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Polish *Protura* V. Genus *Acerentulus* BERLESE, 1908 (*Acerentomidae*)*

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Abstract. *Acerentulus alni, silvanus* and *collaris* are described as new to science; *exiguus, carpaticus, xerophilus, tuxeni, rafalskii, cunhai* and *traegardhi* are redescribed. A list of Polish localities of all 11 species and determination key is given. Sternal porotaxy and lineation are used as taxonomical features. Earlier data concerning *A. confinis* in Poland are rejected. Some corrections to the IMADATÉ's system of setal naming are introduced.

Key words: *Protura*, taxonomy, Poland.

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I. INTRODUCTION

The genus *Acerentulus* is widely distributed over the Holarctic, reaching Southern America, Australia and New Zealand. 24 species and one subspecies are recorded from Europe (ALDABA 1983; NOSEK 1973, 1983; RUSEK 1988; RUSEK, STUMPP 1988; SZEPTYCKI 1979; TUXEN 1964, 1982), three species and one subspecies from Japan (IMADATÉ 1988), and single ones from Argentina (NAJT, VIDAL 1970), United States (EWING 1940, comp. IMADATÉ 1974), Australia (TUXEN 1967) and New Zealand (TUXEN 1985).

Only six species have been recorded from Poland till now (STACH 1955, 1964; SZEPTYCKI 1964, 1969a,b, 1979). *Acerentulus confinis* BERLESE, 1908 has been recorded due to a misidentification. The data of STACH (1964) and of myself (SZEPTYCKI 1969a,b) repeated in NOSEK (1973) concern other species.

The material described here has been collected by many workers. The abbreviations of their names given in brackets in the descriptions of individual samples are as follows:

*Supported by Polish Academy of Sciences, Project CPBP 04.06

Bl - M. BLASKI, Bł - J. BŁOSZYK, Da - H. DASTYCH, Dz - A. DZIABASZEWSKI, IZ - samples taken collectively by the staff of the Institute of Zoology of the Polish Academy of Sciences in Warsaw, Ja - M. JACKIEWICZ, Ka - M. KACZMAREK, Kl - A. KALISZEWSKI, Ko - J. KOLASA, Nd - W. NIEDBAŁA, Pm - R. J. POMORSKI, Pn - Z. PNIEWSKI, R - J. RAFALSKI, Rh - J. ROHLOFF, Rj - A. RAJSKI, St - J. STACH, Sz - A. SZEPTYCKI, Tr - H. TROJANOWSKI, We - W. WEINER, ZM - samples taken by the staff of the Departament of Animal Morphology of A. Mickiewicz University in Poznań.

The coordinates of localites are given in UTM grid. The following abbreviations for developmental instars are used: pm - preimago, mj - maturus junior, l2 - larva II, l1 - larva I.

All materials described here (including the type specimens) are preserved in the collection of the Institute of Systematic and Evolution of Animals of the Polish Academy of Sciences, Kraków, Poland.

I owe the deepest gratitude to all of friends who presented me with materials for this study, especially to Prof. Dr Jan RAFALSKI, Dr Wanda WEINER, Dr Maria KACZMAREK and Dr Maria STERZYŃSKA. The extensive material of the Ojców National Park was given by the late Dr Aleksander RAJSKI. Without the kindness of the mentioned persons, the paper presented would be impossible. The checking of the type material of *A. exiguus, carpaticus* and *ruseki* was possible due to the kindness of Dr B. HAUSER (Genève) and Dr H. ENGHOFF (København). Dr C. TORTI (Genova) presented me a species of *A. confinis* from Italy. Mrs Maria BIENIEK helped me much in preparing the typescript, and Mr Jan RYBICKI checked and corrected my English. I would like to express my thanks to them.

II. GENERAL CHARACTERISTICS

The morphological characteristics of the genus were given in TUXEN (1964), NOSEK (1973, 1978) and IMADATÉ (1974, 1988) and only some new details are added below.

Head. The head chaetotaxy does not differ from that in the other *Acerentomoidea*. The additional seta is lacking in all of the species described here, but it exists in some Japanese ones (IMADATÉ 1988). 3+3 setae are in the shape of sensillae (fig.16,s). They can be hair-like or billet-like. The shape of pseudoculus is sometimes taxonomically important, especially the length of the lever, the PR index can vary in very broad limits. The length of the filamento di sostegno and the CF index is very variable, too. Sometimes the shape of the distal dilation of the filamento is a taxonomical feature. Maxillary palp is the same in all the species studied, in some species the length ratio and the shape of sensillae of maxillary palp is important. More important is the structure of the tuft of labial palp - it can be four- (fig.17) or two-branched (fig.175). Some subtle inter-specific differences exist also in the shape of sensilla of labial palp.

The chaetotaxy of head does not change during the postembryonic develompment beginning from larva I.

Foretarsus. The taxonomical importance of the length and shape of foretarsal sensillae has been well known since long ago. The setae $\beta 1$ and $\delta 4$ are always short,

sensilla-shaped. They are hardly visible and were omitted in many older drawings - but they are present in all the species studied. In larva I sensillae *b'* and *c'* are absent; sensilla *c'* arises in larva II, *b'* in maturus junior. Some proportions of sensillae can change during the postembryonic development (comp. figs 192-197 and 182).

Body chaetotaxy. The symbols for denomination of individual setae in the genus *Acerentulus* were introduced by IMADATÉ (1966, 1974, 1988). The comparative studies on the chaetotaxy of different Proturan genera (especially on the chaetotaxy of *Sinentomon* YIN, 1965 which seems to be the most generalised among *Protura*) led me to the conclusion that this system should be corrected in some details to avoid the naming of not-homologous setae with the same symbols and the naming of homologous setae with different symbols. These corrections are presented in the Table I.

Table I

The differences between the IMADATÉ's system of setal denomination and the proposed system

IMADATÉ's system	Proposed system	IMADATÉ's system	Proposed system
Dorsal side			
Th. II - III		Abd. I	
P5 *P5a*	*P4a* *P5*	*P5*	*P4*
Abd. VIII		Abd. IX - X	
M2 *P2* *M3* *P3* *P4*	*P1* *P1a* *P2* *P2a* *P3a*	*2* *3* *3a* *4* *5*	*1a* *2* *2a* *3* *4*
Ventral side			
Th. II - III		Abd. I - III	
P1 *P2*	*P2* *P3*	*P2*	*P1a*
		Abd. VIII	
		P	*1a*

The development of chaetotaxy was described in four species by ALDABA (1984) and in three species by IMADATÉ (1974,1988). I had an opportunity to study it in *A. exiguus, xerophilus, cunhai, traegardhi* and (partly) *tuxeni*. It is very similar in all the species studied and it is summed up in Table II and III. The diferences in the time of origin of individual setae concern only seta *A4* on urotergite VI (but the time of its origin can vary individually), *P1a* on urosternite I and *1a* on urosternite VIII. The species also differ in the time of the vanishing of larval seta on urosternite XII.

The differentiation of the setae is indentical in all species of the genus. Setae *P1a, P2a*, and *P5* on nota and *P2a* on urotergite I are in the shape of very small, rounded or conical sensillae. Seta *P4a* on metanotum, *A2* and *M2* on thoracal sterna, *A5* on urotergite I and accessory setae on abdominal segments I - VII are in the shape of small elongated sensillae, which can be billet-like (fig. 28) or hair-like (fig. 167). They are hair-like on abd. VII in all studied species.

The specific differences in chaetotaxy concern the length of main setae, the shape of some accessory setae, the presence/absence of setae *P1a* and *P3a* on urotergite I-VII and seta *1* on urotergite XI, the number of setae *A* on urotergite VII and number of setae on urosternite XI.

Porotaxy. Tergal porotaxy is uniform in all the species described here. An identical one was found in some undescribed Balkanian and North American species and in the three Japanese species (own data) - so it is probably a good feature of the genus as a whole.

Tergal porotaxy is as follows (the denomination of the pores according to SZEPTYCKI 1988):

Th. I	0	
Th. II	2 + 2	*al, l*
Th. III	1 + 1	*l*
Abd. I	1 + 1	*psm*
Abd. II-V	2 + 2	*psm, al*
Abd. VI-VII	3 + 3	*psm, psl, al*
Abd. VIII	1 + 1	*psm*
Abd. IX-XI	0	
Abd. XII	1	

Sternal porotaxy is much more differentiated and in many cases can be used as a good taxonomical character. The pores are situated near the seta *P1* or on the medial line. In some species there are groups of 2-4 small pores instead of one pore. In some cases there exists only one pore, asymmetrically situated. This asymmetry is, in many cases, a specific character too. Sternal porotaxy can be described by the following formula (for *A. cunhai*):

Th. I	0	
Th. II-III	1	(single pore situated on medial line)
Abd. I	1 + 0	(single pore asymmetrically situated)
Abd. II-III	0	
Abd. IV-V	1 + 1	(single pores symmetrically situated)
Abd. VI	n + n	(groups of pores symmetrically situated)
Abd. VII	1 + 0	
Abd. VIII-XI	0	
Abd. XII	1 + 1	

The lack of the pores on prosternum and on urosternites VIII-XI, and the presence of 1+1 pore on XII is a common feature for all the species studied.

In the following descriptions of individual species porotaxy is described by a "sternal porotaxy formula" concerning urosternite I-VII. In the case of *A. cunhai* it is: /1+0/0/0/1+1/1+1/n+n/1+0/.

Lineation. There are two distinct types of lineation of antero-lateral corners of sternites IV-VI. In spite of the great variability in the shape of individual lines, the presence or absence of a connecting line (fig. 30, 117 and 162, c) is an important taxonomical feature.

Genitalia. The general patterns of the penis does not differ from that in the related genera (comp. SZEPTYCKI 1988). Additional setae are absent. *Acerentulus traegardhi* differs from the other species by the absence of the lateral setae on the acroperiphallus (comp. fig. 35 and 198). Squama genitalis ♀ is characterised by the presence of a distal prolongation of the stylus surrounding acrostylus. The shape of the squama as a whole, the shape of the prolongation of stylus, and the shape of acrostylus are of great taxonomical importance.

Prelarva (fig. 1-11). There exist some more or less detailed descriptions of the prelarva of *Acerentulus* (CONDÉ 1944a; ALDABA 1984, 1985). The problem of taxonomical characters of this instar is still unsolved, so precise data about the species of *Protura* accompanying it are necessary. The specimen described below was taken from decayed wood of an old dead willow in Puszczykowo ad Poznań, 18.X.1986. (leg. J.RAFALSKI) together with numerous specimens of *A. cunhai, exiguus* and *traegardhi.* The sample contains no other genera of *Protura.*

Length (in μm) of body 610, head 100, foretarsus 45. Head with 2+2 anterior setae, 5+5 spines and no trace of rostrum. Body chaetotaxy and structure of foretarsus exactly as in *Acerentonom* (SZEPTYCKI 1986). Small sensilla *P5* on meso- and metanotum present. Relatively short foretarsal sensillae *c* and *e* might be a specific character of *A. cunhai.*

The prelarva is only known in a few genera of *Acerentomoidea.* They are: *Proturentomon* SILVESTRI, 1909 (CONDÉ 1961; ALDABA 1985), *Protentomon* EWING, 1921 (BERNARD 1975), *Nosekiella* RUSEK, 1974 (TUXEN 1949), *Nipponentomon* IMADATÉ et YOSII, 1959 (IMADATÉ 1974, 1980), *Acerentomon* SILVESTRI, 1907 (FRANÇOIS 1960; ALDABA 1985; SZEPTYCKI 1986), and *Acerentulus* (CONDÉ 1944b; ALDABA 1985). In protentomids it is characterised by very short foretarsal setae and sensillae (if the latter are present). In *Nosekiella* and *Nipponentomon* the head spines seem to be (according the drawings in the quoted papers) replaced by the normal setae. The prelarva of *Acerentulus* differs from that of *Acerentomon* (own data, unpublished) by the presence of 5+5 spines on head (in *Acerentomon* there exist only 3+3 spines, those lying exteriorly to pseudoculus are replaced by small setae), in the lack of rostrum (a small protrusion exists in *Acerentomon*), and in the presence of 2+2 anterior setae on head (in *Acerentomon* there are 3+3 setae).

Table II

Dorsal chaetotaxy of *Acerentulus* sp. sp.

		composition of setae	formula				
			0 pl	I l1	II l2	III mj	IV im
THORAX	I	I I 1 2	0	4	4	4	4
	II-III	I II I A2 A4 M 0 II 0 III 0 0 II 0 P1 P1a P2 P2a P3 P4 P4a P5	0 10	4 10	6 14	6 16	6 16
ABDOMEN	I	III III III A1 A2 A5 0 III 0 II 0 0 P1 (P1a) P2 P2a P3 P4	0 8	0 8	0 10	6 10-12	6 10-12
	II	III III III A1 A2 A5 0 III 0 II 0 0 II I P1 (P1a) P2 P2a P3 P4 P4a P5	0 8	0 10	0 14	6 14-16	6 14-16
	III-V	III III III A1 A2 A5 0 III 0 II 0 IV 0 II I P1 (P1a) P2 P2a P3 (P3a) P4 P4a P5	0 8	0 10	0 14	6 14-16	6 14-18
	VI	III III III-IV III A1 A2 A4 A5 0 III 0 II 0 IV 0 II I P1 (P1a) P2 P2a P3 (P3a) P4 P4a P5	0 8	0 10	0 14	6-8 14-16	8 14-18
	VII	III III III III (A1) A2 (A4) A5 0 III 0 II 0 III 0 II I P1 (P1a) P2 P2a P3 (P3a) P4 P4a P5	0 8	0 10	0 14	6-8 16-18	6-8 16-18
	VIII	III II III A1 A3 A5 IV 0 I 0 I 0 II I M1 P1 P1a P2 P2a P3 P3a P5	0 6	0 12	2 14	6 15	6 16
	IX	II III II III II II 1 1a 2 2a 3 4			8	12	12
	X	III IV III IV III III 1 1a 2 2a 3 4				8	12
	XI	III III III (1) (3) (4)				4-6	4-6
	XII		2 3	6 3	6 3	6 3	6 3

O - prelarval setae, I - primary setae, II - secondary setae, III - tertiary setae, IV - complementary setae, (in brackets) - setae lacking in some species.

Table III

Ventral chaetotaxy of *Acerentulus* sp. sp.

		composition of setae	formula				
			^{0}pl	^{I}l1	^{II}l2	^{III}mj	^{IV}im
THORAX	I	^{I}A1 ^{III}A2 ^{I}M1 ^{III}M2 ^{I}P1 ^{I}P2 ^{III}P3	0 0	2+2 4	2+2 4	4+4 6	4+4 6
	II	^{I}Ac ^{II}A2 ^{I}A3 ^{I}M ^{I}P2 ^{III}P3	0 0	3+2 2	5+2 2	5+2 4	5+2 4
	III	^{I}Ac ^{II}A2 ^{I}A3 ^{III}A4 ^{I}M ^{I}P2 ^{III}P3	0 0	3+2 2	5+2 2	7+2 4	7+2 4
ABDOMEN	I	^{II}Ac ^{II}A2 ^{I}P1 $^{III-IV}$P1a	0 0	0 2	3 2	3 2-4	3 4
	II-III	^{II}Ac ^{III}A2 ^{I}Pc ^{III}P1a ^{I}P2	0 0	0 3	1 3	3 5	3 5
	IV-VI	^{I}Ac ^{III}A2 ^{II}P1 ^{III}P1a ^{0}P2 ^{I}P3	0 2	1 4	1 6	3 8	3 8
	VII	^{I}Ac ^{III}A2 ^{IV}(Pc) ^{II}P1 ^{III}P1a ^{0}P2 ^{I}P3	0 2	1 4	1 6	3 8	3 8-9
	VIII	^{II}1 ^{I}2 $^{III-IV}$1a	0 0	2 0	4 0	4 0-2	4 2
	IX	^{II}1 ^{II}2			4	4	4
	X	^{III}1 ^{III}2				4	4
	XI	^{IV}1 ^{III}(2) ^{IV}3				0-2	4-6
	XII		2 4	2 6	0-2 6	0 6	0 6

Symbols - as in Table II

III. KEY TO THE POLISH SPECIES OF *ACERENTULUS*

1.Urosternite XI with 4 setae 2
–.Urosternite XI with 6 setae 4
2.Connecting line on urosternite VI present, sensilla *b* on foretarsus reaching or passing base of claw 3
–.Connecting line on urosternite VI absent, sensilla *b* not reaching base of claw ..... *rafalskii*
3.Connecting line on urosternite V present, sensilla *a'* on level of *t1* or slightly distally ..... *traegardhi*
–.Connecting line on urosternite V absent, sensilla *a'* proximally to level of *t1* ..... *collaris* sp n.
4.Urotergite II-VI with seta *P1a* ..... *tuxeni*
–.Urotergite II-VI with no seta *P1a* 5
5.Urosternite VI with connecting line ..... *cunhai*
–.Urosternite VI with no connecting line 6
6.Pores on urosternite VI composed 7
–.Pores on urosternite VI simple 8
7.Foretarsus longer than 110 μm, urosternite VII with no seta *Pc* ..... *silvanus* sp. n.
–.Foretarsus shorter than 105 μm, urosternite VII mostly with seta *Pc* ..... *xerophilus*
8.Urotergite VII with seta *P3a*, foretarsus longer than 110 μm ..... *alni* sp. n.
–.Urotergite VII with no seta *P3a*, foretarsus shorter than 105 μm 9
9.Sensilla *a'* situated on level of seta δ2 ..... *occultus*
–.Sensilla *a'* situated proximally to level of δ2 ..... *10*
10.Sensilla *a'* long and thin, mesonotal seta *P2* longer than 38 μm ..... *carpaticus*
–.Sensilla *a'* short, dilated; mesonotal seta *P2* shorter than 37 μm ..... *exiguus*

IV. DESCRIPTIONS OF SPECIES

Acerentulus exiguus CONDÉ, 1944
(Figs 16-36)

Acerentulus confinis exiguus: CONDÉ 1944b; NOSEK 1977
Acerentulus exiguus: TUXEN 1964; NOSEK 1973

Diagnosis. *A. exiguus* belongs to a group of species with long foretarsal sensilla *a*, sensilla *b* of medium length, the lineation of sternites of "exiguus" type (with no connecting line), simple pores on urosternites IV-VI, and pore on VII urosternite situated far from its hind margin. It shares mentioned characters with *occultus, carpaticus, alni* and *confinis*. It differs from *occultus* in the position of sensilla *a'*, from *carpaticus* in shorter and thicker sensilla *a'* and shorter setae on nota, from *alni* and *confinis* in shorter sensilla *a'*, smaller body dimensions, and the lack of *P3a* on urotergite VII.

Description. Head setae short, additional seta absent. Sensory setae billet-like. Pseudoculus round with long lever, PR 13-18. Filamento di sostegno with simple posterior dilation, CF 4-6. Sensillae of maxillary palp thin, lateral slightly shorter than ventral. Tuft of labial palp with four branches, sensilla slender.

Main setae on nota long, *P1a*, *P2a* and *P5* rounded. Length ratio of *P1:P2* on mesonotum as 1 : 1.1-1.6. Seta *P4a* on metanotum, *A2* on thoracal sterna and *M2* on prosternum billet-like. Thoracal sterna with no pores.

Foretarsus with long sensilla *a*, reaching level of γ*3; b* of medium length subequal to *c*; *d* long, reaching level of *f*; *a'* short, situated distally to level of *t1*. Sensilla *a* and *a'* thicker than others, *b'* and *c'* thin. All sensillae parallel-sized. Length formula of foretarsal sensillae: *t1=t3 < g=a' < b' < c' f < b=c=d=e=t2 < a*. Seta β*1* slightly shorter than δ*4*. BS 0.3-0.4, TR 3.0-4.0, EU 0.1-0.2.

Urotergite I with no *P1a*; *P2a* of same shape as *P1a* on nota; *A5* billet-like. Urotergite II-VI with no setae *P1a* and *P3a*; accesory setae billet-like. Urotergite VII with 3+3 anterior setae (*A2, A4, A5*); seta *P1a* presents, *P3a* absents; accessory setae hair-like. Accessory setae on urosternite I-VI billet-like; thinner than that on tergites, on VII hair-like. Urosternite VII with no seta *Pc*. Connecting line on urosternite IV-VI absents. Porotaxy formula of urosternite I-VII /0/0/0/1+1/1+1/1+1/1/. Pore on urosternite VII situated far from its hind margin.

Urotergite VIII with two more or less regular rows of subtle granules, urosternite with one row only and traces of second one. Comb VIII with straight hind margin, composed of 7-14 (mostly 9-10) slender teeth. Seta *1a* on urotergite IX and X shorter than seta *1*. Urotergite XI with 3+3 setae, seta *1* long. Hind margin setae of urotergite XII short, subequal. Urotergite XI with 3+3 setae.

Squama genitalis ♀ with very long distal prolongation of stylus and long, distally-forked acrostylus. Penis with 6+6 setae.

Maturus junior with seta *P1a* on urosternite I and with seta *1a* on VIII. Larva II with no larval seta on urosternite XII.

