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New genera and species of *Protura* from the Altai Mts.

[with 202 text-figs]

Nowe rodzaje i gatunki *Protura* z Altaju

Abstract. Three new genera (*Noldo* gen. n., *Yavanna* gen. n. and *Nienna* gen. n.) of the family *Acerellidae* YIN, 1983, and ten new species (*Hesperentomon martynovae* sp. n., *Proturentomon stebaevae* sp. n., *Filientomon sibiricum* sp. n., *Verrucoentomon aurifer* sp. n., *V. joannis* sp. n., *Noldo submontanus* sp. n., *Yavanna altaica* sp. n., *Nienna parvula* sp. n., *Imadateiella murka* sp. n. and *Eosentomon tshergense* sp n.) are described. The porotaxy (the distribution of the glandular pores) is introduced as taxonomically important character in *Acerentomoidea*. The key to the genera of the subfamilly *Acerellinae* (fam. *Acerellidae*) is provided.

The present paper contains the description of a rich proturan material collected by Dr Maria KACZMAREK in Ulusčerga, Šebalinskij rajon, Gorno-Altajskaja Avtonomnaja oblast (Улусчерга, Шебалинский район, Горно-Алтайская Автономная область) at the foot of Altai Mts. Some specimens collected by Dr I. V. STEBAEV near Novosibirsk (which I have obtained by the kindness of Prof. Dr J. RAFALSKI) are described too.

I like to express my very deep thanks to all the persons mentioned above, and also to Dr G. IMADATÉ for the valuable comparative collection of Japanese *Protura*.

All material from Ulusčerga has been collected on the southern slope of a stony hill about 400 m asl. in June 20th, 25th, and 30th, 1979, on five localities (going down):

1. top of the hill with rocks and stones covered with mosses and small petrophilous plants, soil from the hollows between stones,
2. dry meadow on steep slope with a layer of undecaying grasses,
3. fresh meadow with scattered "karagana" bushes,
4. fresh meadow with no bushes, near a small creek,
5. dry meadow near arable fields.

The new generic names are taken from the mythical world of "The Silmarillon" by J. R. R. TOLKIEN as an expression of my admiration of his talent.

All material described here is preserved in the Institute of Systematic and Experimental Zoology of the Polish Academy of Sciences, Kraków, Poland.

Some explanations concerning the description of the porotaxy, the distribution of glandular pores, of the thorax and abdomen in *Acerentomoidea* are given as the head porotaxy has not been studied to date. In all the species described here there are no pores on the pronotum. On meso- and metanotum there are maximally 2+2 pores, and on urotergites I—VIII maximally 4+4 pores are present. The general scheme of their distribution is common for all

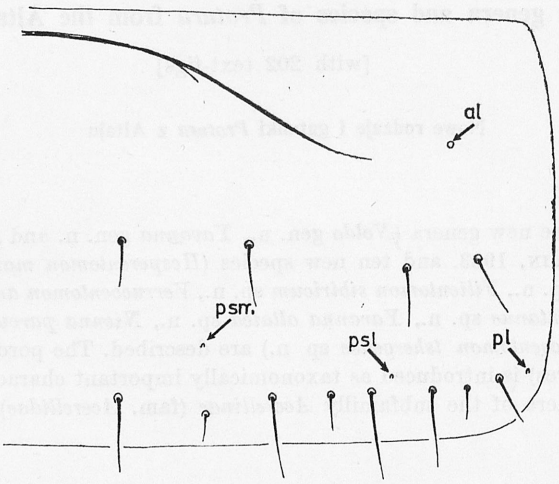

Fig. 1. *Hesperentomon martynovae* sp. n. — scheme of urotergite II (*psm* — posterosubmedial pore, *psl* — posterosublateral pore, *al* — anterolateral pore, *pl* — posterolateral pore)

the species studied. I am naming them as follows: submedial *(sm)* and sublateral *(sl)* pore on meso- and metanotum (fig. 9), and posteromedial *(psm)*, posterosublateral *(psl)*, posterolateral *(pl)* and anterolateral *(al)* pore on urotergite I—VIII (fig. 1). Pore *psm* is present in all studied species on urotergite I—VIII, and pore *al* on urotegite II—VII (it was commonly described as a "rhotary wheel" by the former authors). Only the presence of the pore *psl* and *pl* on the individual tergites is important taxonomically. The porotaxy of ventral side and of the last abdominal segments is very diversified and of the great taxonomical value, but the introduction of the general naming system of the pores is actually impossible.

In the description of the chaetotaxy of urotergite I and VIII I am using the different system of the designation of setae than this used by the previous authors (for example IMADATE, 1966; TUXEN & YIN, 1982) — the homologisation of the setae on said tergites is explained in my paper (SZEPTYCKI, 1986). All the taxonomical characters used in the description of *Eosentomon* are explained in my previous papers (SZEPTYCKI, 1984, 1985). The porotaxy is not described because it is uniform in all the species of the genus *Eosentomon*, at least in the species studied till now.

Hesperentomidae PRICE, 1960 *Hesperentominae* TUXEN, 1963

Hesperentomon martynovae sp. n.

(figs 1—26)

Diagnosis. The new species differs from *macswaini* PRICE, 1960 (c. f. TUXEN, 1964), *tianshanicum* MARTYNOVA, 1970 and *chinghaiense* YIN, 1982 in the presence of sensilla *b'2 (b'')* on foretarsus; and in the presence of seta *P1a* on nota and urotergites I—VII from all the species with foretarsal sensilla *b'2* (*hwashanense* YIN, 1982, *pectigastrulum* YIN, 1984 and *monlunicum* YIN, 1984).

Description. Head setae short, rostrum not protruded. Submedial and sublateral additional seta of posterior part of head present. Setae of hind margin of head of normal shape. Pseudoculus elongate, with long lever, PR 13.4—16.0 (in larvae 15.4—17.0). Two additional pairs of pores between pseudoculi and in posterior part of head present. Filamento di sostegno with elongate calyx and relatively short (about 0.9 of calyx length) posterior filament, CF 3.4—4.4. Maxillary palp short, stocky; basal sensillae equal, slender. Labial palp well developed, with no basal sensilla. Labium smooth.

Nota with short main setae, *P5* on meso- and metanotum as small sensilla, accesory setae of normal shape. Length ratio of *P1* : *P1a* : *P2* on mesonotum as 2.1—2.2 : 1 : 3.1—3.2 (in larvae 1.6—1.9 : 1 : 2.2—2.9). Meso- and metanotum with pores *sm* and *sl*; sternites with simple median pore, situated on prosternum posteriorly, on meso- and metasternum anteriorly to level of setae *M*. All setae on thoracal sternite of normal shape.

Foretarsus with additional sensillae *b'2* and *c'2* (designation after YIN, 1984); *t1* and *t2* thin, setaceous; other sensillae short, equaly thick. Formula of sensillae length: $f < (b'2 = e) < (b = c = t_+ = c'1 = c'2) < a' < (g = d) < b'1 < (t1 = t2)$. Setae *β1* and *δ1* of normal shape, subequal to setae *δ1—δ3*. Claw (with no inner tooth) and empodial appendage relatively short, BS 1.0—1.1 (in larvae 0.8—0.9), TR 3.4—3.5 (in larvae about 3.0) EU about 0.2.

Urotergite I—VII smooth with two lines in anterior part (on I—VI first of which medially interrupted). Pores *psm* and *psl* present on urotergite I—VII, *al* (with no surrounding teeth) on II—VII, *pl* on I—III. All setae on tergites of normal shape. Abdominal legs typical of genus, with 4 setae. Urosternite I with complicated lineation in anterolateral part, II—VII with two lines in anterior part, on II—VI anterior of them interrupted medially. All sternal setae of normal shape. Sternite I—III with one single medial pore, IV—VII with 3 (medial and two sublateral) pores situated in posterior half of sternite, on VII near its hind margin.

Abdominal segment VIII with distinct, individually variable lineation or reticulation. Striate band absent; only single granulated line present. Comb VIII with 11—12 small teeth. Tergite with pores *psm* (with no surrounding teeth) and *pl*, sternite with single median pore. Hind margin of sternite and pleurite smooth.

Abdominal segments IX—XII distinctly lineated; some of lines with small teeth. Tergite X and XI with posterior lamella broad, serrated. All setae of normal shape. Bases of setae of segments X—XI and of some setae on urotergite XII surrounded with very small (and probably fragile) "ciliae" — such "ciliae" exist also on some lines on urosternite XI. Urotergite IX—XII with single median pore situated on hind margin of tergite IX—XI and in anterior part of tergite XII. Urosternite IX and X with 3 pores, XI with no pores, XII with 1+1 pores in its anterolateral part.

Table I

Body chaetotaxy of *Hesperentomon martynovae* sp. n.

		Dorsal		Ventral	
		setae	formula	setae	formula
Thorax	I	**1, 2**	4	**A1, *2*, M** **P1, 2. *3***	4+2 6
	II	**A2, 4, M** **P1, 1a, 2, *2a*, 3, 3a, 4, 5**	6 16	**A1, 3, M** ***Pc*, 1, 2**	4+2 5
	III	**A2. 4, M** **P1, 1a, 2, *2a*, 3, 3a, 4, 5**	6 16	**A1, 2, 3, M** ***Pc*, 1, 2**	6+2 5
Abdomen	I	**A1, *2*** **P1, 1a, 2, 2a, 3, 3a, 4**	4 14	**A1, 2** **P1a, 2**	4 4
	II—III	**A1, *2, 4, 5*** **P1, 1a, 2, 2a, 3, 4, 4a, 5**	8 16	**A1 *2*** **Pc, 1a, 2**	4 5
	IV—VI	**A1, *2, 4, 5*** **P1, 1a, 2, 2a, 3, 4, 4a, 5**	8 16	**A1, 2** **Pc, *1*, 1a, 2, 3**	4 9
	VII	**A1, *2*, 4, 5** **P1, 1a, 2, 2a, 3, 3a, 4, 4a, 5**	4 18	**A1, *2*** **Pc, 1, 1a, 2, 3**	4 9
	VIII	**A1, *2*, 5** **P1, 1a, 2, 2a, 3, 3a, 5**	6 14	**1, *1a*, 2**	6
	IX	**1, *1a*, 2, *2a*, 3, *3a*, 4**	14	**1, *1a*, 2**	6
	X	***1, 1a, 2, 2a, 3, 3a, 4***	14	***1, 1a, 2***	6
	XI	***1, 2, 3, 4***	8	***1, 1a, 2***	6
	XII		9		0 * 8

Fat print — primary setae, normal print — secondary setae, ***italics*** — tertiary and supplementary setae.

* In larva I and II: $\frac{2}{8}$.

Squama genitalis ♀ with slender, pointed acrostyli; males unknown. Body chaetotaxy as in Table I, body dimensions as Table II.

Both larval instars differ from imago in the absence of foretarsal sensilla *b'2*, larva 1 also in the absence of *c'2*. Other instars unknown.

Derivatio nominis: named in the honour of Prof. E. F. MARTYNOVA, an eminent Russian apterologist.

Material: holotype ♀ (nr 2792): Ulusčerga, loc. 3., 30. VI. 1979. leg. M. KACZMAREK. Paratype ♀ (nr. 2791) — as holotype. Not included into type-mateerial: 2 larvae I (loc. 3., 20. and 30. VI. 1979) and one larva II (loc. 4., 25. VI. 1979).

Table II

Dimensions (in μm) of *Hesperentomon martynovae* sp. n.

	Imago	Larva II	Larva I
head	163—168	137	130
pseudoculus (with no „lever")	11—12	9	8
pseudoculus (with „lever")	16—17	13	11—12
filamento di sostegno	48	31	33—40
posterior filament	22—23	13	18—22
mesonotal *P1*	17—18	13	10—11
,, *P1a*	8	7	6
,, *P2*	25—26	19	14—16
foretarsus	100—104	70	63—65
claw	29—30	23	21
empodial appendage	5	4	4
body length	1340	780	620
N° of specimens	2	1	2

Protentomidae EWING, 1936; *Protentominae* EWING, 1904

Proturentomon stebaevae sp. n.

(figs 27—49)

Diagnosis. In the presence of foretarsal sensilla *t1* the new species is most similar to *iowaense* WOMERSLEY, 1938 and to *discretum* CONDÉ, 1961 (cf. TUXEN, 1964). It differs from them in the shape of the comb VIII. From *discretum* it differs in the shape of the basal sensillae of maxillary palp (c. f. NOSEK, 1973; figs 46 *C* and *G*). *Proturentomon chinensis* YIN, 1984 the second East Palearctic species of the genus belongs to the group with sensilla *t1* absent.

Description. Head setae short, rostrum not protruded. Submedian additional seta of posterior part of head present, sublateral absent. One seta

of hind margin of head sensilla-like. Pseudoculus with very long, abcissed lever (c. f. RUSEK, 1975), PR about 10. No additional pores. Filamento di sostegno typical for genus, with short and thick posterior filament, CF 5.1—6.5. Maxillary palp relatively slender; basal sensillae short, dorsal sensilla thicker, apically rounded; ventral sensilla pointed, seta-shaped. Labial palp well developed, without basal sensilla.

Notal setae short, *P1a* sensilla-shaped, situated very near *P2*. Length ratio of *P1* : *P2* on mesonotum as 1 : 1.3 (the precise measurement of very short *P1a* is impossible). Mesonotum with 3 sensillae in anterolateral part (probably homologous with *P4*, *P4a* and *P5*), metanotum with 2 such sensillae (probably *P4* and *P5*). Only pore *sl* on mesonotum present, other pores on thoracal terga and sterna not observed. Seta *A2* on meso- and metasternum sensilla-shaped, other setae of thoracal sterna normally developed.

Sensilla *t1* on foretarsus present. All sensillae thick, stocky, with no inner structure. Length formula of sensillae: $f < (b = t1 = t2 = a') < t3 < e < (a = c = g = b' = c') < d$. Setae *β1* and *δ4* sensila-shaped. Claw (with no inner tooth) and empodial appendage short, BS 0.7—0.8, TR and EU unestablished.

Urotergite I—VII smooth, I—VI with no lineation, VII with two lines (in middle and in posterior half of tergite). Pore *psm* on urotergite I—VII and *al* on II—VII present, other pores absent. Setae *P1a* and *P4* on tergite I, and *P4a* on II—VI sensilla-shaped; additional setae on VII of normal shape, short. Abdominal legs with 4, 4, 2 setae, III leg with no terminal vesicle. Urosternite I—VI with no lineation, VII with one line in its posterior half. Sternite I—VI with no pores, VII with single medial pore.

Abdominal segment VIII with indistinct lineation. Striate band absent, only single line of irregular granulation present. Seta *P3a* sensilla-shaped. Comb VIII with 8 relatively long teeth. Tergite with pore *psm* (with no surrounding teeth), sternite with single medial pore, other pores absent. Lateral portion of hind margin of sternite with 5 subtle teeth, hind margin of pleurite smooth.

Abdominal segments IX—XII with indistinct lineation. Some lines on urotergite XII and lateral part of anterior line of urosternite IX indistinctly serrate. Posterior lamella on segment IX—XI broad, on tergites serrate, on sternites almost smooth. Seta *3a* on tergite IX and X sensilla-like. Tergite IX—XII with medial pore; sternite IX—XI with no pore, XII with 1+1 pores in anterolateral part. Hind margin of sternite XII with indistinct serration in lateral portion.

Squama genitalis ♀ with short, rounded acrostyli; males unknown. Body chaetotaxy as in Table III.

Maturi juniores differ from imagines in the presence of only 2 setae on urosternite XI, lack of setae *2a* and *3a* on urotergite X, and presence of larval seta on urosternite XII. Other instars unknown.

Dimensions (in μm) (in brackets — maturus junior): pseudoculus with no lever about 8 (6—7), with lever about 15 (13—14), filamento di sostegno

Table III

Body chaetotaxy of *Proturentomon stebaevae* sp. n.

		Dorsal		Ventral	
		setae	formula	setae	formula
Thorax	I	1, 2	4	A1, M1 P1, *2*, *3*	2+2 / 6
	II	M, A2 P1, 1a, 2, 3, 3a, 4, 4a, 5 *	4 / 16	A1, 2, 3, M ** P1, 2	6+2 / 4
	III	A2, M P1, 1a, 2, 3, 3a, 4, 5 *	4 / 14	A1, 2, 3, 4, M ** P1, 2	8+2 / 4
Abdomen	I	A1 P1, 1a, 2, 3, 3a, 4	2 / 12	A1, 2 P2	4 / 4
	II—III	A1 P1, 2, 3, 4, 4a, 5	2 / 12	A1, 2 Pc, 2	4 / 3
	IV—VI	A1 P1, 2, 3, 4, 4a, 5	2 / 10	A1, 2 P1, 2, 3	4 / 6
	VII	P1, 1a, 2, 3, 3a, 4, 4a, 5	0 / 16	A1 P1, 2, 3	2 / 6
	VIII	A1, 4, 5 P1, 1a, 2, 2a, 3, 3a, 5	6 / 14	1, 2	4
	IX	1, 1a, 2, 2a, 3, 3a, 4	14	1, 2	4
	X	1, 2, 3, *3a*, 4	10	1, 2	4
	XI	1, 2, 3	6		6 ***
	XII		9		0 **** / 8

Italics — supplementary setae,
* Setae *P4*, *4a*, and *3* sensilla-like.
** Seta *A2* sensilla-like.
*** In maturus junior: 2.
**** In maturus junior: $\frac{2}{8}$.

about 17 (about 12), mesonotal seta *P1* about 8 (about 6), *P2* about 11 (about 9), foretarsus about 48 (43—45). Other dimensions not measured.

Derivatio nominis: species dedicated to my friend, dr S. K. STEBAEVA of Novosibirsk, an eminent investigator of Siberian *Collembola*.

Material. Holotype ♀ (nr 2796): Ulusćerga, loc. 4., 25. VI. 1979. leg. M. KACZMAREK. Paratypes: 2 maturi juniores (nr 2797 and 2798), as holotype, and loc. 2., 20. VI. 1979.

Acerentomidae Silvestri, 1907; *Acerentominae* Yin, 1983

Filientomon sibiricum sp. n.

(figs 50—68)

Diagnosis. From all the species of *Filientomon* Rusek, 1974 the new species differs in the thick forestarsal sensilla *a* and in the lack of seta *A4'* on urotergite VII (comp. Imadaté, 1974). From *takanawanum* (Imadaté, 1956) it differs also (own observations based on the Japanese material) in the presence of the additional seta on head, and in the more posterior position of the group of pores on urosternites VI and VII — in *takanawanum* it is situated anteriorly to seta *Ac.*

Description. Head setae long, rostrum not protruded. Submedian additional seta of posterior part of head present. Setae of hind margin of head of normal shape. Pseudoculus shortened, with short lever, PR 18.0—19.0. Filamento di sostegno with small, indistinctly granulated calyx, short and relatively thick posterior filament, and with large, simple posterior dilation, CF 9.3—10.7. Maxillary palp short, stocky; basal sensillae equal, slender, almost seta-like. Labial palp well developed, with long, slender basal sensilla.

Nota with long main setae. Accessory setae of normal shape, relatively long. Length ratio of *P1* : *P1a* : *P2* on mesonotum as 1.3—1.5 : 1 : 2.2—2.4. Meso- and metanotum with pore *sl*, prosternum with no pores, meso- and metasternum with group of 4—6 small pores situated in anterior half of sternite. All setae of thoracal sternites of normal shape.

Foretarsus with no sensilla *b'*, with filiform *t1*, setiform *t2* and leaflike *t3*. Other sensillae long and slender; *a*, *b* and *a'* thicker than others. Sensilla *d* situated in half of distance *c-e*. Length formula of sensillae: $t3 < t1 < (g = t2) < (c = d = e = f = a') < (b = c') < a$. Setae $\beta 1$ and $\delta 4$ of normal shape, longer than setae $\delta 1$—$\delta 3$. Claw relatively short, with no inner tooth, or with trace of it; empodial appendage short. BS about 0.7, TR 2.8—3.1, EU 0.1—0.2.

Urotergite I—VII smooth, with one (I—II) or two (III—VII) anterior lines. All accessory setae of normal shape, relatively long. Pores *psm* on urotergite I—VII, *al* (without accompanying teeth) on II—VII and *psl* on VII present. Abdominal legs of normal *Acerella*-type. Urosternite I with no lineation, II with traces of two lines in anterolateral portion, III—VII with two continuous lines. All setae of sternites of normal shape. Sternite I—V with no pores, VI and VII with group of 3—6 small pores situated medially, posteriorly to seta *Ac.*

Abdominal segment VIII smooth, with few scattered granules in anterior portion and with well developed striate band. Comb VIII with S-shaped hind margin, consisting of 11—16 small teeth. Pore *psm* mostly with no accompanying teeth (sometime with 2—3 very small ones), other pores absent. Posterior margin of pleurite with 4—6 small teeth, of sternite smooth.

Table IV

Body chaetotaxy of *Filientomon sibiricum* sp. n.

		Dorsal		Ventral	
		setae	formula	setae	formula
Thorax	I	1, 2	4	A1, 2, M1, *2* P1, 2, 3	4+4 6
	II	A2, *3*, 4, M P1, 1a, 2, 2a, 3, 3a, 4, 5	8 16	Ac, 2, 3, M P1, 2	5+2 4
	III	A2, 3, 4, 5, M P1, 1a, 2, 2a, 3, 3a. 4, 5	10 16	Ac, 2, 3, 4, M P1, 2	7+2 4
Abdomen	I	A1, 2 3 P1, 1a, 2, 2a, 3, 3a, 4	6 14	Ac. 2 P1, 1a	3 4
	II	A1, 2, 3, 4, 5 P1, 1a, 2, 2a, 3, 4, 4a, 5	10 16	Ac, 2 Pc, 1a, 2	3 5
	III	A1, 2, 3, 4, 5 P1, 1a, 2, 2a, 3, 4, 4a, 5	10 16	Ac, 2, *3* Pc, 1a, 2	5 5
	IV—VI	A1, 2, 3, 4. 5 P1, 1a, 2, 2a, 3, 4, 4a, 5	10 16	Ac, 2, *3* P1, 1a, 2, 3	5 8
	VII	A1, 2, 3, 4, 5 P1, 1a, 2, 2a, 3, 3a, 4, 4a, 5	10 18	Ac, 2, 3 Pc, 1, 1a, 2, 3	5 9
	VIII	A1, 2, 4, 5 Pc, 1, 1a, 2, 2a, 3, 3a, 4	8 15	1, 2	4
	IX	1, *1a*, 2, 2a, 3, *3a*, 4	14	1, 2	4
	X	1, 2, *2a*, 3, 4	10	1, 2	4
	XI	1, 3, 4	6		6*
	XII		9		0 6

Italics — supplementary setae.
* In maturus junior: 2.

Abdominal segment IX—XII smooth, with no lineation. Seta *2a* on urotergite IX and X very short. Hind margin of all segments smooth, only hind margin of sternite XII with 9—10 small teeth. In anterior part of XII tergite median pore present; other segments with no pores.

Squama genitalis ♀ with pointed acrostyli; penis with additional pair of setae on ventral side of basiperiphallus. Chaetotaxy as in Table IV, body dimensions as in Table V.

Maturi juniores differ from the imagines in the chaetotaxy of urosternite XI (Tabl. IV) and in smaller body dimensions (Tabl. V). Younger instars unknown.

Derivatio nominis: named after the collecting region, Siberia (lat. Sibiria).

Material. Holotype ♀ (nr. 2775): Ulusčerga, loc. 2., 20. VI. 1979. leg. M. KACZMAREK. Paratypes (nr 2776—81) — together with holotype 1 ♀, 1 ♂, 1 praeimago ♂; loc. 1., 20. VI. 1979., 1 ♂, 1 praeimago ♀, 1 maturus junior.

Table V

Dimensions (in μm) of *Filientomon sibiricum* sp. n.

	Imago	Praeimago	Maturus junior
head	132—139	130	130
pseudoculus	7—9	7	7
filamento di sostegno	13—15	12	?
mesonotal *P1*	18—21	18	18
,, *P1a*	13—15	13	12
,, *P2*	30—32	27	28
foretarsus	94—97	86	83
claw	31—33	28	?
empodial appendage	3—5	4	?
N° of specimens	4	1	1

Acerellidae YIN, 1983; *Acerellinae* YIN, 1983

Key to the genera of the subfamily

1. Sensilla *t1* claviform 2
— Sensilla *t1* filiform 3
2. Urotergite IX and X with striate band . . . . . *Yavanna gen. n.*
— Urotergite IX and X without striate band . . . . . *Nosekiella* RUSEK, 1974
3. Calyx with long, racemose appendix . . . . . *Acerella* BERLESE, 1909
— Calyx without long appendix 4
4. Calyx with few strong papillae, pronotum with 3+3 setae . . *Callientomon* YIN, 1980*
— Calyx with many small papillae, pronotum with 2+2 setae 5
5. Sensilla *t3* globular . . . . . *Nienna gen. n.*
— Sensilla *t3* elongate 6
6. Sensilla *d* in half of distance between *c* and *e*, urotergite VIII with 2+2 anterior setae . . . . . *Paracerella* IMADATÉ, 1980
— Sensilla *d* nearer to *e* than to *c*, urotergite VIII with 3+3 anterior setae 7
7. Pseudoculus with long lever, foretarsal seta *β1* sesilla-shaped . . . . *Noldo gen. n.*
— Pseudoculus with short lever, foretarsal seta *β1* of normal shape . . . . . *Verrucoentomon* RUSEK, 1974

* Comp. also TUXEN, 1984.

Verrucoentomon aurifer sp. n.

(fig. 69—93)

Diagnosis. Both Siberian species of *Verrucoentomon* RUSEK, 1974 are characterized by the presence of seta *P2a'* on nota and by the flexed hind margin of comb VIII. They share these characters with *V. xinjiangense* YIN 1987 (YIN 1987) but differ from it in some details of foretarsal morphology. *V. aurifer* differs from all the species of the genus in very thick sensilla *c* on foretarsus and in the presence of seta *P3a'* on urotergite I. From *joannis* it differs in the shorter and thicker setae *A2* and *M2* on prosternum, and *A1* on meso- and metasternum.

Description. Head setae long, rostrum not protruded. Additional setae absent. All setae of hind margin of normal shape. Pseudoculus almost round, with short lever, PR 16.2—19.8. No additional pores. Filamento di sostegno with large, distinctly granulated calyx, relatively short posterior filament, and bilobed posterior dilation, CF 4.7—7.4. Maxillary palp short, stocky; basal sensillae equal, slender, almost seta-like. Labial palps well developed, with broad sensilla. Labium smooth.

Nota with main setae long. Setae *P1a*, *P2a* and *P2a'* short, relatively stocky, apically rounded, *P5* as small sensilla. Length ratio of *P1* : *P1a* : *P2* on mesonotum as 3.6—6.2 : 1 : 5.2—8.2. Setae *A2* and *M2* on prosternum, and *A2* on meso- and metasternum as *P1a* on nota, other sternal setae of normal shape. Pronotum and prosternum with no pore; meso- and metanotum with pore *sl*; meso- and metasternum with simple median pore situated in anterior part of sternite.

Foretarsus with no sensilla *b'*; sensilla *t1* filiform; *t3* leaf-like; *t2*, *d*, *f* and *c'* long and slender, seta-like; *c* remarkably broad and relatively short; *a* thinner than the other ones. Sensilla *d* situated nearer to *e* than to *c*; *a'* slightly distally to level of *t2*. Length formula of sensillae: $t3 < (c = e) < (a = b = t1) < (g = a') < d < t2\ (f = c')$. Seta *β1* of normal shape, subequal to *δ3*; *δ4* short, sensilla-like. Claw relatively short mostly with pair of small inner teeth (sometime with no teeth) empodial appendage short. BS 0.7—1.0 TR 2.7—2.9, EU about 0.1.

