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**Autor:** Mahunka, Sándor / Mahunka-Papp, Luise  
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# Oribatids from Switzerland XII

## Acari: Oribatida: Ceratozetoidea 1 (Acarologica Genavensia CV)

Sándor MAHUNKA<sup>1</sup> and Luise MAHUNKA-PAPP

Ms received 14th July 2005, accepted 7th October 2005

### Abstract

As a first part of the revision of the Swiss ceratozetoid oribatids five new species from Switzerland belonging to the family Ceratozetidae are described: *Ceratozetes brissago* sp. n. from one locality in Ticino; *Ceratozetes genavensis* sp. n. from one locality in Geneva and from one locality in Ticino; *Ceratozetes spiculatus* sp. n. from two localities in Ticino; *Trichoribates hauseri* sp. n. from one locality in Appenzell; *Trichoribates strigatus* sp. n. from one locality in Ticino and from one locality in Appenzell.

**Keywords:** Acari, Oribatida, Ceratozetidae, taxonomy, new species, Switzerland

### Résumé

**Oribates de Suisse XII (Acari: Oribatida: Ceratozetoidea 1) (Acarologica Genavensia CV).** - Dans le cadre de la préparation d'une faune suisse des oribates, cette étude commence la révision des Oribates Ceratozetoidea avec la description de cinq espèces nouvelles appartenant à la famille des Ceratozetidae: *Ceratozetes brissago* sp. n. (1 station au Tessin); *Ceratozetes genavensis* sp. n. (1 station à Genève, 1 station au Tessin); *Ceratozetes spiculatus* sp. n. (2 stations au Tessin); *Trichoribates hauseri* sp. n. (1 station en Appenzell); *Trichoribates strigatus* sp. n. (1 station au Tessin, 1 station en Appenzell).

**Mots-clés:** Acariens, Oribates, Ceratozetidae, taxonomie, nouvelles espèces, Suisse

### Introduction

While elaborating the oribatid fauna of Switzerland we endeavour, beside a treatment by families, to give also – at times – an overall view of larger units like superfamilies e.g. Oppioidea (Mahunka & Mahunka-Papp, 2000a, 2000b, 2001) or higher groups like the “ptychoid” or Ptyctima (Mahunka & Mahunka-Papp, 2003). Of course, there are some particular groups which may not yet be treated owing to their great species number or taxonomical problems.

Such a particular group are the Ceratozetoidea occurring in a great number of species in forests, mountainous and high altitude regions. Only in the family Ceratozetidae e.g. the number of known species in Switzerland is high (Schweizer, 1922, 1948, 1956), furthermore, there are many unsolved problems in this group and numerous misidentifications may be encountered here.

Upon beginning to work on this family both these hindering factors were encountered. So this time we do not give a list of species yet, but present the results gained so far. Consequently, hereunder we give the description of five new species.

The terminology used in our descriptions follows that of Behan-Pelletier (1984, 1985, 1986, 1998, 2000).

### List of localities

**AP-2:** SWITZERLAND: **Appenzell:** Säntis, 2450m; 10.VII.1967; leg. A. Comellini – (Bp-161).

**GE-10:** SWITZERLAND: **Geneva:** Allondon, Malval, roots and sand; 22.X.1982; leg. C. Besuchet – (Bp-209).

**TI-11:** SWITZERLAND: **Ticino:** Rancate, chestnut forest, sifting; 7.IX.1965; leg. C. Besuchet – (Bp-25).

**TI-34:** SWITZERLAND: **Ticino:** Morbio Superiore, tree stump; 6.V.1969; leg. C. Besuchet (Te-69/35) – (Bp-189).

<sup>1</sup> Department of Zoology, Hungarian Natural History Museum and Systematic Zoology Research Group of the Hungarian Academy of Sciences and of the Eötvös Loránd University, H-1088 Budapest, Baross utca 13, Hungary.  
E-mail: mahunka@zoo.zoo.nhmus.hu

Figs. 1–6. *Ceratozetes brissago* sp. n. —  
1, body in dorsal view; 2, body in ventral view;  
3, sensillus; 4, genu and femur of leg  
II; 5, podosoma in lateral view; 6, rostrum.

**TI-37:** SWITZERLAND: **Ticino:** Rancate, old tree stump, extraction by flotation of soil; 5.VI.1969; leg. C. Besuchet & I. Löbl (Te-69/34) – (Bp-192).