Body dimensions (in μm):

	imago	preim.	mat.jun	larva II	larva I
head	115-147	96-126	99-121	88-107	82
pseudoculus	7-10	6-9	7-9	6-7	ca 7
filamento di sostegno	22-37	17-29	17-31	15-21	ca 16
mesonotal P1	20-28	16-22	13-20	10-14	7-9
mesonotal P2	28-37	22-28	19-28	13-21	13-14
foretarsus	86-100	77-87	63-82	54-63	ca 51
claw	23-27	20-24	19-24	17-19	?
empodial appendage	2-5	3-5	2-4	2-4	?
maximum body length	1460	1240	1130	840	610
No of specimens studied	216	36	45	15	2

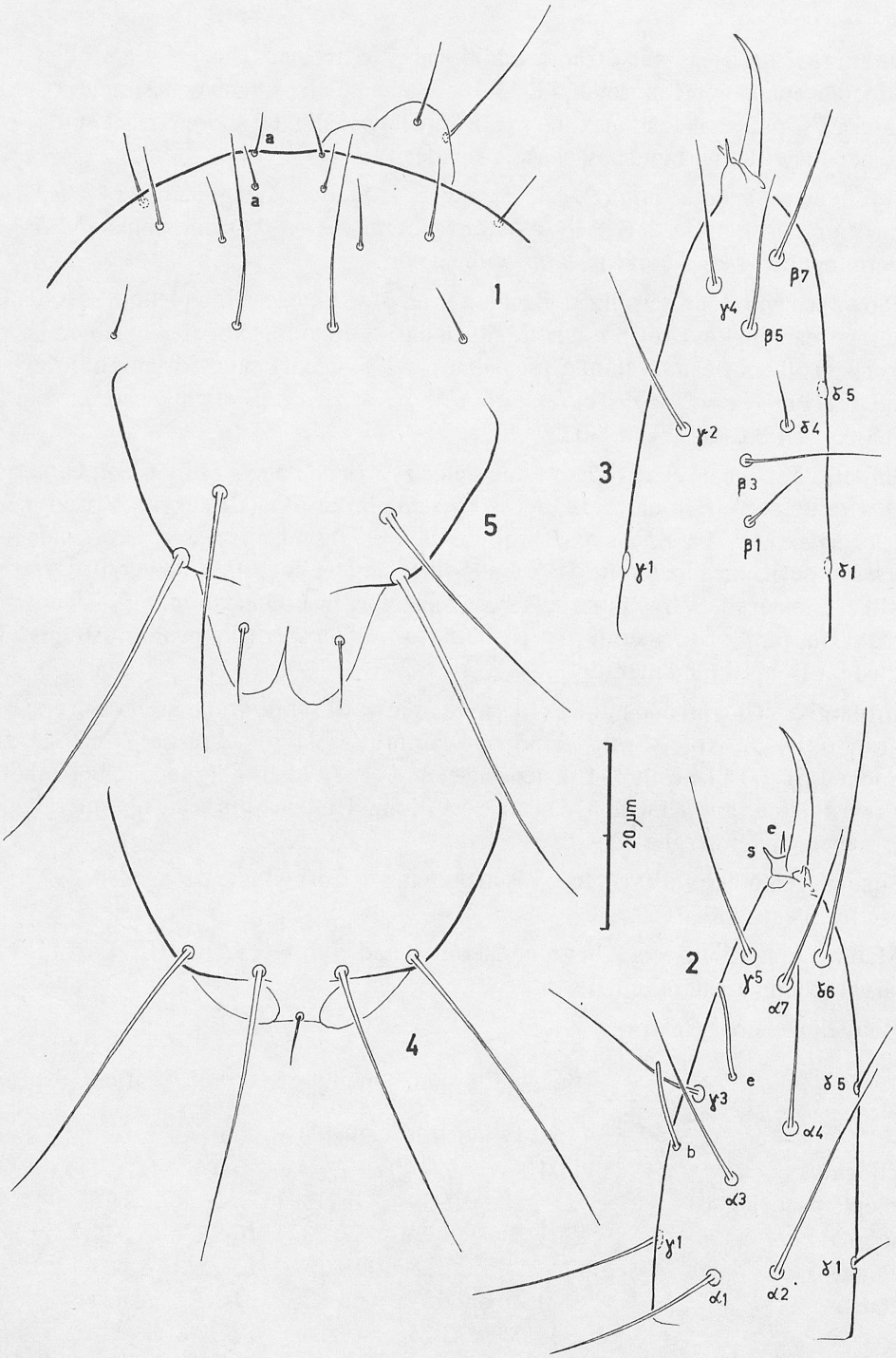

Fig. 1-5. *Acerentulus* sp., prelarva. 1 - anterior part of head, dorsal view (a - anterior setae); 2 - foretarsus, dorso-external viev; 3 - ditto, ventro-internal viev (e - empodial appendage); 4 - telson, dorsal lobe; 5 - ditto, ventral lobe

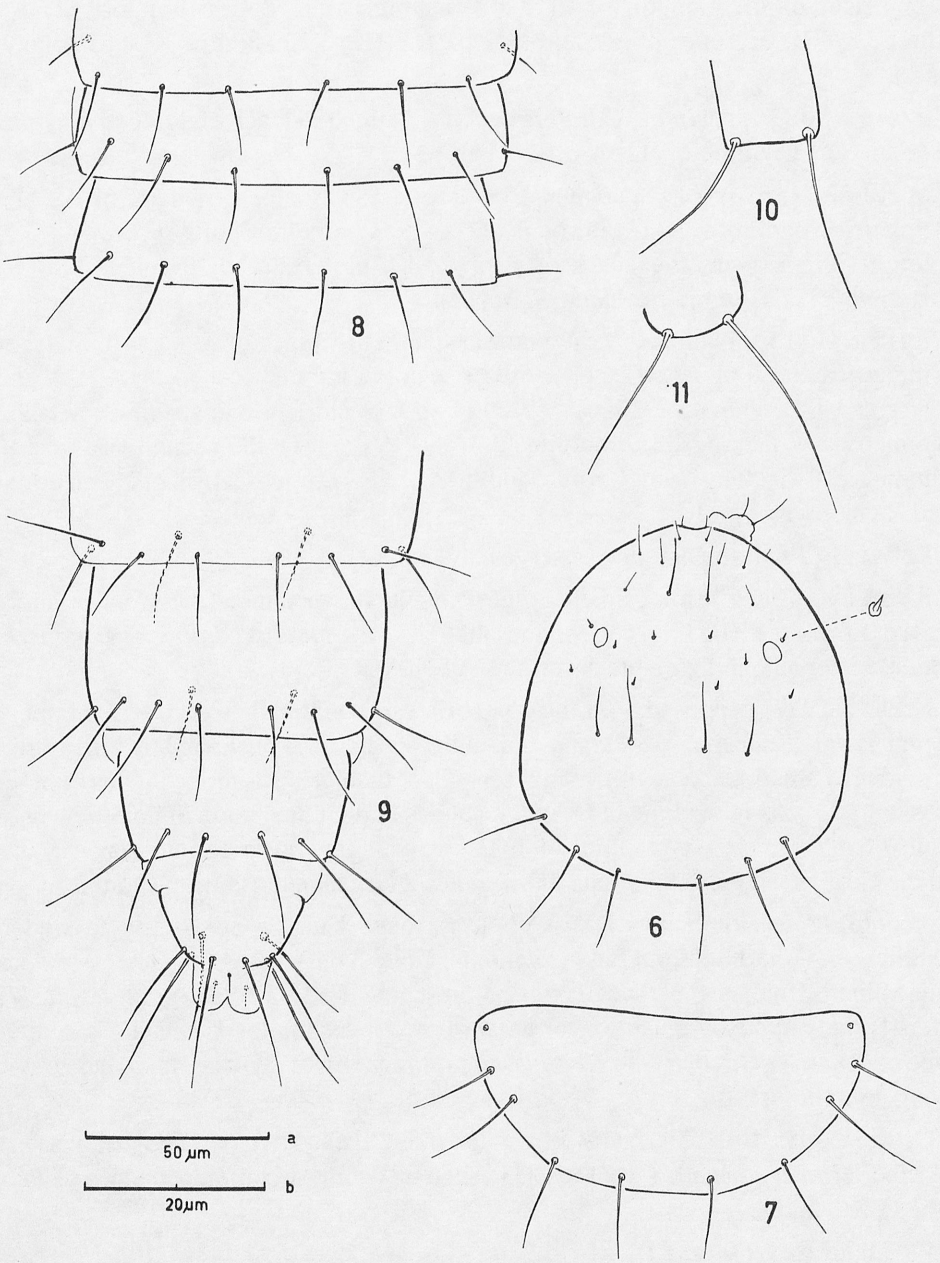

Fig. 6-11. *Acerentulus* sp., prelarva. 6 - head; 7 - mesonotum; 8 - urotergite I-III; 9 - urotergite VI-XII; 10 - abdominal leg I; 11 - abdomonal leg III (14, 15 - magnification b, others - a)

Chaetal variability. Imago (214 specimens). Urotergite VI: asymmetrical lack of *A1* (5 sp.), of *A2* (2 sp.), of *A4* (7 sp.); urotergite VII: symmetrical (3 sp.) and asymmetrical (10 sp.) presence of *A1*, asymmetrical lack of *A2* (1 sp.), of *A4* (1 sp.), symmetrical duplication of *P1a* (1 sp.), asymmetrical duplication of *P2* (1 sp.); urotergite VIII: presence of *Mc* and lack of *M1* (1 sp.); urosternite XI: chaetotaxy 2+3 (1 sp.).

Preimago (36 specimens).Urotergite VI: asymmetrical lack of *A1* (1 sp.), symmetrical (1 sp.) and asymmetrical lack of *A4* (1 sp.)

Maturus junior (43 specimens).Urotergite VI: symmetrical lack of *A2* (1 sp.), asymmetrical lack of *A1* (1 sp.), of *P2* (1 sp.), asymmetrical presence of *A4* (1 sp.); urotergite VII: asymmetrical lack of *P1a* (4 sp.); urotergite VIII: lack of *Mc* (1 sp.); urosternite VIII: asymmetrical lack of *1a* (1 sp.)

Larva II (15 specimens).Mesonotum: asymmetrical lack of *A2* (1 sp.); metanotum: asymmetrical lack of *P1a* (2 sp.); urotergite VI: asymmetrical lack of *P2a* (1 sp.); urotergite VII: asymmetrical lack of *P2a* (1 sp.). Beside, in one specimen seta *P2a* is asymmetrically lacking on urotergite I, II and IV, and in the second one seta *A4* is asymmetrically lacking on metanotum and seta *P2a* is symmetrically lacking on urotergite I and asymetrically on III.

Larva I (2 specimens) - not observed.

Remarks.The Polish specimens agree well with the specimen from Corsica (probably paratype) from the TUXEN's collection (labelled: "*Acerentulus confinis* f. *exiguus*. From original material") and with the description of NOSEK (1973).

NOSEK (1977) supposed - on the base of a large material from Corfu Island - that *exiguus* is only a subspecies of *confinis*. But the specimens considered by him as *exiguus* are evidently smaller and having longer sensilla *a'* than those described in his monograph (NOSEK 1973). As in the time of NOSEK's studies neither the length of notal setae nor the details of sternal porotaxy and lineation were taken into consideration - one can suspect that the Corfu specimens belong to a different species than those from Central Europe.

According the kindness of Dr C.TORTI I have had the oportunity to study one specimen of *A. confinis* from Italy (Piemonte, Colle San Bernardino, Guaressio-Cueno). Besides the differences in chaetotaxy (the presence of *A1* and *P3a* on urotergite VII) it differs from *exiguus* by much longer notal setae, longer foretarsal sensilla *a'* and in the shape of squama genitalis ♀ - in *confinis* the prolongation of stylus is short and acrostylus is long, but not forked.

General distibution. Known from Poland, Czechoslovakia, Yougoslavia, France and Mediterranean islands (NOSEK 1973). One of the most common species of *Protura* of the Polish fauna.

Polish localities (Fig. 12).

VV 67. Wolin Isl., ca 4 km S of Międzyzdroje, soil of peaty meadow on border of mixed forest, 7 VI 1975, 1 ♀, 1 mj (R). **WS 45**. Wleń, Castle Hill, decaying leaves under castle walls, 20 VI 1976, 5 ♀, 3 ♂, 1 mj (R). **WS 74** "Wąwóz Myśliborski" reserve, deciduous forest, 18 VI 1985, 1 pm (Pm). **WT 99**. Woodland east of Opalenica, near

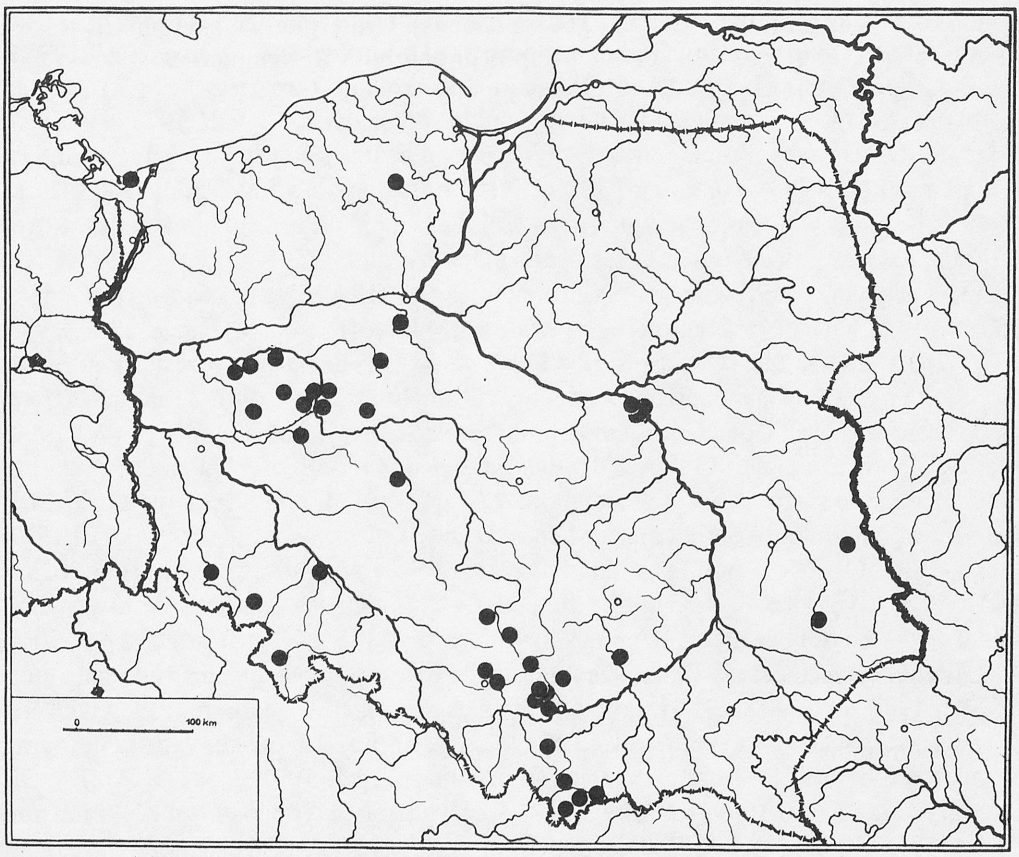

Fig. 12. Polish localities of *Acerentulus exiguus* CONDÉ

Mogielnica Stream, decaying wood and plant-debris from the stump of cutten spruce, 28 IX 1964, 1 ♂ (R). **WU 72**. Gorzyckie Lake, old alder forest with *Ribes rubra* and rich undergrowth, litter, soil, decaying wood, 16 VIII 1985, 6 ♀, 2 ♂, 1 pm, 2 mj, 2 l2 (R). **WU 83**. "Buki nad jez. Lutomskim" reserve, old beech forest, litter, roots etc. near decaying logs, 17 IX 1985, 1 ♀ (R). **WU 93**. Winnogóra, soil of the lucerne field, 24 VI 1968, 1 ♀ (Tr). **XR 18**. Bank of Bystrzyca Kłodzka River in Piekielna Valley, forest of spruce, beech, maple, alder, 12 V 1976, 1 pm (R). **XS 46**. Wrocław - Park Wschodni (Eastern Park), on the lower side of a timber-piece in locality owergrown with *Impatiens parviflora* and *Urtica dioica*, 26 VI 1975, 1 ♀, 1 ♂, 1 pm, 1 mj (R); in the soil and rotten wood from the huge stump of poplar, 11 III 1977, 2 ♀, 1 mj (R). **XT 17**. Racot, soil and litter from abandoned old park, 6 VIII 1975, 1 ♀, 2 mj (R). **XT 19**. Trzebaw - Rosnówko, from decayed *Salix alba* near a lake, 17 IX 1969, 1 ♂ (R); Wielkopolski National Park, deciduous forest, soil under *Ficaria verna*, 30 V 1975, 1 pm (R). **XT 39**. Puszczykowo, wet decaying wood from the base of stump of a dead willow, 18 X 1986, 1 ♀, 6 ♂, 1 l1 (R); decaying wood, pieces of bark, rest of mycelinum under the base of a dead tree in dense forest,

18 VIII 1986, 1 ♂, 1 pm, 4 mj, 1 l1 (R). **XT 49**. Kórnik (SZEPTYCKI 1969a). **XU 11**. Jankowice, decaying wood with rest of the rodent nest from an old cherry-tree, 29 VIII 1985, 5 ♀, 5 ♂, 4 pm, 8 mj, 1 l2 (R). **XU 21**. Poznań - Sołacki Park (SZEPTYCKI 1969a); Poznań - Botanical Garden, soil and litter under *Impatiens parviflora*, 3 VIII 1976, 1 mj (R); Poznań - Szeląg, abandoned park, decaying wood (with roots) from a huge stump of a poplar, 11 III 1983, 3 ♀, 2 pm, 1 l2 (R). **XU 31**. Poznań - Cybina Valley (SZEPTYCKI 1969a); Poznań - Golęcin, abandoned park, soil and litter in the base of horse chesnut-tree, 8 IX 1977, 1 o (R); decaying leaves, soil and plant debris, 21 X 1977, 1 ♀, 1 ♂ (R). **XU 41**. Promno, decaying wood (with ants) from apple-tree, 20 VIII 1964, 2 ♀, 2 ♂, 2 mj (Ja and R). **XU 60**. Nekla, old park, soil with decaying wood and of leaves from an old linden, 27 VII 1978, 5 ♀, 1pm, 1 l2 (R). **XU 84**. Ostrowickie Lake, dense hornbeam-oak forest on steep SE slope with rich shrub layer and undergrowth, soil and litter, 11 VI 1981, 1 pm (R). **XU 97**. Lubostroń, decaying wood (nearly dry), from small hollow in an old poplar, 11 VI 1982, 7 ♀, 2 ♂, 2 pm, 1 mj (R). **XV 88**. Wdzydze Lake near a mouth of Wda River, decaying wood from old *Salix alba*, hollow about 120 cm up, 24 V 1979, 2 ♀ (R). **YT 05**. Gołuchów, Arboretum, wet litter under *Lonicera* and *Symphoricarpa* bushes, 20 VIII 1977, 1 ♀, 1 ♂ (R). **CA 67**. Gołonóg, young cultivated forest with larch, birch, pine, oaks, 21 IX 1974, 14 ♀, 15 ♂, 8 pm, 5 mj, 2 l2 1 l1 (Bl). **CA 76**. "Ostra Góra" reserve, brushwood under scattered old beeches, litter and soil with roots, 28 IV 1979, 10 ♀, 6 ♂, 2 pm, 1 mj, 1 l2 (R). **CB 72**. "Zielona Góra" reserve, beech forest with hornbeam and oak, litter, 10 VIII 1979, 1 ♀ (ZM). **CB 81**. Potok Złoty, palace park, rotten bark from a log with rest of fungi, mosses and decaying wood, 18 X 1982, 1 ♀ (R). **CD 20**. Lubstów, park, decaying wood, plant debris etc. from a huge stump of a linden, 2 X 1971, 1 ♀, 1 ♂ (R). **DV 27**. Szaflary (SZEPTYCKI 1969a). **DV 29**. Rabka - Zaryte, gravel terrace of Luboński Stream, 15 VII 1976, 1 pm (Sz). **DV 37**. "Kramnica" reserve, xerothermical calcareous rock with scattered bushes (mostly *Rosa* sp.) , *Saxifraga aizoon*, *Sempervivum soboliferum* etc., mosses and plant-debris from rock-crevices, 1 VII 1964, 1 ♀ (Da and R). **DV 57**. Pieniny National Park, petrophilous turfs: Trzy Korony Mt, S of main peak, 18 III 1972, 4 ♀, 5 ♂, 1 mj (We) and 12 XI 1972, 1 ♀, 1 pm, 2 l2 (We), Sobczański Gorge, 4 IV 1972, 7 ♀, 1 ♂, 1 mj (We), Gorczyński Gorge, 13 XI 1976, 1 l2 (We); pine forest on calcareous rock: Macelowa Mt, in needles and mosses, 21 VI 1975, 1 pm (We). **DV 67**. Little Pieniny Mts, Homole Gorge, turf on a slope of W exposition, soil, plant-debris between stones. 12 VI 1971, 2 ♂ (We); Czubata Rock, exposition SW, mosses and plant debris from rock-shelves with *Saxifraga aizoon*, *Sempervivum soboliferum* etc., 24 IX 1974, 1 ♀, 1 pm, 1 mj (R). **DA 06**. Czerna, young beech forest with admixture of old pines, linden etc., soil with roots near decaying stump, 28 IX 1978, 1 ♀, 6 ♂, 1 pm, 2 mj (R). **DA 08**. Smoleń, mosses from shadowed rocks under the castle, 25 VIII 1971, 1 ♀ (R); northern foot of castle-hill, beech forest, litter, 12 VIII 1987, 2 ♀, 2 mj (Sz). **DA 14**. Balice, forest with pine, oak, hazel etc., soil and plant debris at foot of limestone rock, 28 IV 1979, 6 ♀, 1 mj (R). **DA 16**. Ojców National Park - *Origano-Brachypodietum* on limestone rocks: above Ciemna Cave, 1 VII 1964, 1 ♀ (Rj), lower part of Rękawica Rock, 2 ♀, 5 ♂, 2 pm, 1 mj (Rj), rocks near Ciemna Cave, 7 VII 1964, 2 ♀, 1 ♂ (Sz); *Origano-Brachypodietum* on deforestrated slopes: Grodzisko, 7 VII 1964, 7 ♀, 2 ♂, 3 mj, 1 l2 (Sz) and slope of Prądnik Valley ca 1.5 km N of Ojców, 18 VII 1964, 1 ♀ (Sz); xerophilous hazel brushwood: rocks between Koronna Mt

and Rękawica Rock, 13 VI 1964, 1 l2 (Sz), southern slope of Koronna Mt, 13 VI 1964, 1 ♂ (Sz) and 14 VI 1964, 1 ♀, 2 ♂, 1 mj (Rj), slope near a chapel, 15 VI 1964, 4 ♀, 2 ♂ (Rj), slope above old path to Skała Town, 18 VII 1964, 1 ♀, 1 pm (Sz); brushwood of *Cerasus fruticosa*: Grodzisko, 5 VI 1964, 1 ♂, 1 mj (Sz); mosses on shadowed limestone rocks: valley under Koziarnia Cave, 1 VII 1964, 1 mj (Sz); *Tilio-Carpinetum*: Koronna Mt, 2 VI 1964, 2 ♂, 2 pm, 2 mj (Rj). **DA 21**. Alder forest near Tyczyna Stream above Lubień, from decaying *Salix alba*, 13 IX 1973, 2 ♀, 1 ♂, 2 mj (R). **DA 47**. "Dąbie" reserve, high hazel bushes with admixture of other shrubs and old pines above xerothermic slope, litter, 26 VI 1977, 1 ♀, 1 pm, 1 mj (R). **DB 60**. Kopernia, xerothermic slope above the village, mosses, soil and plant debris, 10 VIII 1980, 10 ♀, 5 ♂, 1 pm, 2 mj (Pn). **DC 99**. Warszawa-Wrzeciono, soil of a lawn, various dates, 7 ♀, 5 ♂, 1 mj (IZ), Warszawa - Las Sobieskiego, hornbeam-oak forest, 10 I 1984, 1 mj (IZ). **DD 90**. Białołęka, hornbeam-oak forest, 6 V 1980, 1 ♂ (IZ) and 9 VII 1980, 2 ♀, 1 mj (IZ). **EC 09**. Warszawa - Lasek Bielański, hornbeam forest, leaves, plant debris, decaying wood and mosses near decaying log, 13 VIII 1984, 1 ♂, 2 l2 (R). **FB 41**. Zwierzyniec (SZEPTYCKI 1969a). **FB 76**. " Stawska Góra " reserve, xerothermical grassland, soil, mosses and plant-debris, 19 IX 1976, 3 ♀, 1 mj (R).

Acerentulus occultus SZEPTYCKI, 1979
(Figs 37-39)

Acerentulus occultus: SZEPTYCKI 1979

Diagnosis. Very similar to *exiguus*, differs only in more distal position of foretarsal sensilla *a'*.

Description. Details of head and thorax morphology as in *exiguus*. PR 13.5, length ratio of mesonotal setae *P1* : *P2* as 1 : 1.4.

Foretarsus generally similar to that of *exiguus*, but sensilla *e* is relatively shorter, and *a'* is sword-shaped, situated distally, on level of seta δ2. Length formula of sensillae: $t1=t3 < g=a' < c' < e=f=b' < c < b=d=t2 < a$. Seta *d* is not so long as on my previous drawing (SZEPTYCKI, 1979, Fig. 39).

Abdominal chaetotaxy, porotaxy and lineation as in *exiguus*. Comb VIII with 11 slender teeth.

Squama genitalis ♀ with long distal prolongations of stylus and long, forked acrostylus. The last seems to be shorter than in *exiguus* but this can be due to the position of the squama on the slide. Males and younger instars unknown.

Body dimensions (holotype) (in μm): head 113, pseudoculus 8, foretarsus 96, claw 30, empodium 5, mesonotal seta *P1* 24, *P2* 33, body length 1270, length of filamento di sostegno unestablished.

Remarks. There is only one specimen (holotype) known till now. All its dimensions and indices (the number of teeth on comb VIII too) are within the limits of variability of *exiguus*. The peculiar position of sensilla *a'* (which is regular on both foretarsi) can justify

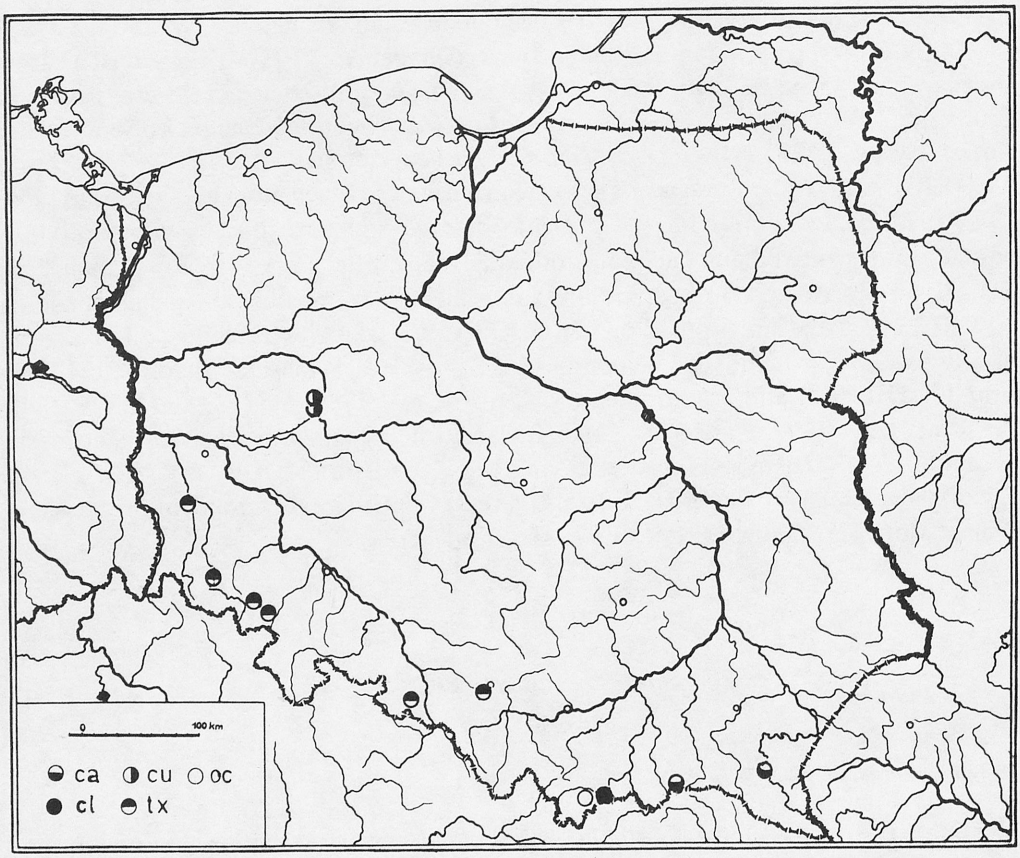

Fig. 13. Polish localities of *Acerentulus carpaticus* NOSEK (ca), *cunhai* CONDÉ (cu), *occultus* SZEPTYCKI (oc.), *collaris* sp.n. (cl) and *tuxeni* RUSEK (tx)

distinguishing it as a different species. Still, the possibility exists that it is only a variability of *exiguus* of no taxonomical value.