Urotergite I—VII smooth with two anterior lines more distinct on tergite IV—VII. Seta *P4* and *P3a'* on tergite I, and all other acces)ory setae on I—VI short and thin, similar to *P1a* on nota, but longer and more slender; on VII of normal shape. Pore *psm* on tergite I—VII, *psl* on VI and *al* (with some small accompanying teeth on VII) on II—VII present. Abdominal legs of normal *Acerella*-type. Urosternite I with no lineation, II—III with some lines in anterolateral portion, IV with two discontinuous, and V—VII with two continuous anterior lines. Seta *P1a* on sternite I—VI as *P1a* on nota, on VII of normal shape. Sternite I with three pores (median and pair of anterolateral), II—VII with one median pore situated on II—VI in middle of sternite (posteriorly to seta *Ac*), on VII anteriorly (on second anterior line).

Table VI

Chaetotaxy of *Verrucoentomon aurifer* sp. n.

		Dorsal		Ventral	
		setae	formula	setae	formula
Thorax	I	**1, 2**	4	**A1**, *2*, **M1**, 2 **P1**, **2**, 3	4+4 6
	II	**A2**, 3, 4, **M** **P1**, 1a, **2**, *2a'*, 2a, **3**, 3a, **4**, **5**	8 18	**Ac**, **1**, **2**, **M** P1, **2**	5+2 4
	III	**A2**, 3, 4, **M** **P1**, 1a, **2**, *2a'*, 2a, **3**, 3a, **4**, 5	8 18	**Ac**, **1**, **2**, 3, **M** P1, **2**	7+2 4
Abdomen	I	**A1**, 2 **P1**, 1a, **2**, 2a, **3**, *3a*; 3a, **4**	4 16	Ac, 2 **P1**, **1a**	3 4
	II	**A1**, 2, *3*, 4, 5 **P1**, 1a[1], **2**, 2a, **3**, **4**, 4a, **5**	10 16	**Ac**, 2 Pc, 1a, **2**	3 5
	III	**A1**, *2*, *3*, 4, 5 **P1**, 1a[1], **2**, 2a, **3**, **4**, 4a, **5**	10 16	**Ac**, 2 P1, 1a, **2**	3 6
	IV—VI	**A1**, 2, *3*, 4, 5 **P1**, 1a[1], **2**, 2a, **3**, **4**, 4a, **5**	10 16	**Ac**, *1*[2], 2 P1, 1a, **2**, **3**	5 8
	VII	**A1**, 2, 4, 5 **P1**, 1a, **2**, 2a, **3**, **4**, 4a, **5**	8 16	**Ac**, 2 Pc, **1**, 1a, **2**, **3**	3 9
	VIII	**A1**, 4, 5 Pc, **1**, **1a**, **2**, **2a**, **3**, 3a, **5**	6 15	**1**, **2** **1a**	4 2
	IX	1, *1a*, 2, 2a, 3, 4	12	1, 2	4
	X	1, 2, *2a*, 3, 4	10	1, 2	4
	XI	1, 3, 4	6		6[3]
	XII		9		6[4]

Fat print — primary setae, normal print — secondary and tertiary setae, *italics* — supplementary setae.

[1] Variable in maturus junior; [2] Variable in praeimago and imago; [3] In maturus junior: 2; [4] In larva I: $\frac{2}{6}$.

Abdominal segment VIII smooth, with one (on tergite) or two (on sternite) rows of irregulary scattered granules in anterior part, and with well developed striate band. Comb VIII with slightly convex hind margin composed of 10—18 small, regular teeth. Pore *psm* mostly with some small accompanying teeth, other pores absent. Posterior margin of pleurite and sternite smooth.

Abdominal segments IX—XII with lineation only in anterior part. Pectinate

structures absent, but in anterior part of tergite IX and X irregular row of large granules present. Seta *2a* on tergite IX and X short. Hind margin of tergite X—XI with very subtle (mostly hardly visible) serration. Tergite XII with single median pore, urosternite XII with pair of anterolateral pores, other segments with no pore. Hind margin of sternite XII smooth.

Squama genitalis ♀ with long, apically rounded acrostyli; penis with pair of additional setae situated near bases of apodemae. Chaetotaxy as Table VI, body dimensions as table VII.

Table VII

Dimensions (in μm) of *Verrucoentomon aurifer* sp. n.

	Imago	Praeimago	Maturus junior	Larva I
head	142—177	132—138	126—131	130
pseudoculus	7—10	7—8	7—8	6
filamento di sostegno	19—32	24—27	20—23	19
mesonotal *P1*	25—34	23—29	20—23	?
,, *P1a*	7—9	5—7	5—7	?
,, *P2*	38—45	32—35	27—28	?
foretarsus	93—111	88—93	72—82	58
claw	33—40	?	?	24
empodial appendage	3—6	?	?	4
N° of specimens	5	2	2	1

In praeimago pores *psm* on urotergite I—III, pore *psl* on VI, and median pore on usosternite I—III lacking. In maturus junior also pore *sl* on nota, *al* on urotergite II, and medial pore on metanotum and on urosternite IV absent. In larva I only pore *psm* on urotergite V, VI and VIII, and median pore on urotergite XII present; foretarsal sensilla *c'* is absent. For chaetotaxy and body dimensions of younger instars see Table VI and VII.

Derivatio nominis: auri-fer (lat.) — bringing gold, because the Mongolian name for Altai Mts (Altain-ula) means "Mountains of Gold".

Material. Holotype ♂ (nr 2803) and paratypes (nr 2799—2801, 2804—06, 2808—10) — 3 ♀, 1 ♂, 2 praeimago ♂, 2 maturi juniores, 1 larva I: Ulusčerga, loc. 2., 20. VI. 1979., leg. M. Kaczmarek.

Verrucoentomon joannis sp. n.
(figs 94—102)

Diagnosis — see *aurifer* sp. n.

Description. Head, mouthparts, pseudoculus and filamento di sostegno as in *aurifer*. Labium with row of small granules in inner part. PR 18.0—29.0, CF 4.6—5.6.

Thoracal segments as in *aurifer*, only setae *P1a*, *P2a*, *P2a'* on nota, setae *A2* and *M2* on prosternum, and *A1* on meso- and metasternum longer and thiner than in previous species, subequal to accessory setae on abdominal terga. Length ratio of mesonotal *P1* : *P1a* : *P2* as 2.9—4.2 : 1 : 4.5—5.4 (in maturus junior 2.4—2.8 : 1 : 3.3—4.0).

General characters of foretarsus as in *aurifer*, but all sensillae slender, *b* and *g* thicker than others, *e* remarkable thin. Length formula of sensillae: $t3 < t1 < (c = e = a') < g < (b = a) < d < (f = t2) < c'$. Claw long, always with pair of strong inner teeth, empodial appendage short. BS 0.7—0.8, TR 2.7—2.9, EU 0.2—0.3.

Table VIII

Dimensions (in μm) of *Verrucoentomon joannis* sp. n.

	Imago	Praeimago	Maturus junior
head	139—149	153	126—130
pseudoculus	7—8	7	6—7
filamento di sostegno	24—32	18	24—26
mesonotal *P1*	26—36	?	19—22
,, *P1a*	8—9	7	7—9
,, *P2*	41—45	30	28—30
foretarsus	91—96	78	79—81
claw	32—35	27	27
empodial appendage	7—9	9	6
N° of specimens	6	1	2

Abdominal segments as in *aurifer*, but *P4* on urotergite I and accessory setae on tergite I—VI subequal to *P1a* on nota (not longer).

Squama genitalis ♀ and penis as in *aurifer*. Chaetotaxy as in *aurifer* with exception of urotergite I (where seta *P3a'* is lacking) and urotergite VI (where *P3a* in some specimens is present). Body dimensions as in Table VIII.

Development of porotaxy similar to that in *aurifer*, but in praeimago and maturus junior pore *psl* is present.

Derivatio nominis: named in the memory of my Father, Jan (Joannes) Szeptycki.

Material: Holotype ♂ (nr 2816): Uluščerga, loc. 4., 25. VI. 1979., leg. M. Kaczmarek. Paratypes (nr 2807, 2811—15, 2817, 18): together with holotype: 1 ♂, 1 ♀, 1 maturus junior; 30. VI. 1979.: 1 ♀, 1 praeimago ♂, 1 maturus junior; loc. 3., 30. VI. 1979.: 1 ♀; loc. 1., 30. VI. 1979.: 1 ♀.

Noldo gen. n.

Pseudoculus round, with relatively long lever. Calyx of filamento di sostegno simple, small, with subtle granulation. Basal sensillae of maxillary palp equal, thin, nearly seta-like. Labial palp with well developed terminal tuft, and broad, leaf-like sensilla. Labium smooth. Metanotum with 3+3 anterior setae *(A2, A3, A4)*, seta *P2a* on nota nearer to *P3* than to *P2*. Prosternum with seta *A2*. Foretarsus with no sensilla *b'*; sensilla *t1* filiform, *t3* leaf-like; *b* and *c* nearly on same level; *d* nearer to *e* than to *c*; *a'* slightly proximally to level of *t2*; seta *β1* and *δ4* sensilla-shaped. Seta *P3* on urotergite II—VI in posterior ("normal") position. Abdominal legs with 4, 2, 2, setae, subapical seta of leg II and III long. Abdominal segment VIII with well developed striate band and $^4/_2$ setae on sternite. Hind margin of comb VIII straight. Abdominal segment IX and X with no striate band. Hind margin of urotergite X and XI with very subtle (hardly visible) serration, other margins of last abdominal segments smooth. Squama genitalis ♀ with relatively short, pointed acrostyli; penis with no additional setae.

Type species: *Noldo submontanus* sp. n.

Remarks. According the classification of *Protura* by YIN (1984) the new genus belongs to the family *Acerellidae* YIN (subfam. *Acerellinae*). It is most similar to *Verrucoentomon* RUSEK, 1974, but differs in the shape of pseudoculus and seta *β1* on foretarsus (seta *δ4* in both genera is of the same shape). There are no data about the shape of *β1* and *δ4* in all the species of the genus *Verrucoentomon*, but *β1* of normal shape and sensilla-shaped *δ4* were recorded in *V. canadensis* (TUXEN, 1955) (TUXEN 1955, fig. 4), *imadatei* NOSEK, 1977 (NOSEK, 1977, fig. 4*B*), *mixtum* NOSEK, 1981 (NOSEK, 1981, fig. 3*B*), and *shirampa* (IMADATE, 1964) (own data, based on the Japanese material).

There are no data about the sternal porotaxy of *Verrucoentomon*. In *V. shirampa* on urosternite II—VI single median pore is present (in some specimens duplicated on sternite IV and V), situated posteriorly to *Ac*. The position of single pore on sternite VII is very variable — it can be situated anteriorly to *Ac*, on the level of this seta (asymmetrically), or posteriorly to it — in the half of the distance between *Ac* and hind margin of the sternite. In *Noldo submontanus* there is also single median pore, but on urosternite II—VI it is situated on the anterior sternal line, and on VII situated posteriorly, near the hind margin of the sternite. The lack of data concerning the sternal protaxy in other genera of *Acerentomoidea* do not allow to estimate this differences.

The morphology of the penis in *V. shirampa* is similar to that in *N. submontanus*, but there are no reliable data concerning this character in other species of *Verrucoentomon*.

Noldo submontanus sp. n.

(figs 103—125)

Description. Head setae long, rostrum not protruded. Additional setae absent, setae of hind margin of normal shape. Pseudoculus round, with long lever, PR 17.2—26.3. No additional pores. Filamento di sostegno with small, densely granulated calyx, long and slender posterior filament, and simple posterior dilation, CF 6.1—7.3. Maxillary palp short, stocky; basal sensillae equal, slender, nearly seta-like. Labial palp well developed, with broad basal sensilla. Labium smooth.

Main setae on nota short, *P1a* and *P2a* short and thin, hair-like; *P2a* nearer to *P3* than to *P2*; *P5* as small sensilla. Length ratio of *P1* : *P1a* : *P2* on mesonotum as 2.0—2.5 : 1 : 2.8—3.2. Meso- and metanotum with pore *sl*, sterna with no pore. Setae *A2* and *M2* on prosternum, and *A2* on meso- and metasternum very thin, hair-like; other sternal setae of normal shape.

Foretarsus with no sensilla *b'*; sensilla *t1* filiform; *t3* short, leaf-like; *t2*, *f*, and *c'* nearly seta-like; others slender, equally broad. Length formula of sensillae: $t3 < (c = e) < (b = d = t1) < (a = e) < (f = t2 = a' = c')$. Sensilla *d* nearer to *e* than to *c*; *a'* slightly proximally to level of *t2*. Setae *β1* and *δ4* sensilla-like, equal. Claw short, with no inner teeth; empodial appendage short. BS 0.9—1.0, TR 3.1—3.7, EU about 0.2.

Urotergite I—VII smooth, with two lines in anterior part. Seta *P4* on urotergite I and accessory setae on I—VI thin, hair-like, on VII equal in length to that on previous tergites, but thicker. Pore *psm* on tergite I—VII, *psl* on VII, and *al* (with some small accompanying teeth on tergite VII) on II—VII present. Abdominal legs of normal *Acerella*-type. Setae *P2* on sternite I—III and *P1a* on IV—VI thin, hair-like; on VII of normal shape. Urosternite I with three simple pores (median and two anterolateral), II—VI with single median pore situated anteriorly, VII with single median pore situated near hind margin of sternite.

Abdominal segment VIII smooth, with one row of small, scattered granules, stronger and more numerous on tergite, and with well developed striate band. Comb VIII with straight hind margin composed of 10—12 long, slender teeth. Pore *psm* with no surrounding teeth, other pores absent. Hind margin of sternite and pleurite smooth.

Abdominal segments IX—XII smooth. Tergite IX with two subtle serrate lines in lateral part. Seta *2a* on tergite IX and X short. Posterior margin of urotergite X and XI with very subtle, hardly visible serration, other segmental margins smooth. In anterior part of tergite XII medial pore present, other pores absent.

Squama genitialis ♀ with short, pointed acrostyli, penis with no additional setae. Body chaetotaxy as in Table IX, body dimensions as in Table X.

In praeimago pore *psl* on urotergite VII, *al* on II—III, and median pore on urosternite I—III are absent. In maturus junior also pore *psm* on uro-

Table IX

Body chaetotaxy of *Noldo submontanus* sp. n.

		Dorsal		Ventral	
		setae	formula	setae	formula
Thorax	I	**1, 2**	4	**A1, 2, M1, 2** **P1, 2, 3**	4+4 6
	II	**A2, 3, 4, M** **P1, 1a, 2, 2a, 3, 4, 4a, 5**	8 16	**Ac, 1, 2, M** **P1, 3**	5+2 4
	III	**A2, 3, 4, M** **P1, 1a, 2, 2a, 3, 4, 4a, 5**	8 16	**Ac, 1, 2, 3, M** **P1, 3**	7+2 4
Abdomen	I	**A1, 2** **P1, 1a, 2, 2a, 3, 3a, 4**	4 14	**Ac, 1** **P1; 1a**	3 4
	II—III	**A1, 2,** *3,* **4, 5** **P1, 1a, 2, 2a, 3, 4, 4a, 5**	10 16	**Ac, 1** **P, 1a, 2**	3 5
	IV—VI	**A1, 2,** *3,* **4, 5**[1] **P1, 1a, 2, 2a, 3, 4, 4a, 5**	10 16	**Ac, 1** **P1, 1a, 2, 3**	3 8
	VII	**A2, 3, 4, 5** **P1, 1a, 2, 2a, 3, 4, 4a, 5**	8 16	**Ac, 1** **P1, 1a, 2, 3**[2]	3 8
	VIII	**A1, 4, 5** **Pc, 1, 1a, 2, 2a, 3, 3a, 5**	6 15	**1, 2** **1a**	4 2
	IX	**1,** 1a, 2, 2a, **3, 4**	12	**1, 2**	4
	X	1, 2, 2a, 3, 4	10	1, 2	4
	XI	1, 3, 4	6		6
	XII		9		0 6

Fat print — primary and secondary setae, normal print — tertiary setae, *italics* — supplementary seatae.

[1] in one adult symmetrical lack of *A3* on urotergite VI, [2] in one adult *Pc* present.

tergite I—II, and anterolatesal pores on urosternite I are lacking. In larva II only pore *psm* on urotergite V—VII, pore *al* on VII and median pore on XII are present. Larva I unknown. For chaetotaxy and body dimensions of younger instars see Table IX and X.

Derivatio nominis: sub-montanus (lat.) — connected with the feet of mountains.

Material: Holotype ♀ (nr 2752): Ulusčerga, loc. 2., 20. VI. 1979., leg. M. Kaczmarek Paratypes: together with holotype, 8 ♀, 4 ♂, 1 praeimago ♂, 6 maturi juniores, Zlarvae II (nr 2751, 2753—72). Mixed forest 25 km S of Novosibirsk, litter under *Pinus sibirica*, leg. I. V. Stebaev, 5. IX. 1978., 1 ♀, 1 maturus junior (nr 2773, 74).

Table X

Dimensions (in μm) of *Noldo submontanus* sp. n.

	Imago	Praeimago	Maturus junior	Larva II
head	126—147	122	107—121	101—104
pseudoculus	5—8	6	6—7	5—6
filamento di sostegno	16—23	18	15—19	15—19
mesonotal *P1*	17—23	19	15—18	15
,, *P1a*	9—10	9	7—8	9
,, *P2*	24—32	24	19—25	18—19
foretarsus	81—90	77	66—78	59—62
claw	23—28	?	24—25	?
empodial appendage	4—6	?	4—5	?
body length	1240	?	1110	?
N° of specimens	14	1	7	2

Yavanna gen. n.

Pseudoculus round, with short lever. Calyx of filamento di sostegno simple, large, with small granulation. Basal sensillae of maxillary palp equal, thin, nearly seta-like. Labial palp good developed, with broad basal sensilla. Labium with small granulation. Metanotum with 3+3 anterior setae *(A2, A3, A4)*, seta *P2a* on nota nearer to *P3* than to *P2*. Prosternum with no seta *A2*. Foretarsus with no sensilla *b'*; sensilla *t1* claviform; *t3* leaf-like; *b* and *c* nearly on same level; *d* nearer to *e* than to *c*; *a'* distally to level of *t2*; seta *β1* of normal shape, *δ4* sensilla-shaped. Seta *P3* on urotergite II—VI in posterior position. Abdominal legs with 4, 2, 2 setae, subapical seta of leg II and III long. Abdominal segment VIII with well developed striate band, and with $^4/_2$ setae on sternite. Hind margin of comb VIII slightly convex. Urosternite IX and X with distinct striate band. Hind margin of urotergite X and XI smooth. Squama genitalis ♀ with blunt acrostyli, males unknown.

Type species: *Yavanna altaica* sp. n.

Remarks. The new genus belongs to the family *Acerellidae* YIN (subfam. *Acerellinae*). In the foretarsal morphology, and in the shape of calyx is most similar to *Nosekiella* RUSEK, 1974. With *N. danica* (CONDÉ, 1947) it shares also the lack of seta *A2* on prosternum — but seta *A2* presents in *N. urasi* IMADATÉ, 1981 (IMADATÉ, 1981). The most peculiar character of the new genus is the presence of the striate band on urosternite IX and X. It was described till now only in the genus *Sugaentulus* IMADATÉ, 1978 (IMADATÉ, 1978, fig. 3*E*), but that genus differs from *Yavanna* in several details and belongs (according YIN, 1984) to the different family.

Yavanna altaica sp. n.

(figs 126—147)

Description. Head setae long, rostrum not protruded. Additional setae absent, setae of hind margin of normal shape. Pseudoculus shortened, with short lever, PR about 19. No additional pores. Filamento di sostegno with large, distinctly granulated calyx, long posterior filament and simple posterior dilation, CF about 5. Maxillary palp short, stocky; basal sensillae equal, slender, nearly seta-like. Labial palp well developed, with broad basal sensilla. Labium with very subtle granulation.

Nota with long main setae, setae *P1a* and *P2a* short, sensilla-shaped; *P2a* situated in half of distance *P1-P2*. Length ratio of *P1* : *P1a* : *P2* on mesonotum as 5 : 1 : 7. Meso- and metanotum with pore *sl*, prosternum with no pore; mesosternum with small single median pore; metasternum with single median and two big posterolateral pores. Seta *M2* on prosternum, and *A2* on meso- and metasternum sensilla-shaped, other sternal setae of normal shape.

Foretarsus with no sensilla *b'*; sensilla *t1* claviform; *t3* leaf-like; *t2*, *d*, *f*, and *c'* nearly seta-like; *b*, *g*, and *a'* thick; others slender. Sensilla *d* situated nearer to *e* than to *c*; *a'* distally to level of *t2*. Length formula of sensillae: $t3 < t1 < (c = g) < (n = e) < a < a' < t2 < (d = f = c')$. Seta *β1* of normal shape, longer than *δ1*, *δ*⁻ sensilla-like. Claw long, with strong, single inner tooth, empodial appendage relatively long. BS about 0.7, TR about 2.9, EU about 0.3.

Urotergite I—VII smooth with two lines in anterior part. Seta *P4* on urotergite I and additional setae on urotergite I—VI short, sensilla-shaped, on VII of normal shape, short. Pore *psm* on tergite I—VII, and *al* (with no surrounding teeth) on II—VII present, *psl* absent. Abdominal legs of normal *Acerella*-type. Urosternite I with no lineation, II—VII with two lines in anterior part, anterior of them on II—VI medially interrupted. All sternal setae of normal shape. Urosternite I—IV with simple median pore, V—VII with group of one big and 1—3 small pores situated medially in anterior portion of sternite.

Abdominal segment VIII smooth with one (on tergite) or two (on sternite) serrated lines. Striate band well developed. Comb VIII with slightly convex hind margin composed of 10—13 long, regular teeth. Pore *psm* with 2—3 small accompanying teeth, other pores absent. Hind margin of pleurite and sternite smooth.

Abdominal segment IX—XII smooth, without serrated lines. Seta *2a* on urotergite IX and X short. Posterior margins of all segments smooth. Urotergite XII with single median pore, other pores absent. Sternite IX and X with well developed striate band.

Squama genitalis ♀ with short, apically rounded acrostyli, males unknown. Body chaetotaxy as in Table XI.

Dimensions (in μm) (in brackets — paratype): head? (146), pseudoculus 8

Table XI

Body chaetotaxy of *Yavanna altaica* sp. n.

		Dorsal		Ventral	
		setae	formula	setae	formula
Thorax	I	1, 2	4	A1, M1, 2 P1, 2, 3	2+4 6
	II	A2, 3, 4, M P1, 1a, 2, 2a, 3. 3a, 4, 5	8 16	Ac, 1. 2. M P1, 2	5+2 4
	III	A2, 3, 4, M P1, 1a, 2, 2a, 3. 3a, 4, 5	8 16	Ac, 1, 2, 3, M P1, 2	7+2 4
Abdomen	I	A1, 2 P1, 1a, 2, 2a, 3, 3a, 4	4 14	Ac, 2 P1, 1a	3 4
	II—III	A1, 2, 3, 4, 5 P1, 1a, 2, 2a, 3, 4, 4a, 5	10 16	Ac, 2 Pc, 1a, 2	3 5
	IV—VI	A1, 2, 3, 4, 5 P1, 1a, 2, 2a, 3, 4, 4a, 5	10 16	Ac, 2 P1, 1a, 2, 3	3 8
	VII	A2, 3, 4, 5 P1, 1a, 2, 2a, 3, 4, 4a, 5	8 16	Ac, 2 Pc, 1, 1a, 2, 3	3 9
	VIII	A1, 4, 5 Pc, 1, 1a, 2, 2a, 3, 3a, 5	6 15	1, 2 1a	4 2
	IX	1, 1a, 2, 2a, 3, 4	12	1, 2	4
	X	1, 2, 2a, 3, 4	10	1, 2	4
	XI	1, 3, 4	6		6
	XII		9		0 6

(7), filamento di sostegno 30 (28), mesonotal seta *P1* 25 (?), *P1a* 5 (?), *P2* 39 (?), foretarsus 112 (91), claw 39 (31), empodial appendage 10 (10).

Younger instars unknown.

Derivatio nominis: altaica — from Altai Mts.

Material. Holotype ♀ (nr 2790) — Ulusčerga, loc. 3., 30. VI. 1979. Paratype ♀ (nr 2789), loc. 4., 30. VI. 1979. leg. M. Kaczmarek.

Nienna gen. n.

Pseudoculus round, with short lever. Filamento di sostegno small, with simple calyx. Basal sensillae of maxillary palp equal, thin, nearly seta-like. Labial palp with well developed terminal tuft and broad sensilla. Labium

smooth. Metanotum with 3+3 anterior setae *(A2, A3, A3)*, seta *P2a* on nota nearer to *P3* than to *P2*. Prosterum with no seta *A2*. Foretarsus with no sensilla *b'*; sensilla *t1* filiform; *t3* globular; *b* and *c* nearly on same level; *d* nearer to *e* than to *c*; *a'* proximally to level of *t2*; setae *β1* and *δ4* of normal shape, subequal to setae *δ1* — *δ3*. Seta *P3* on urotergite II—VI in posterior position. Abdominal legs with 4, 2, 2 setae, subapical seta of leg II and III long. Abdominal segment VIII with well developed striate band and $^1/_2$ setae on sternite. Hind margin of comb VIII straight. Urosternite IX and X with traces of striate band. Hind margin of urotergite X and XI with subtle striation, other margins of last abdominal segments smooth. Squama genitalis ♀ with short, pointed acrostyli, males unknown.

Type species: *Nienna parvula* sp. n.

Remarks. The new genus (similarly as both genera described above) belongs to the family *Acerellidae* (subfam. *Acerellinae*) and is most similar to the genus *Verrucoentomon*. It differs in the relatively smaller filamento di sostegno (but with calyx of identical structure as in *Verrucoentomon*), in the shape of sensilla *t3* on foretarsus, and the shape of accessory setae on abdominal terga.

Nienna parvula sp. n.

(figs 148—162)

Description. Head setae short, rostrum not protruded. Submedial additional seta present, sublateral absent. Setae of hind margin of normal shape. Pseudoculus round, with short lever, PR about 13. No additional pores. Filamento di sostegno with small, indistinctly granulated calyx, short posterior filament and simple posterior dilation, CF about 8. Maxillary palp short, stocky; basal sensillae equal, slender, nearly seta-like. Labial palp well developed, with broad basal sensilla. Labium smooth.

Nota with short main setae, *P1a*, *P2a* and *P5* as very short sensillae. Seta *P2a* slightly nearer *P2* than *P3*. Length ratio of *P1* : *P1a* : *P2* on mesonotum as 5 : 1 : 7. Meso- and metanotum with pore *sl*, thoracal sterna with no pore. Seta *M2* on prosternum and *A2* on meso- and metasternum sensilla-like, other sternal setae of normal shape.

Foretarsus with no sensilla *b'*; sensilla *t1* filiform; *t3* globular; *d*, *f*, and *t2* nearly seta-like; *c'* slender; other sensillae short and thick. Sensilla *d* nearer to *e* than to *c*; *a'* proximally to level of *t2*. Length formula of sensillae: $t3 < e < (c = t1) < a' < (b = g) < (d = t2) < (a = c') < f$. Setae *β1* and *δ4* of normal shape, short, subequal to setae *δ1* — *δ3*. Claw (with no inner teeth) and empodial appendage short. BS 0.8, TR 3.3, EU 0.1.

Urotergite I—VII smooth; I—VI with almost invisible lineation, VII with two lines in anterior part. Seta *P4* on urotergite I and accessory setae on I—VI as small sensillae; on VII of normal shape, short. Pore *psm* on tergite I—VII,

Table XII

Body chaetotaxy of *Nienna parvula* sp. n.