**TI-38:** SWITZERLAND: **Ticino:** Ascona, Mte Verità, dead leaves and soil, 450m; 5.XI.1984; leg. C. Besuchet – (Bp-210).

**TI-40:** SWITZERLAND: **Ticino:** Brissago, dead leaves and old tree stump; 26.IV.1985; leg. C. Besuchet & I. Löbl – (Bp-215).

## Descriptions

### *Ceratozetidae* Jacot, 1925

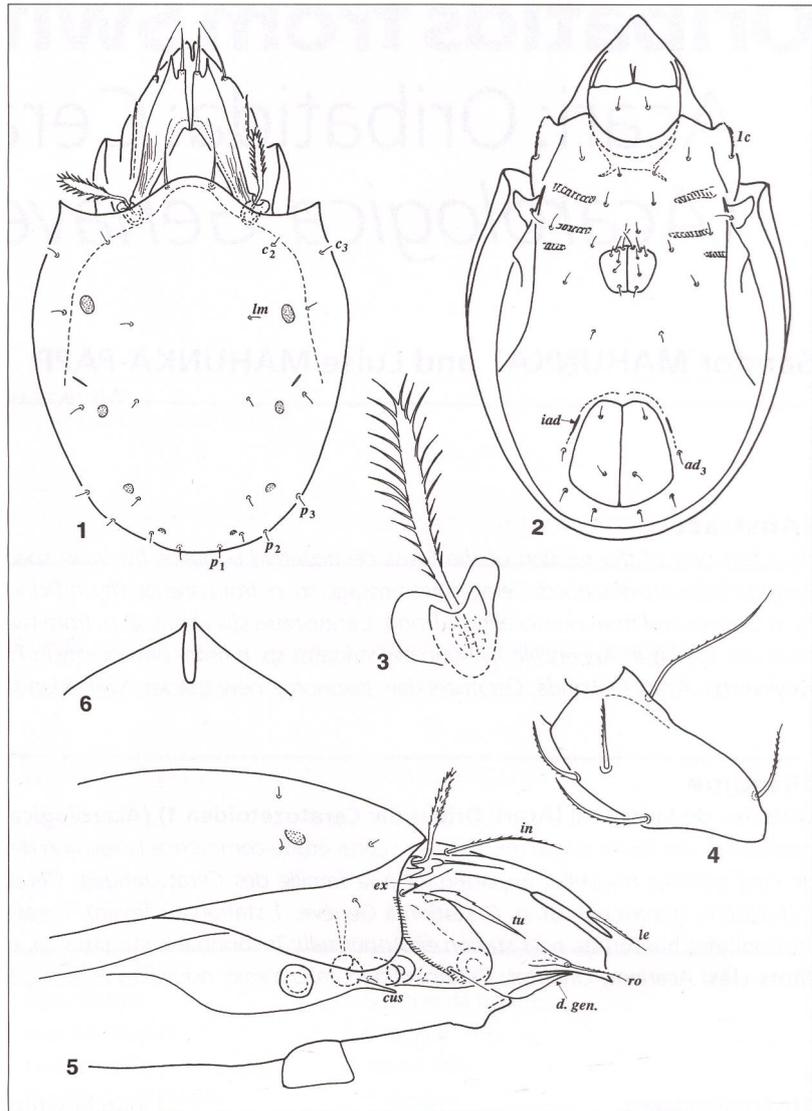
*Ceratozetes brissago* sp. n. (Figs. 1–6)

**Material examined:** **TI-40:** SWITZERLAND (Ticino): Holotype; from the same sample: 16 paratypes. Holotype and 10 paratypes: MHNG<sup>2</sup>; 6 paratypes (1679-P0-04): HNHM<sup>3</sup>.

**Diagnosis:** Rostrum with a deep and narrow incision. Lamellae large, their cusps located near to each other, reaching beyond insertion of rostral setae. Lamellar apex incised, divided into a blunt inner and a sharply pointed outer part. Inner part bearing thick lamellar setae. Sensillus claviform, well ciliate. Tutorium short, ending far behind the insertion of rostral setae. Eleven pairs of minute notogastral setae, 4 pairs of porose areas as usual in the genus.