Distribution (Fig.13, oc.). Only one known specimen (holotype) from: **DV 37**. "Kramnica" reserve (SZEPTYCKI 1979).

Acerentulus carpaticus NOSEK, 1967
(Figs 40 - 54)

Acerentulus carpaticus: NOSEK 1967a ; 1973

Diagnosis. Chaetotaxy, general pattern of foretarsus, sternal porotaxy and lineation as in *exiguus*. Both species differ in the length and shape of foretarsal sensilla *a'* (in

carpaticus it is much longer and more slender than in *exiguus*) and in the length of the main setae on nota (in *carpaticus* longer than in *exiguus*).

Description. Head setae long, additional seta absent. Sensory setae billet-like. Pseudoculus more or less round, with long lever, PR about 15. Filamento di sostegno with simple posterior dilation, CF about 5. Sensillae of maxillary palp thin, lateral shorter than ventral. Tuft of labial palp with four branches, sensilla thin. Main setae on nota long, *P1a*, *P2a* and *P5* rounded. Length ratio of *P1* : *P2* on mesonotum as 1 : 1.2-1.3. Seta *P4a* on metanotum, *A2* on thoracal sterna and *M2* on prosternum billet-like. Thoracal sterna with no pores.

Foretarsus with long sensilla *a*, reaching level of *γ3; b* of medium length, subequal to *c*; *d* short, not reaching level of *f*; *a'* long and slender, situated distally to level of *t1*. Sensillae *a* and *a'* slightly thicker than others; *b'* and *c'* thin. All sensillae parallel-sized. Length formula of foretarsal sensillae: $t1=t3 < a'=b'=c' < e=f=g < b=c=d=t2 < a$. Seta *β1* slightly shorter than *δ4*. BS 0.35-0.38, TR about 3.6, EU about 0.2.

Urotergite I with no *P1a*; *P2a* of same shape as *P1a* on nota; *A5* billet-like. Urotergite II-VI with no setae *P1a* and *P3a* ; acessory setae billet-like. Urotergite VII with 3+3 anterior setae (*A2*, *A4*, *A5*); seta *P1a* present, *P3a* absent; accessory setae hair-like. Accessory setae on urosternite I-VI billet-like, thinner than that on tergites, on VII hair-like.Urosternite VII with no seta *Pc*. Connecting line on urosternite IV-VI absent. Sternal porotaxy formula : 0/0/0/1+1/1+1/1+1/1/. Pore on urosternite VII situated far from its hind margin.

Urotergite and urosternite VIII with irregular row of granules. Comb VIII with straight hind margin composed of 9-11 slender teeth. Seta *1a* on urotergite IX subequal to seta *1*, on X shorter. Urotergite XI with 3+3 setae, seta *1* long. Hind margin setae of urotergite XII short, subequal. Urosternite XI with 3+3 setae.

Squama genitalis ♀ with very long distal prolongation of stylus and long (forked?) acrostylus. Penis with 6+6 setae.

Maturus junior with relatively shorter notal setae. Seta *P1a* on urosternite I and *1a* on VIII present. Other instars unknown.

Body dimensions (3 imagines, in brackets - single specimen of maturus junior) (in μm): head 120-133 (96), pseudoculus about 8 (7), filamento di sostegno about 29 (22), mesonotal *P1* 33-34 (19), *P2* 39-44 (24), foretarsus 91-95 (69), claw about 26 (?), empodial appendage about 4 (?). Total length unestablished.

Chaetal variability: not observed.

Remarks. The Polish specimens agree well with the typical series of NOSEK (from Museum d'Histoire Naturelle in Genève and from Zoological Museum in Kopenhagen).

General distribution. Till now known only from Hron Valley in Slovakia (NOSEK 1973).

Polish localities (Fig.13, ca)

EV 09. Czerteżyki, north-eastern slope - mixed forest with beech, fir, pine etc., litter, 26 VII 1971, 1 ♀ (Pn). **EV 99**. Orle Mts. - at foot of the hill 376 m, border of forest, near a stream, 8 VI 1960, 1 ♀, 1 ♂, 1 mj (R).

Acerentulus alni sp.n.
(Figs 55-71)

Diagnosis. The new species belongs to a group of species with long foretarsal sensilla *a* ("*confinis*" group after NOSEK 1973). By the general morphology of foretarsus, chaetotaxy of urotergite VII, the presence of simple pores on urosternite VI, and the position of pore on VII it is most similar to *confinis*. The two species differ in shape of foretarsal sensilla *a'* (thinner in *confinis*), length of body setae (notal setae in *confinis* are evidently longer) and sternal porotaxy (in *confinis* urosternite II and III are with no pores).

Description. Head setae short, additional seta absent. Sensory setae billet-like. Pseudoculus round with short lever, PR about 17. Filamento di sostegno with bilobed posterior dilation, CF 4-5. Sensillae of maxillary palp thin, lateral shorter than ventral. Tuft of labial palp with four branches, sensilla slender.

Main setae on nota long, *P1a*, *P2a* and *P5* rounded. Length ratio of *P1* : *P2* on mesonotum as 1 : 1.3-1.5. Seta *P4a* on metanotum, *A2* on thorocal sterna and *M2* on prosternum billet-like. Thoracal sterna with no pores.

Foretarsus with long sensilla *a*, not reaching level of $\gamma 3$; sensilla *b* of medium length, shorter than *c*; *d* short, not passing level of *e*; *a'* long and slender, situated distally to *t1*. Sensillae *a* and *a'* thicker than others, *b'* and *c'* thin. All sensillae parallel-sized. Length of foretarsal sensillae: $t1=t3 < g=a'=b'=c' < b=d=e < c=f < a=t2$. Seta $\beta 1$ evidently shorter and thinner than $\delta 4$. BS 3.0-3.5, TR about 4.0, EU 0.1-0.2.

Urotergite I with no seta *P1a*, seta *P2a* of same shape as *P1a* on nota; *A5* billet-like. Urotergite II-VI with no setae *P1a* and *P3a*; accessory setae billet-like. Urotergite VII with 4+4 anterior setae (*A1*, *A2*, *A4*, *A5*); setae *P1a* and *P3a* present; accessory setae hair-like, subequal to that tergites, on VII hair-like. Urosternite VII with no seta *Pc*. Connecting line on urosternite IV-VI lacking. Porotaxy formula of urosternite I-VII as /0/1+0/1+1 or 1+0/1+1/1+1/1+1/1/. Pore on urosternite VII situated far from its hind margin.

Urotergite and urosternite VIII with more or less regular row of small granules and some scattered granules posteriorly to it. Comb VIII with straigth hind margin composed of 9-11 slender teeth. Seta *1a* on urotergite IX subequal to seta *1*, on X shorter. Urotergite XI with 3+3 setae, seta *1* long. Interesegmental membrane with distinct granulation. Posterior setae on urotergite XII short, subequal. Urosternite XI with 3+3 setae.

Females unknown. Penis with 6 + 6 setae.

Maturus junior with seta *P1a* on urosternite I and with seta *1a* on VIII. Larva II without larval seta on urosternite XII.

Body dimensions (in μm):

	imago	preim.	mat.jun.	larva II
head	151-169	139	81-100	73
pseudoculus	9-10	8	7-8	7
filamento di sostegno	33-37	?	24-28	?

mesonotal *P1*	27-33	28	22-26	17
mesonotal *P2*	40-43	36	31-36	24
foretarsus	112-115	98	81-100	73
claw	30-31	?	24	22
empodial appendage	5-6	?	4	4
maximum body length	1610	?	1200	880
No of specimens studied	4	1	4	1

Chaetal variability. Imagines (4 specimens) - not observed. Maturus junior (4 specimens): urotergite VII - symmetrical lack of *A1* (2 sp.).

In other instars - not observed.

Derivatio nominis. Named after the generic name of alder-tree (*Alnus*) because it was mostly collected in river-bank forests, a typical habit for alder.

Material (Fig. 14, al).

Holotype ♂ (specimen nr 3396). **EV 08**. Uście Gorlickie, slope above Ropa River, border of hornbeam forest with hazel, 24 IV 1959 (Pn).

Paratypes. **DV 27**. Szaflary, 1954, 1 ♂ (sp. nr 3397) (St). **DV 47**. Czorsztyn, alder forest on the bank of Dunajec River, 29 IV 1972, 1 ♂, 1 pm, 1 12 (sp. nrs 3398-3400) (We) and gravel terrace of Dunajec River, in tussocks of grass, 10 XI 1986, 1 ♂ (sp. nr 3116) (We). **DA 72**. Ca 10 km S of Brzesko, border of deciduous forest with old oaks and admixture of spruce, 4 X 1983, 3 mj (sp. nrs 3119, 3401, 3402) (R). **EV 08** - as holotype, 1 mj (sp. nr 3395). **FV 07**. Peak 696 near Teleśnica, beech-fir forest near a stream, 7 VII 1977, 1 mj (sp. nr 2422) (ZM). **FA 10**. Kalwaria Pacławska, mixed forest with fir, beech hornbeam etc., in the lower part of Klasztorna (=Monastery) Mt, 9 VIII 1978, 1 mj (sp. nr 3403) (ZM).

Acerentulus xerophilus SZEPTYCKI, 1979
(Figs 72-92)

Acerentulus xerophilus: SZEPTYCKI 1979

Diagnosis. *A. xerophilus* belongs together with *silvanus* sp. n. to a group with long foretarsal sensilla *a*, sensilla *b* of medium length and relatively long sensilla *a'*, composed pores on urosternite VI and very short acrostylus of squama genitalis ♀. It is much smaller than *silvanus*, differs also in relatively shorter foretarsal sensilla *a'*.

Description. Head seate short, additional seta absent. Sensory setae billet-like. Pseudoculus round, with short lever, PR 12-15 (in larva I 10-12). Filamento di sostegno with bilobed posterior dilation, CF 4-5. Sensillae of maxillary palp thin, lateral shorter than ventral. Tuft of labial palp four-branched, sensilla slender.

Main setae on nota long, *P1a*, *P2a* and *P5* rounded. Length ratio of *P1* : *P2* as 1 : 1.3-1.5. Seta *P4a* on metanotum, *A2* on thoracal sterna and *M2* on prosternum billet-like. Thoracal sterna with no pores.

Foretarsus with long sensilla *a*, not reaching level of *γ3*; *b* of medium length, subequal to *c*; *d* long, reaching level of *f*; *a'* long and thick situated distally to level of *t1*. Sensilla *a* slightly, *a'* evidently thicker than others, *b'* and *c'* thin. All sensillae parallel-sized. Length formula of foretarsal sensillae: *t1=t3 < e < a'=c' < g=b' < b=c=d=t2 < f < a*. Setae *β1* and *δ4* thin and short, subequal. BS 0.3-0.4, TR 3.9-4.2, EU 0.1-0.2.

Urotergite I with no seta *P1a*; *P2a* of same shape as *P1a* on nota; *A5* billet-like. Urotergite II-VI with no *P1a*, accessory setae billet-like. Urotergite VII with 3+3 anterior setae (*A2, A4, A5*); setae *P1a* and *P3a* present; accessory setae hair-like. Accessory setae on urosternite I-VI billet-like, thinner than on tergites, on VII hair-like. Urosternite VII mostly with seta *Pc*. Connecting line on urosternite IV-VI lacking. Sternal porotaxy formula: /0/0/0/1+1/1+1/n+n or n+1/1/. Pore on urosternite VII near its hind margin.

Urotergite and urosternite VIII with irregular row of distinct granules. Comb VIII with slightly convex hind margin composed of 6-12 (mostly 9-10) slender teeth. Seta *1a* urotergite IX subequal to seta *1*, on X shorter. Urotergite XI with 3+3 setae, seta *1* very long. Hind margin setae of urotergite XII long, medial seta longer than sublateral ones. Urosternite XI with 3+3 setae.

Squama genitalis ♀ with long prolongation of stylus and short acrostylus. Penis with 6+6 setae.

Maturus junior with seta *P1a* on urosternite I and with seta *1a* on VIII. Larva II with no larval seta on urosternite XII.

Body dimensions (in μm)

	imago	preim.	mat. jun.	larva II	larva I
head	117-149	116-131	112-122	97-113	81-90
pseudoculus	9-11	8-10	8-10	6-9	ca 8
filamento di sostegno	23-36	22-31	23-27	19-24	ca 20
mesonotal *P1*	17-23	15-21	14-19	12-14	ca 9
mesonotal *P2*	26-33	23-29	21-27	17-20	ca 13
foretarsus	93-106	80-93	76-84	61-68	52-54
claw	24-26	22-23	ca 19	ca 19	?
empodial appendage	3-4	3-4	ca 3	ca 4	?
maximum body length	1390	1350	1170	942	600
No of specimens studied	49	9	7	9	2

Chaetal variability. Imago (49 specimens). Urotergite VI: asymmetrical lack of *A1* (1 sp.) and *A4* (6 sp.); VII: asymmetrical (7 sp.) and symmetrical (1 sp.) presence of *A1*, symmetrical lack of *P3a* (1 sp.) asymmetrical lack of *P1* (1 sp.); VIII : seta *Mc* instead of setae *M1* (6 sp.), seta *Ac* instead of setae *A1* (1 sp.); X: asymmetrical lack of seta *1a* (2 sp.); urosternite VII: lack of seta *Pc* (4 sp.).

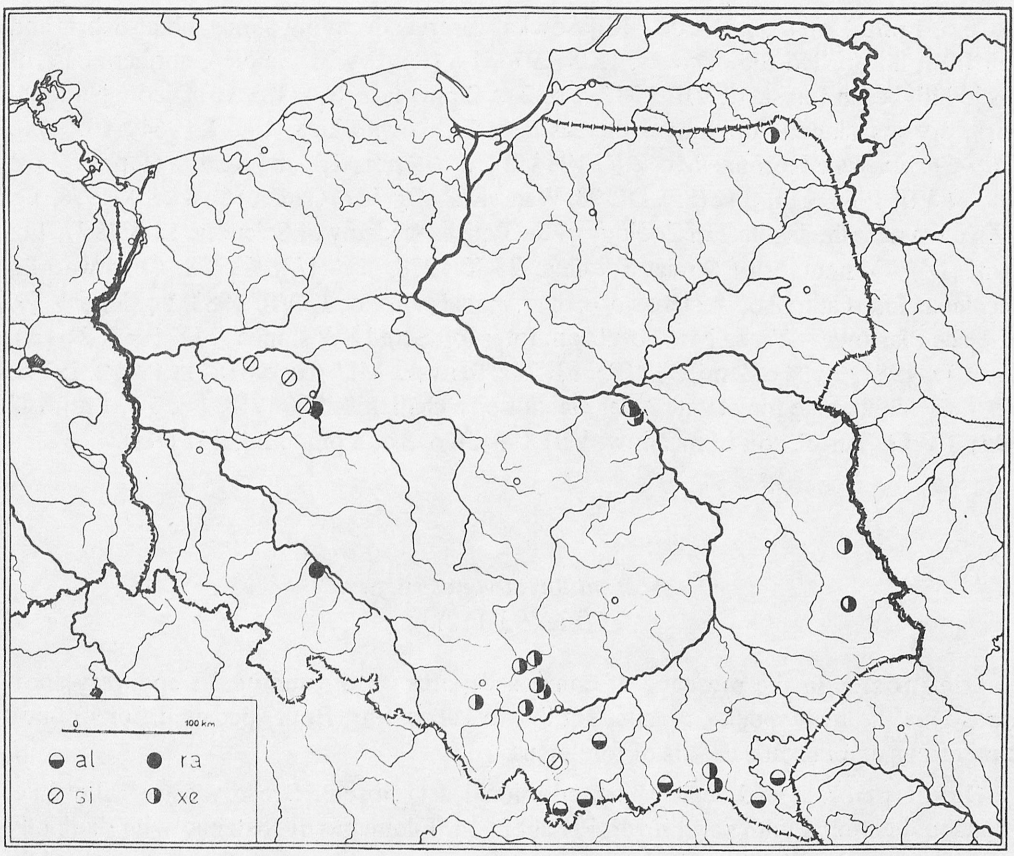

Fig. 14. Polish localities of *Acerentulus alni* sp. n. (al), *rafalskii* SZEPTYCKI (ra), *silvanus* sp. n. (si) and *xerophilus* SZEPTYCKI (xe)

Preimago (9 specimens). Urotergite VI: asymmetrical lack of *A2* (1 sp.); VIII: *Mc* insted of *M1* (1 sp.); X: asymmetrical lack of seta *1* (1 sp.); urosternite VII: lack of *Pc* (4 sp.).

Maturus junior (7 specimens). Urotergite VI: asymmetrical lack of *A1* (1 sp.); VII: asymmetrical presence of *A1* (1 sp.), asymmetrical lack of *P3a* (1 sp.); urosternite VII: presence of *Pc* (1 sp.); VIII: asymmetrical lack of seta *1* (1 sp.) and *1a* (2 sp.).

Larva II (9 specimens). In single specimen seta *P4a* on urotergite IV and *Ac* on urosternite VII are lacking.

Larva I (2 specimens) - not observed.

General distribution: known only from Poland

Polish localites (Fig. 14, xe).

CA 55. Zawiść - town park, small hollow in linden ca 70 cm up, decaying wood, 22 V 1986, 1 ♂(R). **CA 97.** Pomorzany, artificial pine forest on calcareuos hill, 12 VIII 1987,

7 ♀, 5 ♂, 1 pm, 1 mj (Sz). **DA 04**. "Kajasówka" reserve, decaying plants, plant-debris and soil from unforested top of rocks, 15 X 1976, 1 ♀ (R). **DA 08**. Smoleń, northern base of castle-hill, beech forest, 12 VIII 1987, 1 ♀, 2 ♂, 2 pm, 1 l2 (Sz). **DA 16**. Ojców National Park, dry grassland: slope under the castle in Pieskowa Skała, 19 VI 1964,, 1 ♂ (Sz); *Tilio-Carpinetum*: Koronna Mt., 2 VI 1964, 2 ♀, 5 ♂, 2 pm (Rj), and eastern slope of Złota Mt., 24 VIII 1964, 1 mj, 1 l2 (Sz). **DC 98**. Warszawa - Ogród (=Garden) Saski, 8 X 1976, 1 ♂ (IZ); lawn near the Institute of Zoology of the Polish Academy of Sciences, 13 X 1977, 1 ♀, 1 mj (IZ); Cementary of Soviet Soldiers, 25 X 1978, 1 ♂ (IZ). **EV 58**. Cergowa Mt., deciduous forest at foot of western slope, litter, mould, soil etc., 12 VIII 1983, 1 ♀ (R). **EV 59**. Miejsce Piastowe - Winna Mt., hornbeam forest on S and SW slopes, 9 IX 1960, 2 ♀ (R), and 1 IX 1981, 2 ♀, 4 ♂, 2 mj, 3 l2 (R). **FB 76**. "Stawska Mt." reserve (SZEPTYCKI, 1979). **FB 7**. Świdniki, pine forest with *Aster amellus* on a chalk hill, 5 X 1958, 1 ♀, 3 ♂, 1 mj, 1 l2 (Dz). **FF 11**. Turtul, soil of meadow, VIII 1984. 8 ♀, 3 ♂, 3 pm, 3 mj, 2 l1 (Ka).

Acerentulus silvanus sp. n.
(Figs 93-112)

Diagnosis. In the presence of composed pores on urosternite VI and very short acrostylus the new species is most similar to *xerophilus*. Both species differ in body dimensions and in some details of foretarsus.

Description. Head setae short, additional seta absent. Sensory setae billet-like. Pseudoculus round with short lever, PR about 14. Filamento di sostegno with distinctly bilobed posterior dilation, CF about 4. Sensillae of maxillary palp thin, lateral slightly shorter than ventral. Tuft of labial palp with four branches, sensilla slender.

Main setae on nota short, *P1a*, *P2a* and *P5* rounded. Length ratio of *P1* : *P2* on mesonotum as 1 : 1.5-1.8. Seta *P4a* on metanotum, *A2* on thoracal sterna, and *M2* on prosternum billet-like. Thoracal sterna with no pores.

Foretarsus with long sensilla *a*, not reaching level of *γ3; sensilla b* of medium length, subequal to *c*; *d* long, passing level of *f*; *a'* very long, situated distally to level of *t1*. Sensillae *a* and *a'* thicker than others, *b'* and *c'* thin. All sensillae parallel-sized.Length formula of foretarsal sensillae: *t1=t3 < t2 < g < b=c=e=a'=b'=c' < a=d=f*. Setae *β1* and *δ4* short, *δ4* longer and thicker than *β1*. BS about 0.4, TR about 4.0, EU about 0.1.

Urotergite I with no seta *P1a*; *P2a* elongated, longer than *P1a* on nota; *A5* billet-like. Urotergite II-VI with no setae *P1a* and *P3a*; accessory setae billet-like. Urotergite VII with 4+4 anterior setae (*A1, A2, A4, A5*); setae *P1a* and *P3a* present; accessory setae hair-like. Accessory setae on urosternite I-VI billet-like, subequal to that on tergites, on VII hair-like. Urosternite VII with no seta *Pc*. Connecting line on urosternite IV-VI absent. Sternal porotaxy formula: /0/0/0/1+1/1+1/n+n/1/. Pore on urosternite VII near its hind margin.

Urotergite VIII with no granulation, urosternite VIII with iregular row of small granules. Comb VIII with 10-11 slender teeth.Seta *1a* on urotergite IX subequal to seta *1*,

on X shorter. Urotergite XI with 3+3 setae, seta *1* very long. Hind margin setae of urotergite XII long, sublateral ones longer and thicker than medial. Urosternite XI with 3+3 setae. Membrana between segment VIII and IX, and IX and X with two irregular rows of distinct granules.

Squama genitalis ♀ with long prolongation of stylus and very short acrostylus. Males unknown.

Younger instars (with exception of larva I) unknown.

Body dimensions (4 imagines, in brackets - dimensions of single specimen of larva I) (in μm): head 148-156 (97), pseudoculus 10-11 (9), filamento di sostegno 34-39 (22), mesonotal seta *P1* 17-23 (9), *P2* 28-35 (15), foretarsus 119-121 (62), claw 27-29 (?), empodial appendage 4-5 (?), maximum body length of expanded specimen about 1600 (?).

Chaetal variability. Imago (4 specimens). Mesonotum: asymmetrical lack of *A2* (1 sp.); urotergite VIII: seta *Mc* instead of setae *M1* (1 sp.).

Material (Fig. 14, si):

Holotype ♀ (specimen nr 3363): **WU 81**. "Jakubowo" reserve, oak-hornbeam forest with beech, 22 VI 1981 (Bl).

Paratypes: **WU 73**. "Buki nad jez. Lutomskim" reserve, beech forest, litter, decaying wood, mould etc., near decaying logs, 17 IX 1985, 1 ♀ (sp. nr 3364) (R). **WU 81**. as holotype, 9 V 1981, 1 ♀ (sp. nr 3362) (Bl). **DA 21**. Alder forest near Tyczyna Stream above Lubień, 13 IX 1973, 1 ♀ (sp. nr 3370) (R).

Not included into the type material: **XT 29**. Puszczykowo, wet decaying wood from the base of dead willow, 18 X 1986, 1 l1 (R).

Derivatio nominis: silva (lat.) = forest, as all the specimens were collected in soil and litter of forest.

Acerentulus tuxeni RUSEK, 1966
(Figs 113-130)

Acerentulus tuxeni: RUSEK, 1966; NOSEK 1973

Diagnosis. *A.tuxeni* belongs to a group of species with short foretarsal sensilla *a* ("*cunhai*" group of NOSEK 1973). In the peculiar body chaetotaxy it is the most similar to Iberian *ladeiroi* da CUNHA, 1950 (NOSEK 1973; TUXEN 1964) but differs in sensilla *b* subequal to *c* (in *ladeiroi* it is shorter). From two other Polish species of the "*cunhai*" group (*cunhai* and *rafalskii*) it differs in the presence of *P1a* on urotergite II-VI and absence of *P3a* on VII.

