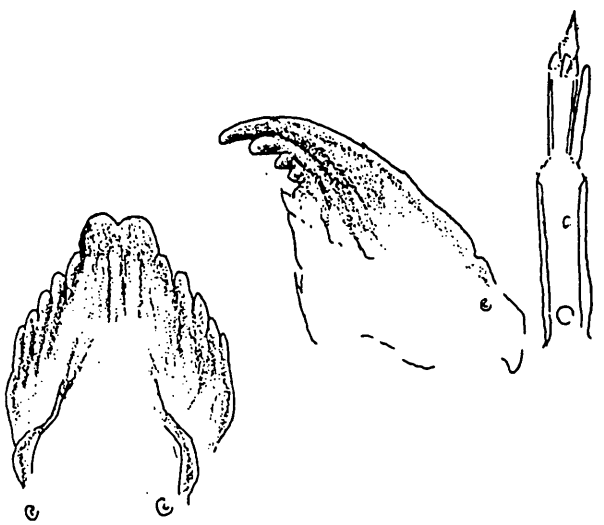
Measurements: (n=3)
CB: $\bar{x}$: 256.1µm (LL: 220.0 UL: 310.0µm)
L : $\bar{x}$: 3.879mm (LL: 3.100 UL: 4.900mm)
X1: $\bar{x}$: 042.1µm (LL: 038.4 UL: 045.8µm)
X2: $\bar{x}$: 020.4µm (LL: 018.7 UL: 021.3µm)
X3: $\bar{x}$: 077.8µm (LL: 070.1 UL: 085.1µm)
X4: $\bar{x}$: 052.7µm (LL: 048.0 UL: 055.7µm)
X5: $\bar{x}$: 032.0µm (LL: 029.8 UL: 035.6µm)
X6: $\bar{x}$: 024.4µm (LL: 020.2 UL: 027.7µm)
X7: $\bar{x}$: 100.0µm (LL: 091.2 UL: 104.6µm)



EUKIEFFERIELLA clypeata

3rd instar

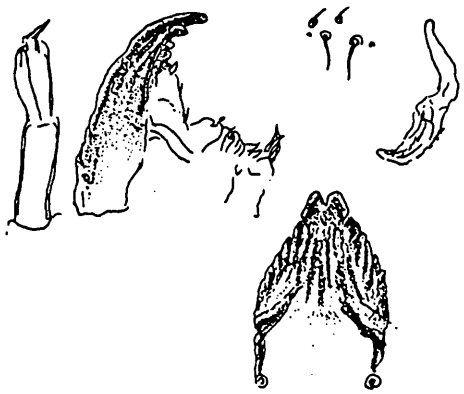
mag:1000x



Measurements: (n=2)
CB: $\bar{x}$: 180.0µm (LL: 160.0 UL: 200.0µm)
L : $\bar{x}$: 1.500mm (LL: 1.400 UL: 1.600mm)
X1: $\bar{x}$: 033.3µm (LL: 031.9 UL: 034.6µm)
X2: $\bar{x}$: 014.6µm (LL: 014.2 UL: 014.9µm)
X3: $\bar{x}$: 056.4µm (LL: 056.4 UL: 056.4µm)
X4: $\bar{x}$: 030.3µm (LL: 028.7 UL: 031.9µm)
X5: $\bar{x}$: 025.6µm (LL: 024.5 UL: 026.6µm)
X6: $\bar{x}$: 018.0µm (LL: 018.0 UL: 018.0µm)
X7: $\bar{x}$: 072.9µm (LL: 069.1 UL: 076.6µm)

EUKIEFFERIELLA clypeata

2nd instar mag:1000x

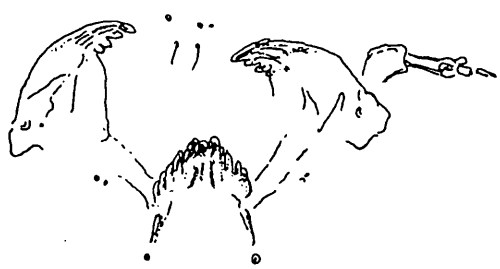


Measurements: (n=3)
CB: $\bar{x}$: 123.3µm (LL: 094.9 UL: 152.4µm)
L: $\bar{x}$: 1.189mm (LL: 0.607 UL: 1.982mm)
X1: $\bar{x}$: 022.8µm (LL: 020.2 UL: 025.3µm)
X2: $\bar{x}$: 008.4µm (LL: 007.1 UL: 009.7µm)
X3: $\bar{x}$: 039.3µm (LL: 034.4 UL: 044.2µm)
X4: $\bar{x}$: 019.8µm (LL: 017.0 UL: 022.5µm)
X5: $\bar{x}$: 021.5µm (LL: 016.7 UL: 026.4µm)
X6: $\bar{x}$: 012.3µm (LL: 010.2 UL: 014.4µm)
X7: $\bar{x}$: 050.4µm (LL: 048.6 UL: 052.2µm)

EUKIEFFERIELLA clypeata

1st instar mag:1000x

Diagnosis:
The first instar differs in the structure of median mental teeth. 3 median teeth within the middle one the smallest.

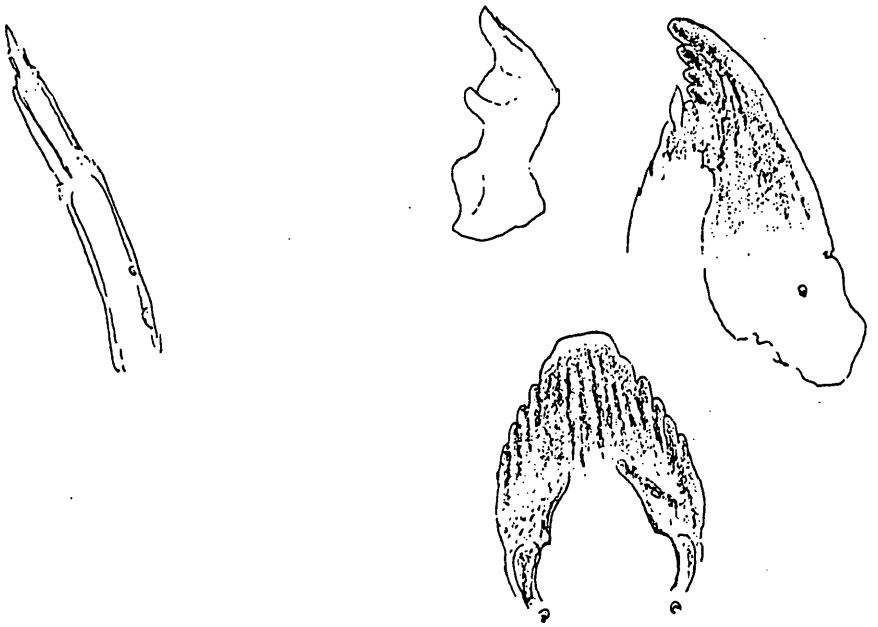


Measurements: (n=3)
CB: $\bar{x}$: 076.7µm (LL: 062.4 UL: 091.1µm)
L : $\bar{x}$: 0.731mm (LL: 0.462 UL: 1.049mm)
X1: $\bar{x}$: 015.7µm (LL: 014.9 UL: 016.4µm)
X2: $\bar{x}$: 006.2µm (LL: 003.4 UL: 009.1µm)
X3: $\bar{x}$: 026.9µm (LL: 022.3 UL: 031.6µm)
X4: $\bar{x}$: 005.0µm (LL: 001.3 UL: 008.8µm)
X5: $\bar{x}$: 018.5µm (LL: 014.8 UL: 022.3µm)
X6: $\bar{x}$: 007.5µm (LL: 006.5 UL: 008.6µm)
X7: $\bar{x}$: 035.8µm (LL: 031.9 UL: 039.8µm)

EUKIEFFERIELLA coerulescens grp. i th instar mag:1000x

Diagnosis:
Caput dark-brown; postoccipital margin black; Ant.4-segmented, blade not reaching 3rd segment.
Mentum with first pair of lateral teeth fused to the median tooth.
Mandible with 2 spines at the inner margin:

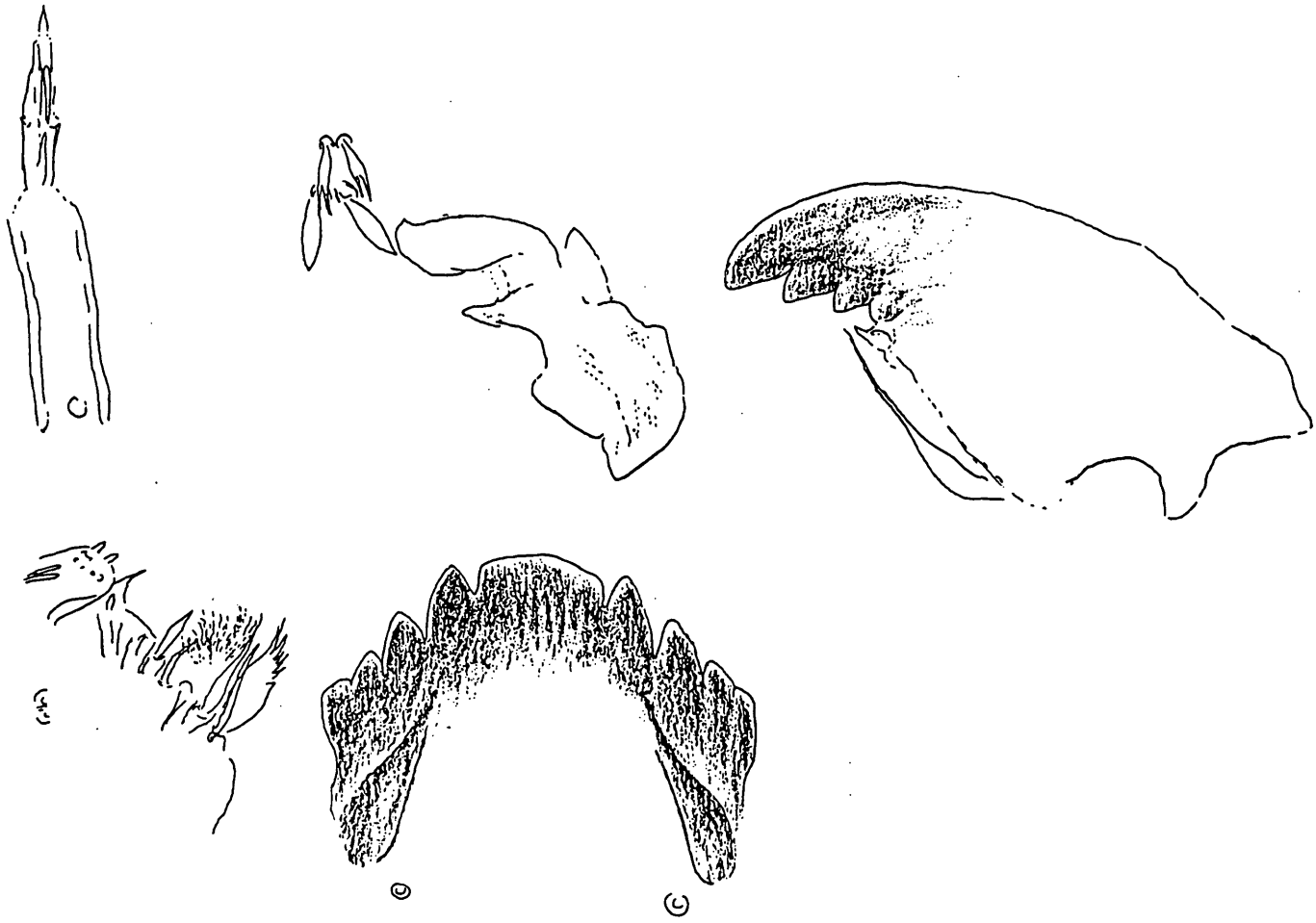
Measurements: none



EUKIEFFERIELLA ilklejensis 4th instar mag:1000x

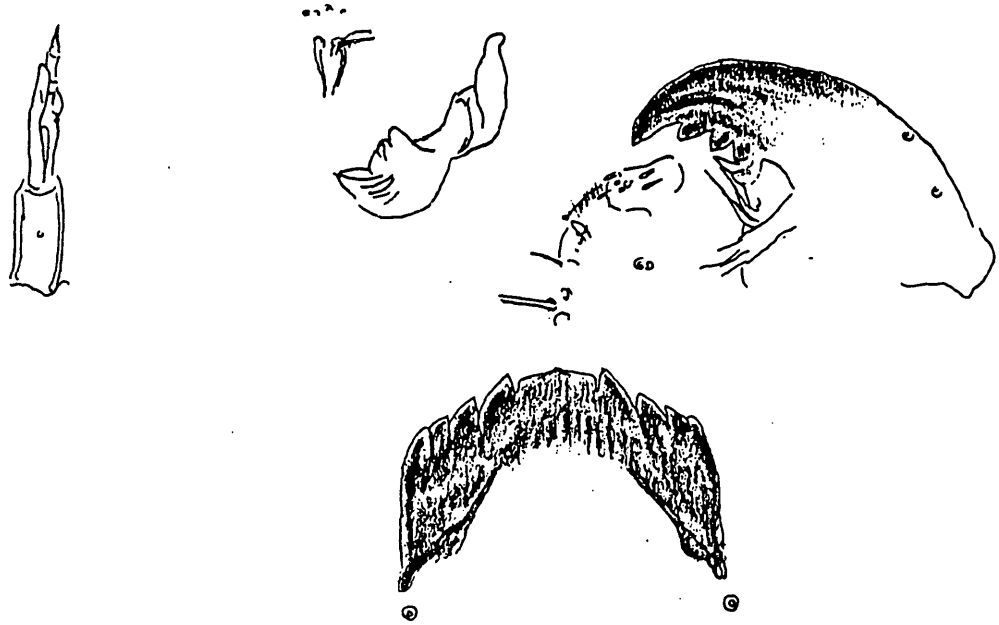
Diagnosis:
Caput dark-brown; postoccipital margin black; Ant.5-segmented; blade not reaching the last segment.
S I simple, S III bifid; Praemandible with large apical tooth.
Mandible with 2 long spines at the base of the mola.
Mentum with one broad median tooth , . . at least twice the width of the first lateral tooth and 4 pairs of lateral teeth.

Measurements: (n=4)
CB: x̄: 302.5µm (LL: 294.6 UL: 310.5µm)
L : x̄: 2.347mm (LL: 2.087 UL: 2.628mm)
X1: x̄: 079.9µm (LL: 071.9 UL: 088.0µm)
X2: x̄: 030.1µm (LL: 023.6 UL: 036.6µm)
X3: x̄: 074.3µm (LL: 074.1 UL: 074.5µm)
X4: x̄: 047.4µm (LL: 042.3 UL: 052.4µm)
X5: x̄: 040.5µm (LL: 031.5 UL: 049.6µm)
X6: x̄: 041.3µm (LL: 036.0 UL: 046.7µm)
X7: x̄: 139.1µm (LL: 124.4 UL: 153.9µm)



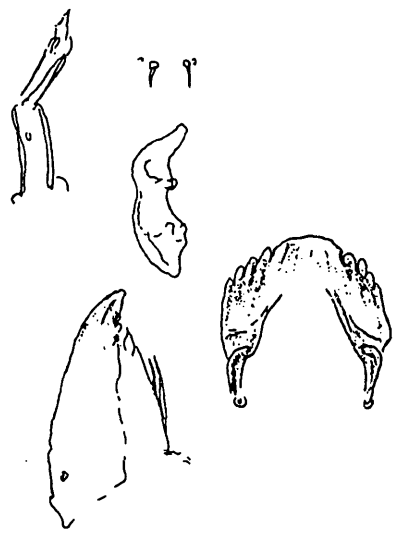
EUKIEFFERIELLA ilklejensis 3rd instar mag:1000x

Measurements: (n=4)
CB: x̄: 194.9µm (LL: 167.8 UL: 222.6µm)
L : x̄: 1.998mm (LL. 1.820 UL: 2.188mm)
X1: x̄: 052.5µm (LL: 043.8 UL: 061.4µm)
X2: x̄; 016.0µm (LL: 014.8 UL: 017.2µm)
X3: x̄: 050.7µm (LL: 045.9 UL: 055.4µm)
X4: x̄: 023.4µm (LL: 019.6 UL: 027.1µm)
X5: x̄: 029.9µm (LL: 027.7 UL: 032.1µm)
X6: x̄: 023.3µm (LL: 020.9 UL: 025.8µm)
X7: x̄: 086.3µm (LL: 081.5 UL: 091.2µm)



EUKIEFFERIELLA ilklejensis 2nd instar mag:1000x

Measurements: (n=1)
CB: 130.0 µm
L : 1.000 mm
X1: 036.2 µm
X2: 007.5 µm
X3: 035.1 µm
X4: 012.7 µm
X5: 024.5 µm
X6: 013.3 µm
X7: 058.5 µm



EUKIEFFERIELLA minor

Diagnosis:

Caput dark-brown; light in the aera of eye spots. Ant.-5-segmented.Blade reaching the 5th segment.
S I, S III simple. Praemandible with one broad apical tooth.
Mandible with 2 long spines at the base of the inner margin.
Mentum with one median tooth at least 3 times wider as the base of the first lateral tooth; 5 pairs of lateral teeth.

4^{th} instar mag:1000x

Measurements: (n=4)

CB: $\bar{x}$: 275.5µm (LL: 224.2 UL: 328.9µm)
L : $\bar{x}$: 3.405mm (LL: 3.303 UL: 3.503mm)
X1: $\bar{x}$: 076.4µm (LL: 067.2 UL: 085.7µm)
X2: $\bar{x}$: 025.9µm (LL: 023.4 UL: 028.5µm)
X3: $\bar{x}$: 089.8µm (LL: 083.4 UL: 096.3µm)
X4: $\bar{x}$: 054.3µm (LL: 048.6 UL: 060.0µm)
X5: $\bar{x}$: 038.7µm (LL: 033.8 UL: 043.6µm)
X6: $\bar{x}$: 034.4µm (LL: 030.0 UL: 038.8µm)
X7: $\bar{x}$: 124.3µm (LL: 117.4 UL: 131.3µm)

EUKIEFFERIELLA minor

3rd instar mag:1000x

Measurements: (n=6)
CB: x̄: 193.2µm (LL: 176.2 UL: 210.5µm)
L : x̄: 2.100mm (LL: 2.000 UL: 2.200mm)
X1: x̄: 055.5µm (LL: 048.3 UL; 062.8µm)
X2: x̄: 016.2µm (LL: 014.7 UL: 017.7µm)
X3: x̄: 054.0µm (LL: 046.7 UL: 061.4µm)
X4: x̄: 022.4µm (LL: 018.9 UL. 025.8µm)
X5: x̄: 029.3µm (LL: 026.2 UL: 032.3µm)
X6: x̄: 022.8µm (LL: 020.3 UL: 025.3µm)
X7: x̄: 084.5µm (LL: 074.8 UL: 094.4µm)

50µm

EUKIEFFERIELLA minor

2nd instar mag:1000x

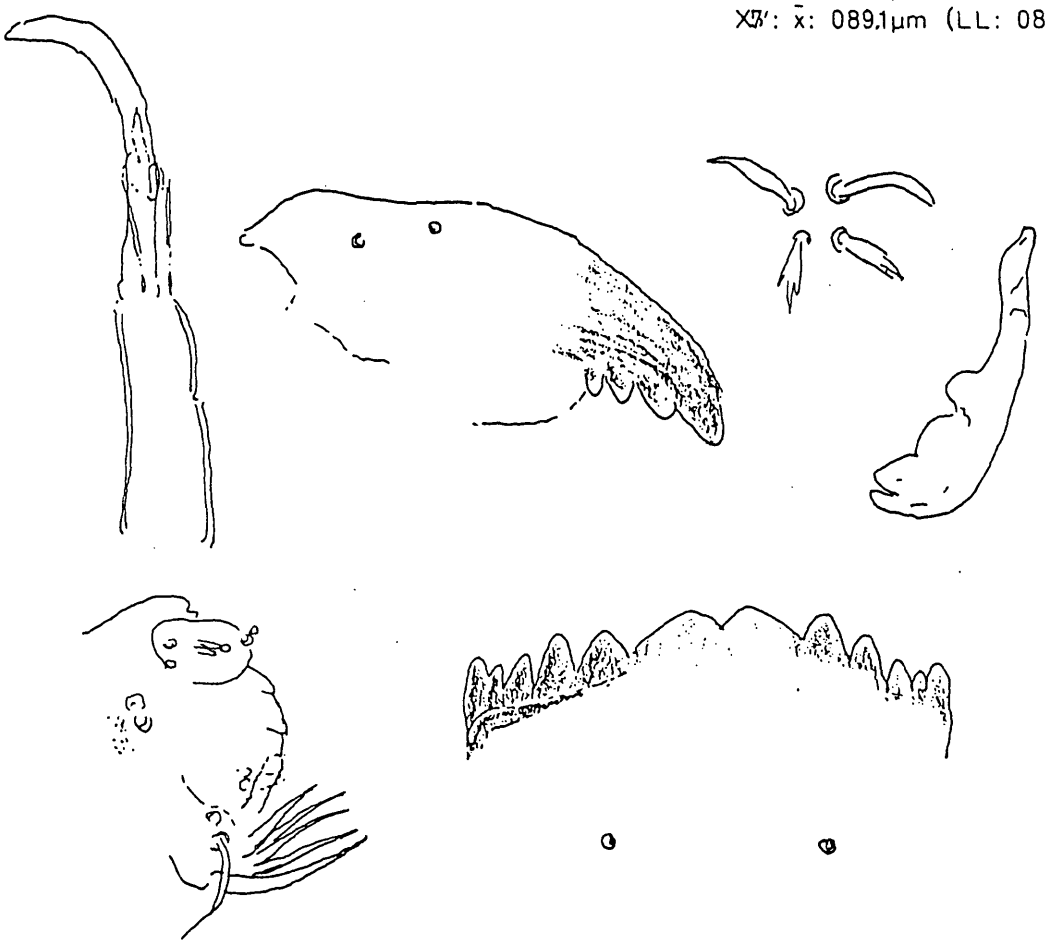
Measurements: (n=6)
CB: x̄: 129.9µm (LL: 112.4 UL: 147.6µm)
L : x̄: 1.316mm (LL:1.137 UL: 1.510mm)
X1: x̄: 031.9µm (LL: 027.5 UL: 036.2µm)
X2: x̄: 010.0µm (LL: 008.5 UL: 011.5µm)
X3: x̄: 035.8µm (LL: 031.7 UL: 039.8µm)
X4: x̄: 012.6µm (LL: 010.0 UL: 015.2µm)
X5: x̄: 020.9µm (LL: 017.5 UL: 024.3µm)
X6: x̄: 013.9µm (LL: 012.6 UL: 015.3µm)
X7: x̄: 053.3µm (LL: 047.1 UL: 059.5µm)

HELENIELLA ornaticollis (4^{th} instar) mag : 1000x

Diagnosis:

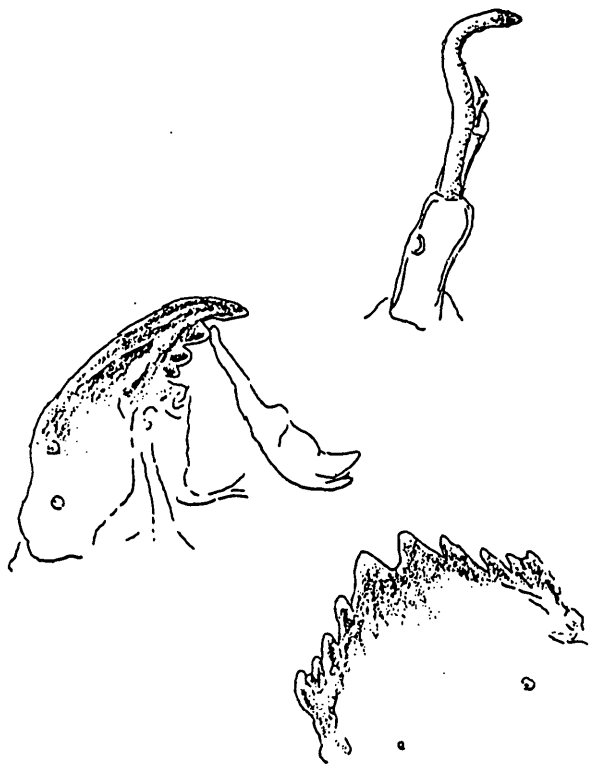
Caput pale.
Ant.5-segmented. Antennal blade extending beyond flagellum, usually by length of the flagellum.
Labrum with S I branched 4-5 times. Premandible with 3 teeth.
Mentum with paired median teeth divided by broad U-shaped notch.

Measurements: (n=4)
CB: $\bar{x}$: 227,4µm (LL: 1925 UL: 263,2µm)
L : $\bar{x}$: 4.699mm (LL: 4.476 UL: 4.930mm)
X1: $\bar{x}$: 037.4µm (LL: 0367 UL: 0432µm)
X2: $\bar{x}$: 029,6µm (LL: 0243 UL: 034,9µm)
X3: $\bar{x}$: 043,4µm (LL: 0362 UL: 050,6µm)
X4: $\bar{x}$: 036.4µm (LL: 0316 UL: 041.1µm)
X6: $\bar{x}$: 025,6µm (LL: 0238 UL: 027,3µm)
X5: $\bar{x}$: 028.7µm (LL: 0234 UL: 034,0µm)
X7: $\bar{x}$: 089,1µm (LL: 0837 UL: 094,5µm)



HELENIELLA ornaticollis 3rd instar mag:1000x

Measurements: (n=3)
CB: x̄: 139,9µm (LL: 0913 UL: 190,7µm)
L : x̄: 2.498mm(LL: 1.265 UL: 4.402mm)
X1: x̄: 025.7µm (LL: 022,1 UL: 029,3µm)
X2: x̄: 019,0µm (LL: 011,8 UL: 026,2µm)
X3: x̄: 036,2µm (LL: 030,5 UL: 042,0µm)
X4: x̄: 022,1µm (LL: 019,8 UL: 024,5µm)
X5: x̄: 022,0µm (LL: 021,9 UL: 022,1µm)
X6: x̄: 017,7µm (LL: 012,7 UL: 022,8µm)
X7: x̄: 064,4µm (LL: 056,1 UL: 072,8µm)



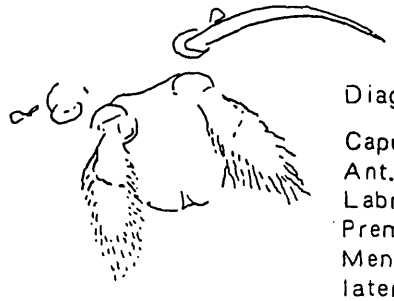
HELENIELLA ornaticollis

2nd instar mag:1000x

Measurements: (n=4)
CB: x̄: 097,4µm (LL: 089,6 UL: 105,9µm)
L : x̄:1.599mm (LL: 1.362 LL: 1.859mm)
X1: x̄: 016,6µm (LL: 012,9 UL: 021,3µm)
X2: x̄: 012,0µm (LL: 010,1 UL: 013,9µm)
X3: x̄: 024,8µm (LL: 018,1 UL: 030,7µm)
X4: x̄: 010,8µm (LL: 008,0 UL: 013,6µm)
X5: x̄: 012,0µm (LL: 009,4 UL: 014,5µm)
X6: x̄: 017,1µm (LL: 012,4 UL: 021,9µm)
X7: x̄: 041,9µm (LL: 033,5 UL: 050,4µm)

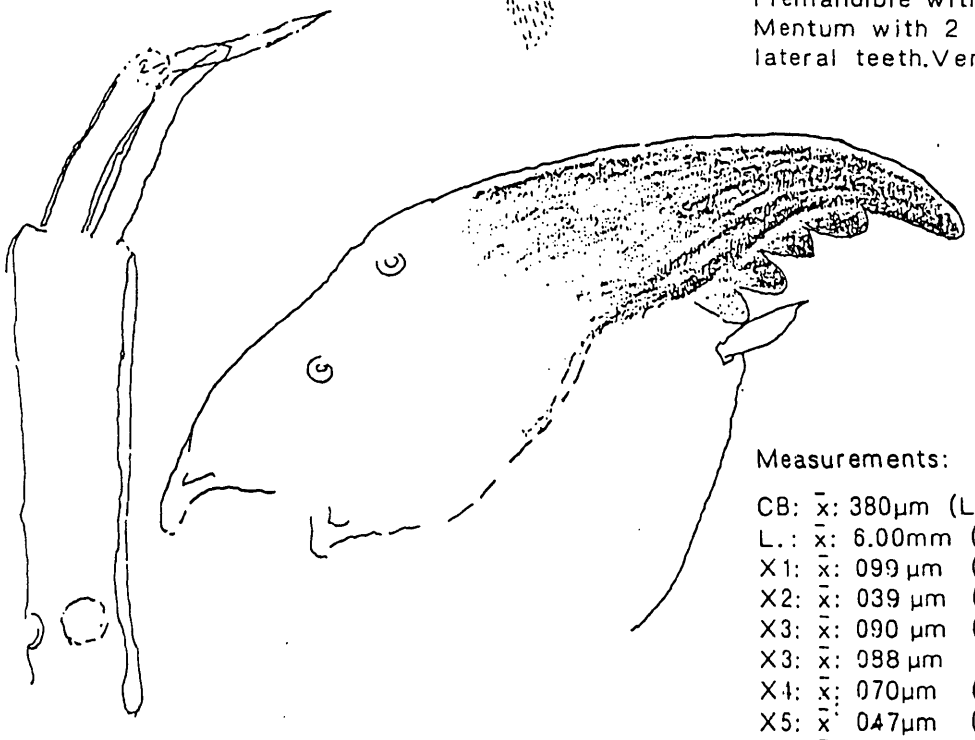
100µm

HETEROTRISSOCLADIUS marcidus (4^{th} instar) mag:1000x



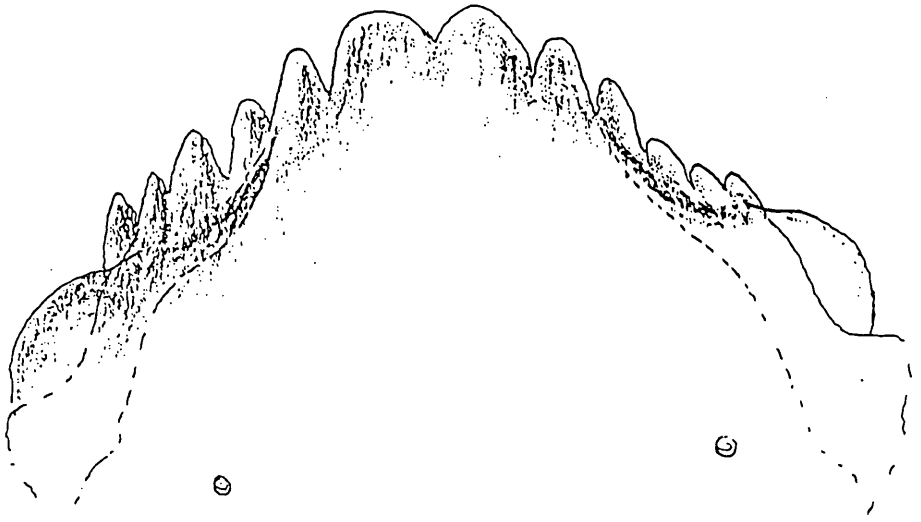
Diagnosis:

Caput yellow.
Ant. 7-segmented
Labrum with plumose S I; two labral lamellae.
Premandible with two indistinct teeth.
Mentum with 2 median teeth and 5 pairs of lateral teeth. Ventromental plate distinct.



Measurements: (n=5)

CB: $\bar{x}$: 380µm (LL: 340 UL: 420µm)
L.: $\bar{x}$: 6.00mm (LL:5.80 UL:6.20mm)
X1: $\bar{x}$: 099 µm (LL:095 UL:104µm)
X2: $\bar{x}$: 039 µm (LL:037 UL:104µm)
X3: $\bar{x}$: 090 µm (LL:038 UL:093µm)
X3: $\bar{x}$: 088 µm (LL:037 UL:049µm)
X4: $\bar{x}$: 070µm (LL:066 UL:075µm)
X5: $\bar{x}$ 047µm (LL:046 UL:049µm)
X6: $\bar{x}$: 159µm (LL:144 UL:174µm)



HETEROTRISSOCLADIUS marcidus 2^{nd} instar mag: 1000x

Measurements: n=5
CB: $\bar{x}$: 134 µm (LL: 123 UL: 145 µm)
L : $\bar{x}$: 1.36 mm (LL:1.01 UL: 1.78 mm)
X1: $\bar{x}$: 029 µm (LL: 025 UL: 034 µm)
X2: $\bar{x}$: 014 µm (LL: 012 UL: 034 µm)
X3: $\bar{x}$: 038 µm (LL: 036 UL: 040 µm)
X4: $\bar{x}$: 021 µm (LL: 019 UL: 023 µm)
X5: $\bar{x}$: 043 µm (LL: 035 UL: 050 µm)
X6: $\bar{x}$: 017 µm (LL: 015 UL: 019 µm)
X7: $\bar{x}$: 066 µm (LL: 061 UL: 070 µm)

HETEROTRISSOCLADIUS marcidus

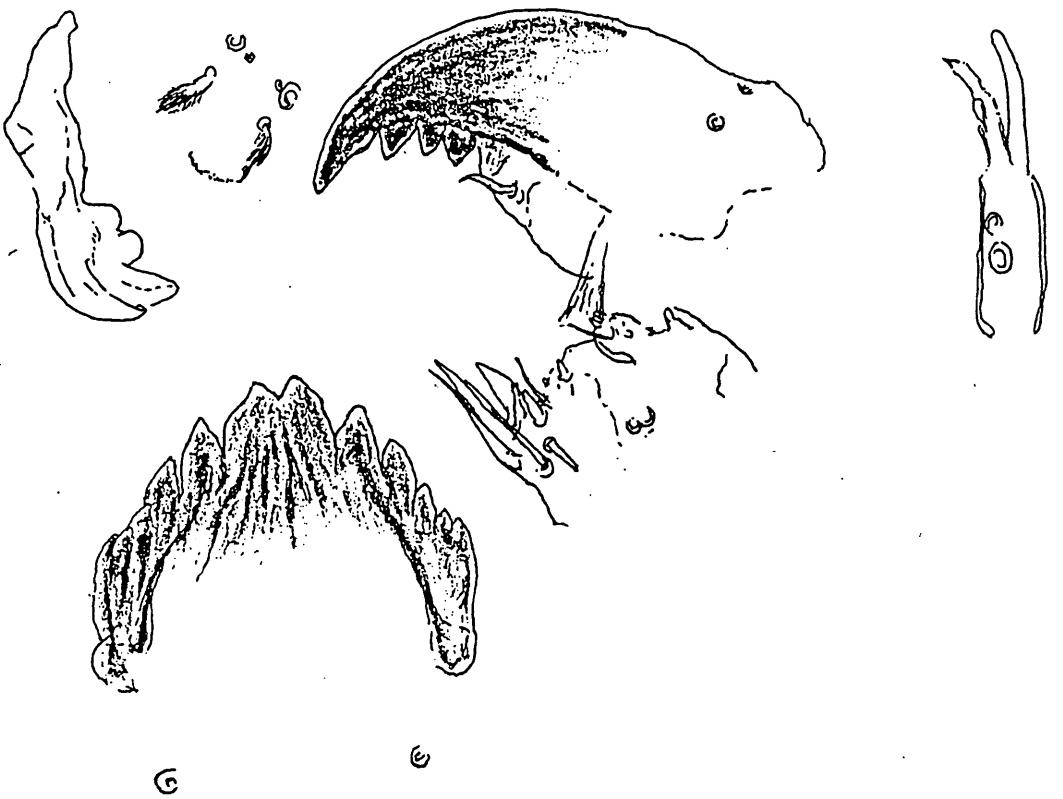
1^{st} to 2^{nd} instar mag:1000x

Measurements: n=2
CB: $\bar{x}$: 095 µm (LL: 090 UL: 100 µm)
L : $\bar{x}$: 1.31 mm (LL: 1.21 UL: 1.42 mm)
X1: $\bar{x}$: 022 µm (LL: 021 UL: 023 µm)
X2: x: 0045 µm (LL: 0043 UL: 0048µm)
X3: x: 0237 µm (LL: 0234 UL: 0239µm)
X4: x: 0043 µm (LL: 0043 UL: 0043µm)
X5: x: 0287 µm (LL: 0287 UL: 0287µm)
X6: x: 0115 µm (LL: 0101 UL: 0128µm)
X7: x: 0442 µm (LL: 0430 UL: 0453µm)

LIMNOPHYES prolongatus 4th instar mag:1000x

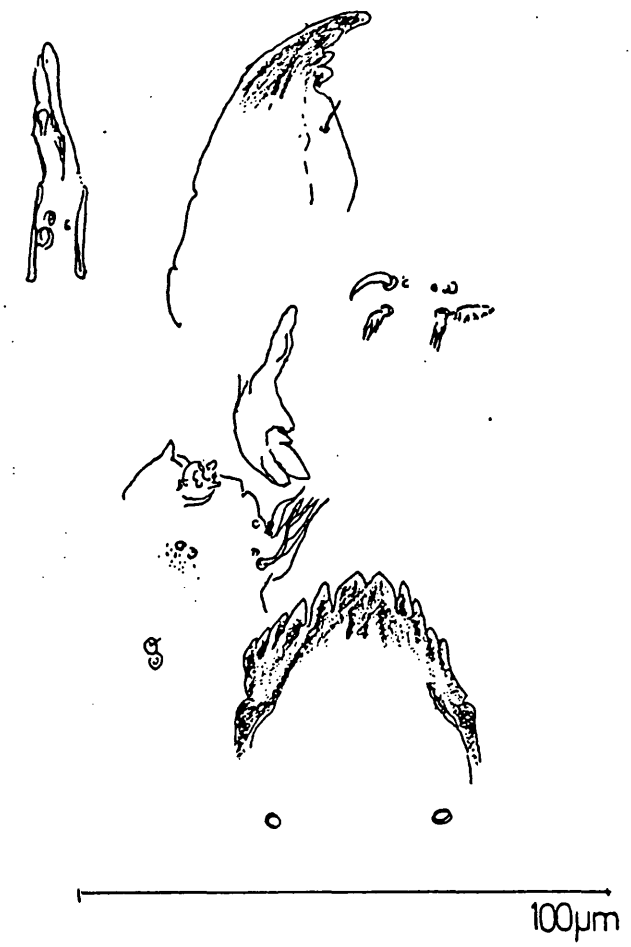
Diagnosis:
Caput yellow; with dark postoccipital margin.Ant.5-segmented; blade longer than flagellum.
S I serrated; Premandible with 2 apical tooth and one inner rounded tooth.
Mandible with thin long seta subdentalis.
Mentum with 2 median teeth and 5 pairs of lateral teeth. Setae submentis originating beneath 3rd pair of lateral teeth.

Measurements: (n=1)
CB: 340.5 µm
L : nc
X1: 058.5 µm
X2: 023.4 µm
X3: 078.7 µm
X4: 029.8 µm
X5: 023.4 µm
X6: 038.3 µm
X7: 117.0 µm



LIMNOPHYES prolongatus

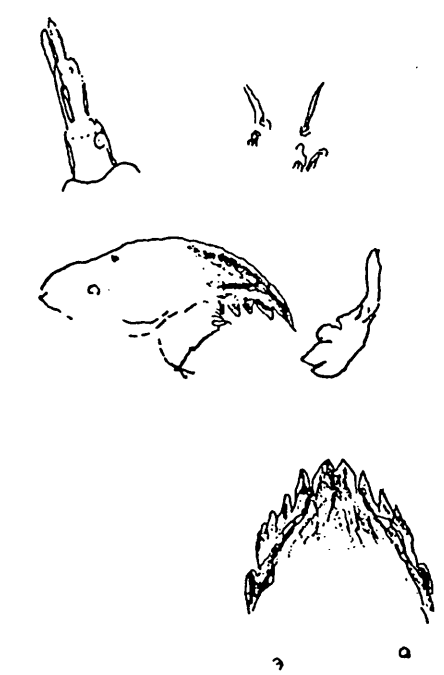
3rd instar mag:1000x



Measurements: (n=2)
CB: x̄: 195.0µm (LL: 190.0 UL: 200.0µm)
L : x̄: 2.000mm (LL: 1.900 UL: 2.100mm)
X1: x̄: 036.1µm (LL: 035.0 UL: 037.2µm)
X2: x̄: 011.1µm (LL: 011.1 UL: 011.1µm)
X3: x̄: 055.4µm (LL: 048.0 UL: 062.8µm)
X4: x̄: 015.0µm (LL: 013.0 UL: 017.0µm)
X5: x̄: 022.1µm (LL: 021.3 UL: 022.9µm)
X6: x̄: 019.1µm (LL: 019.0 UL: 019.2µm)
X7: x̄: 064.4µm (LL: 063.8 UL: 064.9µm)

LIMNOPHYES prolongatus

2nd instar mag:1000x



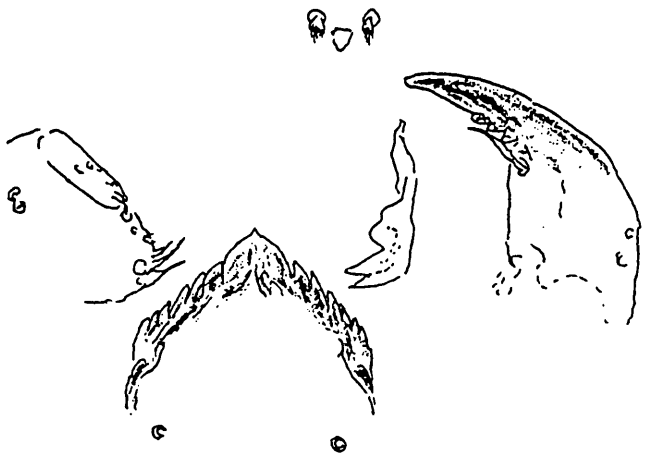
Measurements: (n=4)
CB: x̄: 112.5µm (LL: 104.6 UL: 120.5µm)
L : x̄: 1.386mm (LL: 0.962 UL: 1.903mm)
X1: x̄: 024.1µm (LL: 022.3 UL: 025.9µm)
X2: x̄: 007.3µm (LL: 005.7 UL: 008.8µm)
X3: x̄: 034.8µm (LL: 029.7 UL: 039.9µm)
X4: x̄: 007.8µm (LL: 007.0 UL: 008.6µm)
X5: x̄: 016.9µm (LL: 015.1 UL: 018.6µm)
X6: x̄: 013.0µm (LL: 011.4 UL: 014.6µm)
X7: x̄: 044.7µm (LL: 039.6 UL: 049.8µm)

KRENOSMITTIA boreoalpina

Diagnosis:
Caput light-grey; postoccipital margin black. Ant:4-segmented; blade reaching the tip of 4th segment.
S I serrated;Praemandible with 2 apical pointed teeth.
Mandible with narrow apical tooth longer than the combined width of the 3 inner teeth.
Mentum with nippled median tooth and 6 pairs of lateral teeth.

4^{th} instar mag:1000x

Measurements: (n=3)
CB: $\bar{x}$: 160.0µm (LL: 135.0 UL: 180.5µm)
L : $\bar{x}$: 2.800mm (LL: 2.600 UL: 3.000mm)
X1: $\bar{x}$: 036.2µm (LL: 035.1 UL: 037.8µm)
X2: $\bar{x}$: 014.9µm (LL: 014.8 UL: 015.0µm)
X3: $\bar{x}$: 042.4µm (LL: 041.0 UL: 043.6µm)
X4: $\bar{x}$: 031.2µm (LL: 029.7 UL: 032.8µm)
X5: $\bar{x}$: 024.1µm (LL: 022.3 UL: 025.1µm)
X6: $\bar{x}$: 021.6µm (LL: 019.1 UL: 024.5µm)
X7: $\bar{x}$: 062.4µm (LL: 057.5 UL: 066.5µm)



3^{rd} instar mag:1000x

Measurements: (n=6)
CB: $\bar{x}$: 116.6µm (LL: 108.1 UL: 125.2µm)
L : $\bar{x}$: 1.823mm (LL: 1.311 UL: 2.449mm)
X1: $\bar{x}$: 027.1µm (LL: 024.4 UL: 029.8µm)
X2: $\bar{x}$: 010.1µm (LL: 008.3 UL: 011.9µm)
X3: $\bar{x}$: 032.1µm (LL: 027.6 UL: 036.5µm)
X4: $\bar{x}$: 019.1µm (LL: 013.3 UL: 024.9µm)
X5: $\bar{x}$: 020.9µm (LL: 017.1 UL: 024.7µm)
X6: $\bar{x}$: 016.3µm (LL: 014.9 UL: 017.6µm)
X7: $\bar{x}$: 048.6µm (LL: 043.0 UL: 054.2µm)

2^{nd} instar mag:1000x

Measurements: (n=2)
CB: $\bar{x}$: 080.0µm (LL: 080.0 UL: 080.0µm)
L : $\bar{x}$: 1.350mm (LL: 1.000 UL: 1.700mm)
X1: $\bar{x}$: 025.6µm (LL: 021.3 UL: 029.8µm)
X2: $\bar{x}$: 007.1µm (LL: 006.7 UL: 007.4µm)
X3: $\bar{x}$: 024.1µm (LL: 021.8 UL: 026.4µm)
X4: $\bar{x}$: 013.2µm (LL: 010.6 UL: 015.8µm)
X5: $\bar{x}$: 016.1µm (LL: 014.9 UL: 017.3µm)
X6: $\bar{x}$: 013.6µm (LL: 012.8 UL: 014.4µm)
X7: $\bar{x}$: 045.5µm (LL: 038.3 UL: 042.7µm)

NANOCLADIUS rectinervis

4th instar mag:1000x

Diagnosis:
Caput light-grey;postoccipital margin black.Ant.5-segmented;blade reaching 4th segment.
S I simple. Premandible: faintly divided apical tooth.
Mandible with apical tooth at least the length of the 3 inner teeth.
Mentum with one partially divided median tooth and 5 pairs of lateral teeth.Ventromental plates distinct.

Measurements: (n=3)
CB: $\bar{x}$: 213.3µm (LL: 190.0 UL: 250.0µm)
L : $\bar{x}$: 2.000mm (LL: 2.600 UL: 3.200mm)
X1: $\bar{x}$: 063.3µm (LL: 057.0 UL: 066.0µm)
X2: $\bar{x}$: 020.1µm (LL: 017.0 UL: 023.0µm)
X3: $\bar{x}$: 059.4µm (LL: 057.5 UL: 061.0µm)
X4: $\bar{x}$: 044.4µm (LL: 039.4 UL: 051.1µm)
X5: $\bar{x}$: 036.2µm (LL: 025.5 UL: 051.1µm)
X6: $\bar{x}$: 025.7µm (LL: 023.4 UL: 027.0µm)
X7: $\bar{x}$: 089.0µm (LL: 086.2 UL: 091.5µm)

100µm

NANOCLADIUS rectinervis

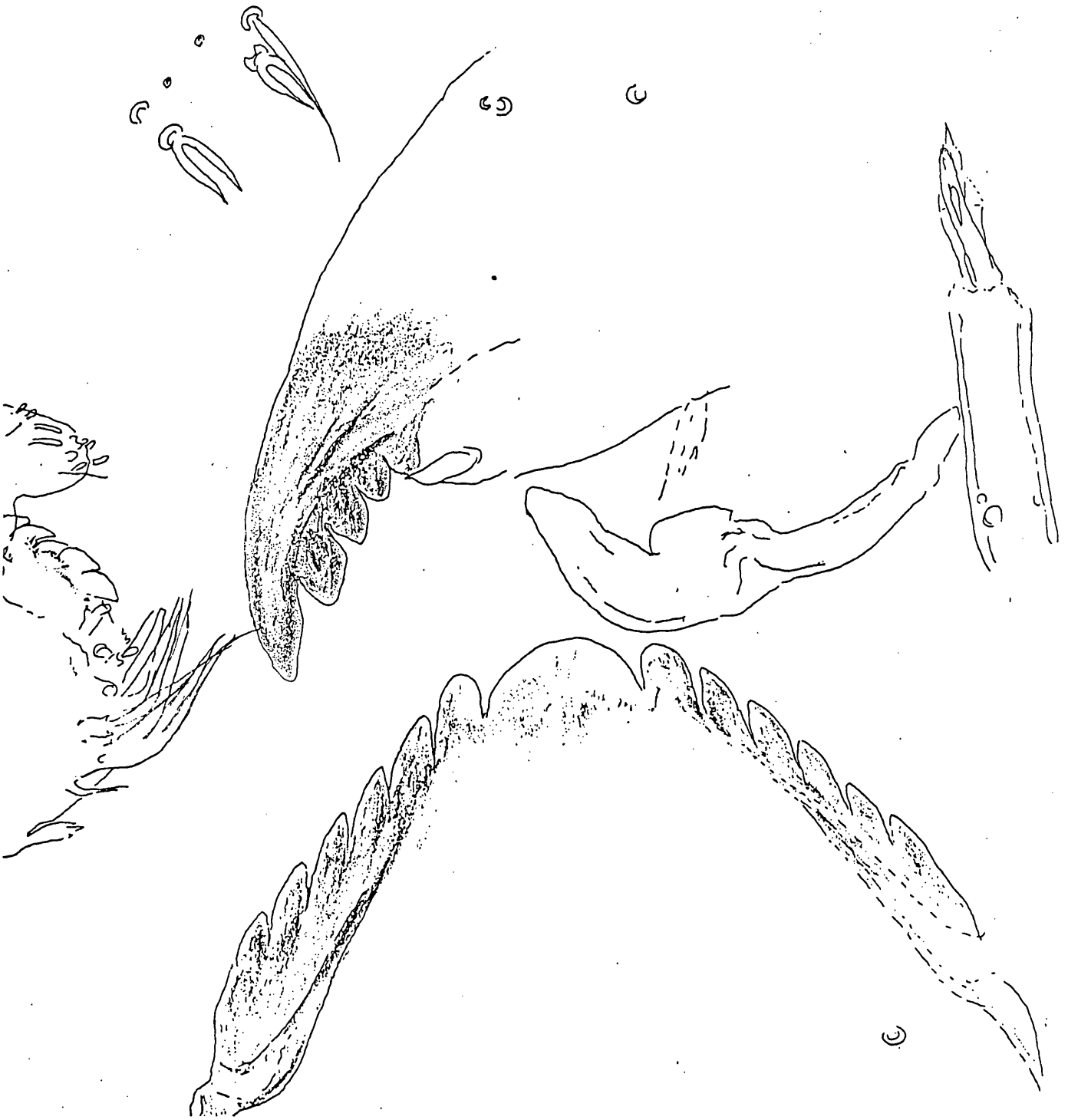
3rd instar mag:1000x

Measurements: (n=2)
CB: $\bar{x}$: 135.0µm (LL: 120.0 UL: 150.0µm)
L : $\bar{x}$: 1.550mm (LL: 1.500 UL: 1.600mm)
X1: $\bar{x}$: 042.6µm (LL: 037.2 UL: 048.0µm)
X2: $\bar{x}$: 011.5µm (LL: 009.6 UL: 013.3µm)
X3: $\bar{x}$: 044.0µm (LL: 042.2 UL: 045.7µm)
X4: $\bar{x}$: 019.4µm (LL: 019.2 UL: 019.5µm)
X5: $\bar{x}$: 024.8µm (LL: 023.0 UL: 026.6µm)
X6: $\bar{x}$: 017.2µm (LL: 016.3 UL: 018.1µm)
X7: $\bar{x}$: 054.5µm (LL: 054.3 UL: 054.7µm)

ORTHOCLADIUS excavatus 4th instar mag:1000x

Diagnosis:
Caput yellow with a black post-occipital margin median ventrally with a light interution.
Ant.5-segmented, blade not reaching the apex. Lauterborn organ distinct.
S I bifid.
Seata subdentalis distally rounded.
Mentum with broad median tooth, twice the width of one first lateral tooth. 6 pairs of lateral teeth.
Seta submentalis situated beneath the 5th lateral teeth.

Measurements: (n=5)
CB: $\bar{x}$: 373.9µm (LL: 349.7 UL: 398.5µm)
L : $\bar{x}$: 3.426mm (LL: 3.153 UL: 3.852mm)
X1: $\bar{x}$: 108.6µm (LL: 095.4 UL: 122.0µm)
X2: $\bar{x}$: 033.1µm (LL: 031.2 UL: 035.0µm)
X3: $\bar{x}$: 094.6µm (LL: 080.3 UL: 109.0µm)
X4: $\bar{x}$: 054.9µm (LL: 049.4 UL: 060.5µm)
X5: $\bar{x}$: 034.3µm (LL: 030.7 UL: 037.9µm)
X6: $\bar{x}$: 054.5µm (LL: 046.3 UL: 062.7µm)
X7: $\bar{x}$: 165.2µm (LL: 146.2 UL: 184.6µm)



ORTHOCLADIUS excavatus

3rd instar

mag: 1000x

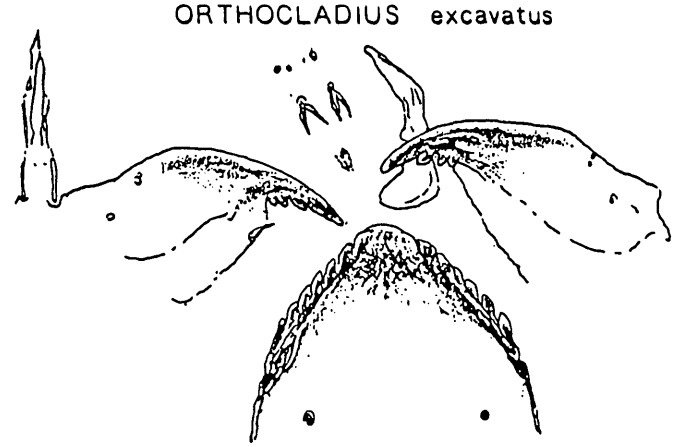
Measurements: (n=5)
CB: x̄: 217.9µm (LL: 201.8 UL: 234.3µm)
L : x̄: 2.327mm (LL: 1.746 UL: 3.032mm)
X1: x̄: 061.8µm (LL: 057.7 UL: 065.8µm)
X2: x̄: 020.9µm (LL: 018.3 UL: 023.6µm)
X3: x̄: 060.9µm (LL: 056.6 UL: 065.3µm)
X4: x̄: 024.5µm (LL: 021.9 UL: 027.0µm)
X5: x̄: 024.1µm (LL: 018.6 UL: 029.6µm)
X6: x̄: 030.1µm (LL: 028.2 UL: 032.0µm)
X7: x̄: 104.6µm (LL: 103.8 UL: 105.3µm)

ORTHOCLADIUS excavatus

2nd instar

mag:1000x

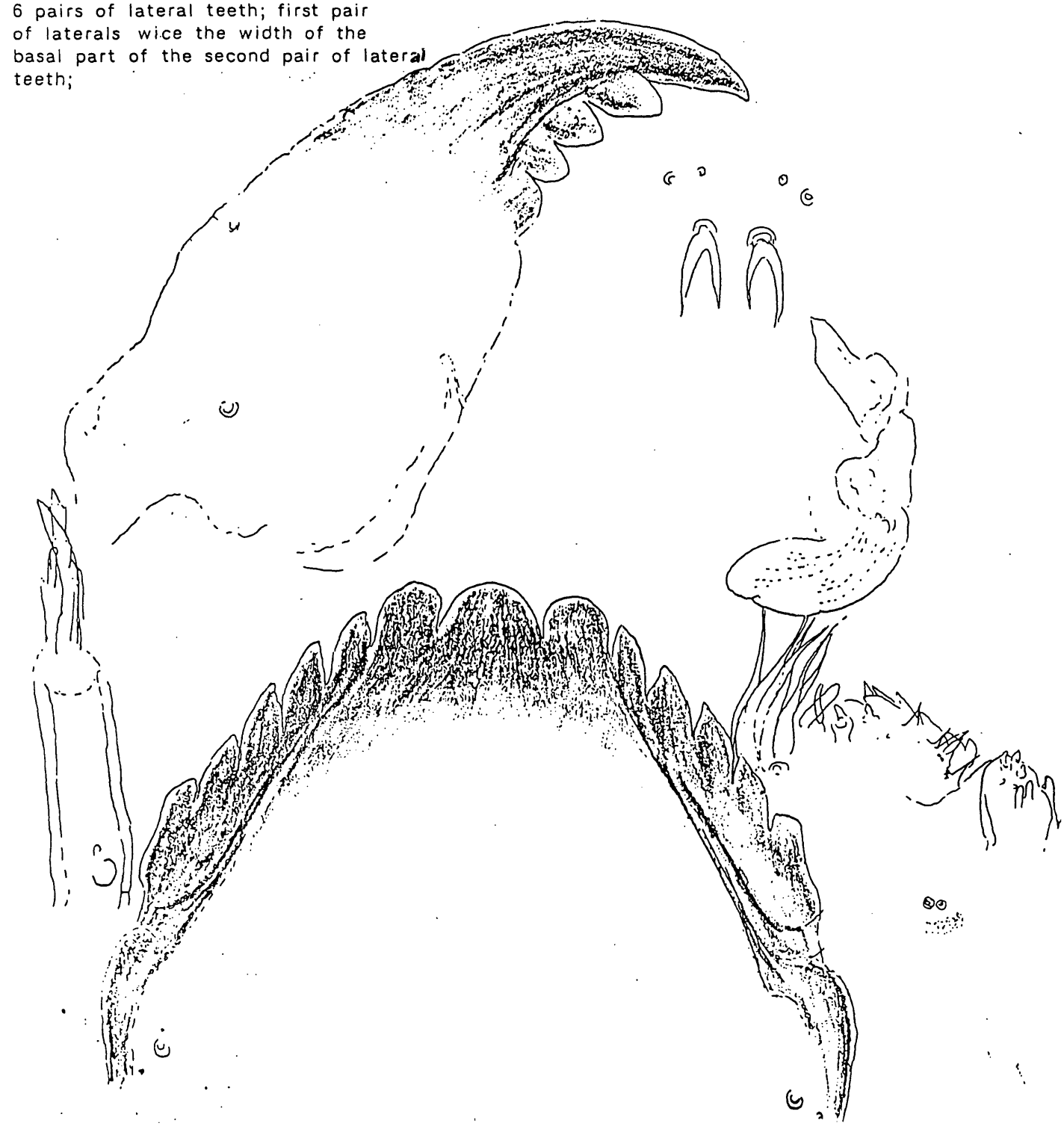
Measurements: (n=3)
CB: x̄: 126.7µm (LL: 112.4 UL: 141.1µm)
L : x̄: 1.299mm (LL: 1.063 UL: 1.561mm)
X1: x̄: 031.5µm (LL: 024.3 UL: 038.8µm)
X2: x̄: 011.5µm (LL: 011.3 UL: 011.6µm)
X3: x̄: 039.8µm (LL: 031.5 UL: 048.1µm)
X4: x̄: 009.5µm (LL: 007.3 UL: 011.7µm)
X5: x̄: 020.7µm (LL: 018.8 UL: 022.6µm)
X6: x̄: 015.6µm (LL: 011.9 UL: 019.3µm)
X7: x̄: 061.7µm (LL: 059.6 UL: 063.7µm)



ORTHOCLADIUS frigidus

Diagnosis:
Caput yellow to darkbrown; post-occipital margin black.
Ant.5-segmented; blade reaching the 5th segment.
S. I bifid; Premandible with one apical tooth.
Mandible crenulated. Seta subdentalis not conspicious.
Mentum with one median tooth and 6 pairs of lateral teeth; first pair of laterals wice the width of the basal part of the second pair of lateral teeth;

4th instar mag:1000x
Measurements: (n=6)
CB: $\bar{x}$: 379.9µm (LL: 341.6 UL: 418.7µm)
L : $\bar{x}$: 4.855mm (LL: 4.000 UL: 5.710mm)
X1: $\bar{x}$: 154.8µm (LL: 139.2 UL: 170.6µm)
X2: $\bar{x}$: 025.5µm (LL: 022.3 UL: 028.8µm)
X3: $\bar{x}$: 129.6µm (LL: 121.3 UL: 138.0µm)
X4: $\bar{x}$: 056.4µm (LL: 050.6 UL: 062.2µm)
X5: $\bar{x}$: 039.4µm (LL: 037.6 UL: 041.1µm)
X6: $\bar{x}$: 063.2µm (LL: 059.5 UL: 066.9µm)
X7: $\bar{x}$: 204.6µm (LL: 191.1 UL: 218.4µm)



ORTHOCLADIUS frigidus

3rd instar mag:1000x

Measurements: (n=4)
CB: $\bar{x}$: 255.0µm (LL: 245.8 UL: 264.2µm)
L : $\bar{x}$: 2.850mm (LL: 2.800 UL: 2.900mm)
X1: $\bar{x}$: 093.3µm (LL: 073.9 UL: 113.1µm)
X2: $\bar{x}$: 014.3µm (LL: 010.3 UL: 018.4µm)
X3: $\bar{x}$: 081.0µm (LL: 068.6 UL: 093.6µm)
X4: $\bar{x}$: 025.8µm (LL: 023.8 UL: 027.7µm)
X5: $\bar{x}$: 031.5µm (LL: 026.8 UL: 036.3µm)
X6: $\bar{x}$: 036.6µm (LL: 032.0 UL: 041.3µm)
X7: $\bar{x}$: 128.4µm (LL: 099.8 UL: 157.7µm)

ORTHOCLADIUS frigidus

2nd instar mag:1000x

Measurements: (n=6)
CB: x̄: 163.8µm (LL: 130.4 UL: 198.1µm)
L : x̄: 1.121mm (LL: 0.897 UL: 1.372mm)
X1: x̄: 047.1µm (LL: 042.8 UL: 051.4µm)
X2: x̄: 010.0µm (LL: 008.0 UL: 012.1µm)
X3: x̄: 050.7µm (LL: 045.0 UL: 056.4µm)
X4: x̄: 011.1µm (LL: 009.4 UL: 012.8µm)
X5: x̄: 022.9µm (LL: 020.2 UL: 025.5µm)
X6: x̄: 020.3µm (LL: 016.0 UL: 024.6µm)
X7: x̄: 076.4µm (LL: 070.0 UL: 082.9µm)

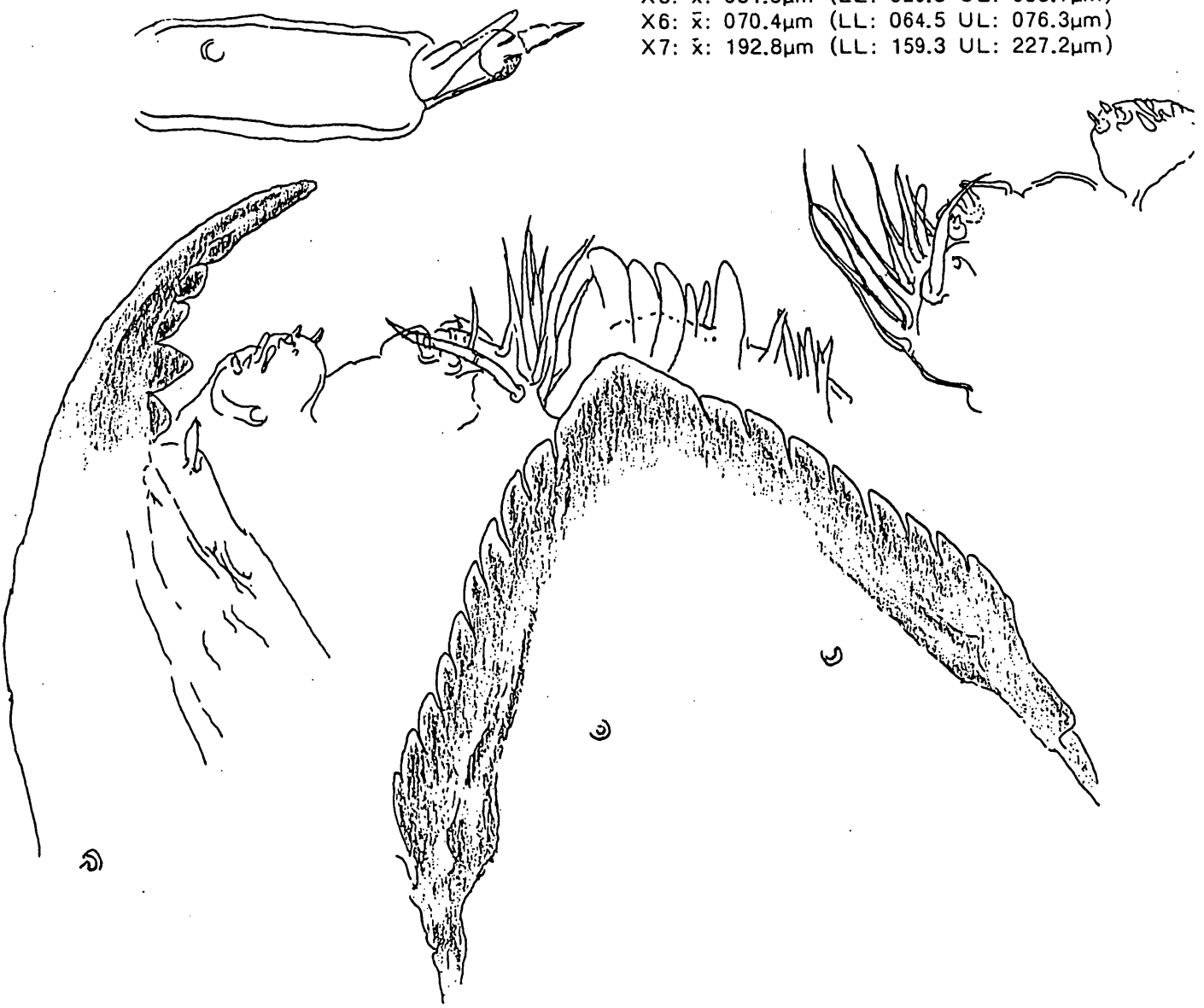
ORTHOCLADIUS rivularum

Diagnosis:

Caput light/grey; occipital margin black.
Ant. 5-segmented. Antennal blade extend beyond the 3rd segment.
SI bifid. Premandible with 1 tooth.
Mentum with one broad median tooth; at least 3x broader than the first lateral tooth; 8-9 pairs of lateral teeth.
Mandible: apical tooth as long or slightly shorter than the inner teeth.