**Measurements:** Length of body: 309–359 µm, width of body: 179–200 µm.

**Prodorsum:** Rostrum with deep, narrow, parallel-sided incision (Fig. 6), forming sharply pointed teeth laterally. Lamellae long, parallel, nearly touching medially. Their cusps very long, reaching over the level of insertion of rostral setae. Their apex incised, with shorter, blunt median part bearing the basally



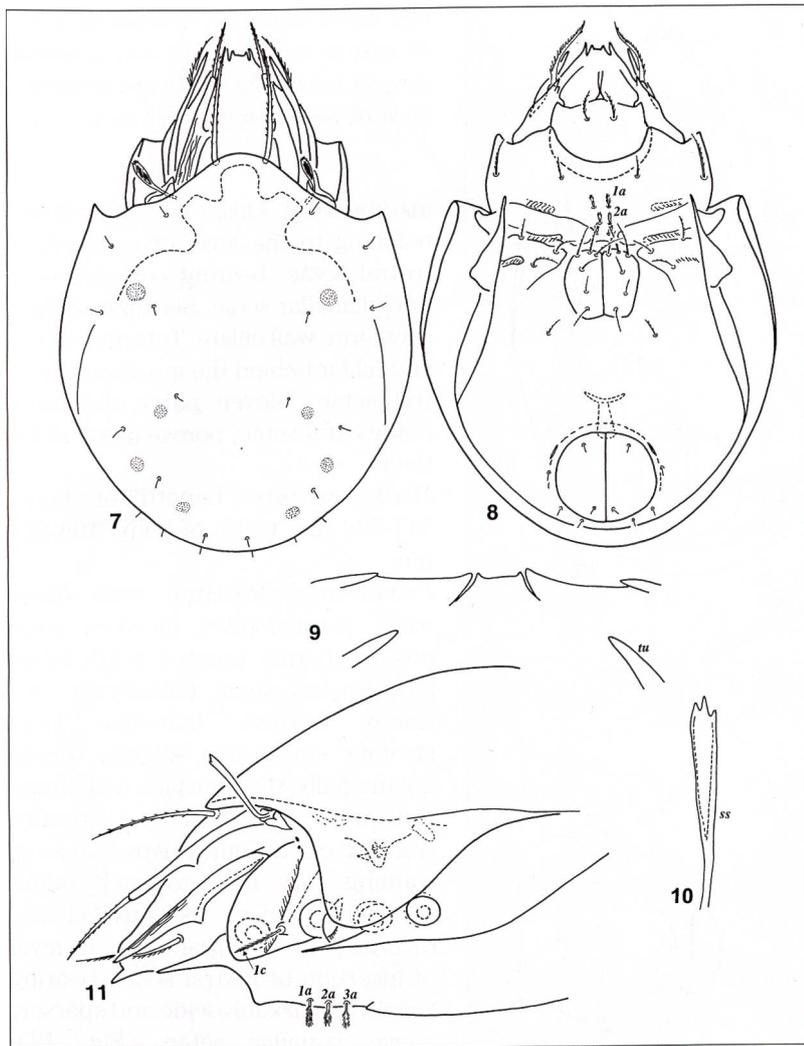
dilated, anteriorly setiform lamellar setae and a much longer, sharply pointed outer part. Basal surface of the lamellae well striated (Fig. 1). Rostral setae arising on small projections, well ciliate. Lamellar and interlamellar setae comparatively short, finely and sparsely ciliate, interlamellar ones ending far behind the lamellar apices, their insertion covered by anterior margin of notogaster. Bothridial scale *svl* very large, *sdm* and *psdm* much smaller. Sensillus (Fig. 3) clavate, directed anteriorad or laterad, bilaterally barbed. Barbs remarkably long. Exobothridial setae long, simple and barbed. Porose area *Aj* oval.

**Lateral part of podosoma:** Tutorium short, narrow, its apex long, but ending far behind the insertion of rostral setae (Fig. 5). Pedotectum I large, convex. Custodium very long, narrow, reaching over pedotecta 2–3.

**Notogaster:** Eleven pairs of very fine, minute notogastral setae (Fig. 1) and four pairs of small and roundish porose areas present. *Aa* larger than other porose areas.

<sup>2</sup> MHNG = deposited in the Muséum d'Histoire naturelle, Geneva.

<sup>3</sup> HNHM = deposited in the Hungarian Natural History Museum, Budapest, with identification number of the specimens in the Collection of Arachnida.