Description. Head setae long, additional seta absent. Sensory setae billet-like. Pseudoculus abbreviated, with short lever, PR 16-19. Filamento di sostegno with distincly bilobed posterior dilation, CF 4.5-6.0. Sensillae of maxillary palp subequal, thin, nearly seta-shaped. Tuft of labial palp four-branched, sensilla thin.

Main setae on nota long, *P1a*, *P2a* and *P5* rounded. Length ratio of *P1* : *P2* as 1 : 1.2-1.3. Seta *P4* on metanotum, *A2* on thoracal sterna and *M2* on prosternum billet-like. Thoracal sterna with no pores.

Foretarsus with very short sensilla *a*, reaching only base of *d*; *b* short, not reaching level of *γ3*, subequal to *c*; *d* long, passing level of *f*; *a'* of medium length, slender, situated distally to level of *t1*. Sensillae *a* and *a'* slightly thicker than others; *b'* and *c'* thin. All sensillae parallel-sized. Length formula of foretarsal sensillae: *t1=t3 < b=c < a' < g=b' < a=e=c' < d=t2 < f*. Seta *β1* and *δ4* short, *δ4* longer than *β1*. BS about 0.4, TR 3.5-3.9, EU 0.1-0.2.

Urotergite I with no seta *P1a*; *P2a* of same shape as *P1a* on nota; *A5* billet-like. Urotergite II-VI with seta *P1a* and with no *P3a*; accessory setae billet-like. Urotergite VII with 4+4 anterior setae (*A1, A2, A4, A5*); seta *P1a* present, *P3a* absent; accessory setae hair-like. Accessory setae on urosternite I-VI billet-like, subequal to that on tergites, on VII hair-like. Urosternite VII with no seta *Pc*. Connecting line on urosternite IV-VI absent. Sternal porotaxy formula: /0/0/0/1+1/1+1/1+1/1/. Pore on urosternite VII near its hind margin.

Urotergite and urosternite VIII with some irregulary scattered single granules. Comb VIII with slightly convex hind margin, composed of 8-11 slender teeth. Seta *1a* on urotergite IX subequal to seta *1*, on X shorter. Urotergite XI with 3+3 setae, seta *1* short. Hind margin setae of urotergite XII short, subequal. Urosternite XI with 3+3 setae.

Squama genitalis ♀ with long prolongation of stylus and long, thick acrostylus. Penis with 6+6 setae.

Maturus junior with seta *P1a* on urosternite I and with seta *1a* on VIII. Seta *P1a* on urotergite II-VI present, but much more variable than in adults. Larva II with larval seta on urosternite XII.

Body dimensions (in μm):

	imago	preim.	mat.jun.	larva II
head	125-149	114-124	114-128	ca 101
pseudoculus	7-8	7-8	ca 7	6-7
filamento di sostegno	24-31	ca 25	17-24	ca 19
mesonotal *P1*	30-38	25-26	22-28	17-21
mesonotal *P2*	38-45	33-34	28-36	24-28
foretarsus	97-108	97-104	75-83	65-66
claw	26-30	ca 25	ca 23	?
empodial appendage	4-5	3-4	3-4	?
maximum body length	1410	?	970	880
No of specimens studied	15	2	3	2

Chaetal variability. Imago (15 specimens). Urotergite VI: asymmetrical lack of *A2* (1 sp.); VII: ditto, (1 sp.); VIII: asymmetrical presence of *A2* (1 sp.); IX: asymmetrical lack of seta *1a* (1 sp.); XI: asymmetrical lack of seta *1* (1 sp.).

Maturus junior (3 specimens). Urotergite II-VII: asymmetrical or symmetrical lack of *P1a* on individual tergites (3 sp.); urosternite XII: symmetrical presence of larval seta (1 sp.).

In other instars - not observed.

General distribution: till now known only from Southern Moravia (RUSEK 1966; NOSEK 1973)

Polish localities (Fig. 13, tx):

WS 45. Wleń, Zamkowa Mt., decaying laeves under castle walls, 10 VI 1976, 1 ♀, 1 ♂, 2 mj (R). **WS 74.** "Wąwóz Myśliborski" reserve, deciduous forest, 18 VI 1985, 2 ♀, 1 pm (Pm). **WS 93.** Książ, decaying wood and plant debris from linden in park, 26 V 1972, 1 ♀, 2 ♂, 1 pm, 1 l2 (R). **WT 21.** Żagań, castle park, litter, soil and moos under bushes of bird chery under old trees, 30 VIII 1977, 1 ♀, 2 ♂, 1 l2 (ZM). **BA 96.** Krowiarki, abandoned castle park, liter, decaying twigs and moss under old trees between dense scrub of *Samb. nigra*, 30 V 1980, 4 ♀, 1 ♂ (R). **CA 46.** Katowice-Ligota, park of Franciscan Monastery, litter, soil and decaying wood of old stumps, 27 IV 1987, 1 ♂, 1 mj (R).

Acerentulus rafalskii SZEPTYCKI, 1979
(Figs 131-147)

Acerentulus rafalskii : SZEPTYCKI 1979

Diagnosis. By the short foretarsal sensilla *a* it belongs to "*cunhai*" group of NOSEK. From all the species of this group it difers by the peculiar shape of sensillae *a* and *a'* and by the presence of only 4 setae on urosternite XI.

Description. Head setae short, additional seta absent. Sensory setae billet-like. Pseudoculus round, with long lever, PR unestablished. Filamento di sostegno with big, trilobed posterior dilation, CF unestablished. Sensillae of maxillary palp subequal in length. Tuft of labial palp with four branches, sensilla slender.

Main stae on nota short, *P1a*, *P2a* and *P5* rounded. Length ratio of *P1* : *P2* on mesonotum as 1 : 1.3-1.8. Seta *P4a* on metanotum, *A2* on thoracal sterna and *M2* on prosternum billet-like. Thoracal sterna with no pores.

Foretarsus with short sensilla *a*, not reaching level of *γ3; b* short, slightly passing level of *γ3*, subequal to *c*; *d* long, reaching level of *f*; *a'* short, situated distally to level of *t1*. Sensillae *a*, *b* and *a'* thicker than other ones, *b'* and *c'* thin. Sensilla *a* and *a'* more or less sword-shaped, other sensilla parallel-sized. Length formula of foretarsal sensillae $t1=t3 < a' < g < b=c=e=f=b'=c' < a=t2 < d$. Setae *β1* and *δ4* short, *β1* shorter than *δ4*. BS 0.3-0.4, TR 4.0, EU 0.1.

Urotergite I with no seta *P1a*, *P2a* of same shape as *P1a* on nota, *A5* billet-like. Urotergite II-VI with no setae *P1a* and *P3a*; accessory setae billet-like. Urotergite VII with 4+4 anterior setae (*A1*, *A2*, *A4*, *A5*); setae *P1a* and *P3a* present, accessory setae hair-like. Accessory setae on urosternite I-VI thin, nearly hair-like, same length as those on tergites. Urosternite VII with no seta *Pc*. Connecting line on urosternite IV-VI absent.

Sternal porotaxy formula /0/0/1+0/1+1/1+1/n+n/1/. Pore on urosternite VII near its hind margin.

Urotergite and urosternite VIII with regular row of small granules. Comb VIII with 7-8 slender teeth. Seta *1a* on urotergite IX same length as seta *1*, on X shorter. Urotergite XI with 3+3 setae, seta *1* short. Hind margin setae of urotergite XII short, subequal. Urosternite XI with 2+2 setae.

Squama genitalis ♀ with short prolongation of stylus and short, stump acrostylus. Penis with 6+6 setae.

Younger instars unknown.

Body dimensions (6 imagines) (in μm): head - unestablished, pseudoculus about 8, filamento di sostegno 22-23, mesonotal *P1* 14-17, *P2* 19-24, foretarsus 79-82, claw ca 20, empodial appendage ca 3, maximum body length 1250.

Chaetal variability. Imago (6 specimens). Urotergite VII: asymmetrical lack of *A4* (1 sp.)

Remarks. In my description of *A. rafalskii* (SZEPTYCKI 1979) the length of the head was established as 111-115 μm, and PR about 14. This measurement was not accurate. The state of preservation of the type material and that newly collected does not allow more precise data. So, actually, the length of head and the indices based on it remain unknown. The body length, measured for the description, was based on not completely expanded specimens.

General distribution: known only from Poland, but in this country it is probably an introduced species.

Polish localities (Fig. 14,ra).

XS 46. Wrocław - Botanical Garden, compost soil, 13 VI 1975, 1 ♀, 3 ♂ (R). **XT 29**. Rogalin (SZEPTYCKI 1979).

Acerentulus cunhai CONDÉ, 1950
(Figs 148-171)

Acerentulus cunhai: CONDÉ 1950; TUXEN 1964; NOSEK 1973; ALDABA 1984

Diagnosis. Very distinct species, characterised in elongated pseudoculus, very short foretarsal sensilla *a*, extremally long *d* and thick sensillae *b'* and *c'*.

Description. Head setae short, additional seta absent. Sensory setae billet-like. Pseudoculus elongated, with long lever, PR 14-18. Filamento di sostegno with indistinctly bilobed posterior dilation, CF about 4. Sensillae of maxillary palp very thin and short, subequal. Tuft of labial palp with four branches, sensilla very thin, nearly seta-like.

Main setae on nota long, *P1a*, *P2a* and *P5* conical. Length ratio of *P1* : *P2* on mesonotum as 1 : 1.4-1.6. Seta *P4a* on mesonotum, *A2* on thoracal sterna and *M2* on

prosternum billet-like. Meso- and metasternum with single pore situated medially, anteriorly to level of seta *M*.

Foretarsus with short sensilla *a*, reaching only base of *d*; *b* short, slightly passing level of *γ3*, longer than *c*; very long *d*, passing level of *f*; *a'* short, parallel-sized, situated distally to *t1*. Sensillae *b*, *c* and *d* thinner than others, *b'* and *c'* thick. All sensillae parallel-sized. Length formula of foretarsal sensillae: *t1=t3 < c=g=a' < e < a=b < t2=c' < b'=f < d*. Setae *β1* and *δ4* short, subequal. BS about 0.5, TR 3.0-3.5, EU 0.1.

Urotergite I with no seta *P1a*, *P2a* of same shape as *P1a* on nota, *A5* billet-like. Urotergite II-VI with no setae *P1a* and *P3a*; accessory setae very short, billet-like. Urotergite VII with 4+4 anterior setae (*A1, A2, A4, A5*); setae *P1a* and *P3a* present; accessory setae longer and thinner than those on preceeding tergites. All accessory setae on urosternite I-VI billet-like, evidently longer and thinner than those on tergites, on VII as on preceeding sternites. Connecting line on urosternite IV-VI present. Sternal porotaxy formula: /1+0/0/0/1+0/1+1/n+n or 1+1/1+0/. Pore on urosternite VII situated asymmetricaly, very near seta *P1*.

Urotergite and urosternite VIII with irregular row of strong granules. Comb VIII with concave margin, composed of 9-11 slender, commonly doubled teeth. Seta *1a* on urotergite IX subequal to seta *1*, on X shorter. Urotergite XI with 3+3 setae, seta *1* long. Hind margin setae on urotergite XII long, sublateral longer and thicker than medial. Urosternite XI with 3+3 setae.

Squama genitalis ♀ with long distal prolongation of stylus and long, thin acrostylus. Males from Poland unknown.

Maturus junior with no seta *P1a* on urosternite I and with *1a* on VIII. Larva II with larval seta on urosternite XII.

Body dimensions (in μm):

	imago	mat. jun.	larva II	larva I
head	139-160	113-131	ca 109	95-109
pseudoculus	9-10	ca 8	ca 8	ca 6
filamento di sostegno	37-44	ca 29	ca 28	24-28
mesonotal *P1*	24-30	19-24	ca 22	13-14
mesonotal *P2*	40-42	33-36	ca 28	17-19
foretarsus	104-110	80-92	ca 73	57-59
claw	31-32	ca 26	ca 23	18-21
empodial appendage	3-5	ca 3	ca 3	ca 2
maximum body length	1670	1320	980	720
No of specimens studied	9	3	1	3

Chaetal variability. Imago (9 specimens studied). Urotergite VI: asymmetrical lack of *A4* (1 sp.); VII: ditto, of *A2* (1 sp,), and *P2a* (2 sp.), presence of *Pc* (1 sp.)

Maturus junior (3 specimens). Urotergite VIII: asymmetrical lack of *A5* (1 sp.).

In other instars - not observed.

General distribution: known from Mallorca, Portugal, Basque Country, Ireland and Sweden (NOSEK 1973, ALDABA 1984). In Poland it is probably an introduced species.

Polish localities (Fig. 13, cu)

XT 29. Puszczykowo, west decaying wood from the base of stump of dead willow, 18 X 1986, 8 ♀, 3 mj, 1 l2, 3 l1 (R). **XU 21.** Poznań - Botanical Garden, soil and litter under *Impatiens parviflora*, 10-20 cm deep, 3 VIII 1976, 1 ♀, (R).

Acerentulus traegardhi IONESCU, 1937
(Figs 172-198)

Acerentulus Trägårdhi : IONESCU 1937
Acerentulus träghårdi : TUXEN 1961, 1964
Acerentulus traegardhi : NOSEK 1973

Diagnosis. In the very long and thick sensilla *b* on foretarsus and in the presence of only four setae on urosternite XI it is very symilar to *ruseki* NOSEK, 1967 (NOSEK 1967b) and *collaris* sp. n. From the both mentioned species it differs in larger body dimension, in thiner and shorter sensilla *b* and in the more distal position of *a'*. From *collaris* it differs also in some details of sternal lineation and porotaxy.

Description. Head setae short, additional seta absent. Sensory setae thin, hair-like. Pseudoculus round, with short lever, PR 16-21 in adults and 14-20 in younger instars. Filamento di sostegno with indistinct, simple distal dilation, CF 4-6. Sensillae of maxillary palp subequal, slender. Tuft of labial palp two-branched, sensilla slender.

Main setae on nota long, *P1a*, *P2a* and *P5* conical. Length ratio of *P1* : *P2* mesonotum as 1 : 1.2-1.5. Seta *P4a* on metanotum, *A2* on thoracal sterna and *M2* on prosternum hair-like. Thoracal sterna with no pores.

Foretarsus with short sensilla *a*, reaching only base of *d*; *b* very long, passing level of *γ5*, much longer than *c*; *d* short, not passing level of *f*; *a'* long, situated nearly on level of *t1*. Sensilla *b* much thicker than other ones, *b'* and *c'* thin. All sensillae parallel-sized. Length formula of foretarsal sensillae: $t1=t3 < a' < c < g=c' < a=b' < d=e=f < t2 < b$. Seta *β1* and *δ4* short, *δ4* longer than *β1*, BS 0.4-0.5, TR 3.3-4.3 (in larvae 3.0-4.0), EU 0.1-0.2.

Urotergite I with no seta *P1a*; *P2a* of same shape as *P1a* on nota; *A5* hair-like. Urotergite II-VI with no setae *P1a* and *P3a*; accessory setae hair-like. Urotergite VII with 3+3 anterior setae (*A2*, *A4*, *A5*); setae *P1a* and *P3a* present; accessory setae hair-like, subequal to that on preceeding tergites. Accessory setae on urosternite I-VII hair-like, subequal to that on tergites. Urosternite VII with no seta *Pc*. Connecting line on urosternite IV-VI presents. Sternal porotaxy formula: /0/0/0/0/0/1+0/1+0 or 1/. Pore on urosternite VII mostly asymmetrically, near seta *P1* (in about 15% of specimens medially, near hind border of sternite).

Urotergite and urosternite VIII with more or less regular row of small granules and with some scattered granules forming trace of second row. Comb VIII with 5-10 (mostly 7-9)

slender teeth. Seta *1a* on urotergite IX subequal to seta *1*, on X shorter. Urotergite XI with 3+3 setae, seta *1* short. Hind margin setae of urotergite XII short, subequal. Urosternite XII with 2+2 setae.

Squama genitalis ♀ with long prolongation of stylus and very short acrostylus. Penis with 4+4 setae.

Preimago and maturus junior with relatively shorter and thiner foretarsal sensilla *b*, slightly passing level of γ*4*. Maturus junior with no seta P1a on urosternite I and mostly with no seta *1a* on urosternite VIII. Urosternite XI with no setae. Larva I and II with much shorter sensilla *b*, not reaching level of γ*4*, larva II mostly with no larval seta on urosternite XII.

Body dimensions (in μm):

	imago	preim.	mat. jun.	larva II	larva I
head	107-141	104-119	92-120	96-104	83-95
pseudoculus	6-8	6-8	6-7	5-6	ca 5
filamento di sostegno	21-34	19-26	16-27	17-24	15-19
mesonotal *P1*	17-30	15-23	14-21	11-16	9-13
mesonotal *P2*	24-37	21-39	18-28	15-23	13-15
foretarsus	75-91	65-76	56-75	54-62	43-51
claw	20-25	16-21	17-23	15-19	15-16
empodial appendage	3-6	3-4	2-4	2-5	2-4
maximum body length	1340	1140	1100	840	630
No of specimens studied	246	22	50	29	7

Chaetal variability. Imago (246 specimens). Urotergite VI: asymmetrical (13 sp.) and symmetrical (2 sp.) lack of *A4*, asymmetrical presence of *A3* (1 sp.); VII: asymmetrical lack of *A2* (1 sp.), of *A4* (2 sp.); VIII: asymmetrical presence of *A3* (2 sp.), asymmetrical lack of *A1* (2 sp.), of *A4* (2 sp.) of *A5* (1 sp.), lack of *A1* and presence of *Ac* (1 sp.), lack of *M1* and presence of *Mc* (6 sp.); urosternite VI : symmetrical lack of *P1a* (1 sp.); VII: lack of *Ac* (1 sp.); VIII: asymmetrical lack of seta *1* (4 sp.), of *1a* (8 sp.); IX: asymmetrical presence of seta *1a*.

Preimago (22 specimens). Urotergite VI : asymmetrical (3 sp.) and symmetrical (1 sp.) lack of *A4*; VII: asymmetrical presence of *A1* (1 sp.), asymmetrical lack of *P2a* and symmetrical of *P3a* (1 sp.); VIII: lack of *M1* and presence of *Mc* (1 sp.); urosternite VIII: asymmetrical lack of seta *1a* (1 sp.)

Maturus junior (50 specimens). Urotergite VI: asymmetrical presence of *A4* (1 sp.), asymmetrical lack of *A1* (1 sp.); VII: asymmetrical presence of *A3*, asymmetrical lack of *A2* (3 sp.), of *A4* (2 sp.), asymmetrical (5 sp.) and symmetrical (2 sp.) lack of *P1a*, asymmetrical (4 sp.) and symmetrical (2 sp.) lack of *P3a*; VIII: asymmetrical lack of *A1* (2 sp.), of *A4* (1 sp.), of *A5* (1 sp.), lack of *A1* and presence of *Ac* (1 sp.); urosternite VIII: asymmetrical (3 sp.) and symmetrical (6 sp.) presence of seta *1a*.

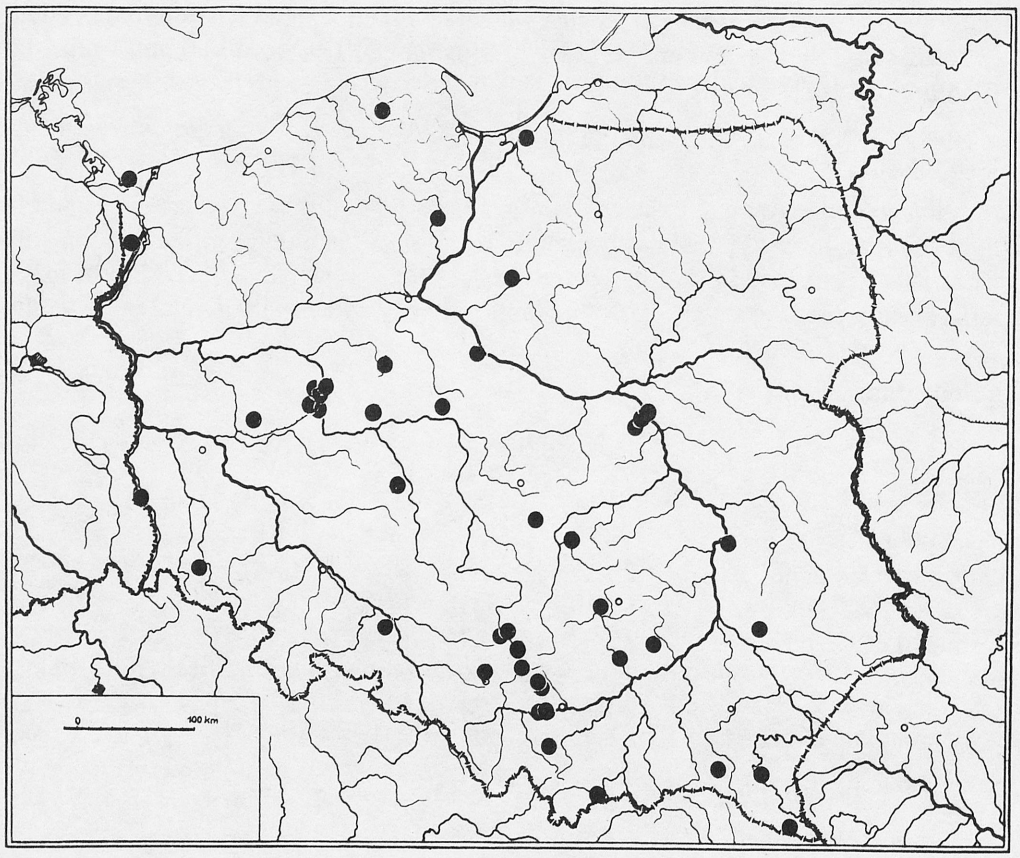

Fig. 15. Polish localities of *Acerentulus traegardhi* IONESCU

Larva II (29 specimens). Mesonotum: asymmetrical lack of *A4* (1 sp.); metanotum: ditto (1 sp.); urosternite IX: asymmetrical lack of seta *1* (1 sp.); XII: asymmetrical (1 sp.) and symmetrical (1 sp.) presence of larval seta.

Larva I (7 specimens) - variability not observed.

Remarks. The species recorded as "*traegardhi*" from Basque Country by ALDABA (1984) differs of the Polish specimens in some taxonomically important features (as length of foretarsal sensilla *a*, position of sensilla *a'* and number of setae on urosternite XI) - it is with no doubt a different species.

General distribution: Recorded from nearly whole Europe (NOSEK 1973) but sometime probably mistaken with the other species with long sensilla *b*. It is one of the most common species of *Protura* in Poland.