		Dorsal		Ventral	
		setae	formula	setae	formula
Thorax	I	1, 2	4	A1, M1, 2 P1, 2, 3	2+4 6
	II	A2, 3, 4, M P1, 1a, 2, 2a, 3, 3a, 4, 5 *	8 16	Ac, 1, 2, M P1, 2	5+2 4
	III	A2, 3, 4, M P1, 1a, 2, 2a, 3, 3a, 4, 5 *	8 16	Ac, 1, 2, 3, M P1, 2	7+2 4
Abdomen	A1, 2	A1, 2 P1, 2, 2a, 3. 3a, 4	4 12	Ac. 2 P1, 1a	3 4
	II—III	A1, 2, 3, 4, 5 P1, 2, 2a, 3, 4, 4a, 5	10 14	Ac, 2 Pc, 1a, 2	3 5
	IV—VI	A1, 2, 3, 4, 5 P1, 2, 2a, 3, 4, 4a, 5	10 14	Ac, 2 P1, 1a, 2, 3	3 8
	VII	A2, 3, 4, 5 P1, 1a, 2, 2a, 3, 4, 4a, 5	8 16	Ac, 2 P1, 1a, 2, 3	3 8
	VIII	A1, 4, 5 Pc, 1, 1a, 2, 2a, 3, 3a, 5	6 15	1, 2 1a	4 2
	IX	1, 1a, 2, 2a, 3, 4	12	1, 2	4
	X	1, 2, 2a, 3, 4	10	1, 2	4
	XI	1, 3, 4	6		6
	XII		9		0 6

* Setae *P1a* and *P2a* sensilla-like.

psl on VII, *al* (with no surrounding teeth) on II—VII present. Abdominal legs of normal *Acerella*-type. Lineation of sternite I—VI nearly invisible, on VII two lines in anterior part. All setae of sternites of normal shape. Sternite I—V with no pore, VI and VII with single median pore in posterior part of sternite.

Abdominal segment VIII smooth, in anterior part with one iregular row of scattered granules. Striate band well developed. Comb VIII with straight hind margin composed of 8 regular teeth. Pore *psm* with no accompanying teeth, other pores absent. Hind margin of sternite and pleurite smooth.

Abdominal segment X—XII smooth. Tergite IX with one subtle serrated line in lateral part. Seta *2a* on tergite X and X long. Posterior margin of tergite X and XI with subtle, hardly visible serration. Urosternite IX with traces of striation in anterior part. Urotergite XII with single median pore, other pores absent. Hind margin of urosternite XII smooth.

Squama genitalis ♀ with very short, pointed acrostyli; males unknown. Chaetotaxy as in Table XII.

Dimensions (in μm): head 97, pseudoculus 7, filamento di sostegno 12, mesonotal seta *P1* 8, *P1a* 2, *P2* 11, foretarsus 62, claw 19, empodial appendage 2, body length about 920.

Younger instars unknown.

Derivatio nominis: parvula (lat.) — small.

Material: Holotype ♀ (nr 2802) — Ulusčerga, loc. 2., 20. VI. 1979. leg. M. KACZMAREK.

Remarks. The *Nienna* gen. n. seems to be widely distributed in Siberia. I have also one damaged specimen from Listvianka on Bajkal Lake (leg. A. SZEPTYCKI), probably conspecific with *parvula*. The state of preservation of this specimen does not allow the exact determination.

Acerellidae YIN, 1983; *Nipponentominae* YIN, 1983

Imadateiella murka sp. n.

(figs 163—185)

Diagnosis. The new species differs from all the species of *Imadateiella* RUSEK, 1974 (IMADATE, 1961, 1964, 1974; MARTYNOVA, 1977; YIN, 1980) in very long and thick sensilla *b*, very long sensilla *d*, and in the presence of seta *P2a'* on nota.

Description. Head setae very long, rostrum not protruded Additional setae absent, setae of hind margin of normal shape. Pseudoculus shortened, with short lever, PR 18—28. No additional pores. Filamento di sostegno large, with large, densely granulated calyx, long and slender posterior filament and simple posterior dilation, CF 3.5—4.1. Maxillary palps short, stocky; basal sensillae equal, slender, nearly seta-like. Labial palps well developed, with broad basal sensilla. Labium with indistinct granulation in inner part.

Nota with very long main setae, setae *P1a*, *P2a* and *P2a'* very short and thin, apically brush-like, *P5* as small sensilla. Length ratio of *P1* : *P1a* : *P2* on mesonotum as 5.3—6.8 : 1 : 6.5—8.2. Meso- and metanotum with pore *sl*, prosternum with no pores, meso- and metasternum with single median pore in anterior part of sternite. Setae *A2* and *M2* on prosternum, and *A2* on meso- and metasternum sensilla-like, other sternal setae of normal shape.

Foretarsus with no sensilla *b'*; sensilla *t1* filiform; *t3* leaf-like; *d*, *f*, *t2* and *c'* nearly seta-like; other sensillae slender. Sensilla *d* nearer to *e* than to *c*; *a'* slightly distally to level of *t2*. Length formula of sensillae: $t3 < (c = e) < g < a' < (a =$

Table XIII

Body chaetotaxy of *Imadateiella murka* sp. n.

		Dorsal		Ventral	
		setae	formula	setae	formula
Thorax	I	**1, 2**	4	**A1, 2, +1, 2** **P1, 2, 3**	4+4 6
	II	A2, 3, **4, M** **P1, 1a, 2,** 2a, 2a', 3, 3a, **4,** 5	8 18	**Ac, 2, 3, M** **P1,** 2	5+2 4
	III	A1, **2,** 3, **4, M** **P1, 1a,** 2, 2a, 2a', 3, 3a, 4, 5	10 18	**Ac, 2, 3, 4,** M **P1,** 2	7+2 4
Abdomen	I	A1, 2 **P1** 1a **2, 2a,** 3, 3a, 4	4 14	**Ac, 2** **P1,** 1a	3 4
	II	A1, 2, 3, 4, 5 **P1,** 1a, **2, 2a,** 3, **4, 4a, 5**	10 16	Ac, 2 **Pc,** 1a, **2**	3 5
	III	A1, 2, 3, 4, 5 **P1,** 1a, **2, 2a,** 3, 4, **4a, 5**	10 16	Ac, 2 P1, **1a,** 2 *	3 6
	IV—VI	A1, 2, 3, 4, 5 **P1,** 1a, **2, 2a,** 3, **4, 4a, 5**	10 16	**Ac,** 2 **P1, 1a, 2, 3**	3 8
	VII	A2, 3, 4, 5 **P1, 2, 2a,** 3, **4, 4a,** 5	8 14	**Ac,** 2 **Pc,** 1, **1a, 2,** 3 **	3 9
	VIII	A1, **4,** 5 **Pc, 1, 1a, 2, 2a,** 3, 3a, **5**	6 15	**1, 2**	4
	IX	**1,** 1a, **2,** 2a, **3, 4**	12	**1, 2**	4
	X	1, 2, 2a, 3, 4	10	1, 2	4
	XI	1, 3, 4	6		6
	XII		9		0 *** 6

Fat print — primary and secondary setae.
* In larva II: *Pc, 1a, 2*; ** In one imago *Pc* absent; *** In larva II: $\frac{2}{6}$.

$= b = t2 = d) < (f = c')$. Seta *β1* of normal shape, longer than *δ1 — δ3*; *δ4* very short, sensilla-like. Claw very long and slender, with small, single inner tooth. Empodial appendage short, pointed. BS 0.6—0.7, TR 2.2—2.4, EU about 0.2.

Urotergite I—VII smooth with two lines in anterior part. Seta *P4* on urotergite I and accessory setae on I—VI sensilla-like (as seta *P1a* on nota); on VII of normal shape, short. Pore *psm* on tergite I—VII, *psl* on VII and *al* (with no surrounding teeth) on II—VII present. Abdominal legs of normal

Acerella-type. Urosternite I with trace of single line in anterolateral portion, II—VII with two lines in anterior part. All sternal setae of normal shape. Sternite I with pair of single pores in anterolateral part, II—VII with three pores — smaller median and two large lateral — situated in anterior part of sternite.

Abdominal segment VIII smooth, with two irregular rows of scattered granules in anterior part, and well developed striate band. Pore *psm* surrounded by some small teeth, other pores absent. Comb VIII with straight hind margin composed of 11—14 regular, short teeth. Hind margin of pleurite and sternite smooth.

Abdominal segment IX—XII smooth. Tergite IX and X with two, XI with one subtle serrated line in lateral part. Hind margin of urotergite IX and X with subtle, hardly visible serration. Seta *2a* on urotergite IX and X short. Tergite XII with single median pore, other pores absent. Hind margin of sternite XII smooth.

Squama genitalis ♀ with long, pointed acrostyli; penis with no additional setae. Chaetotaxy as in Table XIII.

Dimensions (in μm) (in brackets — larva II): head 139—179 (117), pseudoculus 6—8 (5), filamento di sostegno 38—44 (29), mesonotal seta *P1* 47—62 (?), *P1a* 7—11 (?), *P2* 58—70 (38), foretarsus 102—114 (72), claw 44—51 (30), empodial appendage 7—11 (6), maximum body length of imago about 1510.

In larva II only pore *psm* on urotergite IV—VIII and median pore on XII present. Urosternite I—V are with no pores, VI with 3 pores (as in imago) and VII with small median pore only. Other young instars unknown.

Derivatio nominis: "Murka" — a nickname of Dr Maria KACZMAREK to whom I owe most of the materials described here.

Material. Holotype ♀ (nr 2786) — 25 km S of Novosibirsk, mixed forest on the high terrace of the River Ob, 5. IX. 1978., leg. I. V. STEBAEV. Paratypes: together with holotype, 1 ♂ (nr 2788). Ulusčerga (nr 2782—86, 2819) loc. 1., 20. VI. 1979., 1 ♀, 2 ♂; loc. 2 (same datum) 2 ♀; loc. 7., 30. VI. 1979. 1 larva II. leg. M. KACZMAREK.

Eosentomidae BERLESE, 1909; *Eosentominae* YIN, 1983

Eosentomon tshergenese sp. n.

(figs 186—202)

Diagnosis. The new species is most similar to some Chinese species described by YIN et ZHANG, 1982 *(magnum, margarops* and *aegophthalmum)* in the peculiar structure of pseudoculus. It differs from all of them in the presence of seta *A* on urosternite VIII and the presence of seta *1a* on urosternite IX—X. In the shape of squama genitalis ♀ it is the nearest to *aegophthalmum* but differs in the presence of sensilla *b'1* on foretarsus and in the long seta *P1a* on urotergite VI.

Table XIV

Body chaetotaxy of *Eosentomon tshergense* sp. n.

		Dorsal		Ventral	
		setae	formula	setae	formula
Thorax	I	**1, 2**	2	**A1, 2, 3, M** P1, 2, 3	6+2 6
	II	**A2, 4, M** **P1, 1a, 2, 2a, 3, 3a, 4, 5**	6 16	**A1, 2, 3, M** P1, 2, 3	6+2 6
	III	**A2, 4, M** **P1, 1a, 2, 2a, 3, 3a, 4, 4a, 5** *	6 18	**A1, 2, 3, M1, M2** P1, 2, 2a, 3	6+4 8
Abdomen	I	A1, 2 **P1, 1a, 2, 2a, 3, 4** **	4 12	**A1, 2** **P1, 2**	4 4
	II—III	A1, 2, 3, 4, 5 **P1, 1a, 2, 2a, 3, 4, 4a, 5**	10 16	**A1, 2, 3** **P1, 2**	6 4
	IV—VI	A1, 2, 4, 5 **P1, 1a, 2, 2a, 3, 4, 4a, 5**	8 16	**A1, 2, 3** **P1, 2, 2a, 2a', 3**	6 10
	VII	A2, 4, 5 **P1, 1a, 2, 2a, 3, 4, 4a, 5**	6 16	**A1, 2, 3** **P1, 2, 2a, 2a', 3**	6 10
	VIII	**P1, P3, P5** *** **Pc, 1a, 1a', 2, 2a**	6 9	**A** **Pc, 1, 1a, 2**	2 7
	IX—X	1, 2, 3, 4	8	1, 1a, 2	6
	XI	1, 2, 3, 4	8		8
	XII		6 3		6 4

Fat print — primary setae.

* As very small sensilla.

** *P3* and *P4* are in the shape of very small sensillae; Sensilla *P4* was omitted till now, but it seems be widely distributed in the genus, so its presence is of no taxonomical importance.

*** For the homologisation of setae on urotergite VIII see Szeptycki, 1986.

Description. Head setae short, subposterior seta 1.1—1.4 x longer than posterior. Anterior and posterior additional setae present. Labral seta present; rostral subequal to subrostral, simple. Pseudoculus with three distinct, round granules, PR 13.5—17.4 (in larva I 20.7). Lateral sensilla of maxillary palp evidently shorter than dorsal.

Notal setae short, seta *P1a* posteriorly to line *P1* — *P2*, subequal to *P1*; seta *P2a* shorter than *P3a*. Length ratio of *P1* : *P1a* : *P2* on mesonotum as 0.9—1.1 : 1 : 1.2—1.5. Tracheal camerae long and slender.

Foretarsus with no sensilla *c''*, sensilae *e* and *b'1* present. Sensilla *a* longer than half of *c*; *b* short, slightly shorter than *a'*; *d* short, slightly passing base of *a5*; *e* and *g* equal, with spatulate dilation about half of sensilla length; *f1* filiform, longer than half of *g*; *t1* nearer to *a3* than to *a3'*; *t2* equal *b'2*, both filiform, relatively short; *a'* short, not reaching level of *a3'*, shorter than *t2*; *b'1* short, situated proximally to level of *a4*; *c'* short and slender, subequal to *t3*, situated distally to line *a6* — *δ5*. Seta *δ4'* nearly on level of *b'2*. BS 0.9—1.0, TR 6.1—6.3, EU about 0.9. Empodial appendage of leg II and III short. Basal seta of leg III thick, spine-like.

Chaetotaxy formula of urotergite I: 3, 1, 2. Setae *P1a* and *P2a* on urotergite I—VI long, hair-like, situated on hind margin of tergite; *P4a* of normal shape (not hair-like). On tergite VII seta *P1a* short, situated on hind margin of tergite; *P2a* as on former tergites. On tergite VIII seta *P1a'* anteriorly ot *P2*, with no basal dilation. Dorsal setae of urotergite XI longer than half of setae on urotergite X. Antecostae with slightly visible central lobe, laterostigma II—IV small, no reticulation. Urosternite VIII with two lines in anterior part — anterior of them connected with antecosta, posterior continuous.

Squama genitalis ♀ elongated, head small with perpendicular "beak". Penis with short basiphallar setae. Chaetotaxy as in Table XIV.

Chaetal variability (5 specimens): symmetrical presence of *A3* on urotegite IV and V, and asymmetrical lack of *A2* on VI (1 sp.); asymmetrical lack of *A2* on III and V, and asymmetrical presence of *A3* on IV (1 sp.); asymmetrical presence of *A3* on IV (1 sp.); asymmetrical lack of *P4a* on III (1 sp.).

Dimensions (in μm) (in brackets — larva I): head 131—152 (117), pseudoculus 11—13 (10), posterior head seta 9—11 (8), subposterior head seta 11—13 (10), mesonotal seta *P1* 14—15 (11), *P1a* 13—17 (12), *P2* 18—23 (15), foretarsus 94—102 (73) claw 15—16 (?), empodial appendage 14—15 (?), body length about 1220 (810).

Derivatio nominis: named after the type locality.

Material: Holotype ♀ (nr 2720): Ulusčerga, loc. 4., 2 . VI. 1979. Paratypes (nr 2718, 2719, 2721—23): together with holotype 1 ♀, 1 larva I; loc. 2.,30. VI. 1979. 1 ♀; loc. 3., 20. VI. 1979. 1 ♂; loc. 5., 30. VI. 1979. 1 ♀; leg. M. KACZMAREK.

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STRESZCZENIE

W pracy opisano trzy nowe rodzaje i 10 nowych gatunków *Protura* z pogórza Ałtaju. Wszystkie nowe rodzaje należą do rodziny *Acerellidae*, podrodziny *Acerellinae*. Po raz pierwszy wprowadzono tu jako cechę systematyczną (w obrębie *Acerentomoidea*) układ porów gruczołowych, porotaksję.

Redaktor pracy: prof. dr J. Pawłowski

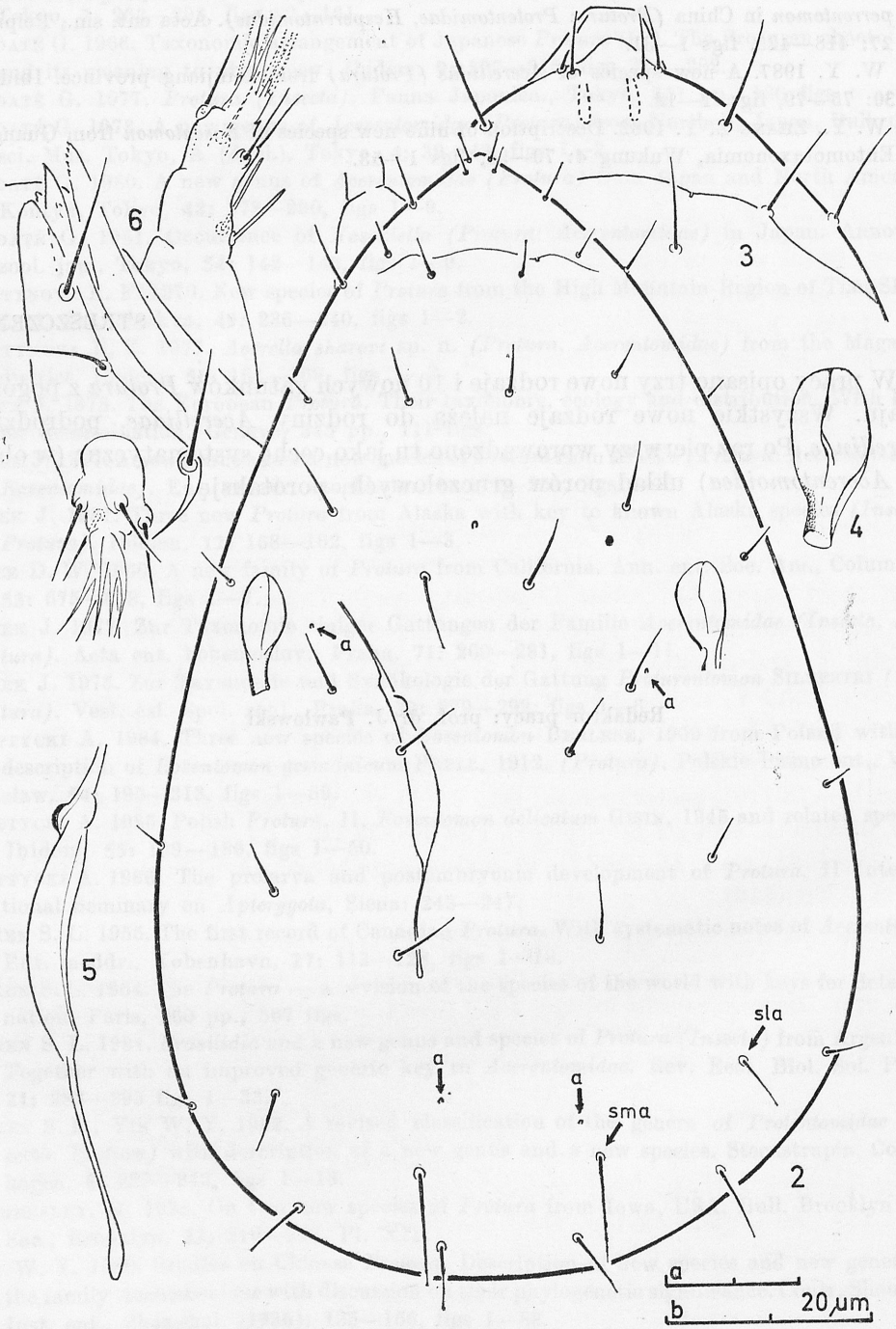

Fig. 2—6. *Hesperentomon martynovae* sp. n. (holotype). 2 — head (*a* — additional pores, *sma* — submedial additional seta, *sla* — sublateral additional seta); 3 — rostral part of head; 4 — pseudoculus; 5 — filamento di sostegno; 6 — mouthparts; (2 — magnification a, others — b)

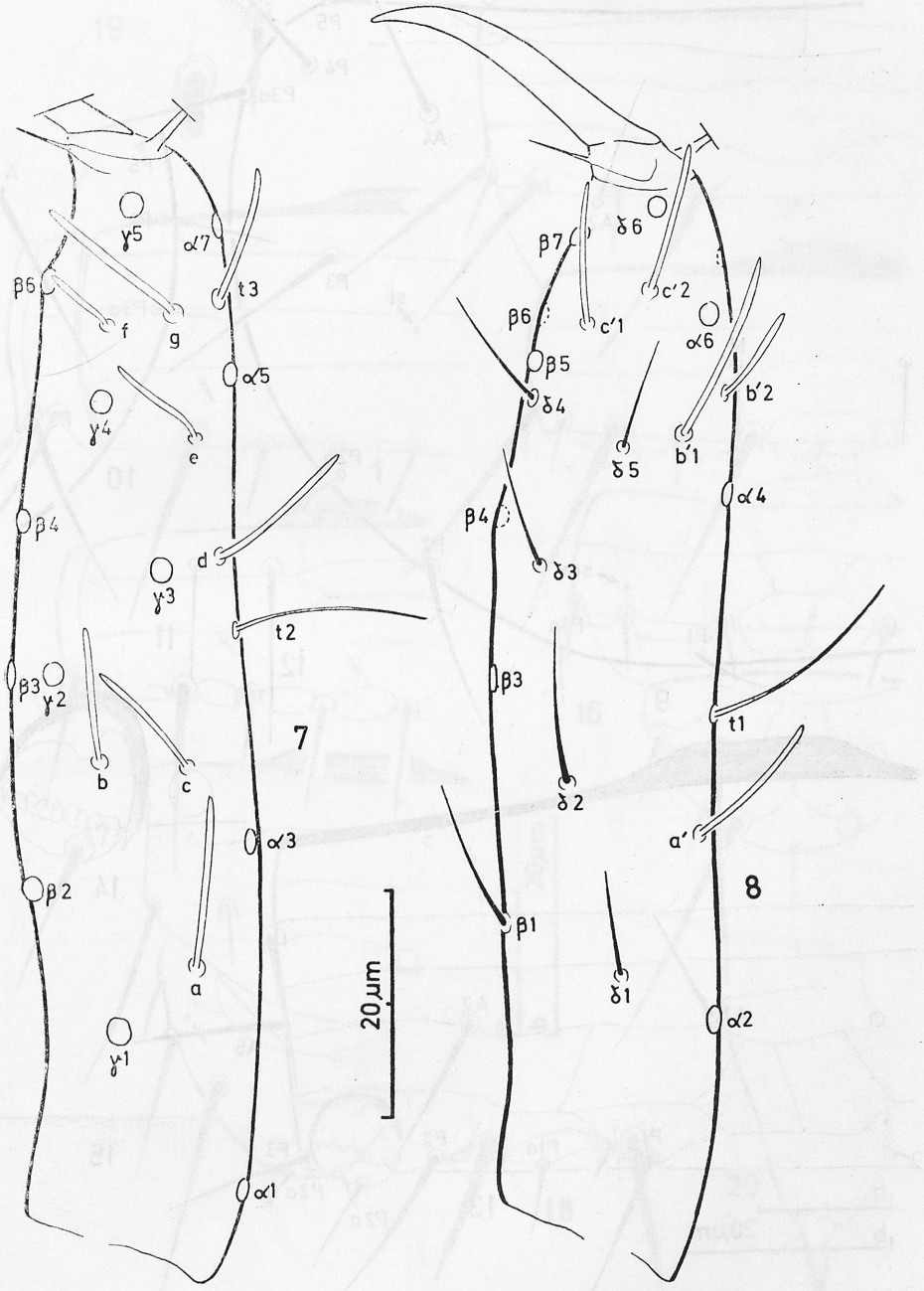

Fig. 7—8. *Hesperentomon martynovae* sp. n., foretarsus (nr 2791) 7 — exterior view; 8 — interior view

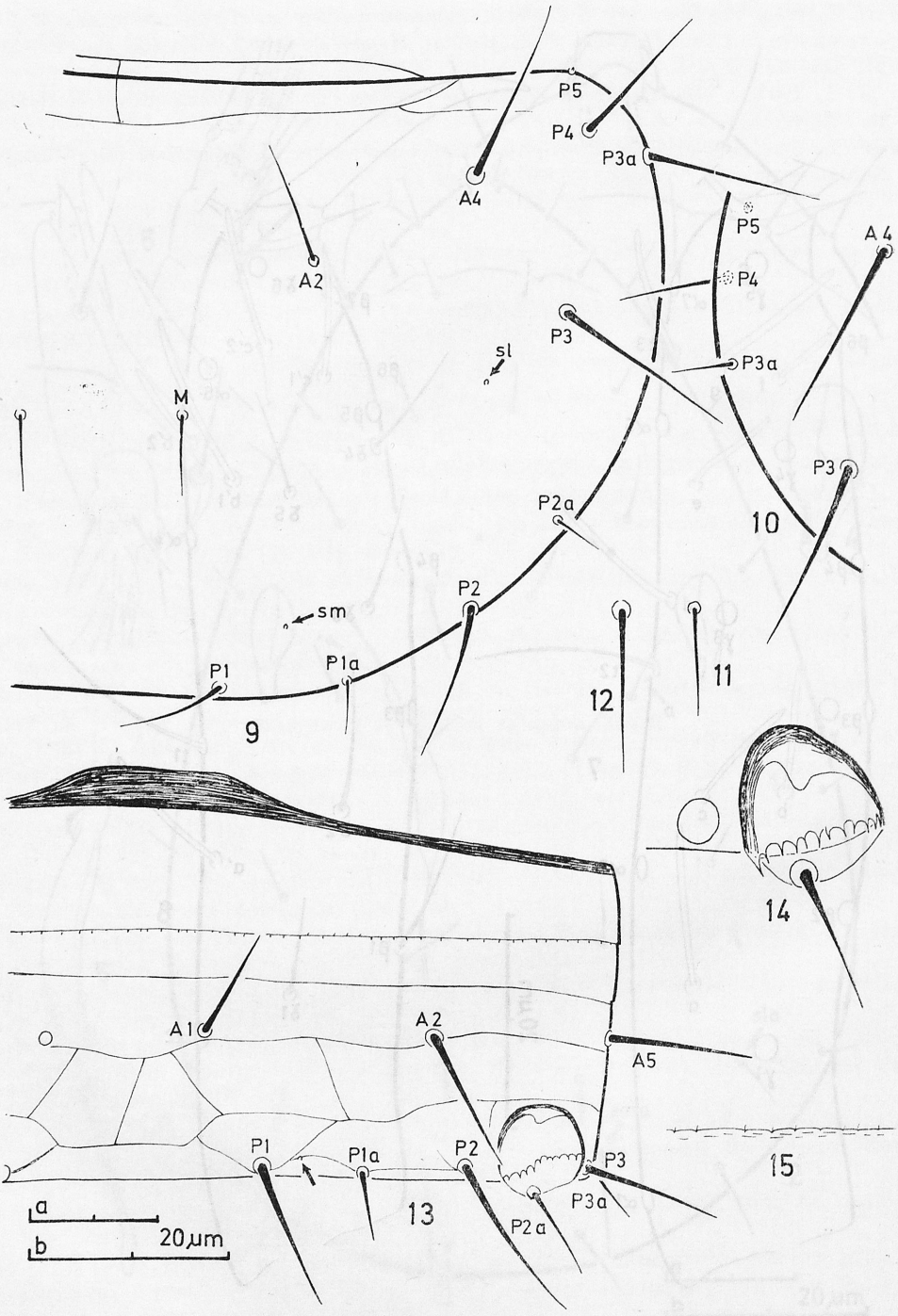

Fig. 9—15. *Hesperentomon martynovae* sp. n. (holotype). 9 — metanotum (*sm* — submedial pore, *sl* — sublateral pore); 10 — anterolateral part of mesonotum; 11 — seta *P1a* on urotergite VI; 12 — ditto, urotergite VII; 13 — urotergite VIII (arrow — pore *psm*); 14 — comb VIII; 15 — „striate band"; (9, 10, 13 — magnification a, others — b)