Figs. 7–11. *Ceratozetes genavensis* sp. n. — 7, body in dorsal view; 8, body in ventral view; 9, rostrum; 10, sensillus; 11, podosoma in lateral view.

**Diagnosis:** Rostrum divided, median apex with two lateral teeth, lateral of those one pair of larger teeth present. Lamellar cusps long, longer than their basal part. Tutorium very large, reaching over the lamellar cusp. Sensillus clavate, with 2-3 thick spines distally. Eleven pairs of minute notogastral setae and 4 pairs of unframed porose areas present on the notogaster. Epimeral setae pilose, 3 pairs in the middle line penicillate.

**Measurements:** Length of body: 388-424 µm, width of body: 274-299 µm.

**Prodorsum:** Rostral apex with median part emerging with two small sharply pointed lateral teeth, laterally with a deep incision and a long narrow tooth on each side (Figs 7,9). Lamellae running marginally, their apices very long, blunt at tip bearing the comparatively short lamellar setae. Basal part wider than the anterior part, with longitudinal striation. Tutorium very long, apex simple, narrow, reaching the rostral apex.

**Ventral parts of body** (Fig. 2): Coxisternal plates with weak ornamentation. Among the epimeral setae *1c* longest and thickest, setae *1c*, *3b*, *3c* well, others hardly ciliate. Genital setae also finely ciliate. Anal and adanal setae clear short, simple, smooth.

**Legs:** Tarsi tridactylous. Genua I and II with strong ventral spur. Femora of leg II with laminiform ridge extending into a sharp distal process (Fig. 4).

**Remarks:** On the basis of the shape and position of the lamellae the new species is unique in the genus *Ceratozetes* Berlese, 1908. The form of the rostral incisure is also remarkable. However, other features (e.g. the number of notogastral setae, the form of the sensillus etc.) relate it closely to the other species.

**Derivatio nominis:** Named after its origin.

***Ceratozetes genavensis* sp. n.** (Figs. 7-11)

**Material examined:** **GE-10:** SWITZERLAND (Geneva): Holotype; from the same sample: 9 + 6 paratypes; **TI-38:** SWITZERLAND (Ticino): 5 + 3 paratypes. Holotype and 14 paratypes: MHNG; 9 paratypes (1680-PO-04): HNHM.

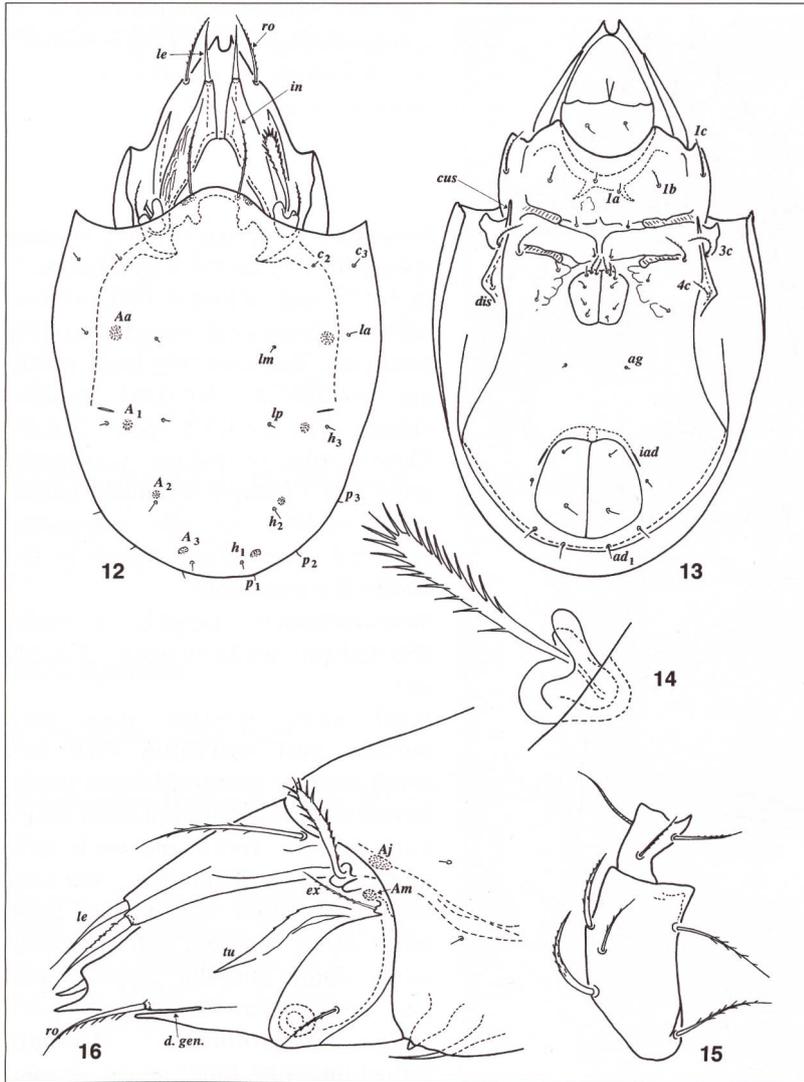
Rostral setae setiform, distinctly barbed, lamellar and interlamellar setae ciliate, the latter longest, reaching over the rostrum, also blunt at tip. Bothridium large. Sensillus (Fig.10) clavate, flat, with 2-3 larger apices on its distal end. Exobothridial setae represented by alveoli.