4th instar mag:1000x

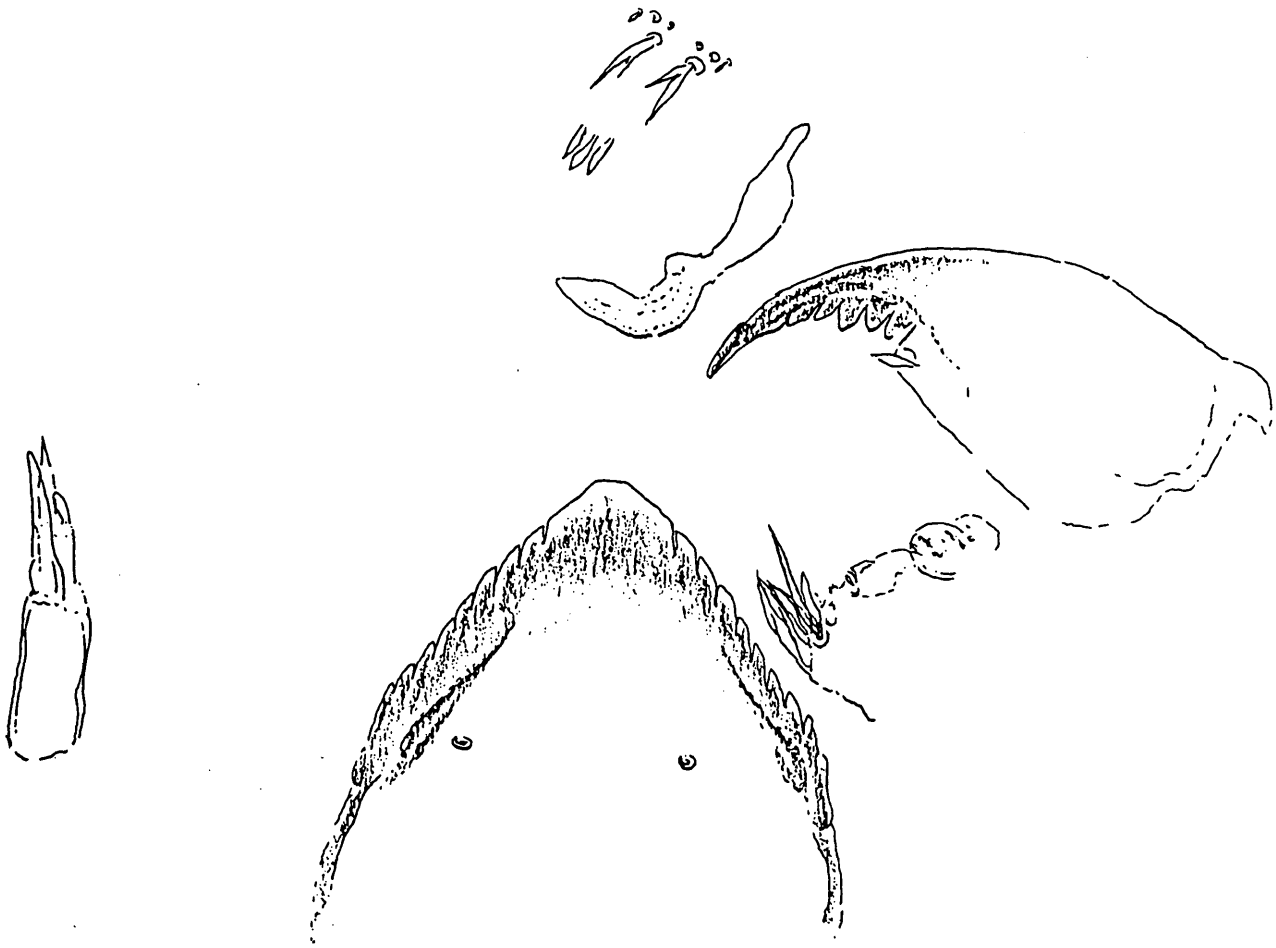
Measurements: (n=5)
CB: x̄: 367.9µm (LL:354.5 UL; 381.6µm)
L : x̄: 5.078mm (LL: 4.406 UL: 5.834mm)
X1: x̄: 051.2µm (LL: 043.9 UL: 058.5µm)
X2: x̄: 039.5µm (LL: 035.7 UL: 043.4µm)
X3: x̄: 076.9µm (LL: 062.4 UL: 091.7µm)
X4: x̄: 058.2µm (LL: 036.9 UL: 080.0µm)
X5: x̄: 031.5µm (LL: 029.3 UL: 033.7µm)
X6: x̄: 070.4µm (LL: 064.5 UL: 076.3µm)
X7: x̄: 192.8µm (LL: 159.3 UL: 227.2µm)



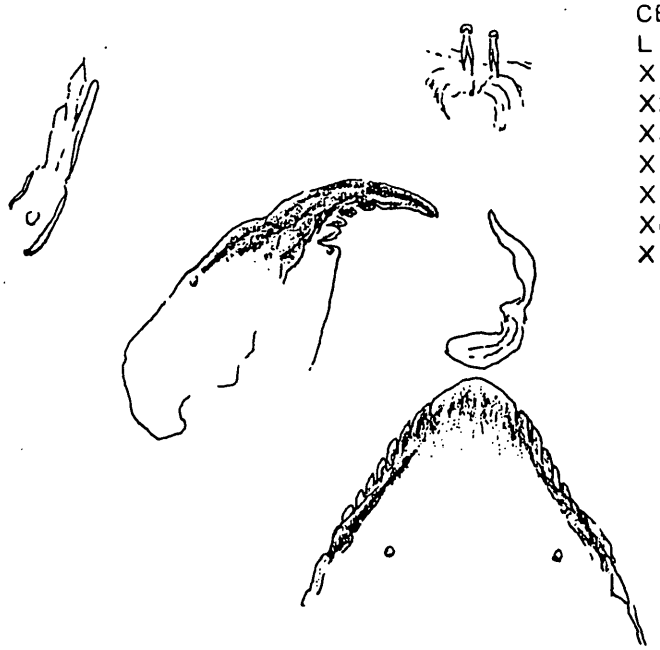
ORTHOCLADIUS rivularum

3rd instar mag:1000x

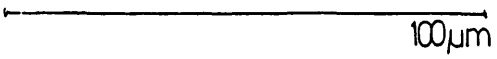
Measurements: (n=5)
CB: $\bar{x}$: 227.9µm (LL: 207.5 UL: 248.6µm)
L : $\bar{x}$: 2.416mm (LL:1.900 UL: 3.025mm)
X1: $\bar{x}$: 037.5µm (LL: 035.3 UL: 039.6µm)
X2: $\bar{x}$: 021.8µm (LL: 021.0 UL: 022.5µm)
X3: $\bar{x}$: 049.5µm (LL: 048.1 UL: 050.9µm)
X4: $\bar{x}$: 024.6µm (LL: 022.5 UL: 026.6µm)
X5: $\bar{x}$: 024.8µm (LL: 023.4 UL: 026.2µm)
X6: $\bar{x}$: 037.6µm (LL: 034.4 UL: 040.9µm)
X7: $\bar{x}$: 110.9µm (LL: 103.9 UL: 118.0µm)



2nd instar mag:1000x



Measurements: (n=4)
CB: $\bar{x}$: 128.0µm (LL: 122.4 UL: 133.6µm)
L : $\bar{x}$: 1.408µm (LL: .9223 UL: 2.017µm)
X1: $\bar{x}$: 030.6µm (LL: 024.0 UL: 037.1µm)
X2: $\bar{x}$: 014.3µm (LL: 012.1 UL: 016.6µm)
X3: $\bar{x}$. 033.5µm (LL: 029.5 UL: 037.6µm)
X4: $\bar{x}$: 009.3µm (LL: 005.6 UL: 012.9µm)
X5: $\bar{x}$: 019.4µm (LL: 017.9 UL: 020.9µm)
X6: $\bar{x}$: 020.1µm (LL: 016.6 UL: 023.6µm)
X7: $\bar{x}$: 054.6µm (LL: 040.6 UL: 068.8µm)



ORTHOCLADIUS rivularum 1st instar mag: 1000x

Measurements: (n=5)
CB: $\bar{x}$: 075.9µm (LL: 069.2 UL: 082.9µm)
L : $\bar{x}$: .8001mm (LL: 5001 UL: 1.1020mm)
X1: $\bar{x}$: 019.2µm (LL: 019.2 UL: 019.2µm)
X2: $\bar{x}$: 007.4µm (LL: 006.2 UL: 008.6µm)
X3: $\bar{x}$: 024 µm (LL: 023 UL: 025 µm)
X4: $\bar{x}$: 003.1µm (LL:002.9 UL: 003.4µm)
X5: $\bar{x}$: 013.7µm (LL: 012.0 UL: 015.4µm)
X6: $\bar{x}$: 011.8µm (LL: 009.6 UL: 013.9µm)
X7: $\bar{x}$: 040.7µm (LL: 039.4 UL: 042.2µm)

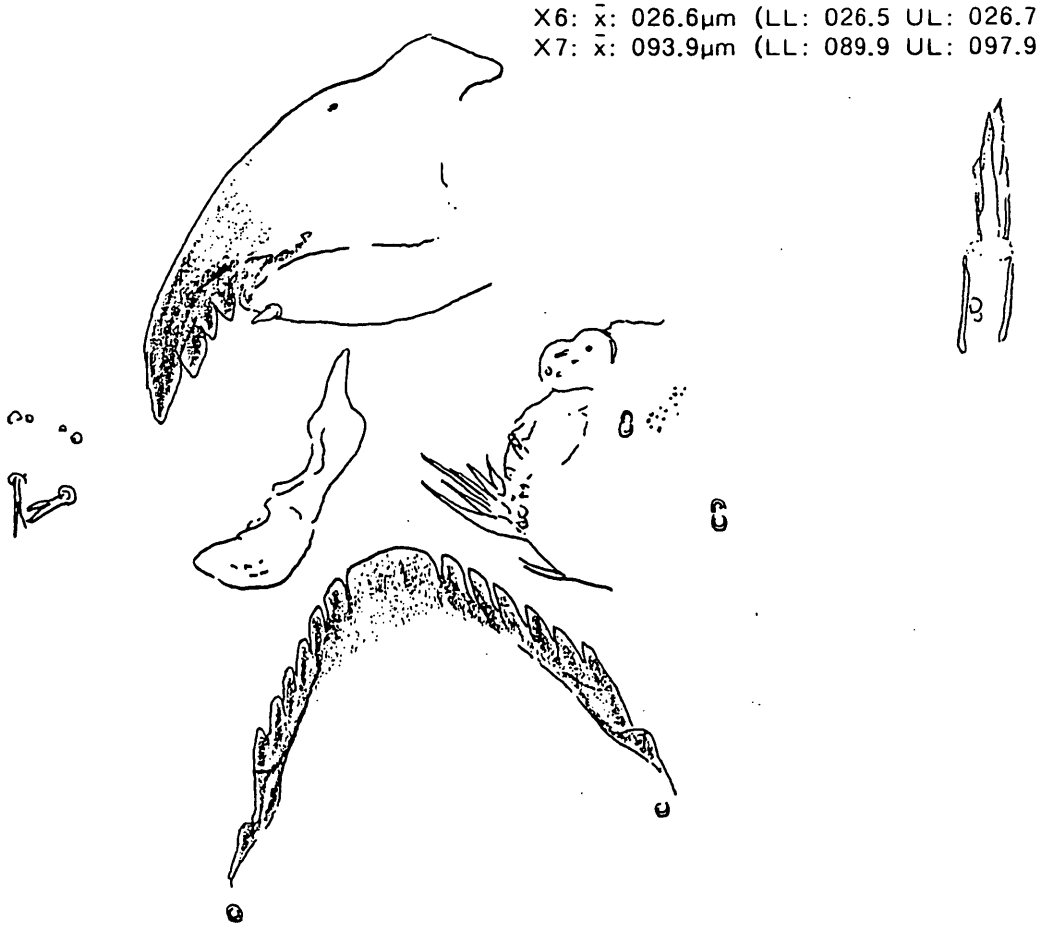
ORTHOCLADIUS saxicola 4th instar mag:1000x

Diagnosis:
Caput yellow; postoccipital margin black. Ant.5-segmented; blade reaching the 5th segment.
S I bifid; premandible with one apical tooth.
Mentum with one broad median tooth, twice as wide than the first lateral tooth. 6 pairs of lateral teeth. Setae *submentalis* situated beneath the last pair of lateral teeth. Ventromental plates triangular.

Measurements: (n=5)
CB: $\bar{x}$: 319.9µm (LL: 296.8 UL: 343.4µm)
L : $\bar{x}$: 3.266mm (LL: 2.430 UL: 4.389mm)
X1: $\bar{x}$: 118.7µm (LL: 112.0 UL: 125.4µm)
X2: $\bar{x}$: 024.0µm (LL: 020.9 UL: 027.7µm)
X3: $\bar{x}$: 092.9µm (LL: 089.3 UL: 096.6µm)
X4: $\bar{x}$: 038.4µm (LL: 033.2 UL: 043.6µm)
X5: $\bar{x}$: 030.9µm (LL: 029.3 UL: 032.6µm)
X6: $\bar{x}$: 040.7µm (LL: 037.7 UL: 043.7µm)
X7: $\bar{x}$: 132.1µm (LL: 126.3 UL: 137.9µm)

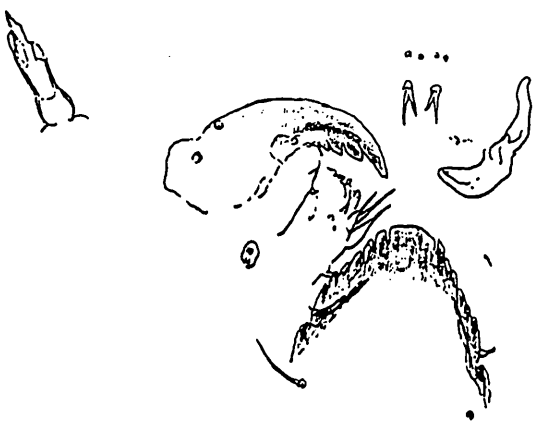
ORTHOCLADIUS saxicola 3rd instar mag:1000x

Measurements: (n=2)
CB: $\bar{x}$: 214.9µm (LL: 200.0 UL: 229.8µm)
L : $\bar{x}$: 1.300mm (LL: 1.050 UL: 1.550mm)
X1: $\bar{x}$: 067.6µm (LL: 066.0 UL: 069.1µm)
X2: $\bar{x}$: 016.1µm (LL: 015.4 UL: 016.7µm)
X3: $\bar{x}$: 067.0µm (LL: 055.3 UL: 072.3µm)
X4: $\bar{x}$: 016.5µm (LL: 016.0 UL: 017.0µm)
X5: $\bar{x}$: 027.2µm (LL: 026.6 UL: 027.7µm)
X6: $\bar{x}$: 026.6µm (LL: 026.5 UL: 026.7µm)
X7: $\bar{x}$: 093.9µm (LL: 089.9 UL: 097.9µm)



ORTHOCLADIUS saxicola 2nd instar mag:1000x

Measurements: (n=1)
CB: 120.0 µm
L : 1.000 mm
X1: 035.6 µm
X2: 008.0 µm
X3: 036.2 µm
X4: 004.3 µm
X5: 014.9 µm
X6: 012.8 µm
X7: 053.2 µm



50µm

ORTHOCLADIUS sp.1 saxosus grp.

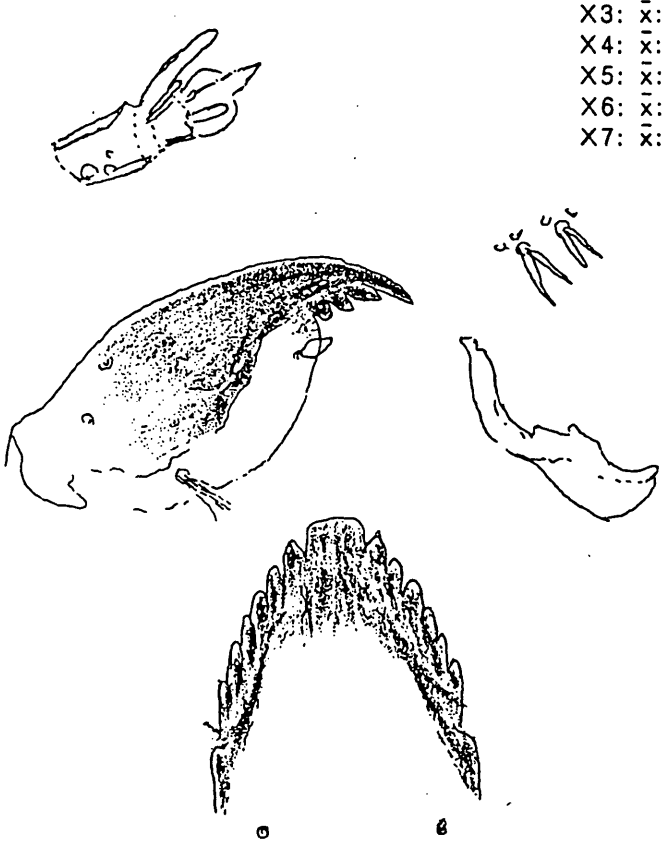
Diagnosis:
Caput darkbrown with a light ribbon all around the caput proximally. Ant.5-segmented, blade not reaching the 5th segment. Premandible with 2 enlarged apical teeth.
S I bifid.
Mentum with one median tooth and 6 pairs tapered lateral teeth. Setae submentis beneath the 5th pair of lateral teeth.

4^{th} instar mag:1000x

Measurements: (n=4)
CB: $\bar{x}$: 287.5µm (LL: 267.5 UL: 307.7µm)
L : $\bar{x}$: 5.375mm (LL:4.450 UL: 6.700mm)
X1: $\bar{x}$: 064.8µm (LL: 057.1 UL: 072.6µm)
X2: $\bar{x}$: 015.0µm (LL: 012.7 UL: 017.3µm)
X3: $\bar{x}$: 085.4µm (LL: 075.7 UL: 095.3µm)
X4: $\bar{x}$: 042.7µm (LL: 038.3 UL: 047.1µm)
X5: $\bar{x}$: 032.1µm (LL: 030.2 UL: 034.1µm)
X6: $\bar{x}$: 030.7µm (LL: 026.5 UL: 035.0µm)
X7: $\bar{x}$: 121.2µm (LL: 111.7 UL: 130.7µm)

ORTHOCLADIUS sp.1 saxosus grp.

3rd instar mag:1000x
Measurements: (n=7)
CB: $\bar{x}$: 171.4µm (LL: 161.6 UL: 181.3µm)
L : $\bar{x}$: 2.186mm (LL: 1.850 UL: 2.752mm)
X1: $\bar{x}$: 041.6µm (LL: 039.2 UL: 044.1µm)
X2: $\bar{x}$: 010.2µm (LL: 009.6 UL: 010.8µm)
X3: $\bar{x}$: 055.6µm (LL: 053.3 UL: 057.8µm)
X4: $\bar{x}$: 015.7µm (LL: 014.9 UL: 016.6µm)
X5: $\bar{x}$: 023.5µm (LL: 022.0 UL: 025.0µm)
X6: $\bar{x}$: 019.9µm (LL: 019.1 UL: 020.8µm)
X7: $\bar{x}$: 082.6µm (LL: 081.1 UL: 084.0µm)



ORTHOCLADIUS sp.1 saxosus grp.

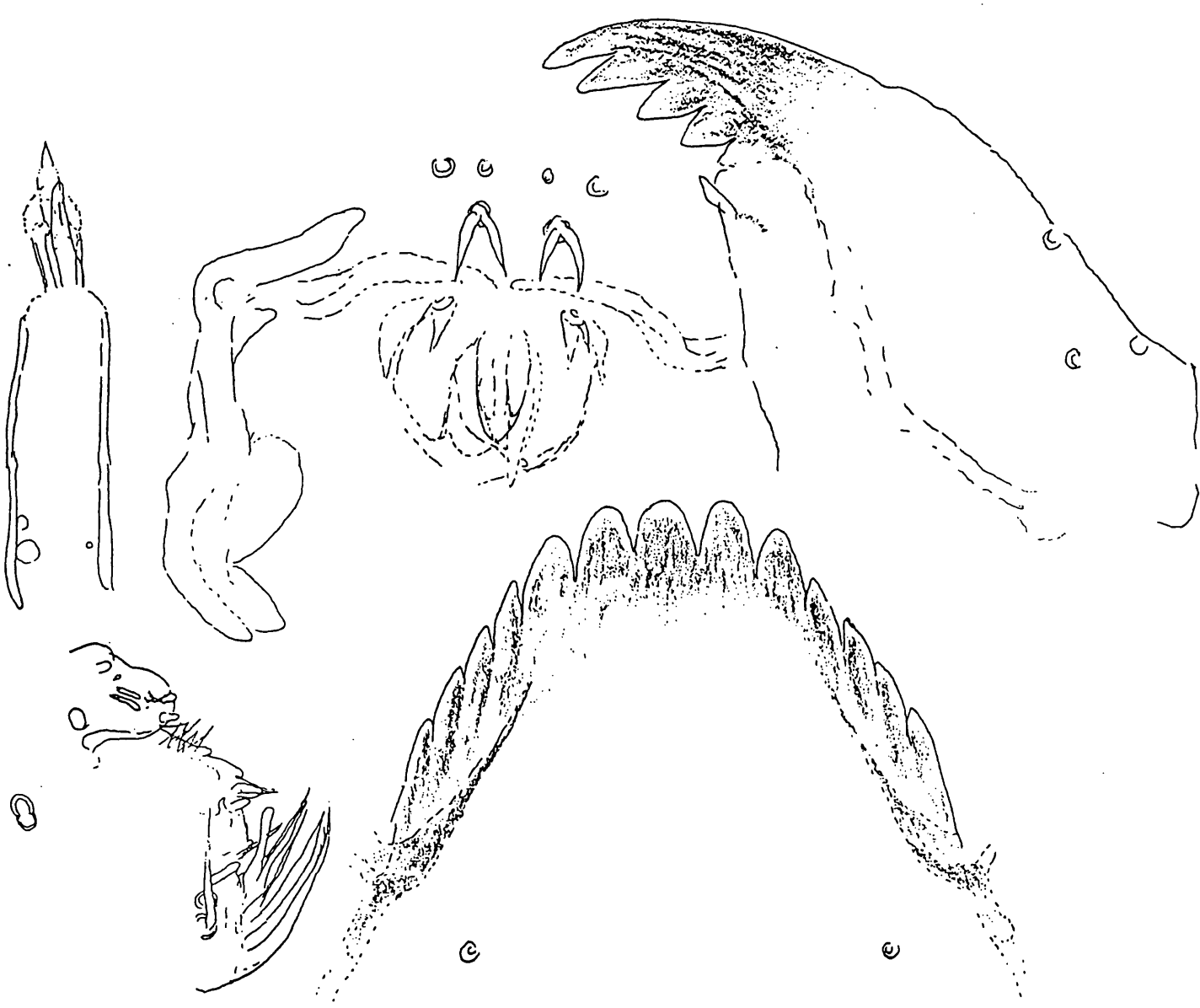
2nd instar mag:1000x
Measurements: (n=3)
CB: $\bar{x}$: 107.5µm (LL: 092.4 UL: 122.8µm)
L : $\bar{x}$: 0.967mm (LL: 0.800 UL: 1.100mm)
X1: $\bar{x}$: 029.2µm (LL: 027.8 UL: 030.1µm)
X2: $\bar{x}$: 007.3µm (LL: 007.2 UL: 007.5µm)
X3: $\bar{x}$: 035.4µm (LL: 033.0 UL: 038.9µm)
X4: $\bar{x}$: 009.9µm (LL: 009.6 UL: 010.6µm)
X5: $\bar{x}$: 019.6µm (LL: 019.2 UL: 020.1µm)
X6: $\bar{x}$: 013.9µm (LL: 013.2 UL: 014.6µm)
X7: $\bar{x}$: 043.9µm (LL: 040.7 UL: 049.9µm)

50µm

ORTHOCLADIUS sp.2 saxosus 4^{th} instar mag:1000x

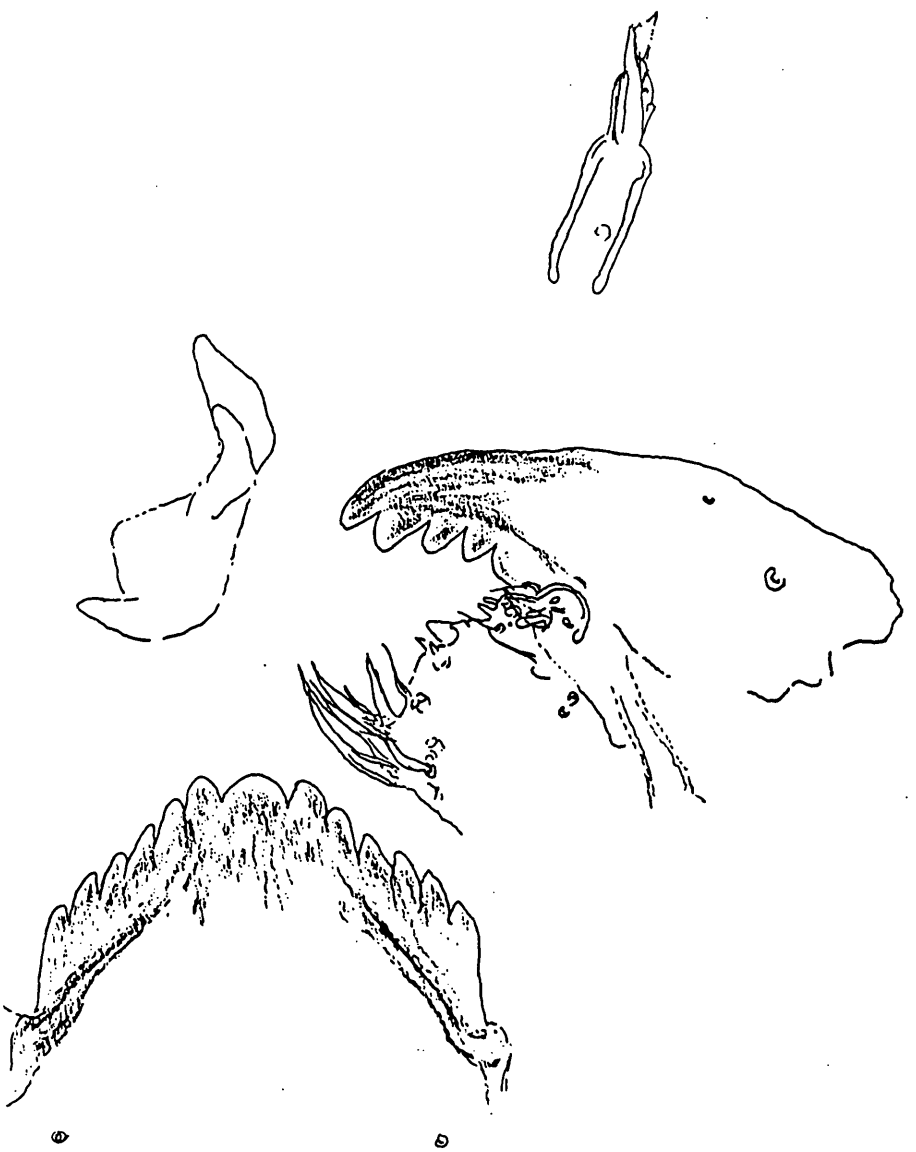
Diagnosis:
Caput yellow; with black postocciptal margin. Ant.5-segmented;blade not reaching the 5th segment.
Premandible with two apical teeth.
S I bifid.
Mentum with one median tooth and 6 pairs of lateral teeth. First pair of lateral about the same size than the median tooth. Setae submentis underneath the 5th pair of lateral teeth.

Measurements: (n=3)
CB: $\bar{x}$: 283.3µm (LL: 269.1 UL: 297.7µm)
L : $\bar{x}$: 3.550mm (LL: 3.050 UL: 4.050mm)
X1: $\bar{x}$: 063.0µm (LL: 051.3 UL: 074.9µm)
X2: $\bar{x}$: 013.1µm (LL: 010.4 UL: 015.9µm)
X3: $\bar{x}$: 076.0µm (LL: 069.4 UL: 082.6µm)
X4: $\bar{x}$: 045.8µm (LL: 038.5 UL: 053.1µm)
X5: $\bar{x}$: 030.2µm (LL: 029.1 UL: 031.4µm)
X6: $\bar{x}$: 033.6µm (LL: 027.3 UL: 039.9µm)
X7: $\bar{x}$: 120.0µm (LL: 113.7 UL: 125.7µm)



ORTHOCLADIUS sp.2 saxosus 3rd instar mag: 1000x

Measurements: (n=1)
CB: 220.0 µm
L ÷ 1.600mm
X1: 048.9 µm
X2: 010.6 µm
X3: 054.3 µm
X4: 022.9 µm
X5: 027.7 µm
X6: 021.3 µm
X7: 079.8 µm



ORTHOCLADIUS thienemanni 4th instar mag:1000x

Diagnosis:

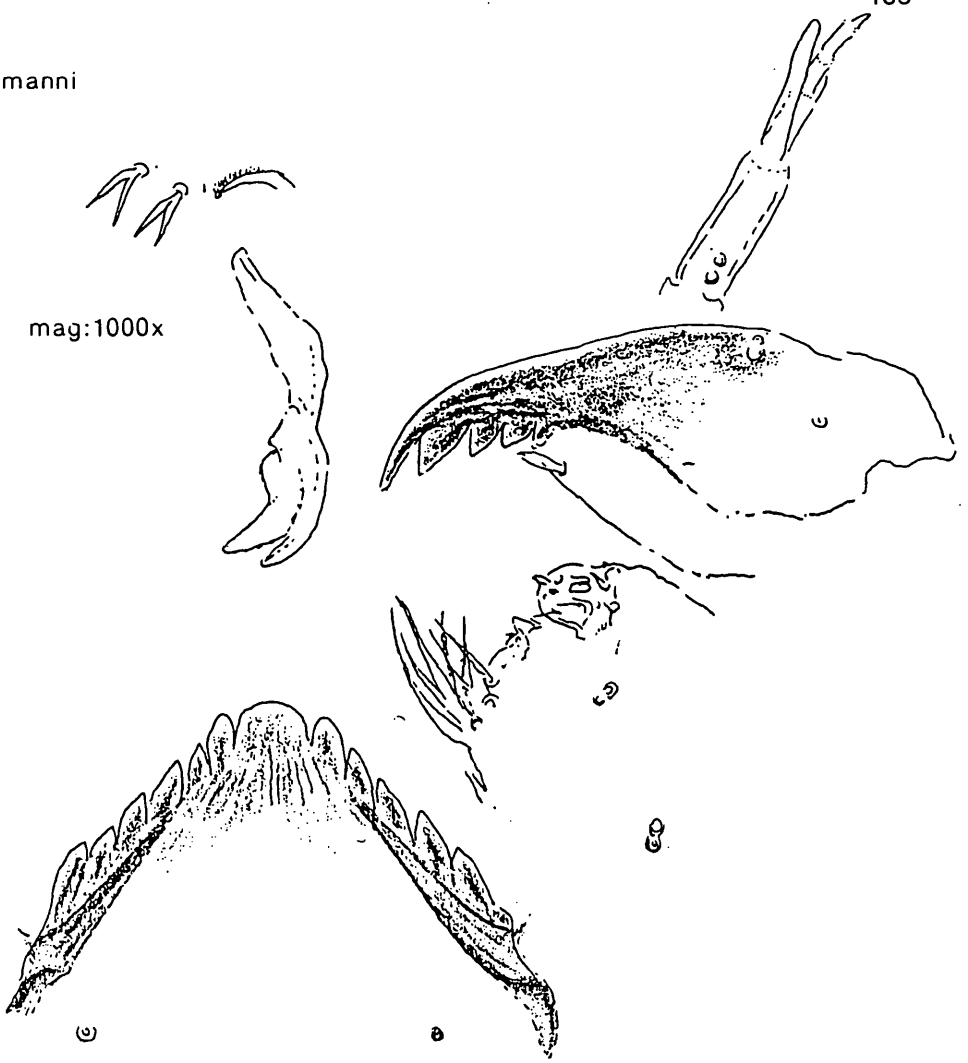
Caput darkbrown; black postoccipital margin
Ant.5-segmented, blade not reaching the 5th segment.Lauterborn organ distinct.
SI bifid.Praemandible bifid .
Mentum with one median tooth and 6 pairs of lateral ones.Setae basalis originating beneath the 4th to 5th pair of lateral teeth.

Measurements: (n=3)
CB: x̄: 419.9µm (LL: 395.4 UL 445.0µm)
L : x̄: 3.010mm (LL: 2.905 UL: 3.105mm)
X1: x̄: 107.6µm (LL: 106.4 UL: 110.1µm)
X2: x̄: 026.0µm (LL: 025.0 UL: 027.0µm)
X3: x̄: 098.2µm (LL: 093.6 UL: 106.4µm)
X4: x̄: 064.5µm (LL: 062.2 UL: 068.6µm)
X5: x̄: 037.2µm (LL: 031.9 UL: 042.6µm)
X6: x̄: 054.1µm (LL: 050.0 UL: 061.2µm)
X7: x̄: 181.0µm (LL: 179.8 UL: 182.3µm)

ORTHOCLADIUS thienemanni

3rd instar mag:1000x

Measurements:(n=2)
CB: 210-250µm
L : 2.00-2.20mm
X2: 145 µm

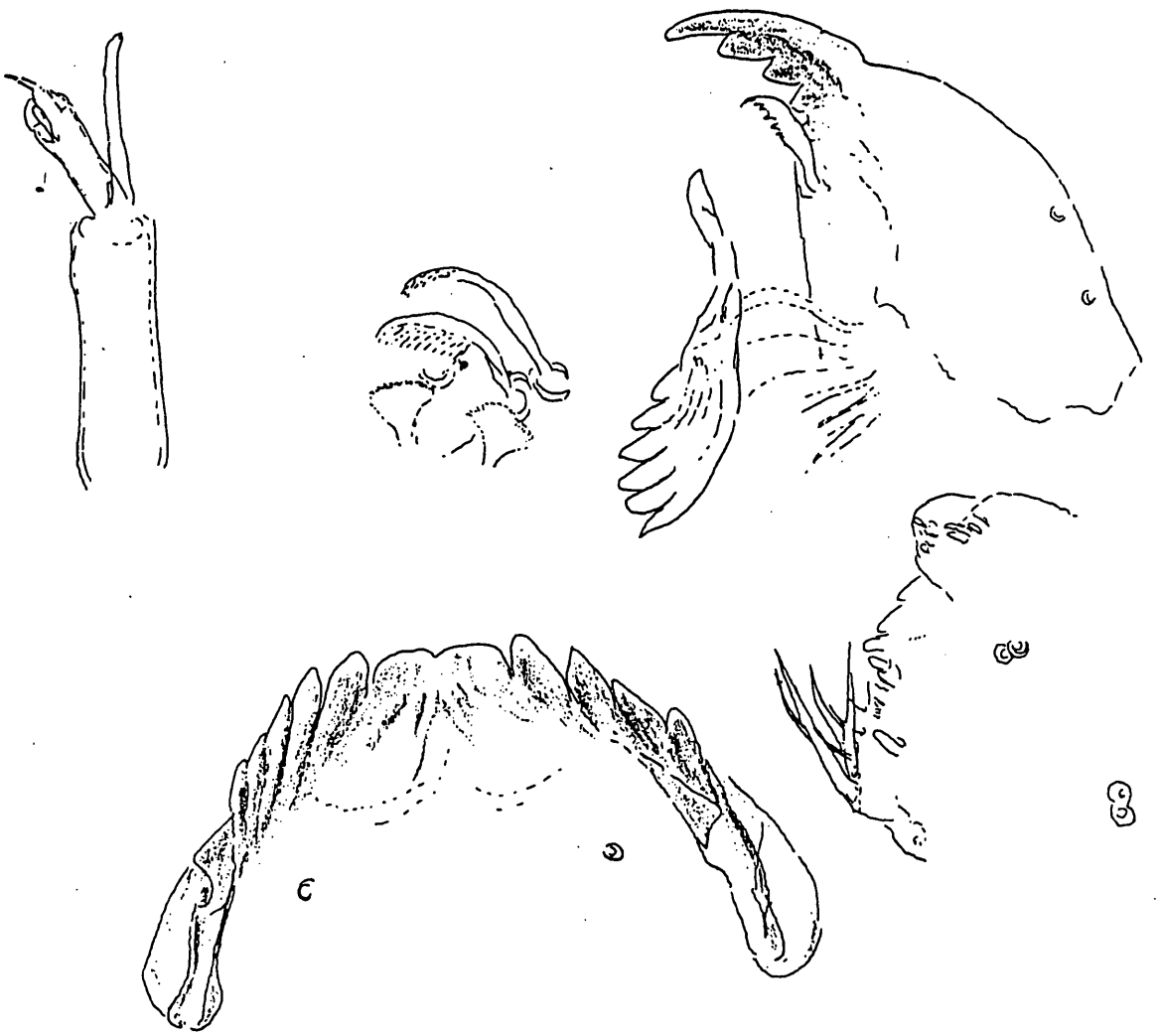


ORTHOCLADIUS thienemanni 2nd instar mag:1000x

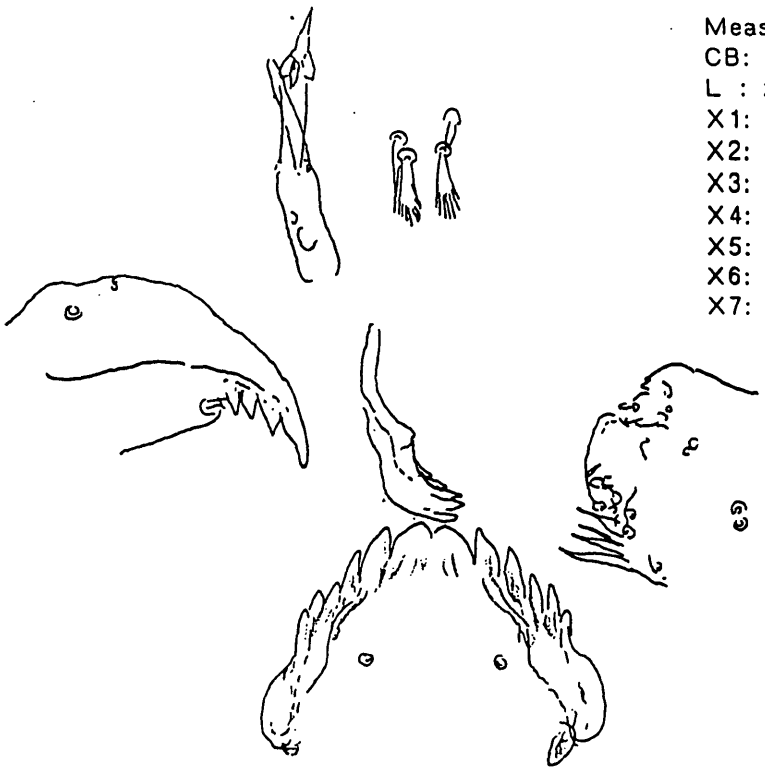
PARAMETRIOCNEMUS borealpinus 4^{th} instar mag:1000x

Diagnosis:
Caput light-grey; postoccipital margin light. Ant.5 segmented; blade reaching the 5th segment.
S I plumose; Premandible with 6 apical teeth.
Mandible with serrated seta subdentalis.
Mentum with one fairly divided median tooth and 5 pairs of lateral teeth. Paralabial plates distinct.

Measurements: (n=5)
CB: $\bar{x}$: 245.9µm (LL: 220.6 UL: 271.7µm)
L : $\bar{x}$: 3.371mm (LL: 3.371 UL: 4.164mm)
X1: $\bar{x}$: 052.3µm (LL: 050.0 UL: 054.6µm)
X2: $\bar{x}$: 025.9µm (LL: 022.3 UL: 029.6µm)
X3: $\bar{x}$: 043.6µm (LL: 039.9 UL: 047.3µm)
X4: $\bar{x}$: 043.4µm (LL: 040.6 UL: 046.2µm)
X5: $\bar{x}$: 029.7µm (LL: 026.9 UL: 032.4µm)
X6: $\bar{x}$: 029.4µm (LL: 026.6 UL: 032.2µm)
X7: $\bar{x}$: 101.7µm (LL: 094.8 UL: 108.6µm)



PARAMETRIOCNEMUS borealpinus



3rd instar

Measurements: (n=3)
CB: $\bar{x}$: 140.0µm (LL: 127.1 UL: 153.1µm)
L : $\bar{x}$: 2.460mm (LL:1.607 UL: 3.593mm)
X1: $\bar{x}$: 032.0µm (LL: 026.4 UL: 037.6µm)
X2: $\bar{x}$: 014.9µm (LL: 012.8 UL: 017.1µm)
X3: $\bar{x}$: 030.0µm (LL: 027.4 UL: 032.5µm)
X4: $\bar{x}$: 017.6µm (LL: 016.3 UL: 018.9µm)
X5: $\bar{x}$: 025.0µm (LL: 022.5 UL: 027.5µm)
X6: $\bar{x}$: 018.5µm (LL: 011.8 UL: 025.3µm)
X7: $\bar{x}$: 067.5µm (LL: 063.9 UL: 071.2µm)

PARAMETRIOCNEMUS borealpinus

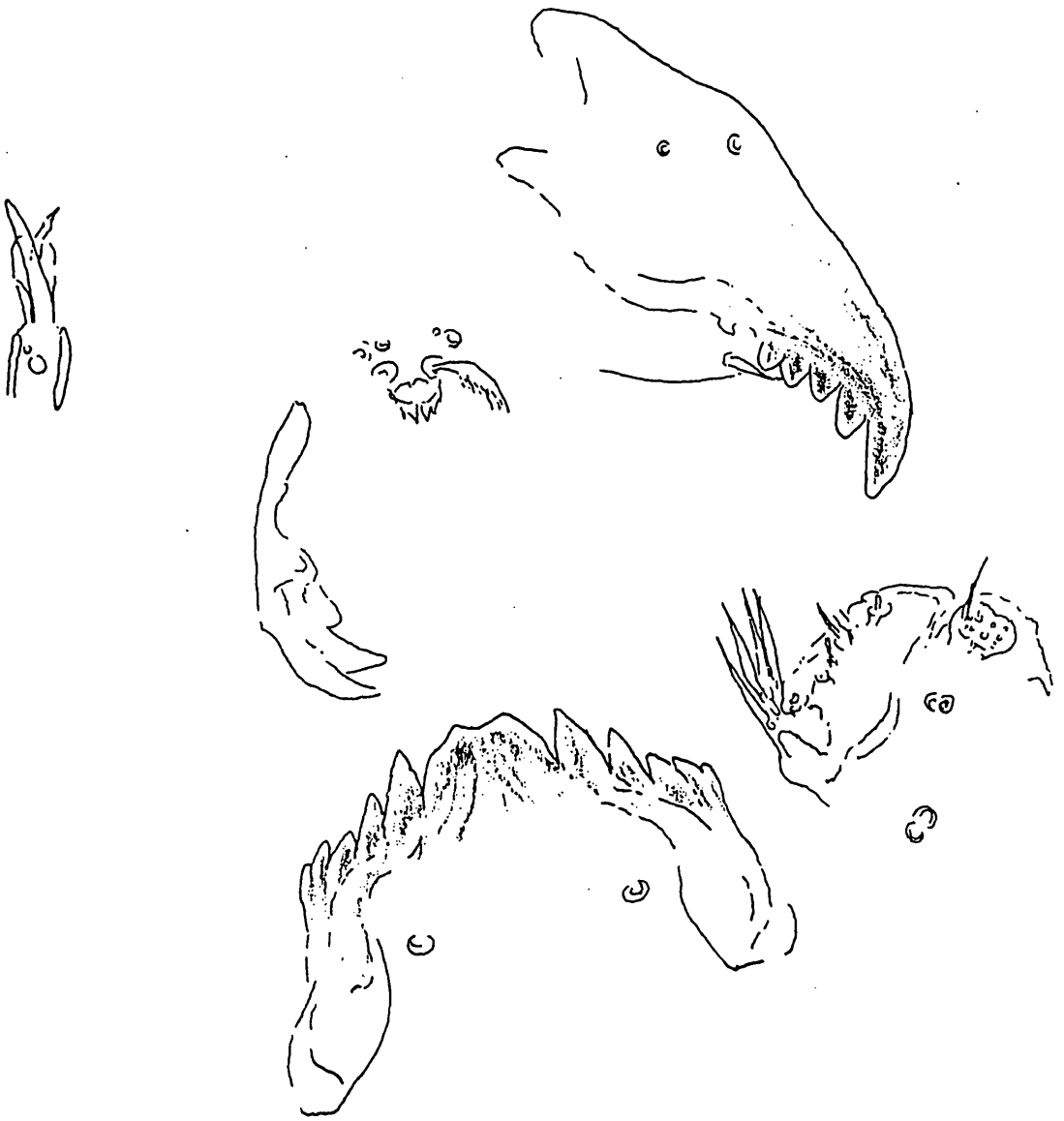
2nd instar

Measurements: (n=1)
CB: 090.0 µm
L : 1.100 mm
X1: 017.0 µm
X2: 009.6 µm
X3: 017.0 µm
X4: 009.6 µm
X5: 018.0 µm
X6: 015.4 µm
X7: 053.2 µm

PARAMETRIOCNEMUS stylatus 4th instar mag:1000x

Diagnosis:
Caput light-grey; postoccipital margin light.Ant.5-segmented; 1st segment much shorter than the following ones.
S I plumose; Premandible with 3 apical teeth.
Mentum with one divided median tooth and 5 pairs of lateral teeth.Mentro-ventral plates distinct.

Measurements: (n=1)
CB: 200.0 µm
L : nc
X1: 044.2 µm
X2: 024.0 µm
X3: 040.3 µm
X4: 013.4 µm
X5: 021.6 µm
X6: 034.6 µm
X7: 096.0 µm



PARATRICHOCLADIUS nivalis 4th instar mag: 1000x

Diagnosis:

Caput yellow; dark postoccipital margin.
Ant.5-segmented,blade not reaching the tip of 5th seg.
Lauterborn organ distinct.
S I bifid, but inner part a quarter shorter than the outer part. Premandible bifid
Mandible not crenulated, seta interna lying rather caudad.
Slender significant apical tooth of mandible.
Mentum with one broad median and 6 pairs of lateral teeth.
Basal mental setae originating beneath the 4th, 5th lateral pairs of teeth.

Measurements: (n=1)
CB: 390 µm
L : nc
X1: 106.3 µm
X2: 025.0 µm
X3: 089.4 µm
X4: 066.0 µm
X5: 037.2 µm
X6: 055.3 µm
X7: 175.5 µm

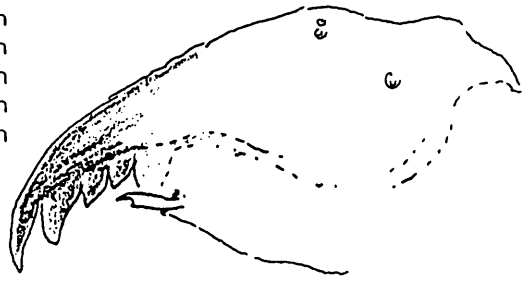
PARATRICHOCLADIUS rufiventris 4th instar mag: 1000x

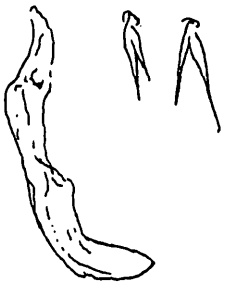
Diagnosis:
Caput yellow;light postoccipital margin. Ant.5-segmented, blade reaching not the half of the 4th segment.Lauterborn organ distinct.
SI bifid,innermost part not reaching the tip of outermost half.
Mentum with one median tooth, less the width of one pair of 1st laterals.
6 pair of lateral teeth.Basal setae originating beneath the 5th pair of laterals.

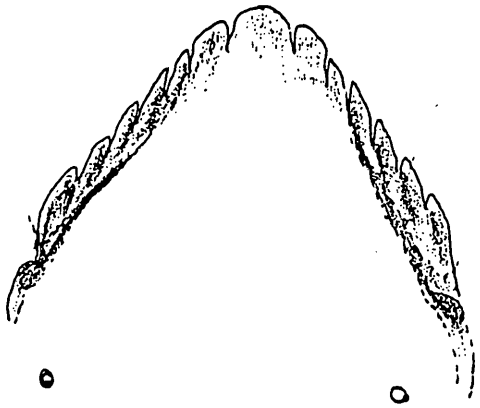
Measurements: (n=3)
CB: $\bar{x}$: 280.0µm (LL: 270.0 UL: 290.0µm)
L : nc
X1: $\bar{x}$: 089.6µm (LL: 086.4 UL: 092.2µm)
X2: $\bar{x}$: 019.5µm (LL: 019.2 UL: 020.2µm)
X3: $\bar{x}$: 099.2µm (LL: 096.0 UL: 102.7µm)
X4: $\bar{x}$: 042.4µm (LL: 041.3 UL: 043.2µm)
X5: $\bar{x}$: 035.5µm (LL: 033.6 UL: 037.0µm)
X6: $\bar{x}$: 043.5µm (LL: 041.3 UL: 046.1µm)
X7: $\bar{x}$: 144.7µm (LL: 140.2 UL: 148.8µm)

PARATRICHOCLADIUS rufiventris 3rd instar mag:1000x

Measurements: (n=1)
CB: 180.0µm
L : nc
X1: 079.8 µm
X2: 012.8 µm
X3: 069.2 µm
X4: 022.3 µm
X5: 027.7 µm
X6: 030.9 µm
X7: 106.4 µm







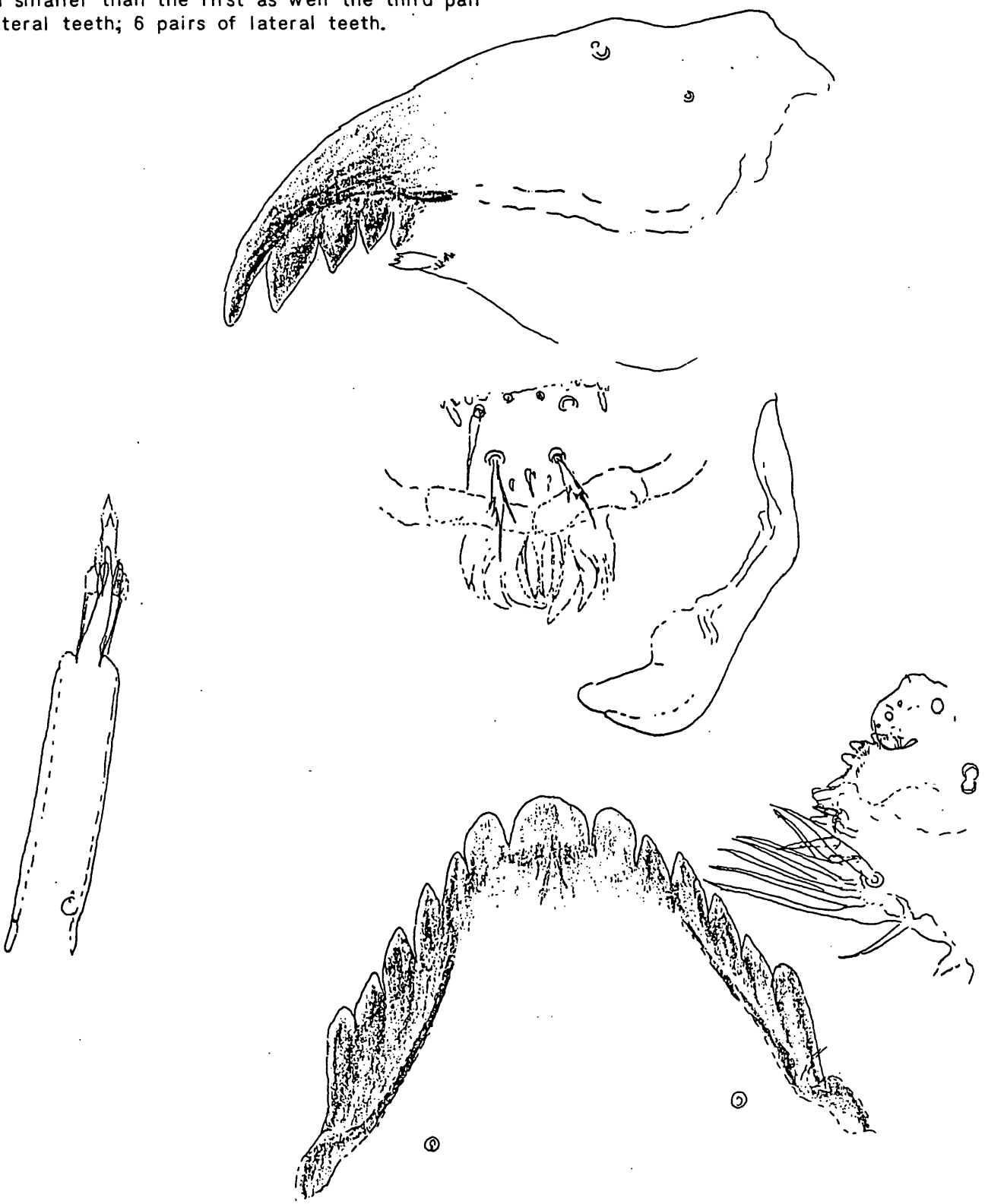
PARATRICHOCLADIUS skirwithensis 4th instar mag:1000x

142

Measurements; (n=4)
CB: x̄: 314.6µm (LL: 255.0 UL: 377.0µm)
L: x̄: 3.300mm (LL:3.000 UL:3.600mm)
X1: x̄: 088.7µm (LL: 080.1 UL: 097.4µm)
X2: x̄: 018.6µm (LL: 017.2 UL: 020.0µm)
X3: x̄: 070.5µm (LL: 063.9 UL: 079.1µm)
X4: x̄: 057.0µm (LL: 052.7 UL: 061.4µm)
X5: x̄: 036.9µm (LL: 032.2 UL: 041.6µm)
X6: x̄: 044.3µm (LL: 040.6 UL: 048.1µm)
X7: x̄: 153.3µm (LL: 138.5 UL: 168.2µm)

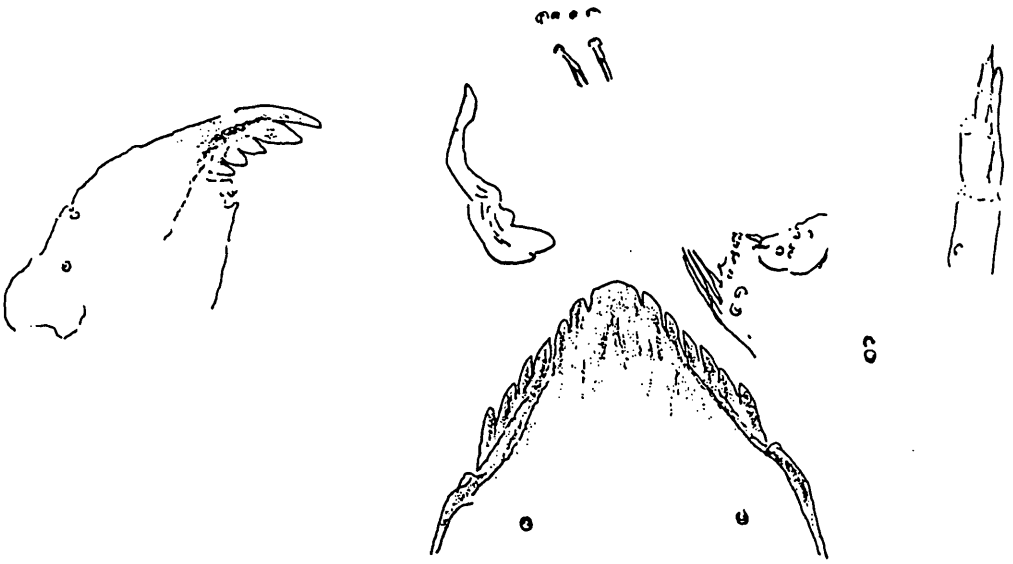
Diagnosis:

Caput yellow; occipital margin black.
Ant. 5-segmented. Lauterborn organ conspicuous.
S I bifid. Premandible with 1 apical tooth.
Mentum with one median tooth, less as broad as the first pair of lateral teeth; second pair of lateral teeth smaller than the first as well the third pair of lateral teeth; 6 pairs of lateral teeth.



PARATRICHOCLADIUS skirwithensis 2nd instar mag:1000x

Measurements: (n=6)
CB: x̄: 130.0µm (LL: 123.4 UL: 136.6µm)
L : x̄: .8830mm (LL:.8398 UL:.9271mm)
X1: x̄: 033.3µm (LL: 031.5 UL: 035.2µm)
X2: x̄: 008.2µm (LL: 007.6 UL: 008.9µm)
X3: x̄: 039.1µm (LL: 035.7 UL: 042.4µm)
X4: x̄: 010.6µm (LL: 010.6 UL: 010.6µm)
X5: x̄: 024.0µm (LL: 023.1 UL: 024.9µm)
X6: x̄: 016.9µm (LL: 016.2 UL: 017.5µm)
X7: x̄: 062.5µm (LL: 060.3 UL: 064.8µm)



PARATRICHOCLADIUS skirwithensis 1st instar mag:1000x

Diagnosis:
Structure of the Mentum differs from all other instar stages: one median tooth with at least doubble width of the first lateral tooth; and 5 pairs of lateral teeth.

Measurements: (n=4)
CB: x̄: 100.0µm (LL: 095.0 UL: 110.0µm)
L : x̄: .7705mm (LL:.5557 UL:1.0149mm)
X1: x̄: 022.1µm (LL: 020.6 UL: 023.6µm)
X2: x̄. 006.7µm (LL: 005.7 UL: 007.6µm)
X3: x̄: 027.9µm (LL: 025.8 UL: 030.0µm)
X4: x̄: 003.2µm (LL: 024.4 UL: 003.9µm)
X5: x̄: 015.7µm (LL: 012.0 UL: 019.5µm)
X6: x̄: 010.2µm (LL: 009.3 UL: 010.6µm)
X7: x̄: 041.2µm (LL: 037.8 UL: 044.6µm)

PARATRICHOCLADIUS triquetra 4th instar mag:1000x

Diagnosis:

Caput white; postoccipital margin black.
Ant.5-segmented; blade not reaching the 5th segment.
S lplumose premandible with two fairly divided apical teeth.
Mandible with apical teeth in the width of 2 inner teeth.
Mentum with one large triangular median tooth, pale in colour and 6 pairs of lateral teeth covered by large ventromental plates.

Measurements: (n=1)
CB: 266.0 µm
L : 2.128 mm
X1: 055.9 µm
X2: 037.2 µm
X3: 055.9 µm
X4: 025.0 µm
X5: 029.3 µm
X6: 023.9 µm
X7: 086.2 µm

PARATRICHOCLADIUS triquetra 3rd instar mag:1000x

Measurements: (n=1)
CB: 185.2 µm
L : nc
X1: 038.3 µm
X2: 022.3 µm
X3: 033.0 µm
X4: 010.5 µm
X5: 022.5 µm
X6: 018.1 µm
X7: 069.1 µm

PARATRICHOCLADIUS triquetra 2nd instar mag:1000x .