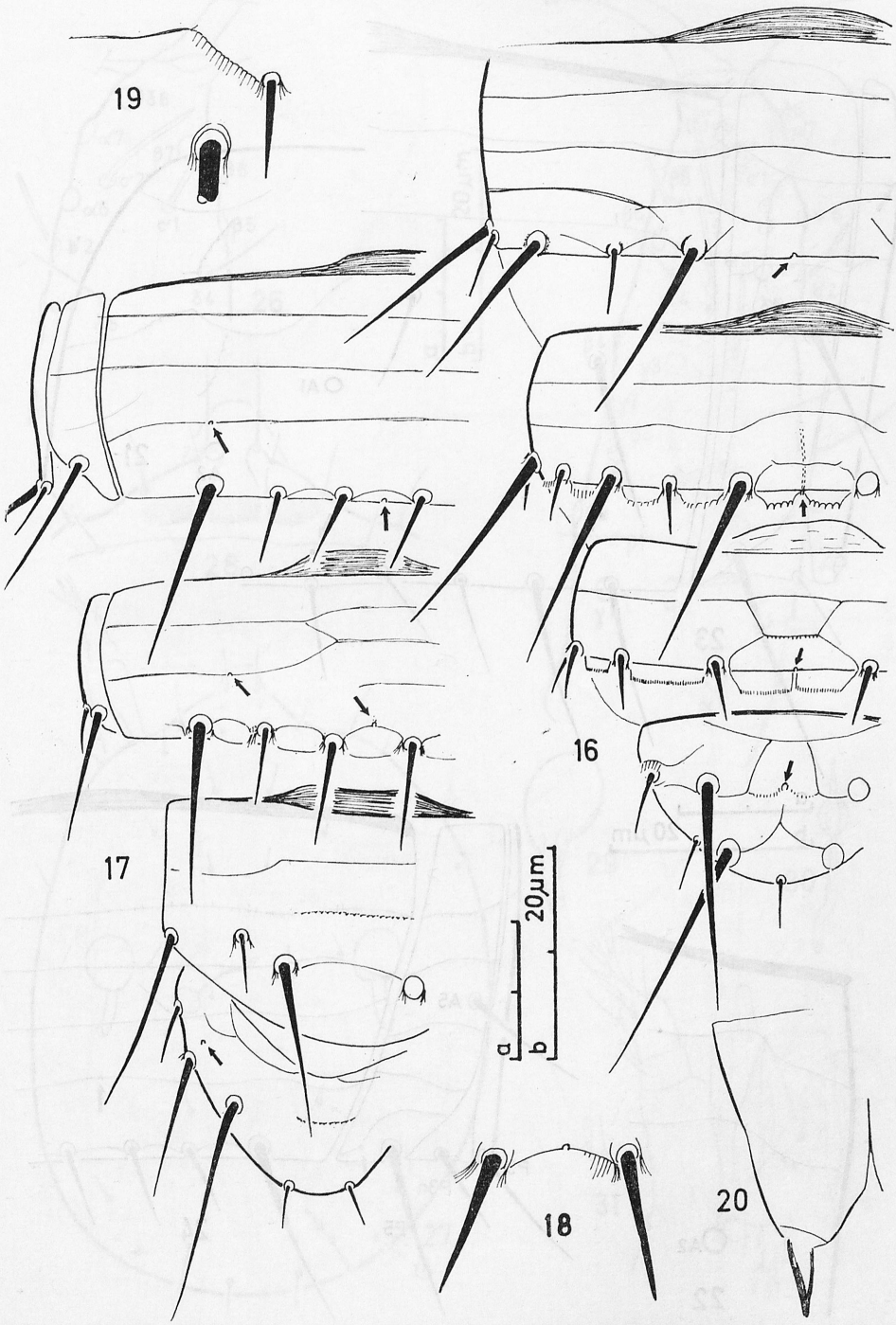

Fig. 16—20. *Hesperentomon martynovae* sp. n. 16 — urotergite IX—XII (holotype); 17 — urosternite IX—XII (holotype, arrows — pores); 18 — medial part of hind margin of urosternite X (nr 2791); 19 — base of submedial setae on urosternite XI (nr 2791); 20 — acrostylus (holotype); (16, 17 — magnification a, others — b)

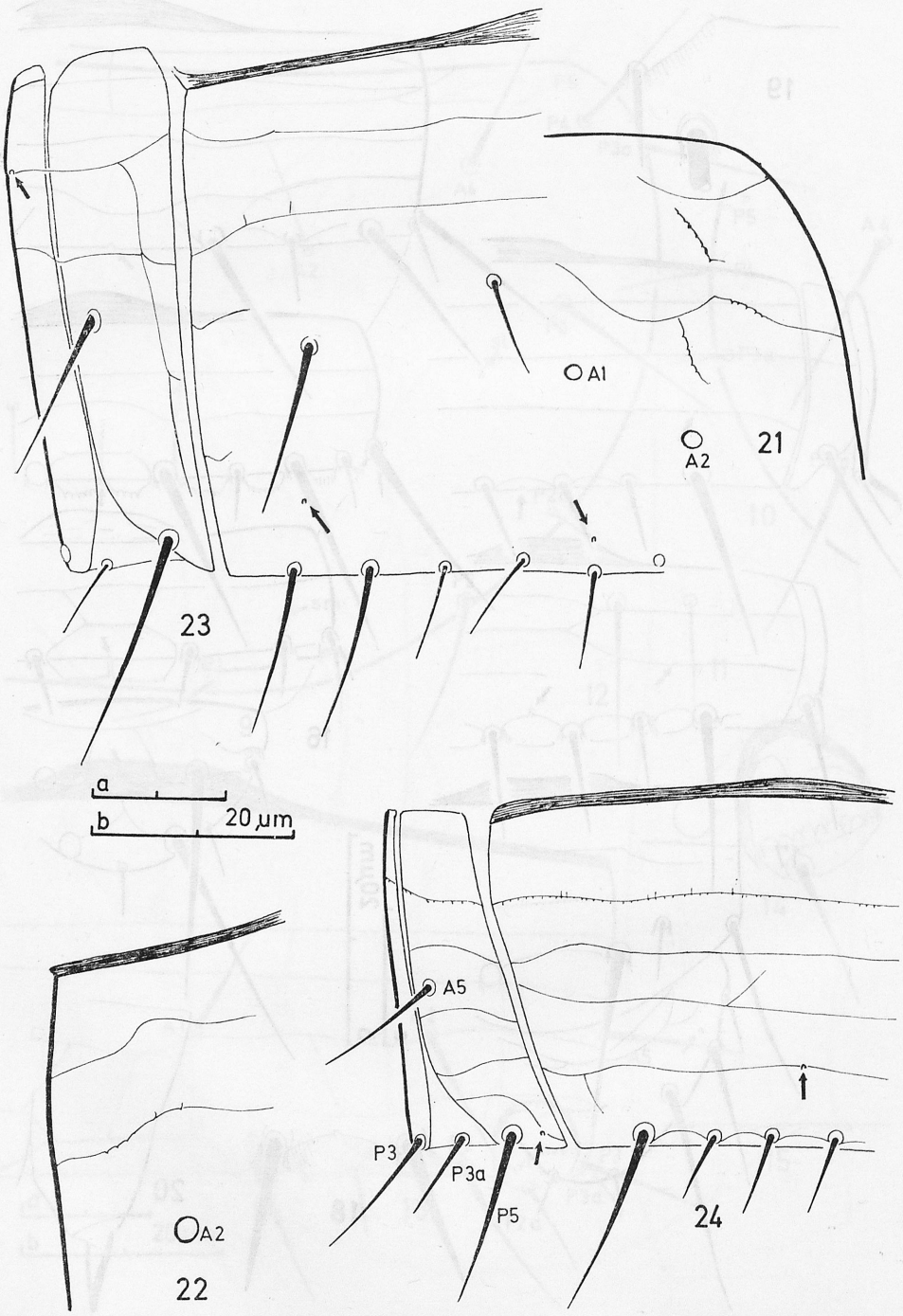

Fig. 21—24. *Hesperentomon martynovae* sp. n. (holotype). 21 — anterolateral part of urosternite I; 22 — ditto, of urosternite IV; 23 — urosternite VI; 24 — urosterite VIII (arrows — pores); (23, 24 — magnification a, others — b)

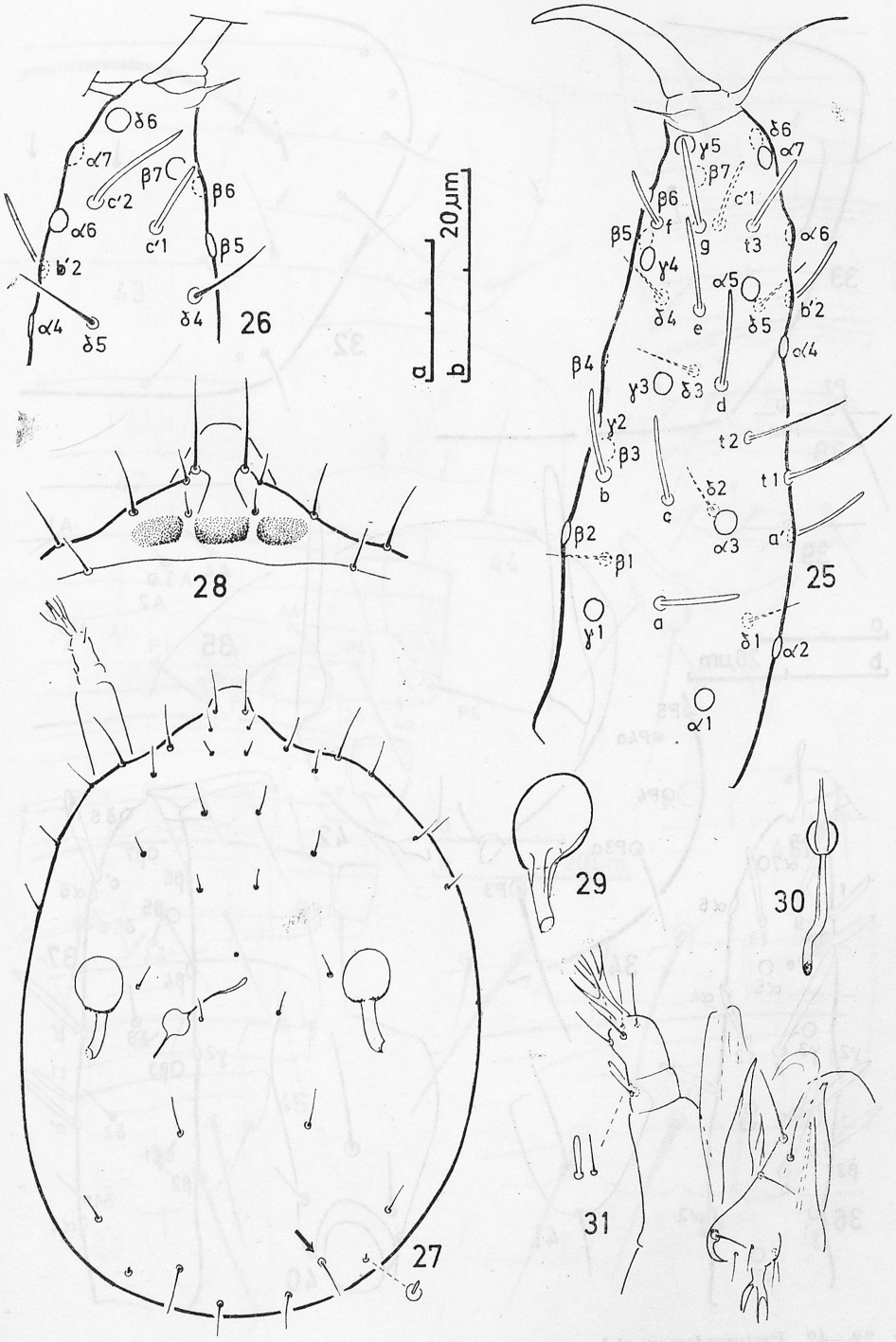

Fig. 25—31. 25—26 — *Hesperentomon martynovae* sp. n. 25 — foretarsus of larva I (nr 2788); 26 — distal part of foretarsus of larva II (nr 2793); 27—31 — *Proturentomon stebaevae* sp. n. 27 — head (arrow — submedial additional seta) (holotype); 28 — rostral part of head (holotype); 29 — pseudoculus (holotype); 30 — filamento di sostegno (nr 2797); 31 — mouthparts (holotype); (27 — magnification a, others — b)

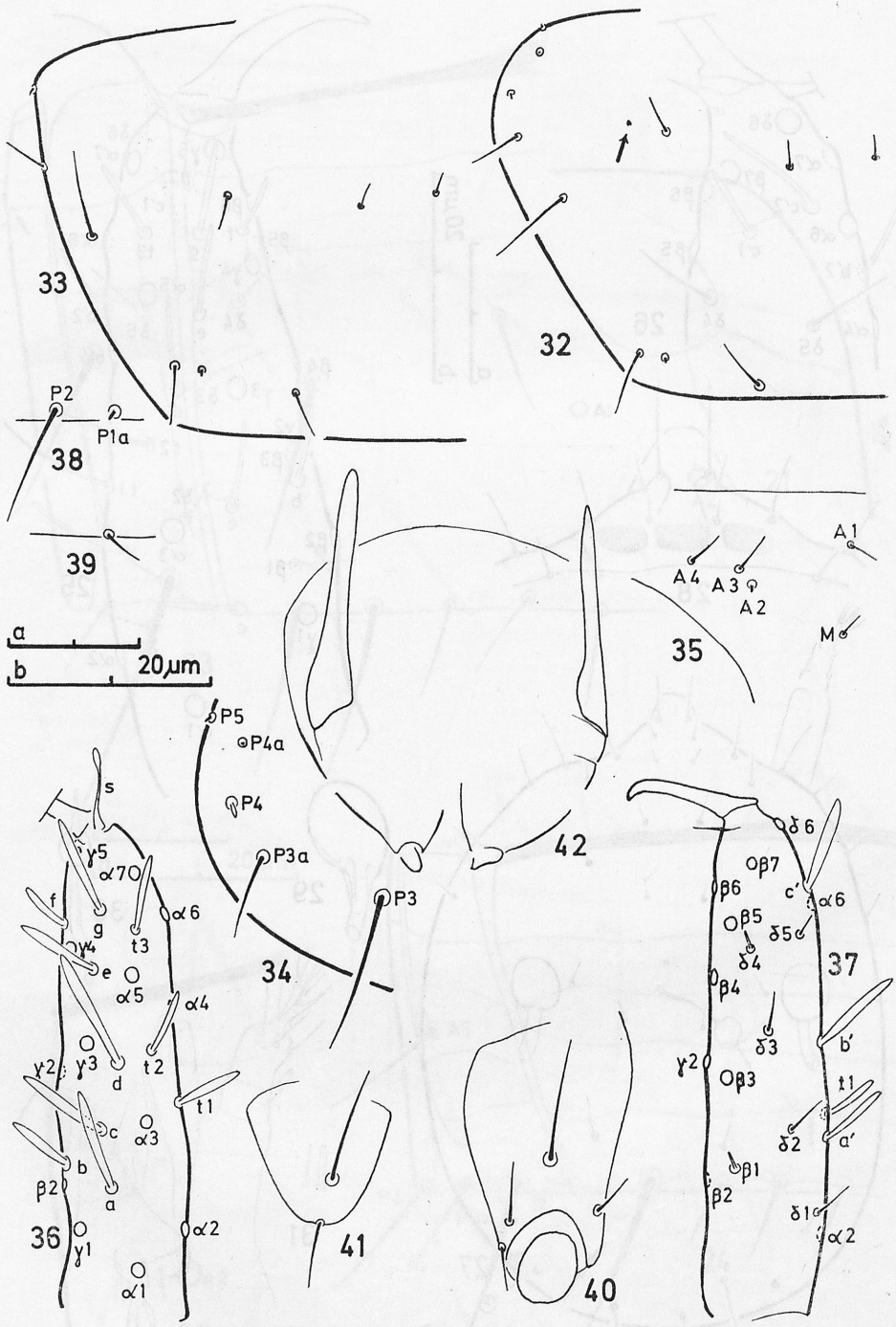

Fig. 32—42. *Proturentomon stebaevae* sp. n. (holotype). 32 — mesonotum (arrow — pore) 33 — metanotum; 34 — anterolateral part of mesonotum; 35 — anterior part of metasternum; 36 — foretarsus, dorsoexterior view; 37 — ditto, ventrointerior view; 38 — seta *P1a* on urotergite I; 39 — ditto, urotergite VII; 40 — abdominal leg I; 41 — abdominal leg III; 42 — squama genitalis ♀; (32, 33 — magnification a, others — b)

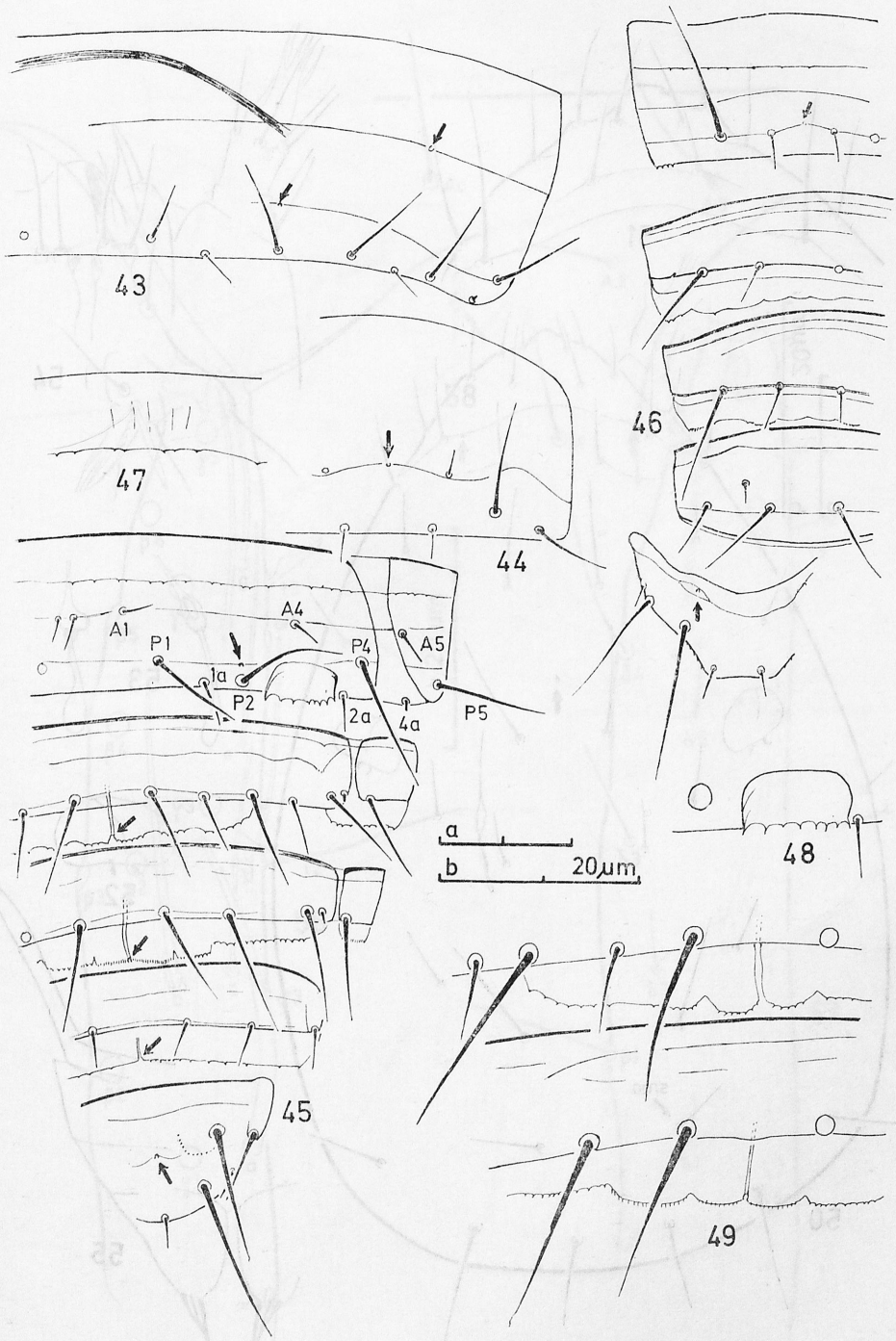

Fig. 43—49. *Proturentomon stebaevae* sp. n. (holotype). 43 — urotergite VII; 44 — urosternite VII; 45 — urotergite VIII—XIII; 46 — urosternite VIII—XII (arrows — pores); 47 — „striate band"; 48 — comb VIII; 49 — hind margin of urotergite IX and X; (43—46 — magnification a, others — b)

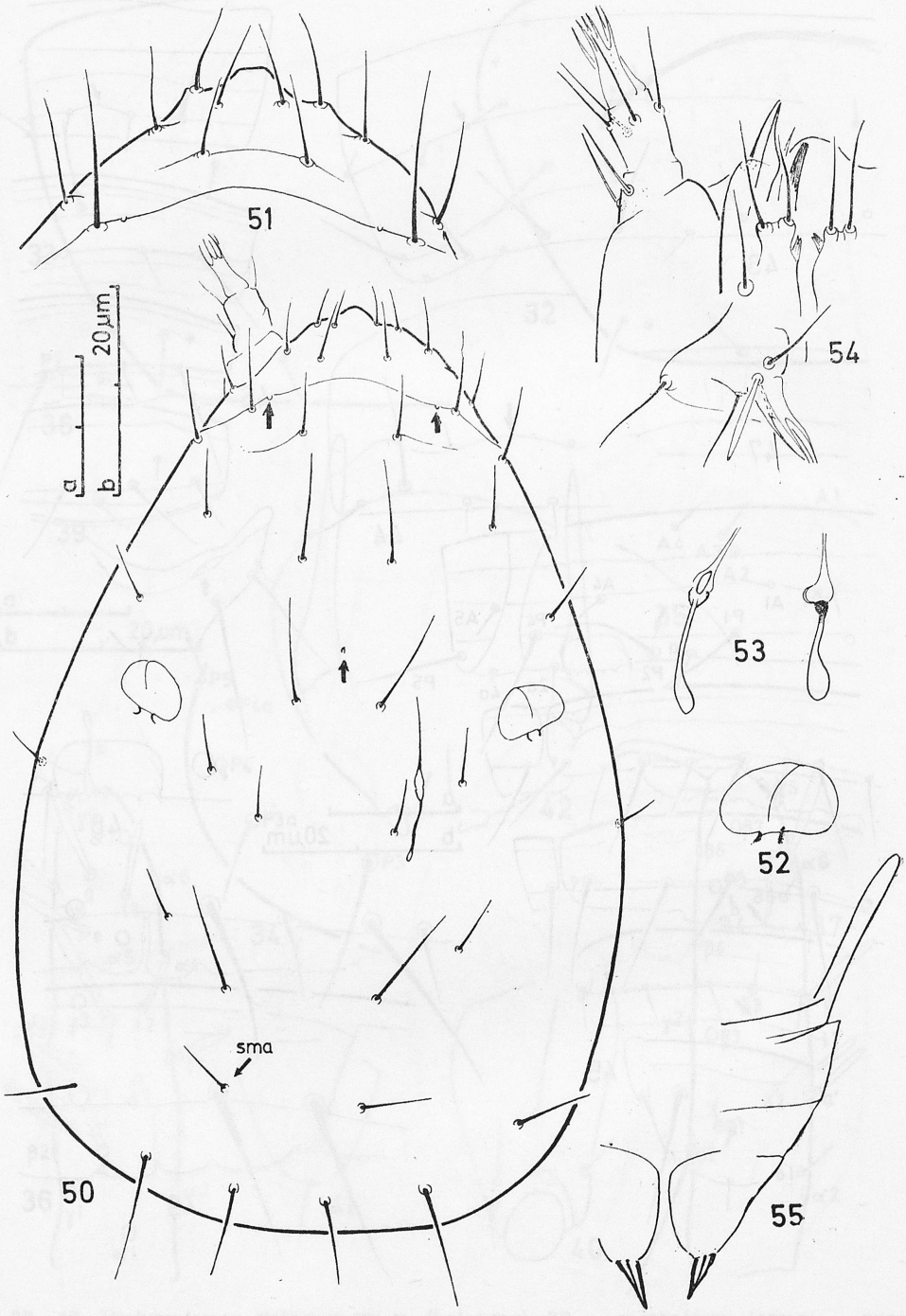

Fig. 50—55. *Filientomon sibiricum* sp. n. 50 — head (*sm* — submedial additional seta, arrows — pores) (holotype); 51 — rostral part of head (holotype); 52 — pseudoculus (holotype); 53 — filamento di sostegno (holotype); 54 — mouthparts (holotype); 55 — squama genitalis ♀ (nr 2780); (50 — magnification a, others — b)

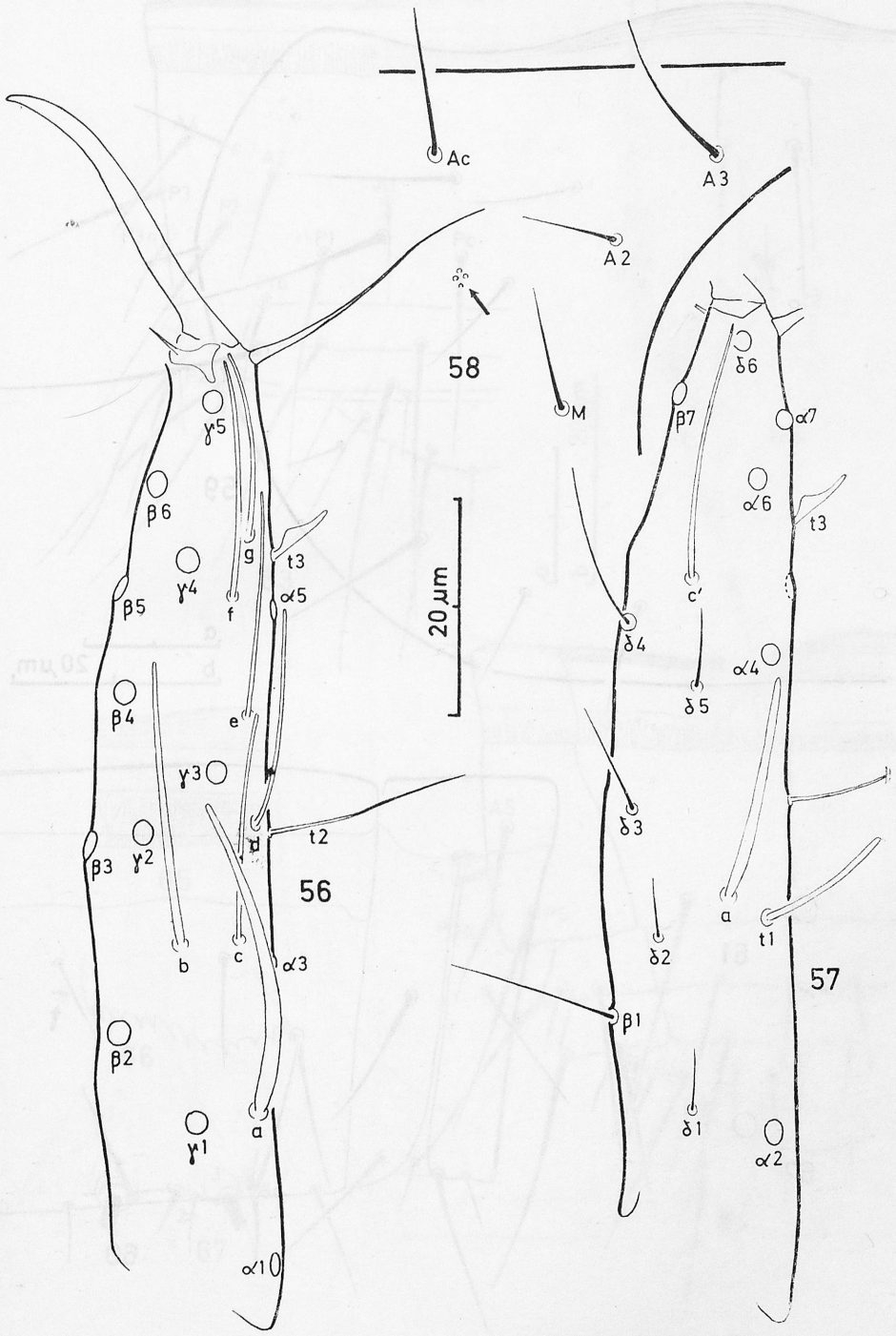

Fig. 56—58. *Filientomon sibiricum* sp. n. (holotype). 56 — foretarsus, exterior view; 57 — ditto, interior view; 58 — anterior part of mesosternum (arrow — groups of pores)