**Lateral part of podosoma:** Genal tooth large, long. Pedotecta 1 wide, with convex dorsal margin. Setae *1c* arising at base of pedotecta 2 (Fig. 11). Pedotecta 2-3 small, round. Custodium reaching anteriorly of pedotecta 2.

**Notogaster:** Eleven pairs of minute, curved notogastral setae and 4 pairs of round, but not framed by a chitinous ridge, hardly observable porose areas present.

**Ventral parts of body** (Fig. 8): All setae of the ventral regions distinctly barbed, setae *1c* longest. Setae *1a*, *2a* and *3a* with very long cilia, penicillate, erect (Fig. 11). Epimeral setal formula 3 – 1 – 2 – 2. Setae *3c* and *4c* not observable. No great differences between genital and aggenital setae, anal and adanal setae shorter, also ciliate.

**Legs:** All legs tridactylous. Femora of leg II-IV with blade like formation ventrally.



Figs. 12–16. *Ceratozetes spiculatus* sp. n. — 12, body in dorsal view; 13, body in ventral view; 14, sensillus; 15, genu and femur of leg II; 16, podosoma in lateral view.

inating very close to each other, reaching to the level of insertion of rostral setae, bearing conspicuously thick lamellar setae. Sensillus slightly claviform, well ciliate. Tutorium short, ending far behind the insertion of rostral setae. Eleven pairs of minute notogastral setae, porose areas indistinct.

**Measurements:** Length of body: 311–344  $\mu\text{m}$ , width of body: 196–221  $\mu\text{m}$ .

**Prodorsum:** Rostrum with deep, wide, parallel-sided incision, composing sharply pointed teeth laterally. Rostral setae unilaterally distinctly barbed. Lamellae long, strongly converging, slightly touching medially, their surface with longitudinal striation laterally, translamella absent. Cusps also long, running very near to each other, tapering, median margins slightly diverging, reaching anterior to level of insertion of rostral setae. bearing basally remarkably wide and sparsely pilose lamellar setae (Fig. 12). Interlamellar setae comparatively short, not extending to the tip of cusps, insertion covered by anterior

**Remarks:** The new species is readily distinguished by the peculiar form of the rostrum, the very long tutorium and by the shape of the sensillus. The shape of the 3 pairs of penicillate epimeral setae is also unique in the genus. It resembles *C. bulanovae* Kuliev, 1962, however the sensillus of that species is much shorter and clavate.

**Derivatio nominis:** Named after its origin and after the place of our work (Muséum d'Histoire naturelle, Geneva).

#### ***Ceratozetes spiculatus* sp. n. (Figs. 12–16)**

**Material examined:** **TI-34:** SWITZERLAND (Ticino): Holotype; from the same sample: 2 + 1 paratypes; **TI-11:** SWITZERLAND (Ticino): 1 + 1 paratypes; **TI-37:** SWITZERLAND (Ticino): 1 + 1 paratypes. Holotype and 4 paratypes: MHNG; 3 paratypes (1672-P0-02): HNHM.