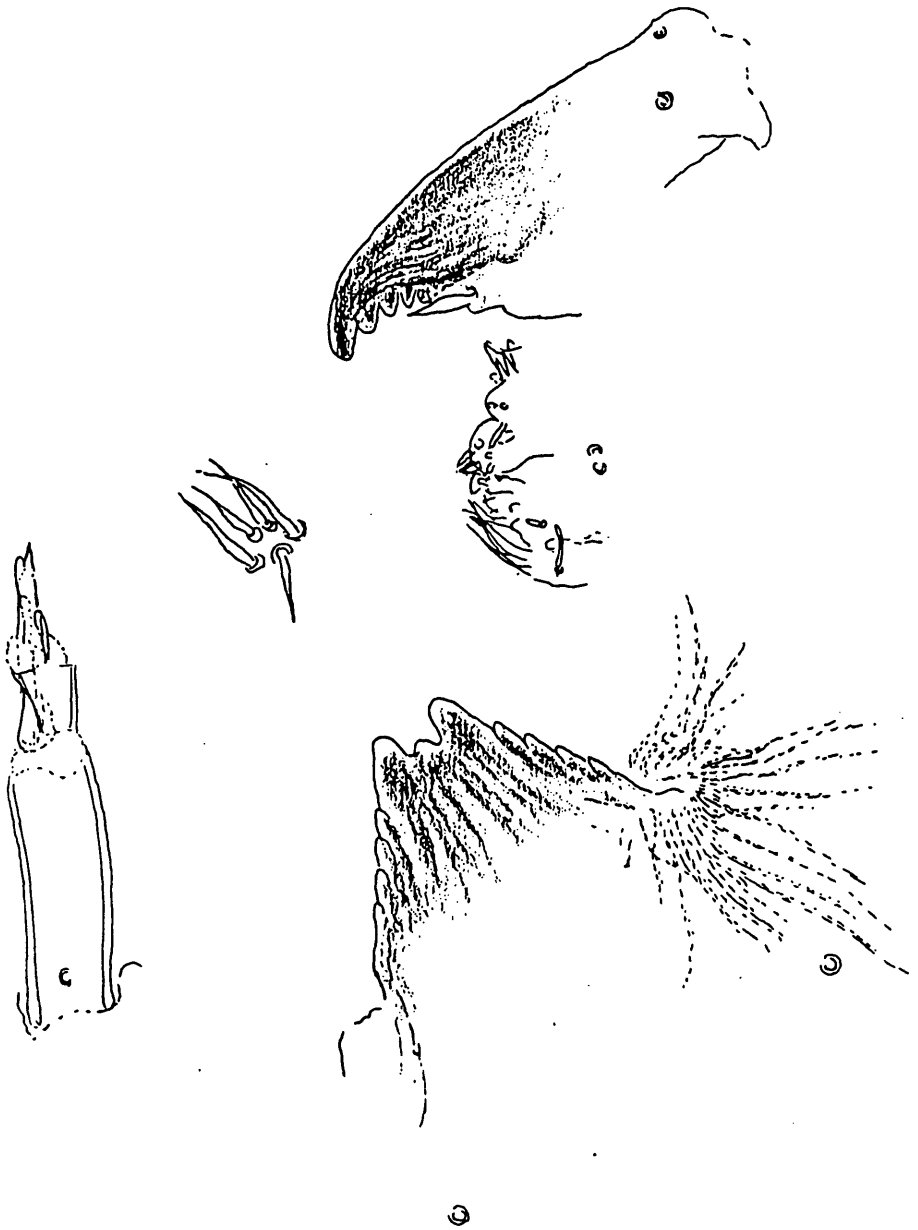
Measurements: (n=1)
CB: 100.0 µm
L : 0.700 mm
X1: 017.0 µm
X2: 008.0 µm
X3: 019.7 µm
X4: 003.2 µm
X5: 010.6 µm
X6: 012.2 µm
X7: 035.6 µm

PARORTHOCLADIUS nudipennis

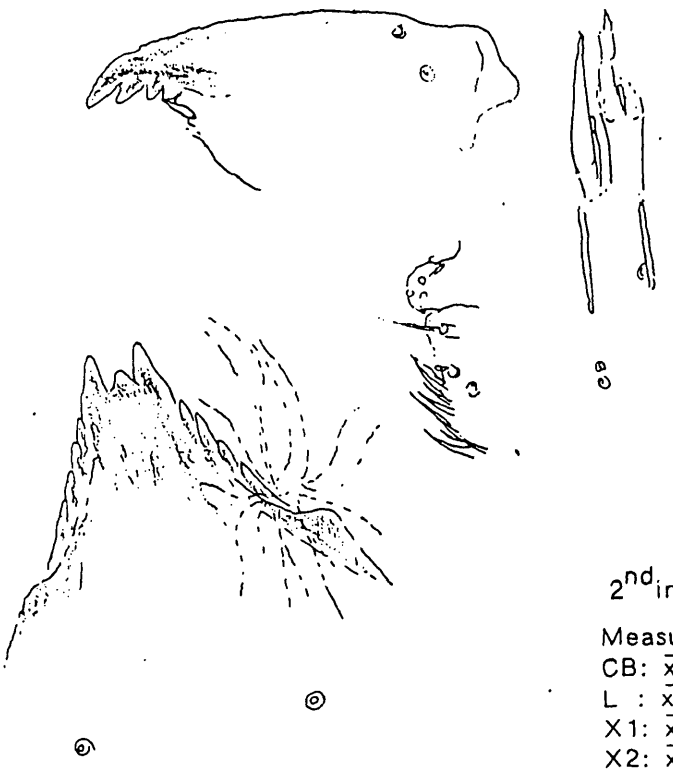
Diagnosis:
Caput dark-brown; postoccipital margin black. Ant.5-segmented; blade reaching the 5th segment. S I simple; premandible with 1 apical tooth:
Mentum with 3 median teeth, the middle one is the smallest and 4 pairs of lateral teeth. Ventromental plates with a tuft of setae as long as the mentum itself.

4^{th} instar mag:1000x

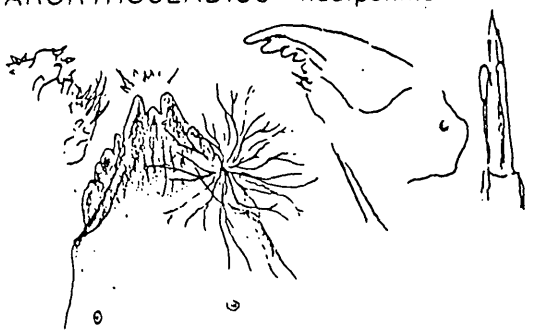
Measurements: (n=5)
CB: $\bar{x}$: 291.9µm (LL: 273.6 UL: 310.5µm)
L : $\bar{x}$: 2.606mm (LL: 1.473 UL: 4.258mm)
X1: $\bar{x}$: 056.8µm (LL: 053.1 UL: 060.5µm)
X2: $\bar{x}$: 025.9µm (LL: 022.6 UL: 029.1µm)
X3: $\bar{x}$: 089.9µm (LL: 084.2 UL: 095.7µm)
X4: $\bar{x}$: 052.0µm (LL: 048.4 UL: 055.7µm)
X5: $\bar{x}$: 041.2µm (LL: 039.2 UL: 043.2µm)
X6: $\bar{x}$: 022.2µm (LL: 020.4 UL: 024.0µm)
X7: $\bar{x}$: 102.8µm (LL: 099.9 UL: 105.8µm)



PARORTHOCLADIUS nudipennis



PARORTHOCLADIUS nudipennis



PARORTHOCLADIUS nudipennis

3rd instar mag:1000x

Measurements: (n=4)
CB: $\bar{x}$: 177.5 µm (LL: 157.5 UL: 197.7µm)
L : $\bar{x}$: 1.550mm (LL: 1.500 UL: 1.600mm)
X1: $\bar{x}$: 040.4µm (LL: 036.3 UL: 044.4µm)
X2: $\bar{x}$: 014.6µm (LL: 013.3 UL: 015.9µm)
X3: $\bar{x}$: 060.5µm (LL: 056.0 UL: 065.1µm)
X4: $\bar{x}$: 016.2µm (LL: 012.1 UL: 020.2µm)
X5: $\bar{x}$: 032.9µm (LL: 027.4 UL: 038.4µm)
X6: $\bar{x}$: 015.3µm (LL: 013.8 UL: 016.8µm)
X7: $\bar{x}$: 072.4µm (LL: 065.9 UL: 078.9µm)

2nd instar mag:1000x

Measurements: (n=4)
CB: $\bar{x}$: 122.5µm (LL: 114.6 UL: 130.5µm)
L : $\bar{x}$: 1.230mm (LL: 0.884 UL: 1.639mm)
X1: $\bar{x}$: 024.0µm (LL: 022.9 UL: 025.0µm)
X2: $\bar{x}$: 008.2µm (LL: 007.1 UL: 009.2µm)
X3: $\bar{x}$: 040.2µm (LL: 039.8 UL: 040.6µm)
X4: $\bar{x}$: 008.6µm (LL: 008.6 UL: 008.6µm)
X5: $\bar{x}$: 028.1µm (LL: 027.1 UL: 029.0µm)
X6: $\bar{x}$: 011.3µm (LL: 010.6 UL: 012.0µm)
X7: $\bar{x}$: 050.4µm (LL: 049.3 UL: 051.5µm)

1st instar

Measurements: (n=3)
CB: $\bar{x}$: 077.5µm (LL: 070.6 UL: 084.5µm)
L : $\bar{x}$: 0.562mm (LL: 0.400 UL: 0.700mm)
X1: $\bar{x}$: 016.6µm (LL: 015.2 UL: 018.0µm)
X2: $\bar{x}$: 005.6µm (LL: 005.1 UL: 006.0µm)
X3: $\bar{x}$: 028.6µm (LL: 027.0 UL: 030.1µm)
X4: $\bar{x}$: 003.0µm (LL: 002.1 UL: 003.9µm)
X5: $\bar{x}$: 021.7µm (LL: 019.5 UL: 023.9µm)
X6: $\bar{x}$: 008.0µm (LL: 007.1 UL: 008.9µm)
X7: $\bar{x}$: 038.2µm (LL: 033.1 UL: 043.3µm)

PSEUDOSMITTIA sp. i^{th} instar mag:1000x

Measurements: nc

Diagnosis:
Caput light-gey; light postocciptal margin; Ant.3?-segmented; blade longer than flagellum.
S I bifid; Premandible with 2 apical teeth.
Mentum with one broad median tooth and 4 pairs of lateral teeth.

RHEOCRICOTOPUS fuscipes 4th instar mag:1000x .

Diagnosis:
Caput light-yellow; dark postoccipital margin; Ant.5-segmented;blade not reaching the 5th segment.
S I bifid; Premandible with 1 apical tooth.
Mentum with 2 median teeth and 1 pair of small accessory teeth; 5 pairs of lateral teeth; ventromental plates distinct;at their bases with long setae.

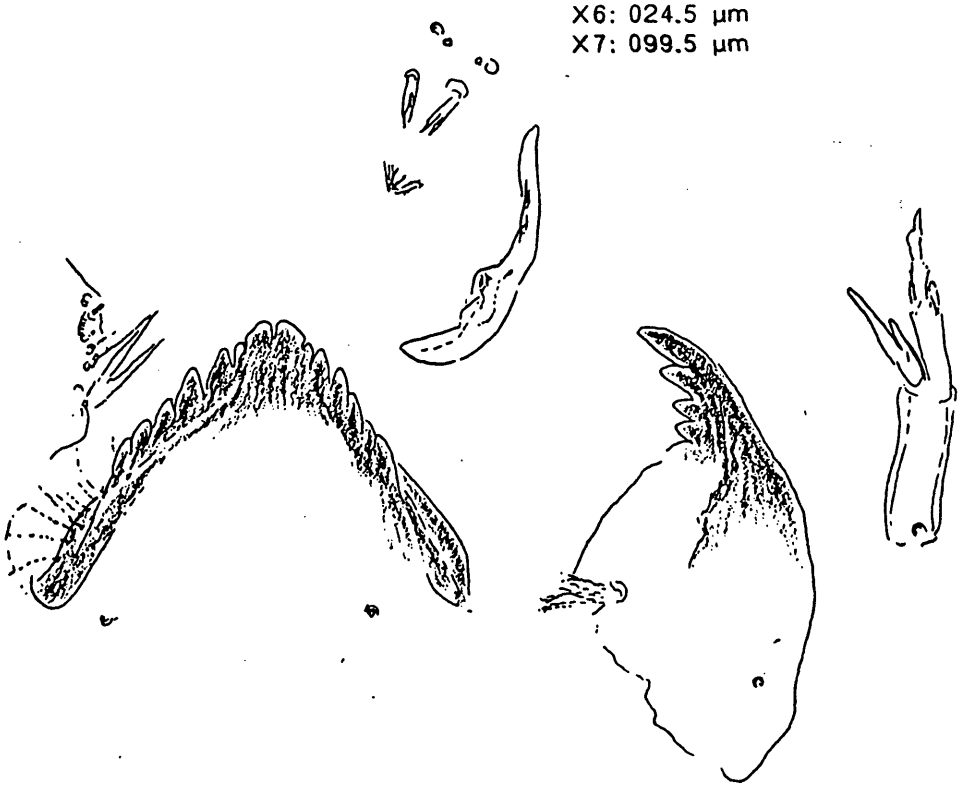
Measurements: (n=2)
CB: x: 330.0µm (LL: 320.0 UL: 340.0µm)
L : $\bar{x}$: 3.700 mm (LL: 3.400 UL 4.000mm)
X1: $\bar{x}$: 083.0µm (LL: 073.5 UL: 092.5µm)
X2: $\bar{x}$: 026.4µm (LL: 025.0 UL: 027.7µm)
X3: $\bar{x}$: 085.7µm (LL: 079.8 UL: 091.5µm)
X4: $\bar{x}$: 060.1µm (LL: 055.3 UL: 064.9µm)
X5: $\bar{x}$: 043.1µm (LL: 039.4 UL: 046.8µm)
X6: $\bar{x}$: 040.5µm (LL: 038.3 UL: 042.6µm)
X7: $\bar{x}$: 146.8µm (LL: 134.0 UL: 159.6µm)

RHEOCRICOTOPUS fuscipes

3rd instar

mag:1000x

Measurements: (n=1)
CB: 210.0 µm
L : 2.700 mm
X1: 052.1 µm
X2: 015.4 µm
X3: 054.5 µm
X4: 033.0 µm
X5: 034.0 µm
X6: 024.5 µm
X7: 099.5 µm



RHEOCRICOTOPUS fuscipes

2nd instar

mag:1000x

Measurements: (n=2)
CB: $\bar{x}$: 135µm (LL: 120.0 UL: 150.0µm)
L : $\bar{x}$: 1.850mm (LL: 1.300 UL: 2.400mm)
X1: $\bar{x}$: 039.5µm (LL: 037.2 UL: 041.8µm)
X2: $\bar{x}$: 010.9µm (LL: 010.6 UL: 011.2µm)
X3: $\bar{x}$: 044.8µm (LL: 042.6 UL: 047.0µm)
X4: $\bar{x}$: 012.0µm (LL: 010.2 UL: 013.8µm)
X5: $\bar{x}$: 026.6µm (LL: 026.6 UL: 026.6µm)
X6: $\bar{x}$: 019.2µm (LL: 018.1 UL: 020.2µm)
X7: $\bar{x}$: 068.9µm (LL: 063.8 UL: 073.9µm)

RHEOCRICOTOPUS effusus 4^{th} instar mag:1000x .

Diagnosis:
Caput light-grey; postoccipital margin black; Ant.5-segmented; blade not reaching the apex of 5th segment. S I bifid; premandible with 1 apical tooth.
Mentum with 2 median teeth and 5 pairs of lateral teeth; Ventromental plates distinct with setae originating at its base.

Measurements: (n=1)
CB: 330.0 µm
L : 4.400 mm
X1: 083.0 µm
X2: 029.3 µm
X3: 089.4 µm
X4: 056.4 µm
X5: 043.6 µm
X6: 035.1 µm
X7: 133.0 µm

RHEOCRICOTOPUS effusus

3rd instar

mag:1000x

Measurements: (n=1)
CB: 220.0 µm
L : 2.800 mm
X1: 050.0 µm
X2: 017.6 µm
X3: 058.5 µm
X4: 023.2 µm
X5: 034.0 µm
X6: 026.6 µm
X7: 093.6 µm

100µm

RHEOCRICOTOPUS effusus

2nd instar

mag:1000x

Measurements:(n=1)
CB: 130.0 µm
L : 1.450 mm
X1: 027.7 µm
X2: 009.6 µm
X3: 037.8 µm
X4: 012.8 µm
X5: 021.8 µm
X6: 017.0 µm
X7: 056.9 µm

RHEOSMITTIA sp. i th instar mag:1000x

Diagnosis:
Caput white; light postoccipital margin; Ant. 5-segmented; segment 2 as long as first; blade as long as 2nd segment. S I not visible; Premandible with small apical teeth.
Mentum with 4 median teeth and 6 pairs of lateral teeth. Median area of hypopharynx with 2 lobate scales.

Measurements: nc

SMITTIA sp. 4th instar mag:1000x

Diagnosis:
Caput yellow; postoccipital margin darkened; Ant.4-segmented; blade not reaching the 4th segment.
S I plumose; Premandible with 2 apical teeth.
Mentum with single median tooth and 4 pairs of lateral teeth.

Measurements: (n=1)
CB: 200.0 µm
L : nc
X1: 053.2 µm
X2: 016.5 µm
X3: 045.7 µm
X4: 011.7 µm
X5: 034.6 µm
X6: 021.2 µm
X7: 074.5 µm

SYMBIOCLADIUS rithrogenae?

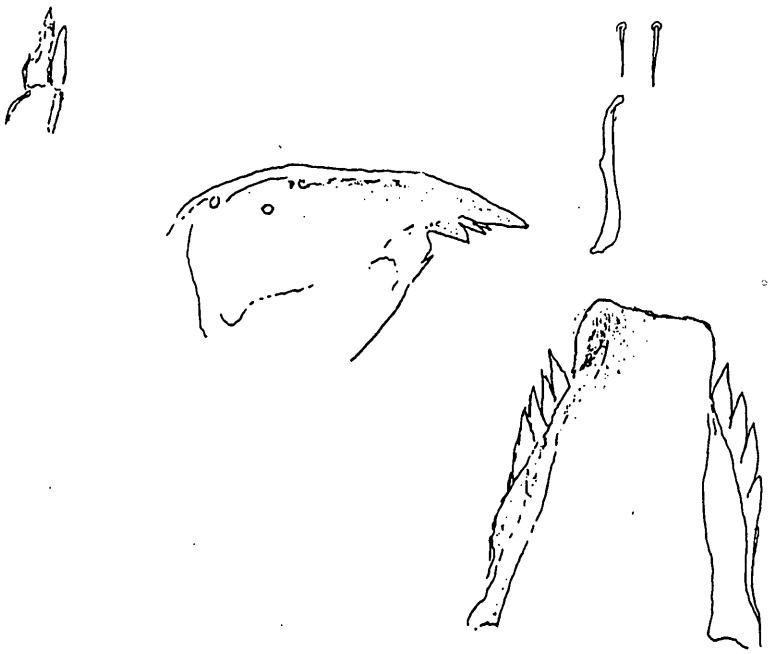
Diagnosis:

Caput light-grey; postoccipital margin darkened;Caput small relative to body size! Ant 5-segmented; balde not reaching the 5th segment.
S I simple;Premandible narrow.
Mandible with spine-like 3 inner teeth,;
Mentum with a median toothless concavity and 4 pairs of pointed lateral teeth.

4th? instar

Measurements: (n=1)
CB: 250.0 µm
L : 2.800 mm
X1: nc
X2: nc
X3: 053.2 µm
X4: 009.1 µm
X5: 016.0 µm
X6: 019.7 µm
X7: 070.7 µm

mag:1000x



SYMPOSIOCLADIUS lignicola 4th instar mag:1000x

Diagnosis :
Caput yellow; postoccipital margin black. Ant.5-segmented;blade not reaching the apex of flagellum. Lauterborn organ very distinct! S I simple; Premandible with 1 apical tooth and one broad inner tooth.
Mentum with a triangular median tooth and 2 pairs of lateral teeth.

Measurements: (n=1)
CB: 260.0 µm
L : 2.800 mm
X1: 097.9 µm
X2: 080.2 µm
X3: 101.8 µm
X4: 023.5 µm
X5: nc
X6: 038.4 µm
X7: 129.6 µm

SYMPOSIOCLADIUS lignicola

3rd instar

mag:1000x

Measurements: (n=2)
CB: x: 165.0µm (LL: 140.0 UL: 190.0µm)
L : x̄: 1.900mm (LL: 1.800 UL: 2.000mm)
X1: x̄: 051.8µm (LL: 050.4 UL: 053.2µm)
X2: x̄: 041.3µm (LL: 040.4 UL: 042.2µm)
X3: x̄: 061.7µm (LL: 059.5 UL: 063.8µm)
X4: x̄: 014.3µm (LL: 012.5 UL: 016.0µm)
X5: x̄: 029.1µm (LL: 027.8 UL: 030.3µm)
X6: x̄: 023.4µm (LL: 020.2 UL: 026.9µm)
X7: x̄: 092.5µm (LL: 068.2 UL: 122.3µm)

SYMPOSIOCLADIUS lignicola

1st instar

mag:1000x

Diagnosis:
The 1st instar differs in the structure of mentum; 1 median tooth and 6 pairs of lateral teeth; the second pair of laterals is the smallest.

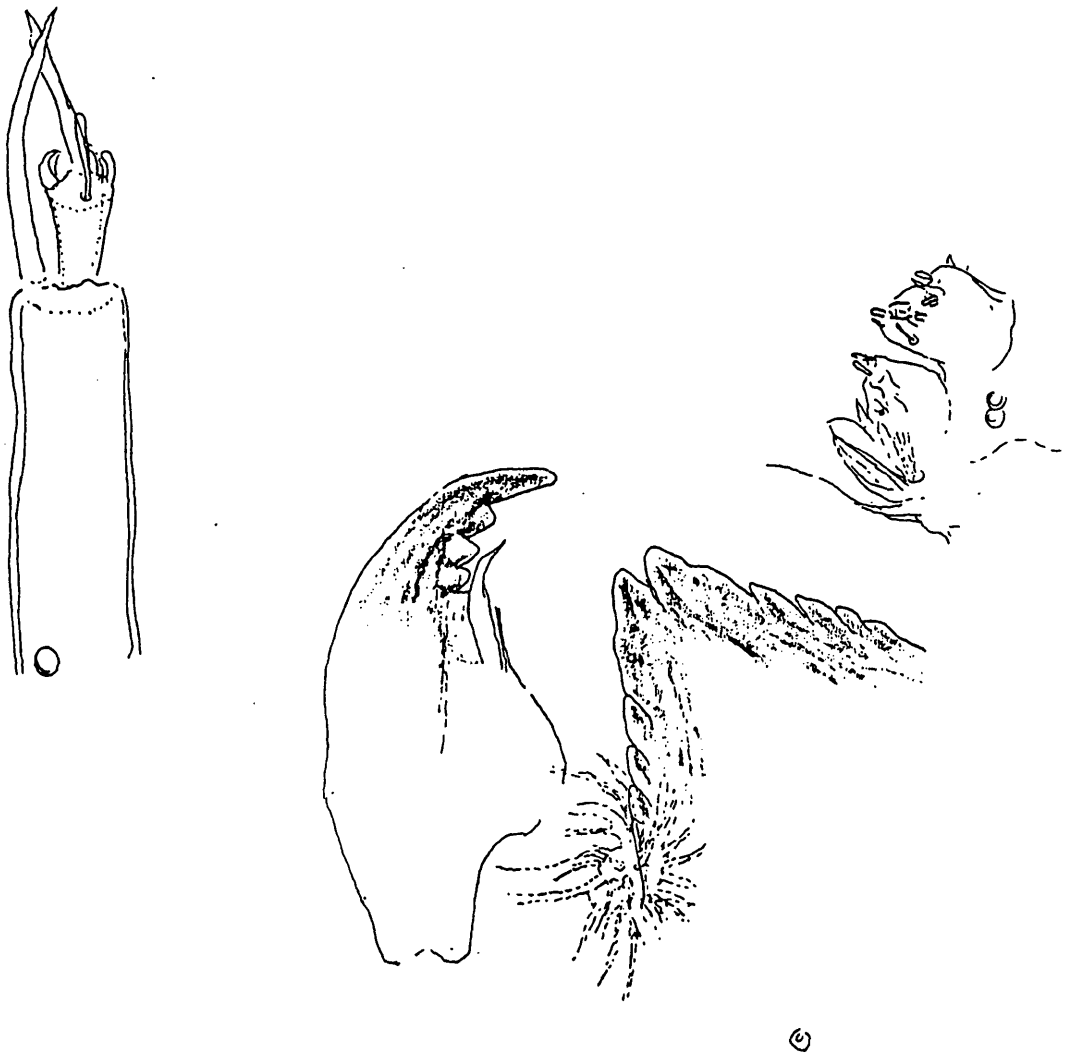
Measurements: (n=1)
CB: 100.0 µm
L : 1.000mm
X1: 018.1 µm
X2: 003.4 µm
X3: nc
X4: 004.3 µm
X5: 022.3 µm
X6: 014.0 µm
X7: 050.0 µm

SYNORTHOCLADIUS semivirens

Diagnosis:
Caput yellow; postoccipital margin darkened; Ant.5-segmented; blade extending a bit beyond flagellum.
S I simple; Premandible with 1 tooth.
Mentum with 2 median teeth and 4 pairs of lateral teeth.
Ventromental plates distinct, bearing long setae.
Mandible with long seta subdentalis.

4^{th} instar mag:1000x

Measurements: (n=3)
CB: $\bar{x}$: 261.9µm (LL: 235.2 UL: 289.1µm)
L : $\bar{x}$: 3.233mm (LL: 3.000 UL: 3.400mm)
X1: $\bar{x}$: 065.3µm (LL: 059.5 UL: 068.7µm)
X2: $\bar{x}$: 028.0µm (LL: 027.0 UL: 028.8µm)
X3: $\bar{x}$: 092.1µm (LL: 087.5 UL: 097.0µm)
X4: $\bar{x}$: 064.6µm (LL: 059.5 UL: 067.7µm)
X5: $\bar{x}$: 050.7µm (LL: 048.0 UL: 052.0µm)
X6: $\bar{x}$: 026.2µm (LL: 024.0 UL: 030.7µm)
X7: $\bar{x}$: 107.2µm (LL: 100.0 UL: 115.2µm)

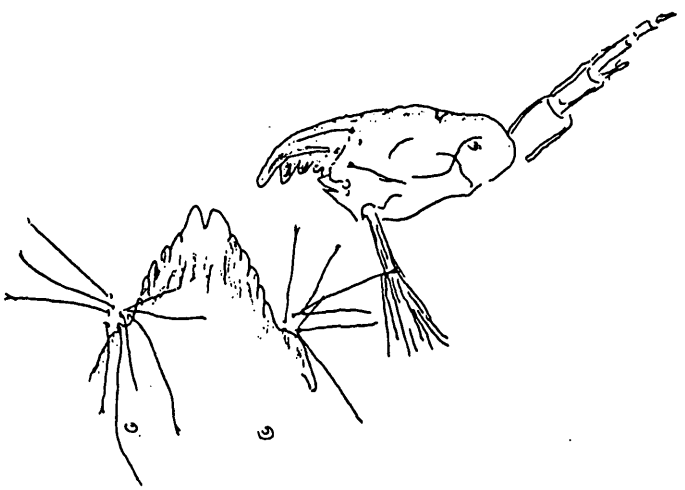


SYNORTHOCLADIUS semivirens 3rd instar mag:1000x

Measurements: (n=1)
CB: 158.0 µm
L : 1.465 mm
X1 - X7: nc

SYNORTHOCLADIUS semivirens 2nd instar mag:1000x

Measurements: (n=2)
CB: $\bar{x}$: 115.0µm (LL: 110.0 UL: 120.0µm)
L : $\bar{x}$: 0.900 mm (LL: 0.800 UL: 1.000mm)
X1: $\bar{x}$: 028.5µm (LL: 025.0 UL: 031.9µm)
X2: $\bar{x}$: 008.5µm (LL: 008.5 UL: 008.5µm)
X3: $\bar{x}$: 040.8µm (LL: 039.0 UL: 042.6µm)
X4: $\bar{x}$: 011.7µm (LL: 010.6 UL: 012.8µm)
X5: $\bar{x}$: 028.9µm (LL: 025.9 UL: 031.9µm)
X6: $\bar{x}$: 012.7µm (LL: 012.5 UL: 012.8µm)
X7: $\bar{x}$: 046.9µm (LL: 046.8 UL: 047.0µm)



SYNORTHOCLADIUS semivirens 1st instar

Measurements: (n=1)
CB: 080 µm
L : 0.90 mm
X1: 015.4 µm
X2: 005.3 µm
X3: 025.9 µm
X4: 003.4 µm
X5: 023.5 µm
X6: 007.7 µm
X7: 035.5 µm

THIENEMANNIELLA partita

Diagnosis:
Caput whitish; postoccipital margin black. Ant. 5-segmented. Segment 2 darkened.
S I simple; premandible with 1 apical tooth and with brush.
Mentum with 3 median teeth, middle smallest one, and 5 pairs of lateral teeth.

4th instar

Measurements: (n=1)
CB: 170.0 µm
L : 2.200 mm
X1: 052.2 µm
X2: 009.3 µm
X3: 052.0 µm
X4: 044.3 µm
X5: 038.8 µm
X6: 011.4 µm
X7: 054.6 µm

mag:1000x

THIENEMANNIELLA partita 3rd instar mag:1000x

Measurements: (n=1)
CB: 100.0 µm
L : 1.500 mm
X1: 023.5 µm
X2: 004.5 µm
X3: 027.7 µm
X4: 031.2 µm
X5: 039.6 µm
X6: 007.9 µm
X7: 033.5 µm

TVETENIA calvescens 4^{th} instar mag:1000x

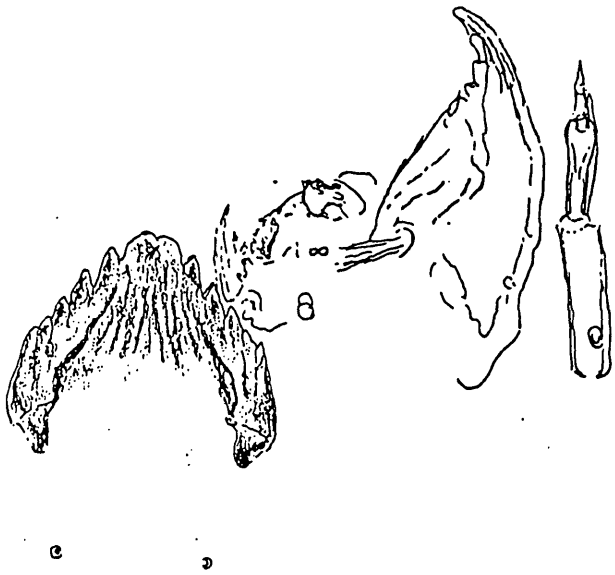
Diagnosis:
Caput yellow; postoccipital margin light.
Ant.5-segmented; blade not reaching the apex of 5th segment.
S I branched 3 times; Premandible with one broad apical toth.
Mandible with 2 spines.
Mentum with 2 median teeth and 5 pairs of lateral teeth.

Measurements: (n=1)
CB: 270.0 µm
L : 4.300 mm
X1: 056.4 µm
X2: 018.0 µm
X3: 094.7 µm
X4: 054.3 µm
X5: 038.8 µm
X6: 028.7 µm
X7: 098.9 µm

TVETENIA calvescens

3rd instar mag:1000x

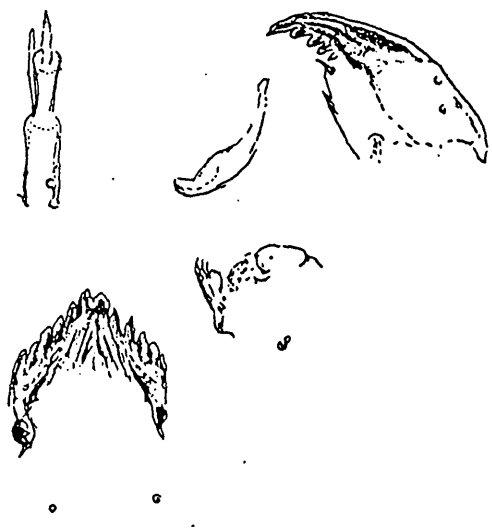
Measurements: (n=1)
CB: 130.0 µm
L: 2.400 mm
X1: 028.8 µm
X2: 010.1 µm
X3: 056.2 µm
X4: 027.4 µm
X5: 027.8 µm
X6: 014.9 µm
X7: 064.8 µm



TVETENIA calvescens

2nd instar mag:1000x

Measurements: (n=5)
CB: $\bar{x}$: 114.0µm (LL: 102.9 UL: 125.2µm)
L : $\bar{x}$: 1.356 mm (LL: 0.940 UL: 1.862mm)
X1: $\bar{x}$: 023.3µm (LL: 021.0 UL: 025.6µm)
X2: $\bar{x}$: 006.9µm (LL: 006.4 UL: 007.4µm)
X3: $\bar{x}$: 042.9µm (LL: 040.3 UL: 045.5µm)
X4: $\bar{x}$: 016.3µm (LL: 015.3 UL: 017.4µm)
X5: $\bar{x}$: 022.5µm (LL: 019.9 UL: 025.1µm)
X6: $\bar{x}$: 011.8µm (LL: 010.8 UL: 012.8µm)
X7: $\bar{x}$: 047.0µm (LL: 043.0 UL: 050.9µm)

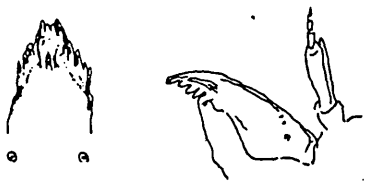


TVETENIA calvescens

1st instar mag:1000x

Diagnosis:
1st instar with 4 median teeth, the 2 middle one spine-like.

Measurements: (n=2)
CB: $\bar{x}$: 090.0µm (LL: 080.0 UL: 100.0µm)
L : $\bar{x}$: 1.050mm (LL: 1.000 UL: 1.100mm)
X1: $\bar{x}$: 019.8µm (LL: 017.8 UL: 021.8µm)
X2: $\bar{x}$: 006.1µm (LL: 005.9 UL: 006.2µm)
X3: $\bar{x}$: 026.0µm (LL: 025.0 UL: 027.0µm)
X4: $\bar{x}$: 010.9µm (LL: 005.8 UL: 016.0µm)
X5: $\bar{x}$: 021.4µm (LL: 018.2 UL: 024.5µm)
X6: $\bar{x}$: 067.6µm (LL: 007.2 UL: 008.0µm)
X7: $\bar{x}$: 033.5µm (LL: 033.1 UL: 033.8µm)



TVETENIA discoloripes

Diagnosis:
Caput yellow; postoccipital margin black!
Ant 5-segmented; blade not reaching the 5th segment.
S I plumose; Premandible with one broad apical tooth.
Mentum with 1-2 median teeth and 5 pairs of lateral teeth.
Mandible without inner spines.

4th instar

Measurements: (n=1)
CB: 300.0 µm
L : 3.000 mm
X1: 063.8 µm
X2: 018.7 µm
X3: 094.0 µm
X4: 067.2 µm
X5: 042.7 µm
X6: 030.7 µm
X7: 129.6 µm

mag:1000x

TVETENIA discoloripes

3rd instar

mag:1000x

Measurements: (n=1)
CB: 220.0 µm
L: 2.300 mm
X1: 045.5 µm
X2: 014.3 µm
X3: 059.9 µm
X4: 033.2 µm
X5: 039.9 µm
X6: 024.6 µm
X7: 096.2 µm

TVETENIA discoloripes

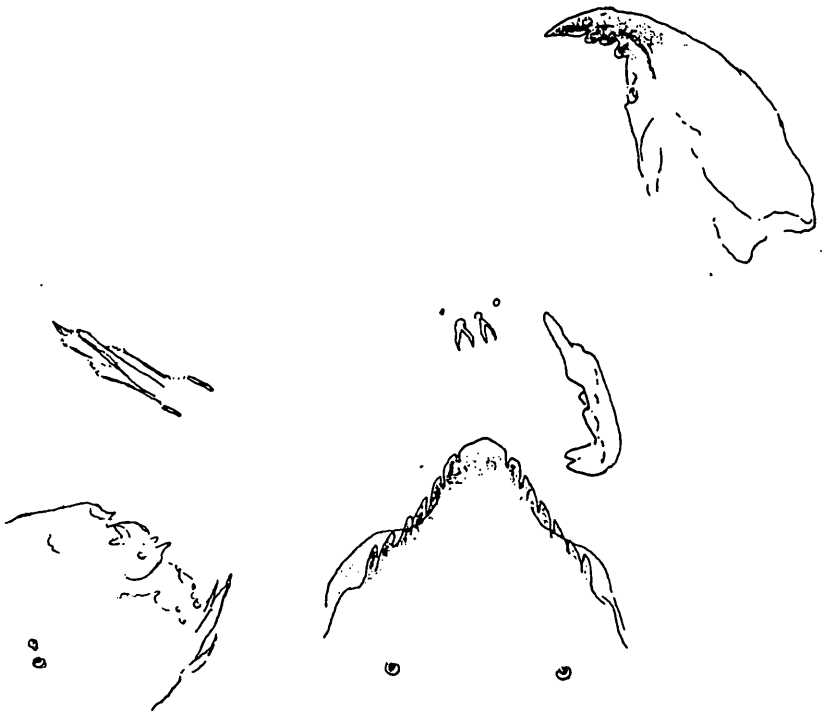
2nd instar

Measurements (n=2)
CB: $\bar{x}$: 125.0µm (LL: 120.0 UL: 130.0µm)
L : $\bar{x}$: 1.600mm (LL: 1.500 UL: 1.700mm)
X1: $\bar{x}$: 026.4µm (LL: 025.4 UL: 027.4µm)
X2: $\bar{x}$: 006.8µm (LL: 006.7 UL: 006.9µm)
X3: $\bar{x}$: 038.4µm (LL: 038.2 UL: 038.6µm)
X4: $\bar{x}$: 020.4µm (LL: 020.2 UL: 020.6µm)
X5: $\bar{x}$: 023.0µm (LL: 022.0 UL: 024.0µm)
X6: $\bar{x}$: 012.5µm (LL: 011.5 UL: 013.4µm)
X7: $\bar{x}$: 049.9µm (LL: 049.4 UL: 050.4µm)

ORTHOCLADIUS sp:1 1st instar mag:1000x ..

Diagnosis:
Caput light-grey; postoccipital margin black;Ant.5-segmented;blade not reaching the apex.Lauterborn organ distinct. S I bifid. Premandible with 2 apical teeth.
Mentum with one median tooth and 6 pairs of lateral teeth. Ventromental plates distinctly covering the 5th, 6th pairs of laterals.
Mandible with slightly elongated apical tooth.

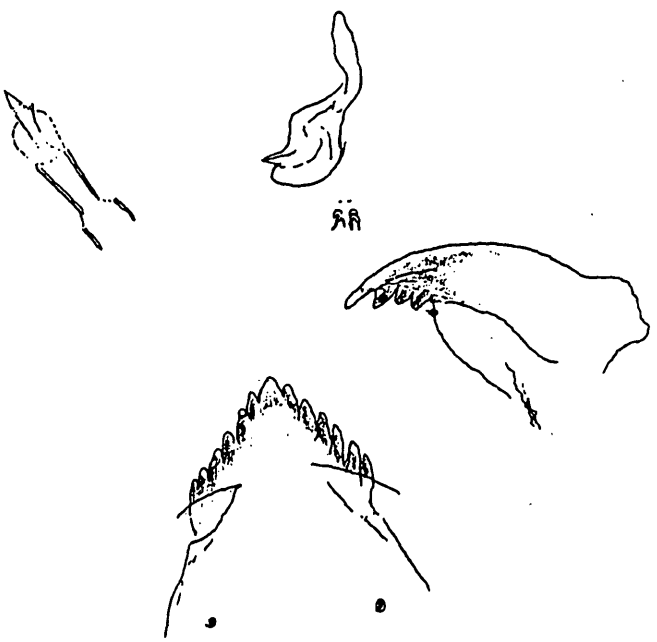
Measurements: (n=3)
CB: $\bar{x}$: 083.3µm (LL: 080.0 UL: 090.0µm)
L : $\bar{x}$: 0.700mm (LL: 0.600 UL: 0900mm)
X1: $\bar{x}$: 021.6µm (LL: 021.1 UL: 022.3µm)
X2: $\bar{x}$: 004.5µm (LL: 004.3 UL: 004.8µm)
X3: $\bar{x}$: 028.3µm (LL: 026.9 UL: 030.9µm)
X4: $\bar{x}$: 002.9µm (LL: 002.7 UL: 003.1µm)
X5: $\bar{x}$: 015.8µm (LL: 014.9 UL: 016.5µm)
X6: $\bar{x}$: 011.0µm (LL: 010.1 UL: 012.2µm)
X7: $\bar{x}$: 041.4µm (LL: 038.3 UL: 044.6µm)



ORTHOCLADIUS sp.2 1st instar mag:1000x ..

Diagnosis:
Caput light-grey;postoccipital margin black; Ant. 4?-segmented; Lauterborn organ very distinct.
S I bifid; premandible with 2 apical teeth. Mentum with one median tooth and 6 pairs of lateral teeth. Ventromental plates distinct.

Measurements: (n=5)
CB: $\bar{x}$: 095.9µm (LL: 089.2 UL: 102.8µm)
L : $\bar{x}$: 0.817mm (LL: 0.689 UL: 0.956mm)
X1: $\bar{x}$: 019.6µm (LL: 018.1 UL: 021.0µm)
X2: $\bar{x}$: 002.4µm (LL: 001.8 UL: 003.0µm)
X3: $\bar{x}$: 029.4µm (LL: 026.3 UL: 032.4µm)
X4: $\bar{x}$: 003.7µm (LL: 002.8 UL: 004.7µm)
X5: $\bar{x}$: 017.4µm (LL: 015.6 UL: 019.1µm)
X6: $\bar{x}$: 009.3µm (LL: 007.7 UL: 010.8µm)
X7: $\bar{x}$: 038.5µm (LL: 036.1 UL: 040.6µm)



ORTHOCLADIUS sp. 3b

4^{th}?instar mag:1000x

Diagnosis:
Caput yellow; postoccipital margin black. Ant.: 5-segmented, blade reaching the 5th segment.
S I bifid, the inner branches smaller than the outer ones; Premandible with one fairly divided apical tooth and one basal inner roundness.
Mandible with pointed seta subdentalis.
Mentum with 1 broad median tooth, twice the width than one lateral tooth and 6 pairs of lateral teeth. Setae submenti arising underneath the 4th, 5th pair of lateral teeth.

Measurements: (n=2)
CB: $\bar{x}$: 350.0µm (LL: 0340.0 UL: 0360.0µm)
L : $\bar{x}$: 4.350mm (LL: 4.200 UL: 4.500mm)
X1: $\bar{x}$: 113.4µm (LL: 111.4 UL: 115.2µm)
X2: $\bar{x}$: 029.3µm (LL: 027.8 UL: 030.7µm)
X3: $\bar{x}$: 102.7µm (LL: 105.6 UL: 099.8µm)
X4: $\bar{x}$: 050.2µm (LL: 049.0 UL: 051.4µm)
X5: $\bar{x}$: 033.9µm (LL: 033.1 UL: 034.6µm)
X6: $\bar{x}$: 051.3µm (LL: 048.0 UL: 054.7µm)
X7: $\bar{x}$: 178.6µm (LL: 177.6 UL: 179.5µm)

ORTHOCLADIUS sp. 3a

Diagnosis:
Caput light-brown; dark postoccipital margin; Ant. 5-segmented; blade reaching the apex S I bifid; premandible with one fairly divided apical tooth.
Mentum with 1 broad median tooth, twice the width than one lateral tooth and 6 pairs of lateral teeth. Setae submenti dituated underneath the 5th pair of lateral teeth.

2nd instar mag:1000x

Measurements: (n=6)
CB: $\bar{x}$: 164.9µm (LL: 15o.6 UL: 179.5µm)
L : $\bar{x}$: 2.283mm (LL: 2.206 UL: 2.362mm)
X1: $\bar{x}$: 062.1µm (LL: 056.9 UL: 067.4µm)
X2: $\bar{x}$: 012.7µm (LL: 010.9 UL: 014.5µm)
X3: $\bar{x}$: 058.2µm (LL: 054.4 UL: 062.1µm)
X6: $\bar{x}$: 022.5µm (LL: 019.7 UL: 025.3µm)
X5: $\bar{x}$: 022.4µm (LL: 020.3 UL: 024.4µm)
X4: $\bar{x}$: 015.2µm (LL: 013.8 UL: 016.6µm)
X7: $\bar{x}$: 081.9µm (LL: 078.7 UL: 085.1µm)

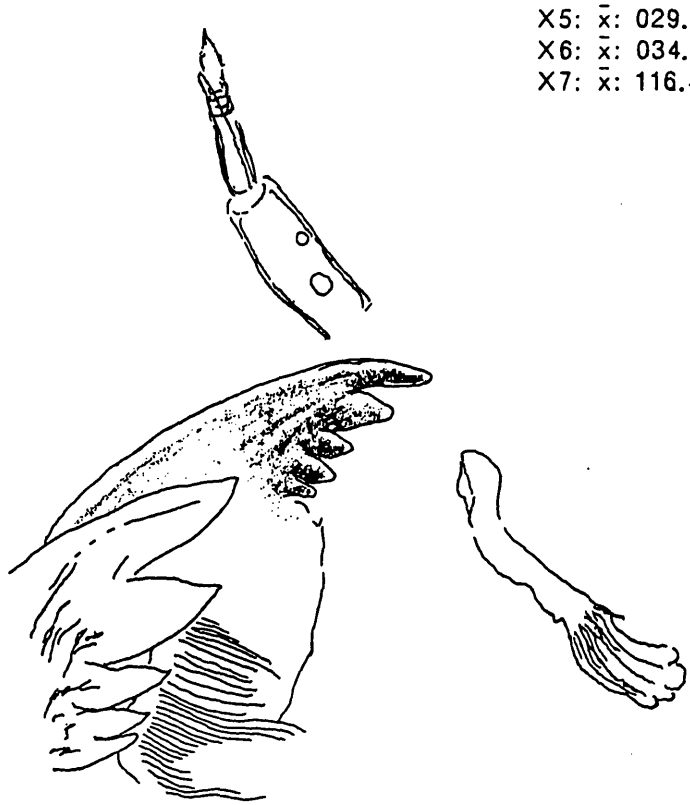
DIAMESA insignipes 4th instar mag:1000x

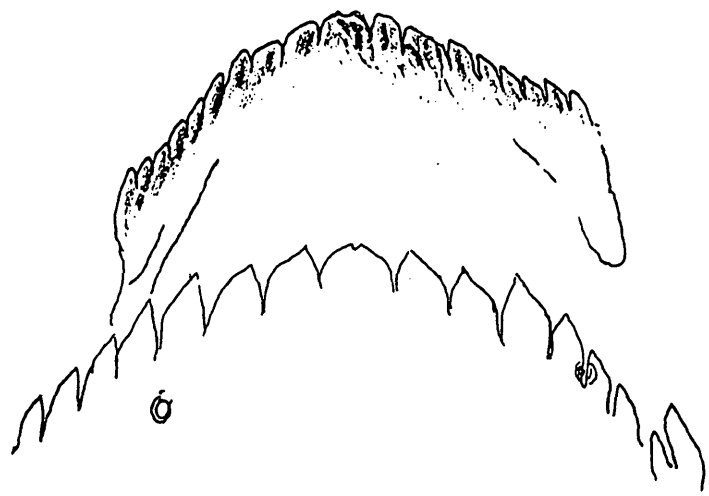
Diagnosis:
Caput light-grey; broad postoccipital margin in black. Ant. 5-segmented; 3rd segment annulated; Blade not reaching the 5th segment.
S I simple; Premandible with 7 apical teeth; Mentum with 1 median tooth with a small V-shaped notch and 9-10 pairs of lateral teeth.

Measurements: (n=5)
CB: $\bar{x}$: 471.7µm (LL: 433.2 UL: 511.3µm)
L : $\bar{x}$: 4.940mm (LL: 3.896 UL: 6.206mm)
X1: $\bar{x}$: 092.1µm (LL: 081.4 UL: 102.8µm)
X2: $\bar{x}$: 015.2µm (LL: 013.1 UL: 017.3µm)
X3: $\bar{x}$: 114.8µm (LL: 105.8 UL: 123.8µm)
X4: $\bar{x}$: 059.5µm (LL: 053.8 UL: 065.3µm)
X5: $\bar{x}$: 036.9µm (LL: 032.7 UL: 041.1µm)
X6: $\bar{x}$: 056.3µm (LL: 050.2 UL: 062.4µm)
X7: $\bar{x}$: 173.3µm (LL: 157.4 UL: 189.4µm)

DIAMESA insignipes 3rd instar mag:1000x

Measurements: (n=3)
CB: $\bar{x}$: 346.5µm (LL: 330.0 UL: 380.0µm)
L : $\bar{x}$: 3.896mm (LL: 3.700 UL: 4.100mm)
X1: $\bar{x}$: 067.6µm (LL: 061.9 UL: 072.0µm)
X2: $\bar{x}$: 010.3µm (LL: 009.6 UL: 010.6µm)
X3: $\bar{x}$: 076.9µm (LL: 070.9 UL: 081.2µm)
X4: $\bar{x}$: 028.1µm (LL: 027.8 UL: 028.8µm)
X5: $\bar{x}$: 029.0µm (LL: 028.8 UL: 029.3µm)
X6: $\bar{x}$: 034.4µm (LL: 033.6 UL: 035.5µm)
X7: $\bar{x}$: 116.4µm (LL: 106.6 UL: 126.7µm)



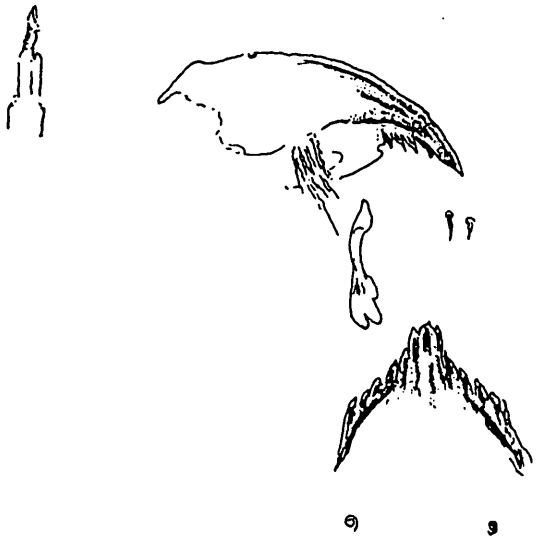


DIAMESA insignipes 2nd instar mag:1000x

Measurements: (n=5)
CB: $\bar{x}$: 167.9µm (LL: 151.8 UL: 184.3µm)
L : $\bar{x}$: 2.372mm (LL: 2.062 UL: 2.714mm)
X1: $\bar{x}$: 041.8µm (LL: 038.5 UL: 045.2µm)
X2: $\bar{x}$: 005.9µm (LL: 005.3 UL: 006.5µm)
X3: $\bar{x}$: 052.2µm (LL: 048.2 UL: 056.3µm)
X4: $\bar{x}$: 011.1µm (LL: 009.5 UL: 012.7µm)
X5: $\bar{x}$: 021.8µm (LL: 020.5 UL: 023.1µm)
X6: $\bar{x}$: 019.8µm (LL: 018.5 UL: 021.1µm)
X7: $\bar{x}$: 075.3µm (LL: 071.4 UL: 079.3µm)

DIAMESA insignipes 1st instar mag:1000x

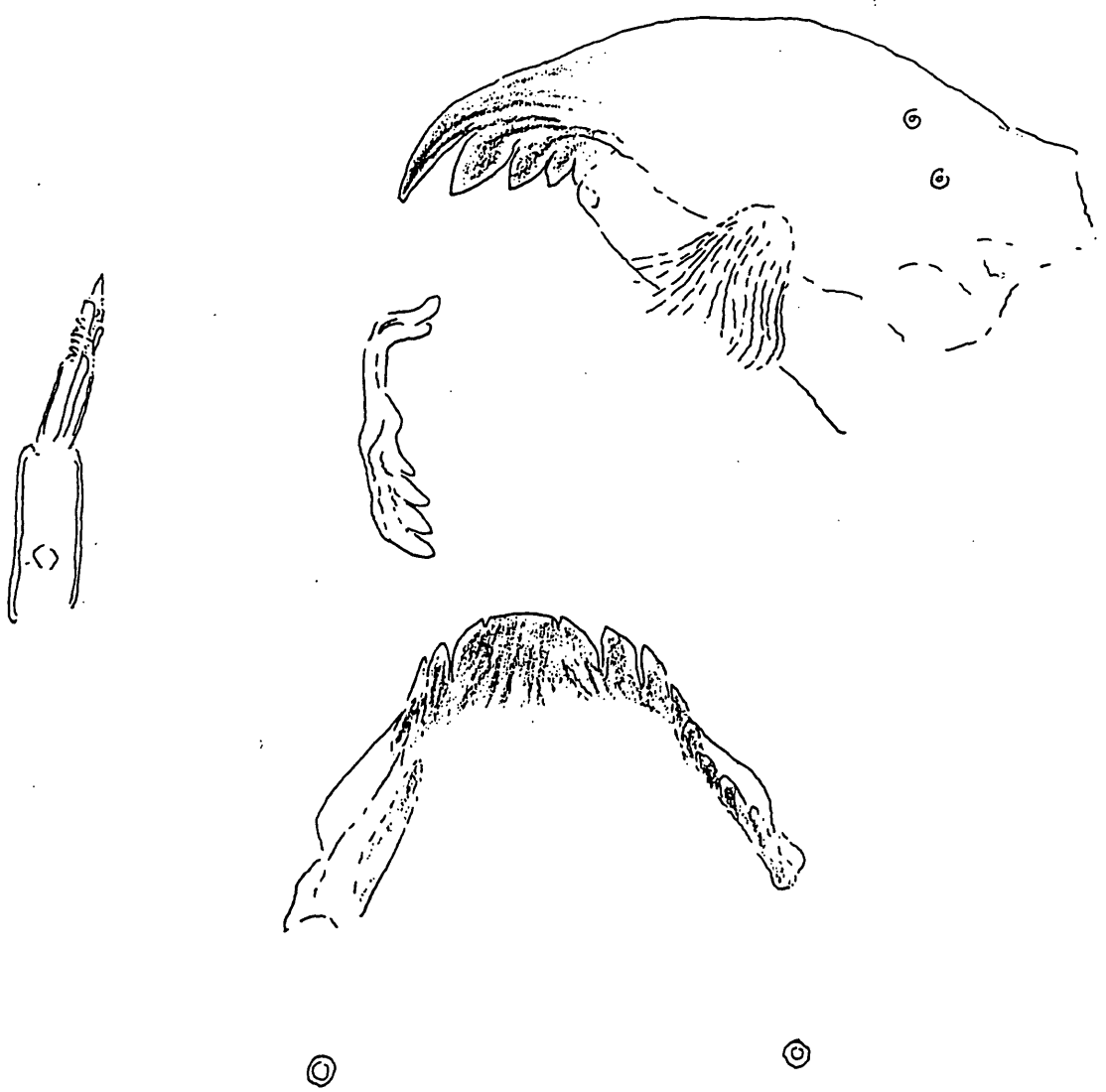
Measurements: (n=3)
CB: $\bar{x}$: 110.0µm (LL: 097.1 UL: 123.1µm)
L : $\bar{x}$: 1.000mm (LL: 0.900 UL: 1.200mm)
X1: $\bar{x}$: 024.1µm (LL: 021.1 UL: 027.0µm)
X2: $\bar{x}$: 002.8µm (LL: 002.5 UL: 003.1µm)
X3: $\bar{x}$: 035.3µm (LL: 034.6 UL: 036.5µm)
X4: $\bar{x}$: 004.7µm (LL: 004.6 UL: 004.8µm)
X5: $\bar{x}$: 015.7µm (LL: 015.4 UL: 016.3µm)
X6: $\bar{x}$: 014.1µm (LL: 013.9 UL: 014.4µm)
X7: $\bar{x}$: 054.4µm (LL: 052.8 UL: 056.6µm)



DIAMESA sp.2 4^{th}?instar mag:1000x

Diagnosis:
Caput dark-brown; postoccipital margin black. Ant.5-segmented; 3rd segment annulated; blade not reaching the 5th segment.
Premandible with 4 apical teeth.
Median tooth of the mentum fairly divided twice and 7 pairs of lateral teeth.

Measurements: (n=1)
CB: 320.0µm
L : 1.900mm
X1: 095.7 µm
X2: 029.8 µm
X4: 030.3 µm
X5: o28.7 µm
X6: 039.4 µm
X7: 132.9 µm
X3: 088.8 µm



POTTHASTIA longimana 4^{th} instar mag:1000x

Diagnosis:
Caput redish-brown; postoccipital margin black; Ant.5-segmented; blade not reaching the apex of 5th segement..
S I simple; Labral lamellae bifid to trifid.
Premandible with 10 spine-like apical teeth.
Mandible with hook-like apical tooth and 3 undistinct inner teeth.
Mentum without teeth.

Measurements: (n=1)
CB: 310.0 µm
L : 5.10 mm
X1: 080.9 µm
X2: nc
X3: 075.5 µm
X4: 024.9 µm
X5: 040.4 µm
X6: 024.5 µm
X7: 080.9 µm

POTTHASTIA longimana

3rd instar

Measurements: (n=1)
CB: 240.0 µm
L : 4.300 mm
X1: 065.0 µm
X2: nc
X3: 063.8 µm
X4: 011.0 µm
X5: 027.7 µm
X6: 021.2 µm
X7: 069.1 µm

POTTHASTIA longimana

2nd instar

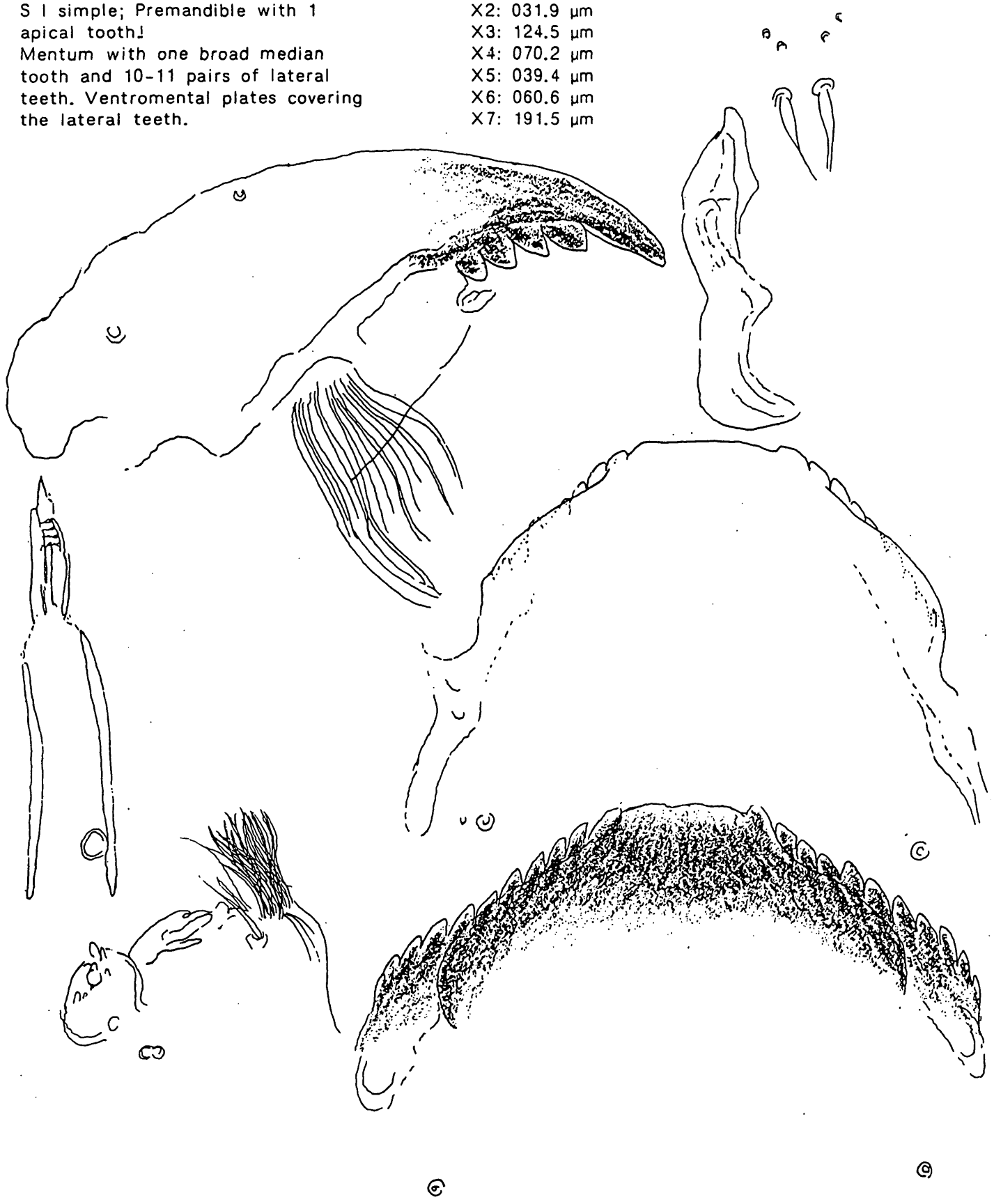
mag:1000x

Measurements: (n=1)
CB: 120.0 µm
L : 1.350 mm
X1: 028.5 µm
X2: 005.9 µm
X3: 036.4 µm
X4: 006.2 µm
X5: 018.6 µm
X6: 013.3 µm
X7: 039.9 µm

POTTHASTIA gaedii grp. 4th instar mag:1000x

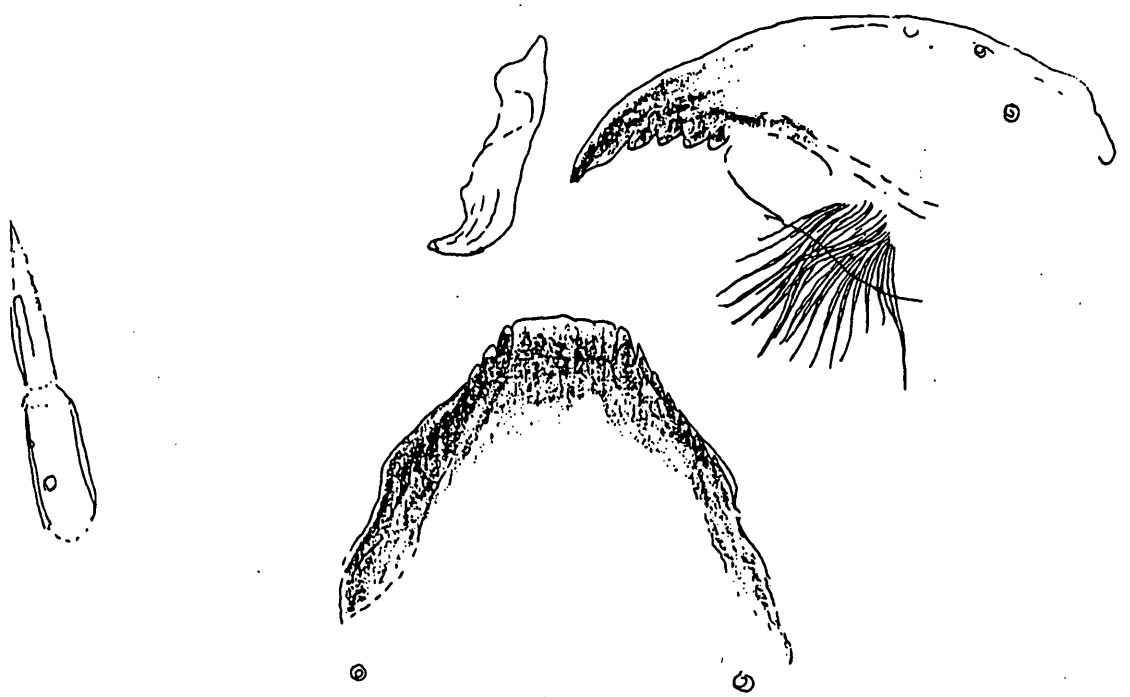
Diagnosis:
Caput yellow; postoccipital margin black; Ant.5-segmented; blade not reaching the 5th segment.
S I simple; Premandible with 1 apical tooth!
Mentum with one broad median tooth and 10-11 pairs of lateral teeth. Ventromental plates covering the lateral teeth.