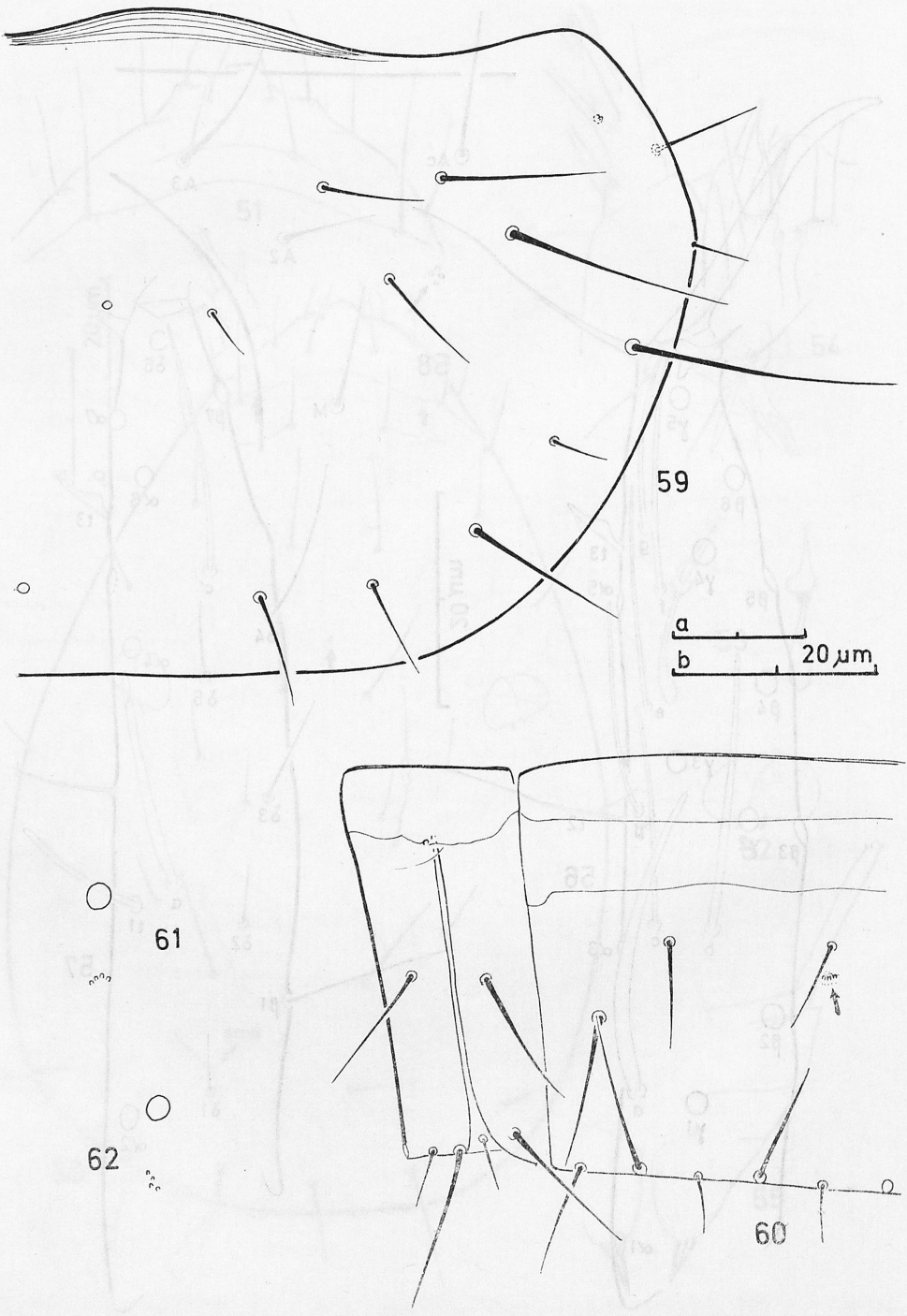

Fig. 59—62. *Filientomon sibiricum* sp. n. 59 — metanotum (holotype); 60 — sternite VII (nr 2777, arrow — group of pores); 61 — group of pores on urosternite VI (holotype); 62 — ditto, on urosternite VII (holotype); (59, 60 — magnification a, others — b)

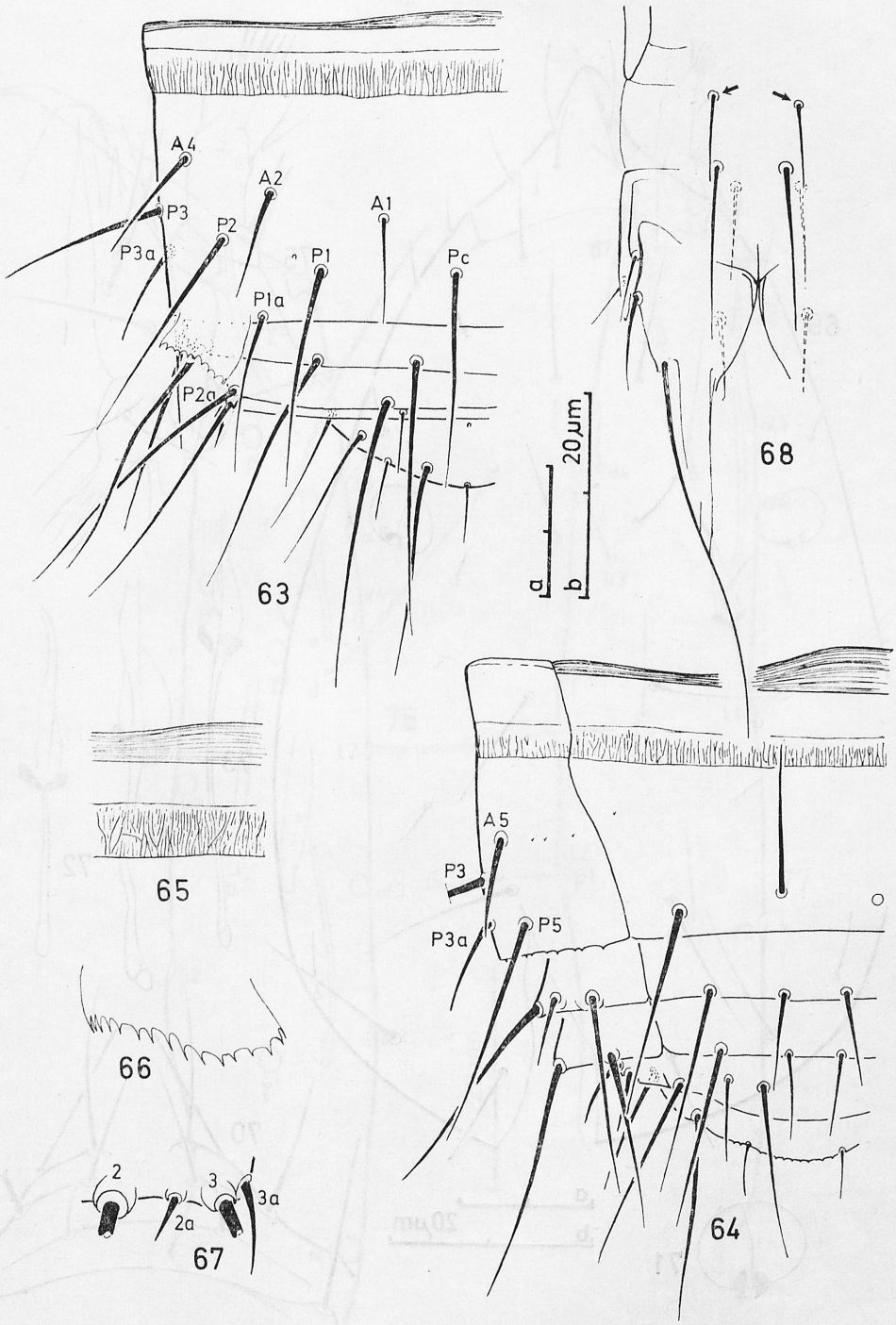

Fig. 63—68. *Filientomon sibiricum* sp. n. 63 — urotergite VIII—XII (nr 2776); 64 — urosternite VIII—XII (nr 2776); 65 — striate band (holotype); 66 — comb VIII (nr 2780), 67 — lateral part of urotergite IX (nr 2776); 68 — penis (holotype, arrows — additional setae); (63, 64 — magnification a, others — b)

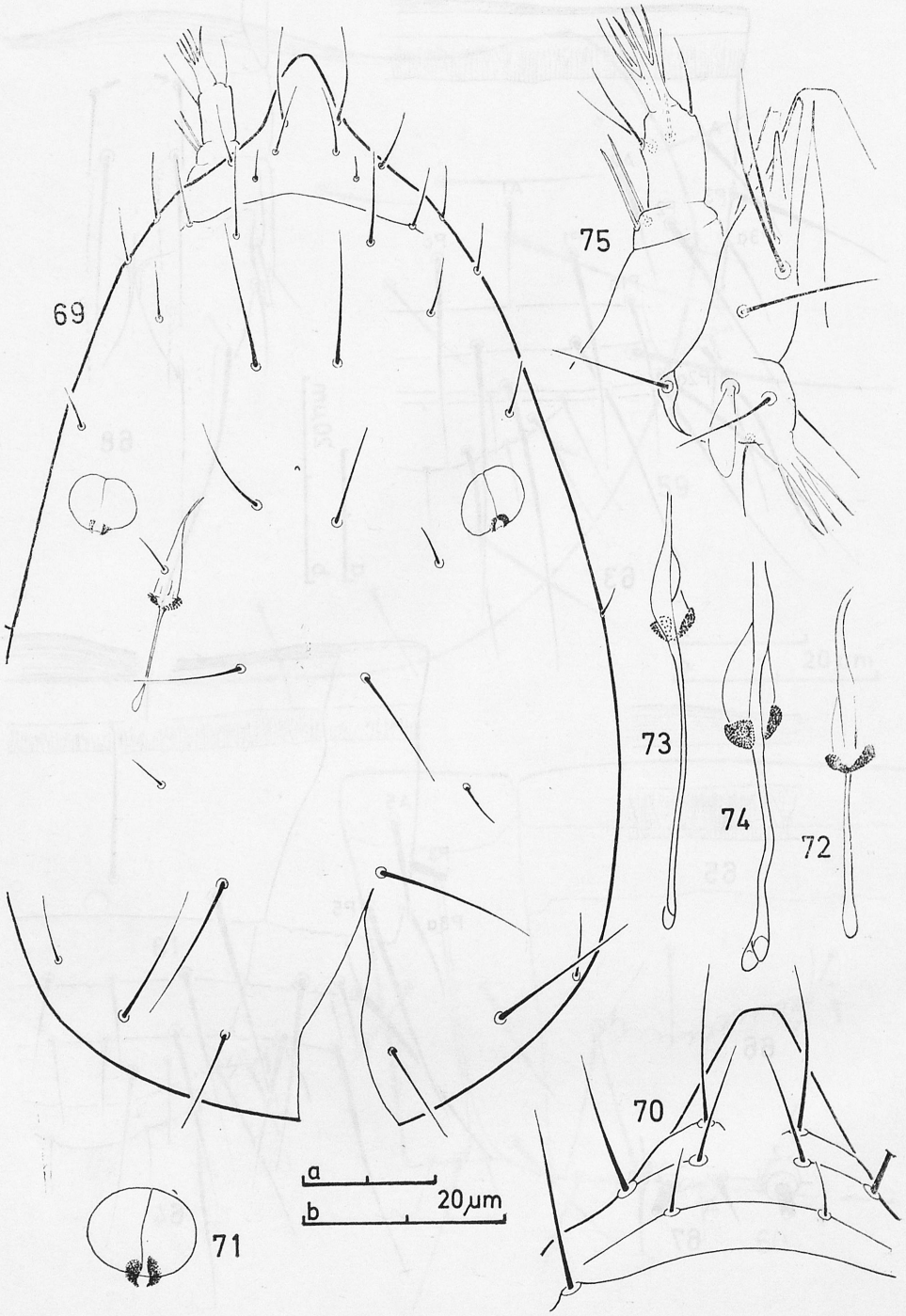

Fig. 69—75. *Verrucoentomon aurifer* sp. n. 69 — head (holotype), 70 — rostral part of head (holotype), 71 — pseudoculus (holotype), 72—74 — filamento di sostegno (holotype, nr 2800, 2801), 75 — mouthparts (holotype); (69 — magnification a, others — b)

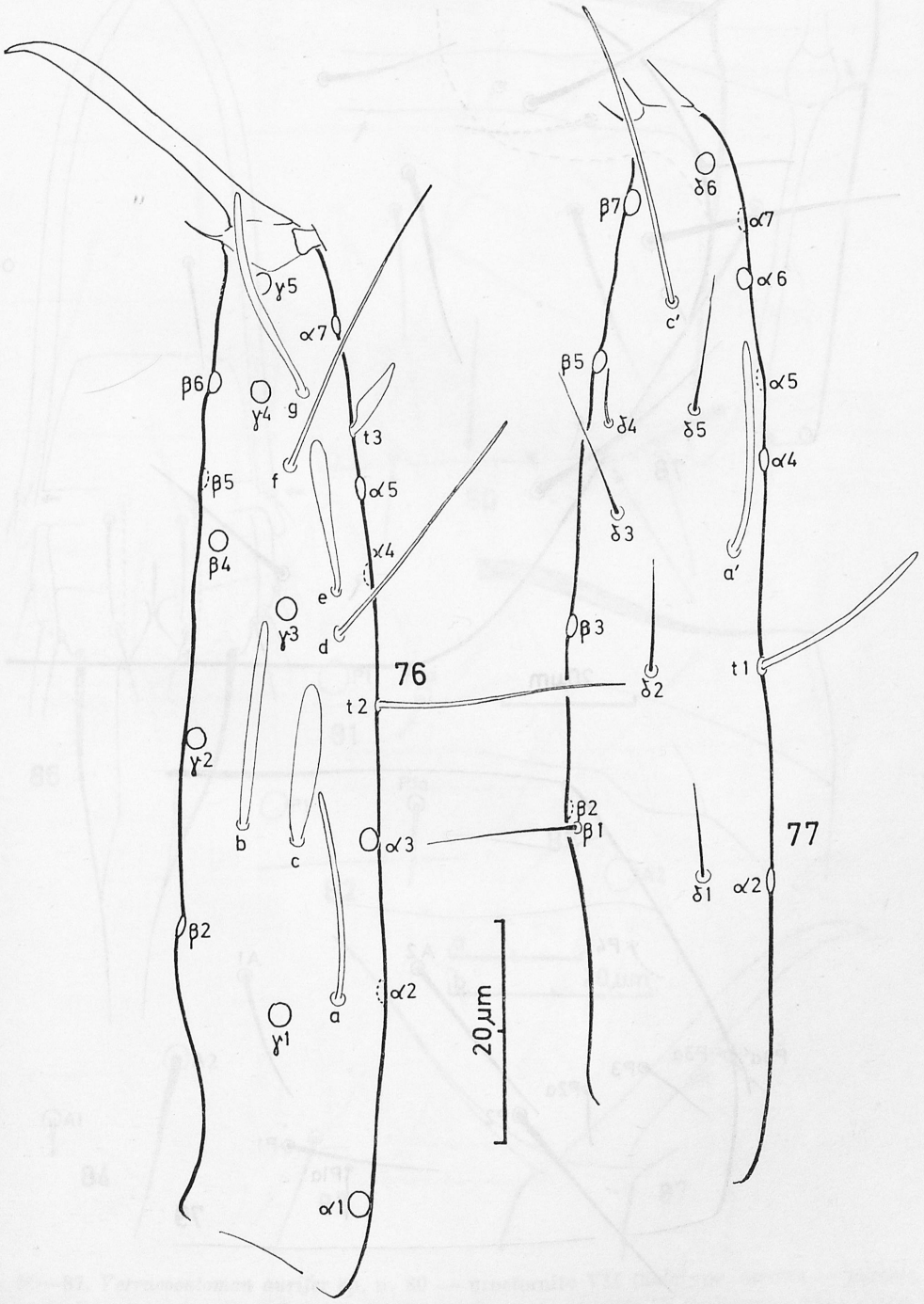

Fig. 76—77. *Verrucoentomon aurifer* sp. n., foretarsus holotype) 76 — exterior view, 77 — interior view

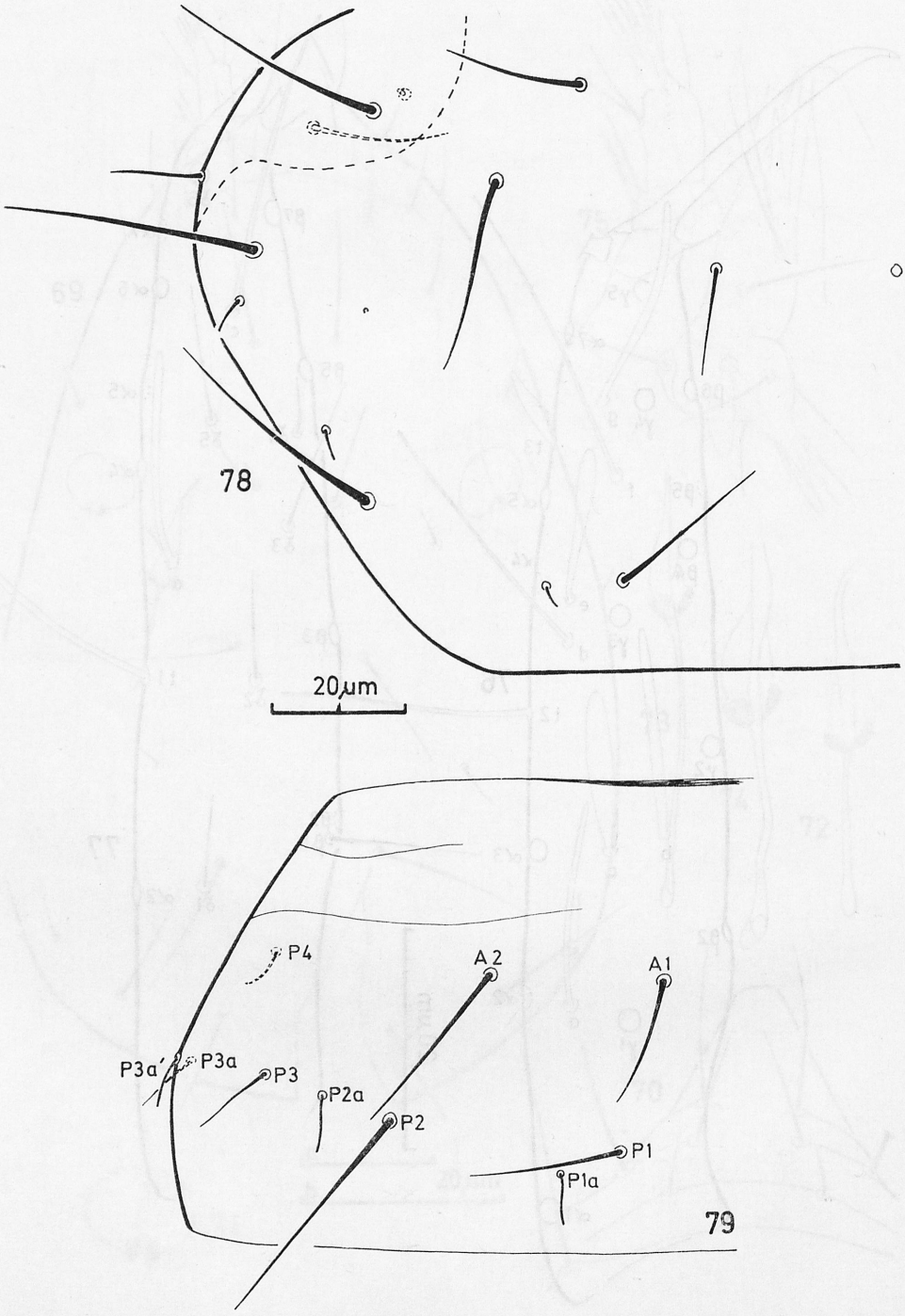

Fig. 78—79. *Verrucoentomon aurifer* sp. n. 78 — metanotum (holotype), 79 — urotergite I (nr 2808)

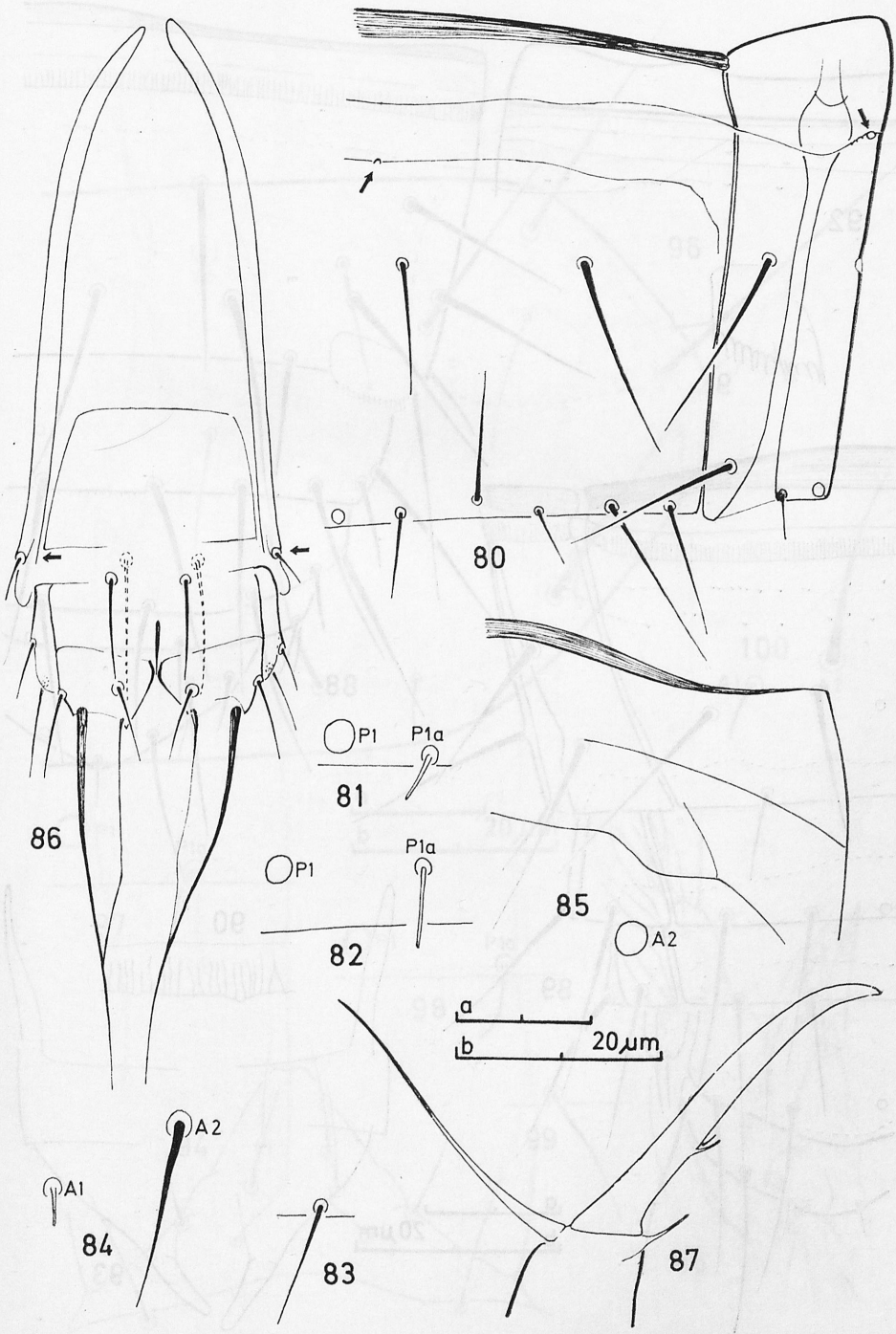

Fig. 80—87. *Verrucoentomon aurifer* sp. n. 80 — urosternite VII (holotype, arrows — pores); 81 — seta *P1a* on metanotum (holotype); 82 — ditto, on urotergite IV (holotype); 83 — ditto, on urotergite VII (holotype); 84 — setae *A1* and *A2* on mesosternum (holotype); 85 — anterolateral part of urosternite II (nr 2799); 86 — penis (holotype, arrows — additional setae), 87 — claw (nr 2801); (80 — magnification a, others — b)

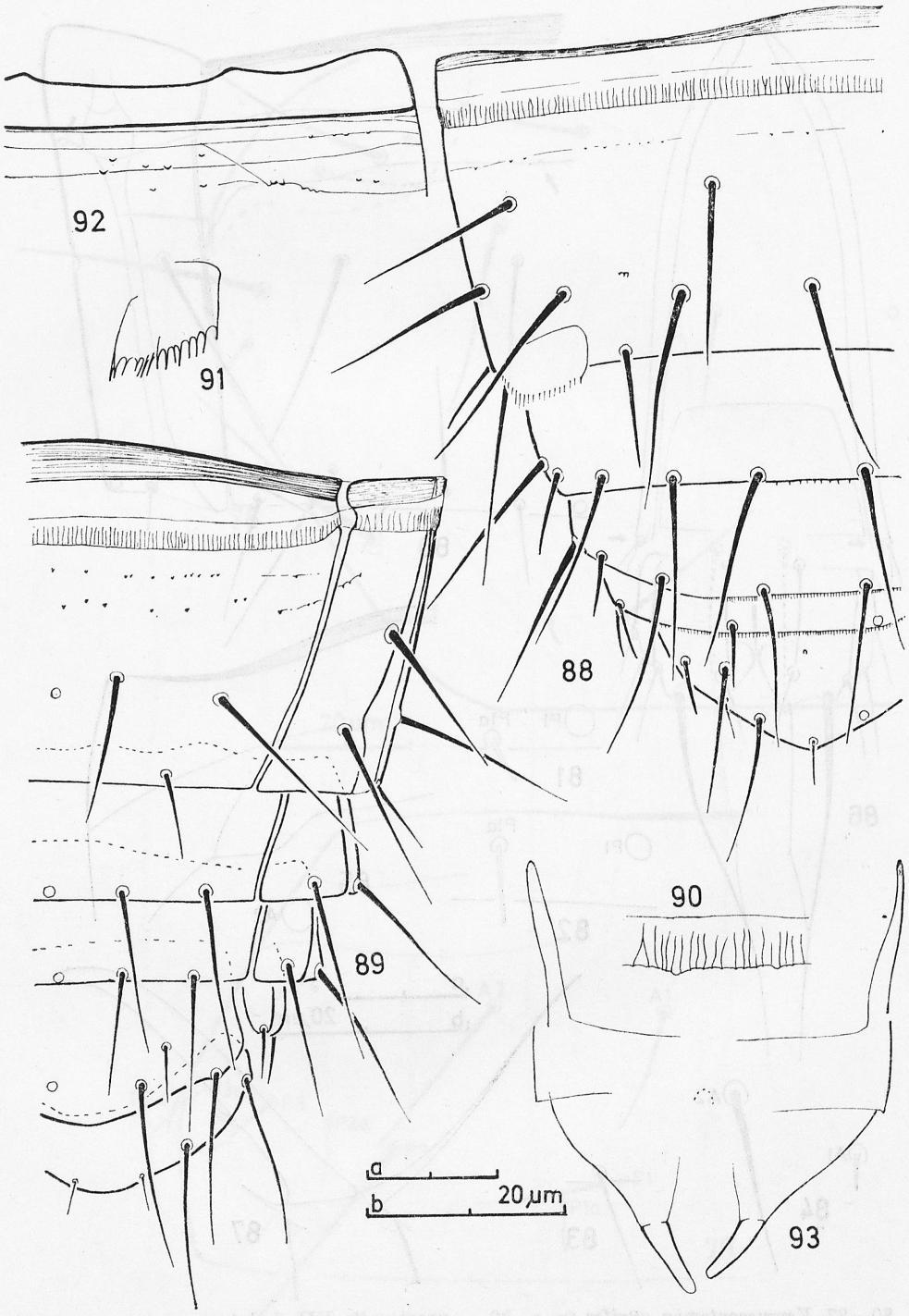

Fig. 88—93. *Verrucoentomon aurifer* sp. n. 88 — urotergite VIII—XII (holotype); 89 — urosternite VIII—XII (holotype); 90 — striate band (holotype); 91 — comb VIII (holotype); 92 — anterior part of urotergite IX (holotype); 93 — squama genitalis ♀ (nr 2799); (88, 89 — magnification a, others — b)