Polish localities (Fig.15)

VT 80. Łęknica, park-forest with old trees, litter under very old beech, 30 VIII 1977, 1 ♀ (R). **VV 67.** Międzyzdroje (SZEPTYCKI 1964). **VV 73.** Szczecin, rotten wood and

plant-debris with the rests of fungi from rotten maple, 16 II 1974, 1 ♀ (R). **WS 45**. Wleń - Zamkowa Mt., decaying leaves under castle-walls, 20 VI 1976, 4 ♀, 1 ♂, 3 pm, 1 mj, 1 l2 (R). **WT 77**. Wolsztyn, palace park near the lake, decaying wood, leaves, remnants of fungi etc., from crevices in old, decaying stump, 28 IV 1983, 4 ♀, 2 ♂ (R). **XS 46**. Wrocław - Botanical Garden, compost soil, 13 VI 1975, 1 ♂ (R). **XT 29**. Puszczykowo, wet decaying wood from base of stump of dead willow, 18 X 1986, 2 ♀ (R); Rogalin (SZEPTYCKI 1969a), and from thick layer of litter and decaying leaves under timber pieces in abandoned park, 18 IV 1972, 14 ♀, 12 ♂, 1 mj, 3 l2 (R), and thick layer of wet decaying wood near base of stump of horse chesnut-tree, 5 IV 1985, 3 ♀, 1 ♂, 1 pm, 2 mj (R). **XU 21**. Poznań-Golęcin, abandoned park, soil and litter near base of horse chesnut-tree, 8 IX 1977, 2 ♀, 5 ♂ (R). **XU 30**. Poznań-Cybina Valley (SZEPTYCKI 1969a); Poznań-Kobylepole, decaying wood with leaves, plant debris, soil etc., under decaying log in mixed forest, 14 VII 1979, 3 ♀, 1 mj (R). **XU 41**. Promno, decaying wood (with ants) from apple-tree, 20 VIII 1964, 1 ♀, 2 ♂ (J,R). **XU 60**. Nekla, old park, soil and decaying wood with remnants of leaves from old linden, 27 VII 1978, 1 ♀, 1 l2 (R). **XU 84**. Ostrowickie Lake, dense hornbeam-oak forest on steep SE slope with rich undergrowth and herb layer, soil and litter, 11 VI 1981, 1 ♀, 3 ♂, 1 pm (R). **XA 74**. Ca 7 km S of Lębork (SZEPTYCKI 1969a). **YS 10**. Woodland ca 5 km SE Opole, humid decidous forest, 28 V 1980, 2 ♀ (R, Ko). **YT 05**. Gołuchów-Aboretum, humid litter under *Lonicera* and *Symphoricarpa* bushes, 20 VIII 1977, 2 ♀, 1 ♂ (R). **CA 67**. Gołonóg, young, cultivated forest with larch, birch, pine, oaks, 21 V 1974, 1 ♀, 1 l2 (Bl). **CA 97**. Pomorzany, dry calcareous rock of southern exposition, mosses and plant-debris, 12 VIII 1987, 2 ♀, 1 pm, 1 l2 (Sz). **CB 81**. Trzebniów - Kacza Skała, lower layer of litter from beech forest between calcareous rocks, 19 X 1982, 1 ♀, 3 ♂, 1 mj (R); Potok Złoty - "Parkowe" reserve, beech forest with maple, oak, hornbeam, pine etc.,litter with decaying wood from old log, 20 X 1982, 1 l2, 1 l1 (R). **CD 20**. Lubstów, park, decaying wood and plant debris from huge stump of linden, 2 X 1971, 1 ♀, 1 pm, 2 mj (R). **CD 63**. "Kulin" reserve (SZEPTYCKI 1969a), and turf of mosses under shrubs in a gorge, 31 VII 1971, 29 ♀, 10 ♂, 3 pm, 2 mj (R). **CE 25**. Łuby, slope above Wda Valley, mixed forest with pine, oak, linden, hazel etc., 24 V 1979, 13 ♀, 1 ♂, 1 l2 (R). **CE 80**. "Mieliwo" reserve, hornbeam-oak forest with beech and pine, dry decaying wood from old hornbeam, 24 VII 1974, 8 ♀, 3 ♂, 1 pm (ZM). **DV 57**. Pieniny National Park - petrophilous turfs: Głowa Cukru, 28 VI 1976, 1 ♀, 4 mj (We), and 26 VIII 1976, 1 l2 (We); petrophilous pine forest: Macelowa Mt., needles, litter and mosses, 21 VI 1975, 8 ♀, 3 ♂, 2 mj, 1 l2 (We), and Czerwone Skałki, needles, 10 IV 1976, 2 ♂ (We); fir-spruce forest, soil: Wawóz Sobczański, 15 I 1977, 1 ♀ (We); beech forest: Ociemny Potok, 19 III 1972, 1 ♀ (We); decidous forest, litter: Rabsztyn, 25 VIII 1975, 1 ♀, 1 mj (We), and Harczygrund, 27 VIII 1975, 1 ♂ (We), and Ganek by base of Okrąglica Mt., 24 VIII 1976, 13 ♀, 5 ♂, 1 pm, 6 mj (We); litter in the cave: Ociemne, ca 4 m from the entrance, 15 VII 1977, 1 l2 (We). **DA 05**. Kleszczów, beech forest, litter, 1 V 1974, 1 ♀, 1 l2 (Sz), and mosses from shadowed calcareous rocks, 30 VI 1982, 1 l2 (R). **DA 07**. Podlesie - Djabla Mt., border of spruce forest, in small ant-nest near a stump, 29 IV 1987, 1 ♂ (R). **DA 15**. Zabierzów, pine-oak forest, soil and plant debris at foot of calcareous rocks, 28 IV 1979, 2 ♂ (R). **DA 16**. Ojców National Park - petrophilus xerothermic turfs: Rękawica Rock, 14 VI 1964, 1 ♀, 2 ♂ (Rj), and Grodzisko, sloper under the chapel, 7 VII 1964, 2 ♀, 1 ♂, 1 pm, 1 mj (Sz); *Origano-Bra-*

chypodietum: lower part of Rękawica Rock, 1 VII 1964, 4 ♀, 2 ♂, 1 pm, 2 mj (Rj), and slope above Ciemna Cave, 1 VII 1964, 1 pm (Rj); *Corylo-Peucedanetum*: Koronna Mt., 13 VI 1964, 1 ♂, 1 pm (Sz); brushwood of *Cerasus fruticosa*: Grodzisko, 5 VI 1964, 1 l2 (Sz); *Tilio-Carpinetum*: Koronna Mt., 2 VI 1964, 6 ♀, 4 ♂, 2 mj (Rj). **DA 78**. Skorocice, upper part of the reserve, xerophilus turf on gypsum rock, 8 V 1980, 1 ♂, 1 l2 (We, Sz). **DA 91**. Falkowa, short moss on soil, 20 IX 1980, 1 pm (We). **DB 29**. Sulejów, decaying wood and plant debris from hollow in elm, 8 V 1968, 1 ♀ (R). **DB 47**. Modliszewice, plant remnants (mostly dry grasses) from nest of a rodent in small hole in a wall, 24 IX 1984, 1 ♀ (R). **DB 52**. Milechowska Mt., mixed forest with many shrubs, litter (mostly under hazel), 25 IX 1984, 1 ♀, 1 ♂ (R). **DC 77**. Podkowa Leśna, 15 V 1984, 5 ♀, 5 ♂, 1 pm, 5 mj, 2 l2, 1 l1 (Iz). **DC 99**. Warszawa - Pałac Kultury i Nauki, soil of a lawn, 25 II 1977, 1 pm (Iz); Warszawa - Las Sobieskiego, 10 I 1984, 18 ♀, 9 ♂, 1 pm, 4 mj. 7 l2, 4 l1 (Iz). **DF 01**. Kadyny (SZEPTYCKI, 1969a). **EV 59**. Miejsce Piastowe - Winna Mt., *Querceto-Carpinetum* (mostly hornbeam) on S and SW slopes, litter, soil, moss etc., 1 IX 1981, 1 ♀ (R). **EV 89**. Sobień Mt., border between hornbeam forest and bushes on SE slope, litter, decaying grasses etc., 9 VI 1960, 1 ♀, 1 l2 (R). **EB 00**. Szydłów, xerothermic slope above old quarry, mosses and plant debris from a rock, 10 VIII 1979, 5 ♀, 1 ♂, 1 mj (Kl). **FV 14**. Gorge of Wołosaty Stream under Bereżki Mt., beech forest with maple on stony slope, 1 l2 (Ja, R). **FB 03**. "Góra Chełmowa" reserve, oak-larch forest, litter, pieces of bark etc., under an old larch, 26 IX 1984, 1 ♀, 2 ♂ (R). **FB 68**. Kazimierz-Męćmierz, pine forest, 29 VIII 1972, 5 ♀, 3 ♂, 2 mj (Nd).

Acerentulus collaris sp. n.
(Figs 199-215)

Diagnosis. In many body features the new species is very similar to *traegardhi*, but it is smaller, with longer and thicker sensilla *b*, and with more posteriorly situated *a'*. The lack of the connecting line and the presence of pore on urosternite V are also specific characters - in the big material of *traegardhi* (more than 200 specimens) these features were never found. The foretarsus of *collaris* is very similar to that of *ruseki* but sensilla *t2* in the former is thinner. The tuft of labial palp in *collaris* is composed of two branches and sensilla is slender - in *ruseki* the tuft is reduced to one branch only, and sensilla is bulb-like.

Description. Head setae short, additional seta absent. Sensory setae thin, hair-like. Pseudoculus small, round, with short lever, PR 15.4. Filamento di sostegno with bilobed posterior dilation, CF 4.6. Sensillae of maxillary palp subequal, slender, relatively short. Tuft of labial palp with two branches, sensilla slender.

Main setae on nota short, *P1a*, *P2a* and *P5* conical. Length ratio of *P1* : *P2* on mesonotum as 1 : 1.3. Seta *P4a* on metanotum, *A2* on thoracal sterna and *M2* on prosternum hair-like. Thoracal sterna with no pores.

Foretarsus with short sensilla *a*, reaching base of *d*; extremally long sensilla *b*, passing base of claw; *c* subequal to *a*; *d* short, slightly passing base of *e*; *a'* short, situated proximmally to level of *t2*. Sensilla *b* much thicker than others, *b'* and *c'* thin, *b*

sword-shaped, other sensillae parallel-sized. Length formula of foretarsal sensillae: *t1=t3 < g=a'=c' < a < c=d=e < b' < f=t2 < b*. Setae β*1* and δ*4* short, subequal. BS 0.5, TR 3.6, EU 0.2.

Urotergite I with no seta *P1a*, *P2a* of same shape as *P1a* on nota, *A5* hair-like. Urotergite II-VI with no setae *P1a* and *P3a*; accessory setae hair-like. Urotergite VII with 3+3 anterior setae, setae *P1a* and *P3a* present, accessory setae hair-like, subequal to that on preceeding tergites. Accessory setae on urosternite I-VII hair-like, subequal to that on tergites. Seta *Pc* on urosternite VII absents. Sternal porotaxy formula: /0/0/0/0/1+0/1+0/1/. Pore on urosternite VII far from its hind border. Connecting line on urosternite IV-V absents, on VI present, sternal lines slightly serrated. Abdominal legs II and III with two setae, inner apical seta absent.

Urotergite and urosternite VIII with some scattered granules. Comb VIII with 8-9 slender teeth. Seta *1a* on urotergite IX and X shorter than seta *1*. Urotergite XI with 2+2 setae, seta *1* absent. Hind margin setae of urotergite XII short, subequal. Urosternite XI with 2+2 setae.

Squama genitalis ♀ seems to be similar to that in *traegardhi*, but in only one specimen studied it is poorly visible. Males unknown.

Younger instars unknown.

Body dimensions (holotype) (in μm): head 125, pseudoculus 8, filamento di sostegno 27, mesonotal *P1* 14, *P2* 18, foretarsus 74, claw 20, empodial appendage 5, total body length unestablished.

Remarks. The new species differs from all other *Acerentulus* species by the presence of only two setae on abdominal legs II-III. As the only one specimen is known up to date - the taxonomical value of this peculiar character remains unclear.

Derivatio nominis: collis (lat.) = hill.

Material (Fig. 13, cl):

Holotype ♀ (specimen nr 159): **DV 57**. Pieniny National Park, Polana (= Glade) Kosarzyska, soil of meadow, 23 VI 1973 (We).

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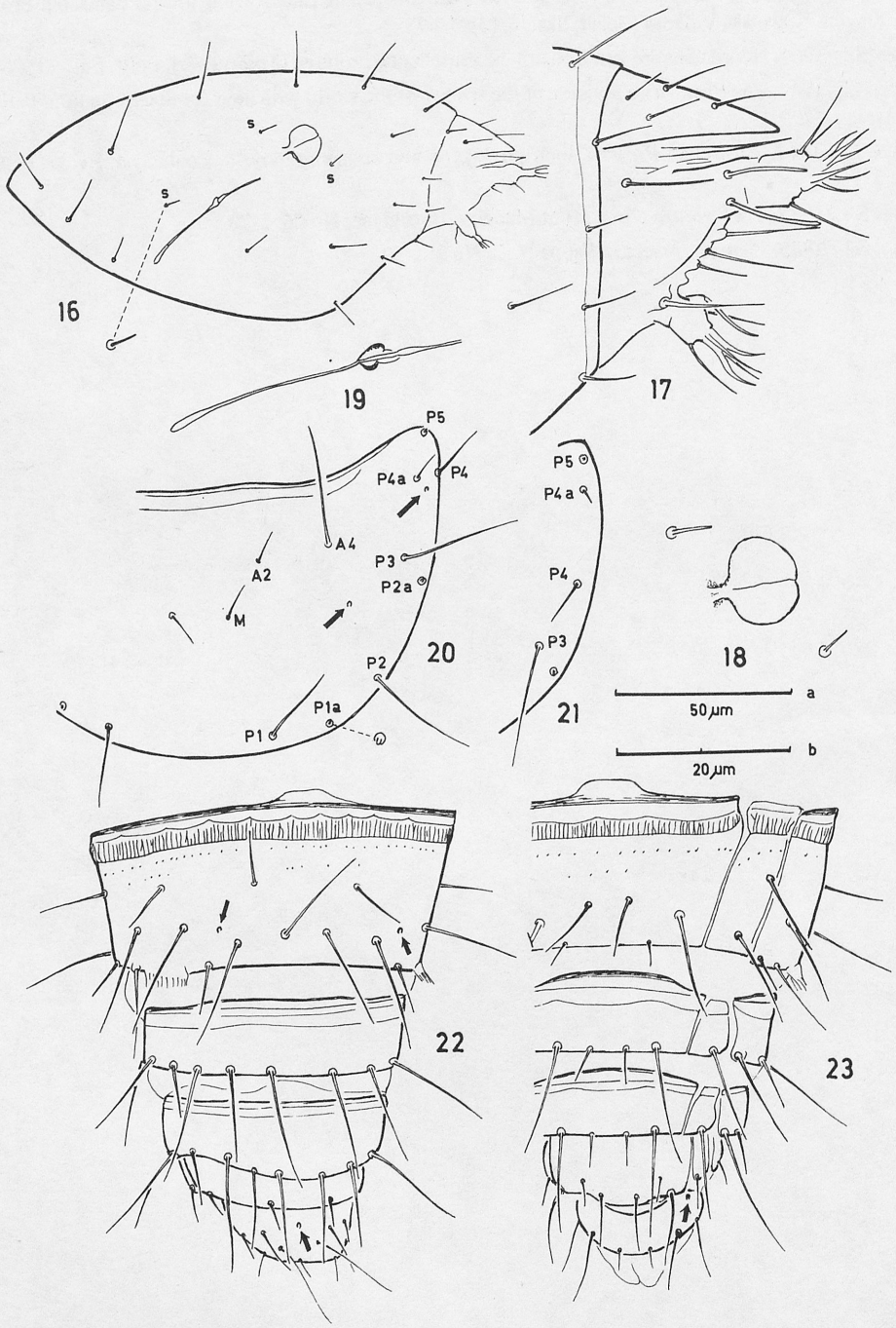

Fig. 16-23. *Acerentulus exiguus* CONDÉ. 16 - head (s - sensory setae); 17 - mouthparts, lateral view; 18 - pseudoculus; 19 - filamento di sostegno; 20 - mesonotum (arrows - pores); 21 - anterolateral margin of metanotum; 22 - urotergite VIII-XII (arrows - pores); 23 - urosternite VIII-XII (17-19 - magnification b, others - a)

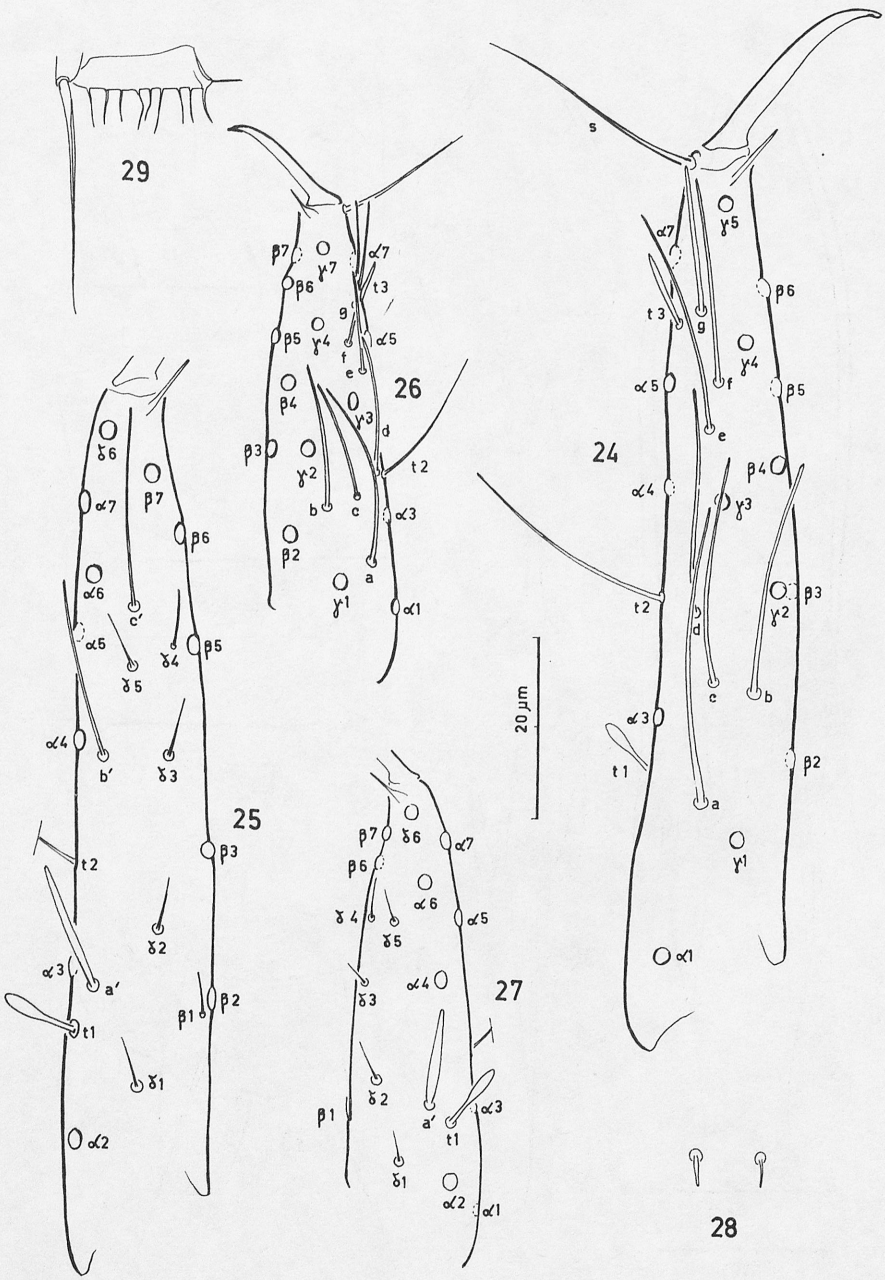

Fig. 24-29. *Acerentulus exiguus* CONDÉ. 24 - foretarsus of imago, exterior viev; 25 - ditto, interior view; 26 - foretarsus of larva I, exterior view; 27 - ditto, interior view; 28 - accesory seta of urotergite (left) and urosternite (right) III; 29 - comb VIII

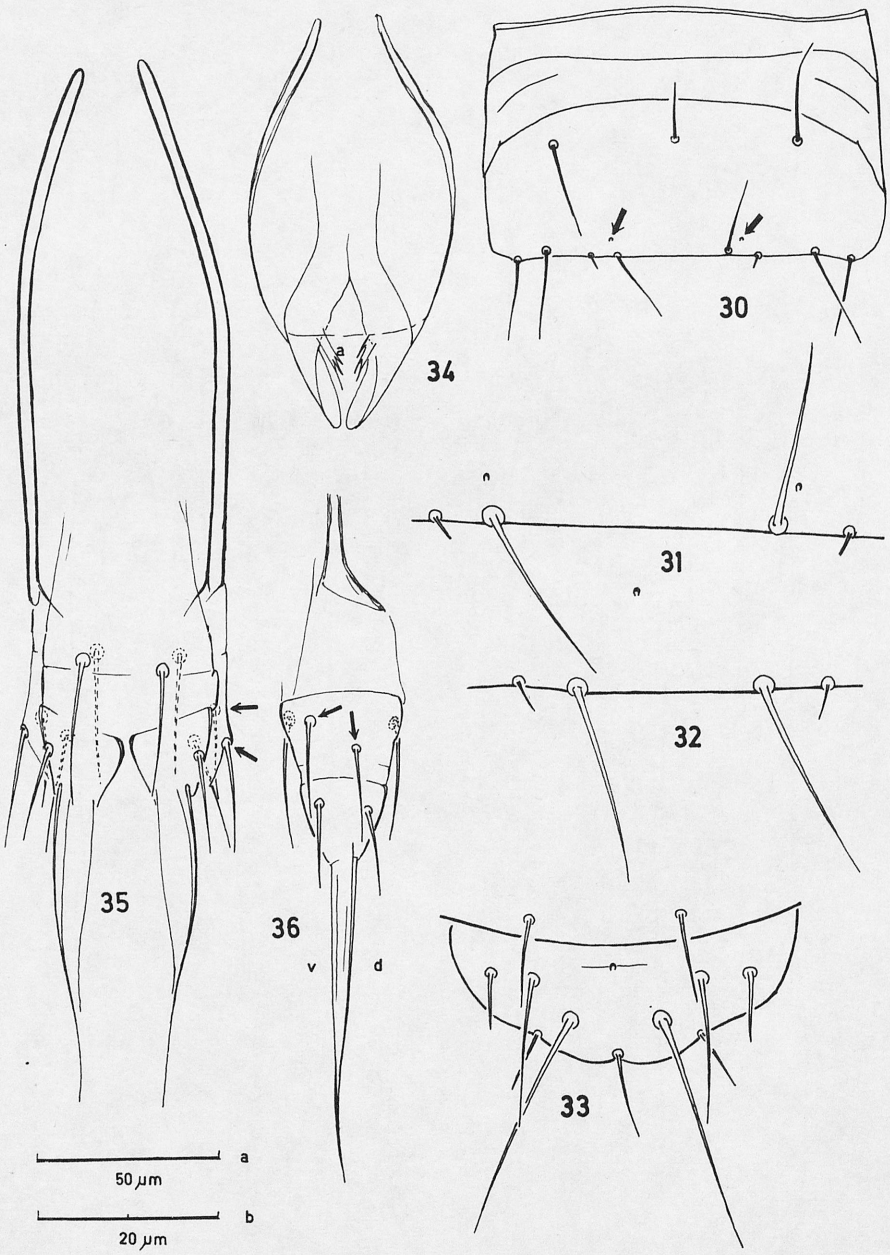

Fig. 30-36. *Acerentulus exiguus* CONDÉ. 30 - urosternite VI (arrows - pores); 31 - hind margin of urosternite VI; 32 - ditto, of urosternite VII; 33 - urotergite XII; 34 - squama genitalis ♀ (a - acrostylus); 35 - penis, dorsal view; 36 - penis, lateralview (d - dorsal side, v - ventral side, arrows - acroperiphallar setae) (30 - magnification a, others - b)

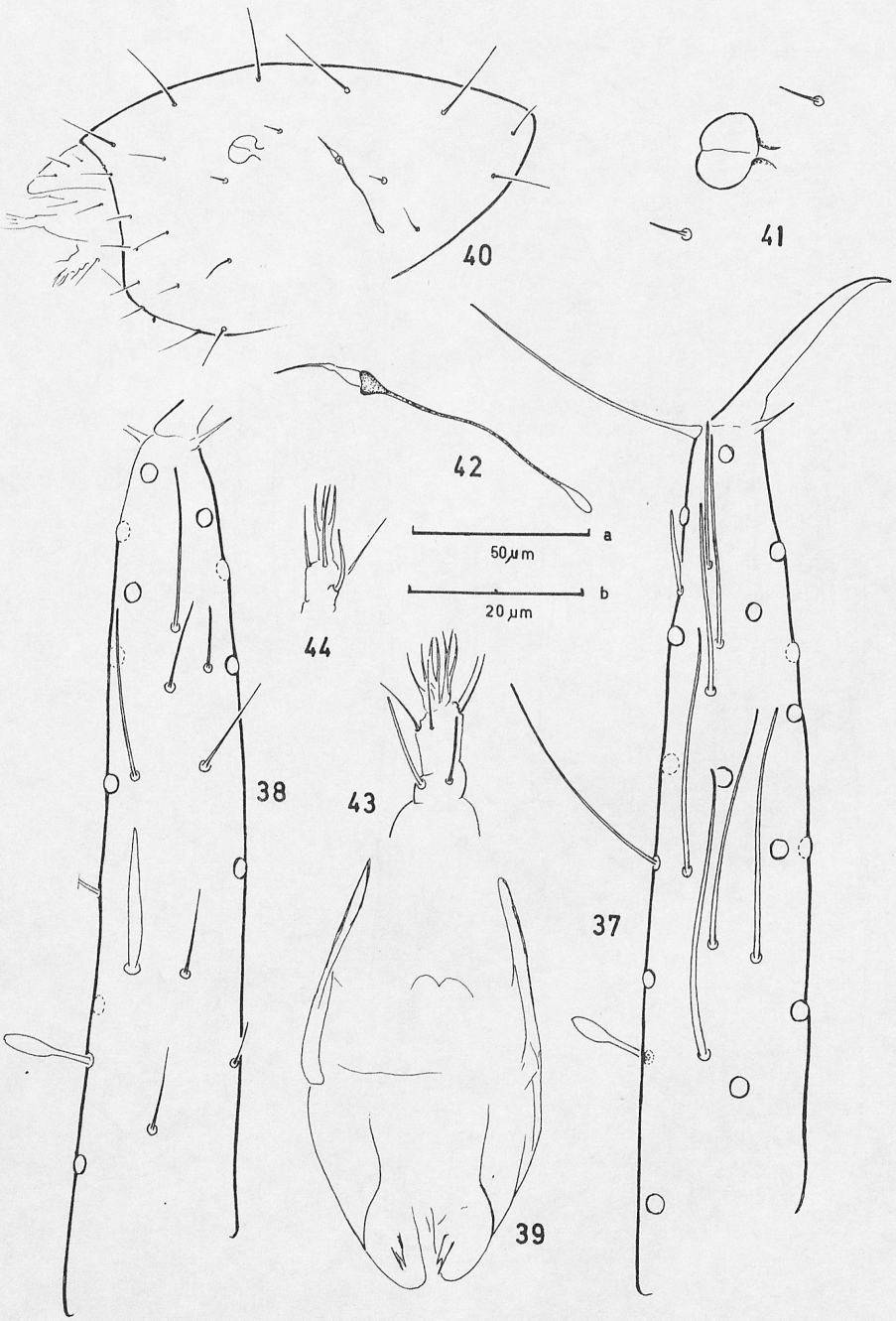

Fig. 37-44. 37-39 - *Acerentulus occultus* SZEPTYCKI. 37 - foretarsus, exterior view; 38 - ditto, interior view; 39 - squama genitalis ♀. 40-44 - *Acerentulus carpaticus* NOSEK. 40 - head; 41 - pseudoculus; 42 - filamento di sostegno; 43 - maxillary palp; 44 - labial palp (40 - magnification a, others - b)