Measurements: (n=1)
CB: 360.0 µm
L : nc
X1: 104.3 µm
X2: 031.9 µm
X3: 124.5 µm
X4: 070.2 µm
X5: 039.4 µm
X6: 060.6 µm
X7: 191.5 µm



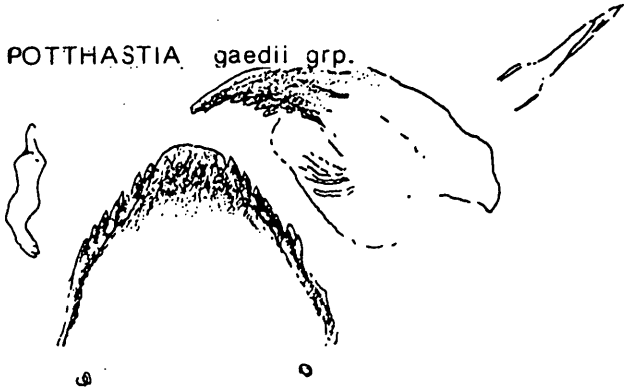
POTTHASTIA gaedii grp. 3rd instar mag:1000x

Measurements: (n=3)
CB: x̄: 293.3µm (LL: 0229.1 UL: 0257.7µm)
L : x̄: 3.430mm (LL: 2.409 UL: 3.985mm)
X1: x̄: 077.6µm (LL: 063.4 UL: 092.1µm)
X2: x̄: 019.4µm (LL: 015.3 UL: 023.5µm)
X3: x̄: 070.2µm (LL: 060.1 UL: 080.5µm)
X4: x̄: 025.5µm (LL: 017.8 UL: 033.3µm)
X5: x̄: 030.2µm (LL: 026.8 UL: 033.6µm)
X6: x̄: 031.1µm (LL: 026.6 UL: 033.3µm)
X7: x̄: 106.5µm (LL: 094.2 UL: 118.1µm)



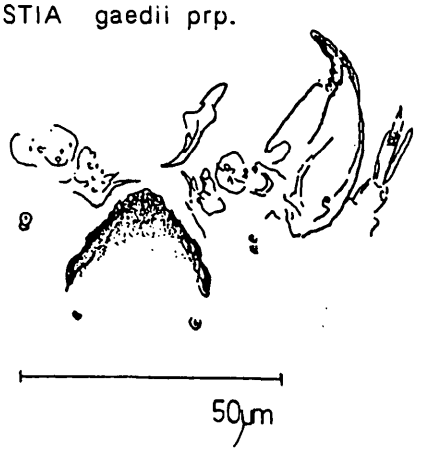
POTTHASTIA gaedii grp. 2nd instar mag:1000x

Measurements: (n=1)
CB: 150.0µm
L : 1.600mm
X1: 038.9µm
X2: 011.0µm
X3: 014.4µm
X4: 006.9µm
X5: 020.2µm
X6: 018.9µm
X7: 064.9µm



POTTHASTIA gaedii prp. 1st instar mag:1000x

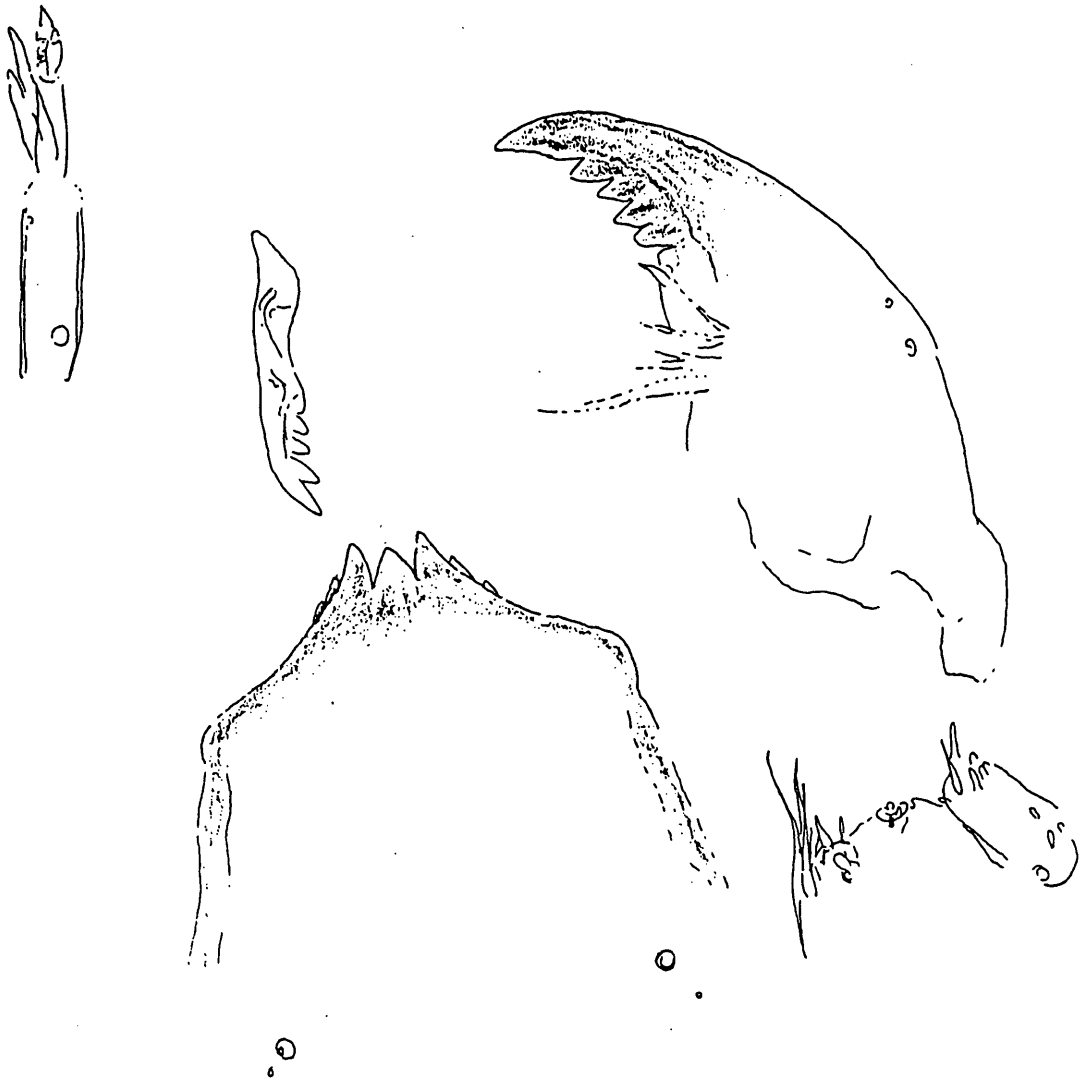
Measurements: (n= 2)
CB: x̄: 090µm (LL: 080.0 UL: 100.0µm)
L : x̄: 0.950mm (LL: 0.900 UL: 1.000mm)
X1: x̄: 026.5µm (LL: 024.2 UL: 028.7µm)
X2: x̄: 008.1µm (LL: 007.6 UL: 008.5µm)
X3: x̄: 027.6µm (LL: 025.4 UL: 029.8µm)
X4: x̄: 005.6µm (LL: 005.3 UL: 005.9µm)
X5: x̄: 020.7µm (LL: 020.0 UL: 021.3µm)
X6: x̄: 011.0µm (LL: 011.0 UL: 011.0µm)
X7: x̄: 042.5µm (LL: 042.3 UL: 042.7µm)



PSEUDODIAMESA branickii 4th instar mag:1000x

Diagnosis:
Caput dark-grey;postoccipital margin black; Ant.5-segmented; blade not reaching the apex of 5th segment.
S I simple; premandible with 4 apical teeth.
Mentum with 1 median tooth and 7 pairs of lateral teeth; visible only in flattened position.

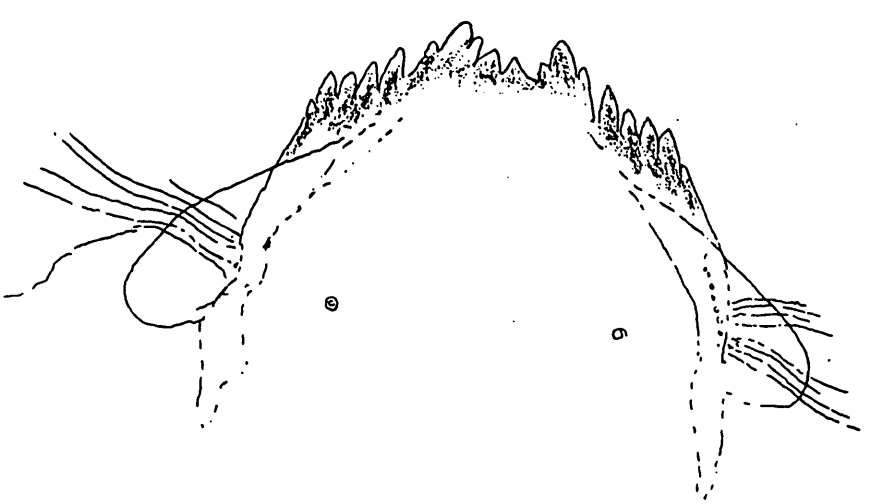
Measurements: (n=1)
CB: 260.0µm
L : nc
X1: 074.5µm
X2: 021.3µm
X3: 087.2µm
X4: 031.9µm
X5: 031.9µm
X6: 037.2µm
X7: 122.3µm



PRODIAMESA olivacea 3rd?instar mag:1000x

Diagnosis:
Caput yellow; postoccipital margin black; gula darkened;
Ant.4-segmented; blade longer than flagellum;
S I apically plumose; Premandible with 2 apical teeth .
Mentum with 2 small median teeth and 8 pairs of lateral teeth, different in shape; the first lateral teeth with 2 pairs of small accessory teeth.
Ventromental plates distinct with beard.

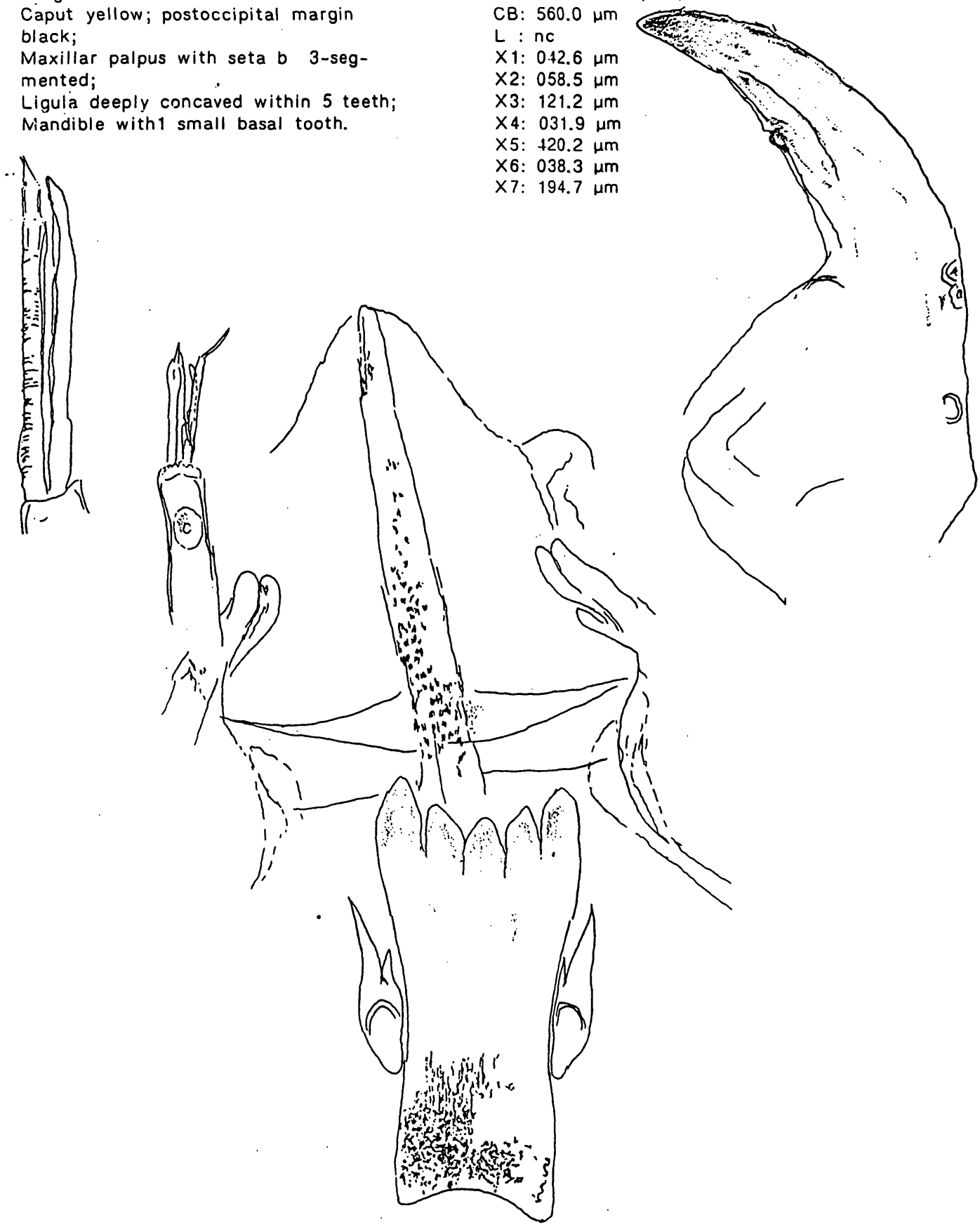
Measurements (n=1)
CB: 245.5µm
L : nc
X1: 058.5µm
X2: 023.4µm
X3: 059.6µm
X4: 027.7µm
X5: 027.9µm
X6: 010.2µm
X7: 093.6µm



CONCHAPELOPIA sp. 4th instar mag:1000x

Diagnosis:
Caput yellow; postoccipital margin black;
Maxillar palpus with seta b 3-segmented;
Ligula deeply concaved within 5 teeth;
Mandible with1 small basal tooth.

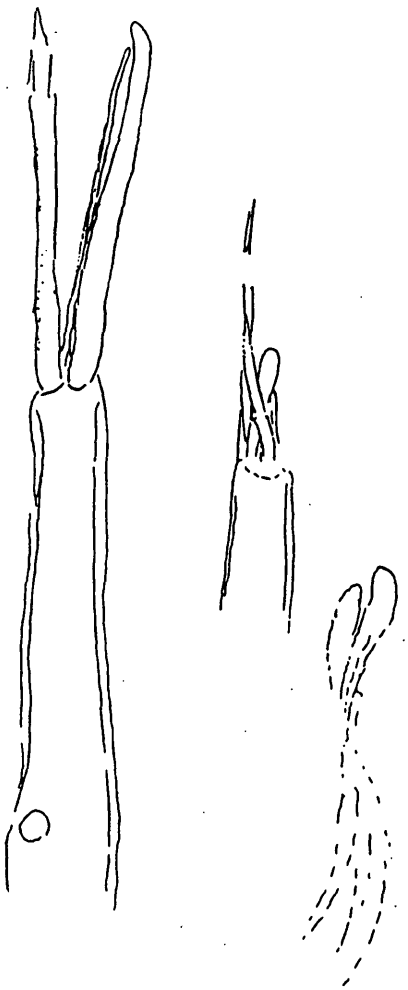
Measurements: (n=1)
CB: 560.0 µm
L : nc
X1: 042.6 µm
X2: 058.5 µm
X3: 121.2 µm
X4: 031.9 µm
X5: 420.2 µm
X6: 038.3 µm
X7: 194.7 µm



CONCHAPELOPIA sp.

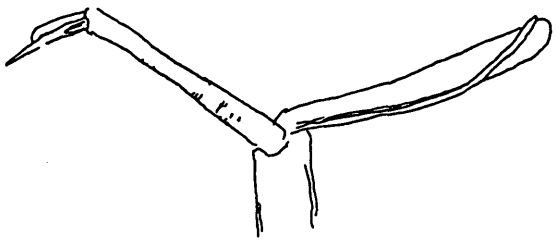
3rd instar mag:1000x

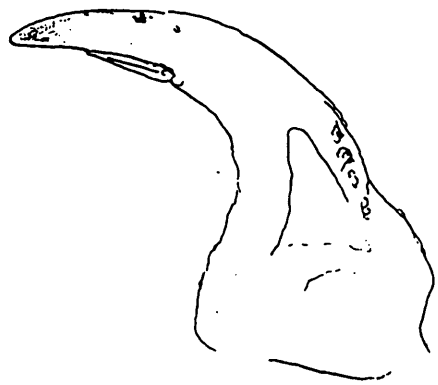
Measurements: (n=2)
CB: x̄: 430.0µm (LL: 410.0 UL: 450.0µm)
L : x̄: 5.900mm (LL: 5.000 UL: 6.800mm)
X1: x̄: 031.9µm (LL: 031.8 UL: 032.0µm)
X2: x̄: 034.3µm (LL: 033.5 UL: 035.1µm)
X3: x̄: 078.9µm (LL: 078.7 UL: 079.0µm)
X4: x̄: 026.1µm (LL: 025.5 UL: 026.6µm)
X5: x̄: 270.2µm (LL: 266.0 UL: 274.4µm)
X6: x̄: 028.7µm (LL: 028.7 UL: 028.7µm)
X7: x̄: 120.4µm (LL: 110.6 UL: 130.2µm)



CONCHAPELOPIA sp. 2nd instar mag:1000 x

Measurements: (n=1)
CB: 280.0 µm
L : 3.100 mm
X1: 016.0 µm
X2: 018.0 µm
X3: 043.6 µm
X4: 017.0 µm
X5: 152.1 µm
X6: 016.0 µm
X7: 058.5 µm





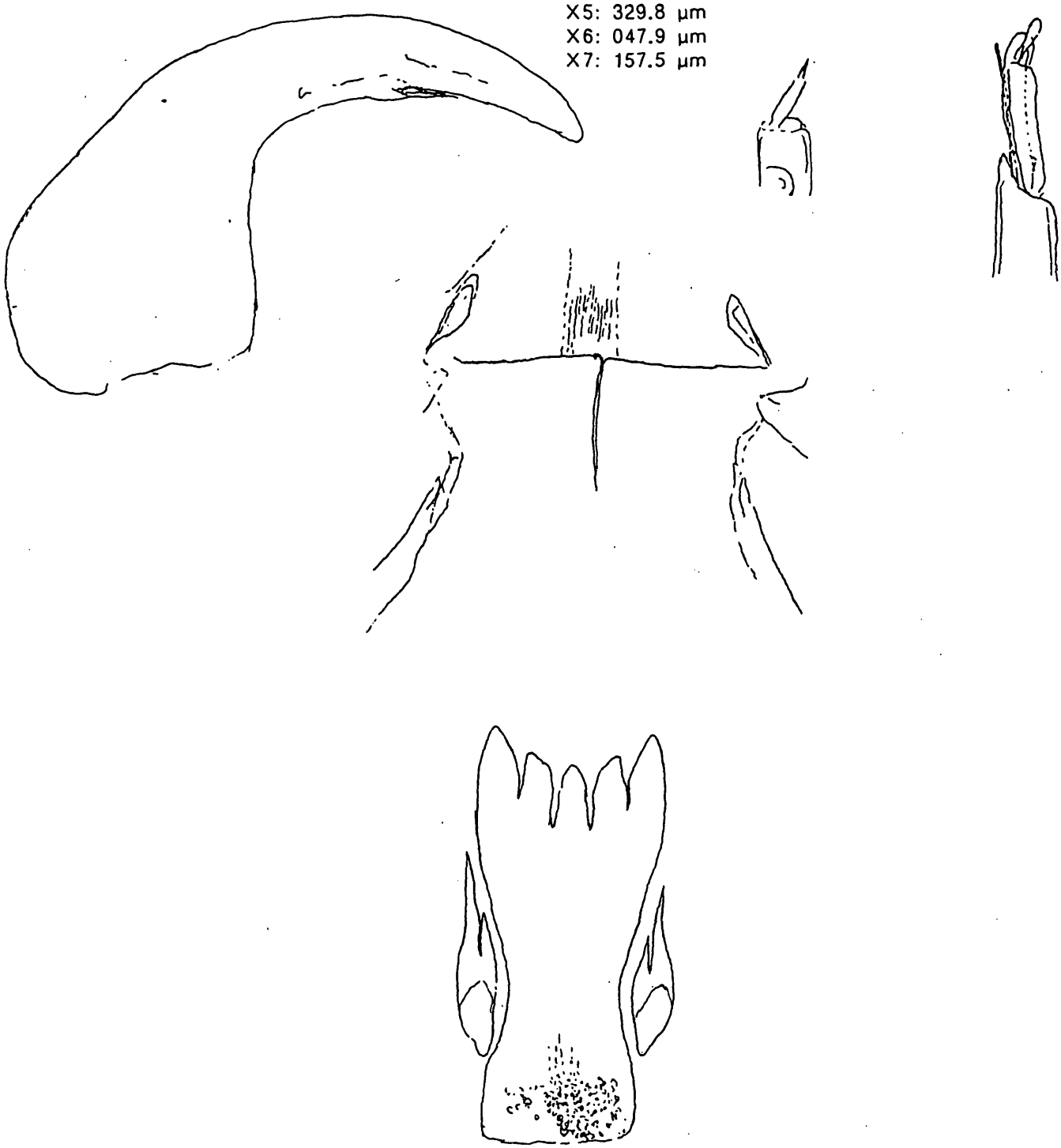
THIENEMANNIMYIA gejjskesi

Diagnosis:
Caput yellow with greyish-darkened ribbon nearby the black postoccipital margin
Maxillar palpus with b seta 2-segmented.
Ligula concaved with 5 teeth.
Mandible with undistinct basal tooth.

4th instar

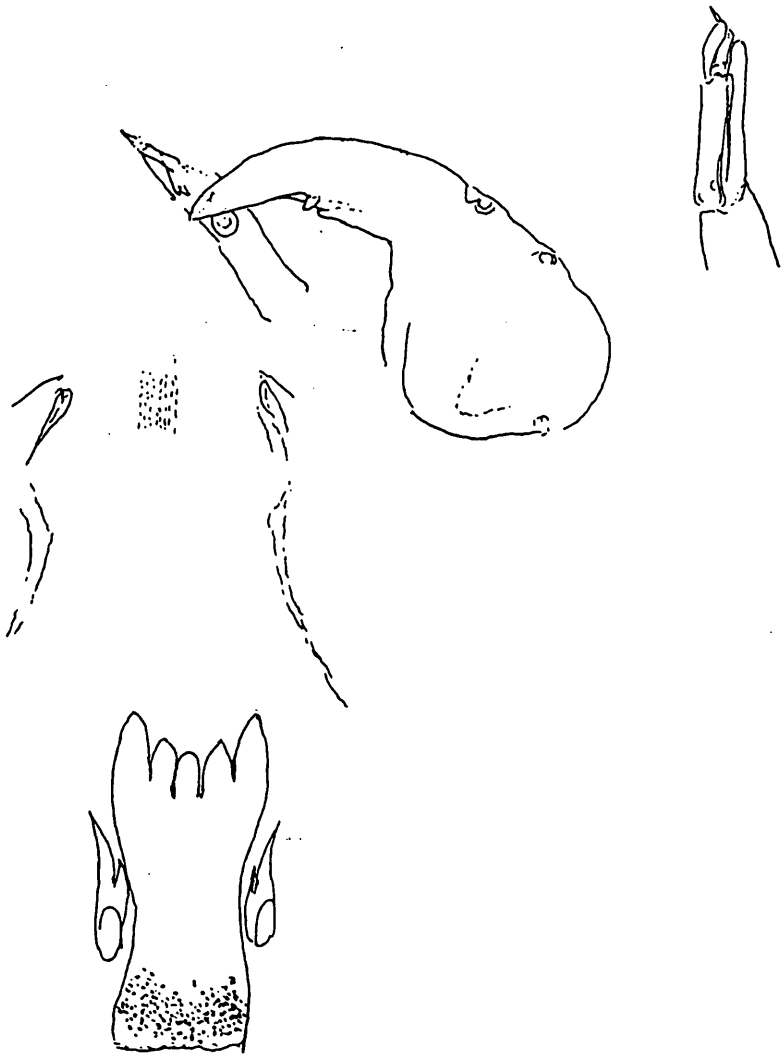
Measurements: (n=1)
CB: 521.5 µm
L : nc
X1: 031.9 µm
X2: 056.4 µm
X3: 110.6 µm
X4: 031.9 µm
X5: 329.8 µm
X6: 047.9 µm
X7: 157.5 µm

mag:1000x



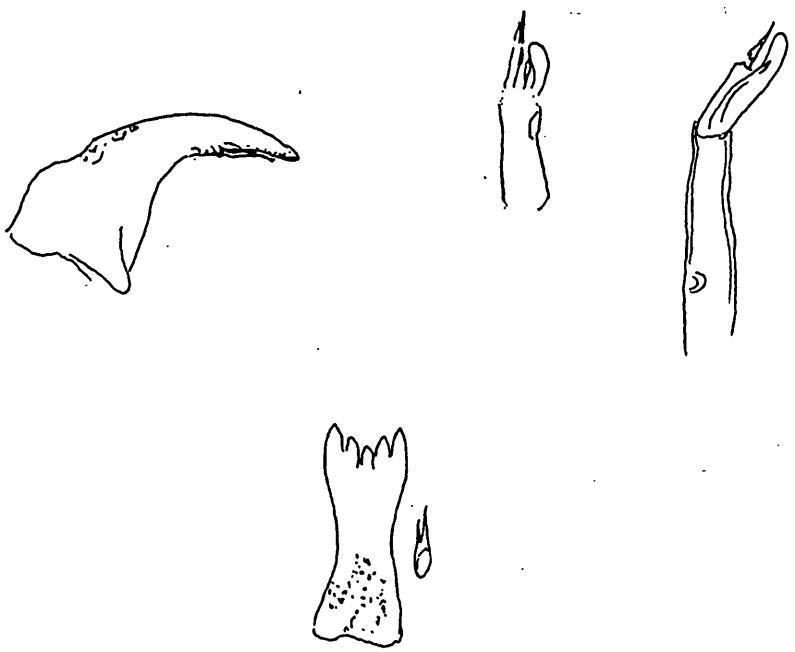
THIENEMANNIMYIA geijskesi 3rd instar mag:1000x

Measurements: (n=3)
CB: $\bar{x}$: 355.5µm (LL: 350.0 UL: 360.0µm)
L : $\bar{x}$: 3.050mm (LL: 3.000 UL: 3.100mm)
X1: $\bar{x}$: 026.1µm (LL: 024.5 UL: 027.7µm)
X2: $\bar{x}$: 030.9µm (LL: 029.8 UL: 031.9µm)
X3: $\bar{x}$: 065.2µm (LL: 063.8 UL: 066.5µm)
X4: $\bar{x}$: 023.9µm (LL: 023.4 UL: 024.4µm)
X5: $\bar{x}$: 186.4µm (LL: 183.0 UL: 189.8µm)
X6: $\bar{x}$: 024.7µm (LL: 023.9 UL: 025.5µm)
X7: $\bar{x}$: 094.7µm (LL: 092.5 UL: 096.8µm)



THIENEMANNIMYIA geijskesi 2^{nd} instar mag:1000x

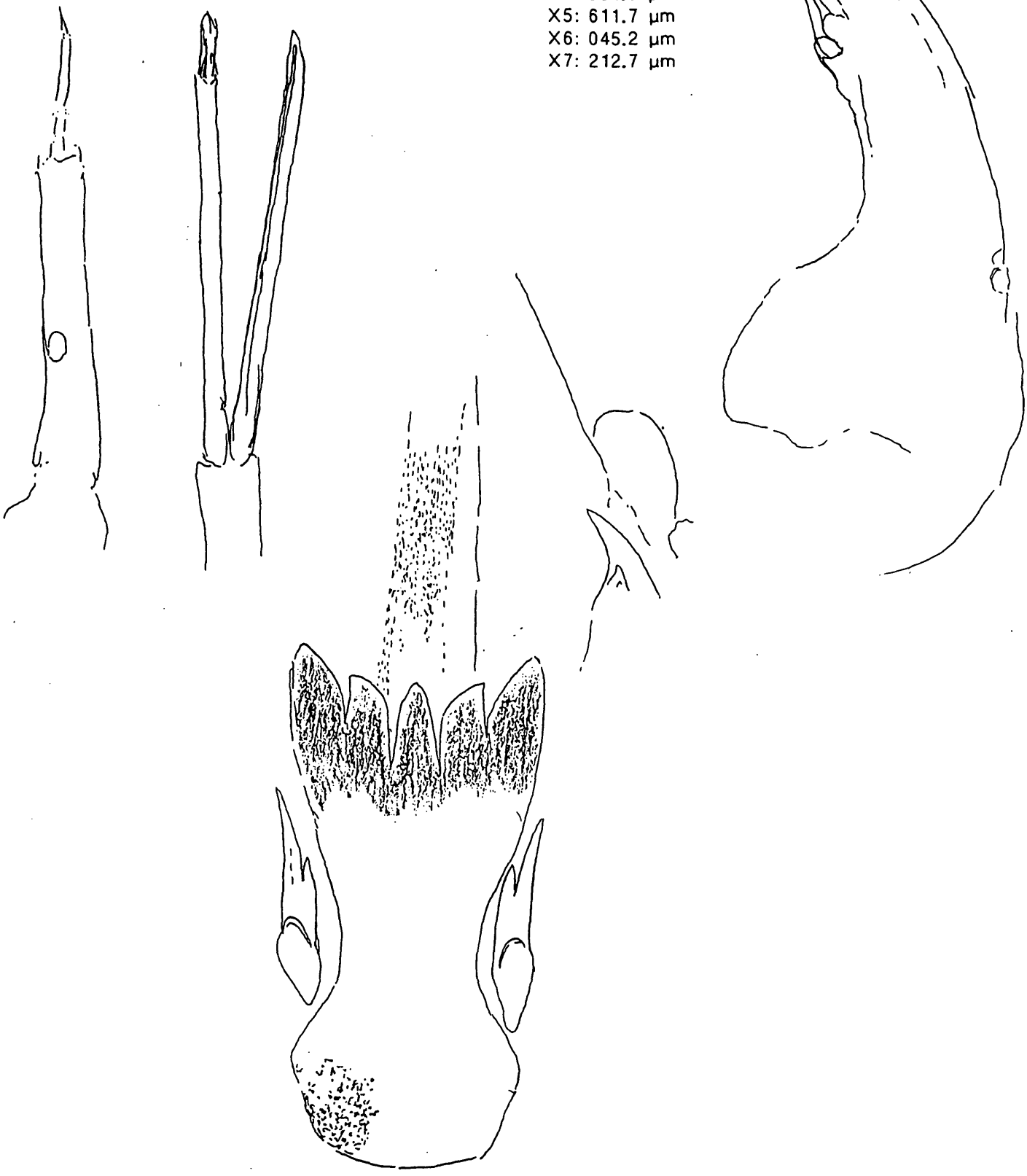
Measurements: (n=1)
CB: 255.0 µm
L : 1.700mm
X1: .020.2 µm
X2: 020.2 µm
X3: 040.4 µm
X4: 016.5 µm
X5: 133.0 µm
X6: 016.0 µm
X7: 061.2 µm



TRISSOPELOPIA longimana 4th instar mag:1000x

Diagnosis:
Caput yellow; postoccipital margin black;
Maxillar palpus with b-seta: 4-segmented.
Ligula concave;
Mandible with large bluntly rounded basal tooth.

Measurements: (n=1)
CB: 734.0 µm
L : nc
X1: 079.8 µm
X2: 071.3 µm
X3: nc
X4: 034.0 µm
X5: 611.7 µm
X6: 045.2 µm
X7: 212.7 µm

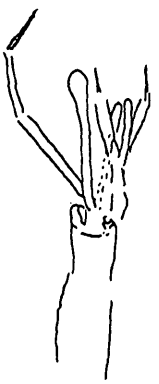


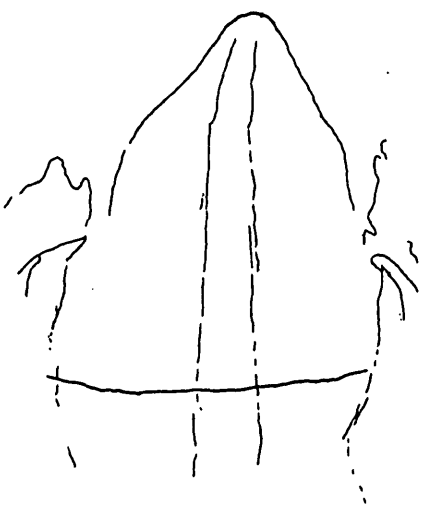
TRISSOPELOPIA longimana

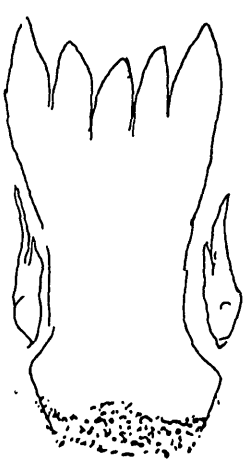
3rd instar

mag:1000x

Measurements: (n=1)
CB: 489.4 µm
L: 3.723 mm
X1: 042.6 µm
X2: 043.6 µm
X3: 083.0 µm
X4: 025.5 µm
X5: 329.8 µm
X6: 029.3 µm
X7: 117.0 µm







TRISSOPELOPIA longimana

2nd instar

Measurements: (n=1)
CB: 212.8 µm
L : nc
X1: 019.1 µm
X2: 020.2 µm
X3: 041.5 µm
X4: 016.0 µm
X5: 159.6 µm
X6: 014.9 µm
X7: 063.8 µm

P. E. Schmid

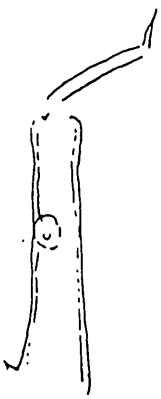
ZAVRELIMYIA signatipennis

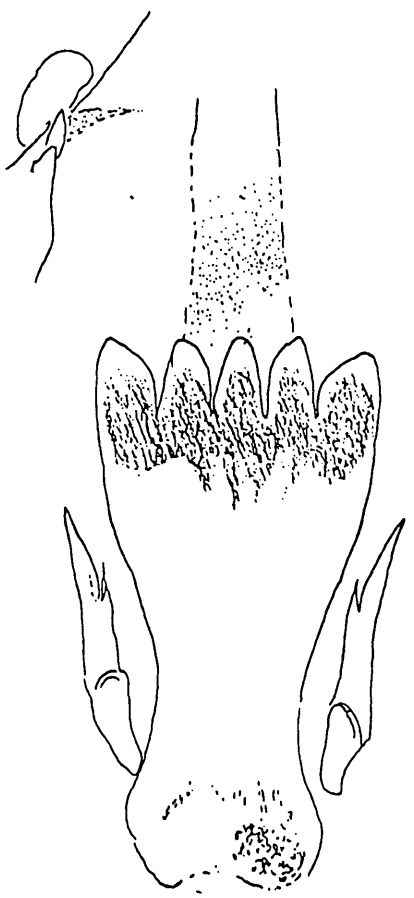
4th instar

mag:1000x

Diagnosis:
Caput yellow; postoccipital margin dark; Maxillar palpus with b-seta: 2-segmented. Ligula weakly concave with 5 teeth. Mandible with large blunt basal tooth and a distinct hump dorsally at base of basal tooth.

Measurements: none.



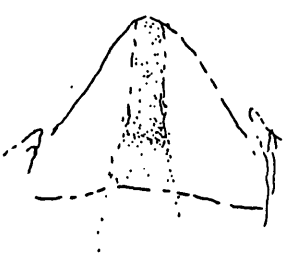


ZAVRELIMYIA signatipennis

2nd instar

mag:1000x

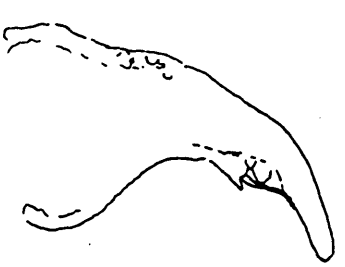
Measurements: (n=1)
CB: 191.5 µm
L: 1.850 mm
X1: 019.7 µm
X2: 018.1 µm
X3: 037.2 µm
X4: 016.5 µm
X5: 129.8 µm
X6: 016.0 µm
X7: 055.3 µm

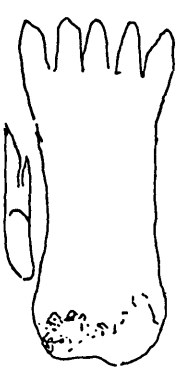


ZAVRELIMYIA signatipennis

3rd instar

Measurements: (n=1)
CB: 350.0 µm
L: nc
X1: 027.7 µm
X2: 036.2 µm
X3: 071.3 µm
X4: 027.7 µm
X5: 287.2 µm
X6: 023.4 µm
X7: 096.8 µm

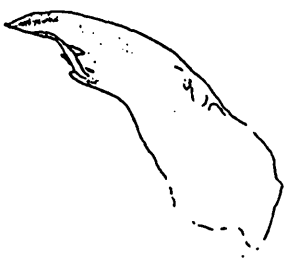




NILOTANYPUS dubius 4th instar mag:1000x

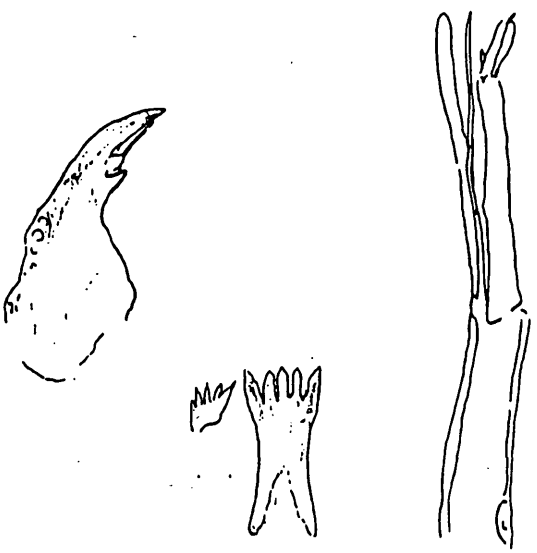
Diagnosis:
Caput yellow; postoccipital margin black; Ligula with 5 teeth; middle tooth extending beyond other teeth.
Mandible with large , apically produced basal tooth; ventrally on inner edge, a larger pointed accessory tooth.

Measurements: (n=5)
CB: $\bar{x}$: 225.9µm (LL: 207.1 UL: 245.0µm)
L : $\bar{x}$: 2.998mm (LL: 2.806 UL: 3.199mm)
X1: $\bar{x}$: 021.9µm (LL: 021.2 UL: 022.6µm)
X2: $\bar{x}$: 021.9µm (LL: 021.2 UL: 022.6µm)
X3: $\bar{x}$: 045.3µm (LL: 044.3 UL: 046.4µm)
X4: $\bar{x}$: 021.3µm (LL: 020.5 UL: 022.1µm)
X5: $\bar{x}$: 258.5µm (LL: 248.8 UL: 268.3µm)
X6: $\bar{x}$: 014.2µm (LL: 013.8 UL: 014.6µm)
X7: $\bar{x}$: 066.2µm (LL: 063.7 UL: 068.6µm)



NILOTANYPUS dubius

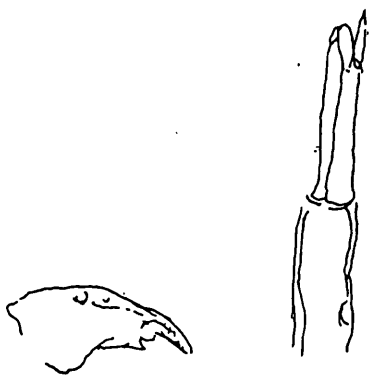
3rd instar mag:1000x



Measurements: (n=5)
CB: x̄: 156.0µm (LL: 141.9 UL: 170.2µm)
L : x̄: 1.812mm (LL: 1.346 UL: 2.365mm)
X1: x̄: 014.2µm (LL: 013.3 UL: 015.2µm)
X2: x̄: 013.9µm (LL: 013.2 UL: 014.7µm)
X3: x̄: 035.5µm (LL: 033.4 UL: 037.6µm)
X4: x̄: 016.2µm (LL: 015.9 UL: 016.5µm)
X5: x̄: 161.4µm (LL: 151.6 UL: 171.2µm)
X6: x̄: 011.7µm (LL: 010.9 UL: 012.6µm)
X7: x̄: 046.9µm (LL: 042.2 UL: 051.6µm)

NILOTANYPUS dubius

2nd instar mag:1000x



Measurements: (n=5)
CB: x̄: 112.0µm (LL: 106.5 UL: 117.5µm)
L : x̄: 1.094mm (LL: 0.880 UL: 1.332mm)
X1: x̄: 007.9µm (LL: 006.4 UL: 009.5µm)
X2: x̄: 010.5µm (LL: 009.7 UL: 011.2µm)
X3: x̄: 022.6µm (LL: 022.0 UL: 023.3µm)
X4: x̄: 011.7µm (LL: 010.7 UL: 012.7µm)
X5: x̄: 105.6µm (LL: 097.0 UL: 114.2µm)
X6: x̄: 008.7µm (LL: 006.5 UL: 010.8µm)
X7: x̄: 036.6µm (LL: 035.1 UL: 038.1µm)

MACROPELOPIA notata

Diagnosis:
Caput yellow; postoccipital margin darkened;
Ligula with 5 teeth , deeply concave.
Mandible with one pointed basal tooth.
Dorsomentum with 7 pairs of teeth.

4th instar

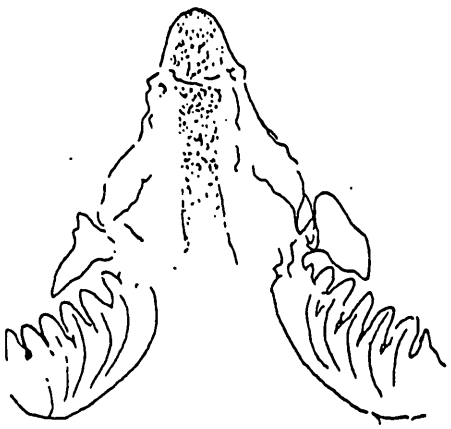
Measurements: (n=1)
CB: 630.0 µm
L: 7.900 mm
X1: 040.4 µm
X2: 056.4 µm
X3: 101.1 µm
X4: 034.0 µm
X5: 176.6 µm
X6: 048.9 µm
X7: 167.0 µm

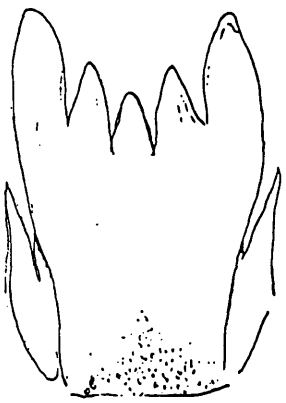
MACROPELOPIA notata

3rd instar

mag: 1000

Measurements: (n=1)
CB: 410.0 µm
L : 5.300 mm
X1: 023.4 µm
X2: 039.4 µm
X3: 075.5 µm
X4: 026.6 µm
X5: 170.2 µm
X6: 036.2 µm
X7: 111.7 µm





MACROPELOPIA notata

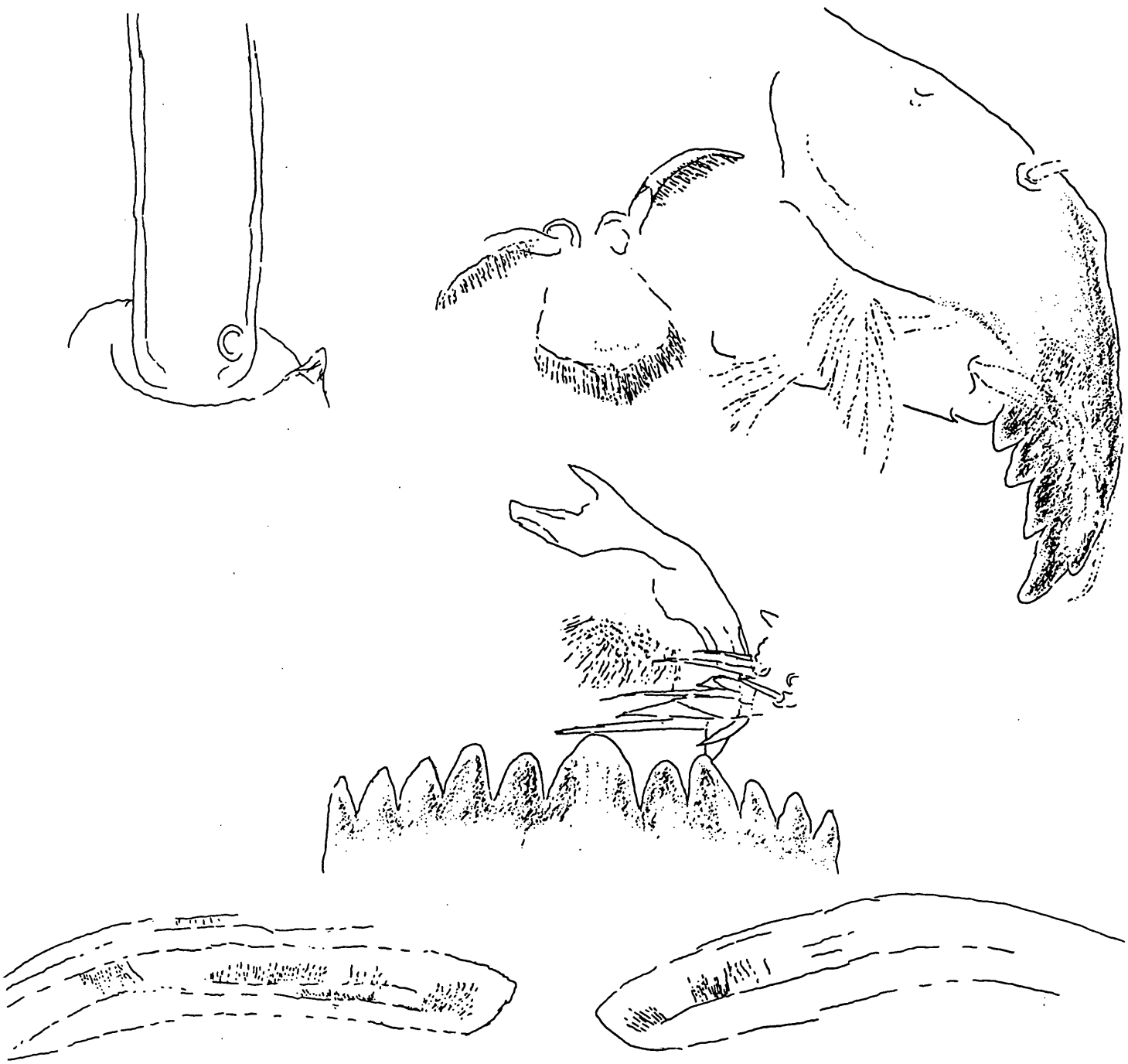
2nd instar

Measurements: (n=1)
CB: 310.0 µm
L: 1.600 mm
X1: 021.3 µm
X2: 023.7 µm
X3: 042.6 µm
X4: 023.4 µm
X5: 101.1 µm
X6: 023.9 µm
X7: 050.0 µm

MICROPSECTRA notescens 4^{th} instar mag:1000x

Diagnosis:
Caput light-grey; postoccipital margin black; Ant.5-segmented, placed on pedestials with apical tooth. Lauterborn organ on pedicels. S I comb-like; S II plumose; labral lamellae distinct; Premandible with 2 apical teeth and brush; Mentum with 1median notched tooth and 5 pairs of lateral teeth. Ventromental plates close medially.

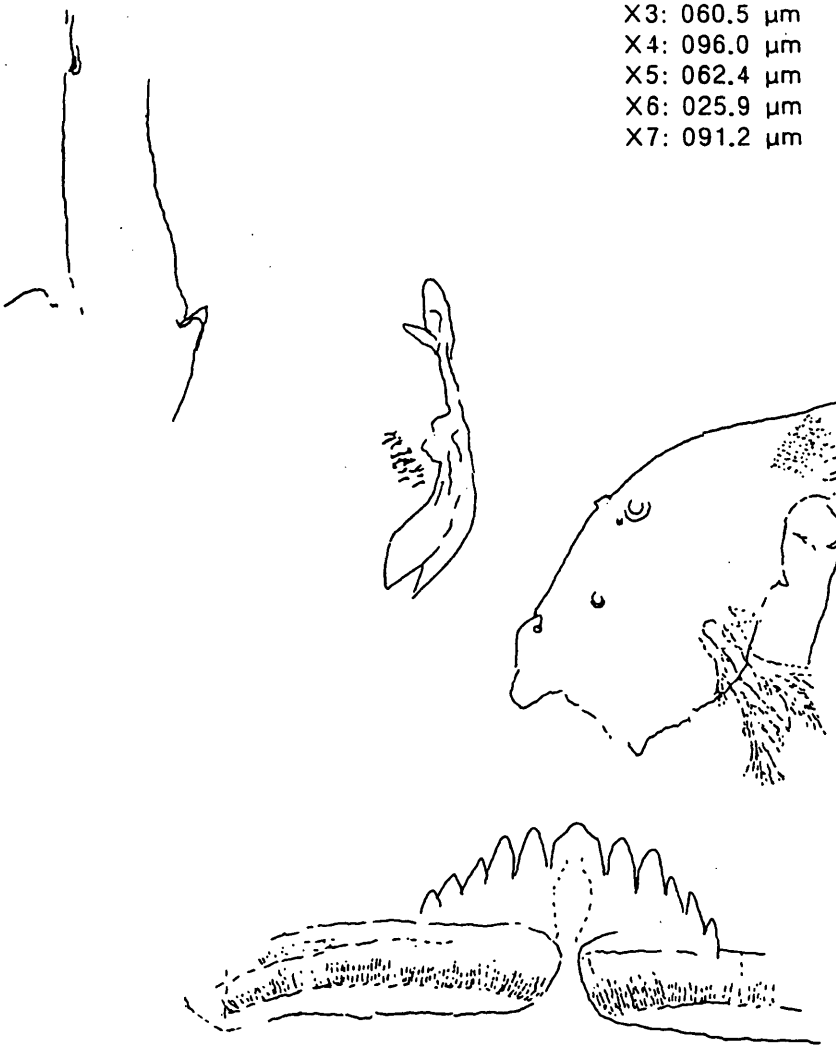
Measurements: (n=1)
CB: 385.0 µm
L : 1.200 mm
X1: 140.4 µm
X2: 023.9 µm
X3: 118.0 µm
X4: 202.1 µm
X5: 100.0 µm
X6: 044.7 µm
X7: 160.0 µm



P. E. Schmid

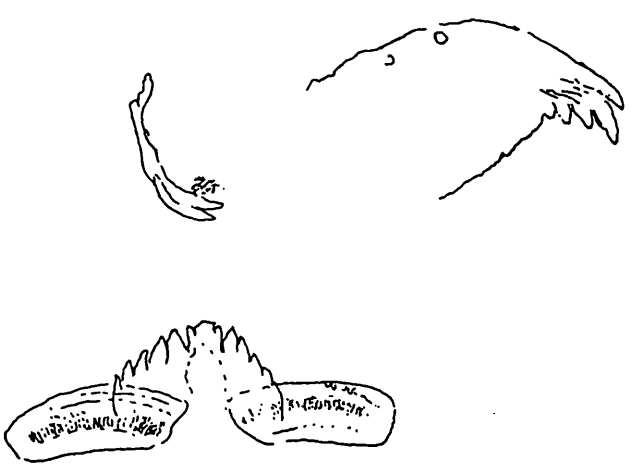
MICROPSECTRA notescens 3rd instar mag:1000x

Measurements: (n=1)
CB: 170.0 µm
L : 1.900 mm
X1: 075.8 µm
X2: 011.5 µm
X3: 060.5 µm
X4: 096.0 µm
X5: 062.4 µm
X6: 025.9 µm
X7: 091.2 µm



MICROPSECTRA notescens 2nd instar mag:1000x

Measurements: (n=1)
CB: 100.0 µm
L : 0.900 mm
X1: 031.9 µm
X2: 003.7 µm
X3: 023.1 µm
X4: 021.3 µm
X5: 037.2 µm
X6: 010.6 µm
X7: 032.0 µm



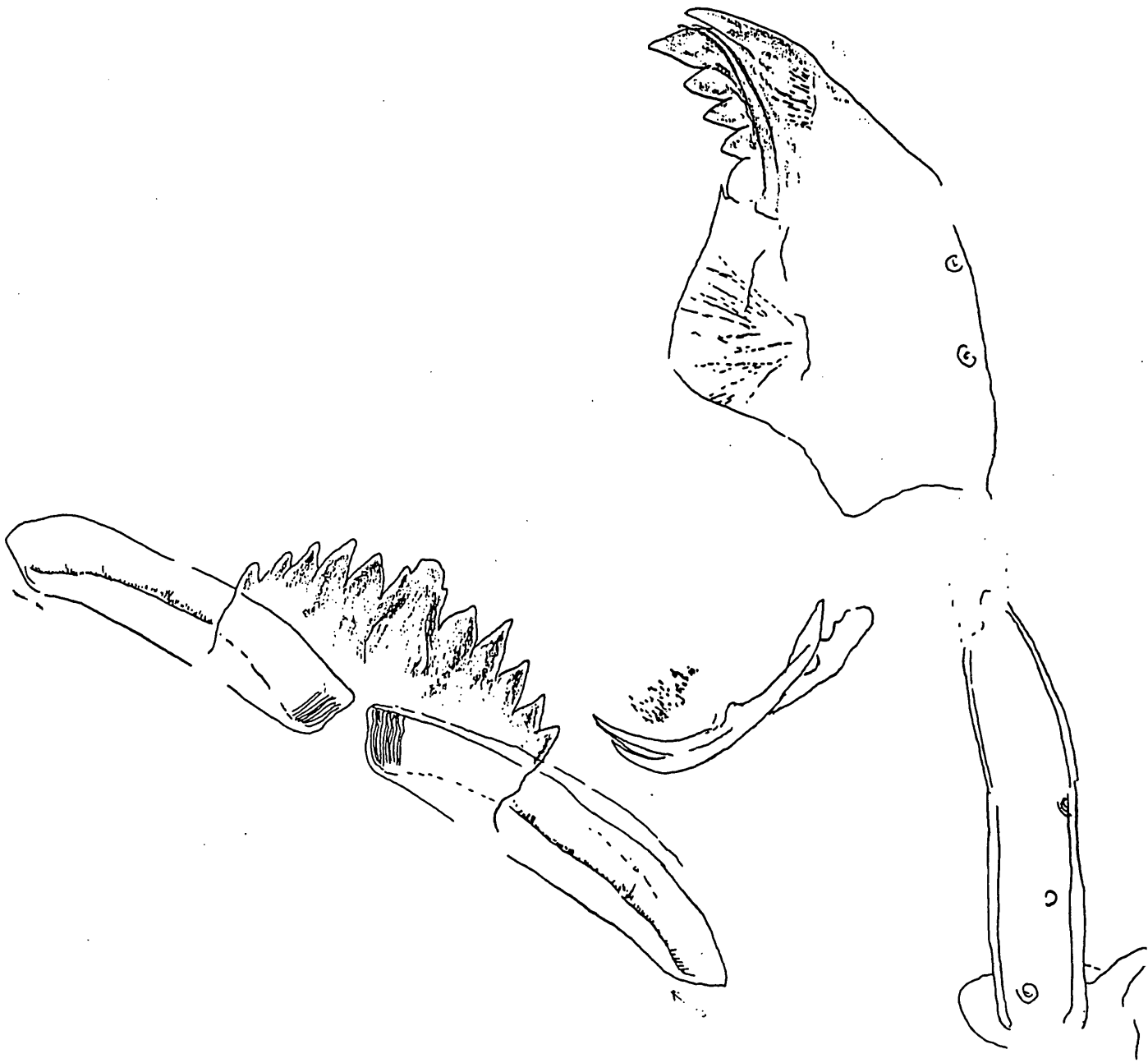
MICROPSECTRA sp.1

4th instar

mag:1000x

Diagnosis:
Caput light-grey; postoccipital margin black; Ant. 5-segmented; placed on pedestials, bearing apical tooth. Lauterborn organ on pedicels;
S I comb-like; S II plumose; labral lamellae distinct; premandible with 2 apical teeth and brush.
Mentum with 1 median notched tooth and 5 pairs of lateral teeth. Ventromental plates close medially.

Measurements: (n=1)
CB: 250.0 µm
L : 2.400 mm
X1: 111.7 µm
X2: 020.2 µm
X3: 100.0 µm
X4: 159.6 µm
X5: 085.1 µm
X6: 045.7 µm
X7: 115.1 µm

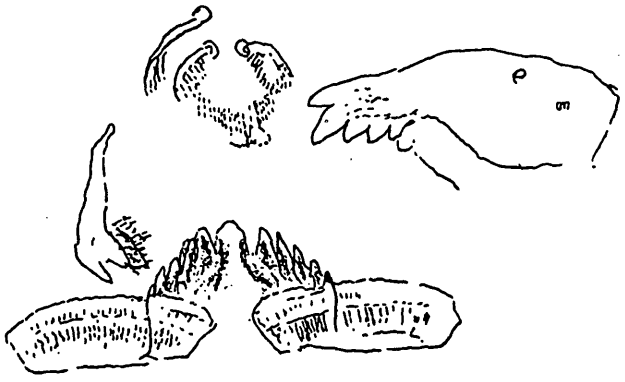


MICROPSECTRA sp.1

3rd instar

mag:1000x

Measurements: (n=1)
CB: 140.0 µm
L : 1.400 mm
X1: 048.9 µm
X2: 007.4 µm
X3: 045.2 µm
X4: 048.9 µm
X5: 054.3 µm
X6: 017.0 µm
X7: 064.9 µm

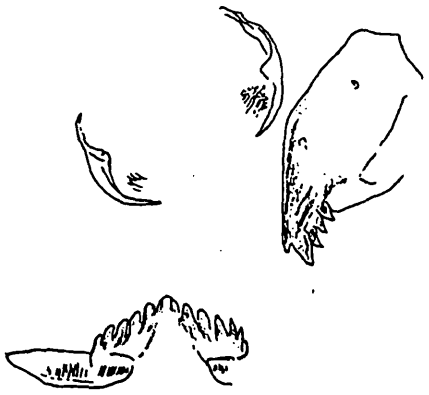


MICROPSECTRA sp.1

2nd instar

mag:1000x

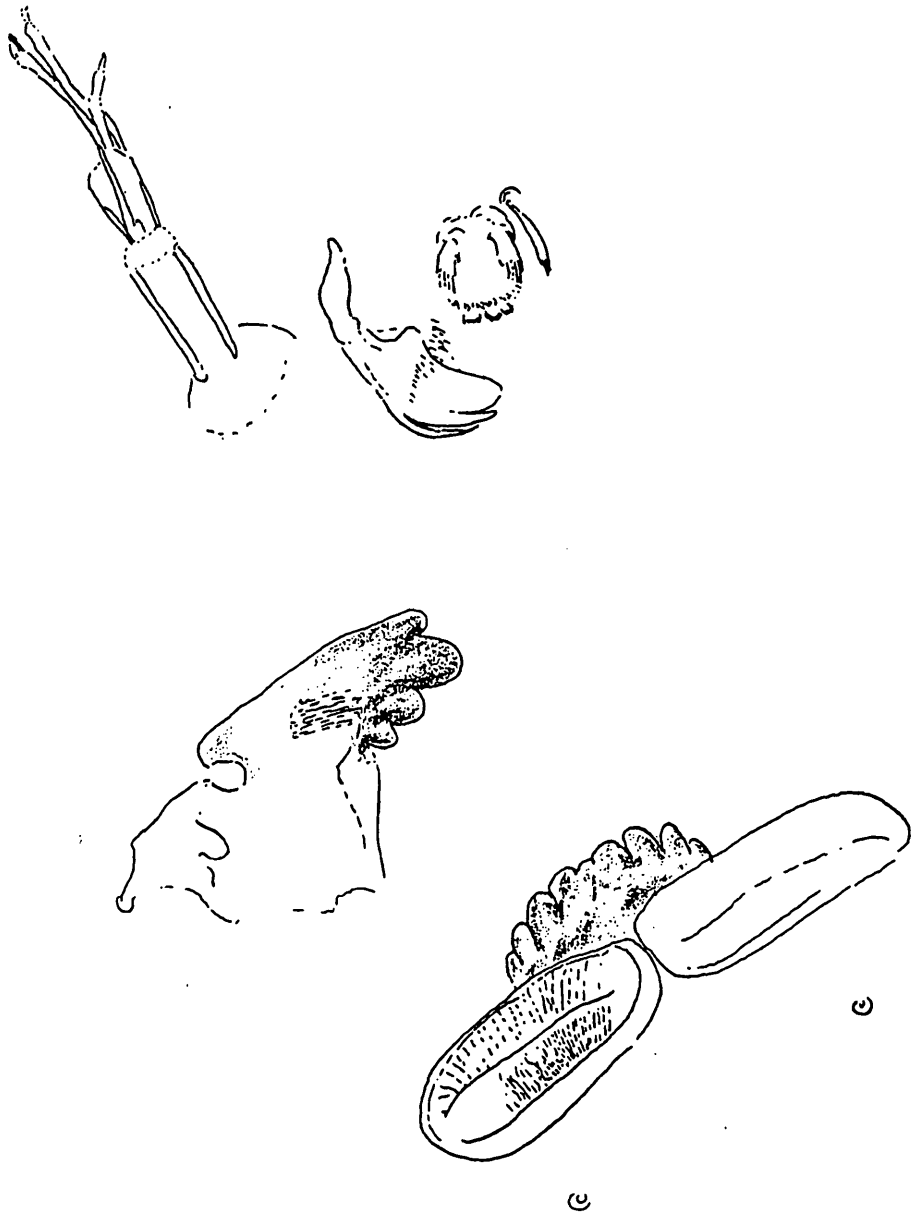
Measurements: (n=1)
CB: 090.0 µm
L : 1.000 mm
X1: 029.3 µm
X2: 003.2 µm
X3: 020.7 µm
X4: 021.2 µm
X5: 034.0 µm
X6: 010.6 µm
X7: 040.4 µm



NEOZAVRELIA sp. 4th instar mag:1000x

Diagnosis:
Caput dark-brown; postoccipital maragin black.
Ant. 5-segmented; blade reaching the 3rd segment.Lauterborn organs placed on broad pedicels which extend slightly beyond the apex of flagellum.
S I comb-like; S II plumose; Premandible with 2 apical teeth and 1 lateral pale tooth.
Mandible with 2 inner teeth;
Mentum with 1 small median tooth and 4 pairs of lateral teeth.Ventromental plates very close together medially.