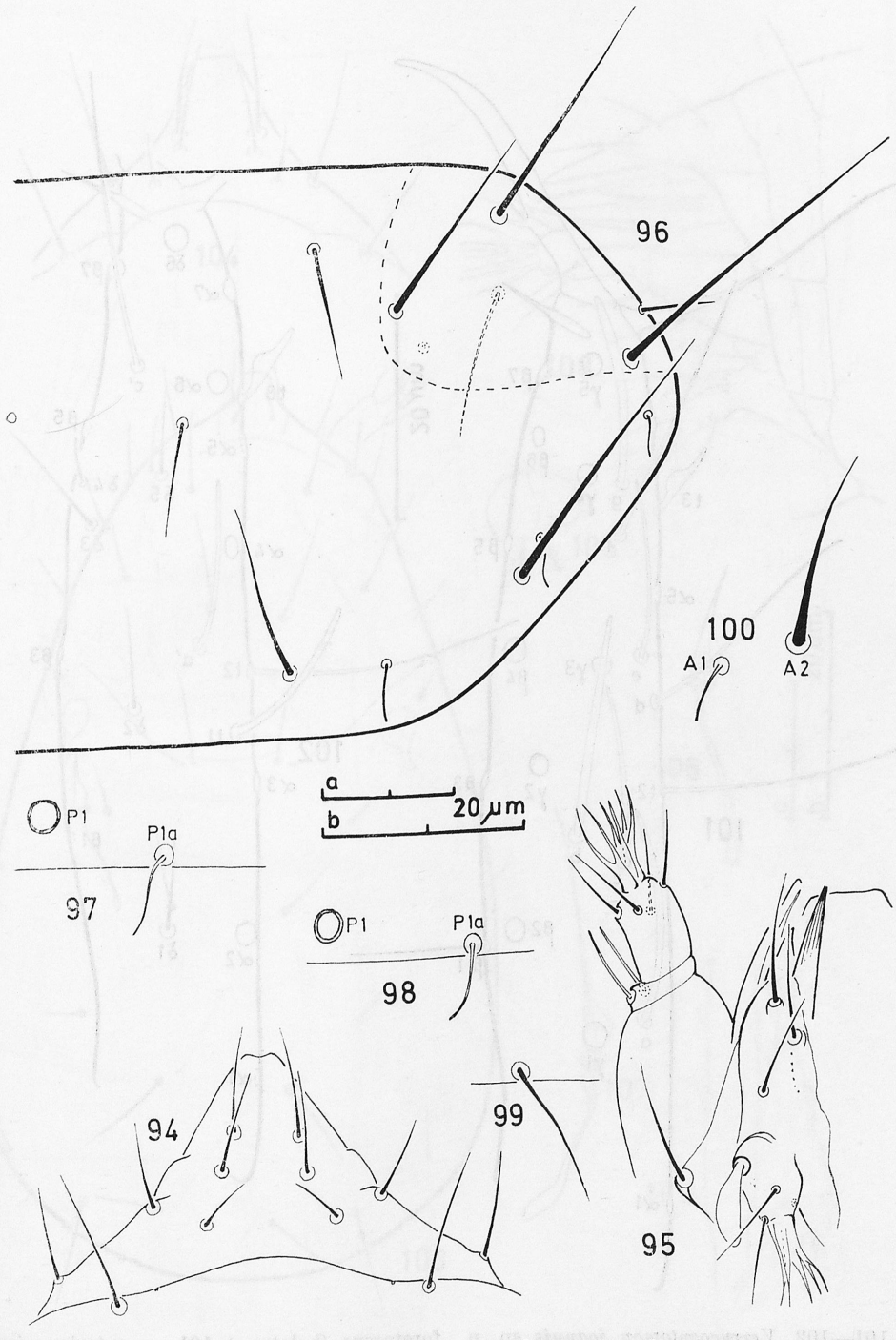

Fig. 94—100. *Verrucoentomon joannis* sp. n. 94 — rostral part of head (nr 2815); 95 — mothparts (nr 2815); 96 — metanotum (nr 2817); 97 — seta *P1a* on metanotum (nr 2812); 98 — ditto, on urotergite IV (nr 2812); 99 — ditto, on urotergite VII (nr 2812); 100 — setae *A1* and *A2* on mesosternum (nr 2812); (96 — magnification a, others — b)

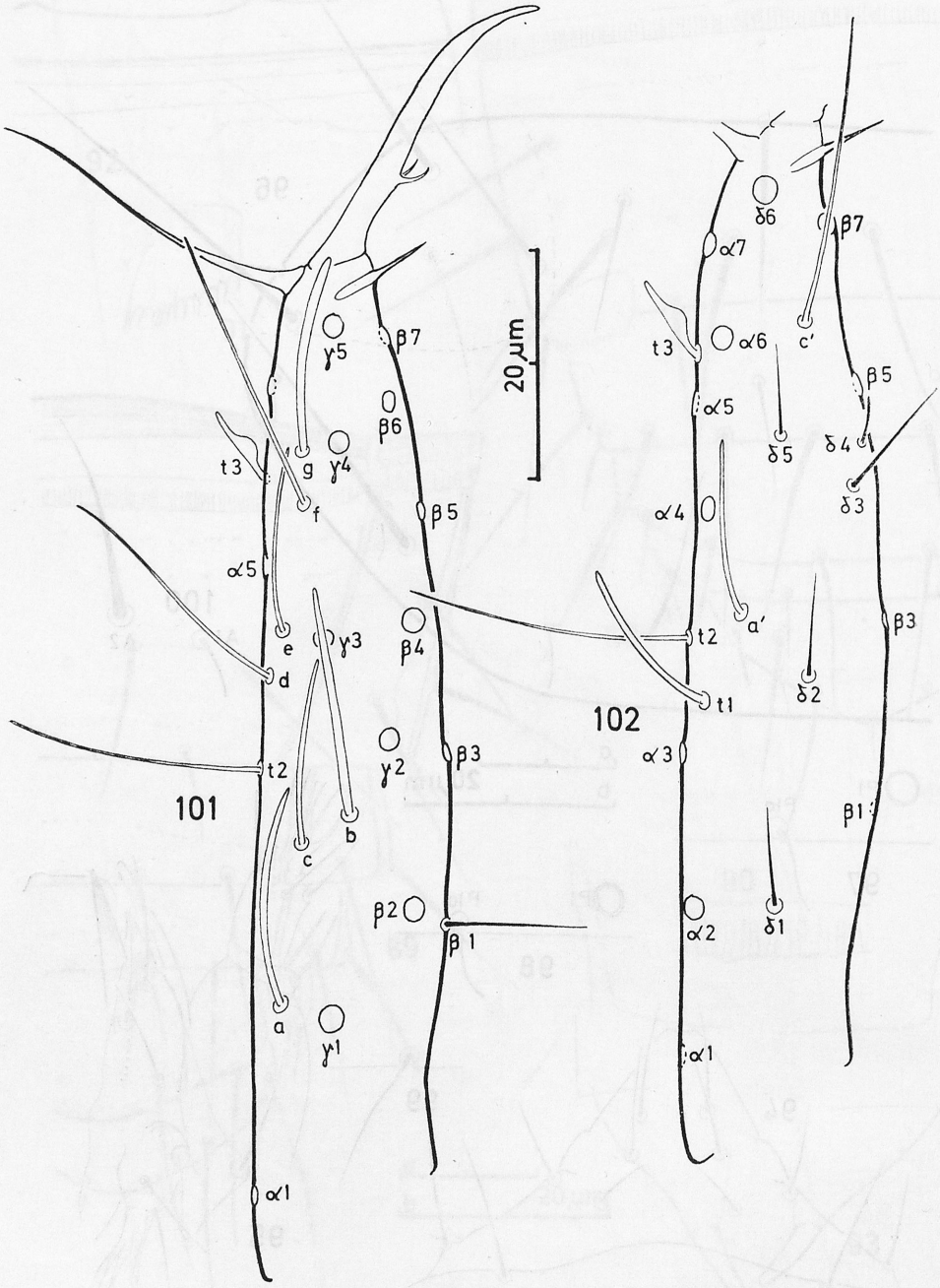

Fig. 101—102. *Verrucoentomon joannis* sp. n., foretarsus (holotype) 101 — exterior view; 102 — interior view

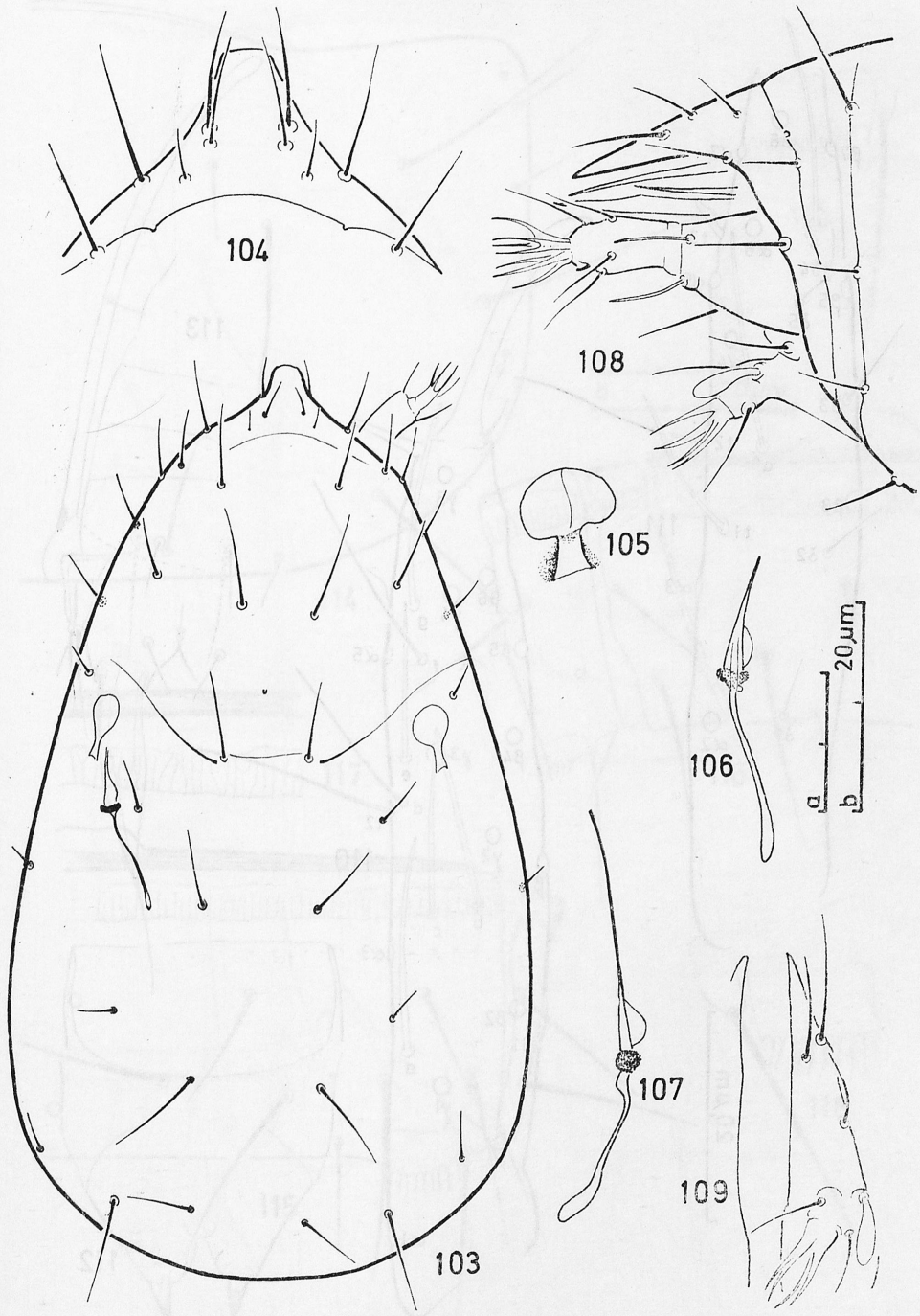

Fig. 103—109. *Noldo submontanus* sp. n. 103 — head (holotype), 104 — rostral part of head (nr 2757); 105 — pseudoculus (nr 2751); 106, 107 — filamento di sostegno (nr 2754, 2751); 108 — anterior part of head, lateral view (nr 2751); 109 — labium (holotype); (103 — magnification a, others — b)

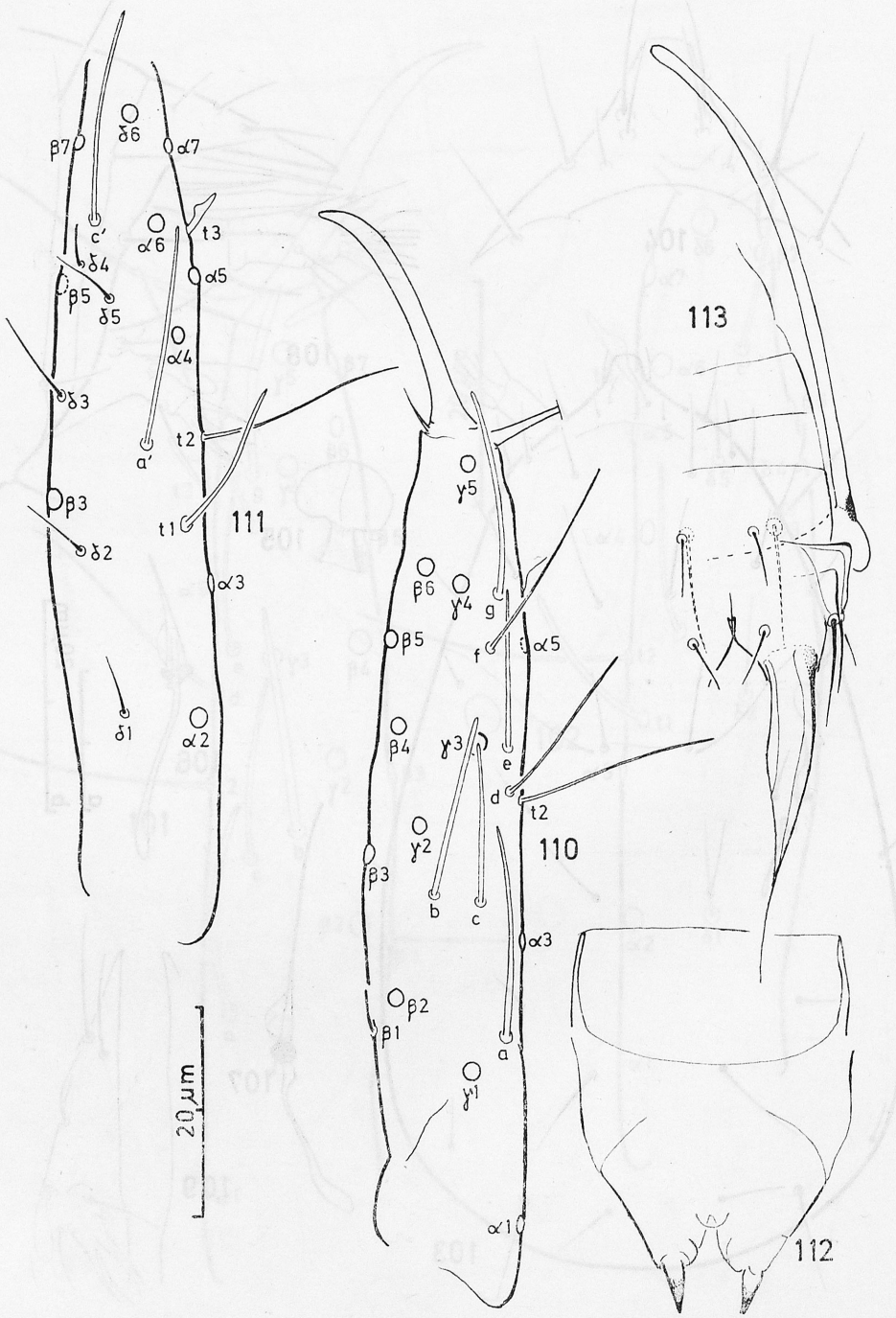

Fig. 110—113. *Noldo submontanus* sp. n. 110 — foretarsus, exterior view (holotype); 111 — ditto, interior view (holotype), 112 — squama genitalis ♀ (holotype); 113 — penis (nr 2760)

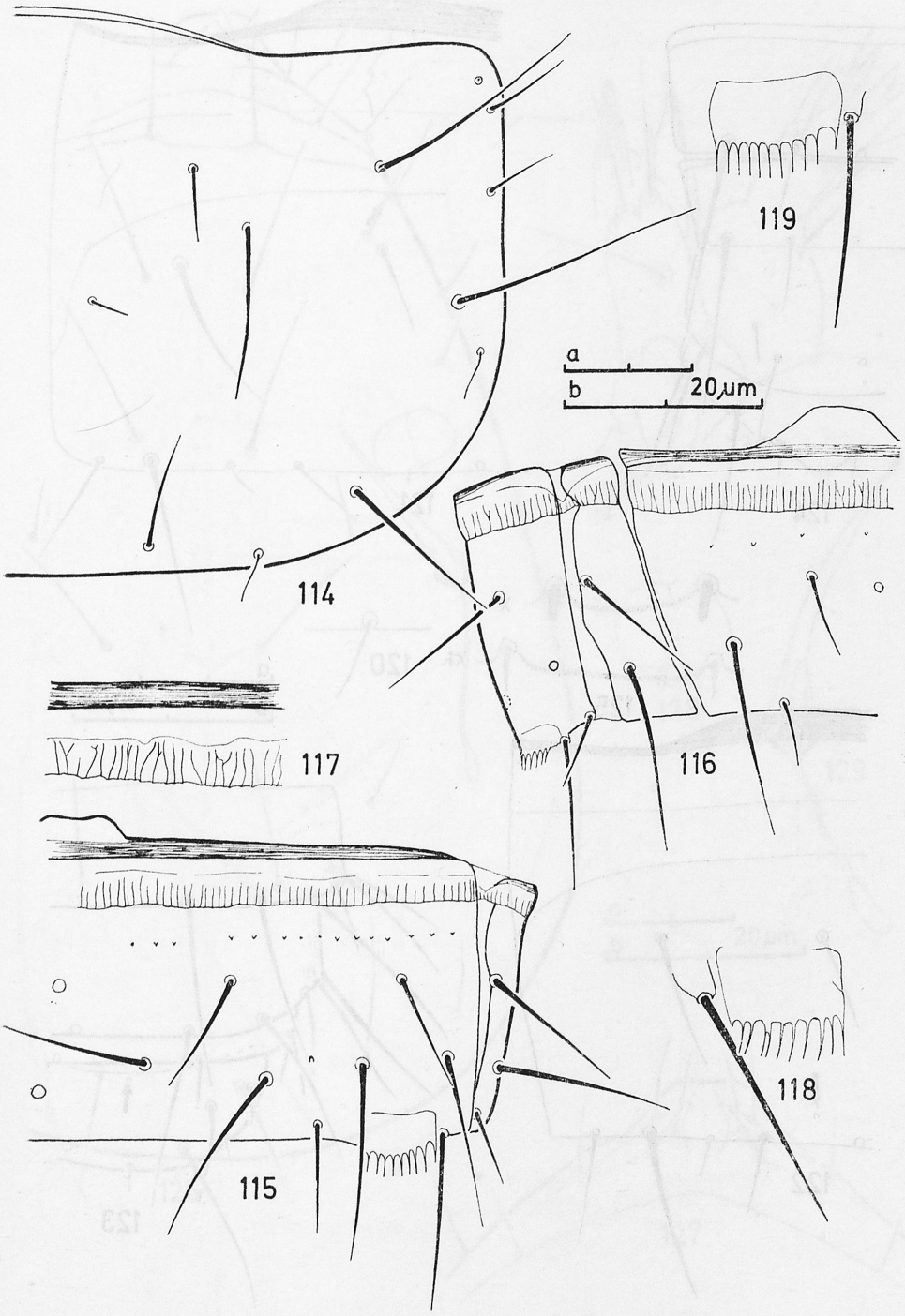

Fig. 114—119. *Noldo submontanus* gen. n., sp. n. 114 — metanotum (holotype); 115 — urotergite VIII (nr 2756); 116 — urosternite VIII (nr 2756); 117 — striate band (nr 2751); 118, 119 — comb VIII (nr 2751, 2756); (114—116 — magnification a, others — b)

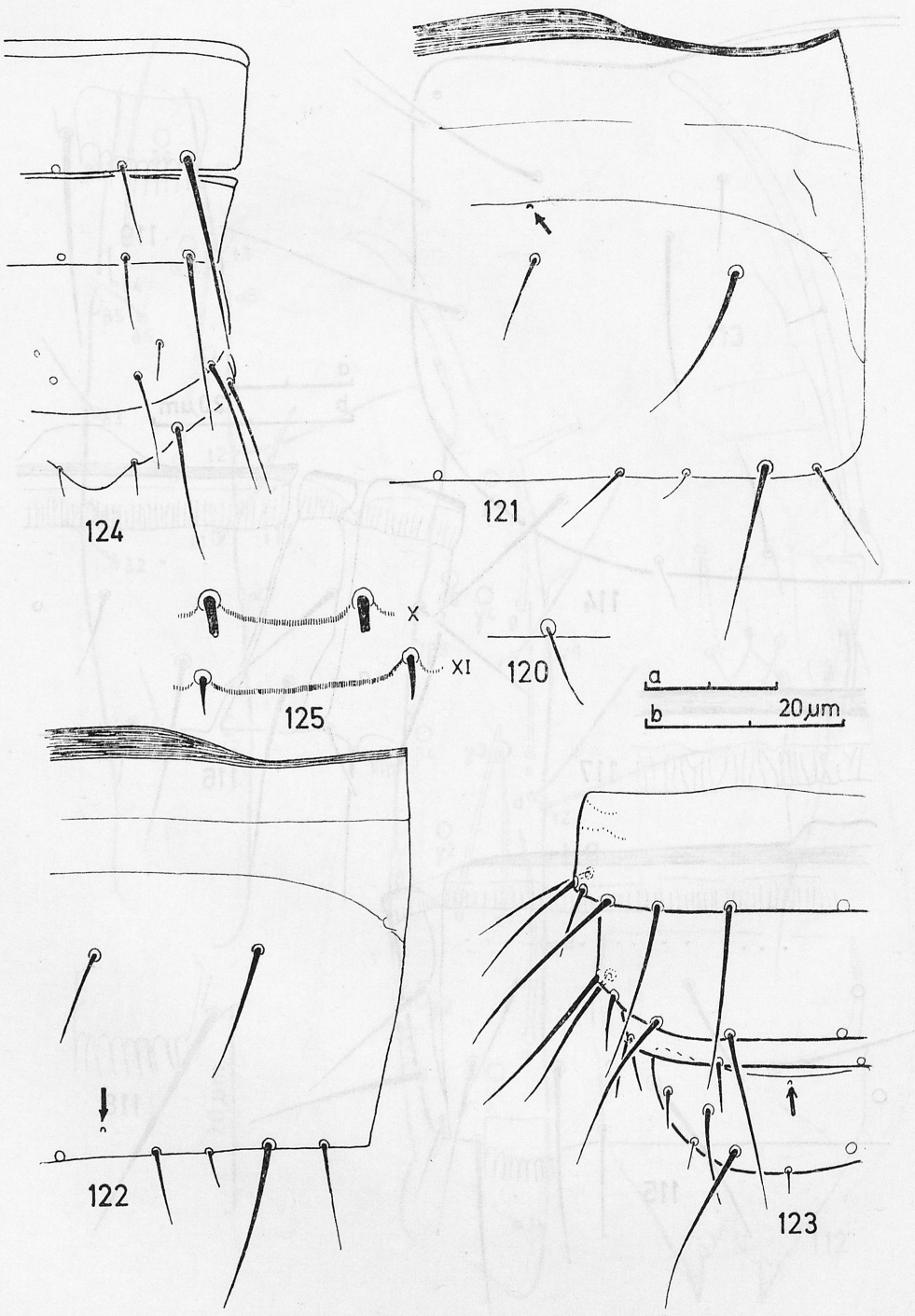

Fig. 120—125. *Noldo submontanus* sp. n. 120 — seta *P1a* on urotergite VI (nr 2757); 121 — urosternite VI (nr 2751); 122 — urosternite VII (nr 2751, arrow — pore); 123 — urotergite IX—XII (nr 2754); 124 — urosternite IX—XII (nr 2754); 125 — hind margin of urotergite X and XI (nr 2758); (121—124 — magnification a, others — b)