**Diagnosis:** Rostrum with deep U-shaped incision. Lamellae extremely converging, their cusps long, orig-

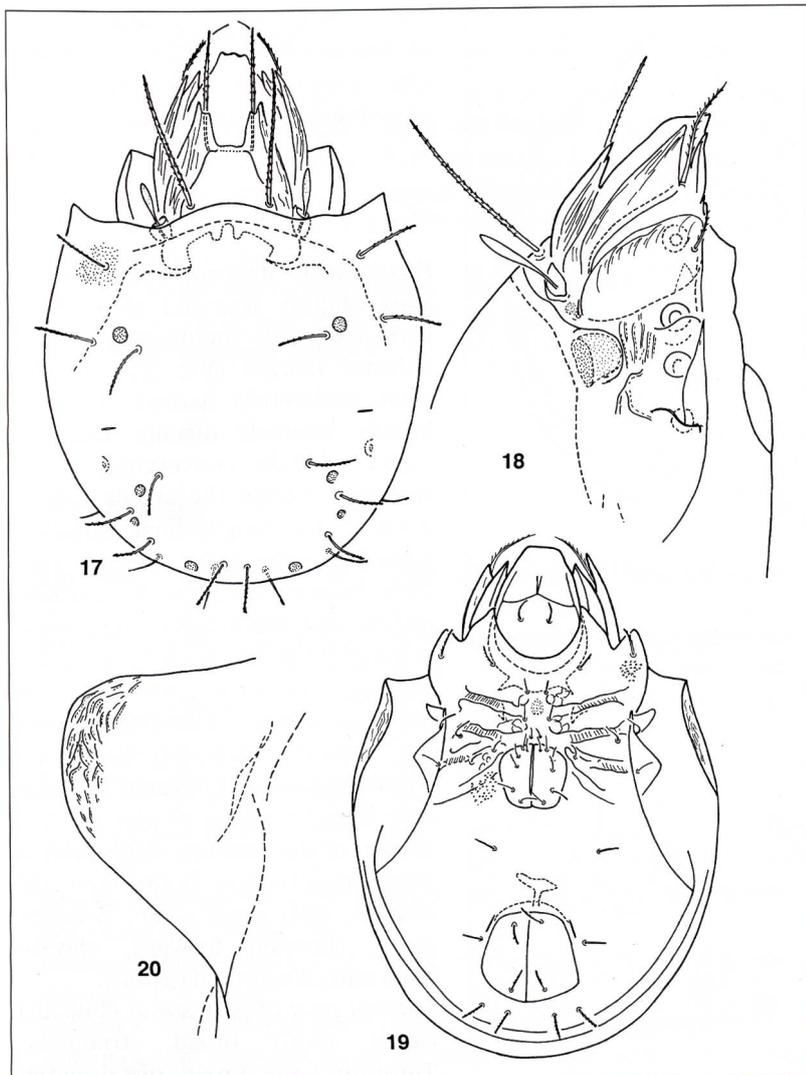
margin of notogaster. Bothridial scale *svl* and *svm* very large. Sensillus (Fig. 14) clavate, directed anteriorly, bilaterally barbed. Barbs remarkably long. Exobothridial setae simple, barbed. Porose area *Aj* oval.

**Lateral part of podosoma:** Tutorium short, narrow, its apex long, ending far behind the insertion of rostral setae (Fig. 16). Pedotectum I large, but not covering the insertion of exobothridial setae. Custodium very long, narrow, curved to acetabula.

**Notogaster:** Eleven pairs of very fine, minute notogastral setae (Fig. 12). Four pairs of porose areas weakly bordered by a chitinous ridge, hardly discernible.

**Ventral parts of body:** Coxisternal plates divided by well developed borders and their apodemes (Fig. 13). Among the epimeral setae *Ic* longest, setae *Ic*, *3b*, *3c* well, others slightly ciliate. Genital setae also finely ciliate. Anal and adanal setae simple, smooth.

**Legs:** Tarsi tridactylous. Genua I and II with strong ventral spur (Fig. 15). Femur of leg II with laminiform ridge extending into a sharp distal process.



Figs. 17–20. *Trichoribates hauseri* sp. n. — 17, body in dorsal view; 18, podosoma in lateral view; 19, body in ventral view; 20, pteromorpha.

**Remarks:** On the base of the form and position of sensilli and other features the new species is closely related to *Ceratozetes conjunctus* Mihelcic, 1956, *Ceratozetes contiguus* Jeleva, 1962 and *Ceratozetes lagrecai* Bernini, 1973. However, the lamellar apices are much longer and narrower in the new species than in the three others, the tutorium of *C. conjunctus* and *C. lagrecai* is long, reaching to the insertion of rostral setae, but short in the new species, and the shape of sensilli is also different.