Measurements: none



RHEOTANYTARSUS nigricauda

Diagnosis:
Caput light-yellow; postoccipital margin black. Ant. 5-segmented; Lauterborn organs on rather short pedicels only slightly longer than 3rd to 5th segment.
S I plumose; S II plumose; Premandible with 2 apical teeth.
Mentum with 1 median tooth and 5 pairs of lateral teeth; median tooth with 1 to 2 notches laterally. Ventromental plates almost in contact medially.

RHEOTANYTARSUS nigricauda

RHEOTANYTARSUS nigricauda

4th instar

Measurements: (n=2)
CB: $\bar{x}$: 215.0µm (LL: 194.6 UL: 235.7µm)
L : $\bar{x}$: 2.350 mm (LL: 1.900 UL: 2.800mm)
X1: $\bar{x}$: 101.0µm (LL: 095.7 UL: 106.3µm)
X2: $\bar{x}$: 007.8µm (LL: 007.5 UL: 008.0µm)
X3: $\bar{x}$: 084.1µm (LL: 083.0 UL: 085.1µm)
X4: $\bar{x}$: 129.8µm (LL: 127.7 UL: 131.9µm)
X5: $\bar{x}$: 052.1µm (LL: 046.8 UL: 057.4µm)
X6: $\bar{x}$: 034.6µm (LL: 034.0 UL: 035.1µm)
X7: $\bar{x}$: 118.6µm (LL: 117.0 UL: 120.2µm)

3rd instar mag:1000x

Measurements: (n=2)
CB: $\bar{x}$: 163.9µm (LL: 157.2 UL: 170.8µm)
L: $\bar{x}$: 1.900mm (LL: 1.700 UL: 2.100mm)
X1: $\bar{x}$: 069.5µm (LL: 064.4 UL: 074.5µm)
X2: $\bar{x}$: 004.6µm (LL: 004.3 UL: 004.8µm)
X3: $\bar{x}$: 052.7µm (LL: 052.1 UL: 053.2µm)
X4: $\bar{x}$: 071.3µm (LL: 070.2 UL: 072.3µm)
X5: $\bar{x}$: 038.0µm (LL: 038.0 UL: 038.0µm)
X6: $\bar{x}$: 020.2µm (LL: 019.1 UL: 021.3µm)
X7: $\bar{x}$: 077.1µm (LL: 074.4 UL: 079.8µm)

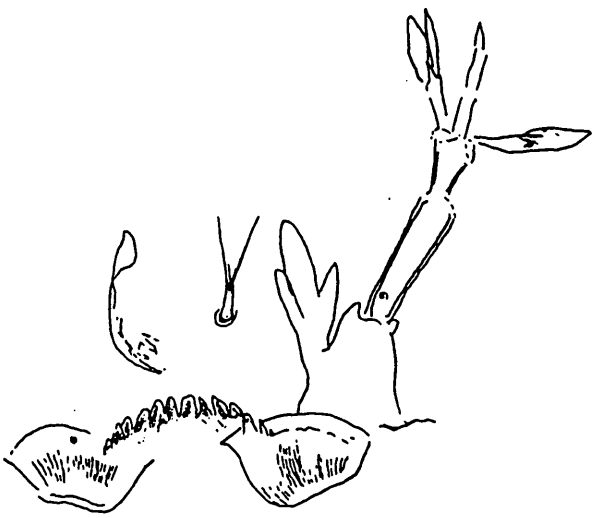
2nd instar

Measurements: (n=3)
CB: $\bar{x}$: 120.0µm (LL: 110.0 UL: 130.0µm)
L : $\bar{x}$: 1.550mm (LL: 1.300 UL: 1.800mm)
X1: $\bar{x}$: 044.2µm (LL: 043.6 UL: 044.7µm)
X2: $\bar{x}$: 003.2µm (LL: 003.2 UL: 003.2µm)
X3: $\bar{x}$: 034.9µm (LL: 033.5 UL: 037.2µm)
X4: $\bar{x}$: 033.1µm (LL: 031.9 UL: 034.0µm)
X5: $\bar{x}$: 030.0µm (LL: 029.5 UL: 030.8µm)
X6: $\bar{x}$: 014.0µm (LL: 012.8 UL: 016.0µm)
X7: $\bar{x}$: 053.9µm (LL: 053.2 UL: 055.2µm)

STEMPELLINA bausei 3rd instar mag:1000x

Diagnosis:
Caput greyish; postoccipital margin darkened: 2 knob-like processes posteriorly; Ant.5-segmented, situated on pedestal bearing palmate process mesally. 2nd segment bearing style and paired Lauterborn organs distally. S I comb-like; S II plumose; labral lamellae distinct.
Mnetum with 1 median rounded tooth and 6 pairs of lateral teeth.

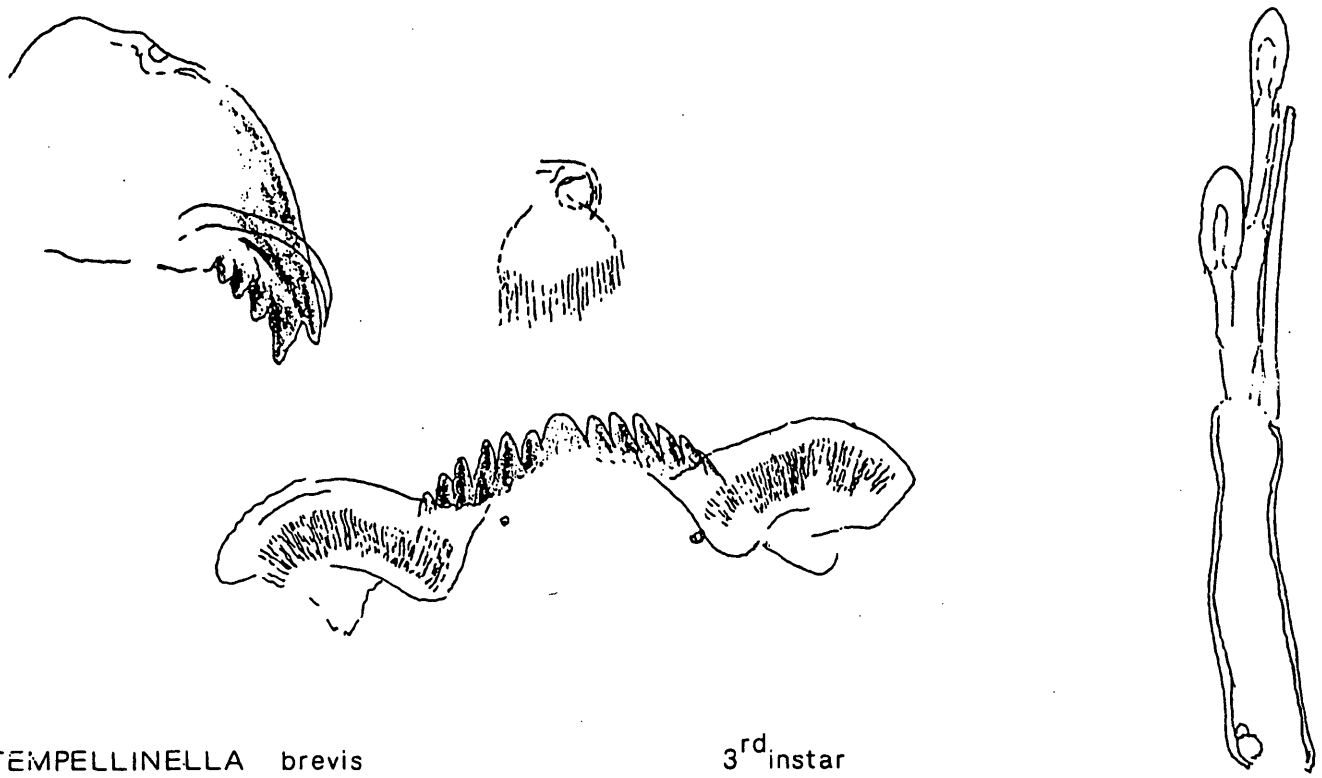
Measurements: none



STEMPELLINELLA brevis 4th instar mag:1000x

Diagnosis:
Caput light-grey; postoccipital margin darkened; Ant.5-segmented; 2nd segment with one pair of alternate Lauterborn organs;
S I comb-like, S II plumose; Labral lamellae distinct., premandible with 2 apical teeth. Mentum with 1 median rounded tooth and 6 pairs of lateral teeth. Ventromental plates fan-shaped and widely separated medially.

Measurements: (n=5)
CB: $\bar{x}$: 166.7µm (LL: 152.4 UL: 181.1µm)
L : $\bar{x}$: 1.900mm (LL: 1.700 UL: 2.100mm)
X1: $\bar{x}$: 042.2µm (LL: 039.5 UL: 045.0µm)
X2: $\bar{x}$: 007.7µm (LL: 007.1 UL: 008.4µm)
X3: $\bar{x}$: 027.8µm (LL: 022.5 UL: 033.4µm)
X4: $\bar{x}$: 062.6µm (LL: 054.6 UL: 070.6µm)
X5: $\bar{x}$: 050.9µm (LL: 021.6 UL: 080.9µm)
X6: $\bar{x}$: 022.0µm (LL: 020.7 UL: 023.3µm)
X7: $\bar{x}$: 078.4µm (LL: 069.9 UL: 086.9µm)



STEMPELLINELLA brevis 3rd instar

Measurements: (n=2)
CB: $\bar{x}$: 120.0µm (LL: 110.0 UL: 130.0µm)
L : $\bar{x}$: 1.350mm (LL: 1.300 UL: 1.400mm)
X1: $\bar{x}$: 037.5µm (LL: 035.6 UL: 039.4µm)
X2: $\bar{x}$: 005.7µm (LL: 005.6 UL: 005.8µm)
X3: $\bar{x}$: 021.3µm (LL: 019.8 UL: 022.8µm)
X4: $\bar{x}$: 032.8µm (LL: 030.9 UL: 034.6µm)
X5: $\bar{x}$: 044.5µm (LL: 042.6 UL: 046.3µm)
X6: $\bar{x}$: 012.6µm (LL: 012.2 UL: 012.9µm)
X7: $\bar{x}$: 053.2µm (LL: 052.1 UL: 054.3µm)

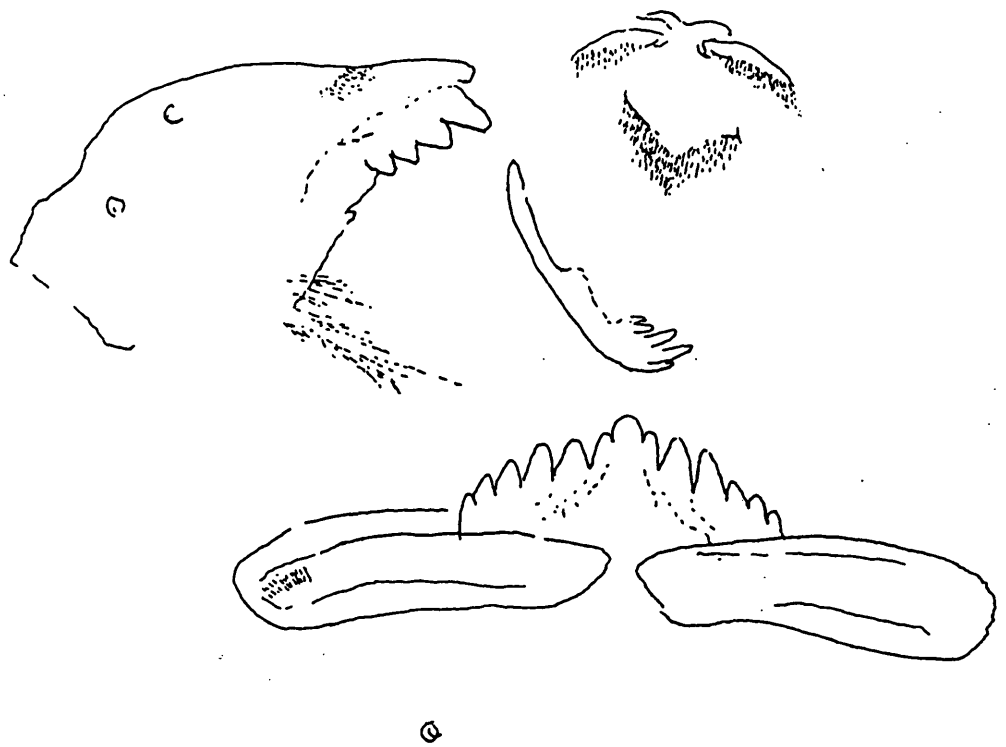
STEMPELLINELLA brevis 2nd instar

Measurements: (n=2)
CB: $\bar{x}$: 095.0µm (LL: 090.0 UL: 100.0µm)
L : $\bar{x}$: 1.000mm (LL: 0.800 UL: 1.200mm)
X1: $\bar{x}$: 021.2µm (LL: 021.2 UL: 021.2µm)
X2: $\bar{x}$: 003.0µm (LL: 002.7 UL: 003.3µm)
X3: $\bar{x}$: 014.7µm (LL: 012.8 UL: 016.5µm)
X4: $\bar{x}$: 016.0µm (LL: 013.3 UL: 018.6µm)
X5: $\bar{x}$: 031.6µm (LL: 031.2 UL: 031.9µm)
X6: $\bar{x}$: 009.8µm (LL: 009.0 UL: 010.6µm)
X7: $\bar{x}$: 035.4µm (LL: 034.6 UL: 036.1µm)

TANYTARSUS sp.1 4th instar mag:1000X

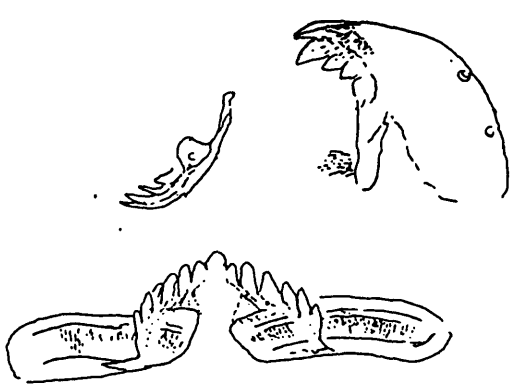
Diagnosis:
Caput greyish; postoccipital margin light;
Ant.5-segmented; pedestals without spurs.
2nd segment more transparent than 1st.
Lauterborn organs small and indistinct
situated on long pedicels.
S I comb-like; S II plumose; premandible with
4 apical teeth.
Mentum with rounded median tooth and 5 pairs
of lateral teeth; Ventromental plates narrowly
saparated.

Measurements: none



TANYTARSUS sp.1 3rd instar mag:1000x

Measurements: none



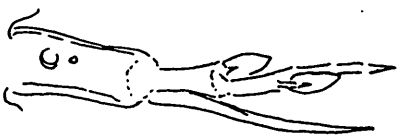
MICROTENDIPES pedellus grp. 4th instar mag:1000X

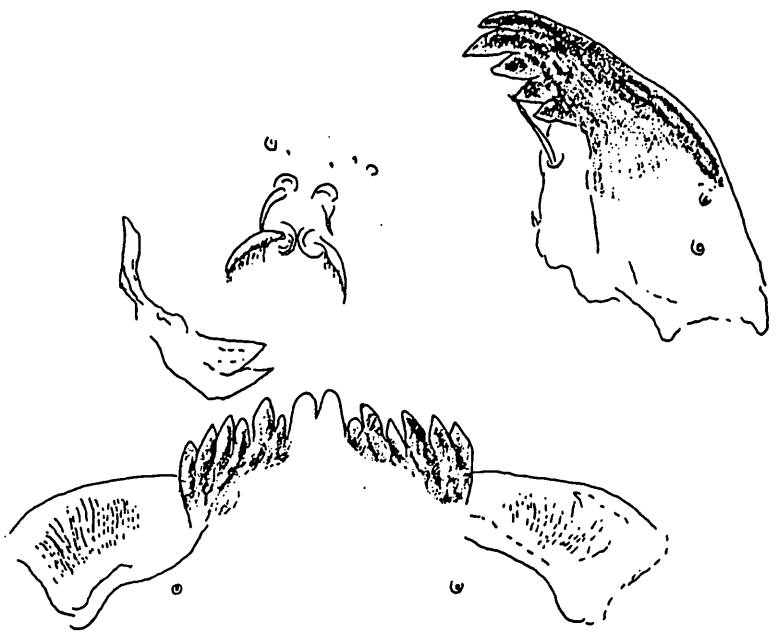
Diagnosis:
Caput yellow; postoccipital margin black. Ant.6-segmented; blade not reaching the apex of 6th segment; S I plumose; pecten epipharyngis with 3 broad teeth; premandible with 2 apical teeth and 1 small tooth more proximal. Mandible with a paler dorsal tooth; Mentum with trifid median tooth, pale in colour and the middle tooth is very indistinct. 6 pairs of lateral brownish teeth; 1st lateral tooth narrowet and lower than second.
Ventromental plates strongly curved.

Measurements: (n=1)
CB: 455.0 µm
L: 4.250 mm
X1: 128.7 µm
X2: 050.0 µm
X3: 095.7 µm
X4: 104.3 µm
X5: 092.6 µm
X6: 071.3 µm
X7: 234.0 µm

MICROTENDIPES pedellus grp. 3rd instar mag:1000x

Measurements: (n=1)
CB: 340.0 µm
L: nc
X1: 092.6 µm
X2: 029.8 µm
X3: 066.0 µm
X4: 056.4 µm
X5: 070.7 µm
X6: 049.5 µm
X7: 113.8 µm





MICROTENDIPES pedellus grp. 2nd instar mag:1000x

Measurements: (n=1)
CB: 190.0 µm
L: nc
X1: 051.3 µm
X2: 033.3 µm
X3: 037.2 µm
X4: 031.4 µm
X5: 048.9 µm
X6: 027.7 µm
X7: 086.2 µm

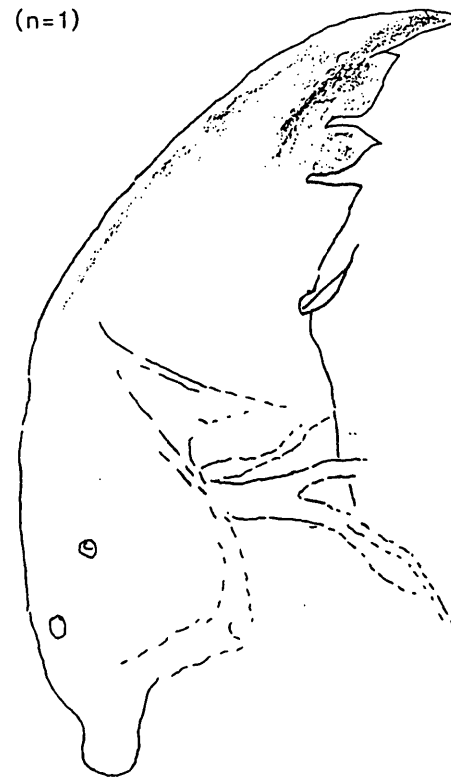
PARACLADOPELMA camptolabis grp.

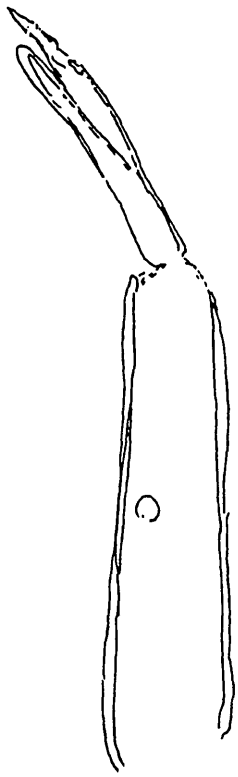
4th instar

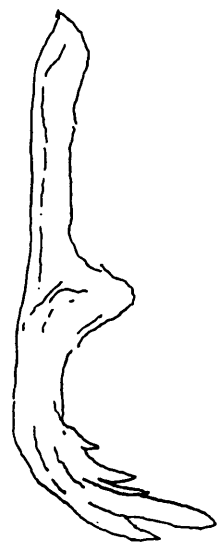
mag:1000x

Diagnosis:
Caput brown; postoccipital margin black. Ant.5-segmented;blade fused with 2nd segment at the base.
S I, S III small; S II long, simple. Premandible with 5 apical teeth.
Mandible without dorsal tooth; 3 inner pointed teeth.
Mentum with 2 median teeth and 7 pairs of lateral teeth; 2 median teeth and 1st pair of laterals pale in colour.

Measurements: (n=1)
CB: 330.0 µm
L : nc
X1: 099.8 µm
X2: 030.7 µm
X3: 053.8 µm
X4: 081.6 µm
X5: 044.2 µm
X6: 039.4 µm
X7: 146.9 µm

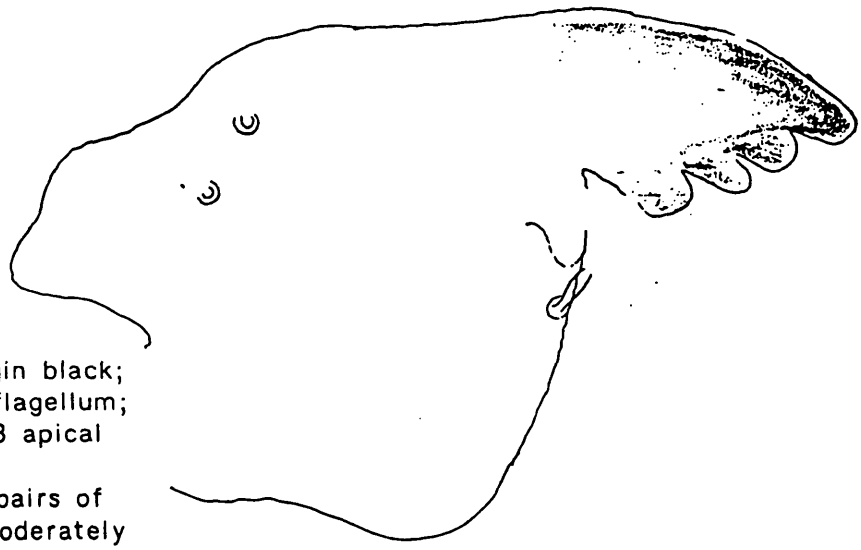






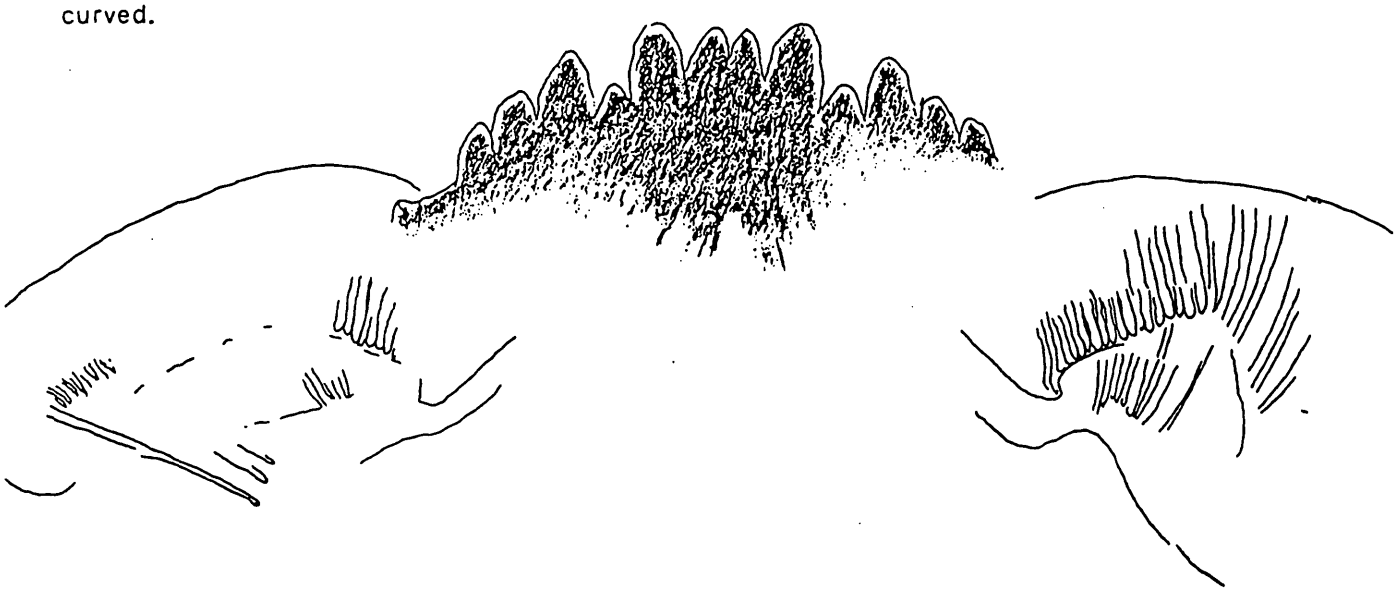
4th instar mag:1000x

Measurements: none



PHAENOPSECTRA flavipes

Diagnosis:
Caput dark-brown; postoccipital margin black; Ant. 5-segmented; blade as long as flagellum; S I, S II plumose; premandible with 3 apical teeth.
Mentum with 4 median teeth and 6 pairs of lateral teeth. Ventromental plates moderately curved.



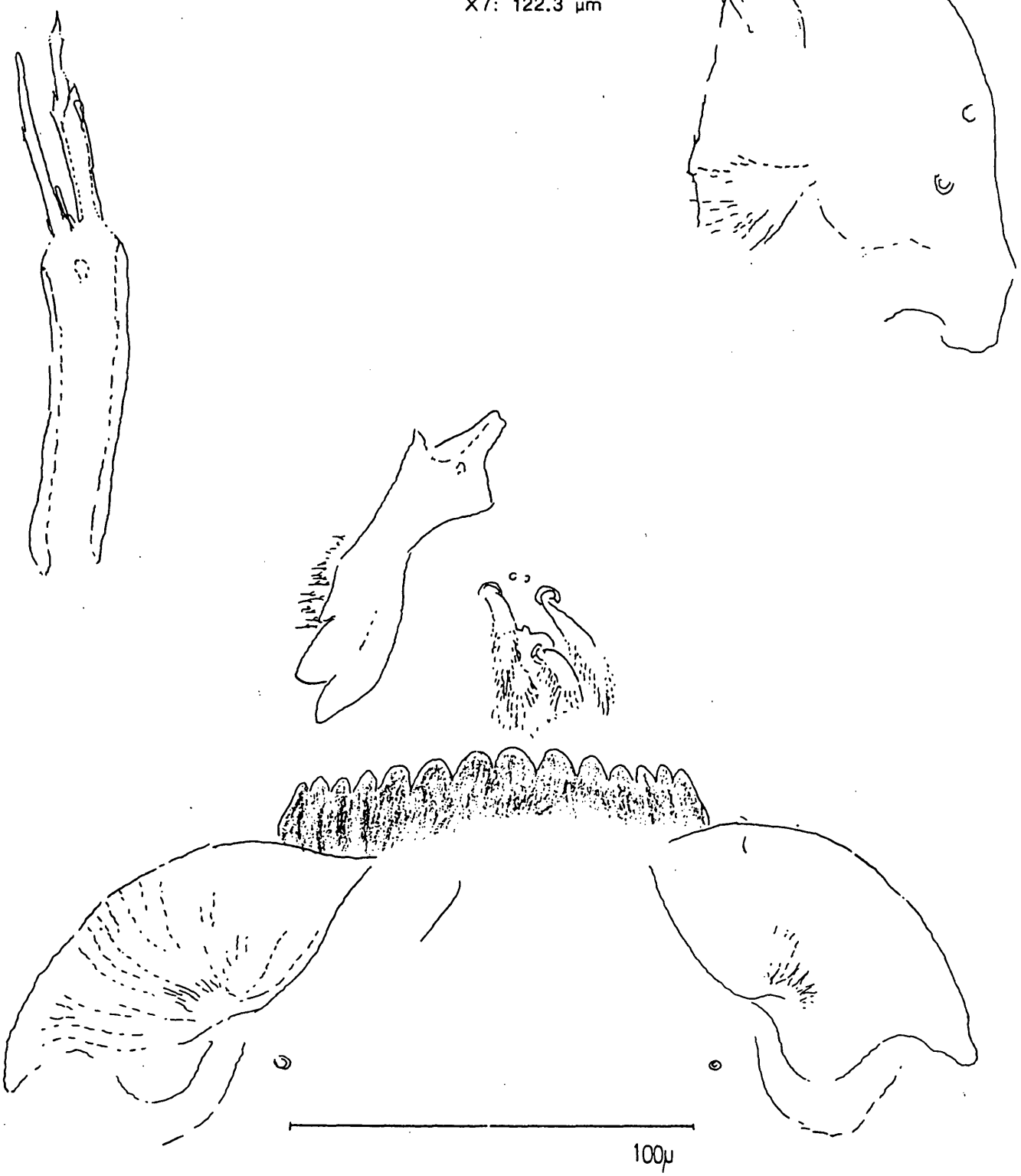
3rd instar

Measurements: (n=3)
CB: $\bar{x}$: 178.7µm (LL: 150.0 UL: 210.0µm)
L : $\bar{x}$: 2.700mm (LL: 2.500 UL: 02.900mm)
X1: $\bar{x}$: 048.7µm (LL: 041.3 UL: 056.6µm)
X2: $\bar{x}$: 019.2µm (LL: 018.2 UL: 020.2µm)
X3: $\bar{x}$: 045.4µm (LL: 043.2 UL: 048.0µm)
X4: $\bar{x}$: 028.1µm (LL: 026.8 UL: 028.8µm)
X5: $\bar{x}$: 036.2µm (LL: 033.6 UL: 038.4µm)
X6: $\bar{x}$: 020.4µm (LL: 020.2 UL: 021.1µm)
X7: $\bar{x}$: 079.8µm (LL: 076.8 UL: 081.6µm)

POLYPEDILUM albicorne 4^{th} instar mag:1000x

Diagnosis:
Caput light-grey; postoccipital margin black; Ant.5-segmented;
S I, SII plumose; premandible with 2 apical teeth.
Mentum with 4 median teeth and 6 pairs of lateral teeth; nearly all equal in size. Ventromental plates widely separated.

Measurements: (n=1)
CB: 270.0 µm
L : 4.200 mm
X1: 099.5 µm
X2: 037.2 µm
X3: 086.7 µm
X4: 053.2 µm
X5: 048.9 µm
X6: 037.7 µm
X7: 122.3 µm

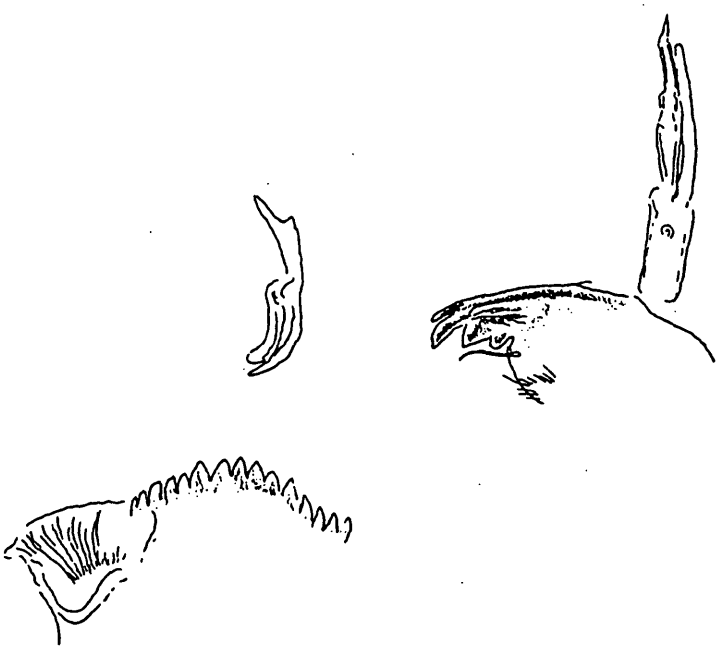


POLYPEDILUM albicorne

2nd instar

mag:1000x

Measurements: (n=1)
CB: 130.0 µm
L : 1.500 mm
X1: 037.8 µm
X2: 014.4 µm
X3: 026.5 µm
X4: 016.5 µm
X5: 028.7 µm
X6: 013.8 µm
X7: 046.8 µm



POLYPEDILUM sp.

1th instar

Diagnosis:
Caput light-grey; postoccipital margin black; Ant.5-segmented; S I , S II plumose; premandible with 2 apical teeth. Mentum with 4 median teeth, within the innermost 2 teeth higher than the 2nd pair of median teeth and 6 pairs of lateral teeth, all brownish in colour. Ventromental plates widely separated.

Measurements: (n=1)
CB: 330.0 µm
L : 6.300 mm
X1: 108.5 µm
X2: 042.6 µm
X3: 096.8 µm
X4: 057.4 µm
X5: 051.1 µm
X6: 040.4 µm
X7: 152.1 µm

POLYPEDILUM sp.

2nd instar

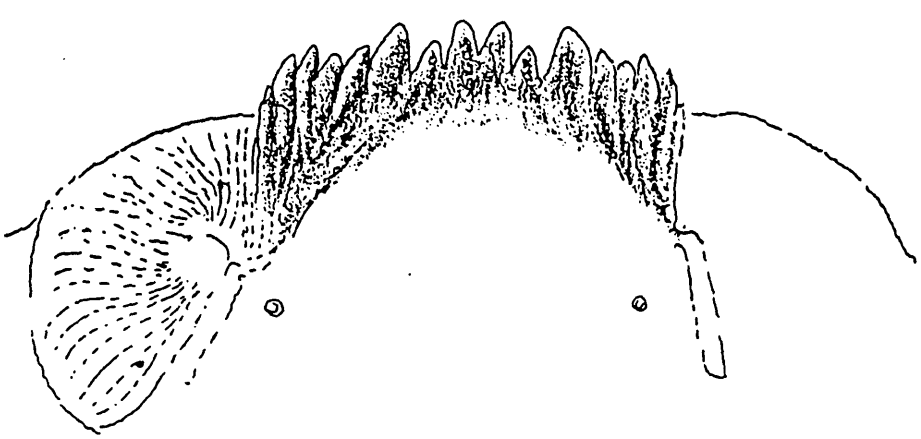
mag:1000x

Measurements: (n=1)
CB: 110.0 µm
L : 2.000 mm
X1: 032.9 µm
X2: 011.1 µm
X3: 031.9 µm
X4: 021.3 µm
X5: 031.0 µm
X6: 011.9 µm
X7: 055.3 µm

POLYPEDILUM sp.

3rd instar
Measurements: (n=1)
CB: 220.0 µm
L : 3.200 mm
X1: 063.8 µm
X2: 091.1 µm
X3: 047.3 µm
X4: 027.7 µm
X5: 035.1 µm
X6: 021.9 µm
X7: 078.1 µm

mag:1000x



100µm

REGRESSION ANALYSES

Based on the Model I Regression Analysis (SOKAL and ROHLF 1969) three two-state characters (X1/X3; X1/X2; CB/X4) were randomly choosen out of 7X-character- and CB- measurements. X1 and CB were evaluated as the least dependent variables within the set of characters.

All species and their instars represented by ≥ 9 n of measurements per character unit were taken for the analyses.

In all cases the correlation between the different characters within the instars of a species showed a very high significance (*** = $P < 0.001$).

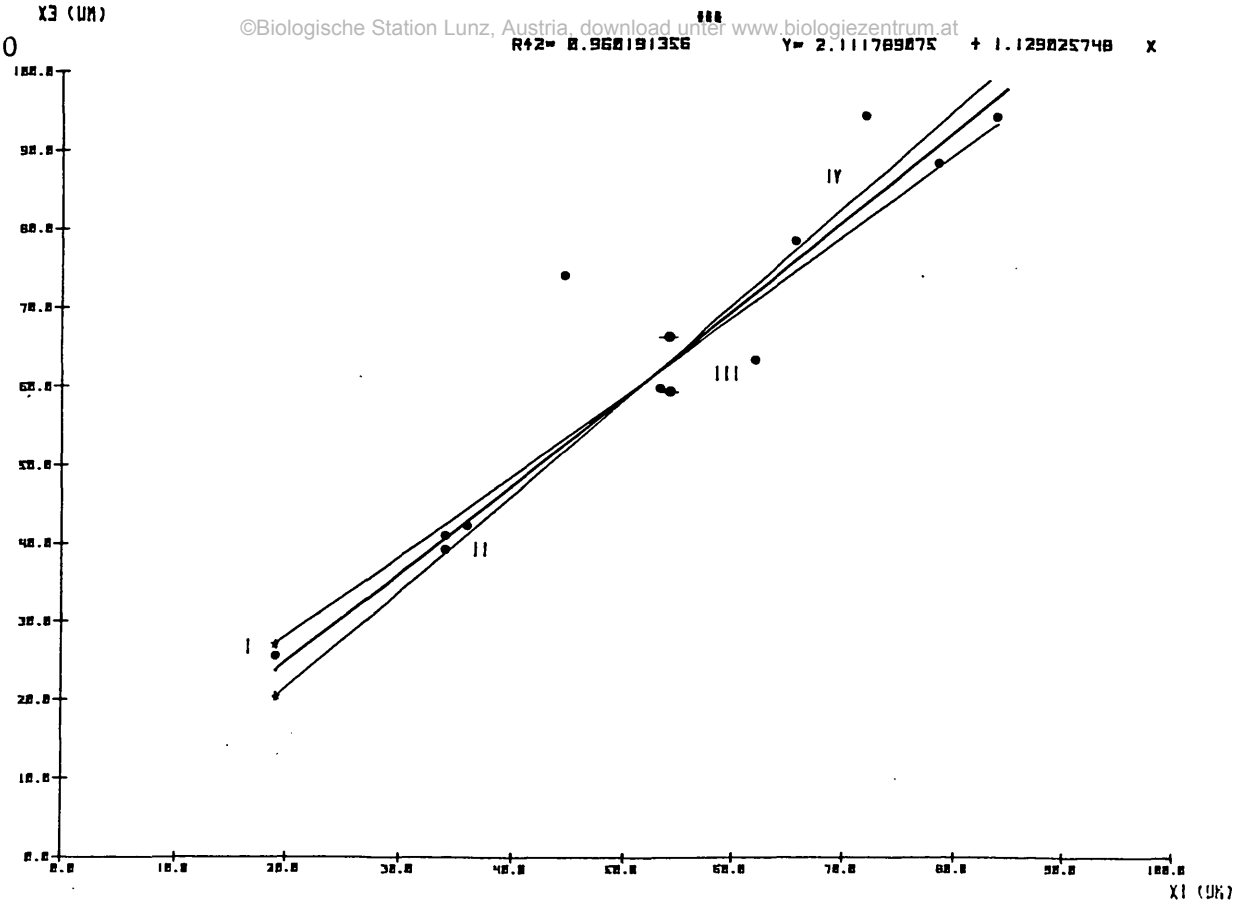
95 % confidence limits for the regression coefficient and for the μ_x corresponding to $\bar{x}$ were computed and plotted showing the significance of the regression analyses.

Abbreviations:

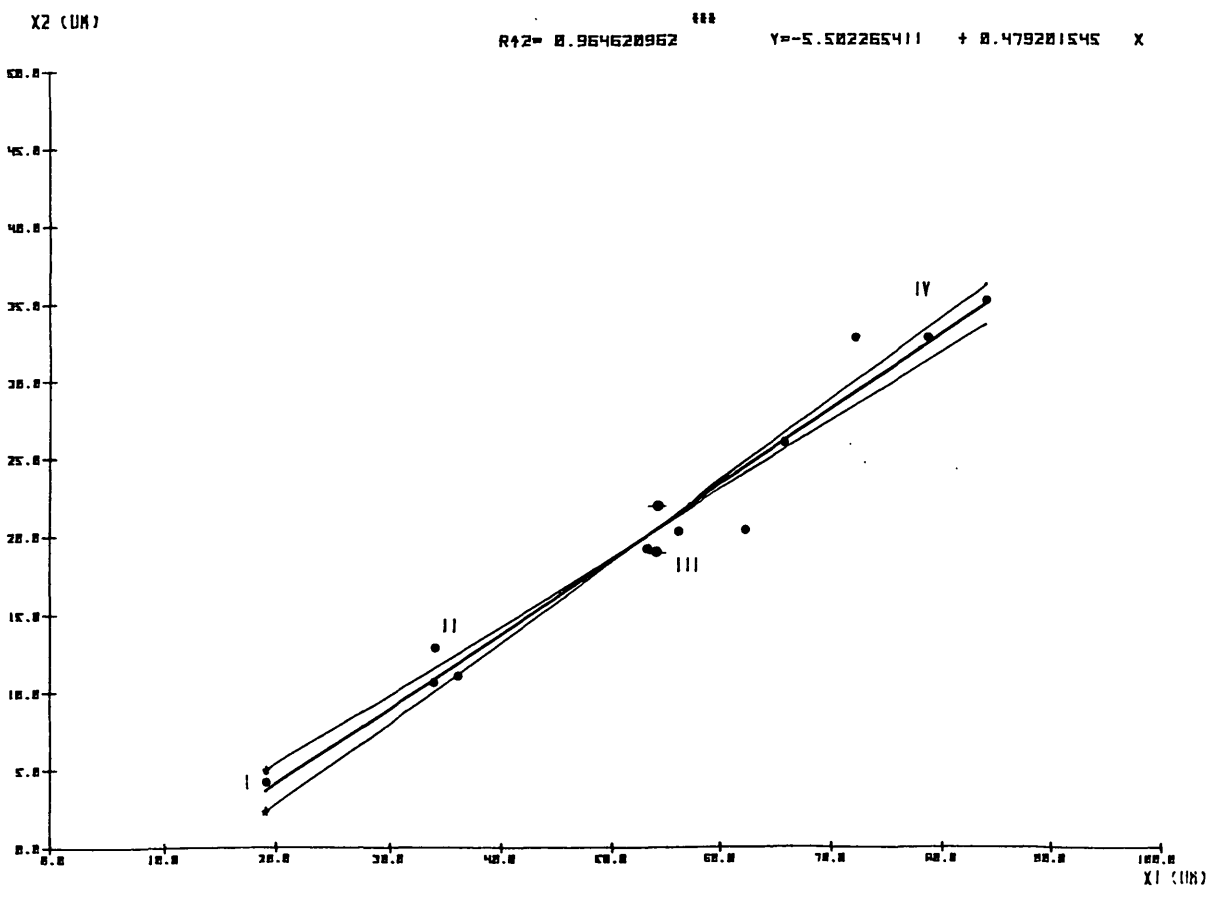
———	.....	95% confidence limits of the regression line (UL and LL)
———	.....	regression line
•	.....	two-state characters
⊷	.....	95% confidence limits for the regression coefficient (UL and LL)
★ ★	.....	95% confidence limits for the μ_x (UL and LL).

Reference:

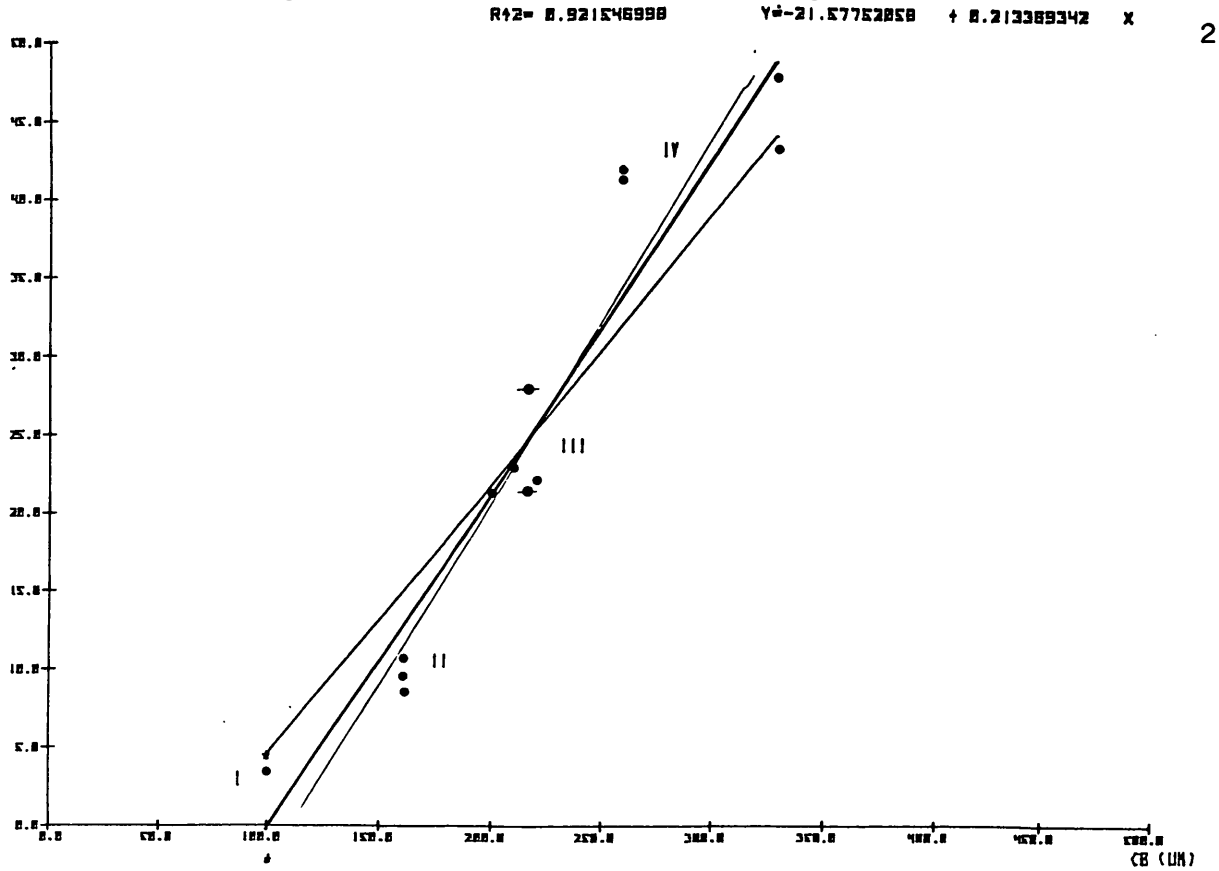
SOKAL R.R. and ROHLF F.J. 1969 BIOMETRY
The principles and practice of statistics in biological research. Freeman &Co. S.Francisco