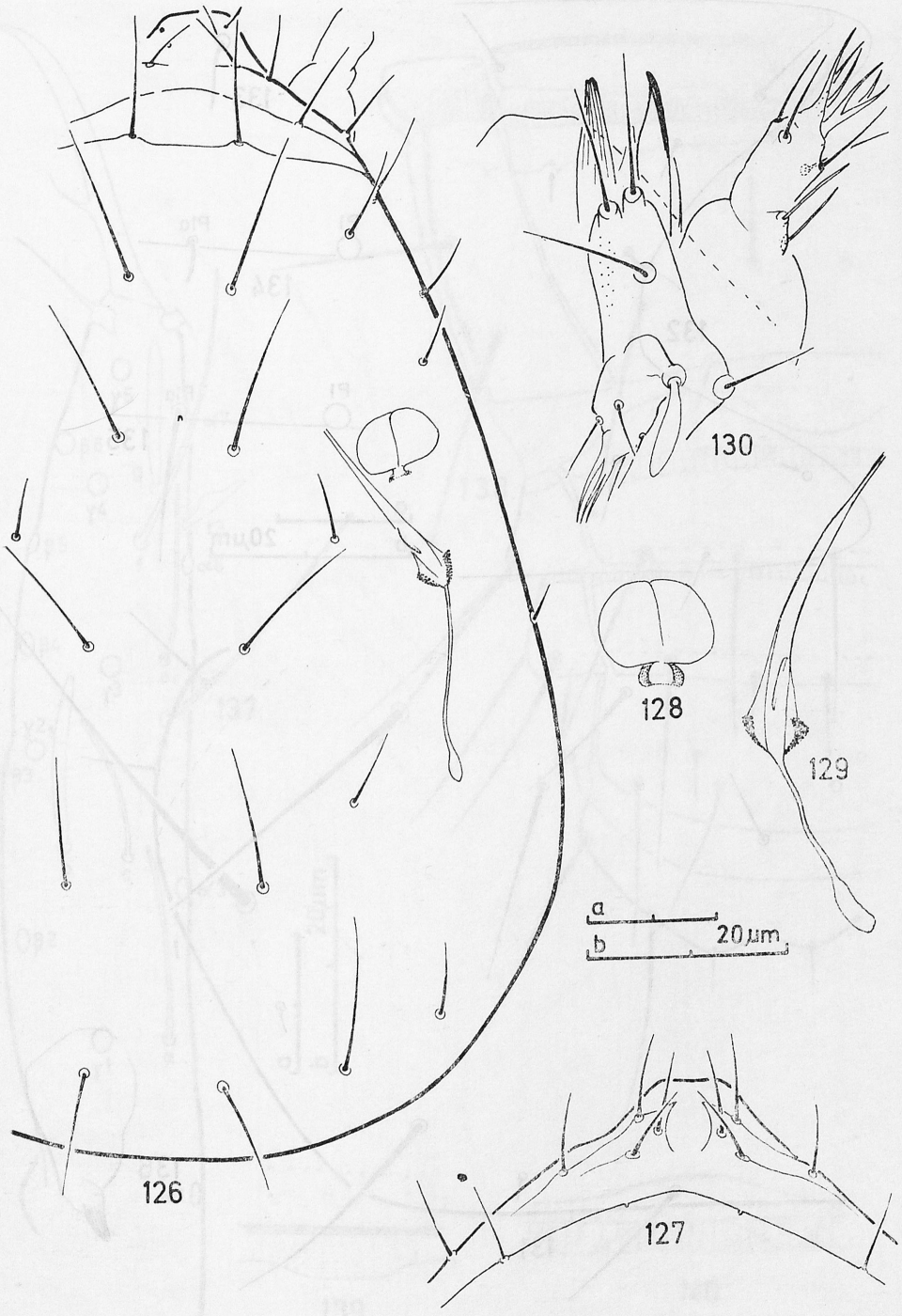

Fig. 126—130. *Yavanna altaica* sp. n. (holotype) 126 — head; 127 — rostral part of head; 128 — pseudoculus; 129 — fialmento di sostegno; 130 — mouthparts; (126 — magnification a, others — b)

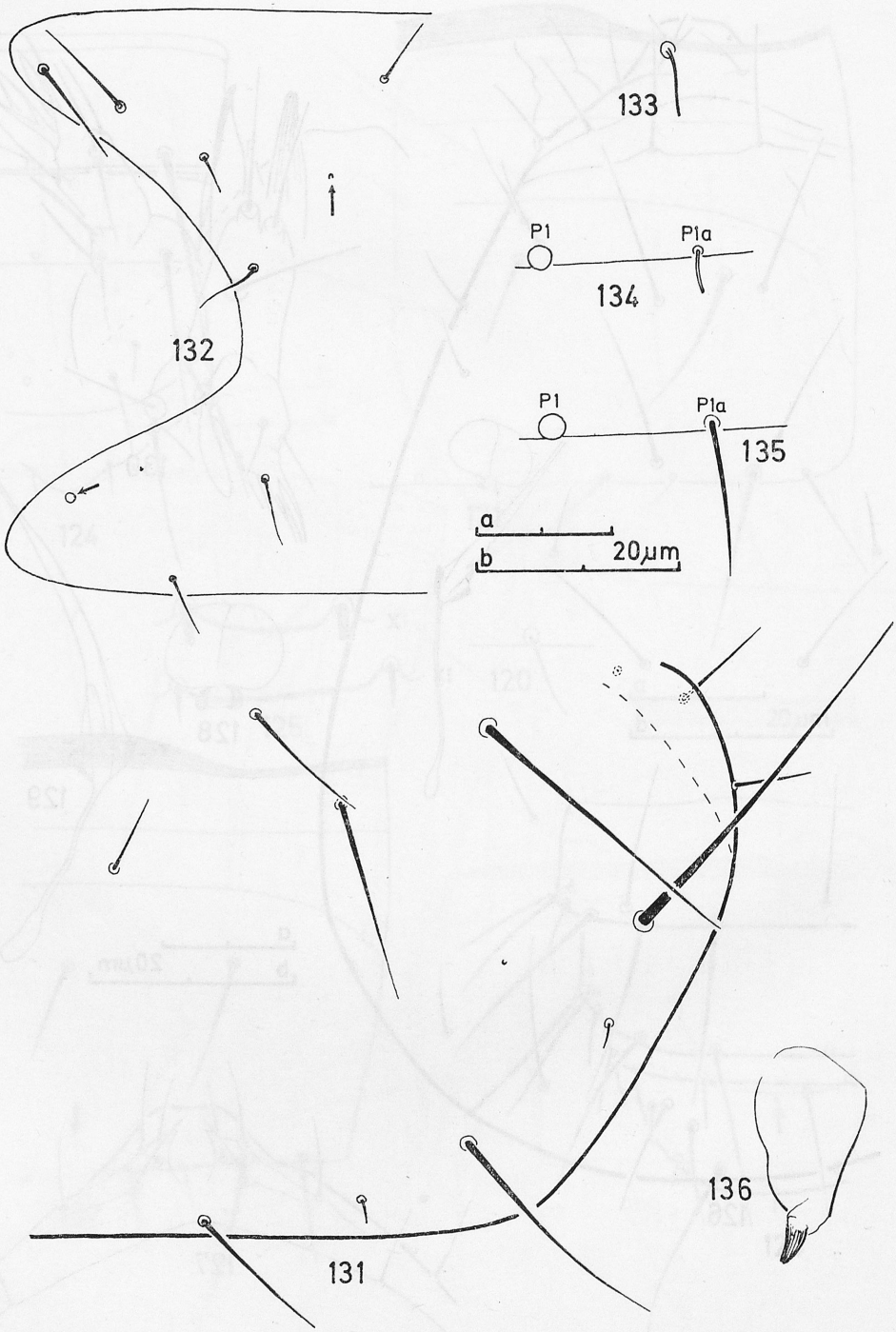

Fig. 131—136. *Yavanna altaica* sp. n. (holotype) 131 — metanotum; 132 — metasternum (arrows — pores); 133 — seta *P4* on urotergite I; 134 — seta *P1a* on urotergite VI; 135 — ditto, on urotergite VII; 136 — acrostylus; (131, 132 — magnification a, others — b)

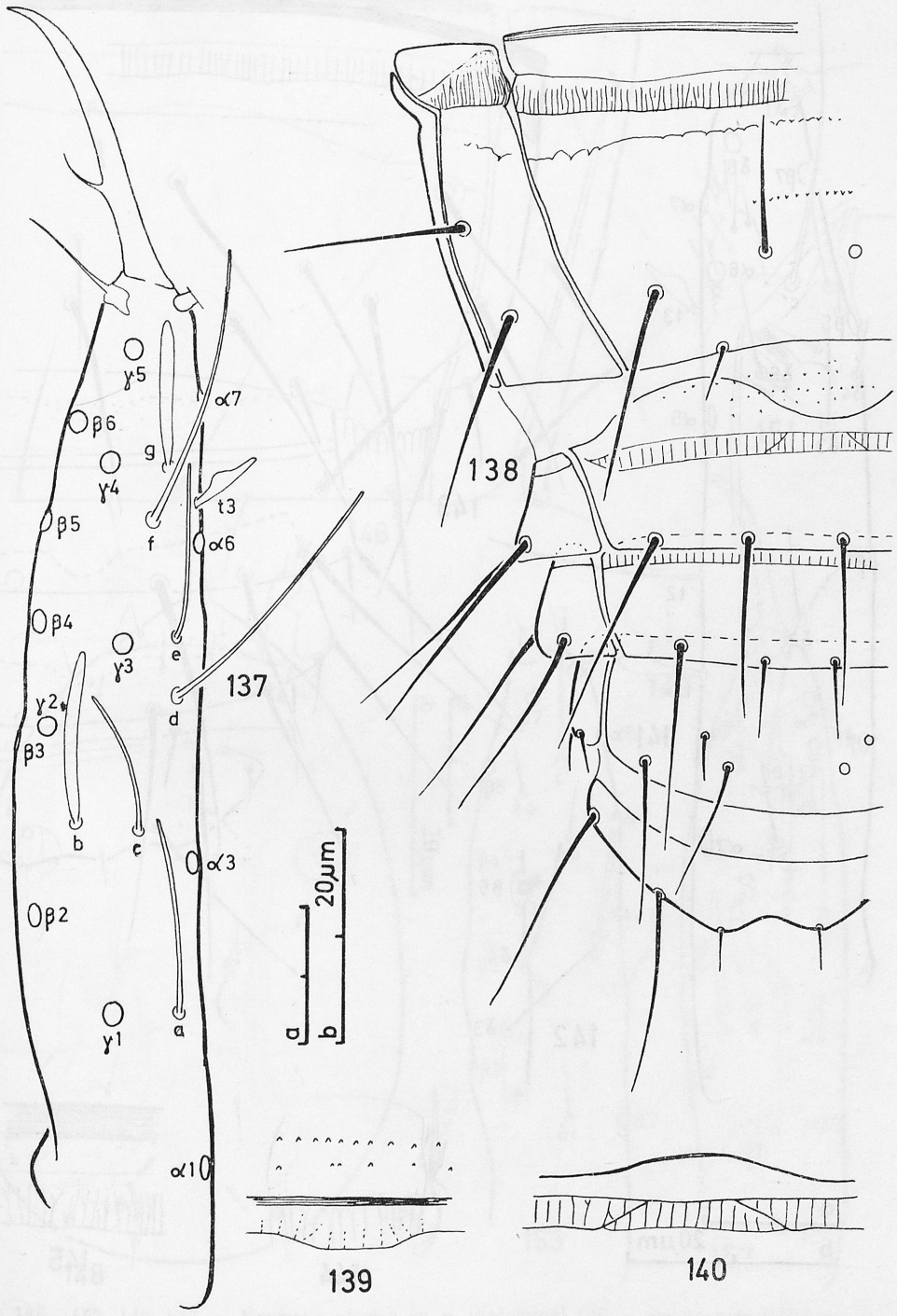

Fig. 137—140. *Yavanna altaica* sp. n. 137 — foretarsus, exterior view (nr 2789); 138 — urosternite VIII—XII (holotype); 139 — anterior part of urotergite IX (holotype); 140 — ditto, of urosternite IX (holotype); (138 — magnification a, others — b)

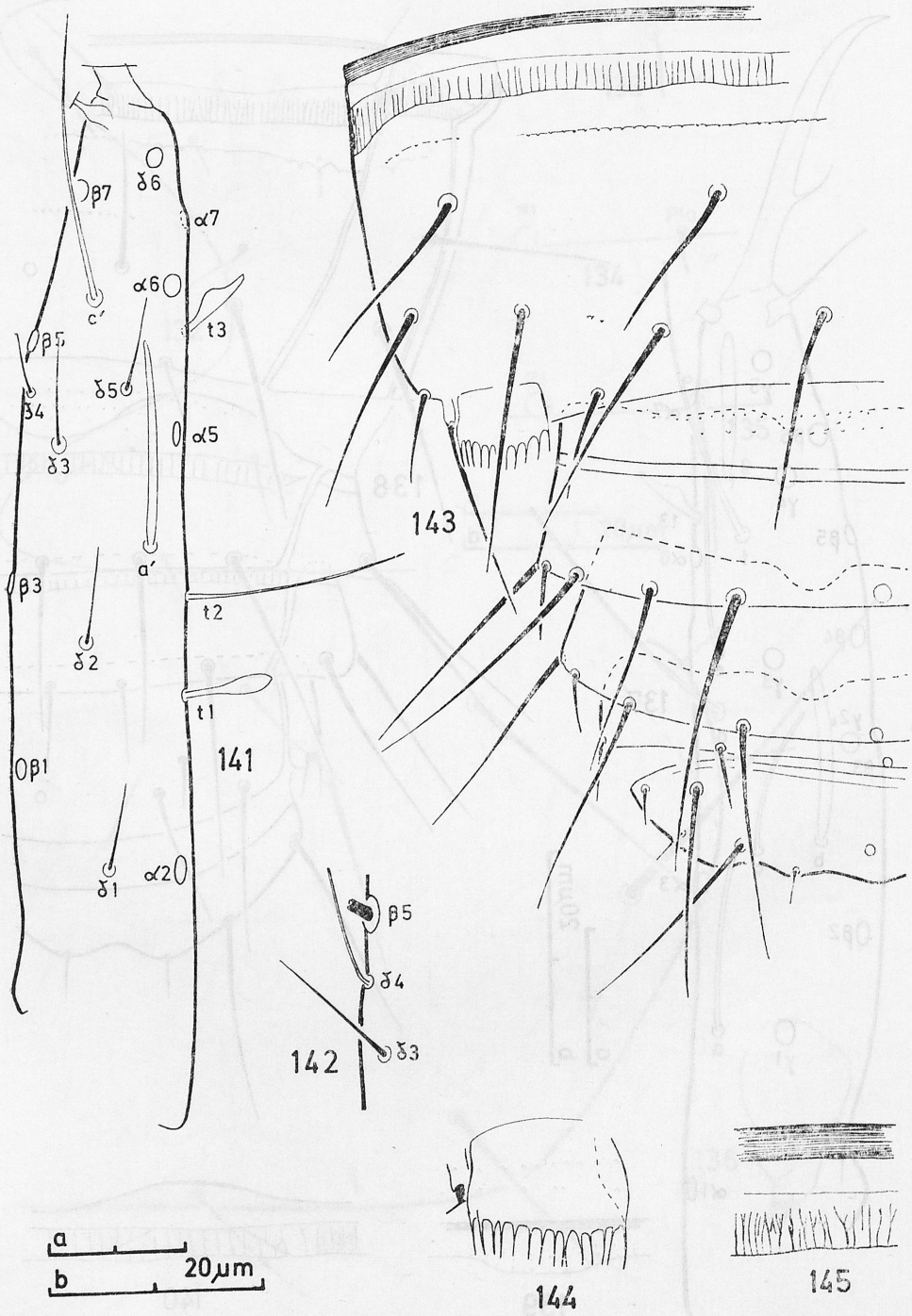

Fig. 141—145. *Yavanna altaica* sp. n. 141 — foretarsus, interior view (nr 2789); 142 — seta δ4 on foretarsus (holotype); 143 — urotergite VIII—XII (holotype); 144 — striate band (holotype); 145 — comb VIII (holotype); (143 — magnification a, others — b)

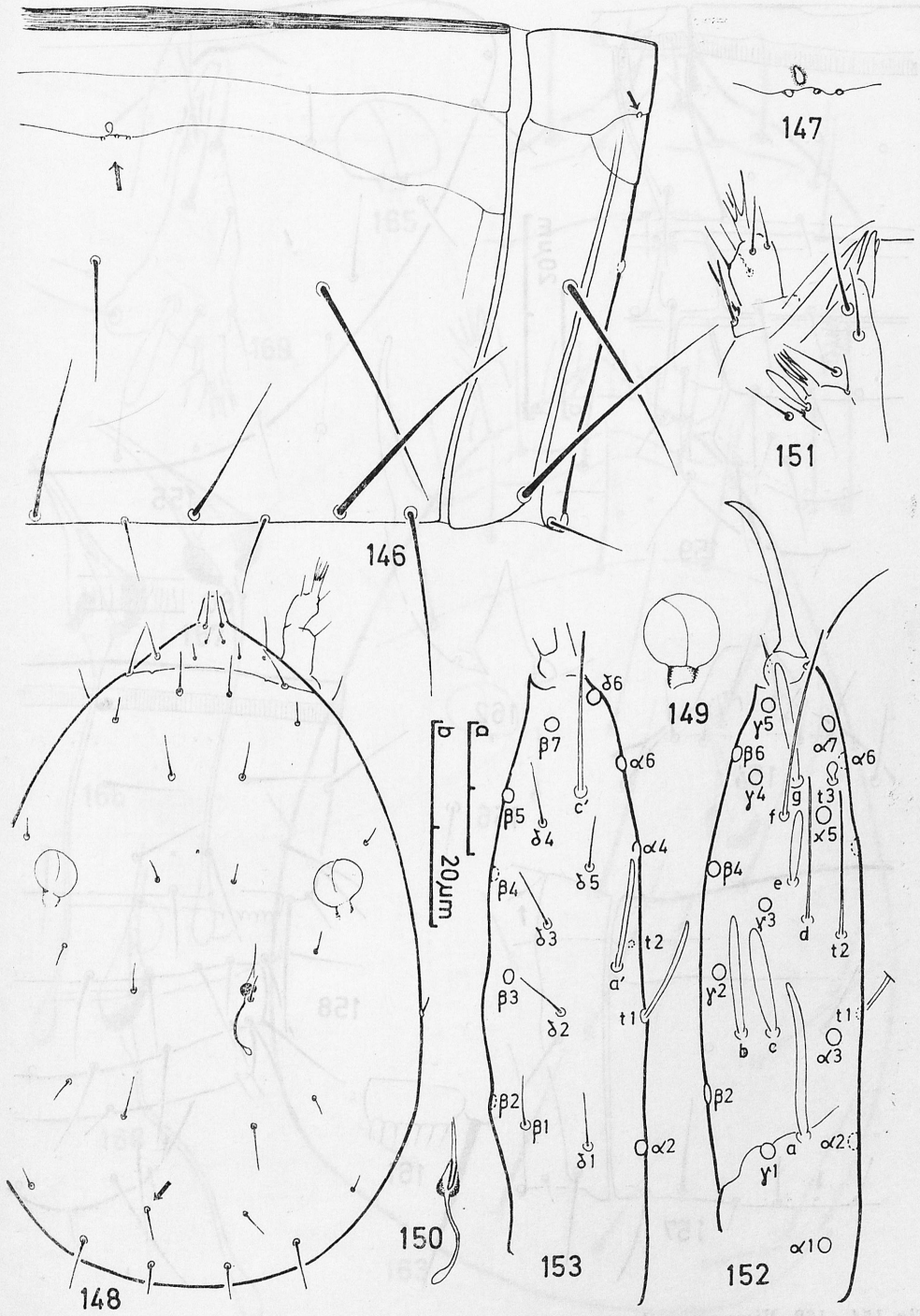

Fig. 146—153. 146, 147 — *Yavanna altaica* sp. n. (holotype) 146 — urosternite VII (arrows — pores); 147 — group of pores on urosternite VII; 148—153. *Nienna parvula* sp. n. (holotype); 148 — head (arrow — submedial additional seta); 149 — pseudoculus; 150 — filamento di sostegno; 151 — mouthparts; 152 — foretarsus, exterior view; 153 — ditto, interior view; (146, 149 — magnification a, others — b)

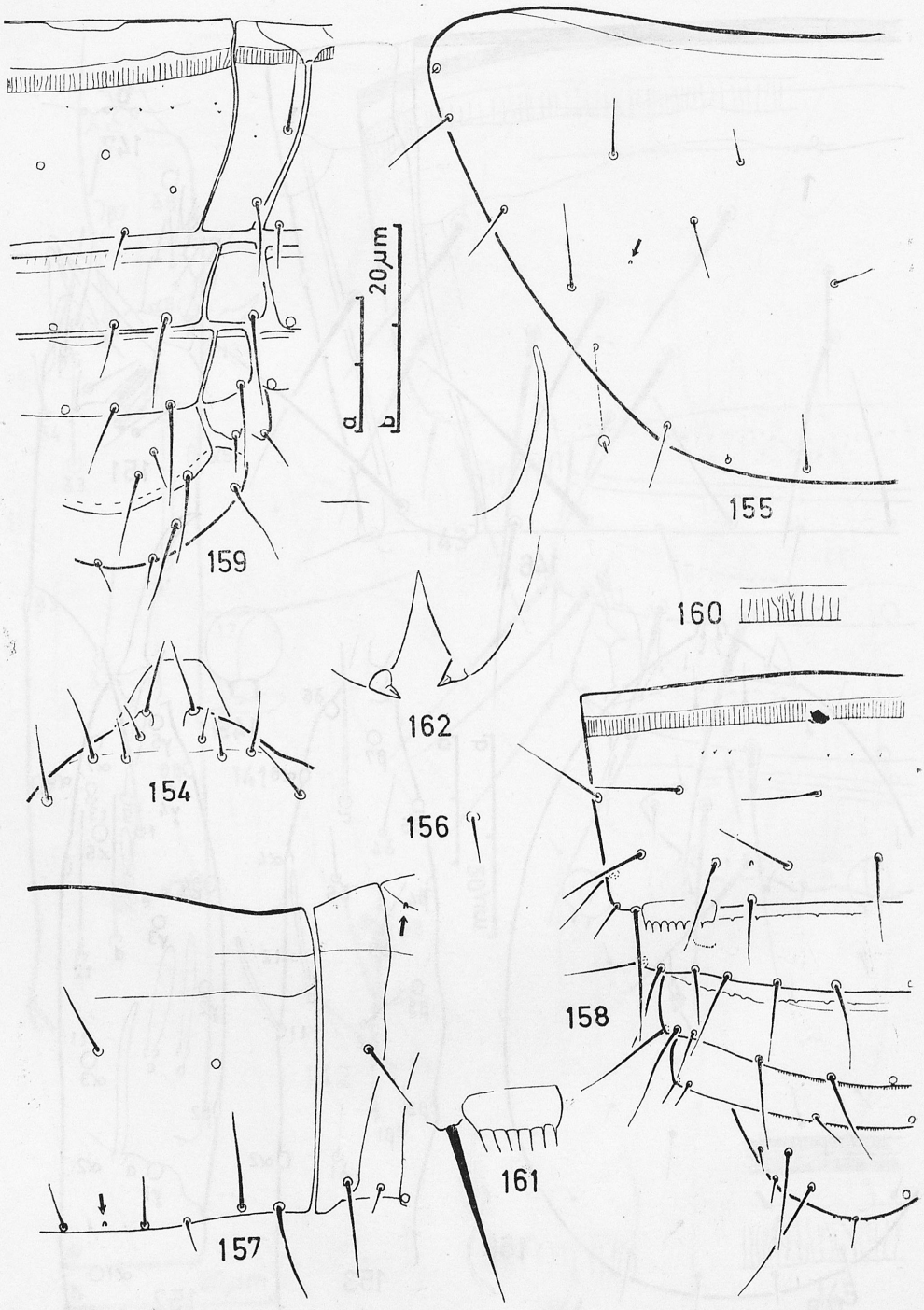

Fig. 154—162. *Nienna parvula* sp. n. (holotype) 154 — rostral part of head; 155 — metanotum; 156 — seta *P2a* on urotergite VI; 157 — urosternite VII (arrows — pores); 158 — urotergite VIII—XII; 159 — urosternite VIII—XII; 160 — striate band; 161 — comb VIII; 162 — squama genitalis ♀; (155, 157, 159 — magnification a, others — b)

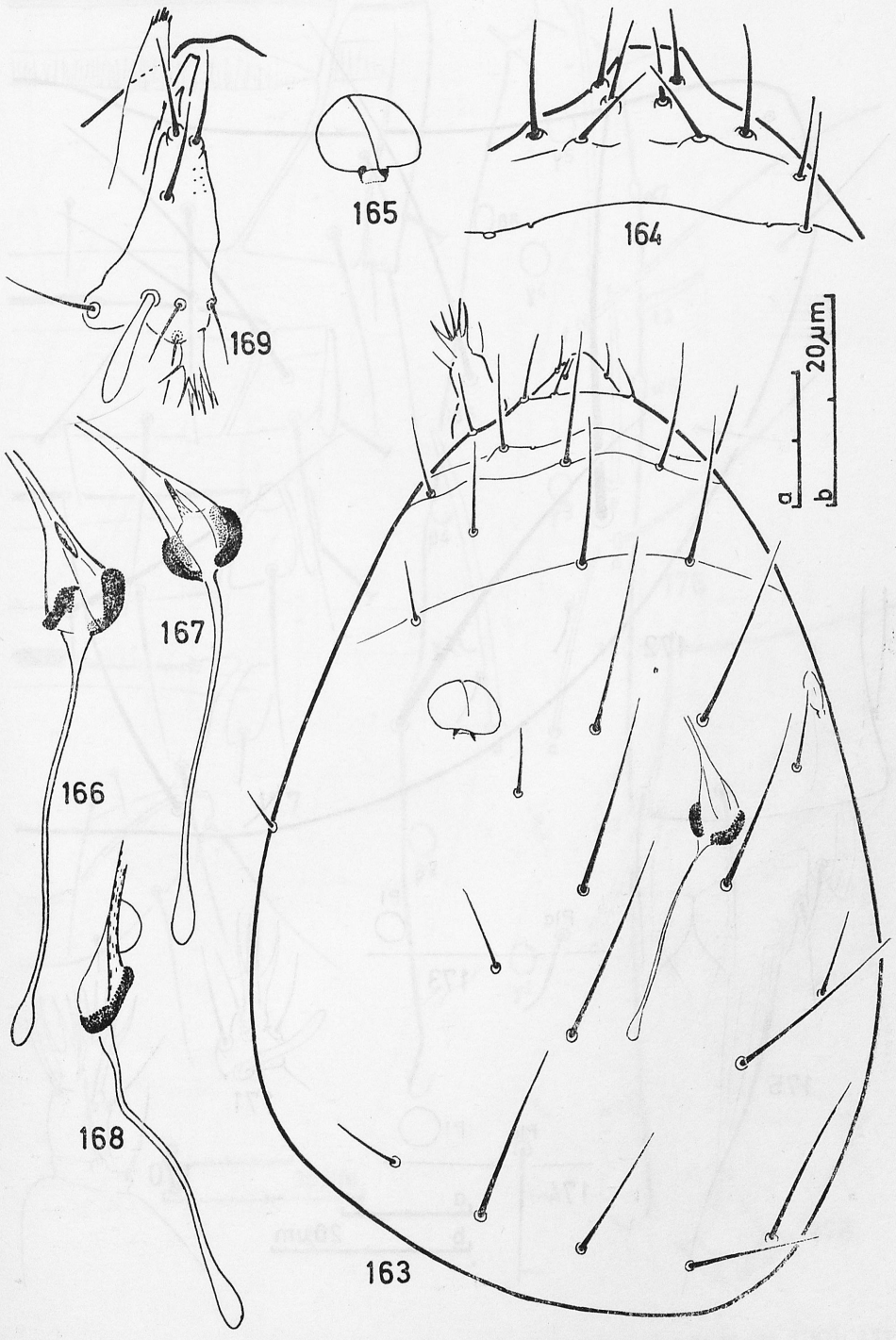

Fig. 163—169. *Imadateiella murka* sp. n. 163 — head (nr 2782); 164 — rostral part of head (holotype); 165 — pseudoculus (nr 2787); 166—168 — filamento di sostegno (nr 2788 and 2788); 169 — mouthparts (holotype); (163 — magnification a, others — b)