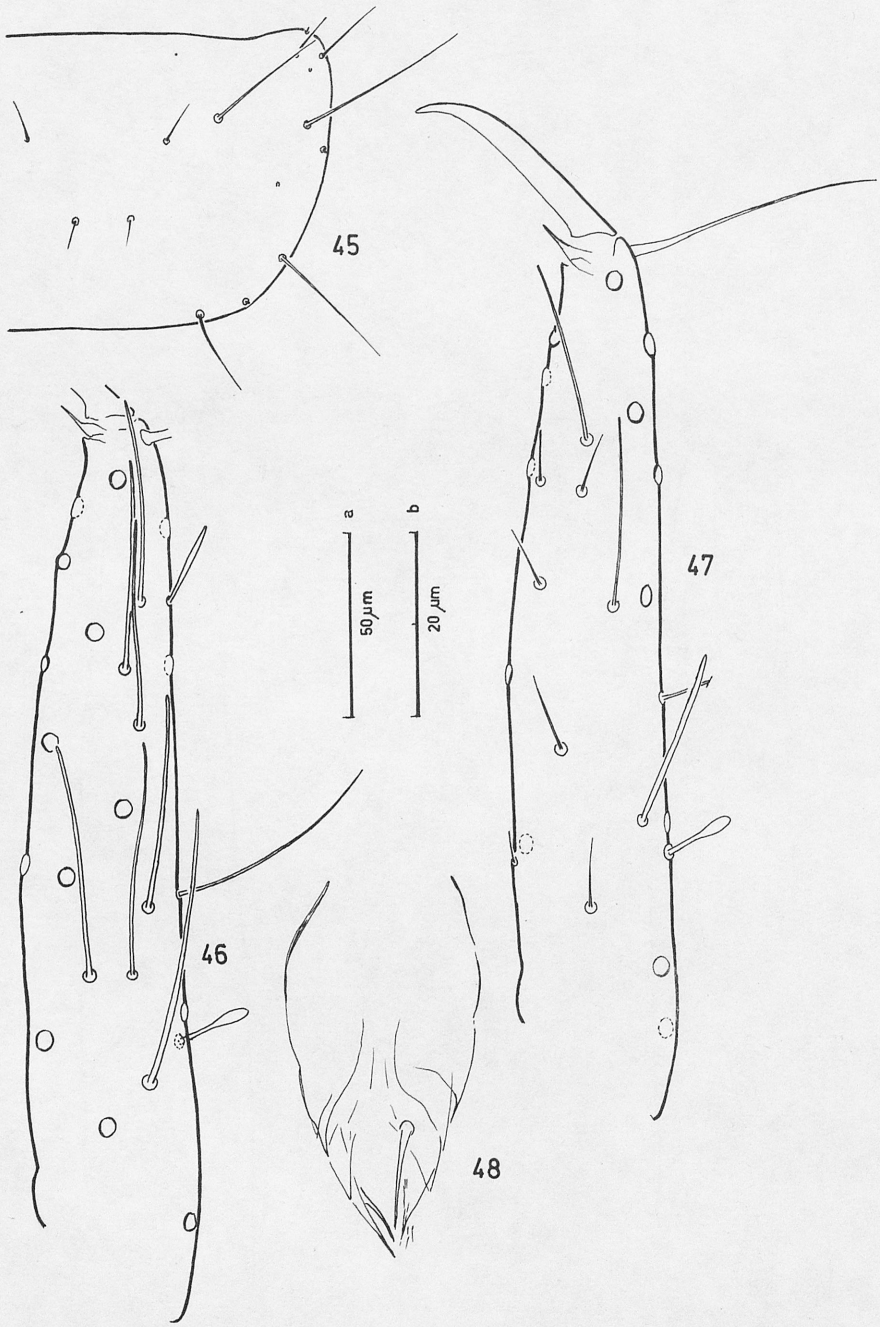

Fig. 45-48. *Acerentulus carpaticus* NOSEK. 45 - mesonotum; 46 - foretarsus, exterior view; 47 - ditto, interior view; 48 - squama genitalis ♀ (45 - magnification a, others - b)

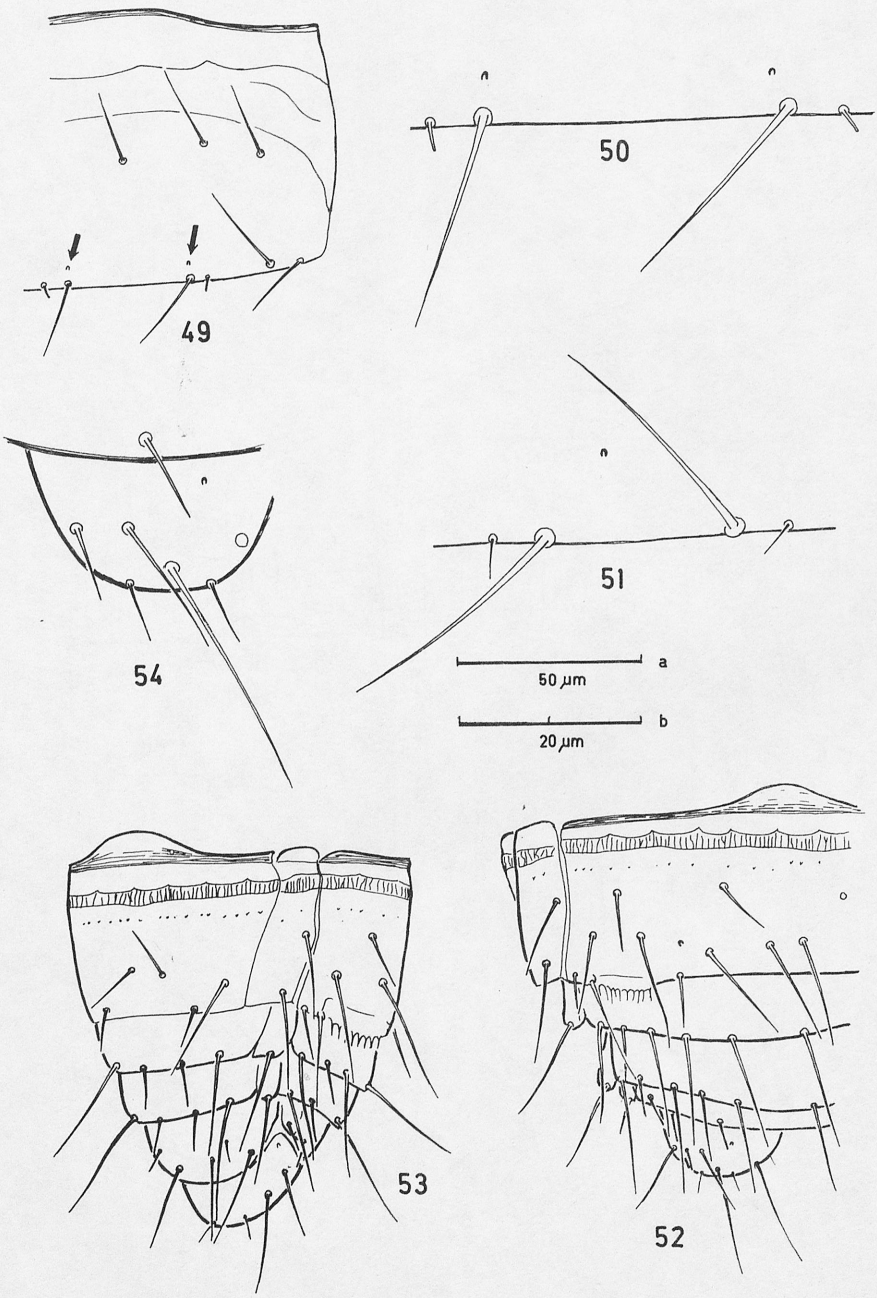

Fig. 49-54. *Acerentulus carpaticus* NOSEK. 49 - urosternite VI (arrows - pores); 50 - hind margin of urosternite VI; 51 - ditto, of urosternite VII; 52 - urotergite VIII-XII; 53 - urosternite VIII-XII; 54 - urotergite XII (49, 52, 53 - magnification a, others - b)

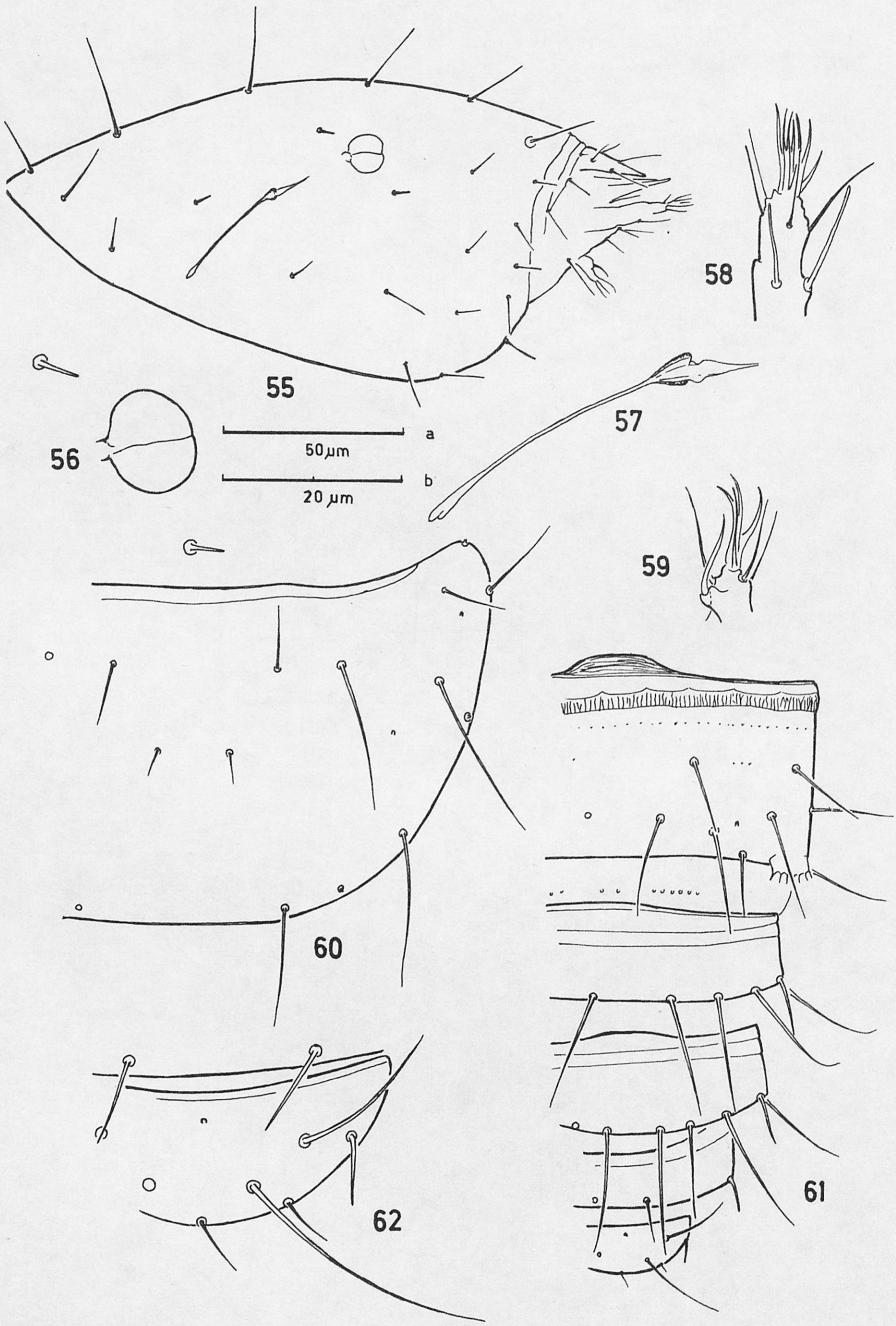

Fig. 55-62. *Acerentulus alni* sp. n. (55-59 - holotype, 60-62 - paratype nr 3116). 55 - head; 56 - pseudoculus; 57 - filamento di sostegno; 58 - maxillary palp; 59 - labial palp; 60 - mesonotum; 61 - urotergite VIII-XII; 62 - urotergite XII (55-59, 62 - magnification b, others - a)

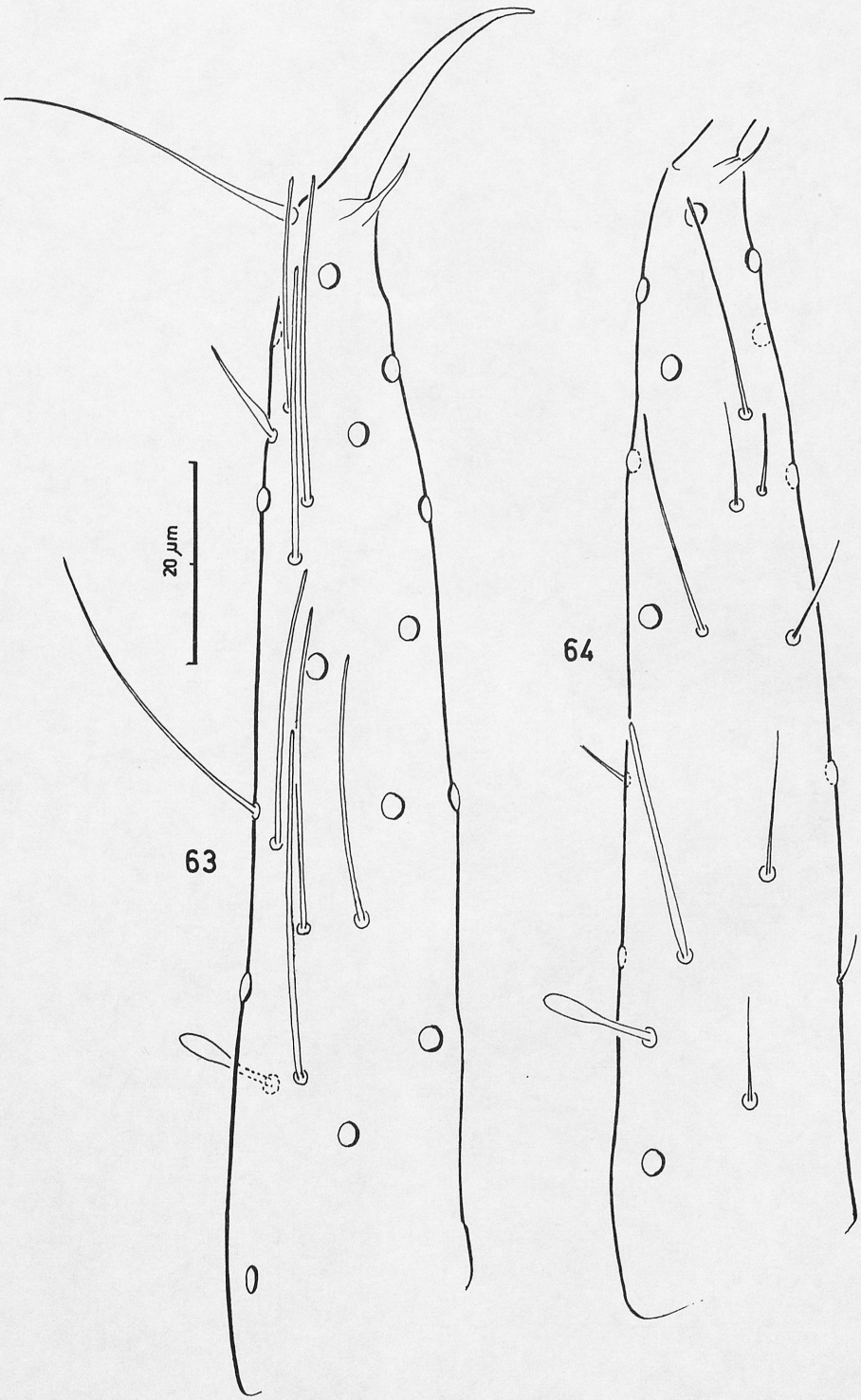

Fig. 63-64. *Acerentulus alni* sp. n., foretarsus (paratype nr 3116). 63 - exterior view; 64 - interior view

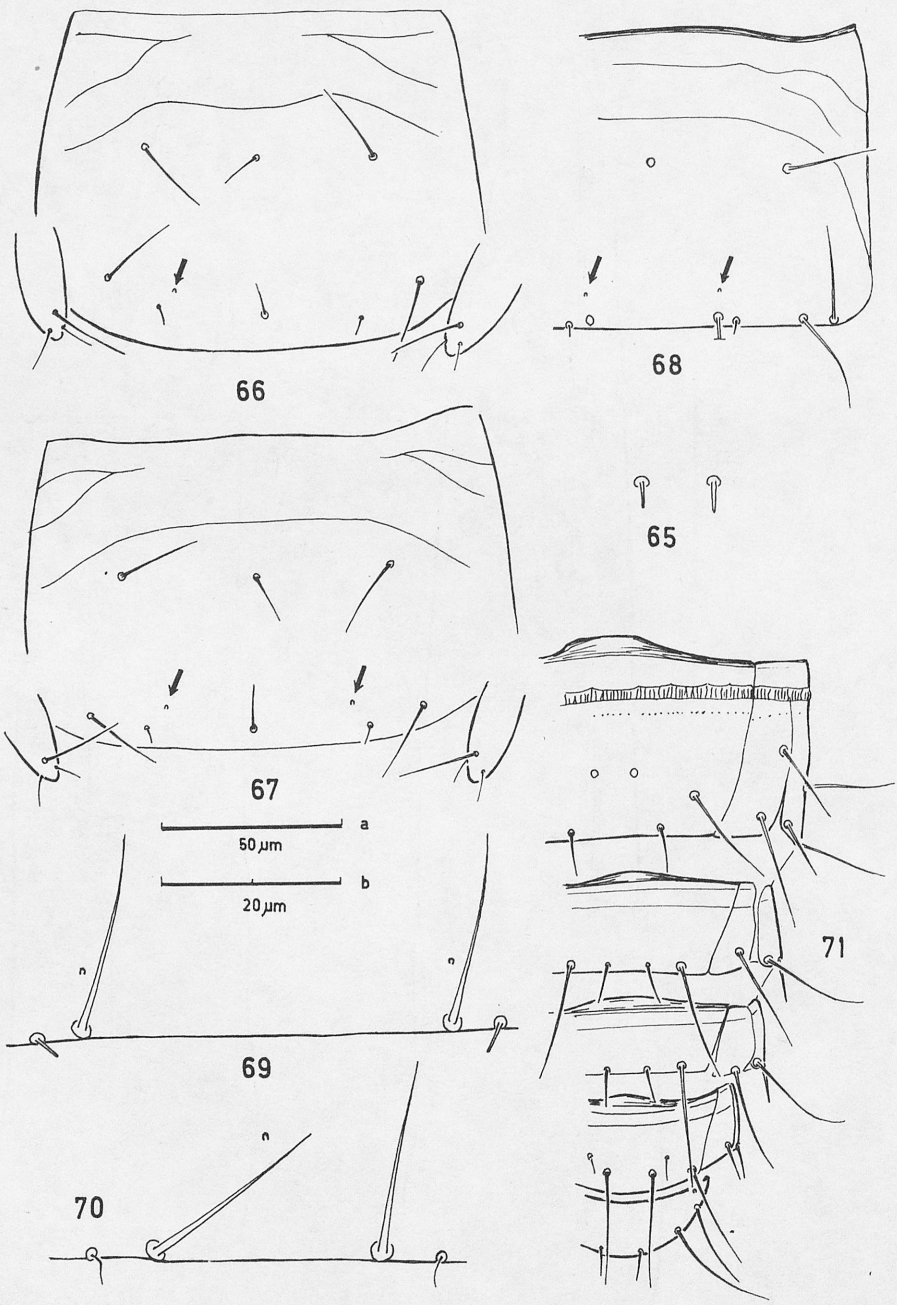

Fig. 65-71. *Acerentulus alni* sp. n. (65 - holotype, 66, 67, 69, 70 - paratype nr 3400, 68, 71 - nr 3116). 65 - accessory seta of urotergite (left) and and urosternite (right) III; 66 - urosternite II; 67 - urosternite III; 68 - urosternite VI (arrows - pores); 69 - hind margin of urosternite VI; 70 - ditto, of urosternite VII; 71 - urosternite VIII-XII (66-68, 71 - magnification a, others - b)

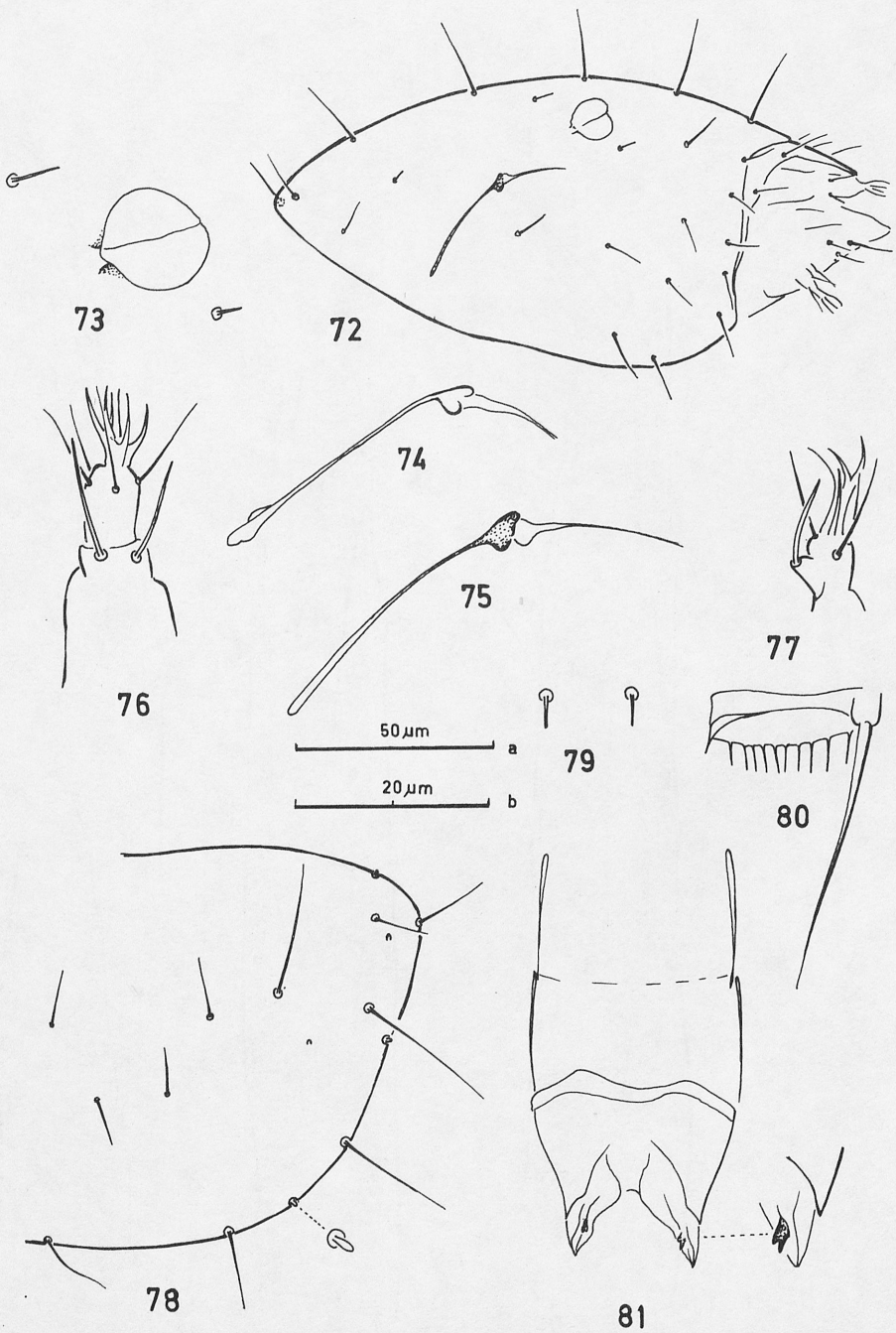

Fig. 72 -81. *Acerentulus xerophilus* SZEPTYCKI. 72 - head; 73 - pseudoculus; 74, 75 - filamento di sostegno of different specimens; 76 - maxillary palp; 77 - labial palp; 78 - mesonotum; 79 - accessory seta of urotergite (left) and urostergite (right) III; 80 - comb VIII; 81 - squama genitalis ♀ (72, 78 - magnification a, others - b)