Chaetocladius laminatus a1

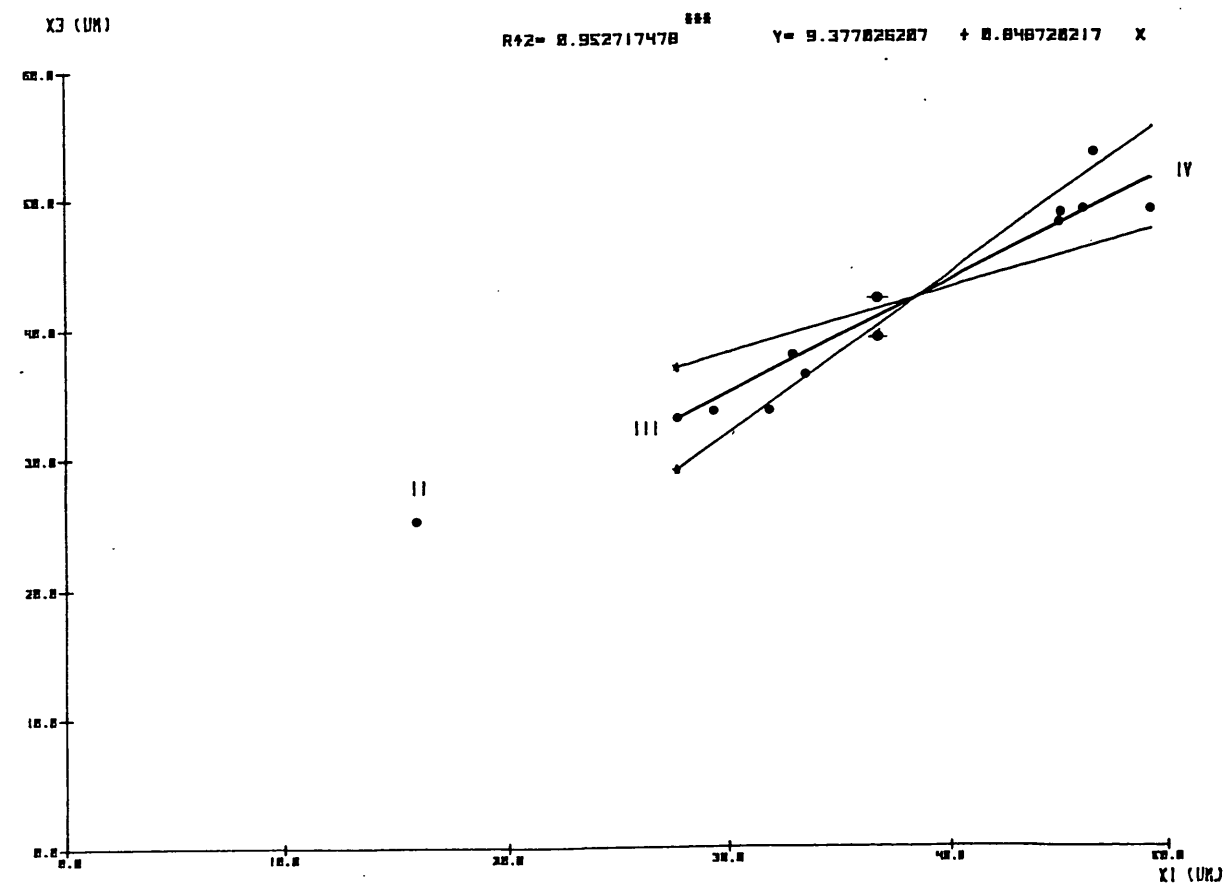


Chaetocladius laminatus a2



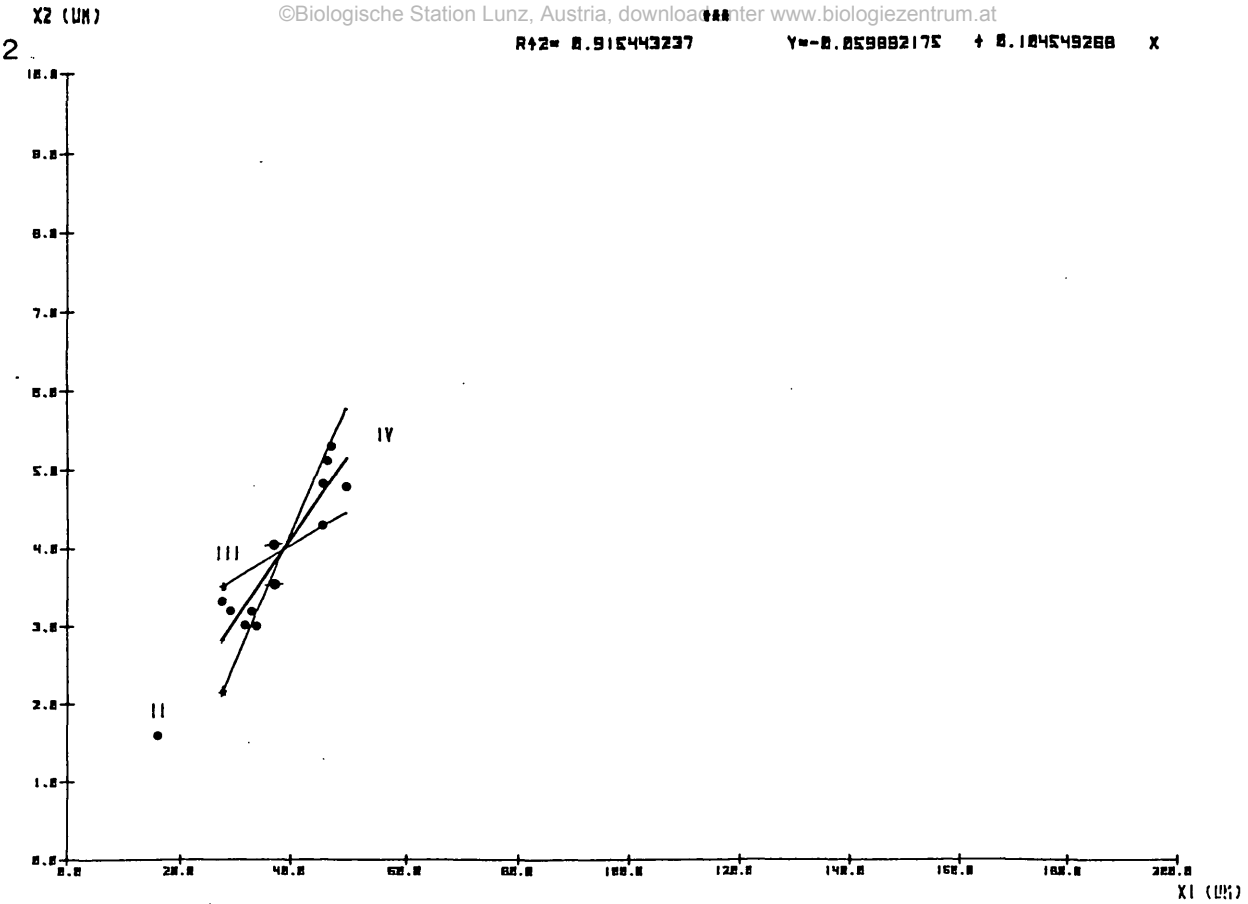
Chaetocladius laminatus

a3



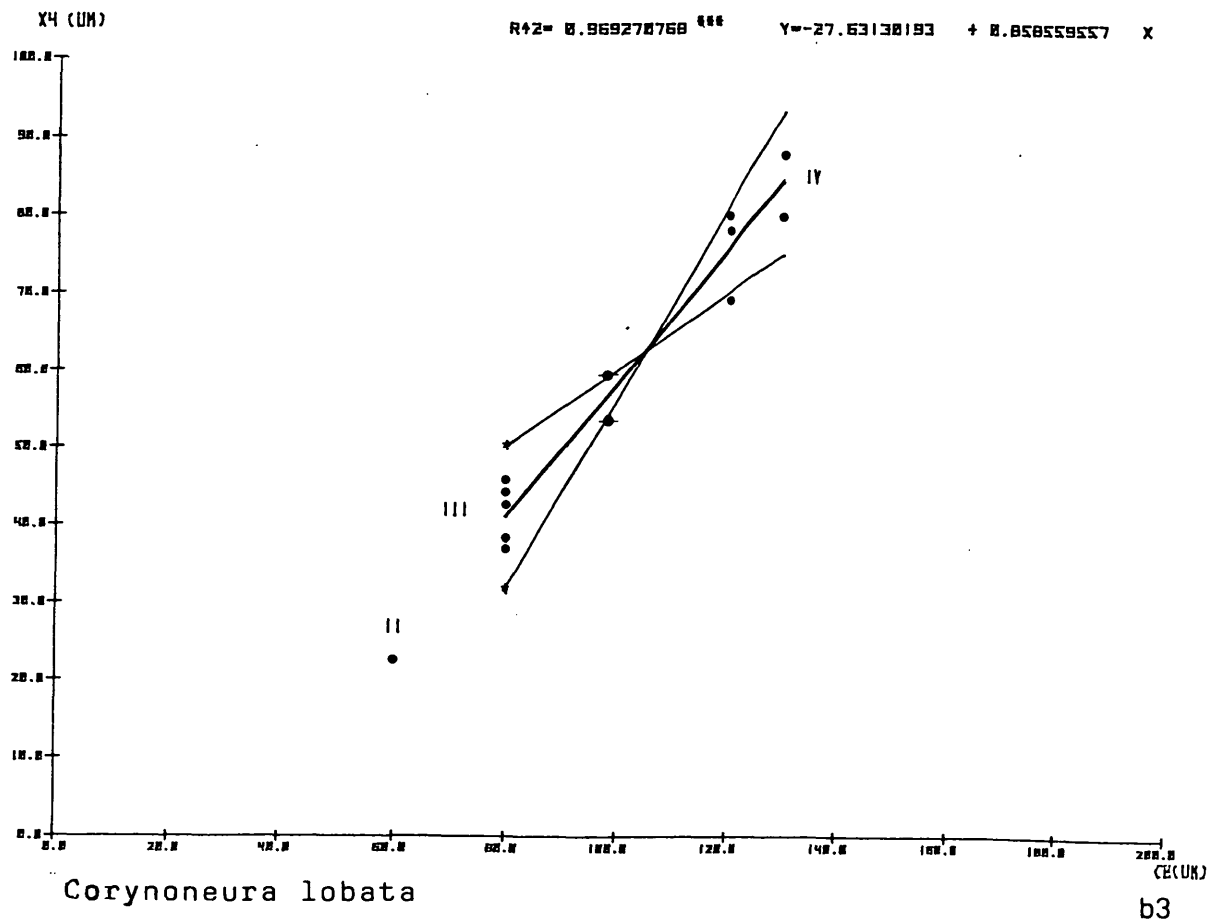
Corynoneura lobata

b1



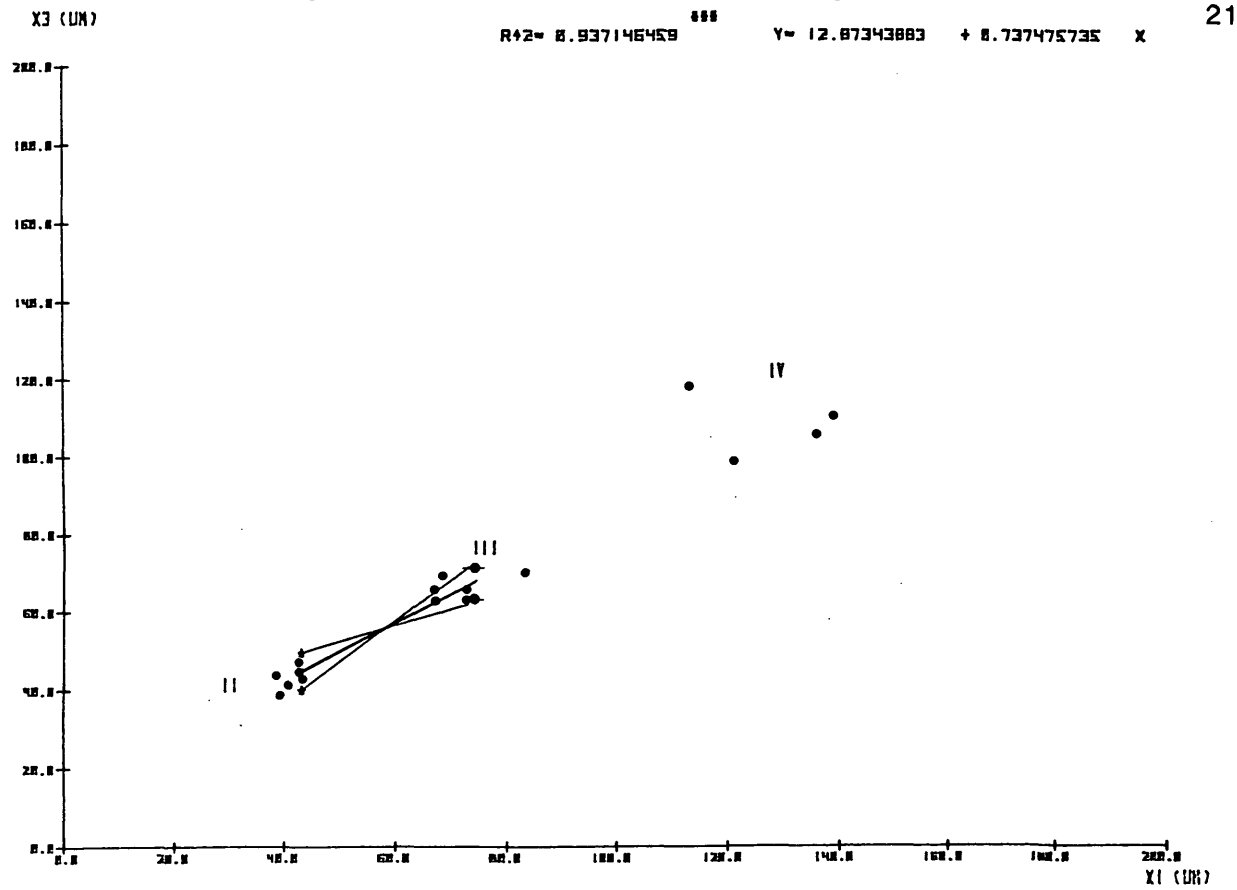
Corynoneura lobata

b2



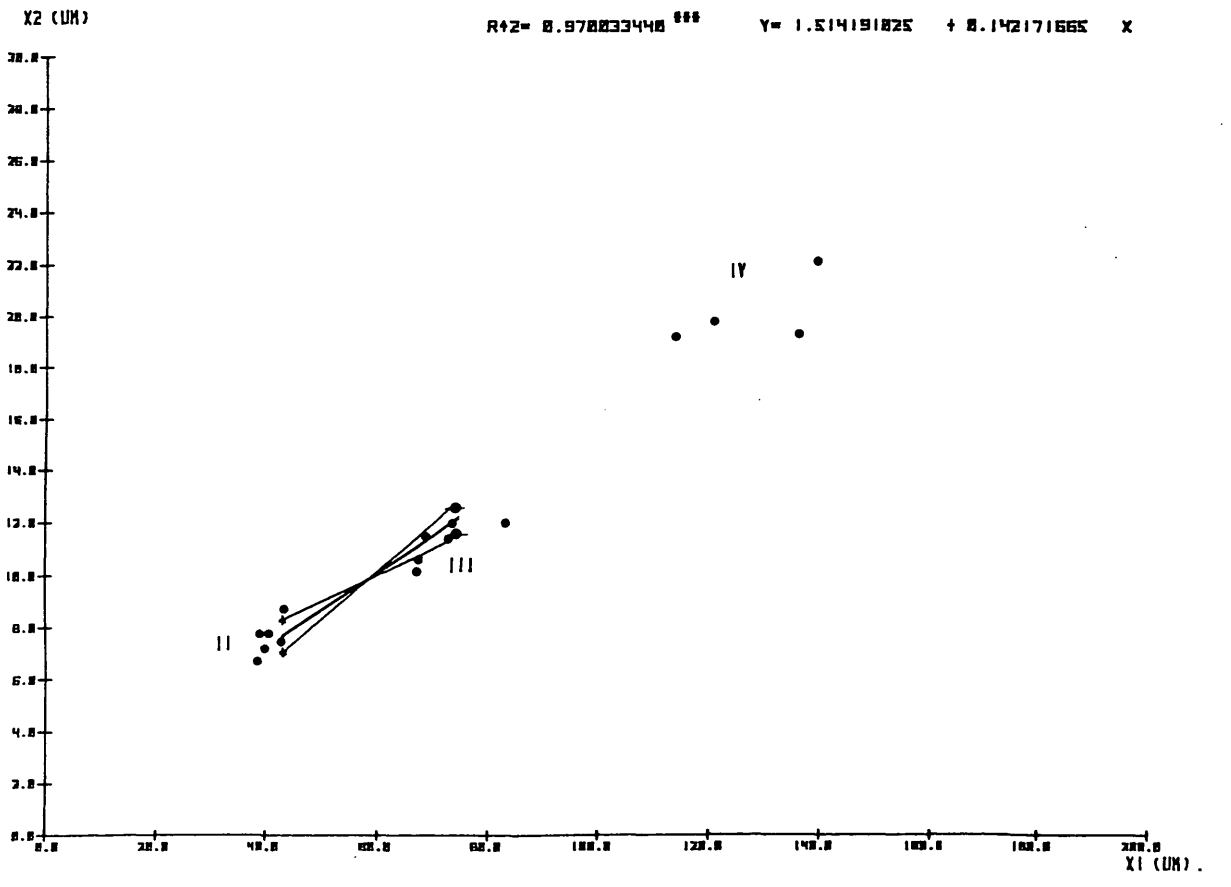
Corynoneura lobata

b3



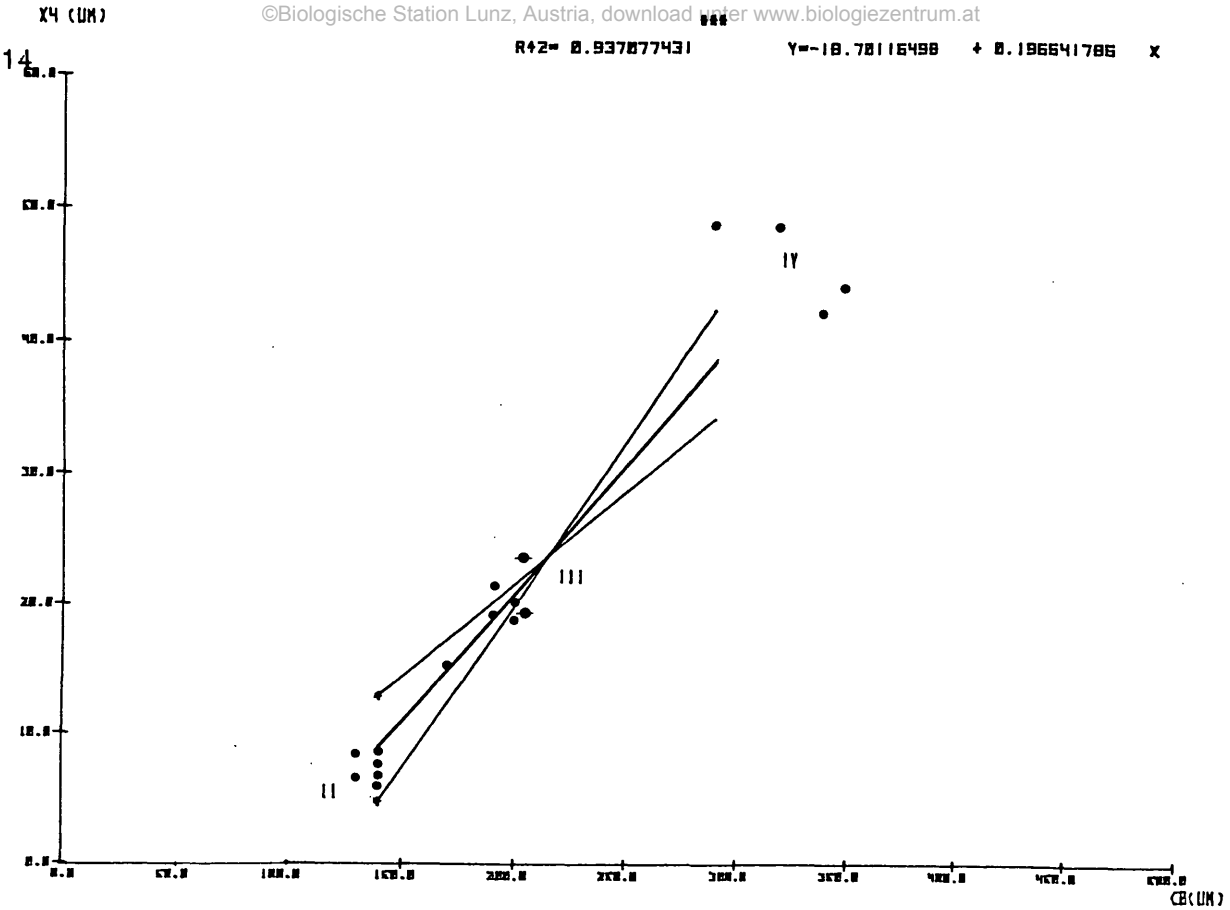
Cricotopus curtus

c1



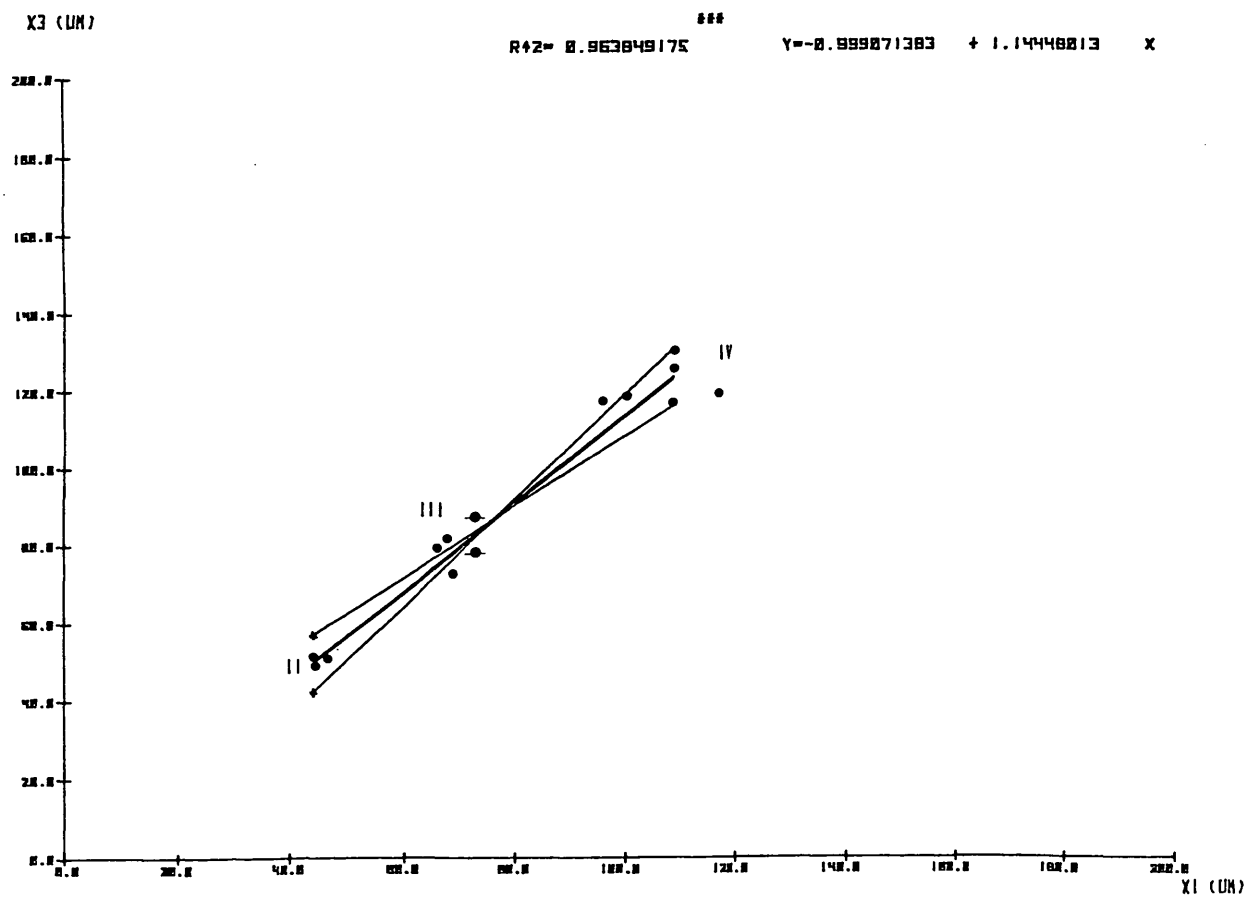
Cricotopus curtus

c2



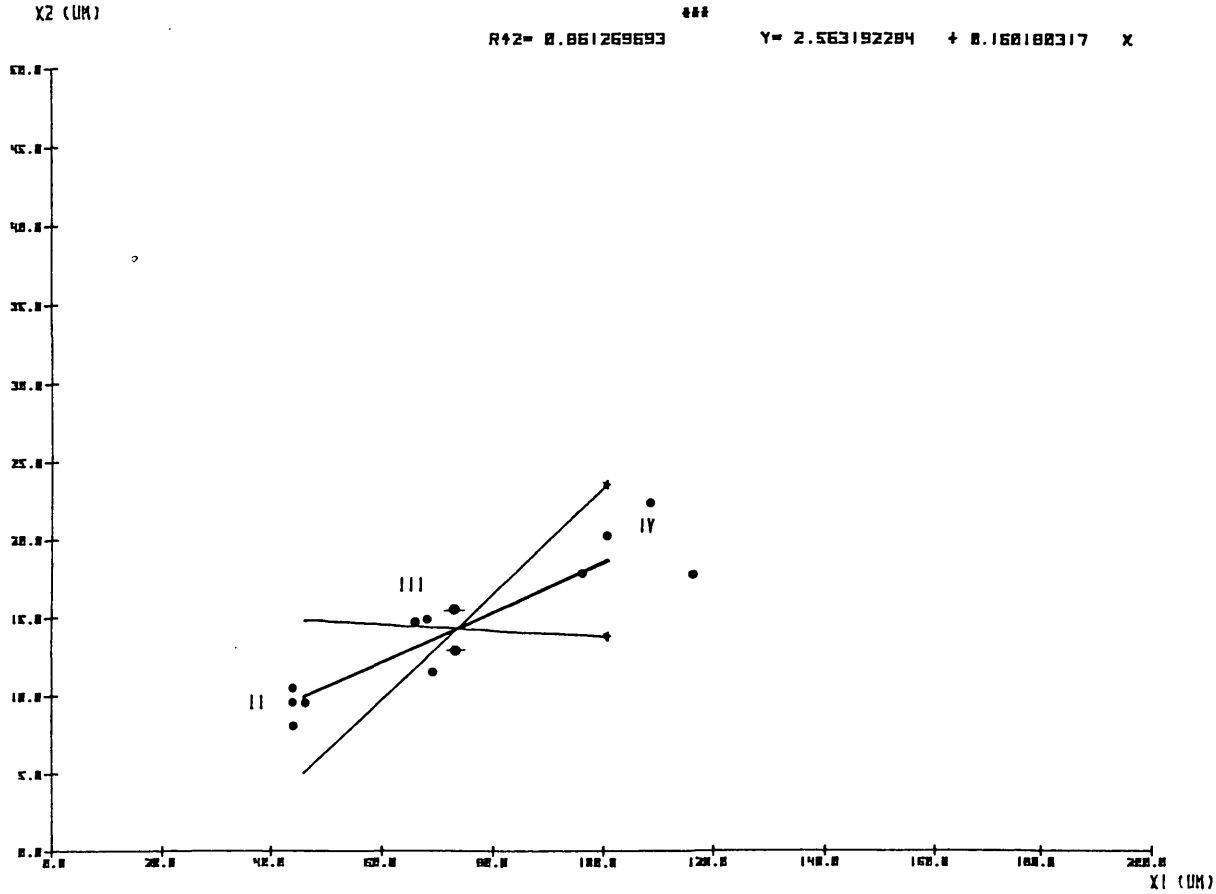
Cricotopus curtus

c3



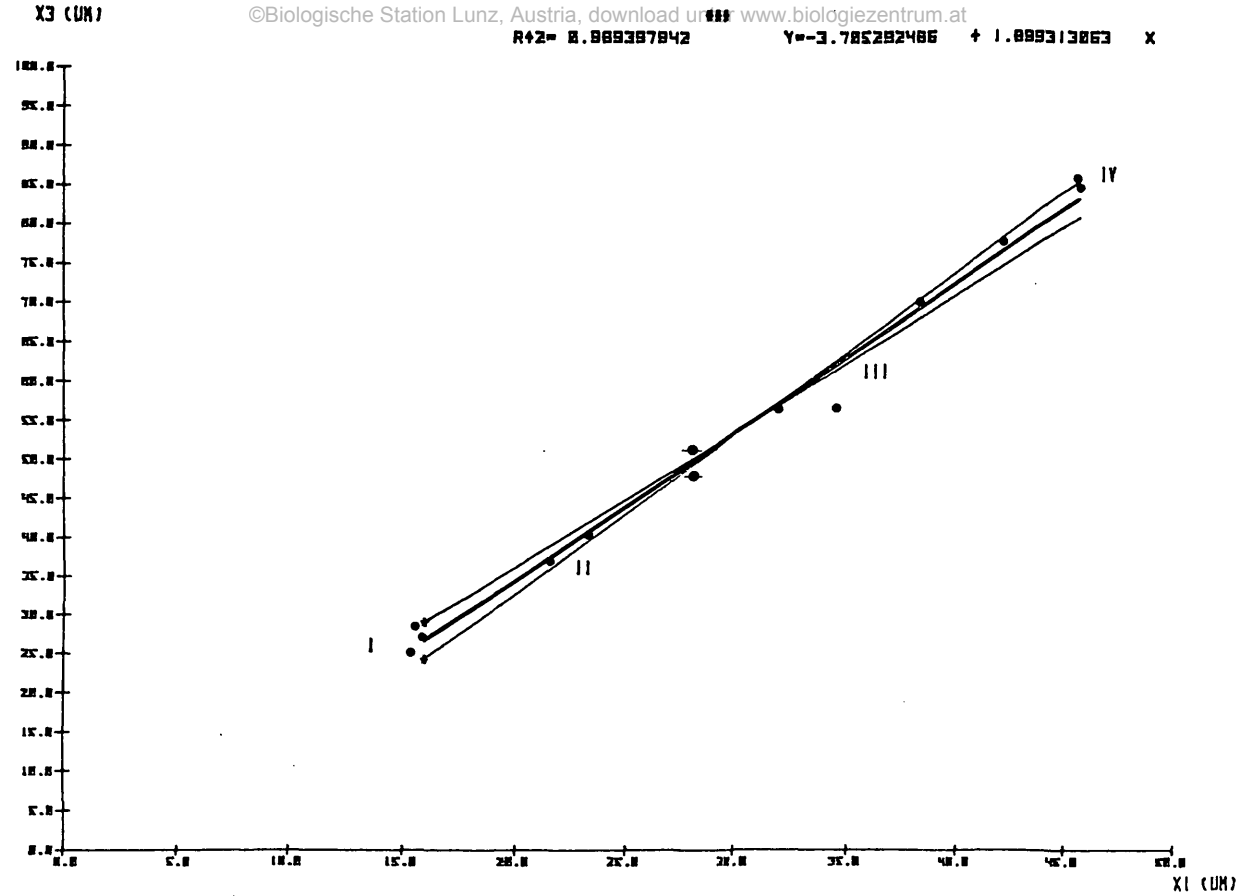
Cricotopus sp. 2

d1



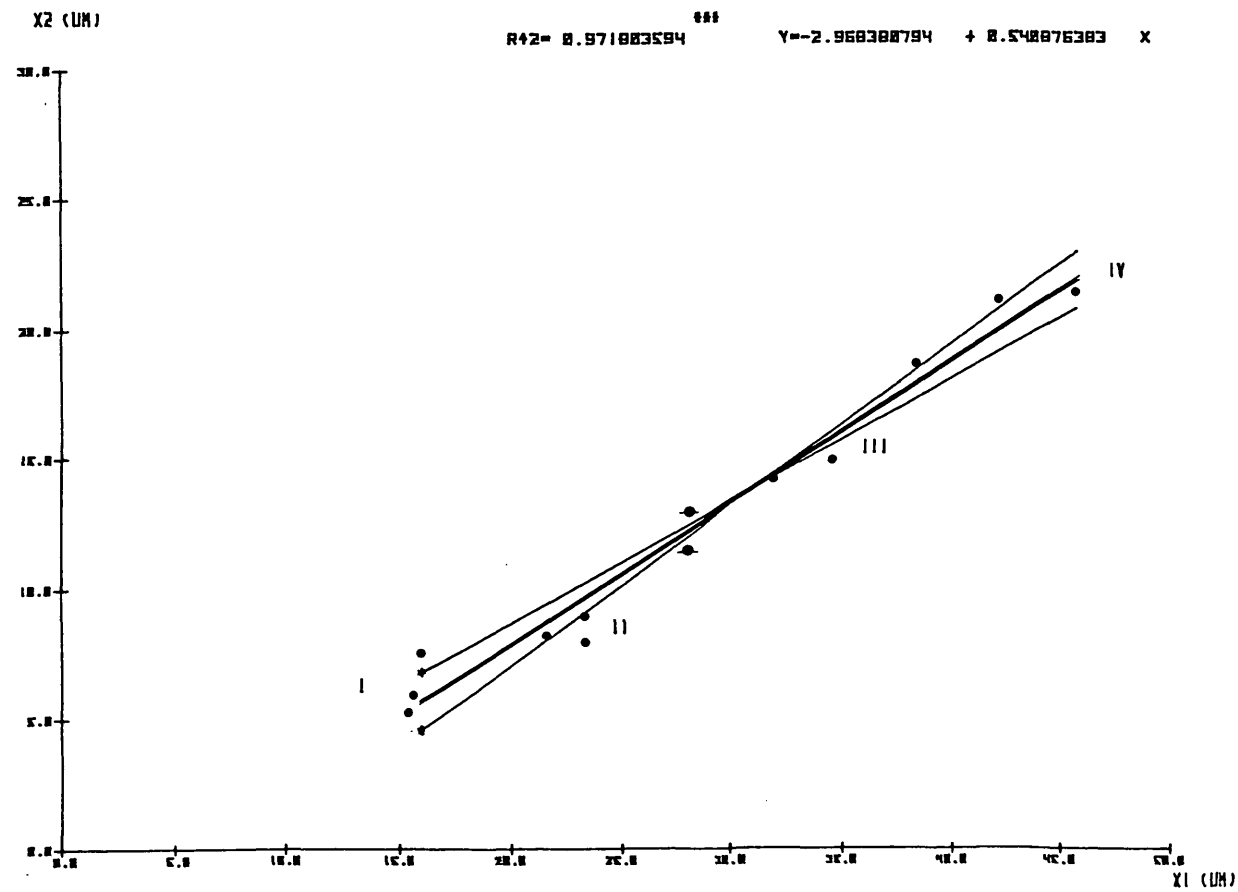
Cricotopus sp. 2

d2



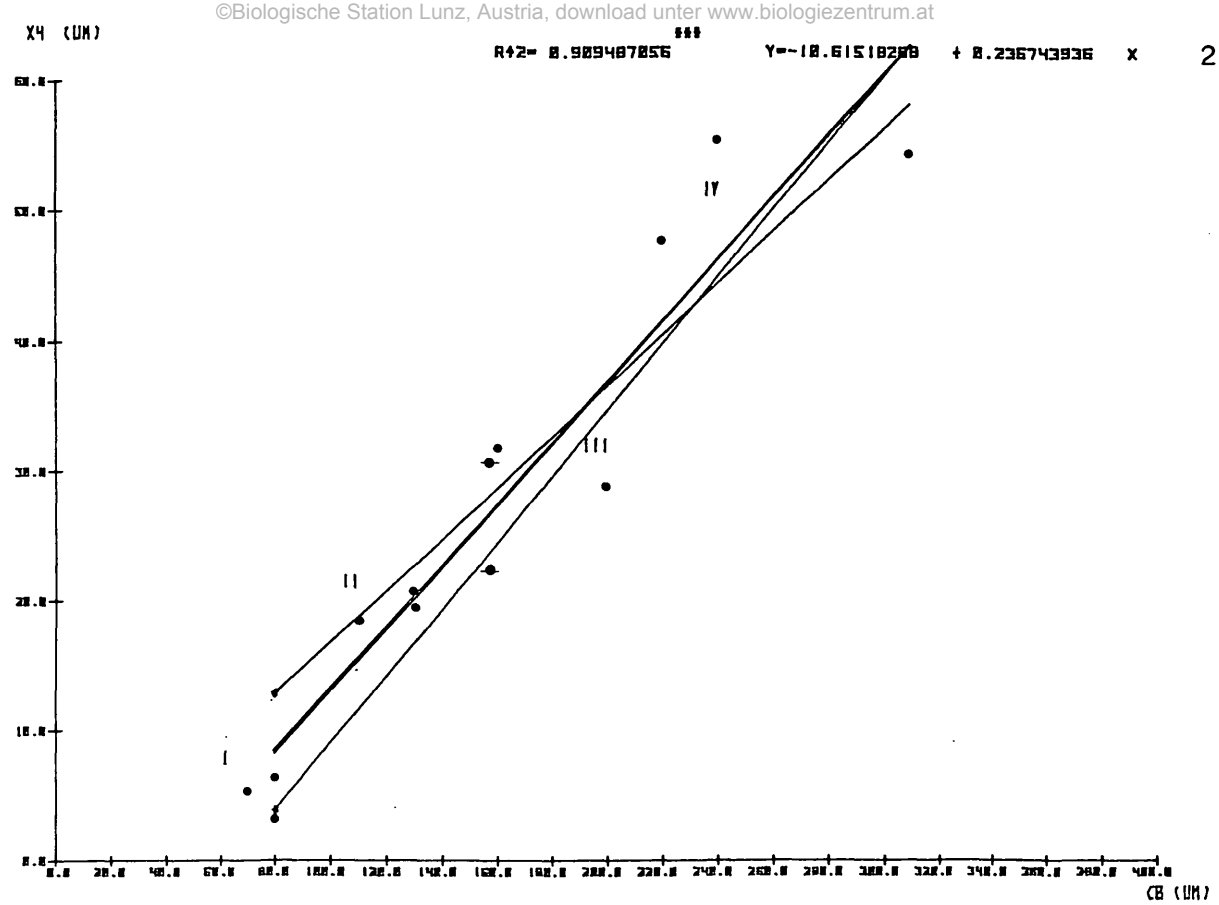
Eukiefferiella clypeata

e1

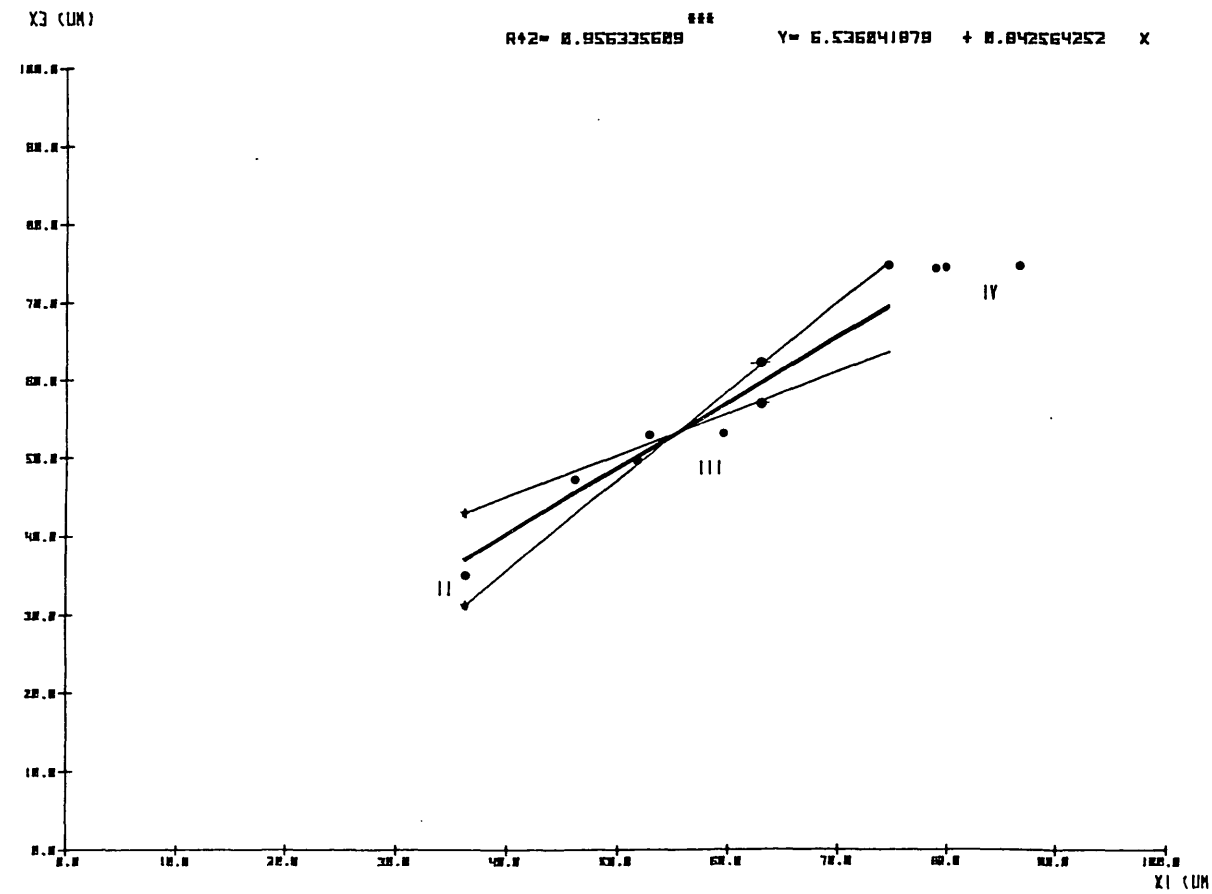


Eukiefferiella clypeata

e2



Eukiefferiella clypeata e3



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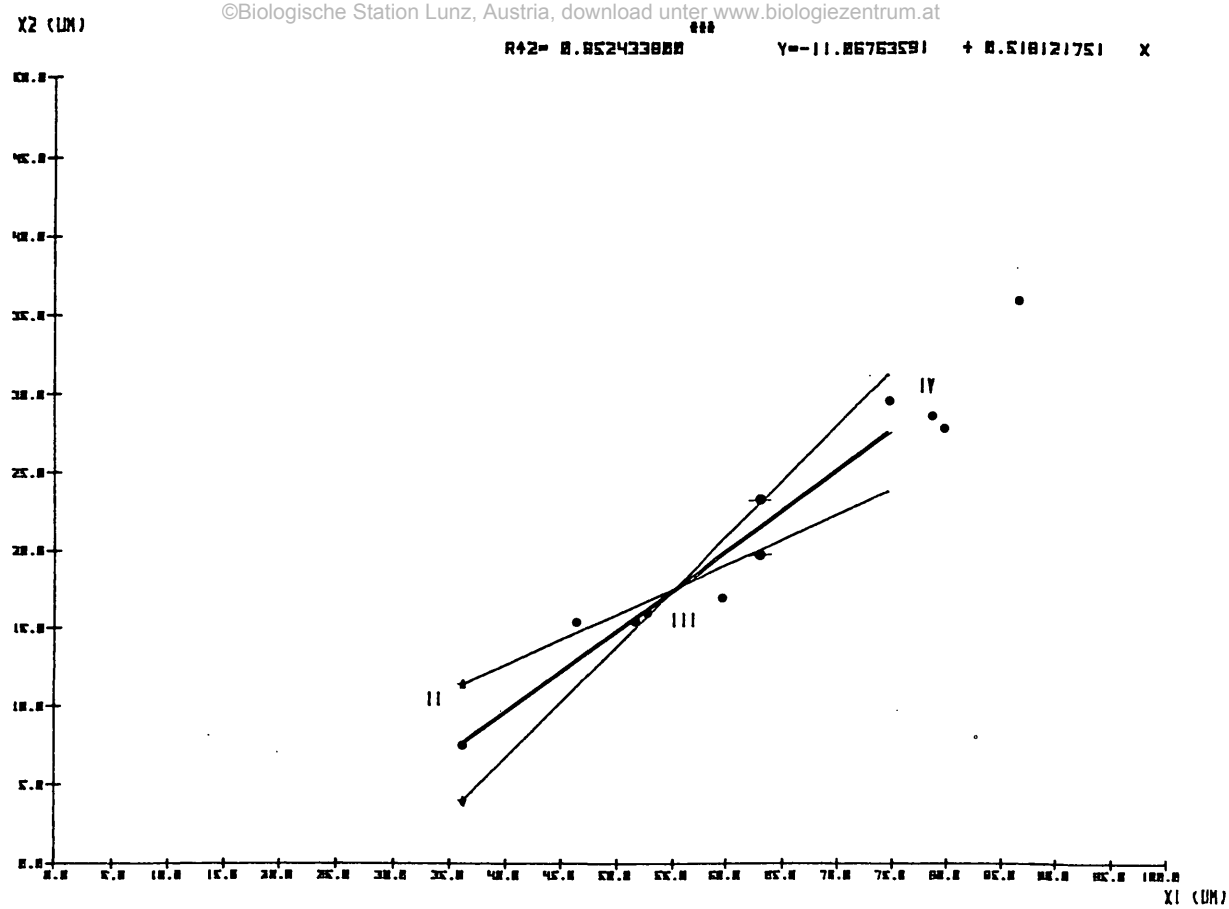
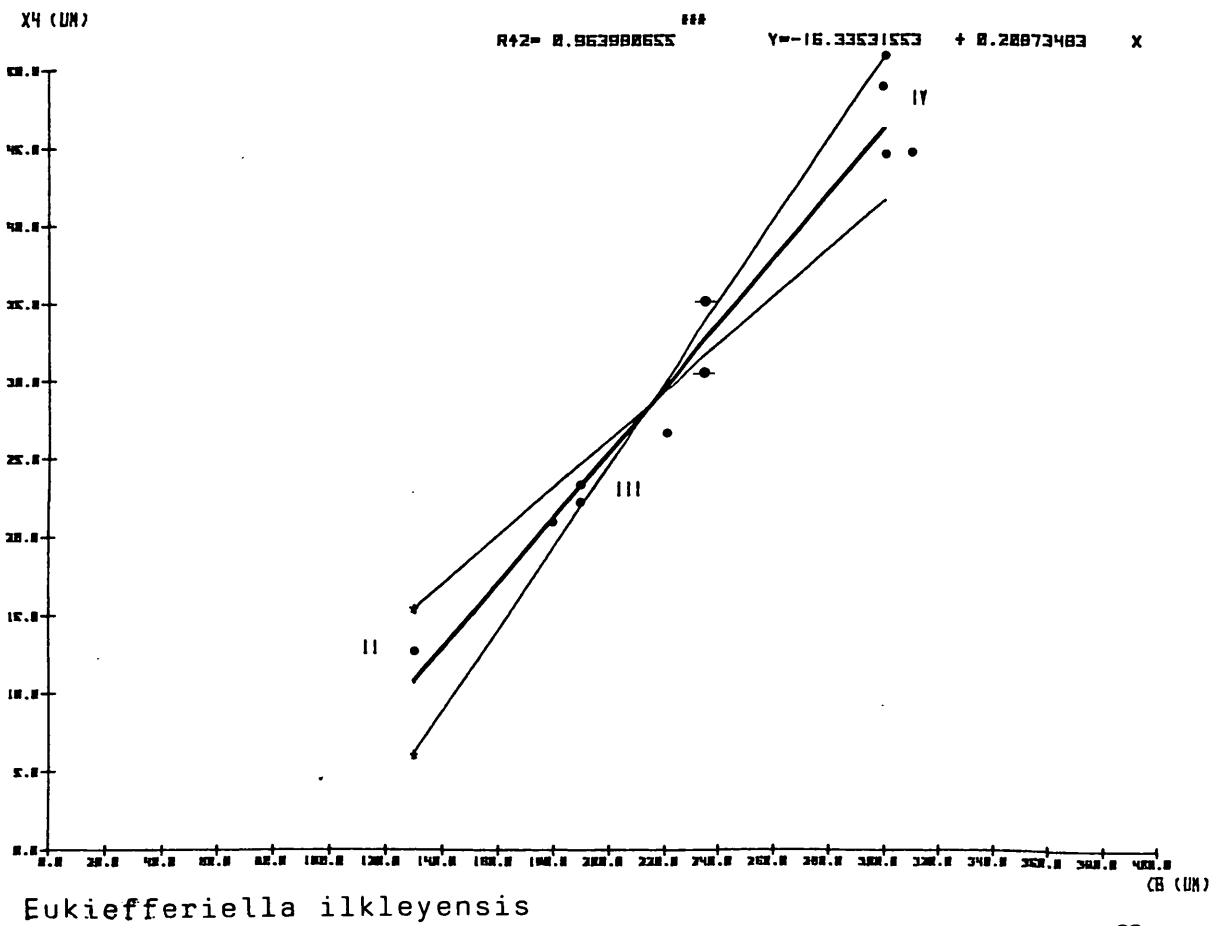


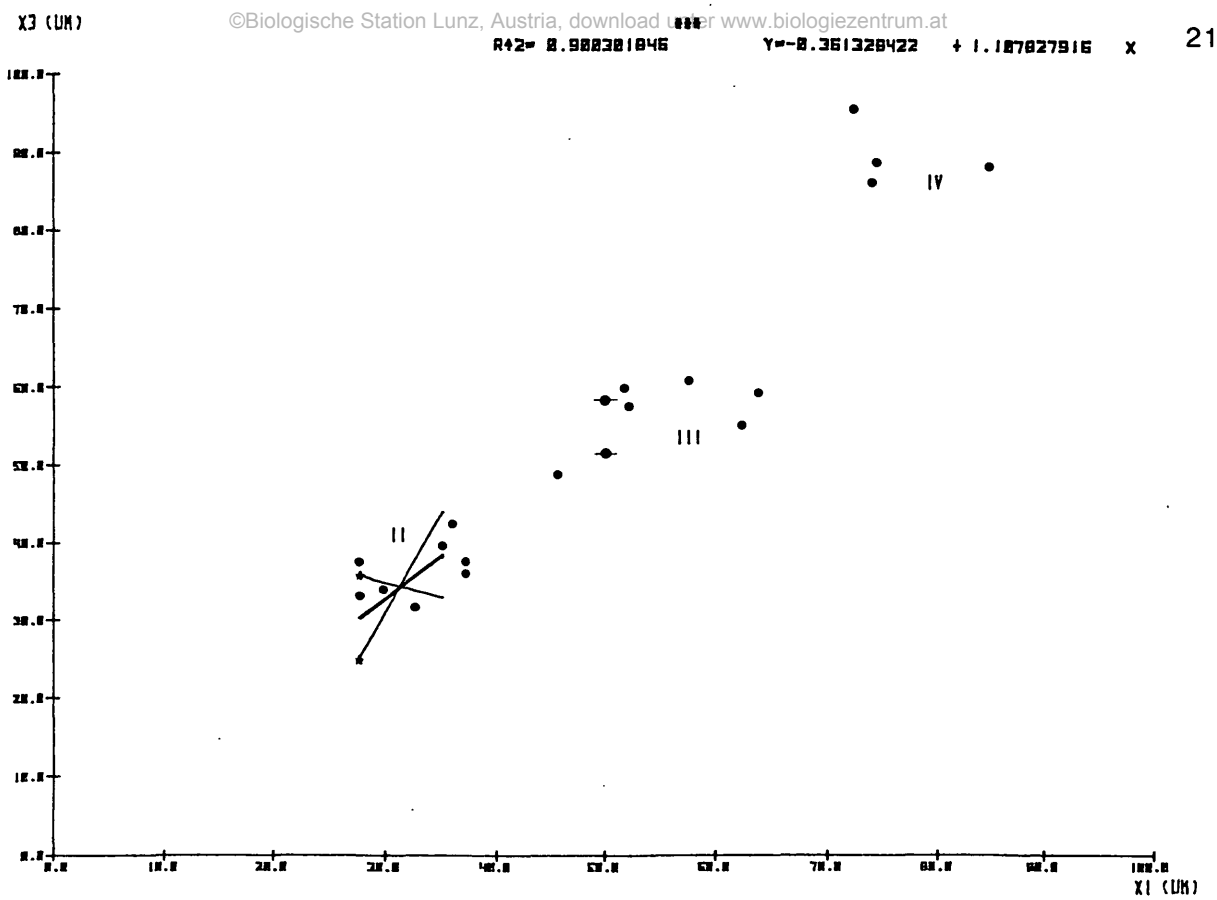
Eukiefferiella ilkleyensis

f2



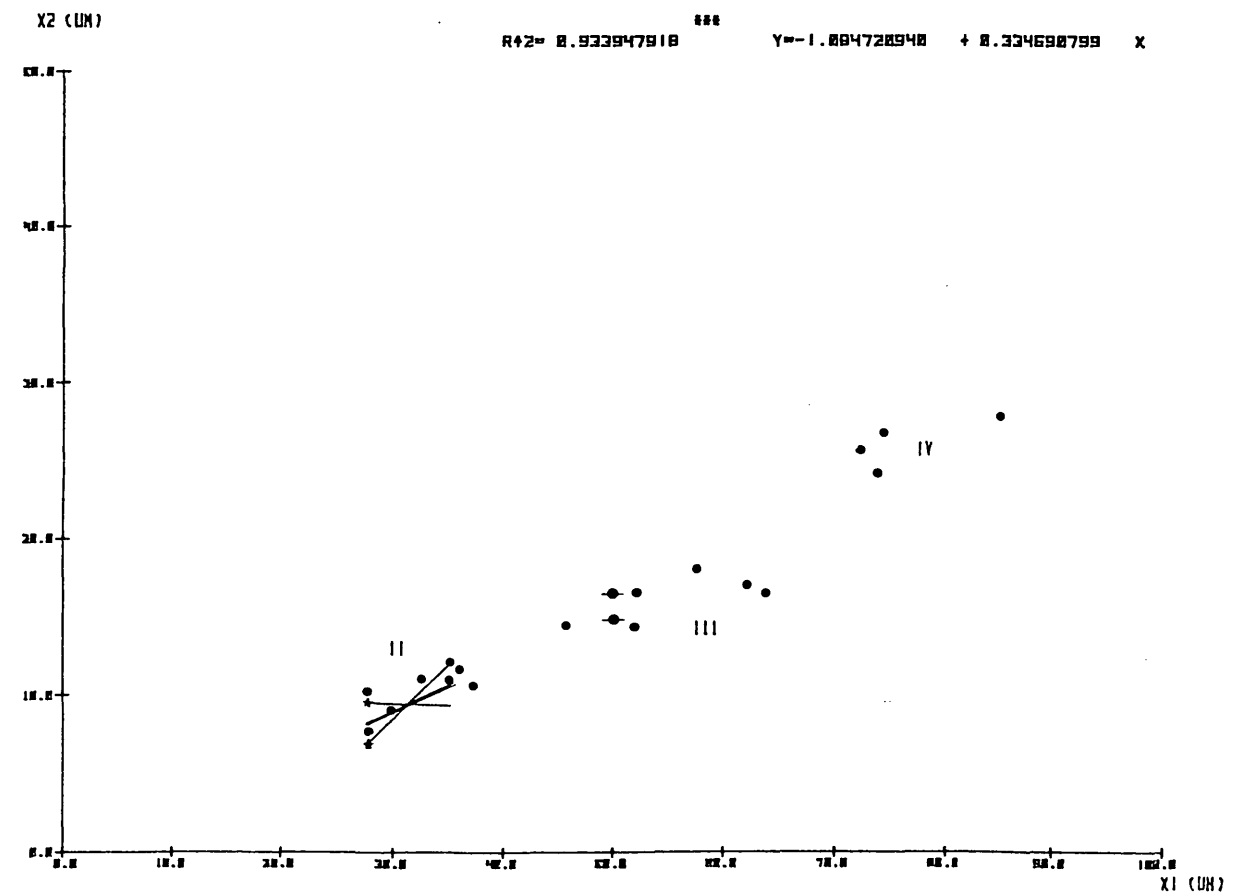
Eukiefferiella ilkleyensis

f3



Eukiefferiella minor

g1



Eukiefferiella minor

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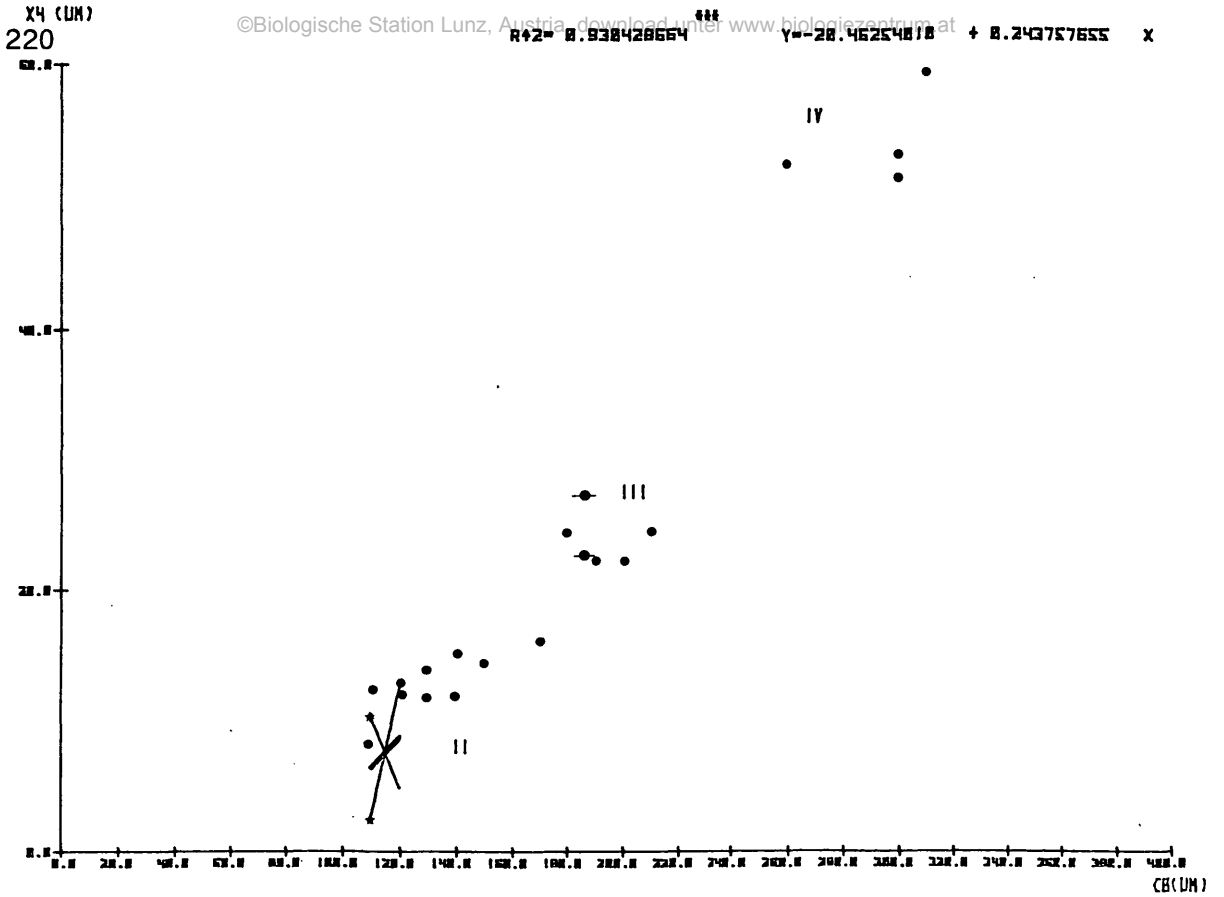
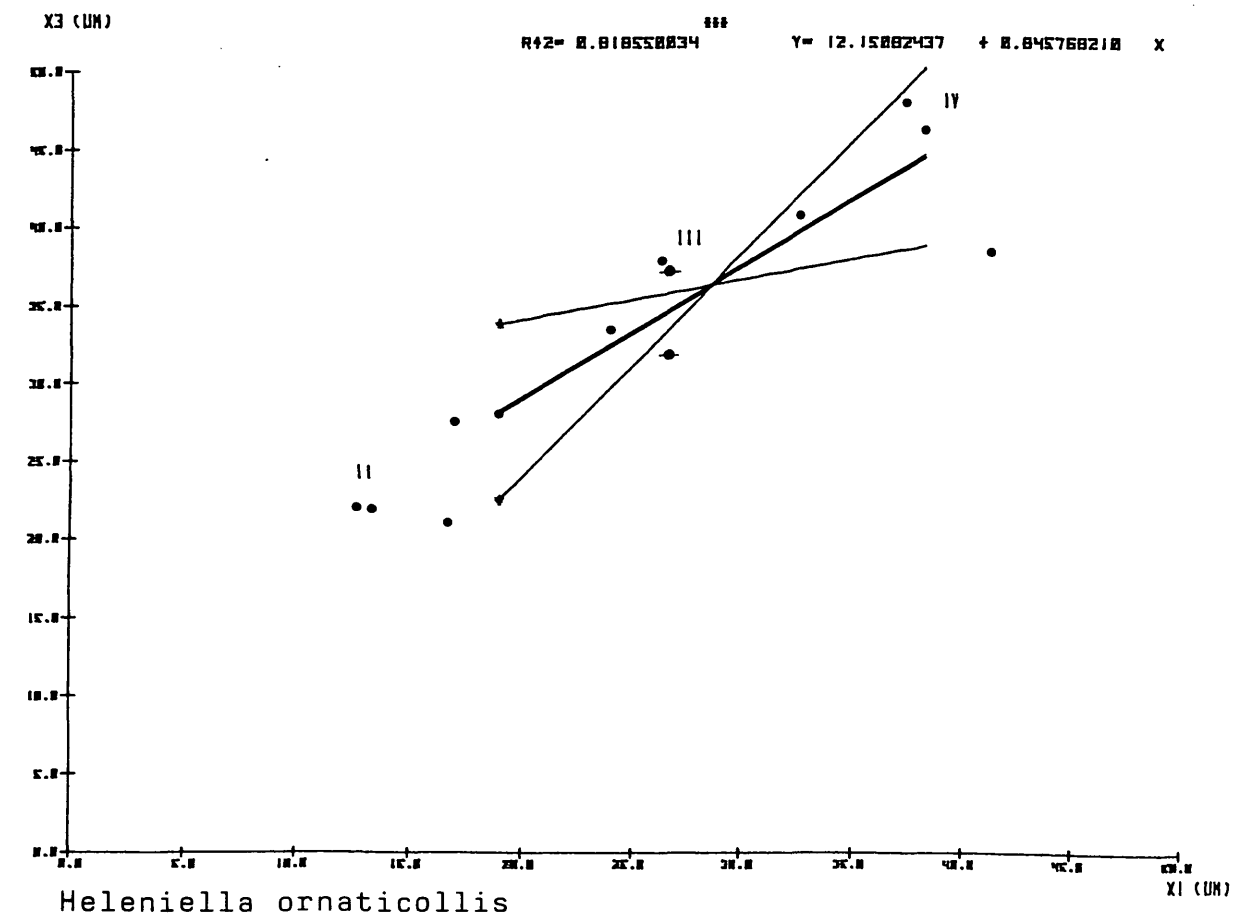


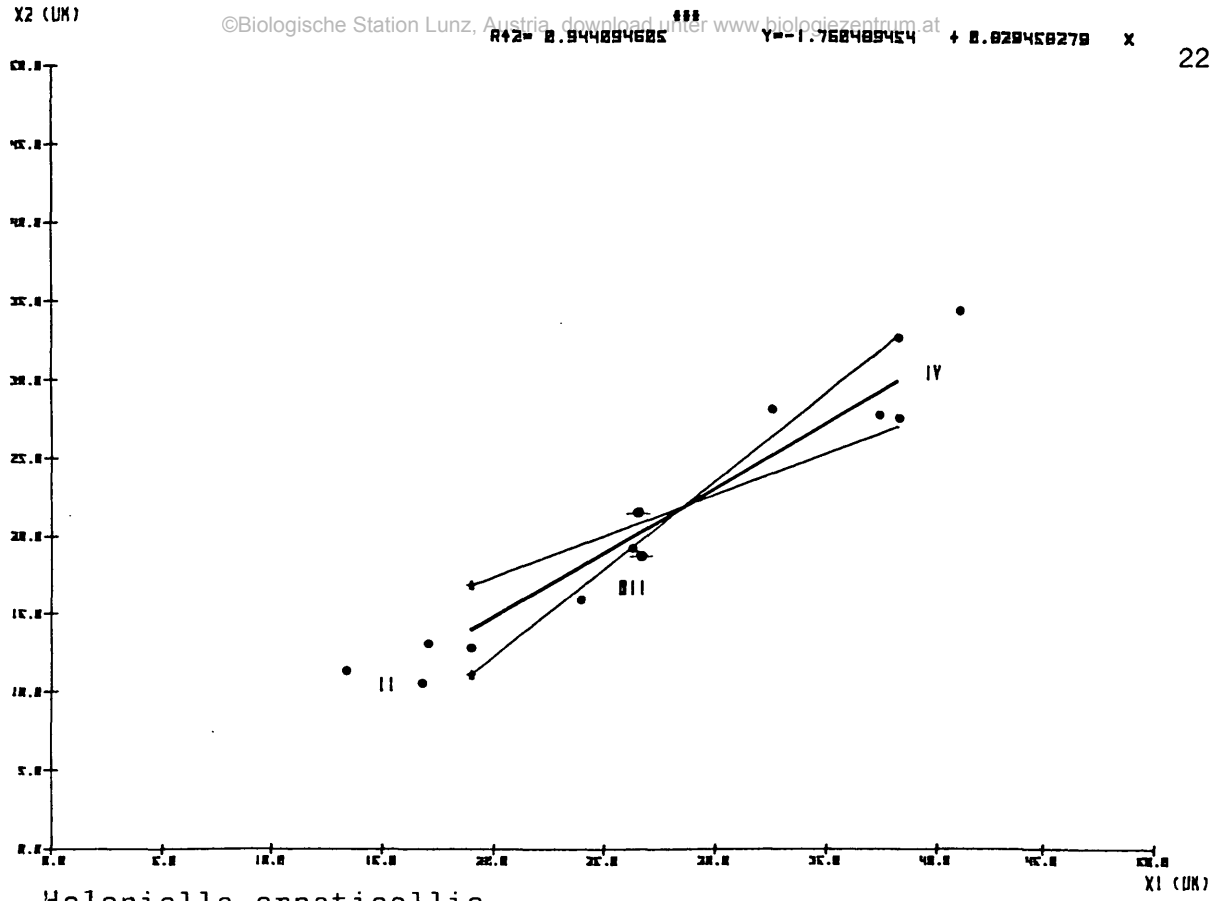
Eukiefferiella minor

g3



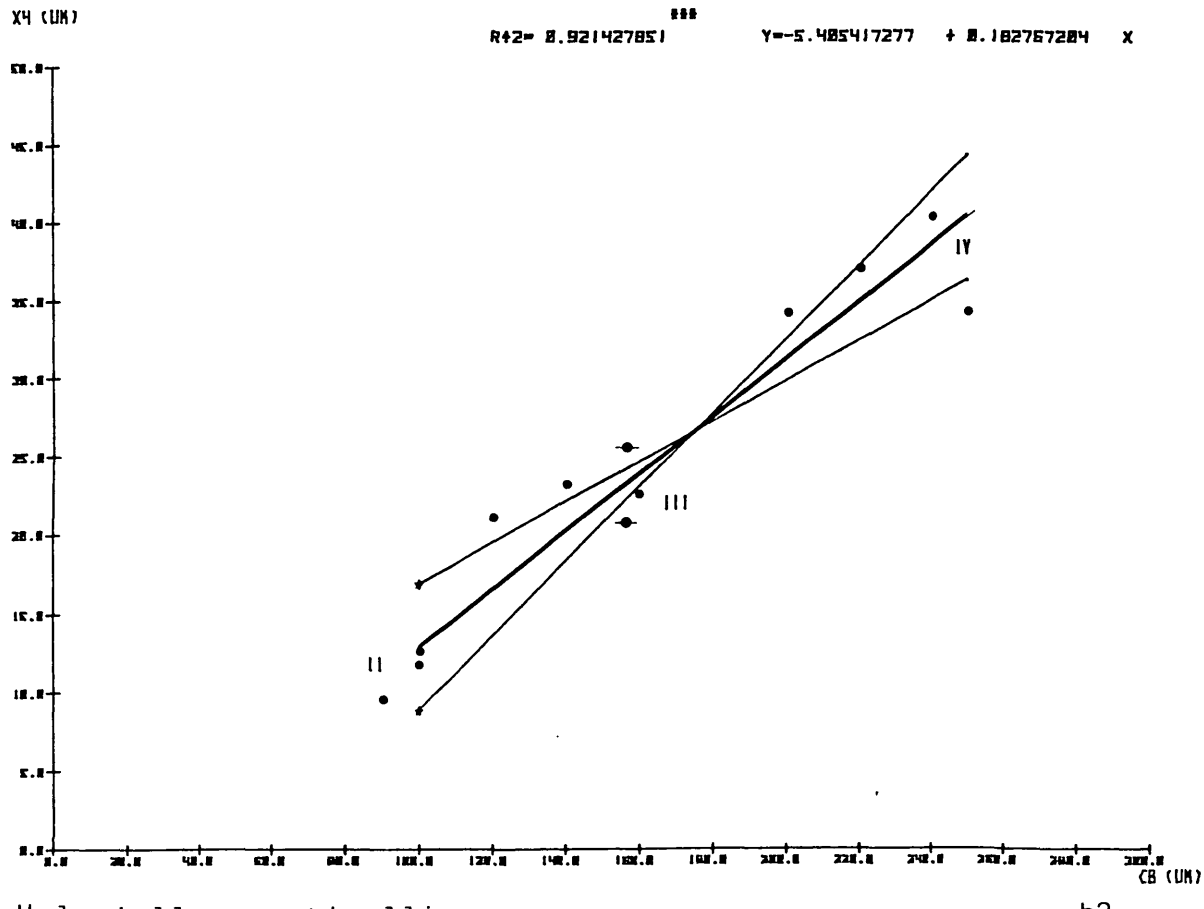
Heleniella ornaticollis

h1



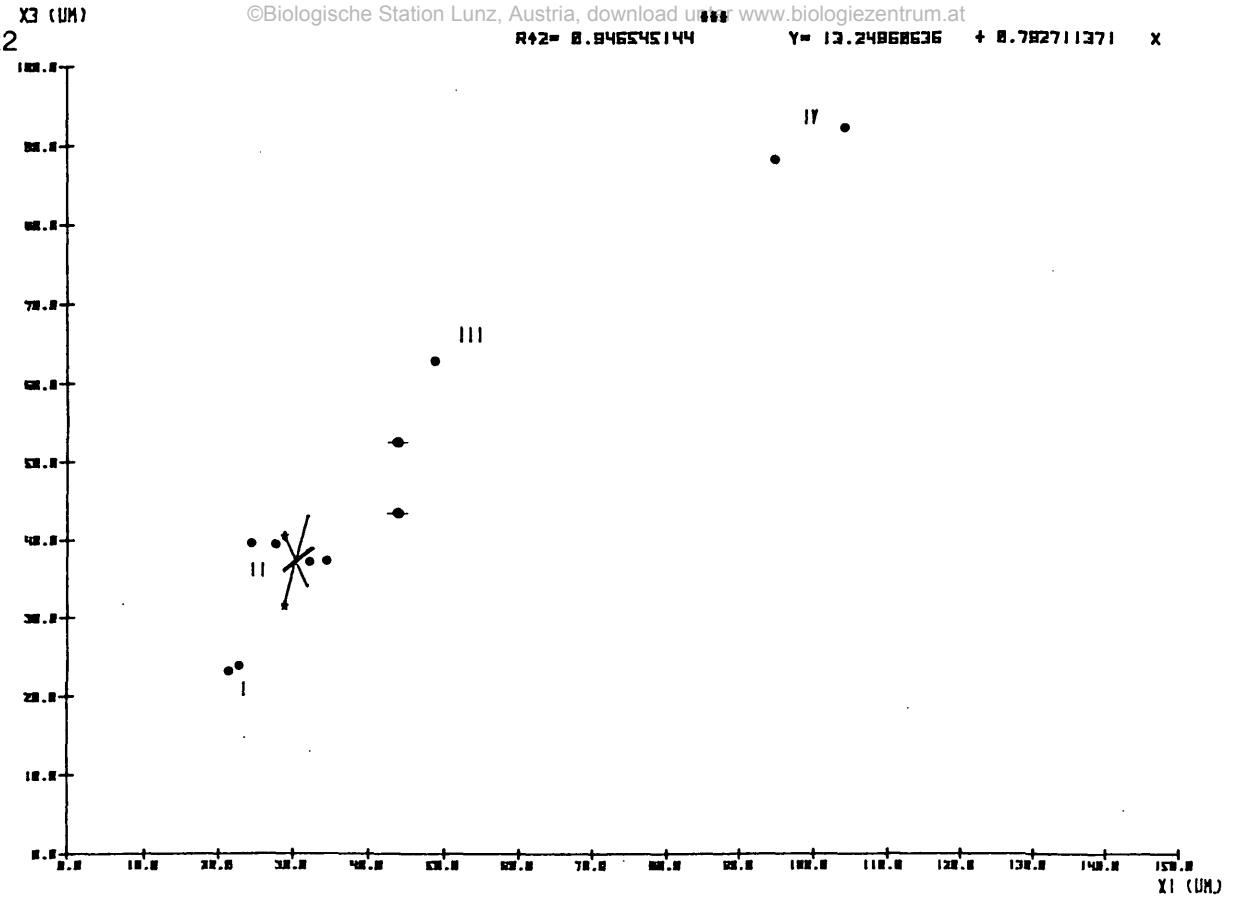
Heleniella ornaticollis

h2

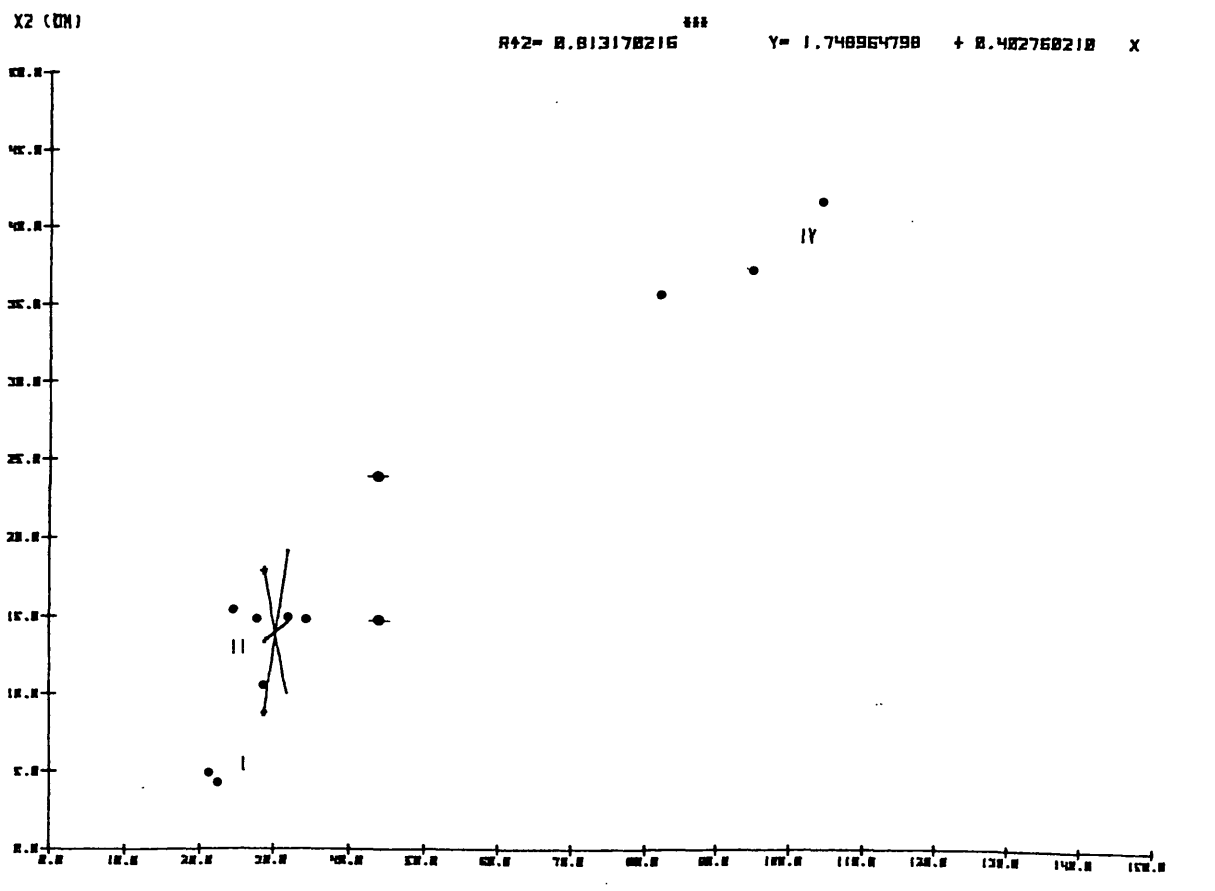


Heleniella ornaticollis

h3



Heterotrissocladius marcidus i1



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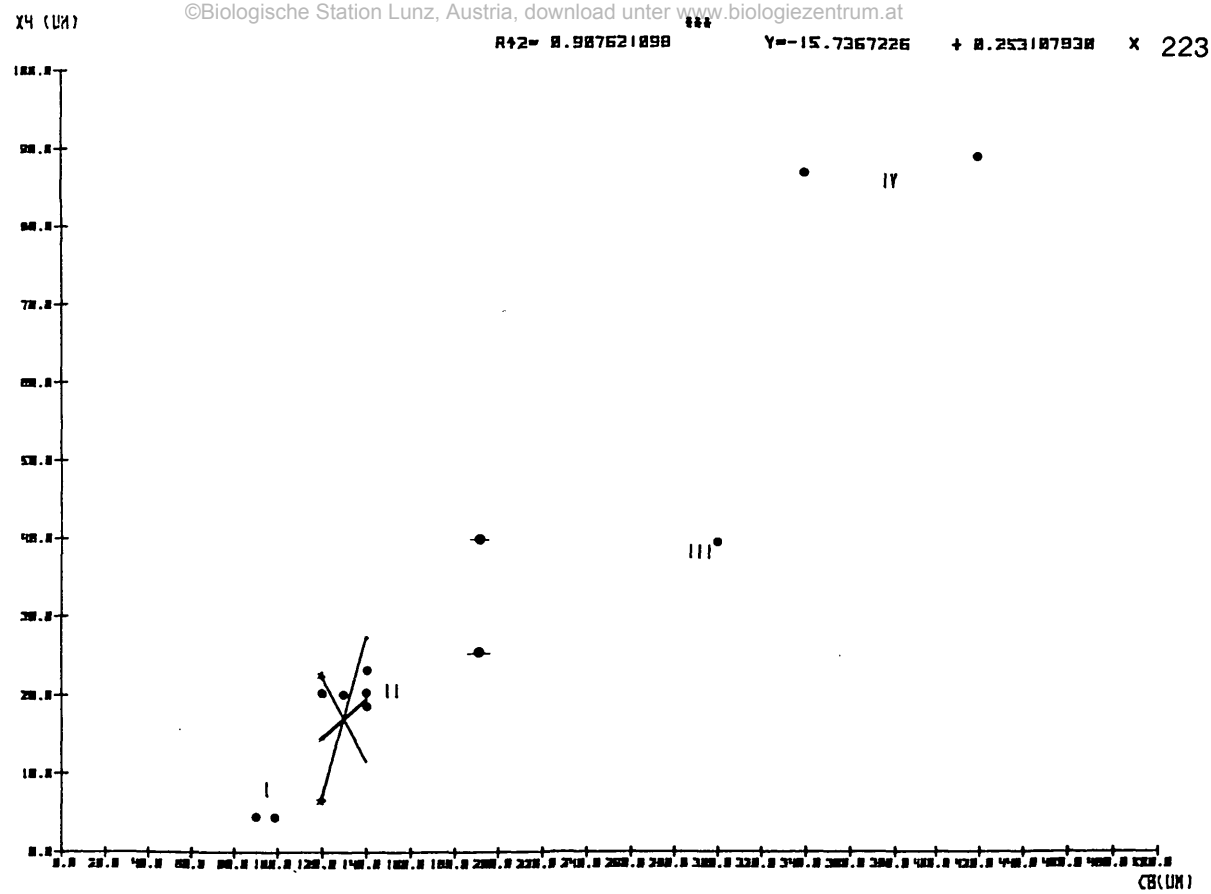
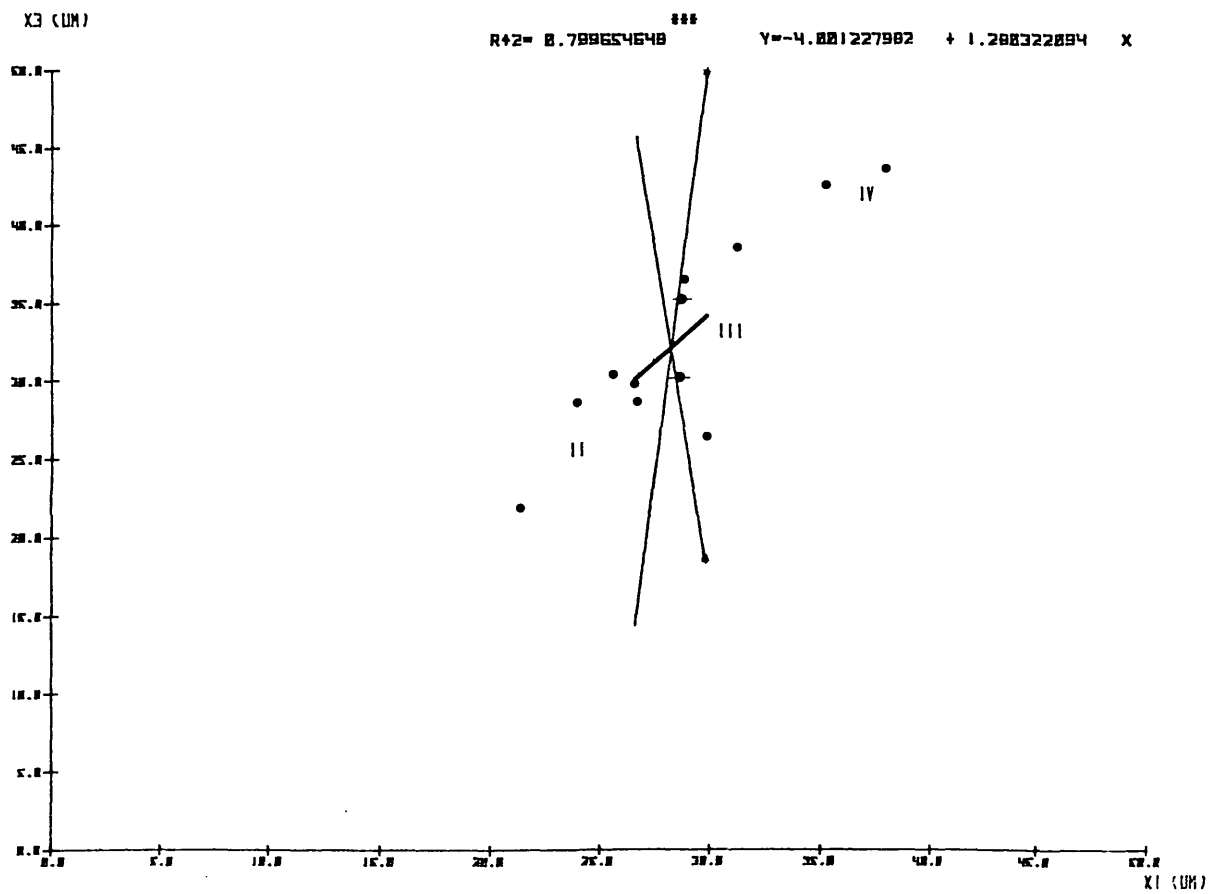