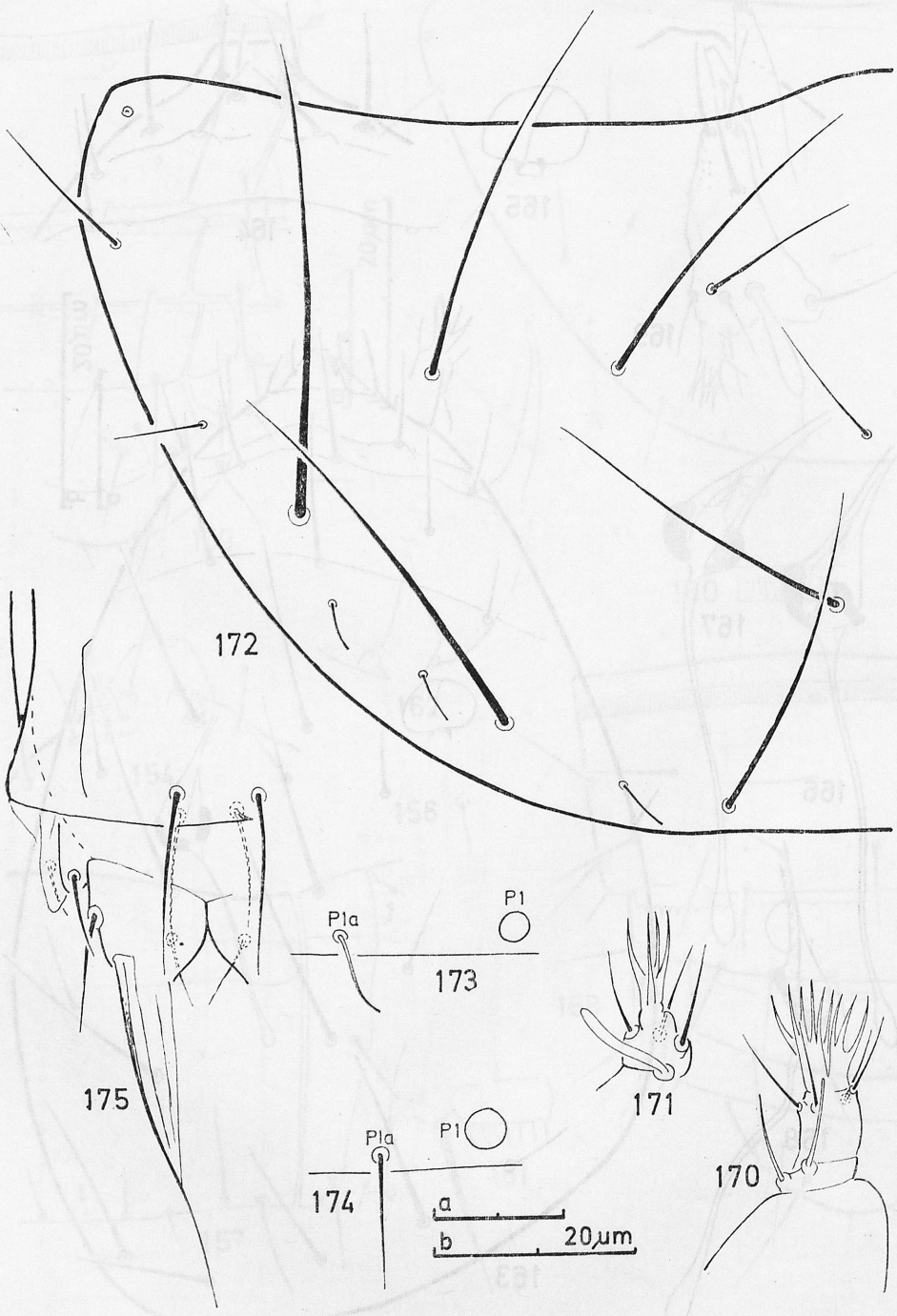

Fig. 170—175. *Imadateiella murka* sp. n. 170 — maxillary palp (nr 2788); 171 — labial palp (nr 2788); 172 — metanotum (nr 2788); 173 — seta *P1a* on urotergite VI (nr 2787); 174 — ditto, on urotergite VII (nr 2787); 175 — penis (holotype); (172 — magnification a, others — b)

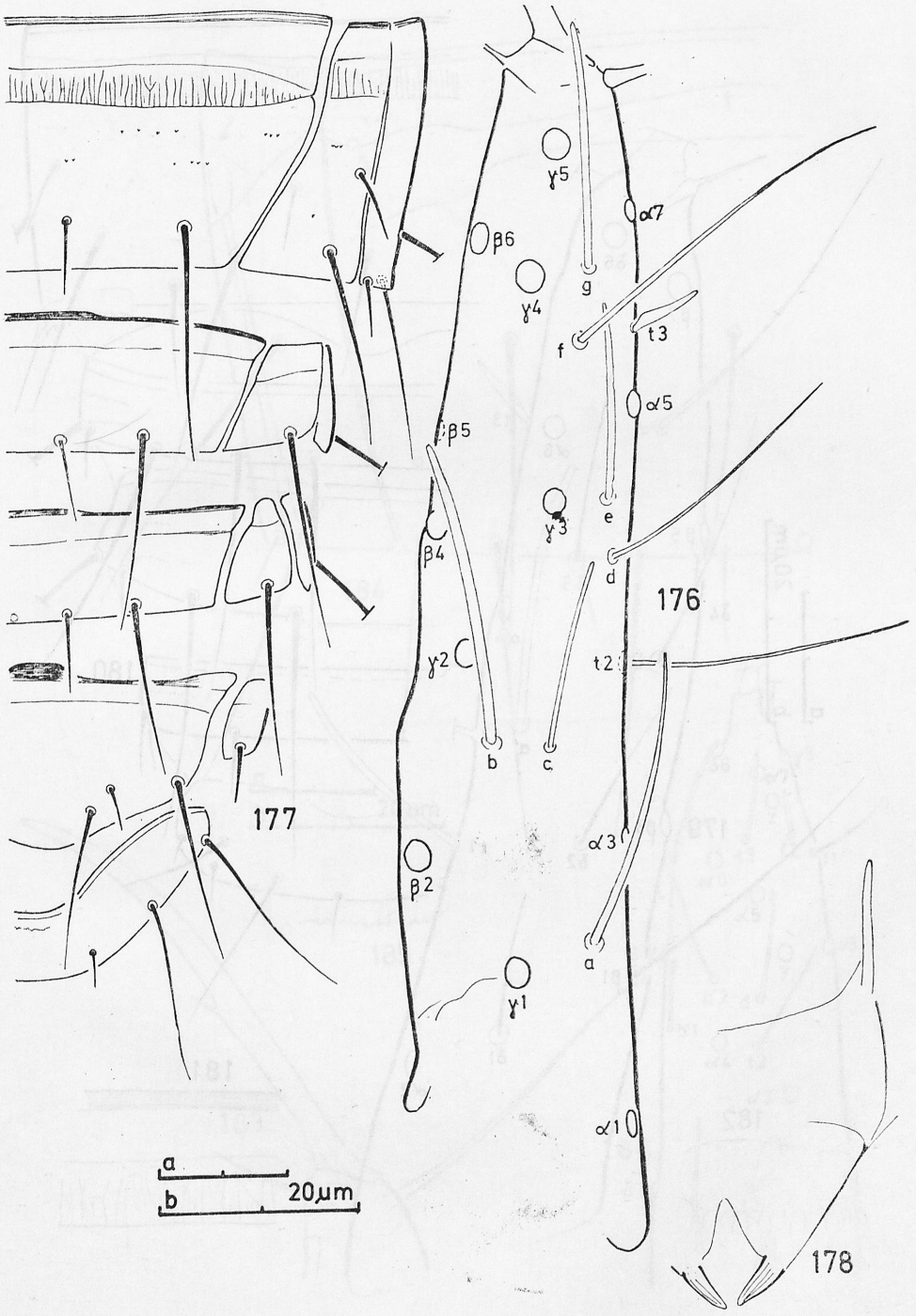

Fig. 176—178. *Imadateiella murka* sp. n. 176 — foretarsus, exterior view (nr 2787); 177 — urosternite VIII—XII (nr 2788); 178 — squama genitalis ♀ (nr 2782); (177 — magnification a, others — b)

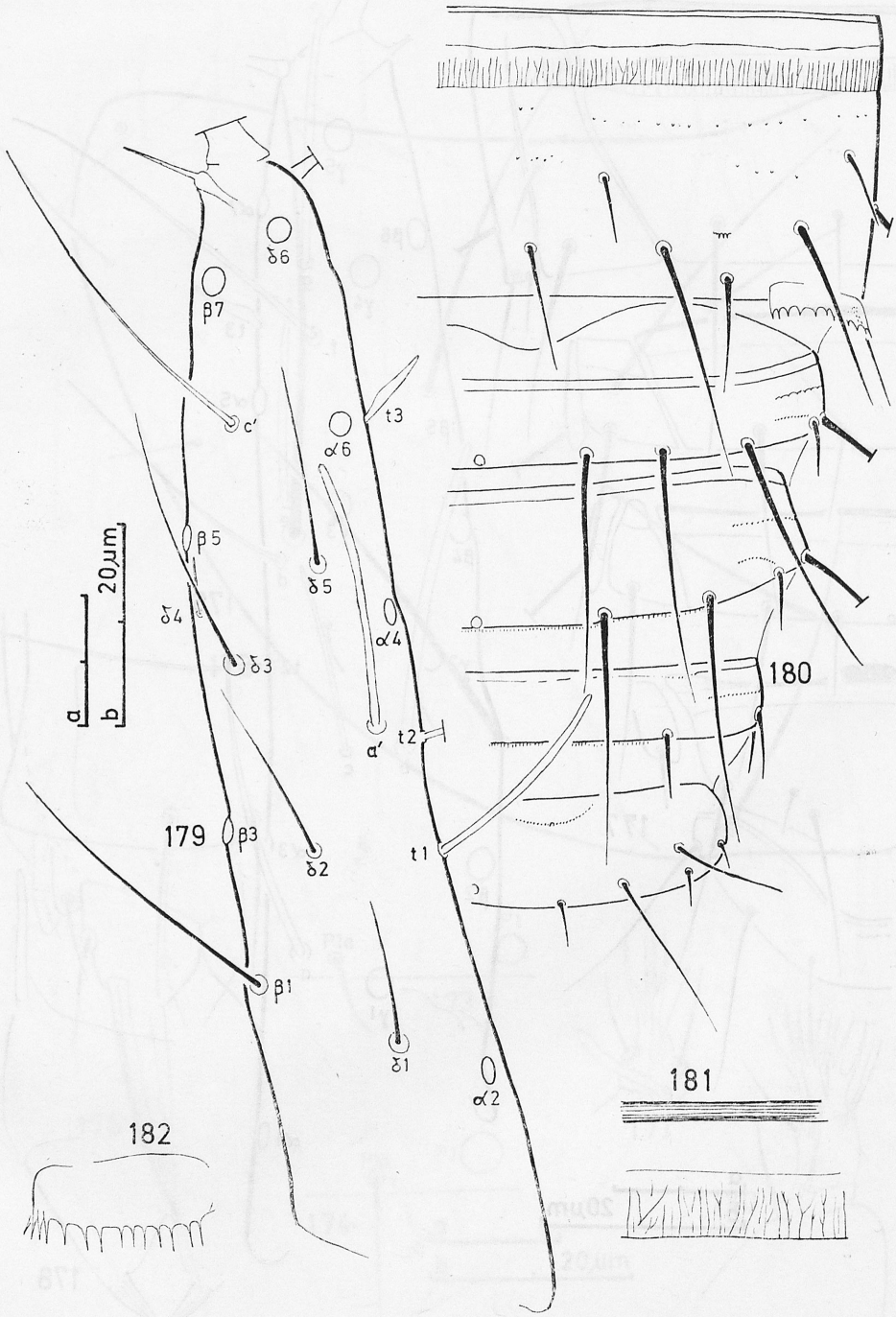

Fig. 179—182. *Imadateiella murka* sp. n. 179 — foretarsus, interior view (nr 2787); 190 — urotergite VIII—XII (nr 2788); 181 — striate band (nr 2787); 182 — comb VIII (nr 2787); (180 — magnification a, others — b)

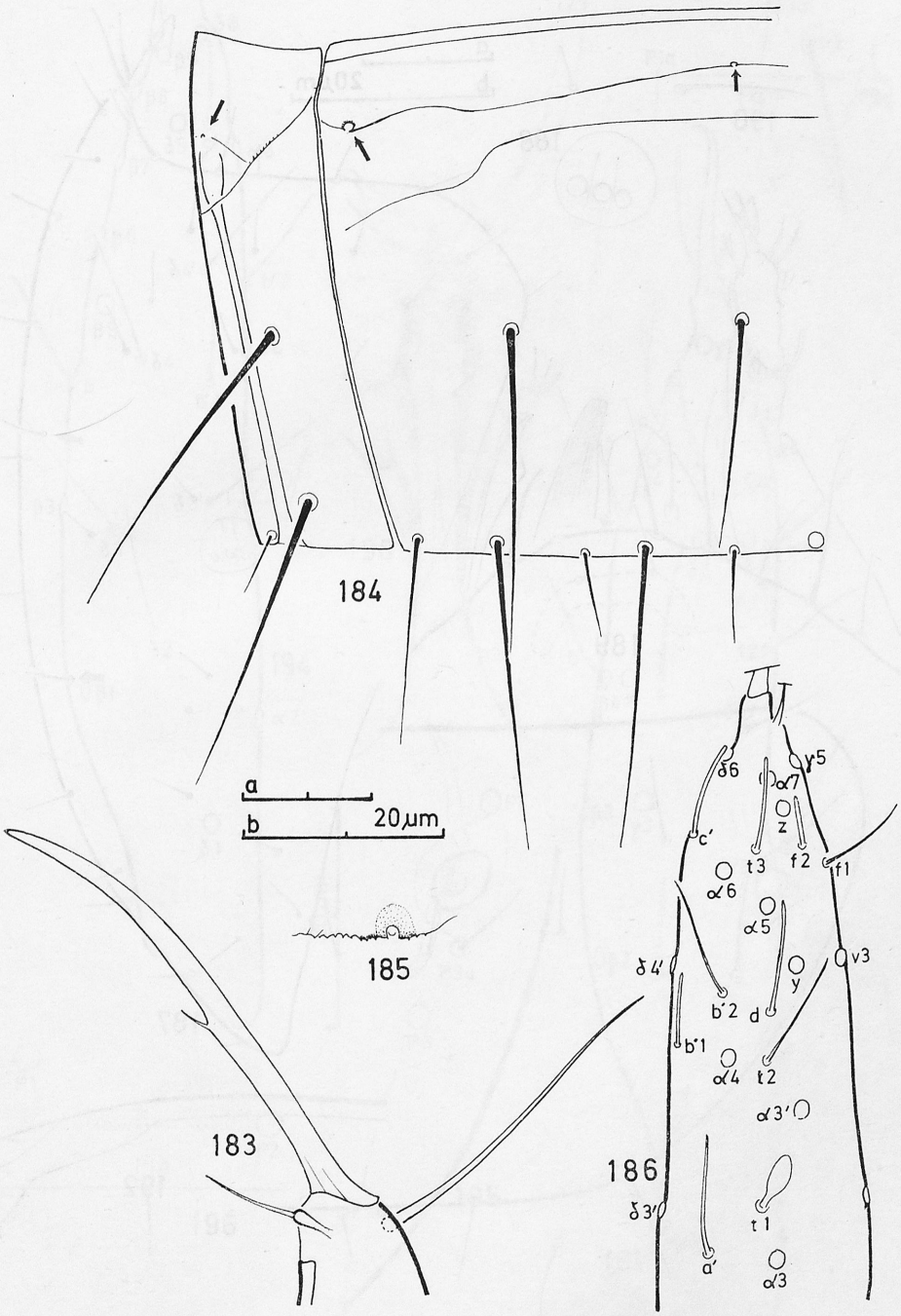

Fig. 183—186. 183—185 — *Imadateiella murka* sp. n. 183 — claw (nr 2787); 184 — urosternite VII (nr 2788, arrows — pores); 185 — lateral pore on urosternite VI (nr 2787); 186 — *Eosentomon tshergense* sp. n., distal part of foretarsus, dorsal view (nr 2719); (184 — magnification a, others — b)

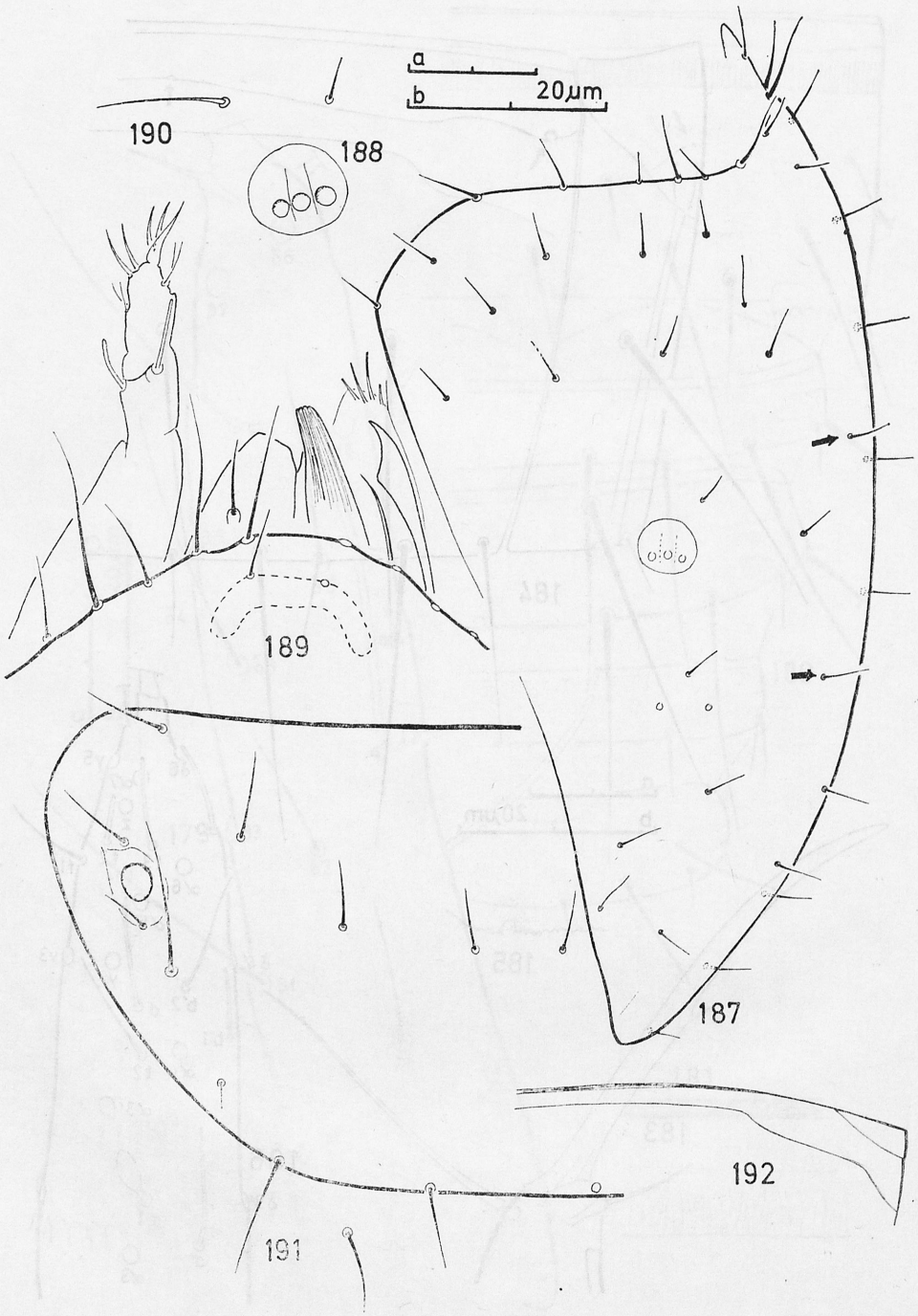

Fig. 187—192. *Eosentomon tshergense* sp. n. 187 — head (nr 2718, arrows — additional setae); 188 — pseudoculus (nr 2718); 189 — mouthparts, dorsal view (holotype); 190 — rostral seta, lateral view (nr 2718); 191 — mesonotum (holotype); 192 — anterolateral part of urosternite VIII (holotype); (187, 191, 192 — magnification a, others — b)

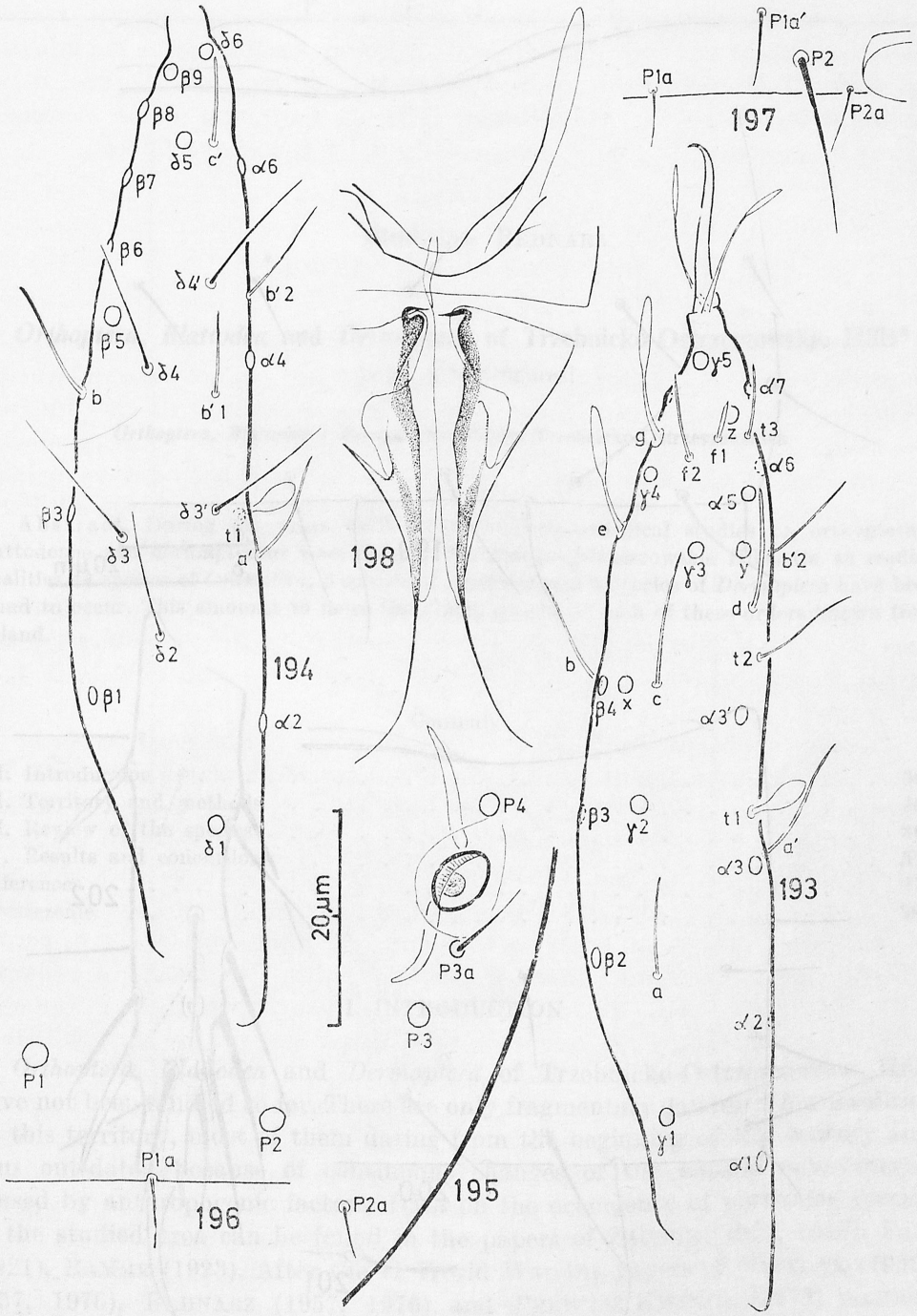

Fig. 193—198. *Eosentomon tshergense* sp. n. 193 — foretarsus, exterior view (nr 2719); 194 — ditto, interior view (nr 2719); 195 — tracheal camerae and seta *P2a* on mesonotum (holotype); 196 — seta *P1a* on urotergite VII (holotype); 197 — seta *P1a'* on urotergite VIII (holotype); 198 — squama genitalis ♀ (holotype)

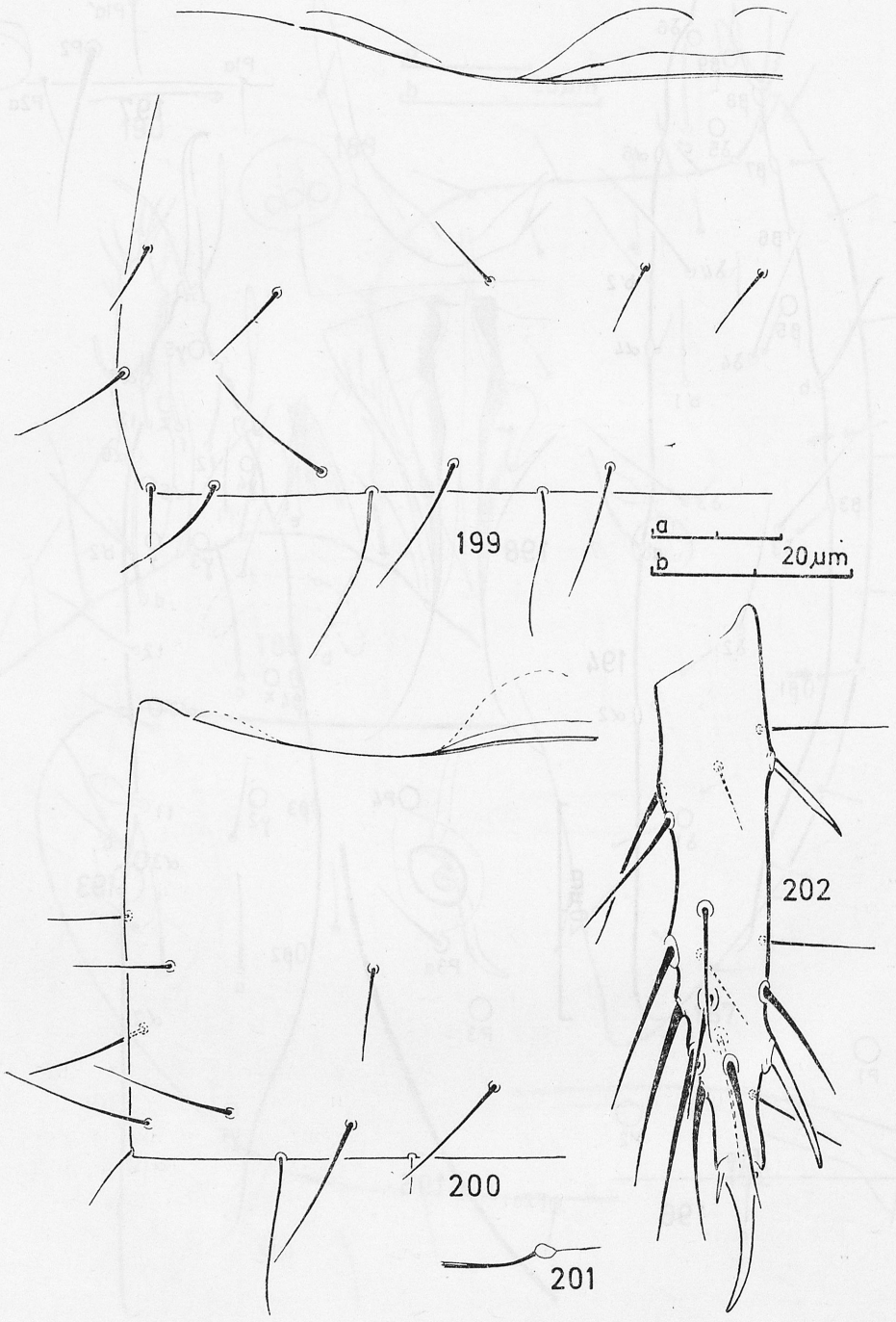

Fig. 199—202. *Eosentomon tshergense* sp. n. 199 — urotergite VI (holotype); 200 — urotergite VIII (holotype); 201 — laterostigma IV (holotype); 202 — leg III (nr 2718); (199, 200 — magnification a, others — b)