**Derivatio nominis:** Named after the form of the lamellar setae.

***Trichoribates hauseri* sp. n. (Figs. 17-20)**

**Material examined:** AP-2: SWITZERLAND (Appenzell): Holotype; from the same sample: 1 paratype. Holotype: MHNG; the paratype (1673-P0-02): HNHM.

**Diagnosis:** Rostrum wide, with waved anterior margin. Lamellae large, lamellar cusps asymmetrical,

inner tooth absent. Lamellar and interlamellar setae long, sensillus elongate, lanceolate. Tutorium large, with a simple but strong cusp. Ten pairs of comparatively long and ciliate notogastral setae and 4 pairs of round areae porosae present. Pteromorphae rugose laterally.

**Measurements:** Length of body: 500-535 µm, width of body: 375 µm.

**Prodorsum:** Rostrum very wide, blunt medially. Its apex waved, seeming to be tridentate (Fig. 17). Rostral setae distinctly barbed. Lamellae narrow, slightly converging, their surface – except the apices – ornamented by longitudinal striation. Outer lamellar teeth long, inner reduced. Lamellar setae reaching beyond the rostrum. Translamella narrow, straight. Interlamellar setae very long, reaching to the anterior margin of the rostrum. Both pairs of setae finely barbed. Bothridium cup-shaped, with small scale. Sensillus elongated, directed forward, lanceolate.

**Lateral part of podosoma (Fig. 18):** Genal tooth narrow. Tutorium large, with a simple triangular apex.

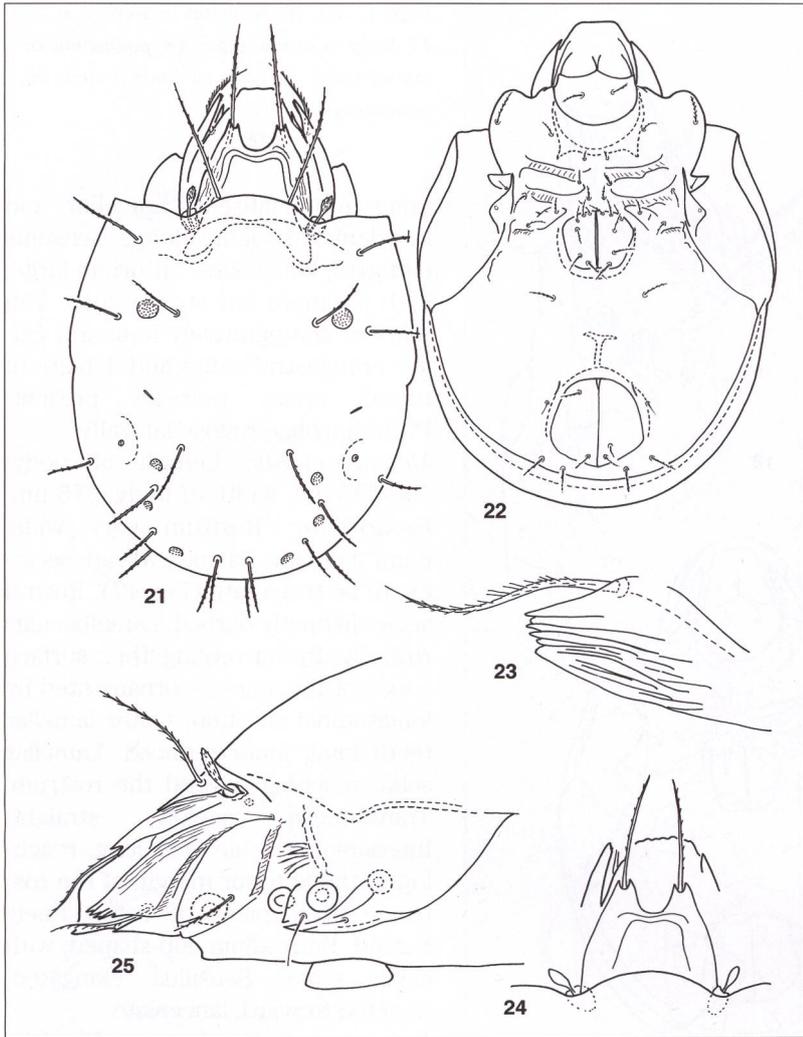
Pedotecta I large, not covering the insertion of exobothridial seta. Acetabula II and III also well developed.