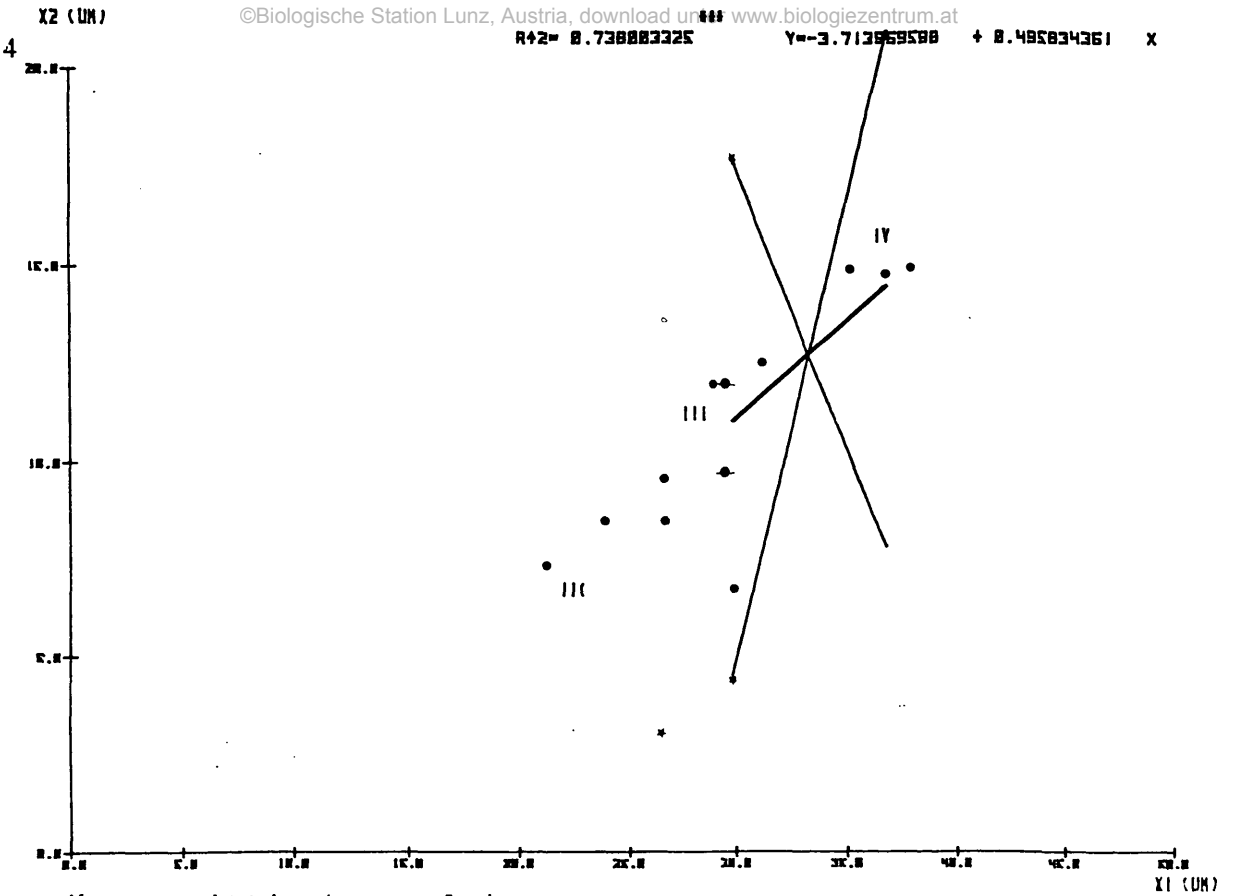
Heterotrissocladius marcidus

i3



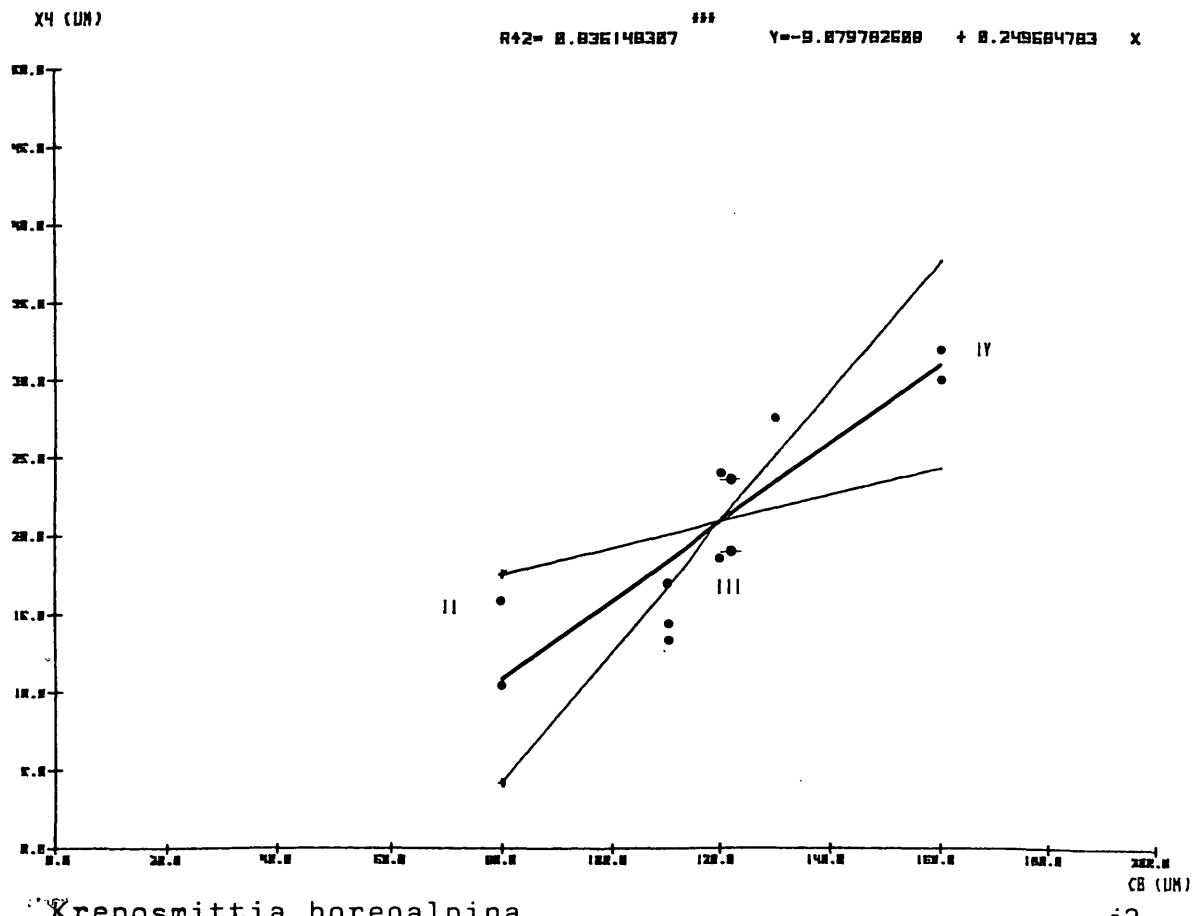
Krenosmittia boreoalpina

j1



Krenosmittia boreoalpina

j2



Krenosmittia boreoalpina

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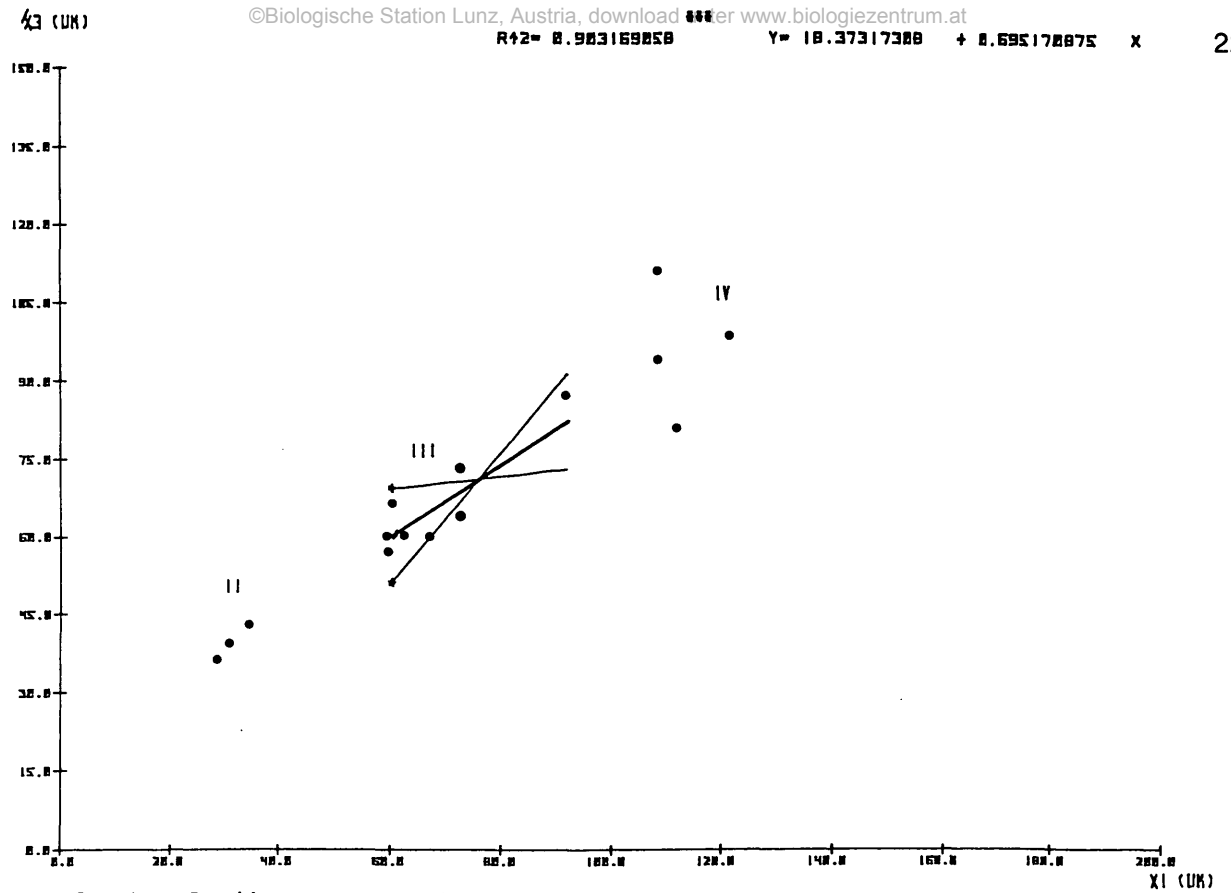
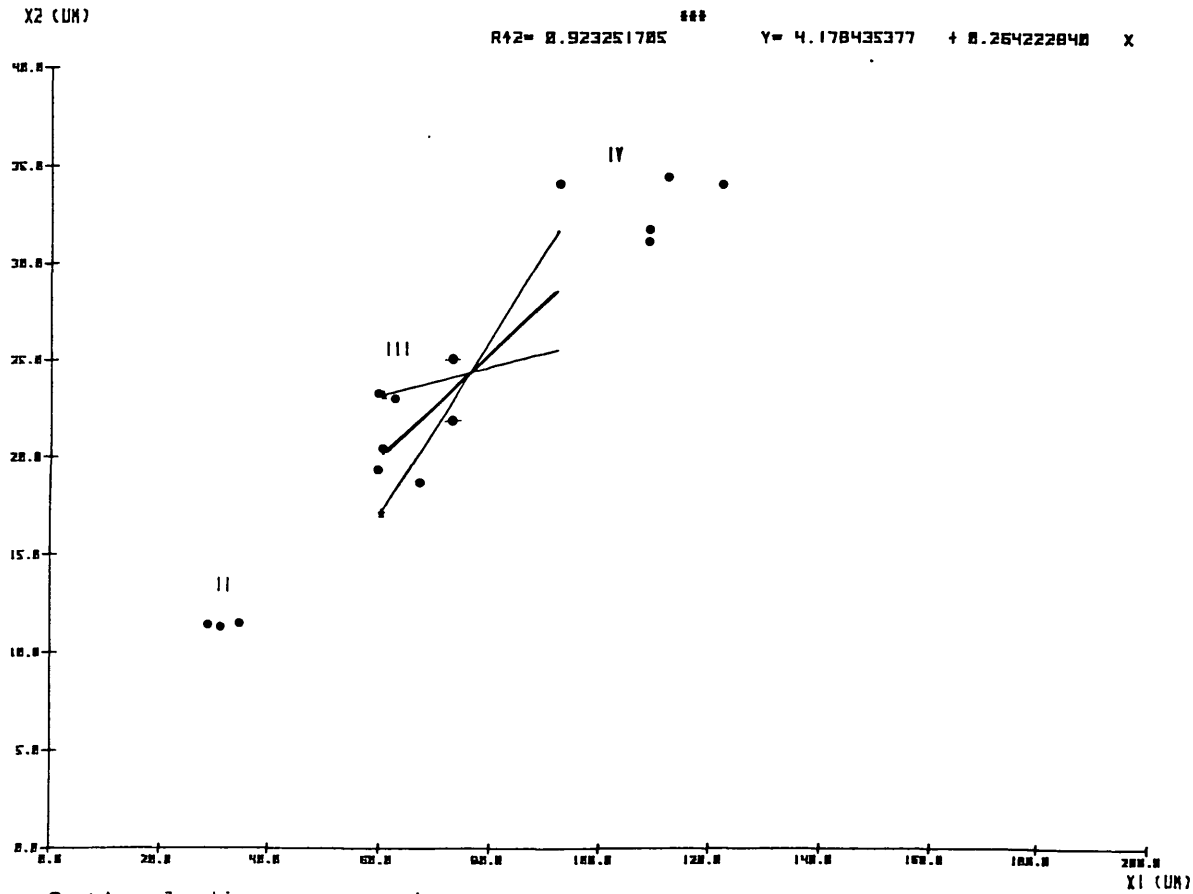