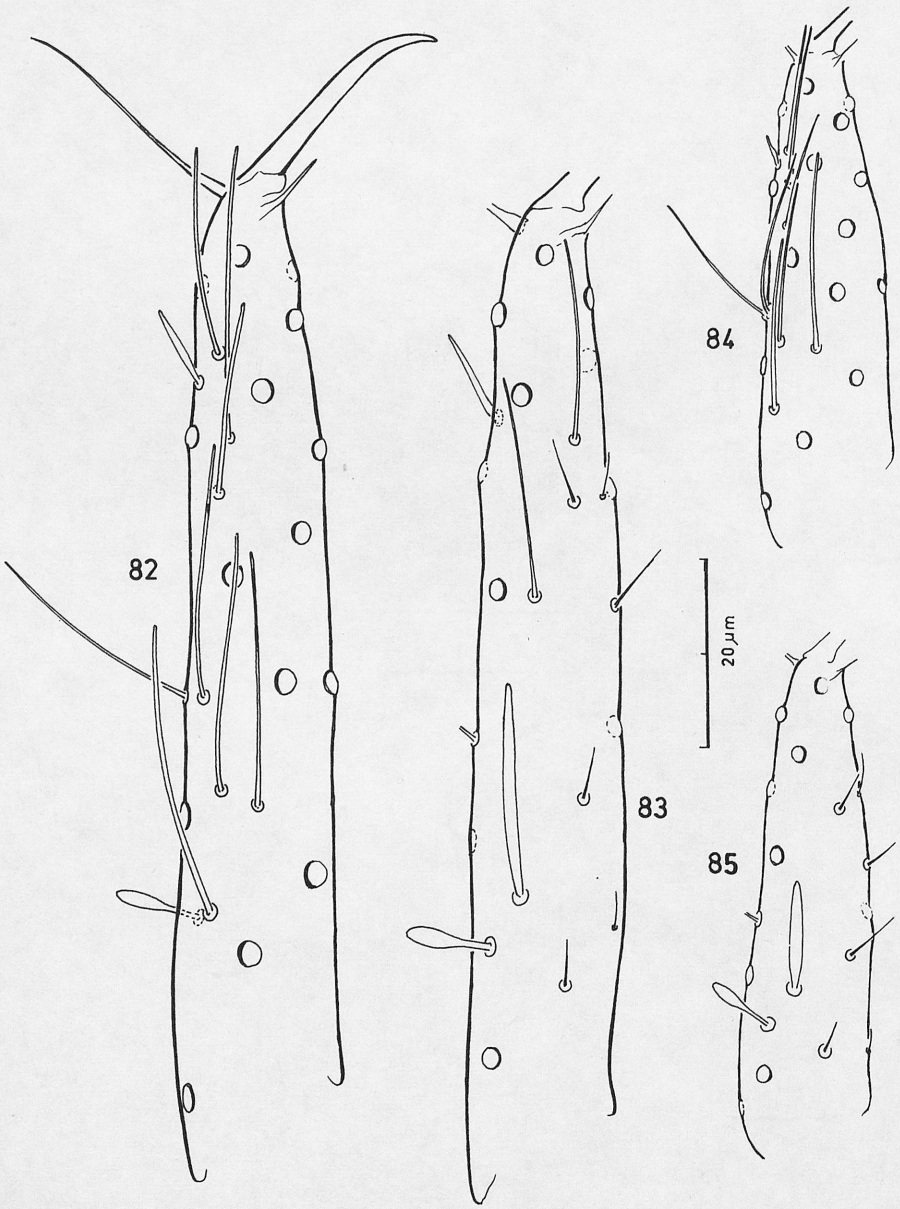

Fig. 82-85. *Acerentulus xerophilus* SZEPTYCKI, foretarsus. 82 - imago, exterior view; 83 - ditto, interior view; 84 - larva I, exterior view; 85 - ditto, interior view

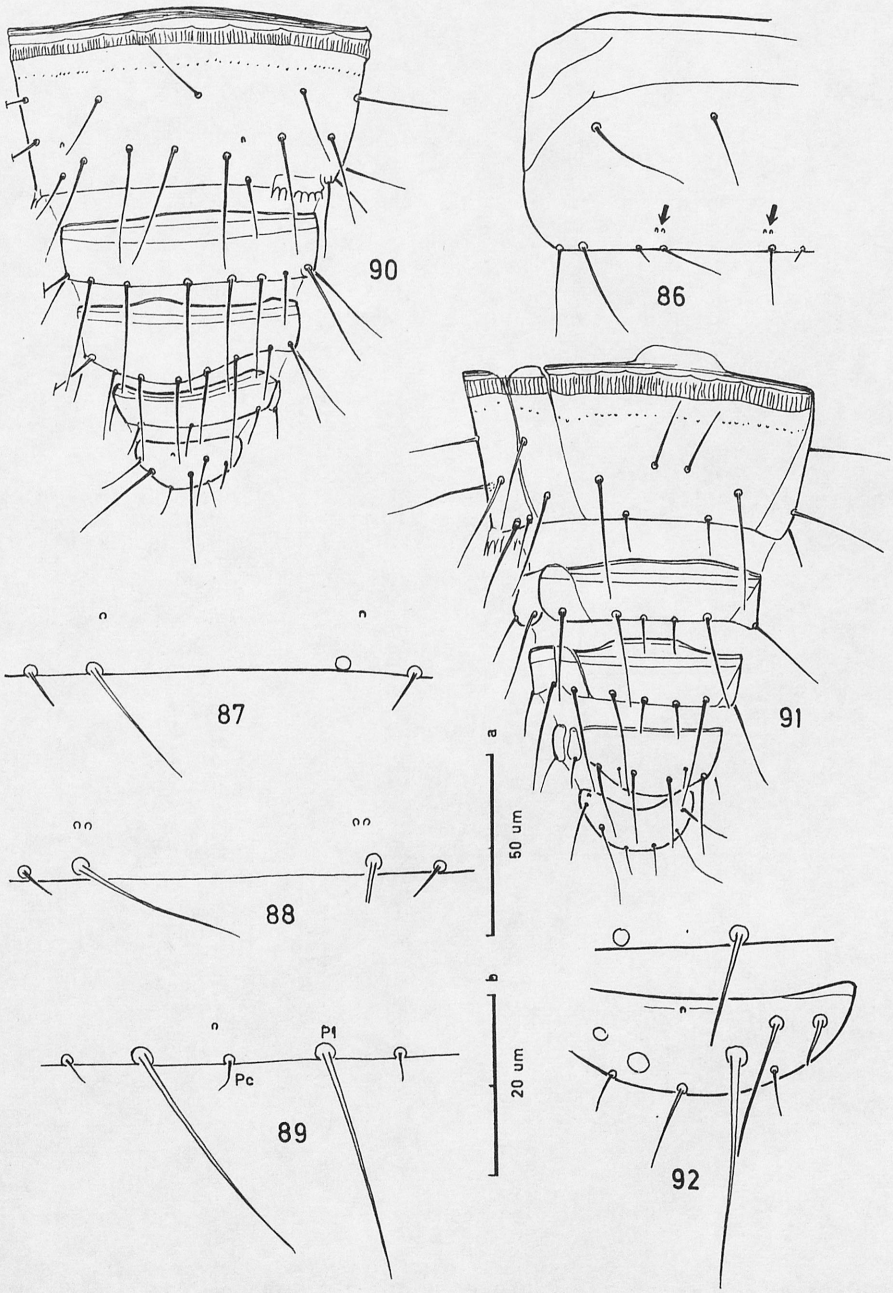

Fig. 86-92. *Acerentulus xerophilus* SZEPTYCKI. 86 - urosternite VI (arrows - pores); 87 - hind margin of urosternite V; 88 - ditto, of urosternite VI; 89 - ditto, of urosternite VII; 90 - urotergite VIII-XII; 91 - urosternite VIII-XII; 92 - urotergite XII (87-89, 92 - magnification b, others - a)

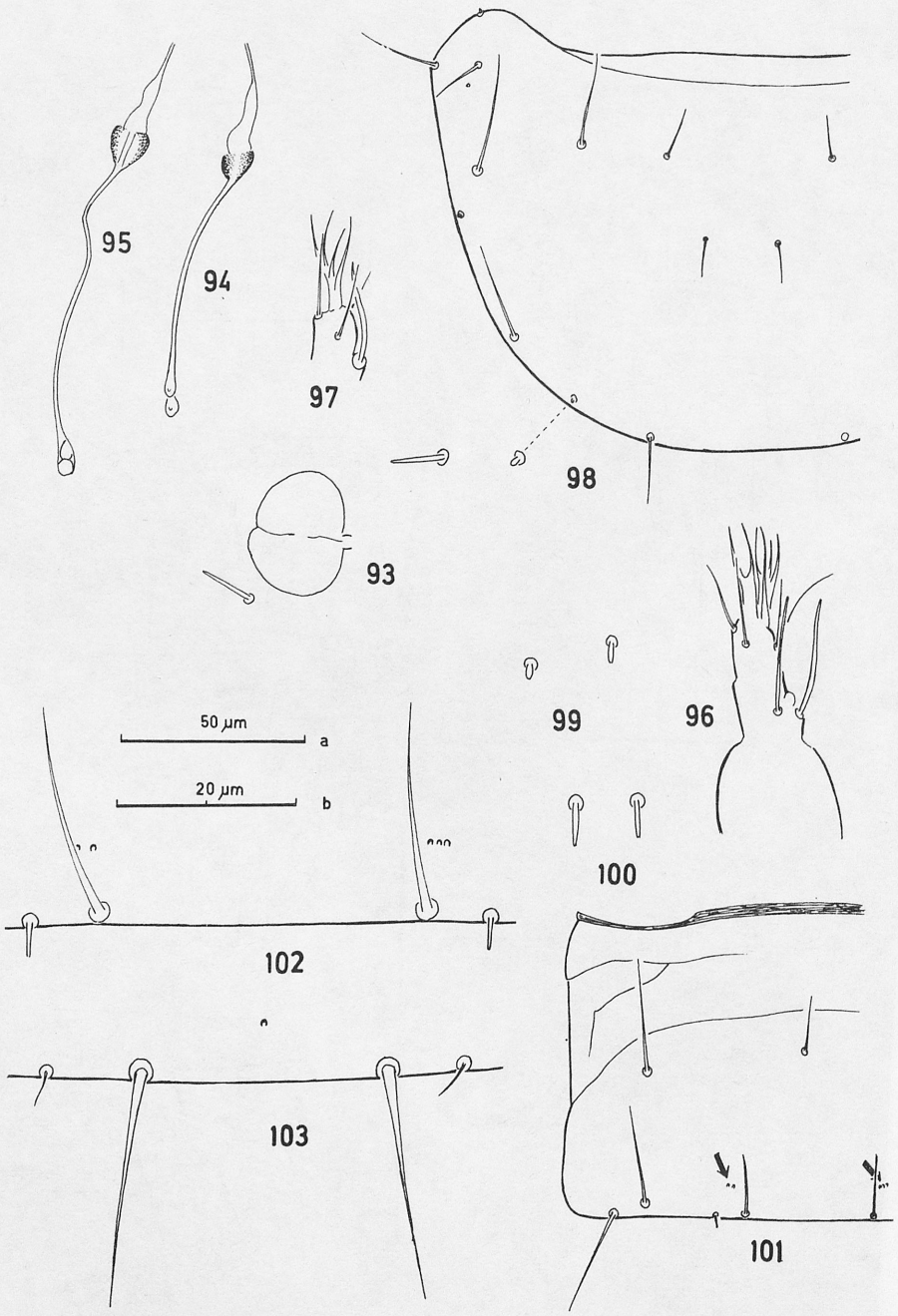

Fig. 93-103. *Acerentulus silvanus* sp. n. (93, 96, 98, 102, 103 - holotype, 94,97,99,100 - paratype nr 3362, 95 - nr 3370, 101 - nr 3364). 93 - pseudoculus; 94,95 - filamento di sostegno; 96 - maxillary palp, 97 - labial palp; 98 - mesonotum, 99 - seta *P1a* on mesonotum (left) and *P2a* on urotergite I (right); 100 - accessory seta of urotergite (left) and urosternite (right) III; 101 - urosternite VI (arrows - pores); 102 - hind margin of urosternite VI; 103 - ditto, urosternite VII (98, 101 - magnification a, others - b.)

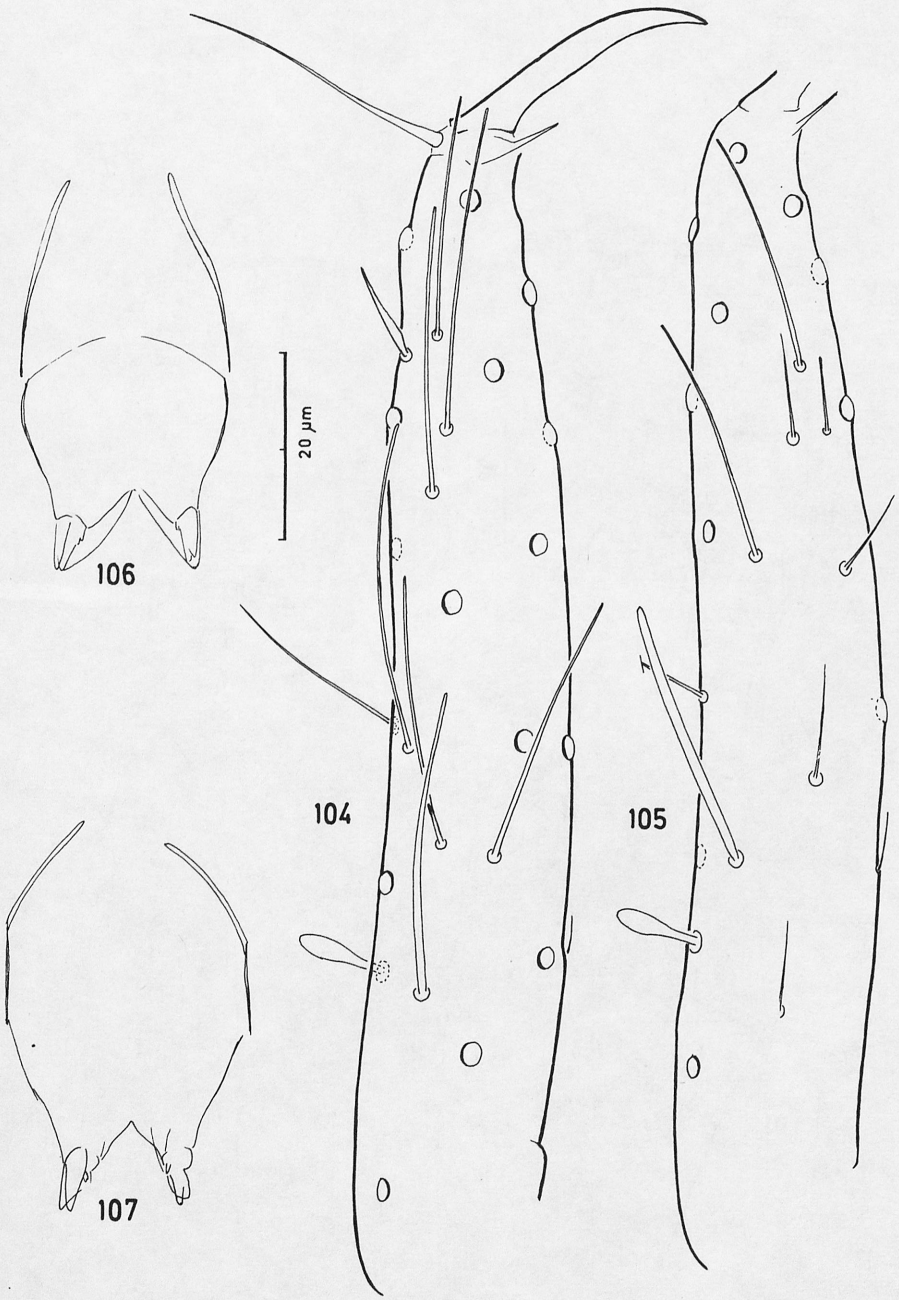

Fig. 104-107. *Acerentulus silvanus* sp. n. (104, 105 - holotype, 106 - partype nr 3370, 107 - nr 3362). 104 - foretarsus, exterior view; 105 - ditto, interior view; 106, 107 - squama genitalis ♀

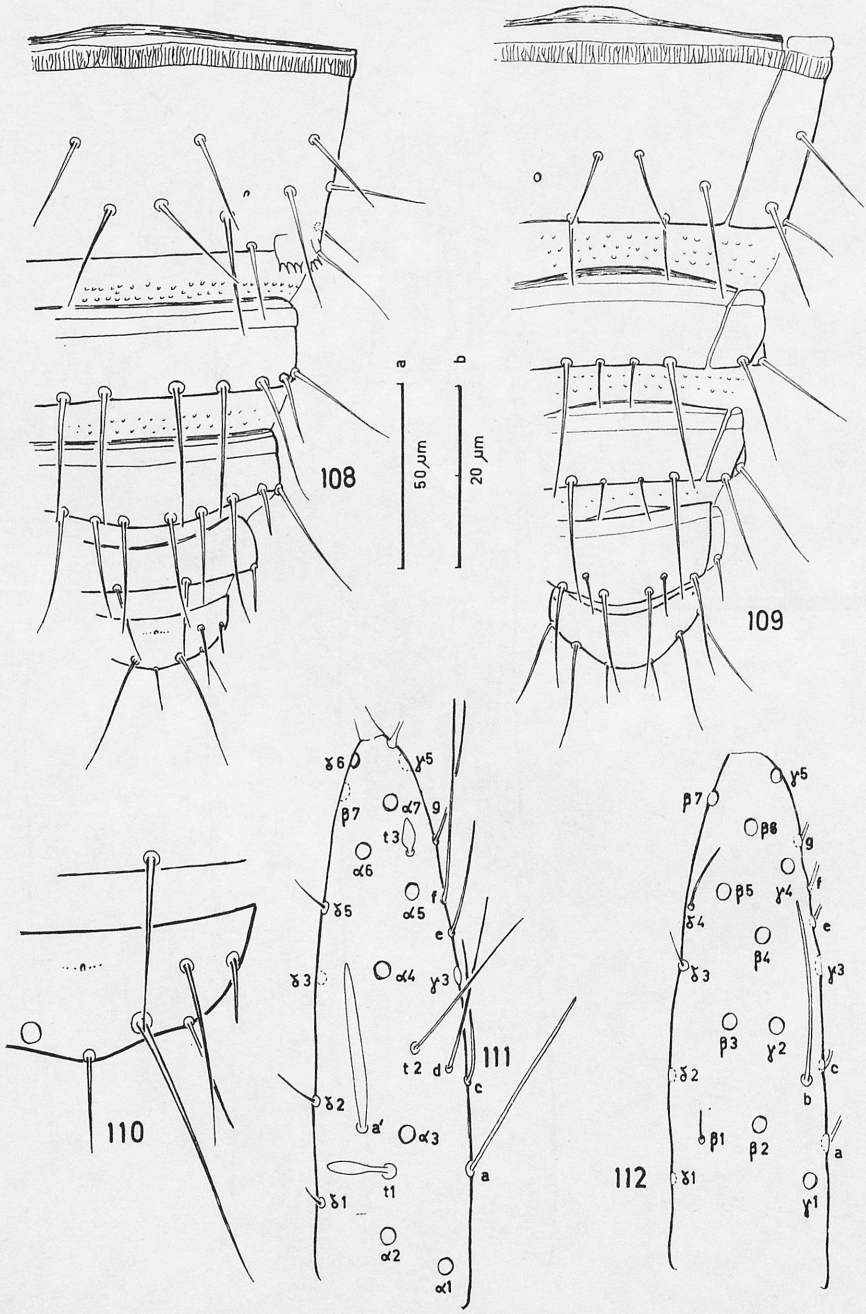

Fig. 108-112. *Acerentulus silvanus* sp. n. (108-110 - holotype, 111-112 - specimen of Puszczykowo). 108 - urotergite VIII-XII; 109 - urosternite VIII-XII; 110 - urotergite XII; 111 - foretarsus of larva I, dorsal view; 112 - ditto, ventral view (108, 109 - magnification a, others - b)

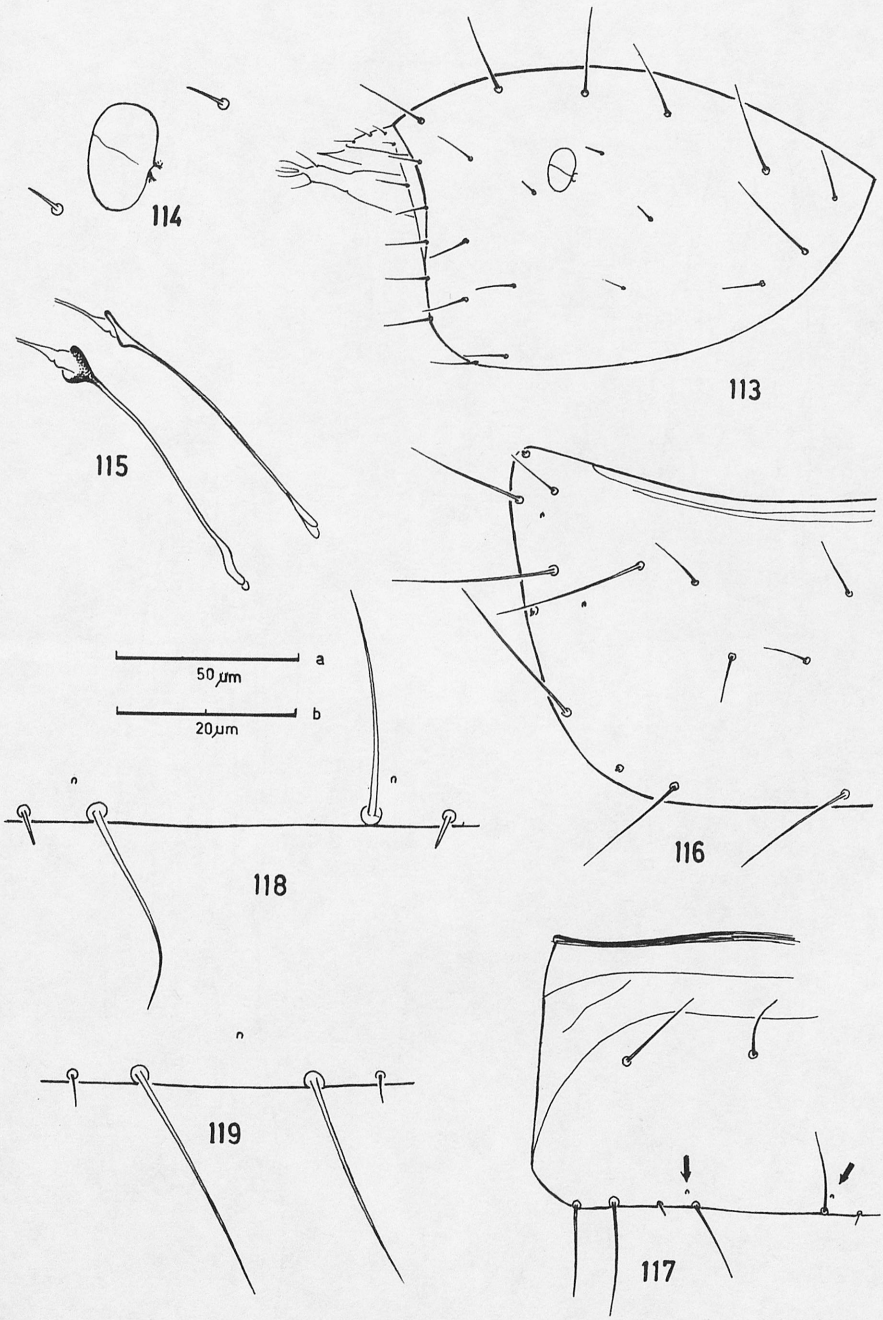

Fig. 113-119. *Acerentulus tuxeni* RUSEK. 113 - head; 114 - pseudoculus; 115 - right and left filamento di sostegno of same specimen; 116 - mesonotum; 117 - urosternite VI (arrows - pores); 118 - hind margin of urosternite VI; 119 - ditto of urosternite VII (113, 116, 117 - magnification a, others - b)