**Notogaster:** Anterior margin convex medially and laterally, concave posterior to the sensillus. Median part not covering the insertion of the interlamellar setae. Pteromorphae with irregular rugae distally (Fig. 20), inner surface punctulate. Ten pairs of long notogastral setae, setae in the anterior part of the notogaster longer than in the posterior part. Setae *p* shortest of all. All setae distinctly barbed. Four pairs of porose areas well discernible, no essential difference among them.

**Ventral parts of body (Fig. 19):** All setae of the ventral regions distinctly barbed, setae *Ic* longest. No great differences between aggenital, anal and adanal setae, genital ones slightly shorter.

**Legs:** Typical for the genus.

**Remarks:** This species is readily distinguished by the shape of the rostrum and the lamellar teeth. It stands closest to *Trichoribates novus* (Sellnick, 1928), however the rostrum of that species is elongated (waved in the new species) and the pteromorphae are smooth (well sculpturated in the new species).



Figs. 21–25. *Trichoribates strigatus* sp. n. — 21, body in dorsal view; 22, body in ventral view; 23, apex of the tutorium; 24, propodosoma; 25, podosoma in lateral view.

**Prodorsum:** Rostrum very wide, its apex slightly rounded or straight, with irregularly undulate or serrate anterior margin (Fig. 21). Rostral setae unilaterally barbed, distinctly basally, sparsely distally. Lamellae broad, slightly converging, whole surface – except the apices – ornamented by longitudinal striation. Lamellar cusps short, shorter than their distance, apices well separated, median and lateral teeth nearly equal in length (Fig. 21), their form slightly varying. Lamellar setae arising between teeth, extending beyond the rostrum. Translamella broad, curved posteriad. Interlamellar setae very long, reaching to the anterior margin of the rostrum. Both pairs of setae finely barbed. Bothridium cup-shaped, with small scale. Sensillus small, directed forward, clavate, head almost rounded distally.

**Lateral part of podosoma** (Fig. 25): Genal tooth broad, triangular. Tutorium large, broad, distal margin peculiarly serrate (Fig. 23). Number

**Derivatio nominis:** We dedicate the new species to our friend and adviser Dr. B. Hauser (Geneva), for his continuing help in our studies in the Museum of Geneva.

***Trichoribates strigatus* sp. n.** (Figs. 21–25)

**Material examined:** **TI-37:** SWITZERLAND (Ticino): Holotype; from the same f sample: 6 + 2 paratypes; **AP-2:** SWITZERLAND (Appenzell): 1 paratype. Holotype and 7 paratypes: MHNG; 2 paratypes (1674-P0-02): HNHM.

**Diagnosis:** Rostrum wide, slightly convex. Lamellae large, lamellar cusps with apices of equal length. Lamellar and interlamellar setae long, sensillus very small, head clavate. Tutorium large, with serrate anterior margin. Ten pairs of comparatively long notogastral setae and 4 pairs of round areae porosae present. Custodium comparatively short and wide.

**Measurements:** Length of body: 590–608  $\mu\text{m}$ , width of body: 372–421  $\mu\text{m}$ .

and shape of teeth varying, dorsal surface striated. Pedotecta I large, not covering the insertion of exobothridial setae. Folds dorsal of acetabula II and III, well developed.

**Notogaster** (Fig. 21): Anterior margin convex medially and laterally, concave behind the sensillus. Median part covering the insertion of the interlamellar setae. Ten pairs of long notogastral setae present,  $c_2$  longest (73  $\mu\text{m}$ ), setae  $p_1$  shortest. All setae distinctly barbed. Four pairs of porose areas well discernible,  $Aa$  much larger than the others.

**Ventral parts of body** (Fig. 22): All setae of the ventral regions distinctly barbed, setae  $Ic$  the longest. No great differences between genital, aggenital, anal and adanal setae. Postanal porose area long and narrow. **Legs:** Typical for the genus.

**Remarks:** This species can be distinguished from other species of *Trichoribates* in having following combination: rostrum stout, tutorium large, with serrate anterior margin, lamellae with apices of equal length, notogastral setae long.

**Derivatio nominis:** Named after the characteristic apex of the tutorium.

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