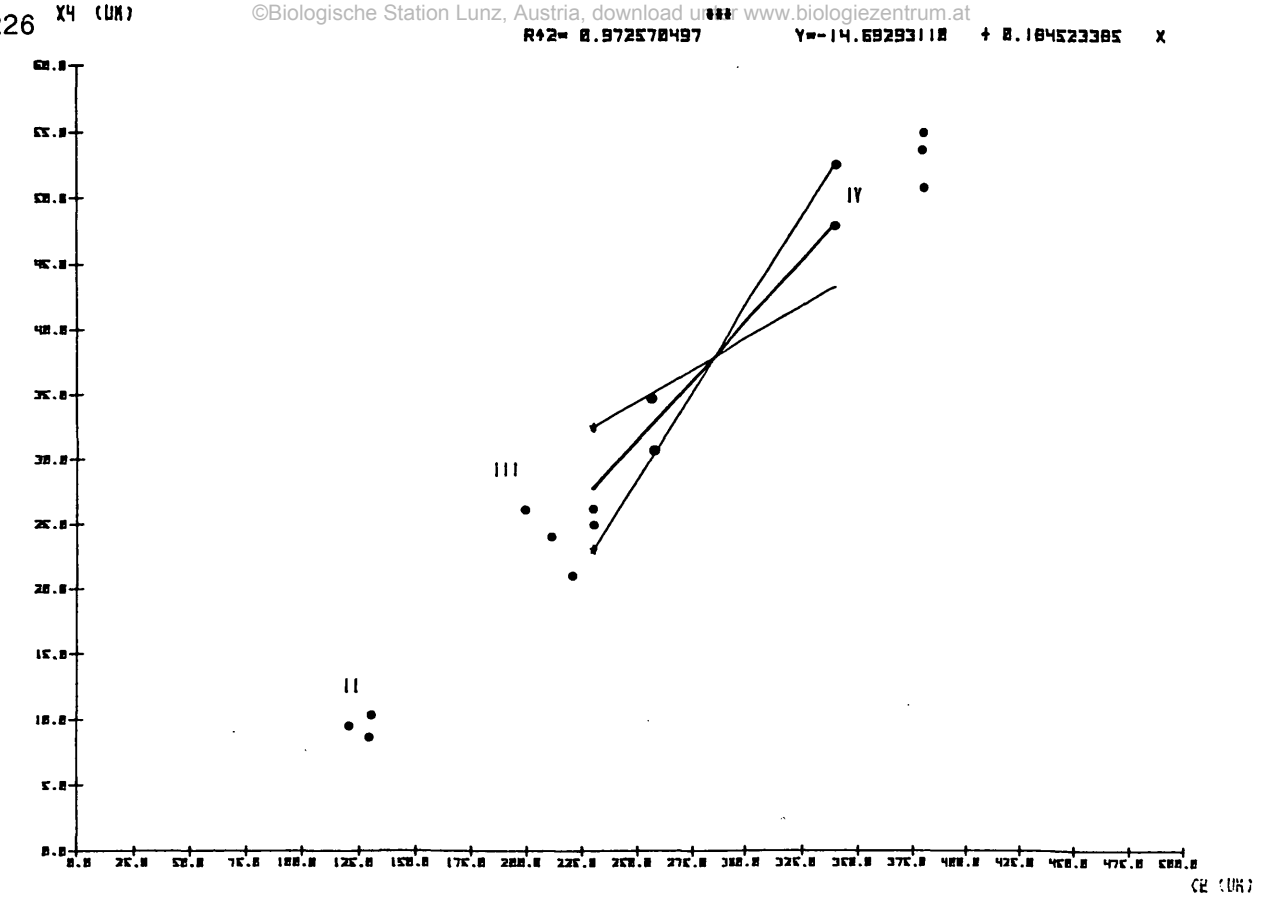
Orthocladius excavatus

k1



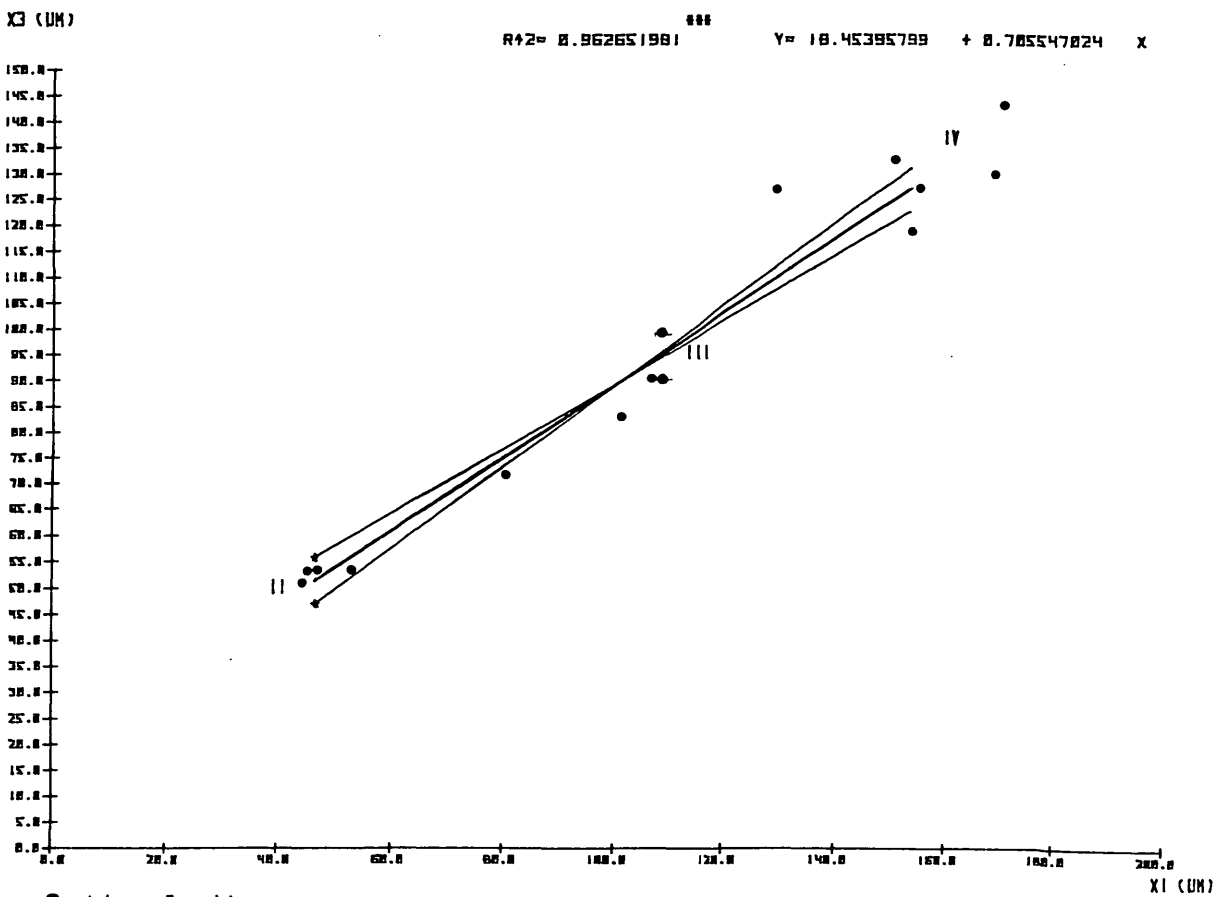
Orthocladius excavatus

k2



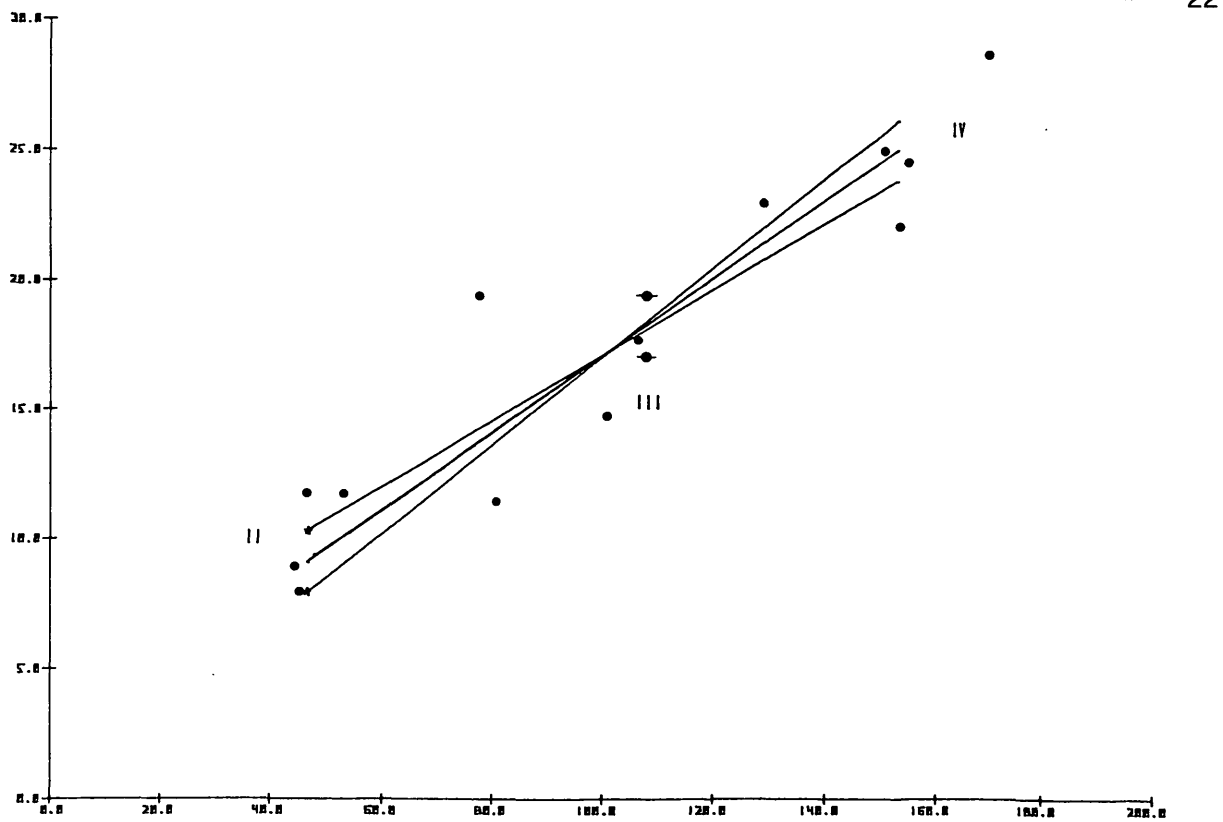
Orthocladius excavatus

k3



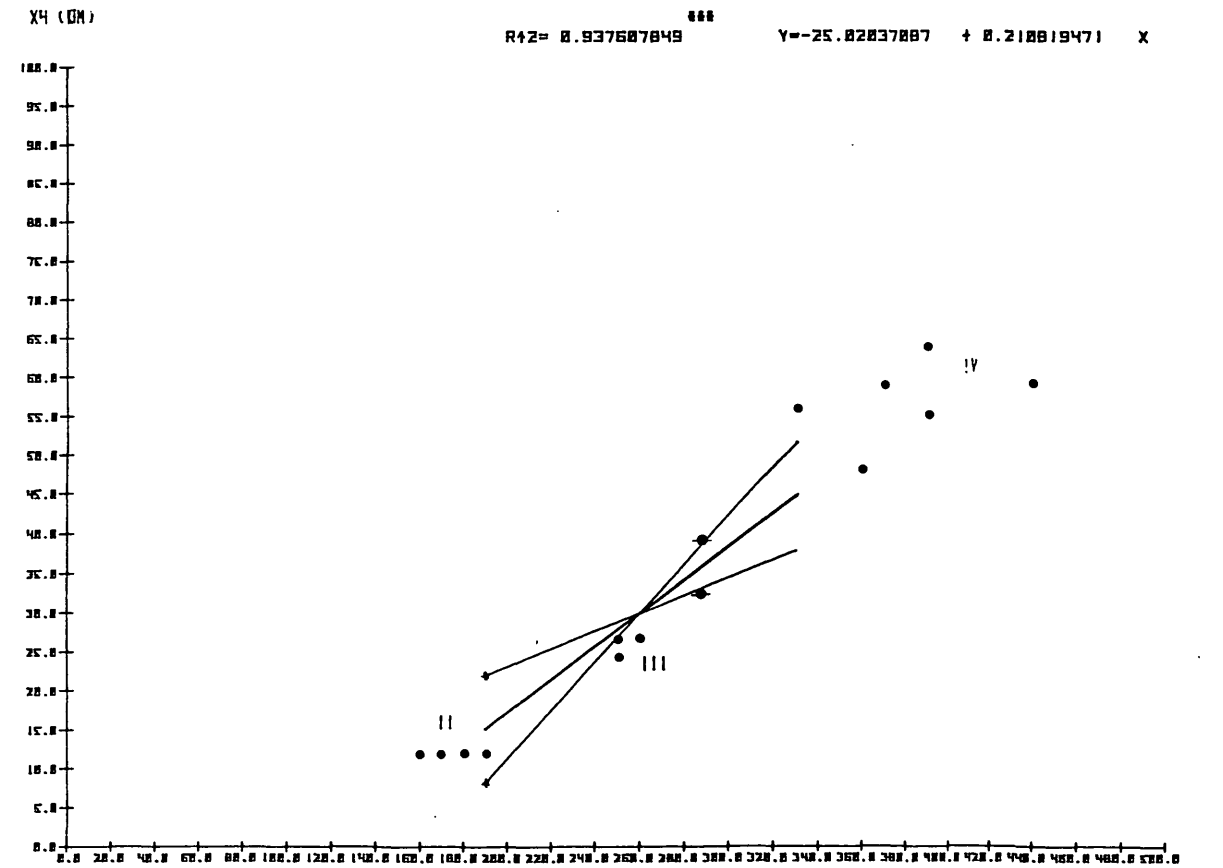
Orthocladius frigidus

l1



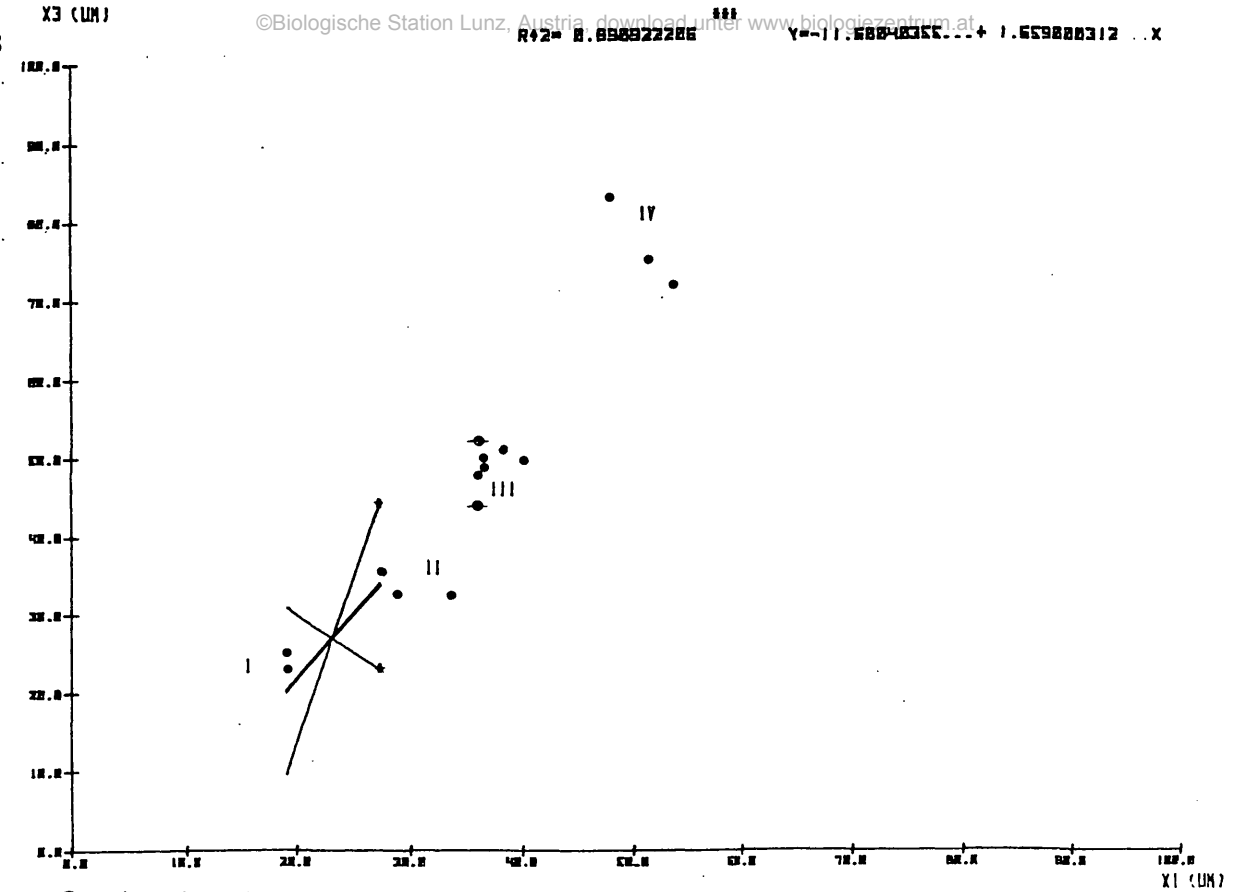
Orthocladius frigidus

12



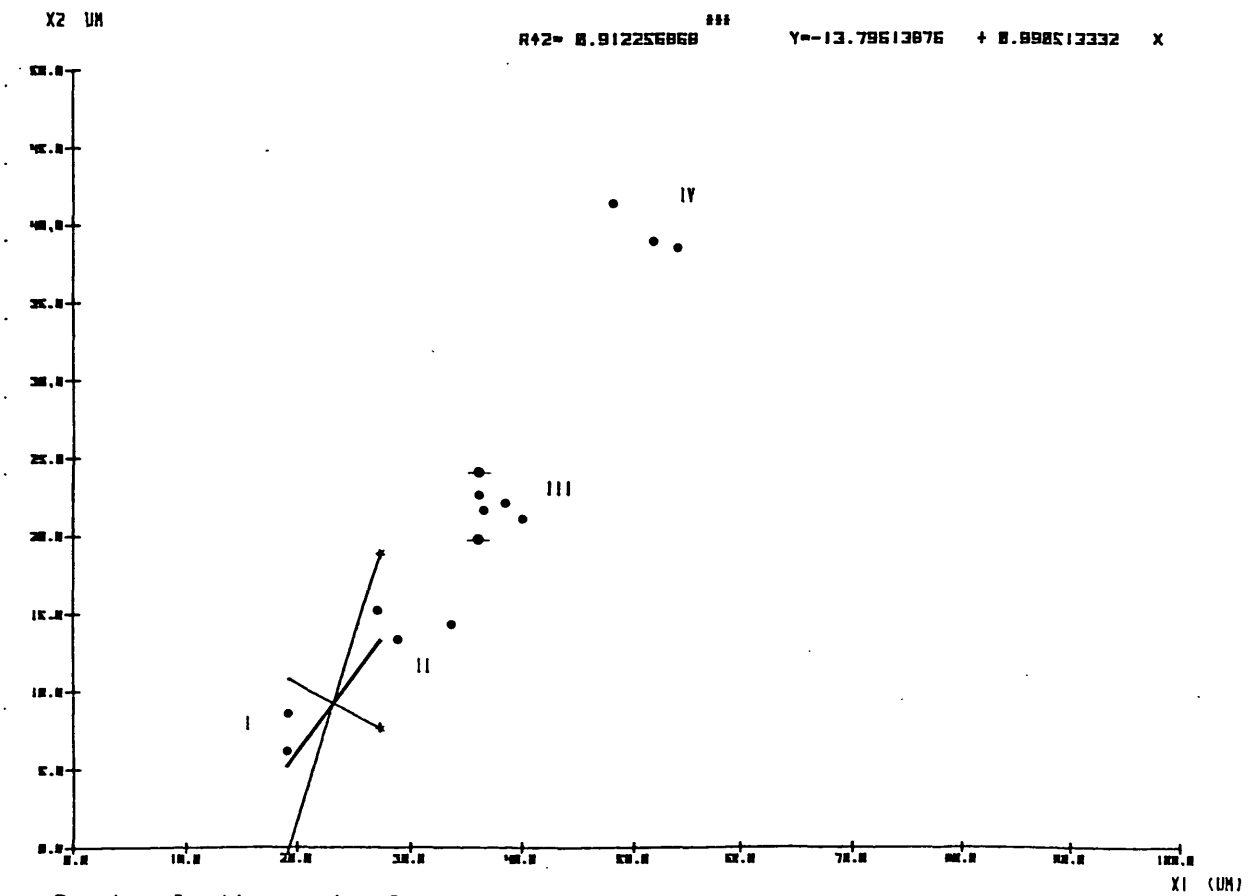
Orthocladius frigidus

13



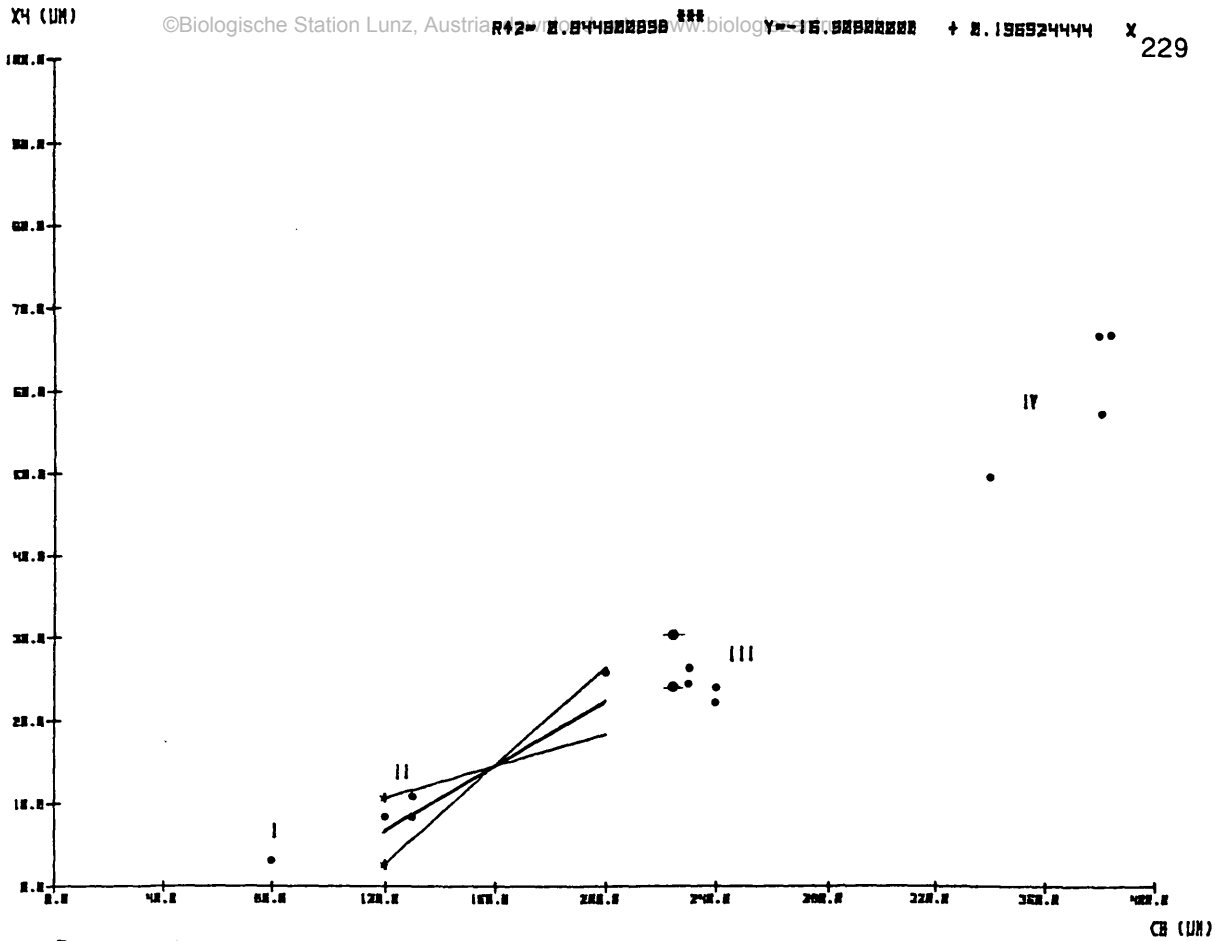
Orthocladius rivulorum

m1

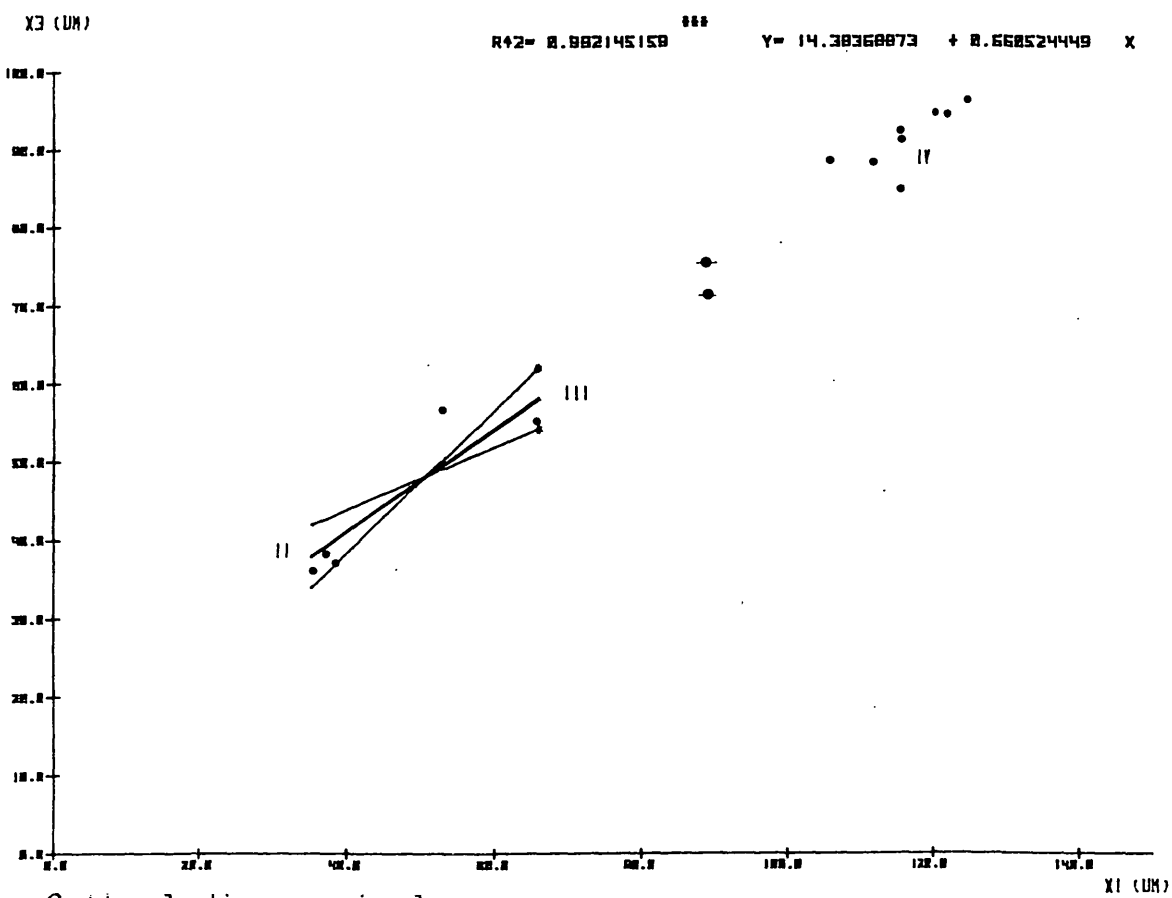


Orthocladius rivulorum

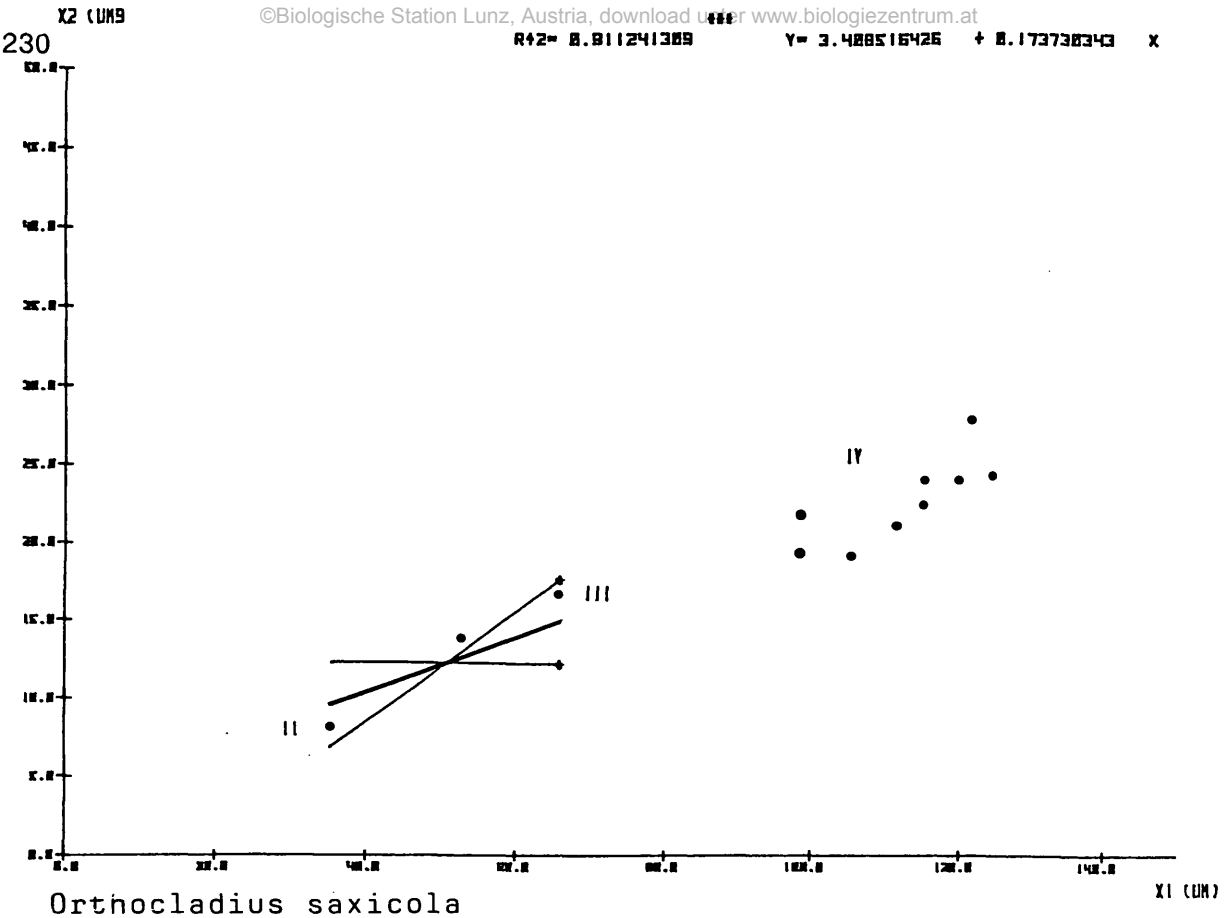
m2



Orthocladius rivulorum m3

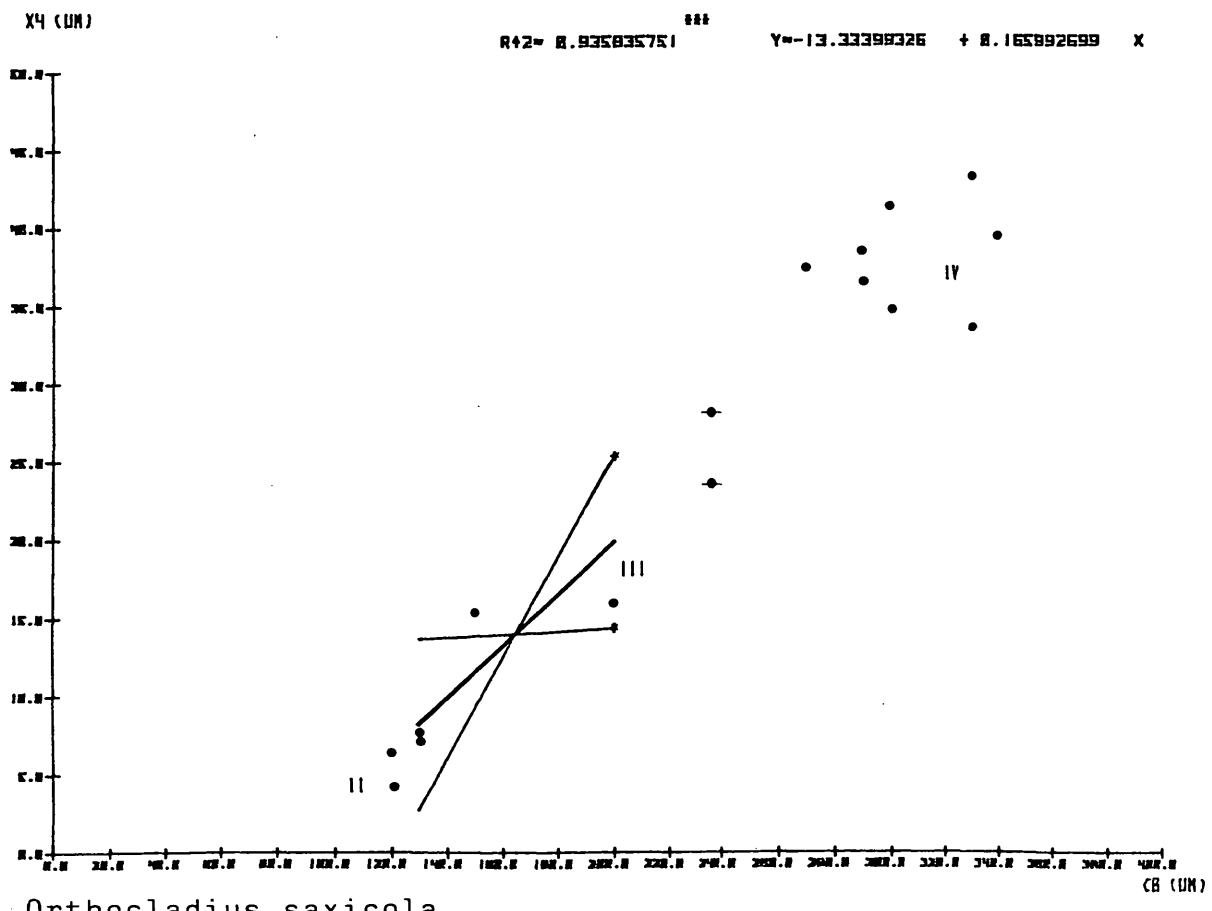


Orthocladius saxicola n1



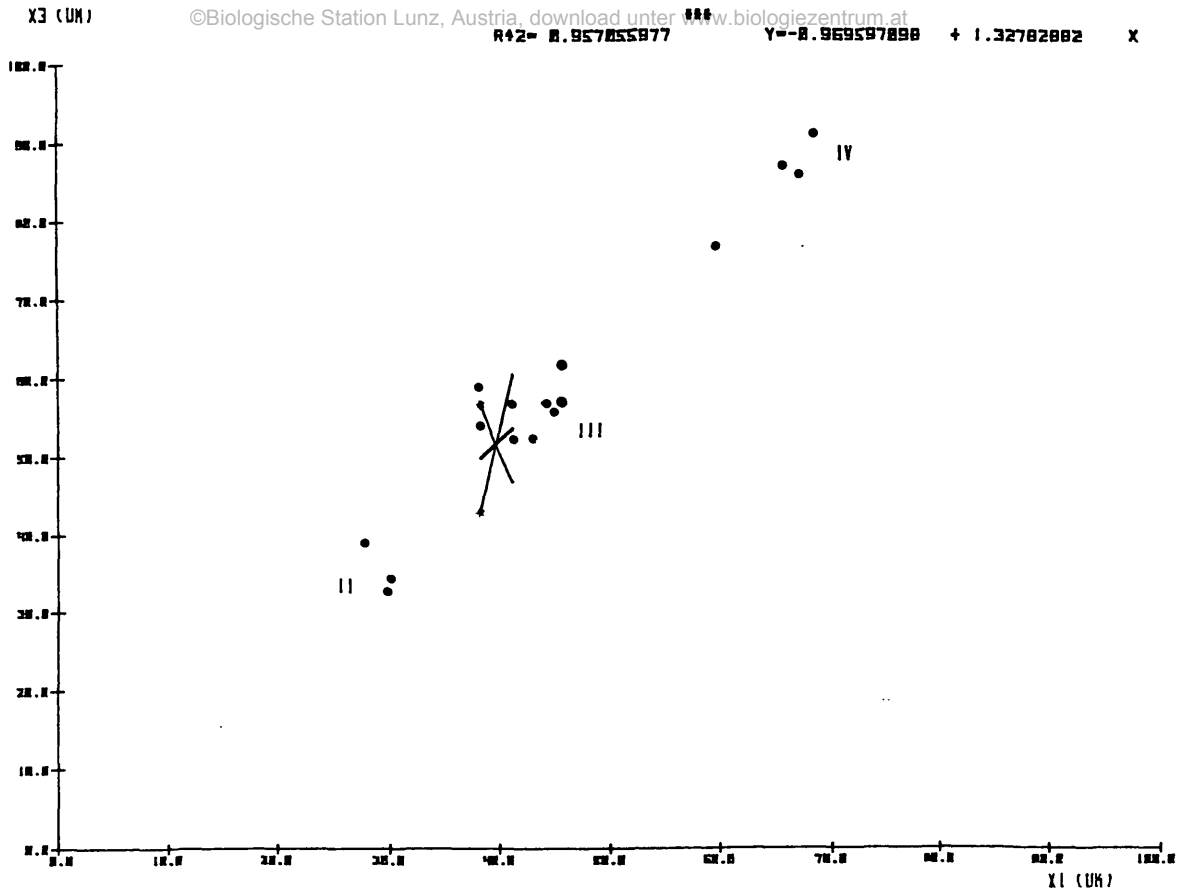
Orthocladius saxicola

n2



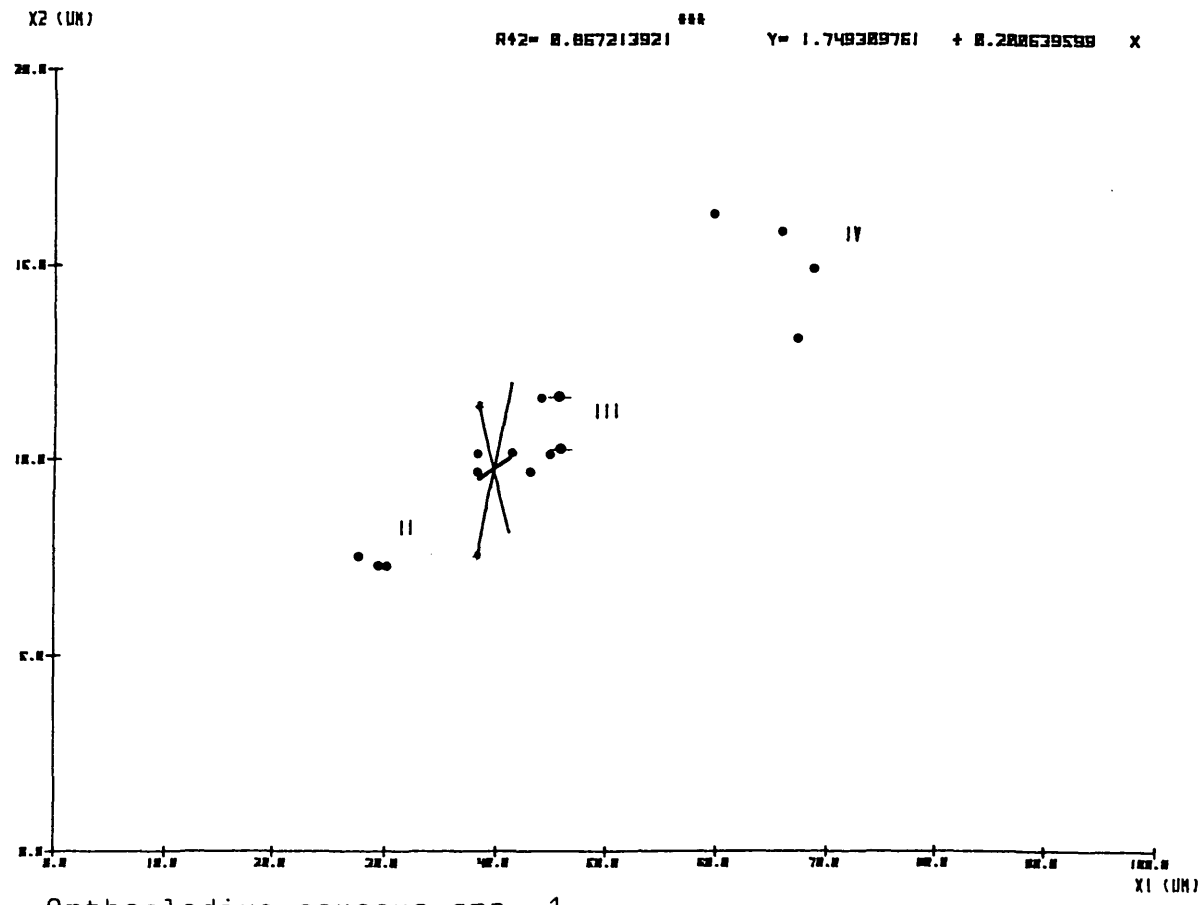
Orthocladius saxicola

n3



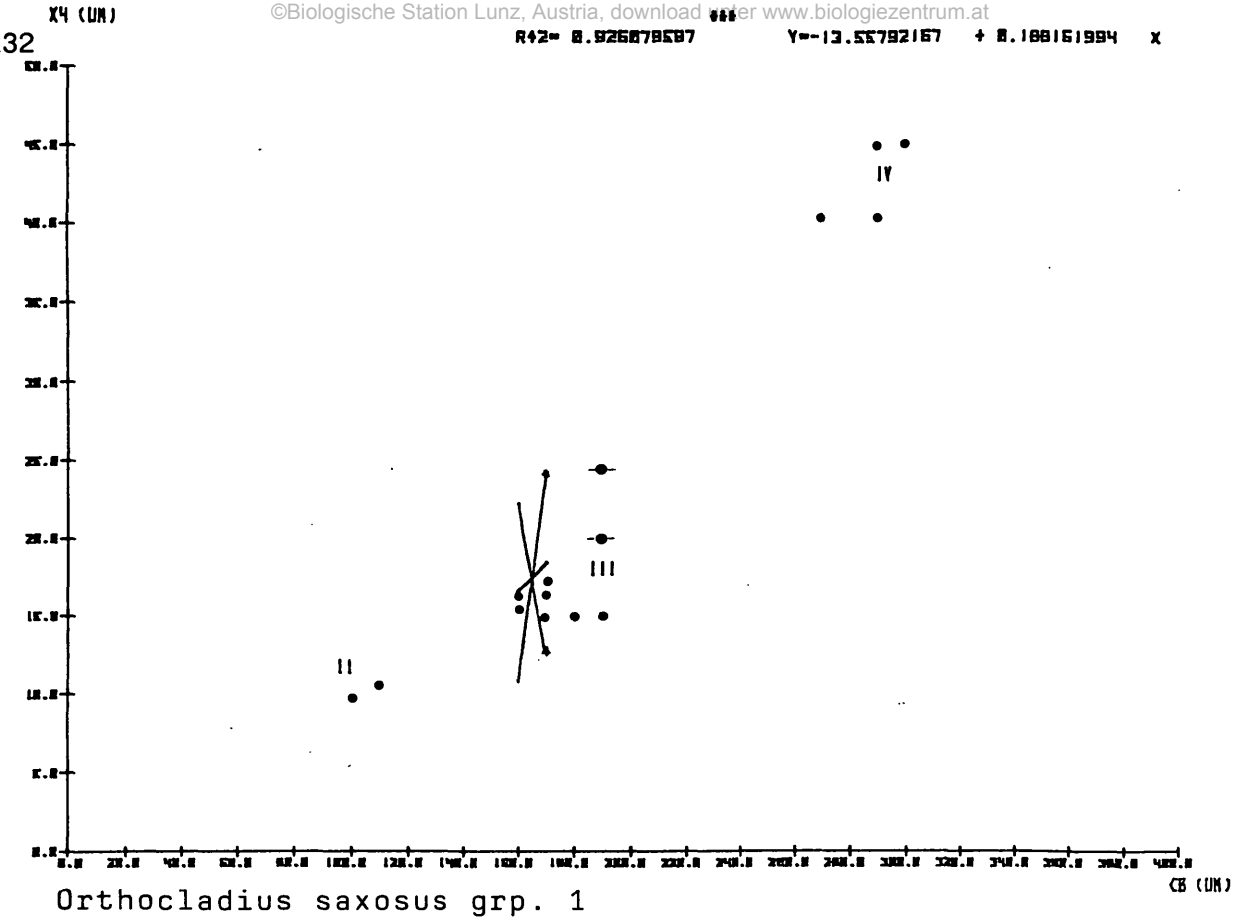
Orthocladius saxosus grp. 1

o1



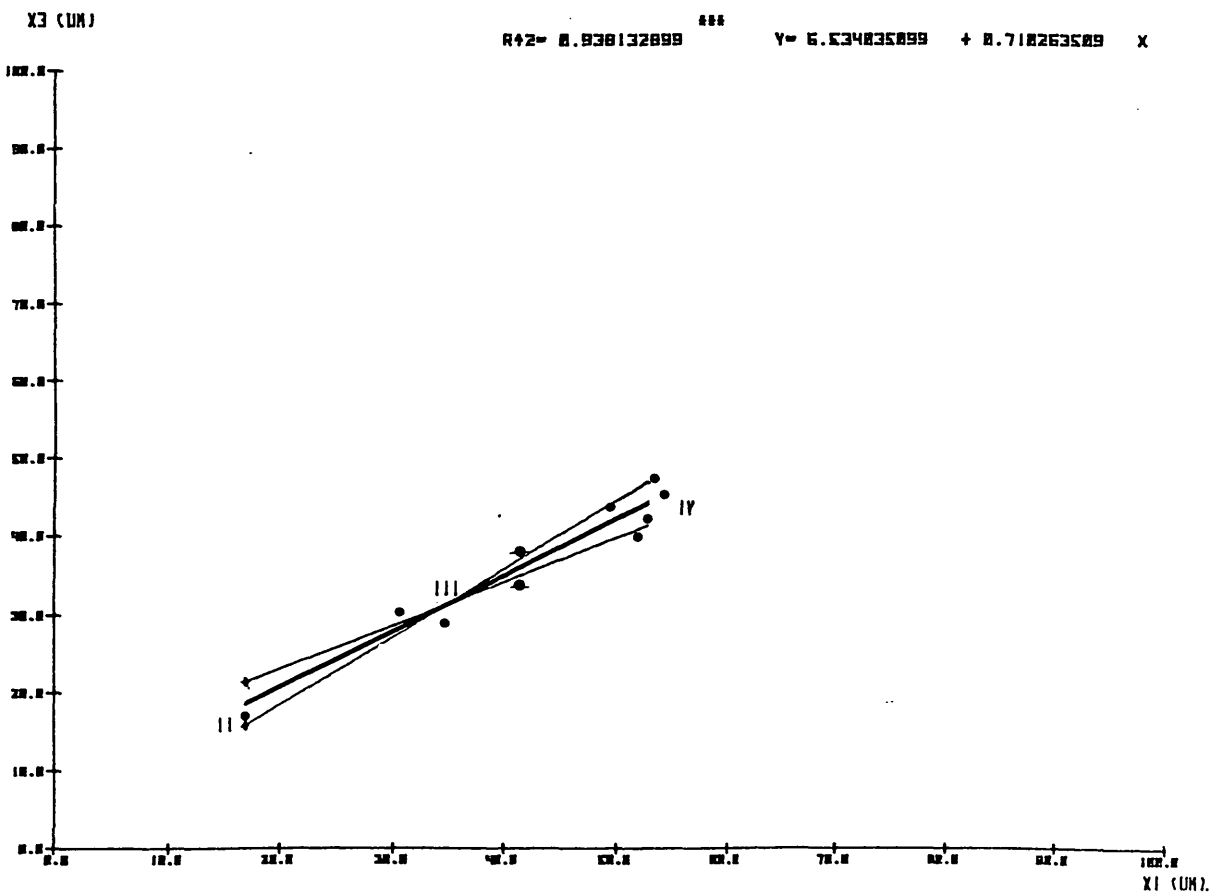
Orthocladius saxosus grp. 1

o2



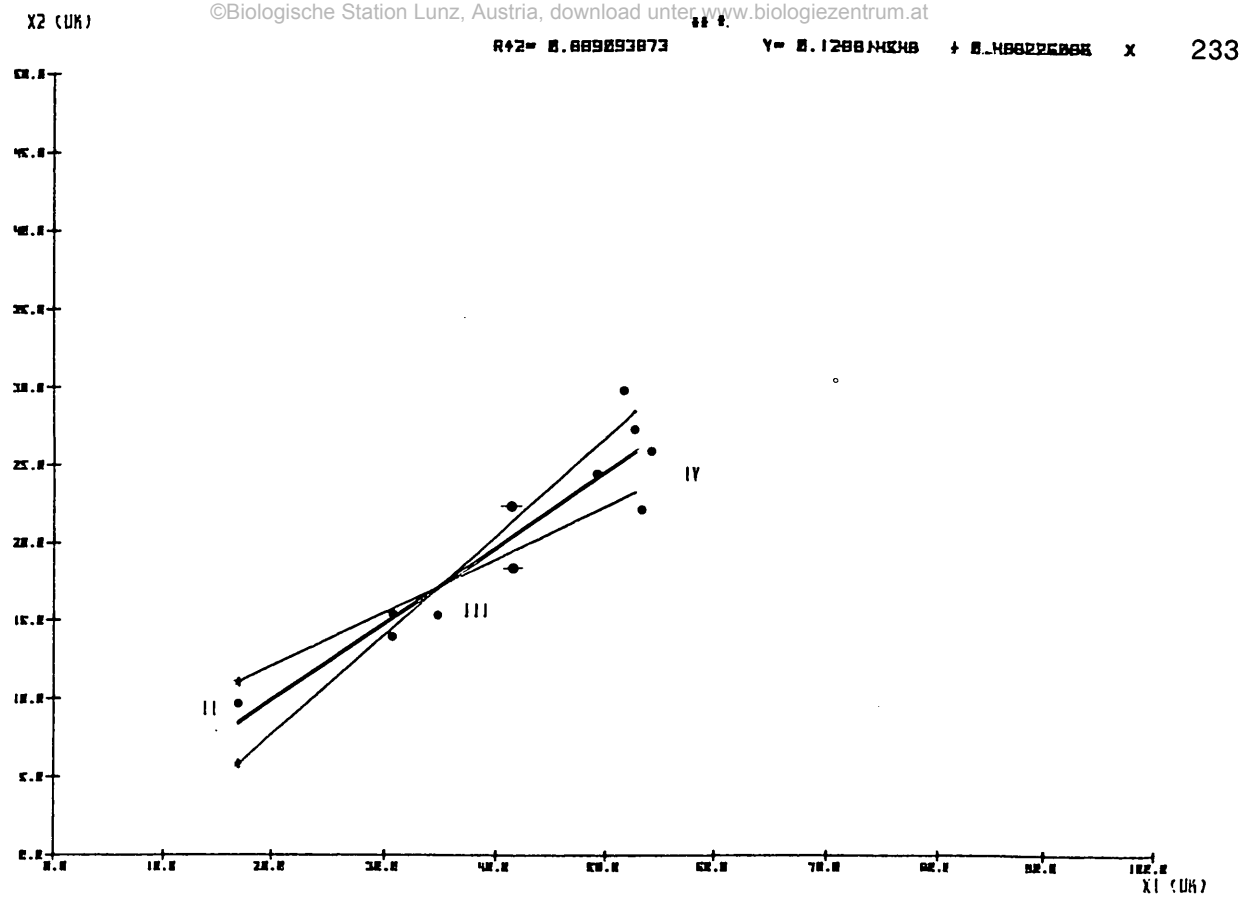
Orthocladius saxosus grp. 1

o3



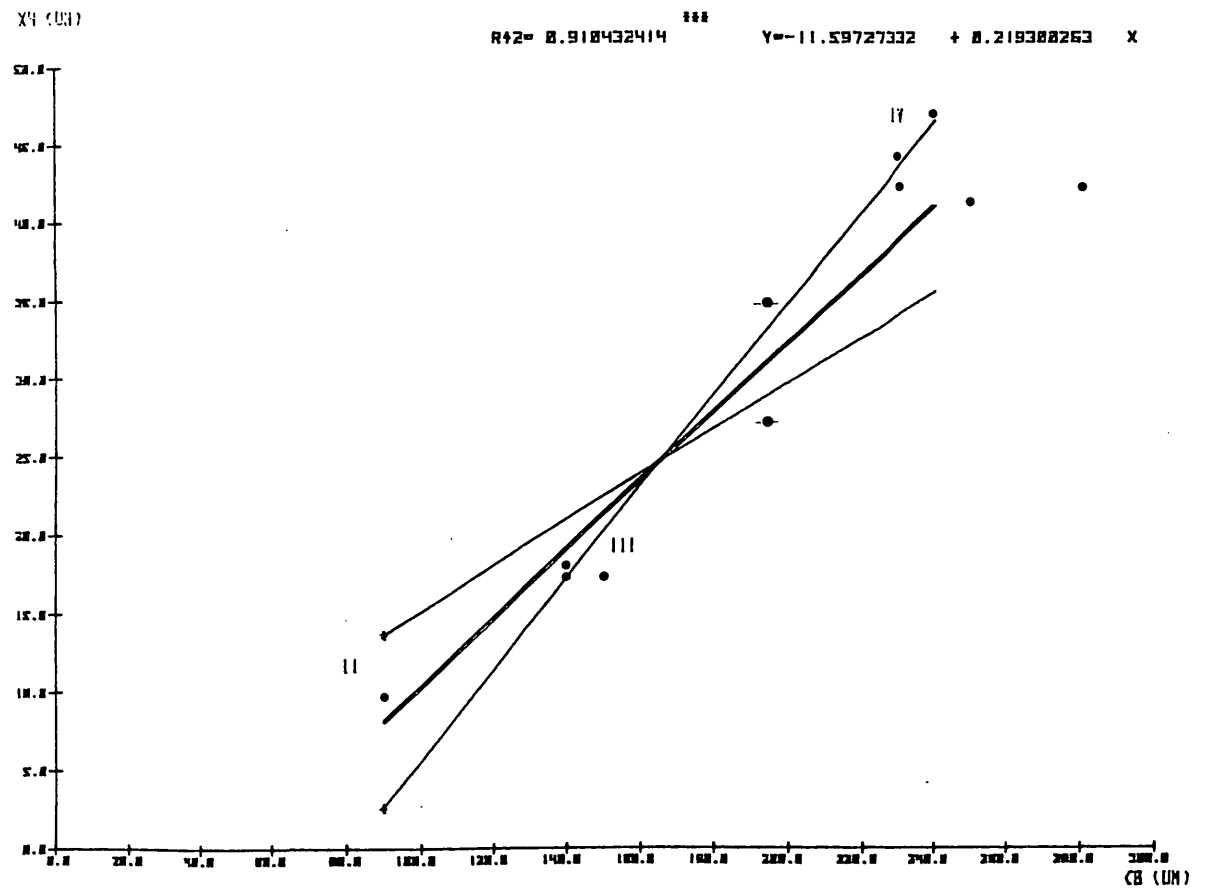
Parametriocnemus borealpinus

p1



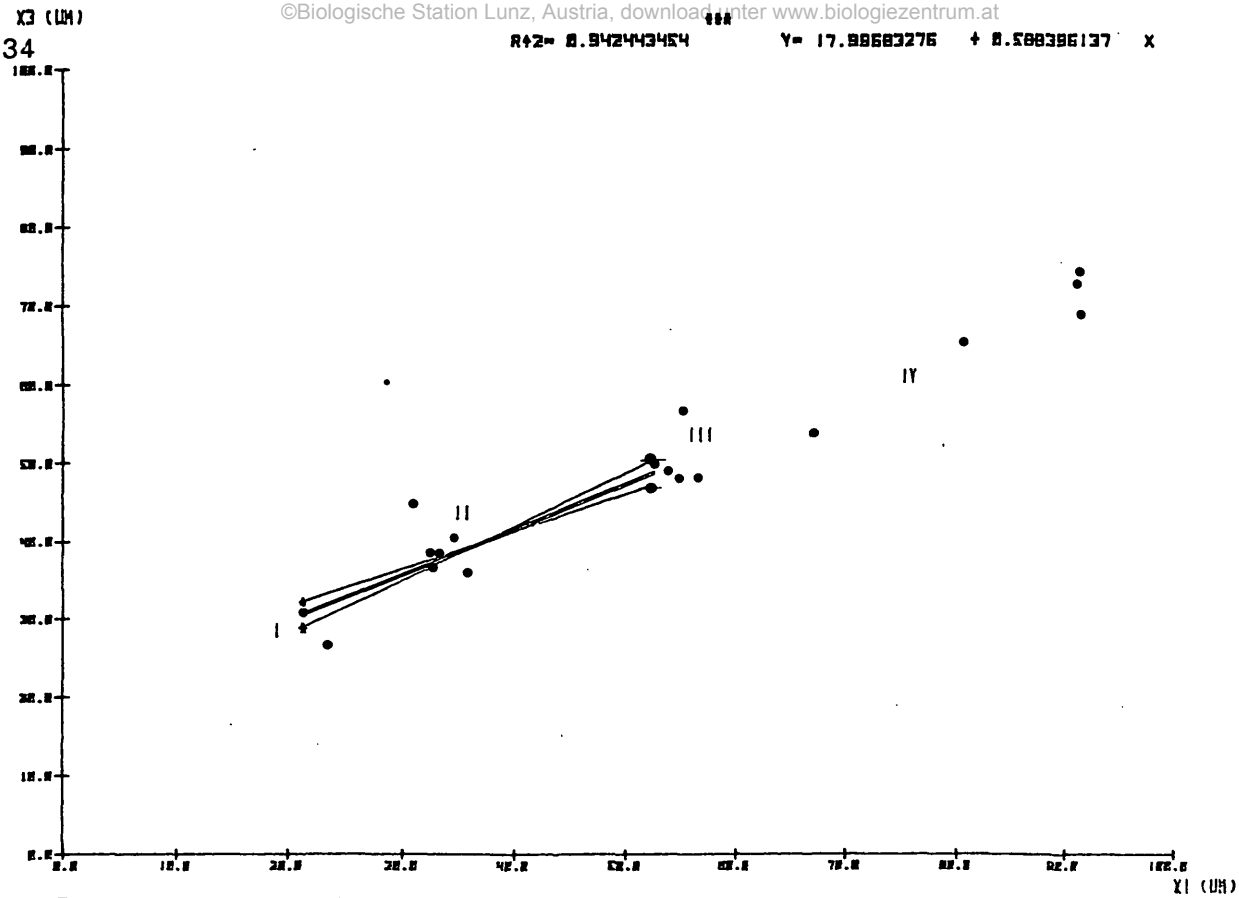
Parametriocnemus borealpinus

p2



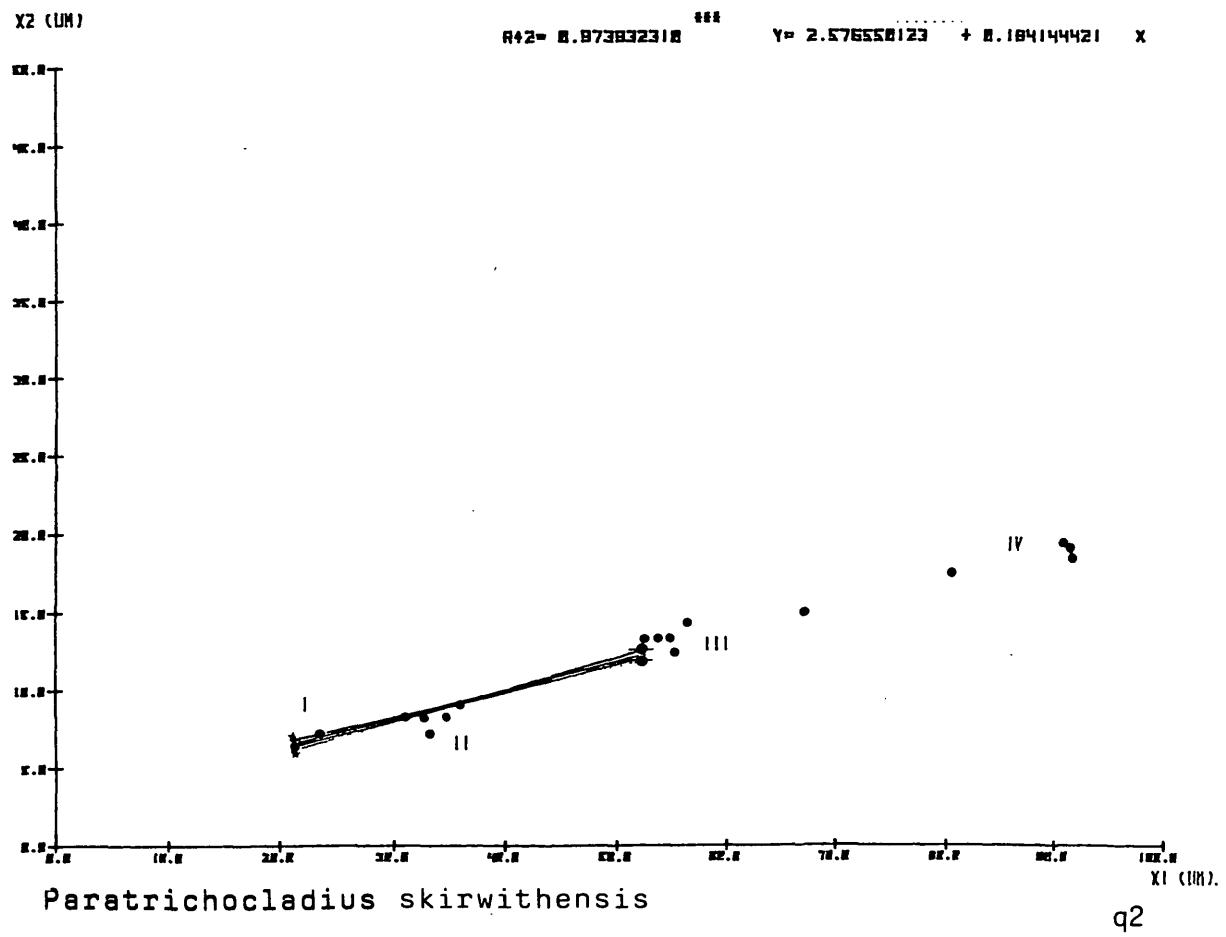
Parametriocnemus borealpinus

p3



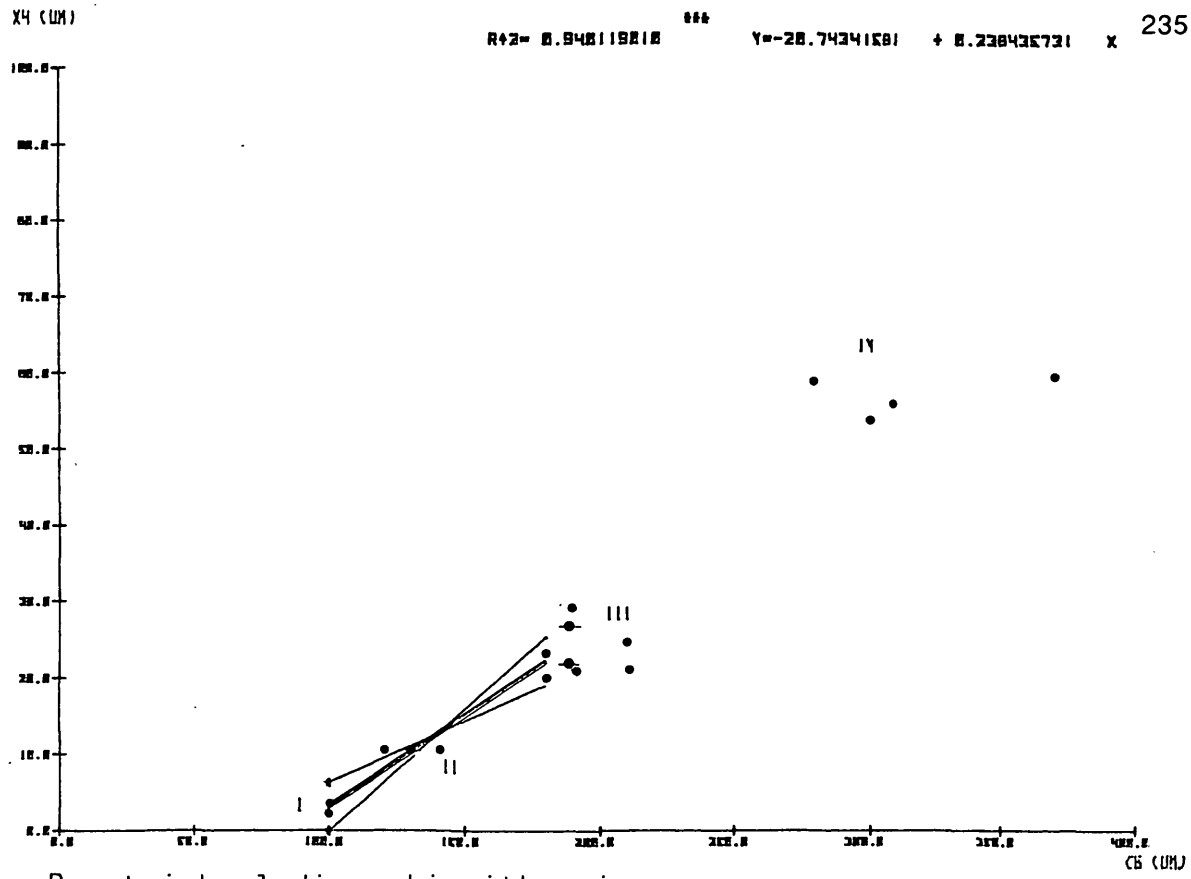
Paratrichocladius skirwithensis

q1



Paratrichocladius skirwithensis

q2



Paratrichocladius skirwithensis

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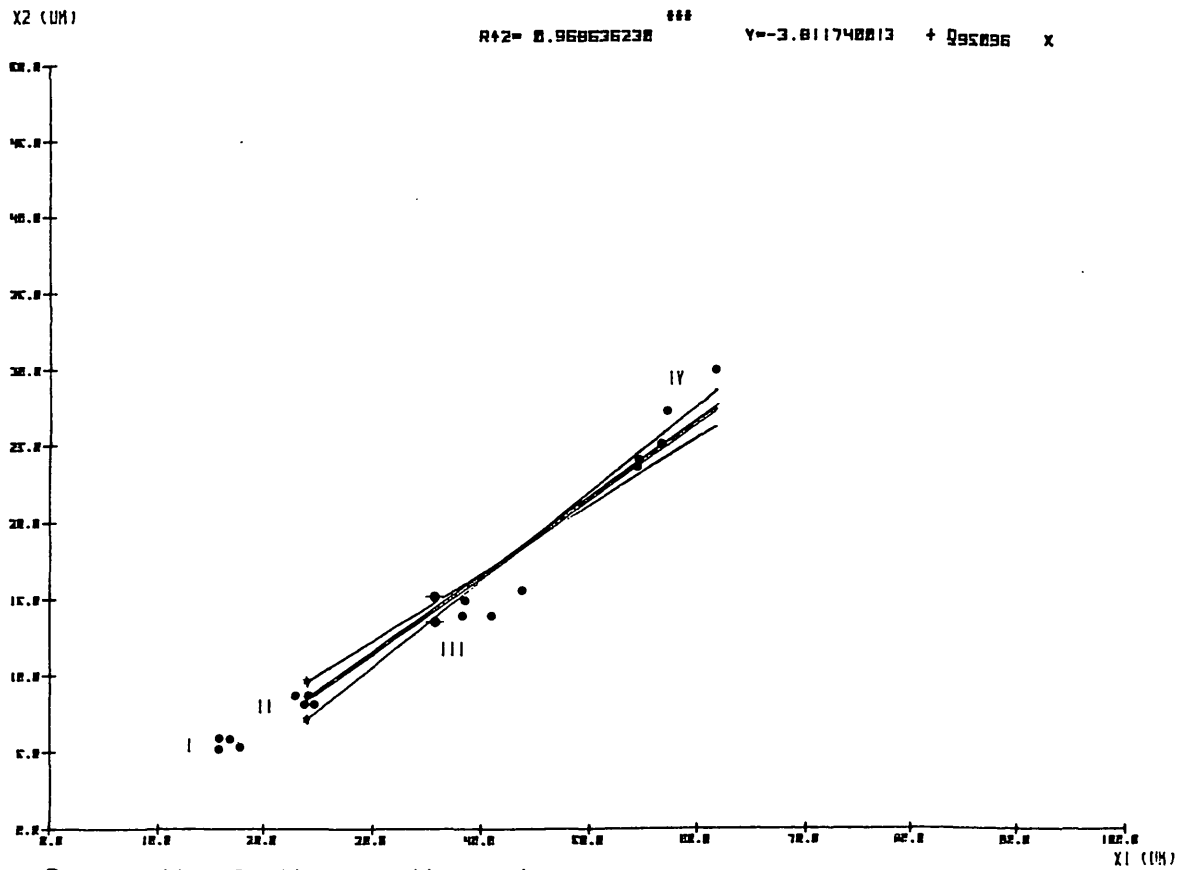
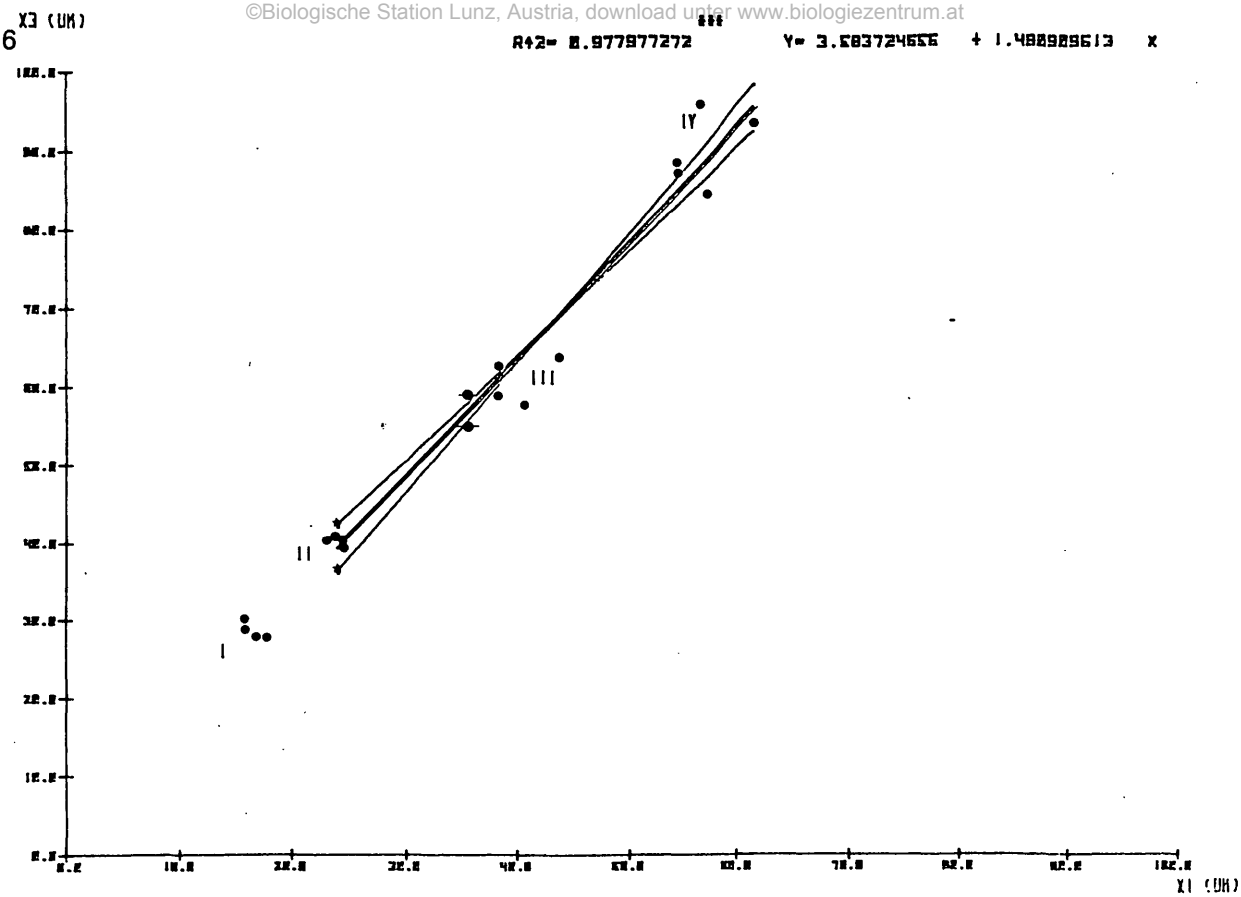


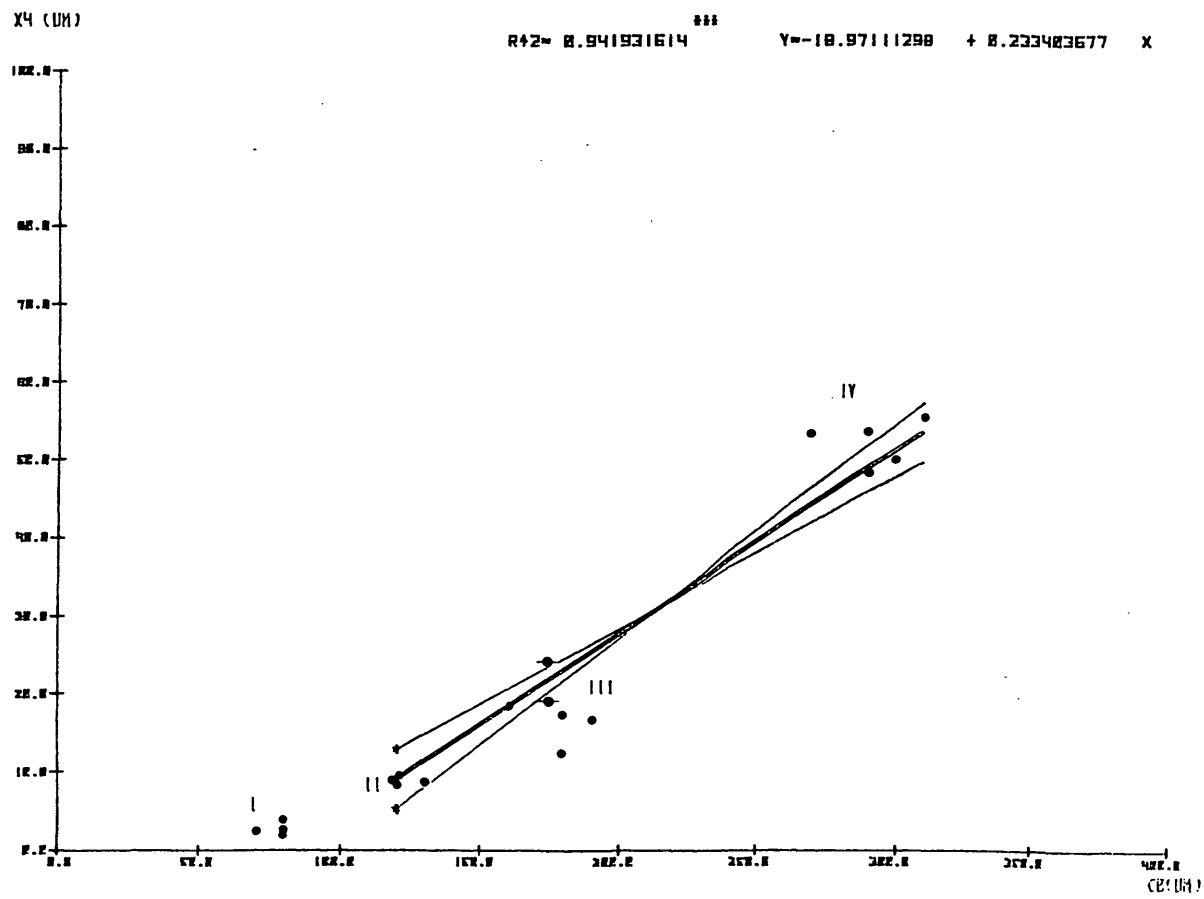
Paraorthocladius nudipennis

r1



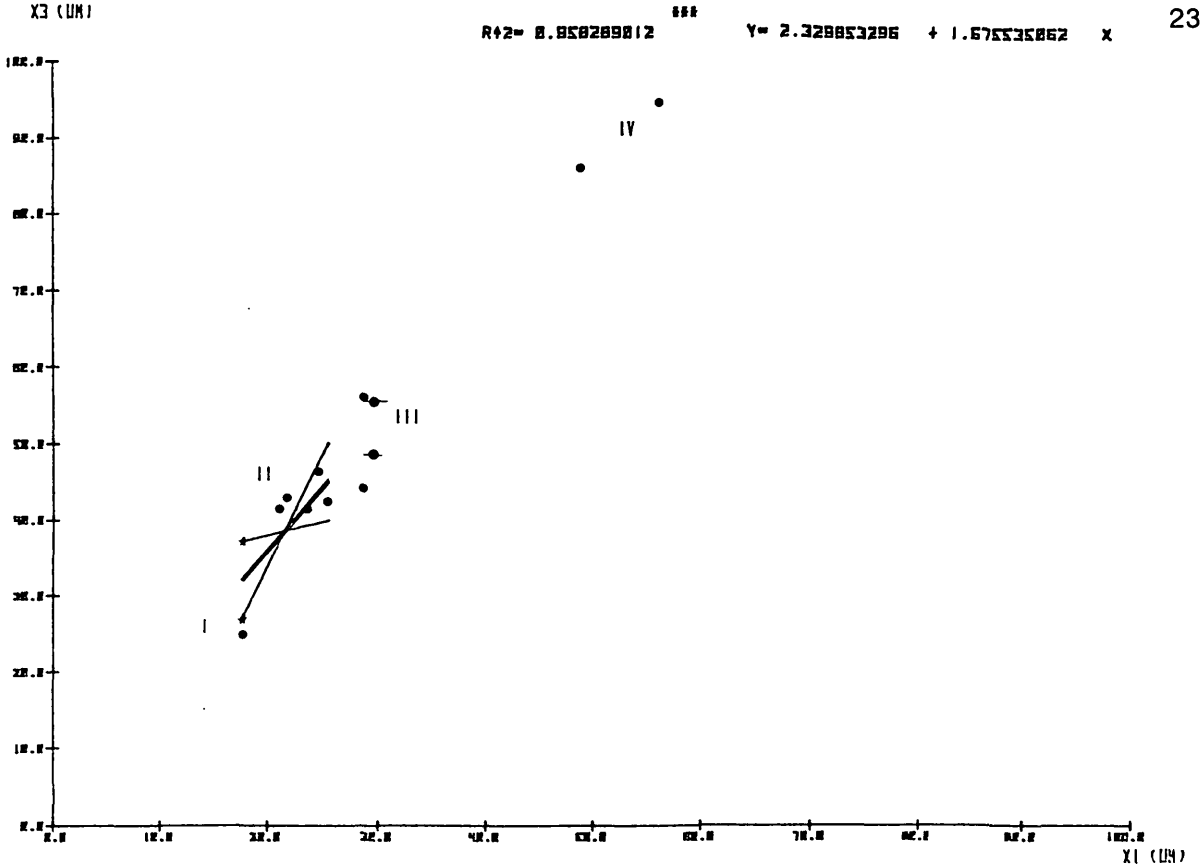
Paraorthocladius nudipennis

r2



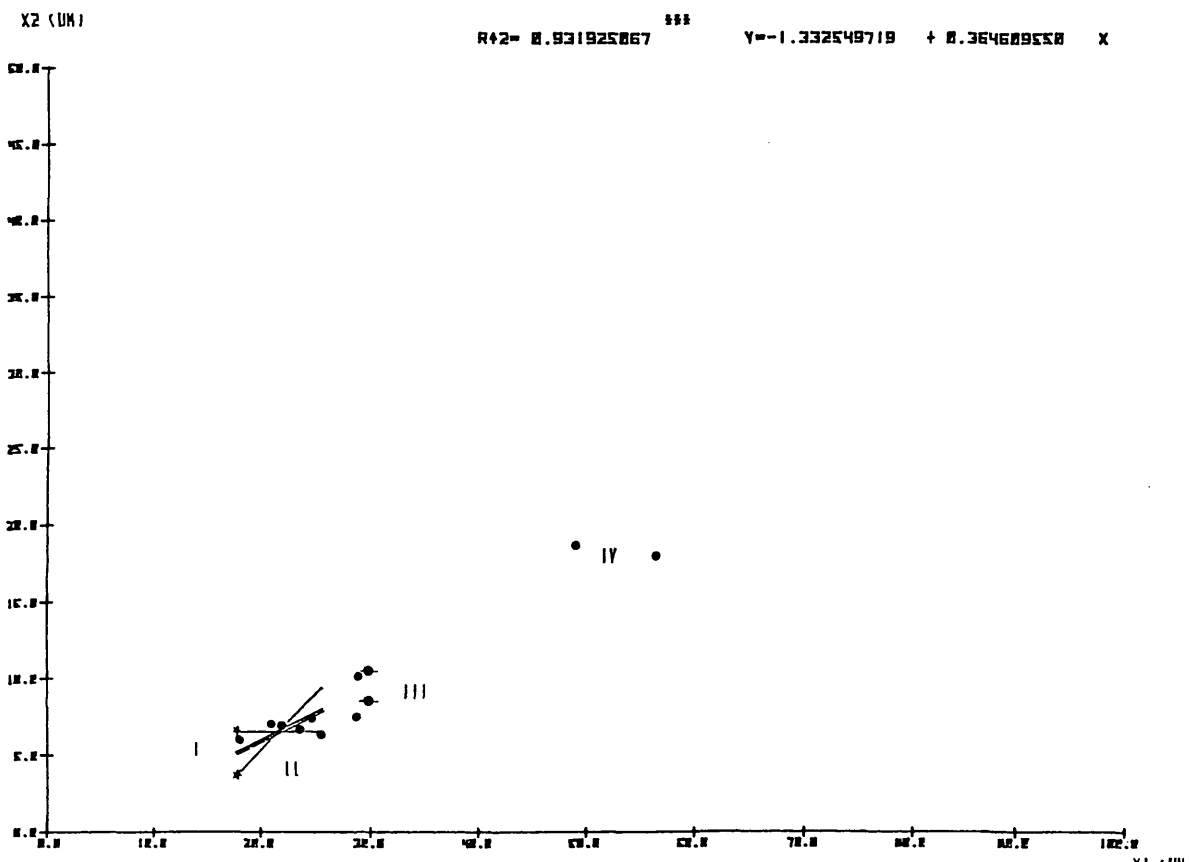
Paraorthocladius nudipennis

r3



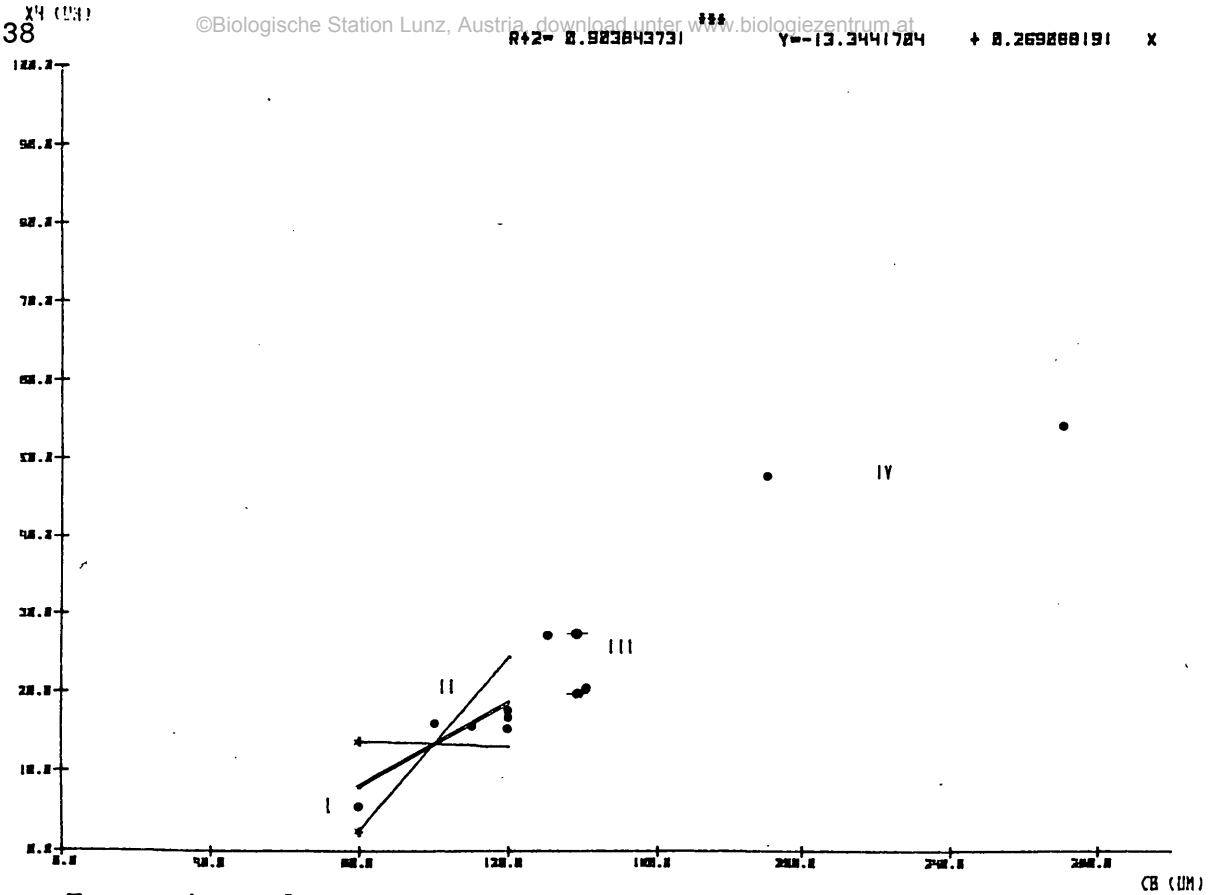
Tvetenia calvescens

s1



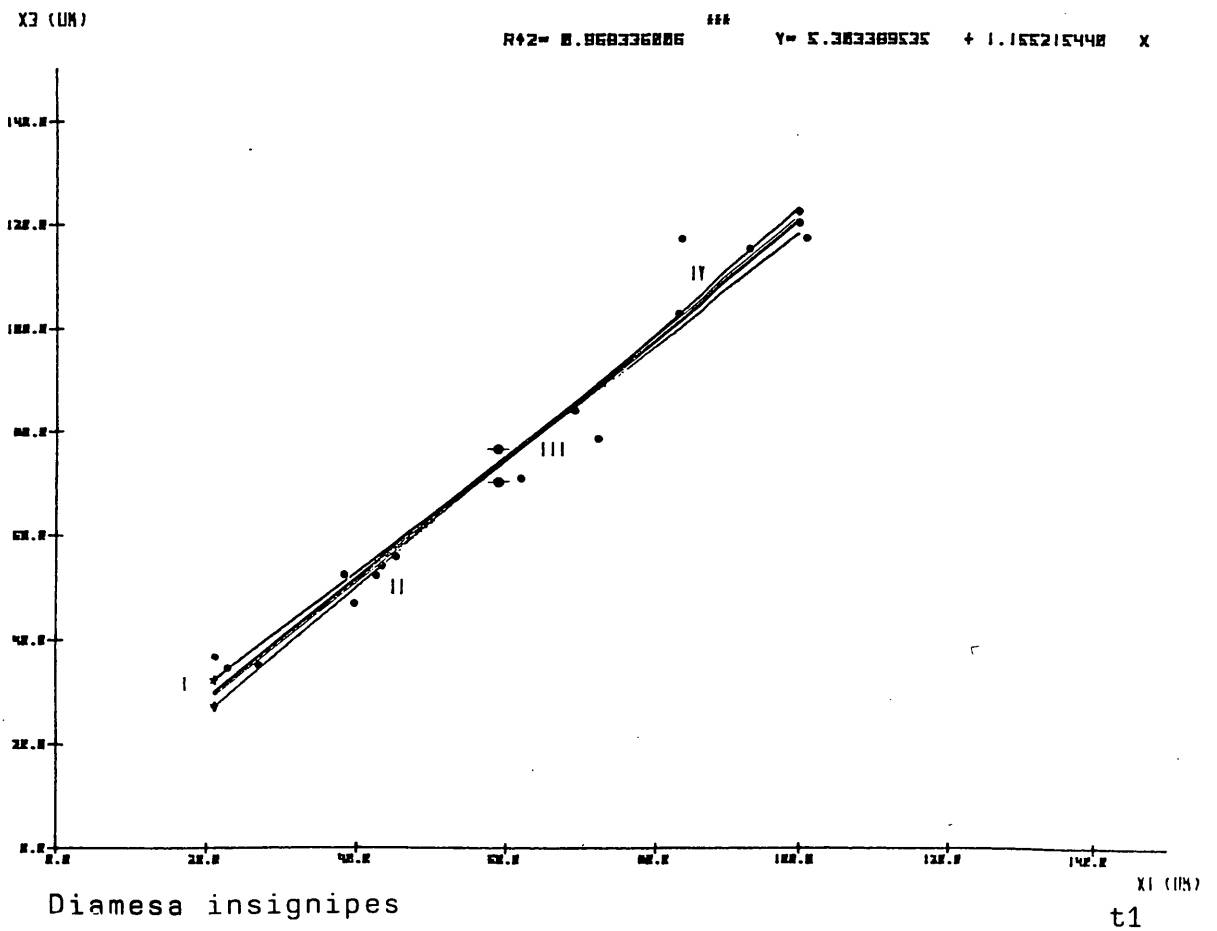
Tvetenia calvescens

s2



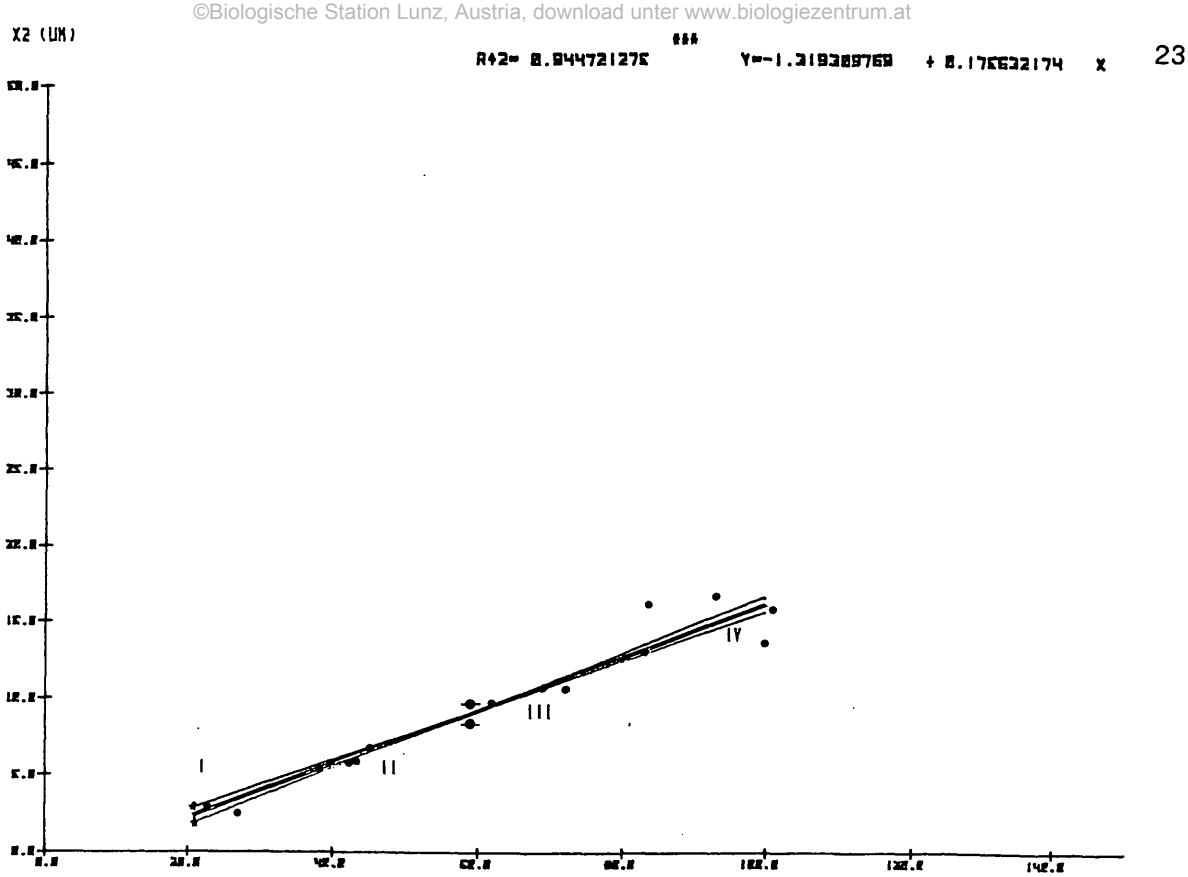
Tvetenia calvescens

s3



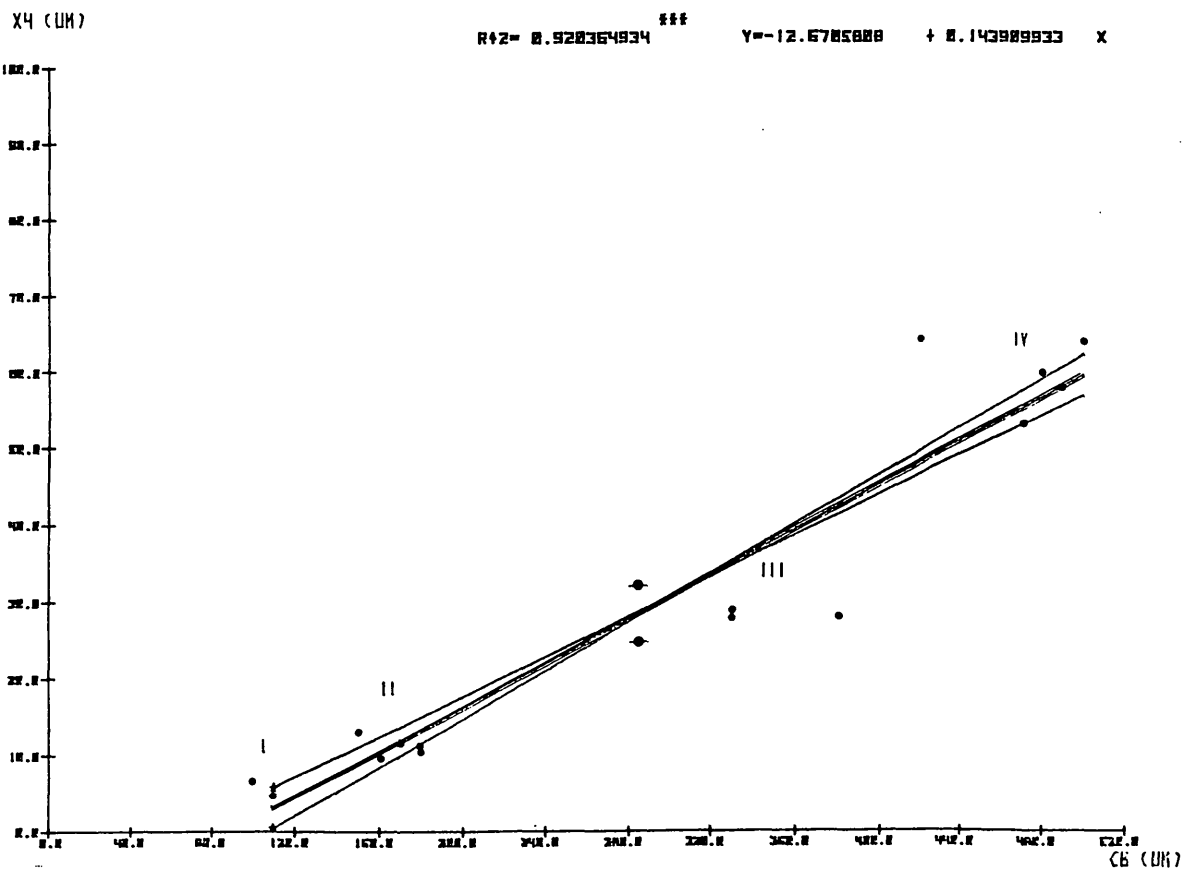
Diamesa insignipes

t1



Diamesa insignipes

t2



Diamesa insignipes

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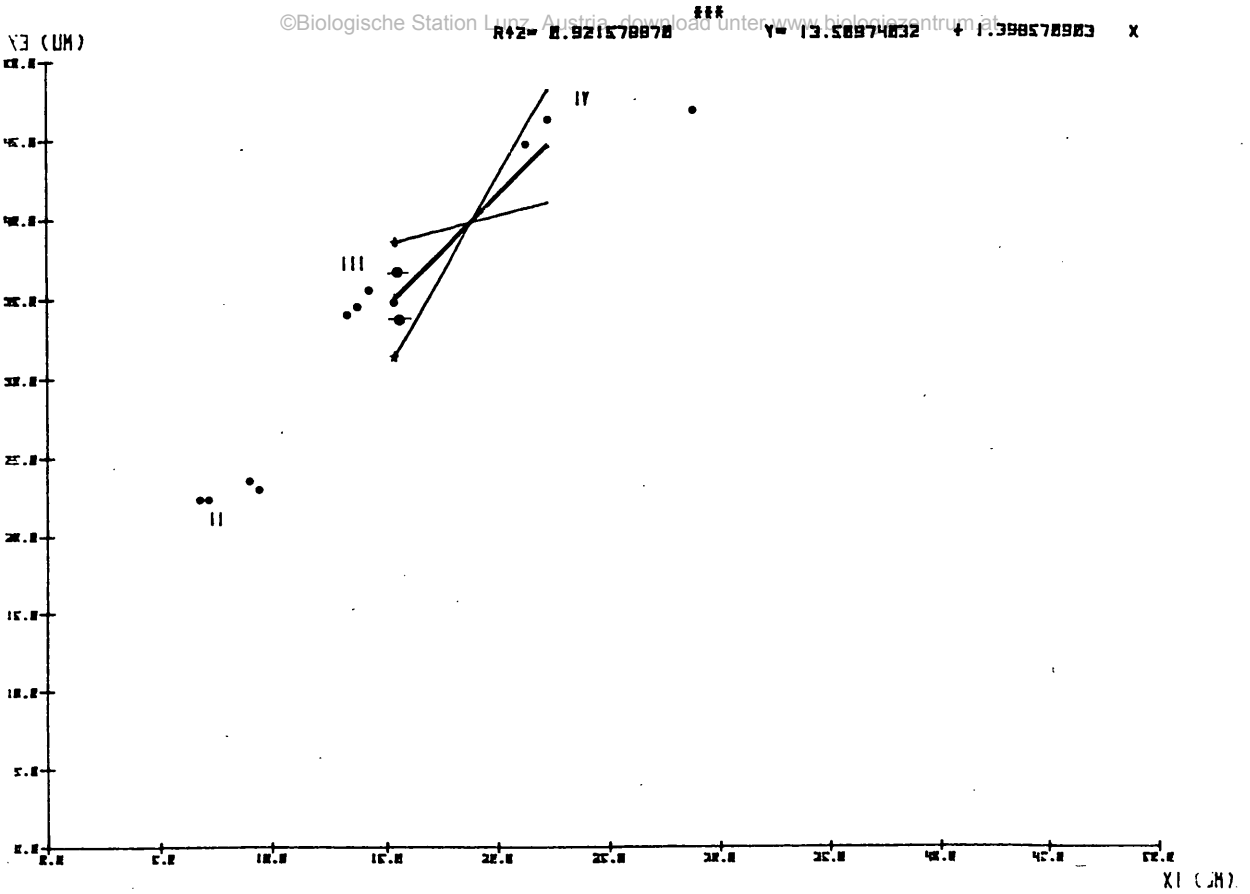
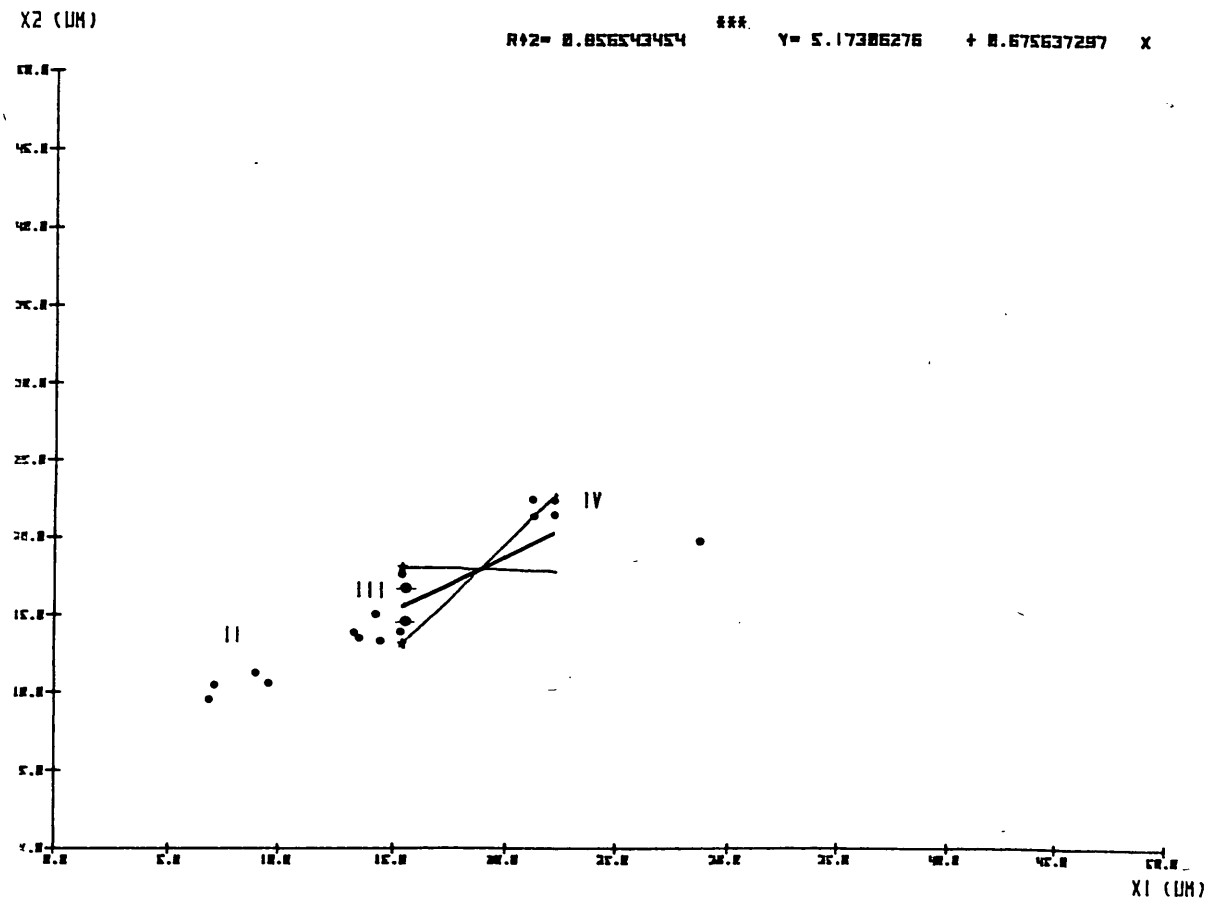
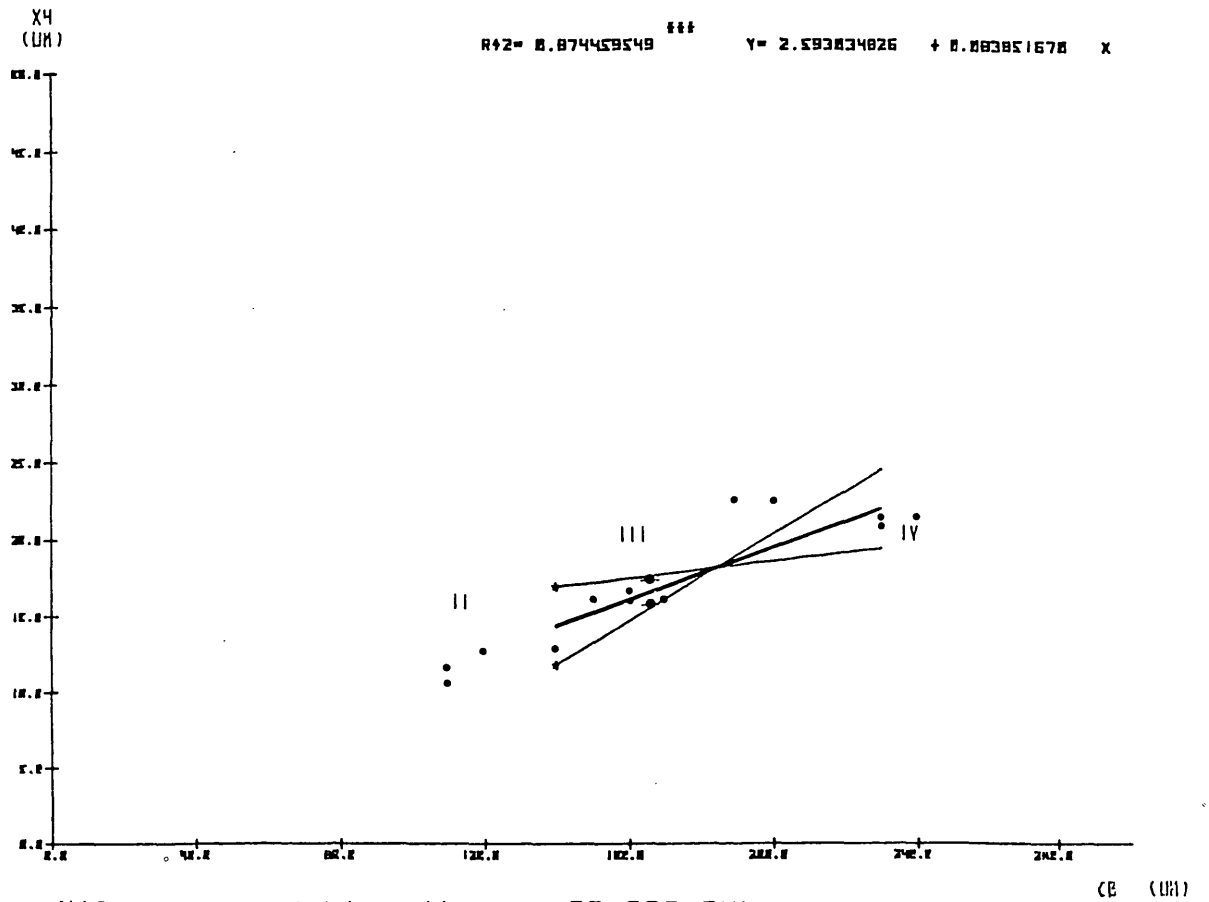


Nilotanypus dubius u1



Nilotanypus dubius u2



Nilotanypus dubius (instar II,III,IV)

u3

Alphabetical Chironomid Index

* denotes figures (x*: in the key, *x: in the species descriptions, * diagrams)