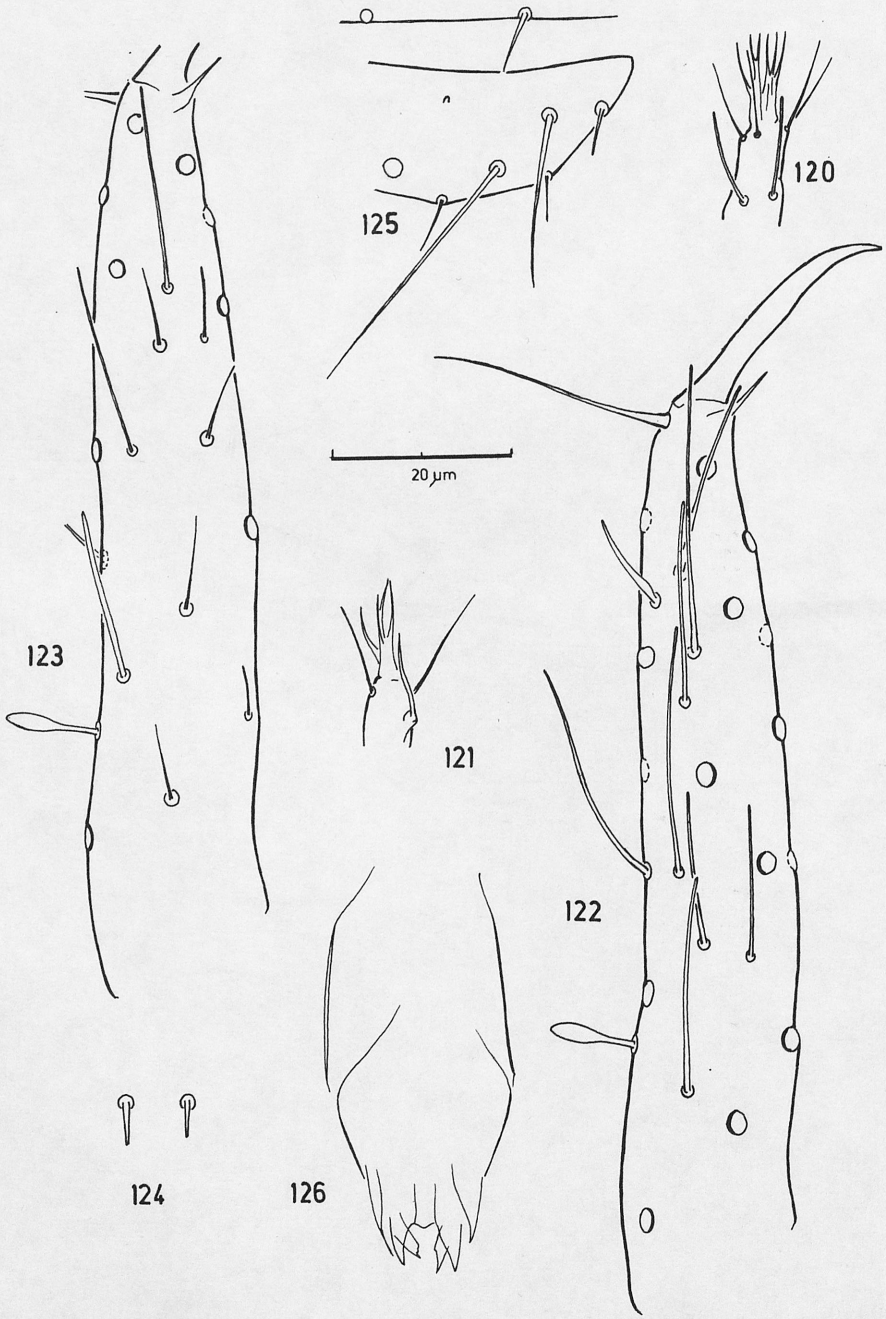

Fig. 120-126. *Acerentulus tuxeni* RUSEK. 120 - maxillary palp; 121 - labial palp; 122 - foretarsus, exterior view; 123 - ditto, interior view; 124 - accessory seta of urotergite (left) and urosternite (right) III; 125 - urotergite XII; 126 - squama gentalis ♀

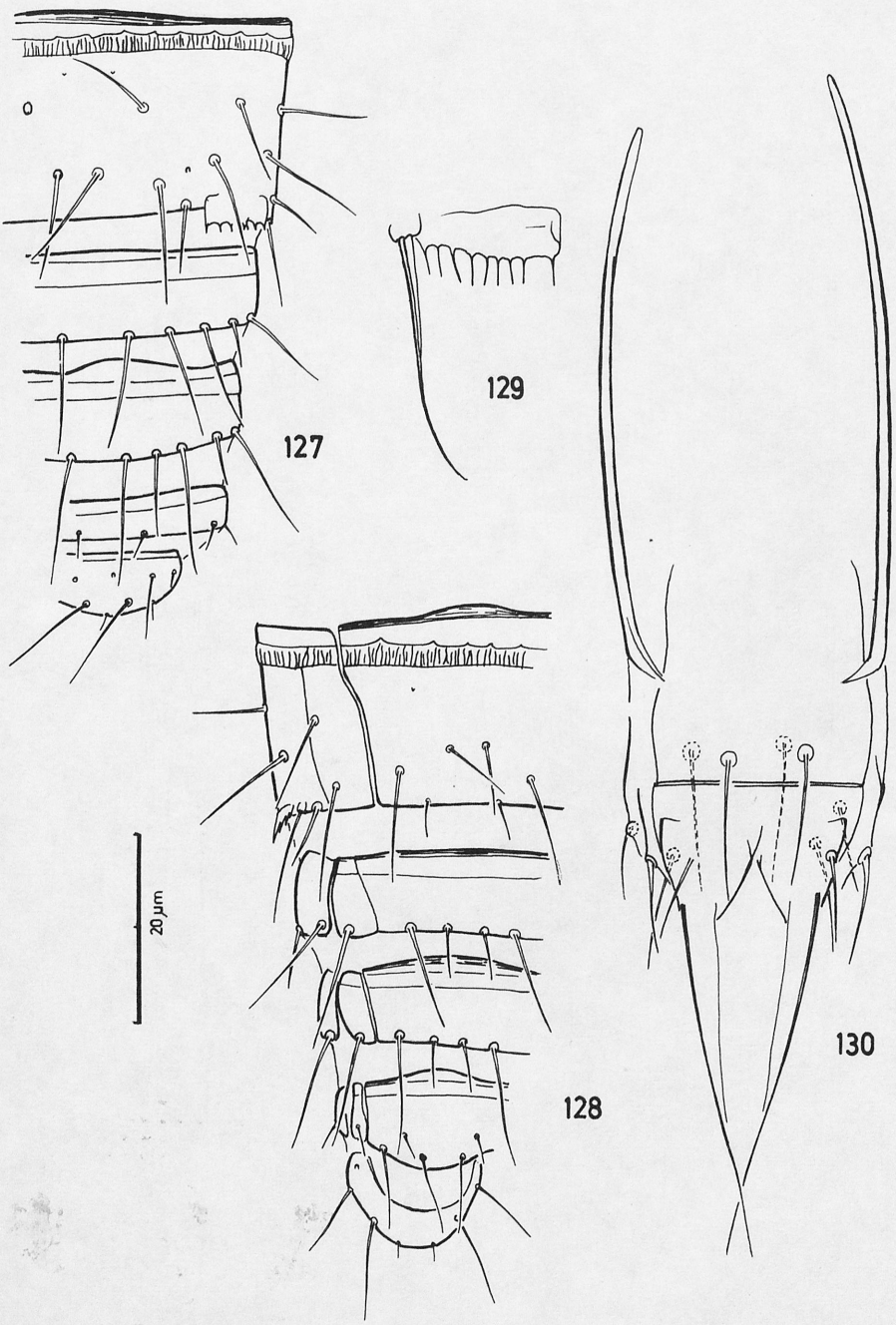

Fig. 127-130. *Acerentulus tuxeni* RUSEK. 127 - urotergite VIII-XII; 128 - urosternite VIII-XII; 129 - comb VIII; 130 - penis

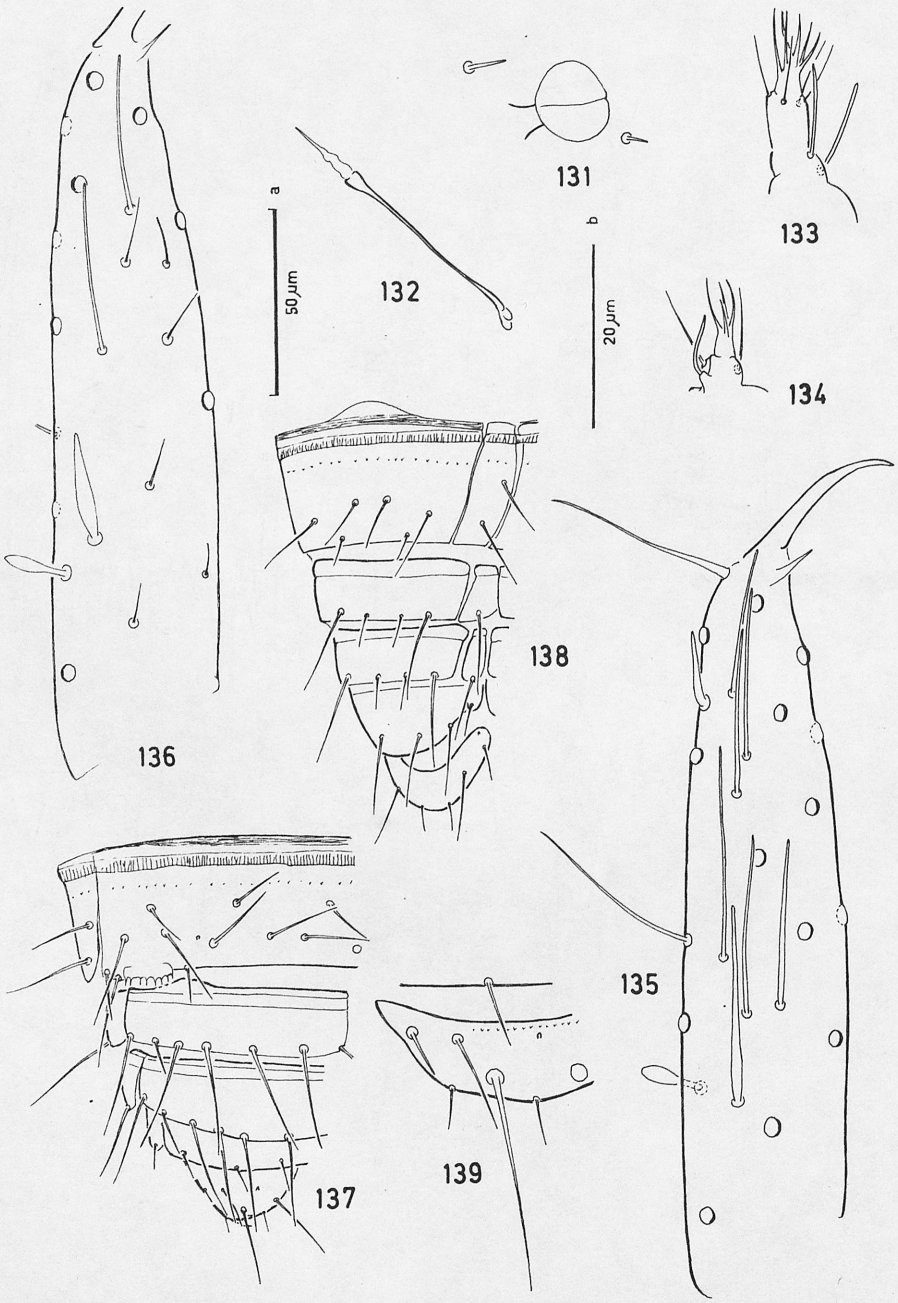

Fig. 131-139. *Acerentulus rafalskii* SZEPTYCKI. 131 - pseudoculus; 132 - filamento di sostegno; 133 - maxillary palp; 134 - labial palp; 135 - foretarsus, exterior view; 136 - foretarsus, interior view; 137 - urotergite VIII-XII; 138 - urosternite VIII-XII; 139 - urotergite XII (137,138 - magnification a, others - b)

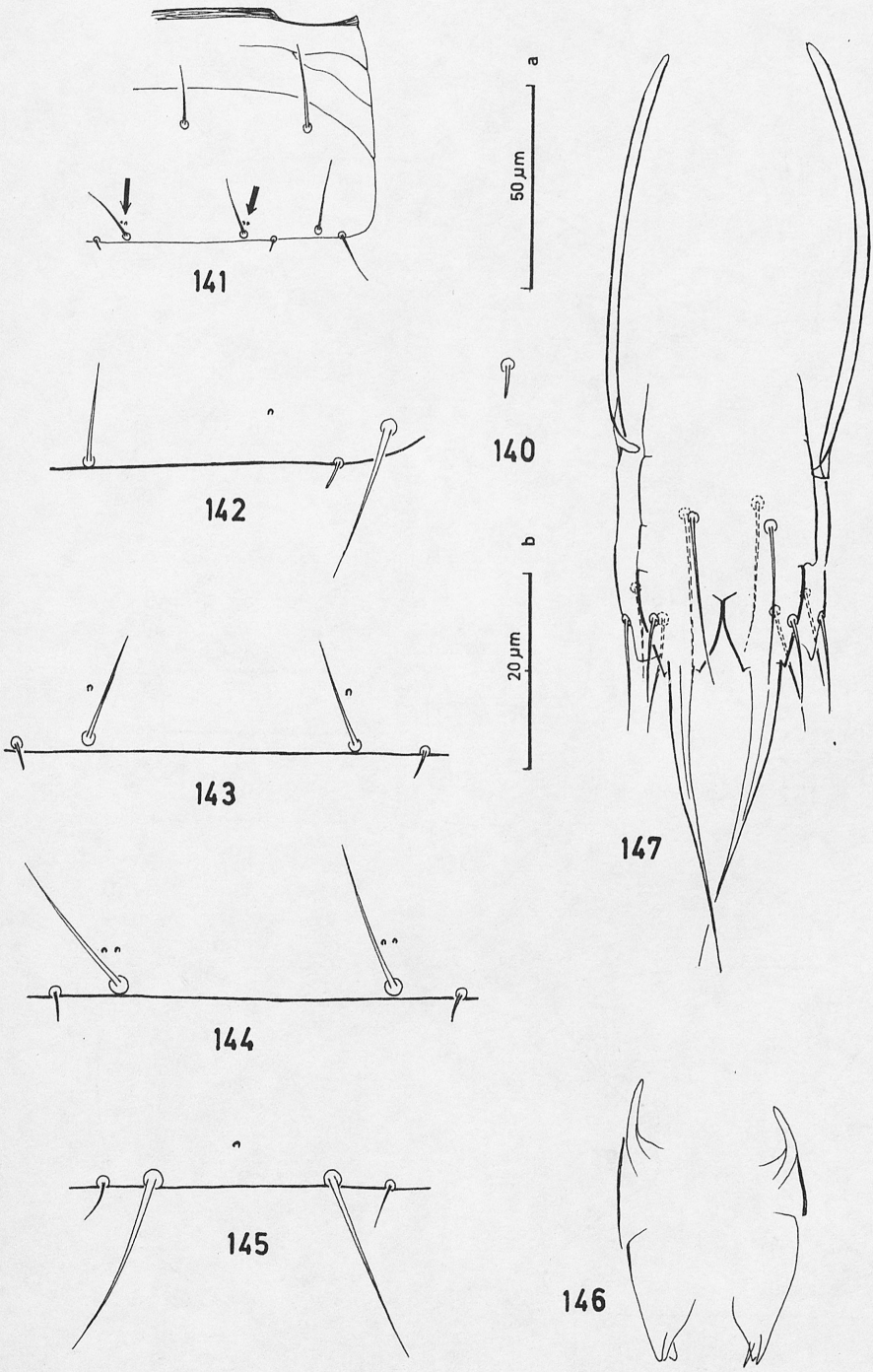

Fig. 140-147. *Acerentulus rafalskii* SZEPTYCKI. 140 - accessory seta of urotergite III; 141 - urosternite VI; 142 - hind margin of urosternite III; 143 - ditto, of urosternite VII; 146 - squama genitalis ♀; 147 - penis (141 - magnification a, others - b)

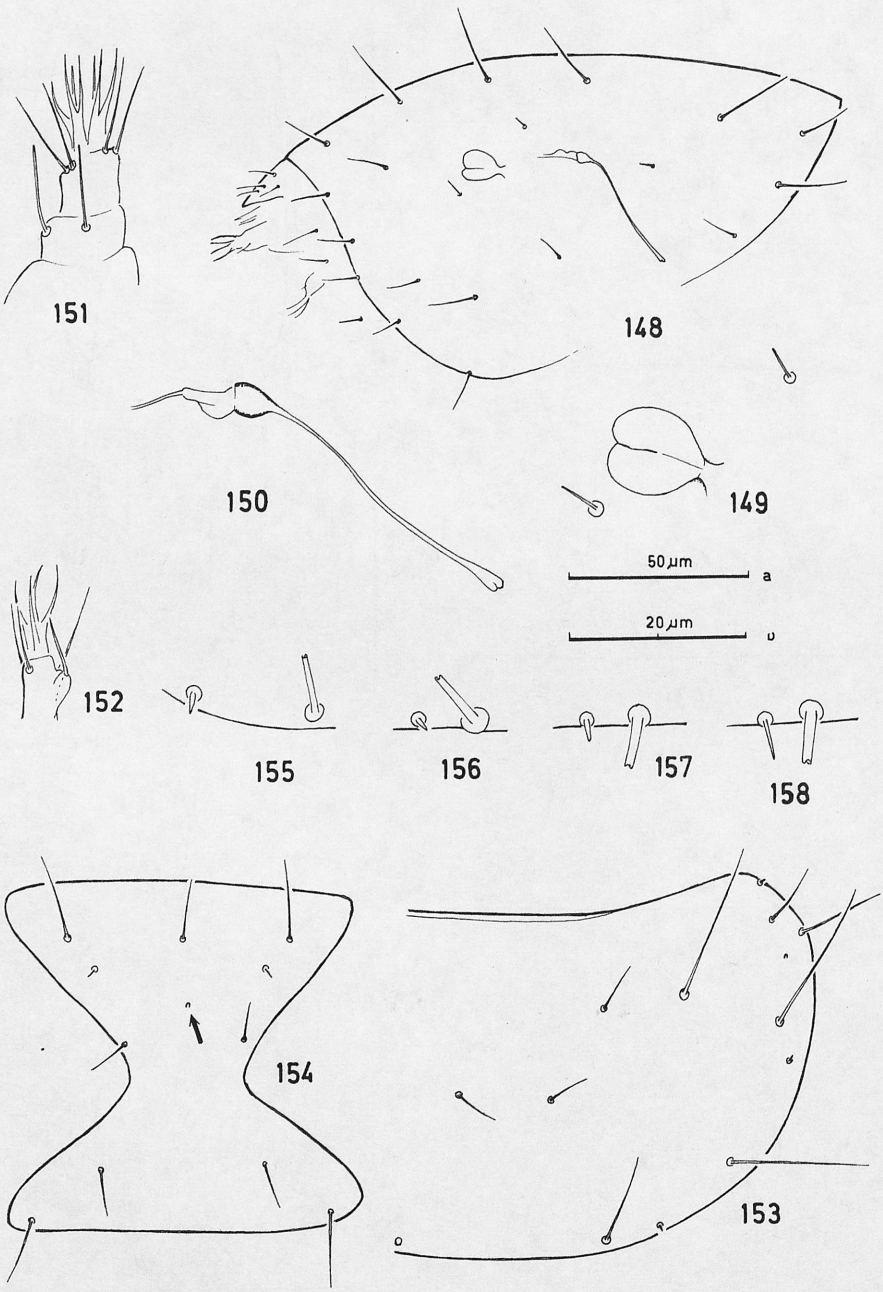

Fig. 148-158. *Acerentulus cunhai* CONDÉ. 148 - head; 149 - pseudoculus; 150 - filamento di sostegno; 151 - maxillary palp; 152 - labial palp; 153 - mesonotum; 154 - mesosternum (arrow - pore); 155 - seta *P1a* on metanotum; 156 - seta *P2a* on urotergite VI; 158 - ditto, on urotergite VII (148,153,154 - magnification a, others - b)

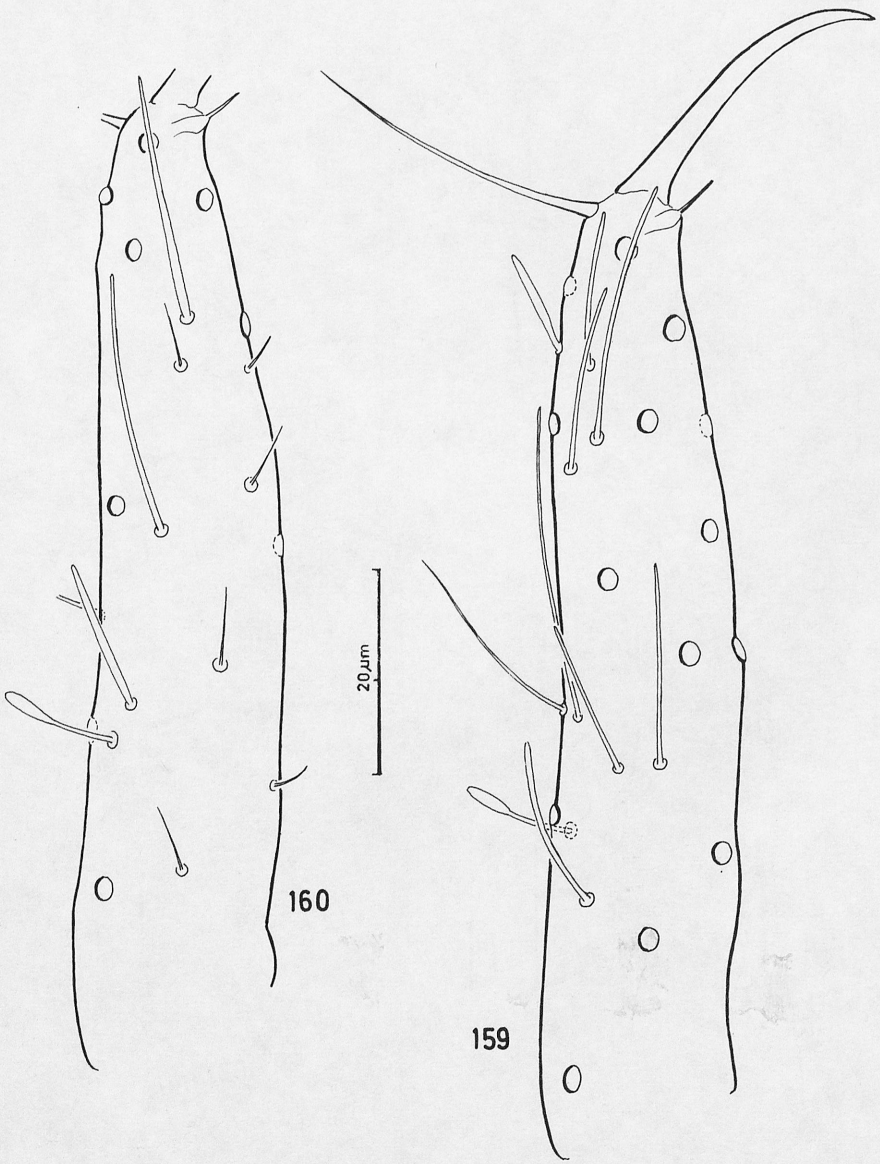

Fig. 159-160. *Acerentulus cunhai* CONDÉ, foretarsus. 159 - exterior view; 160 - interior view.

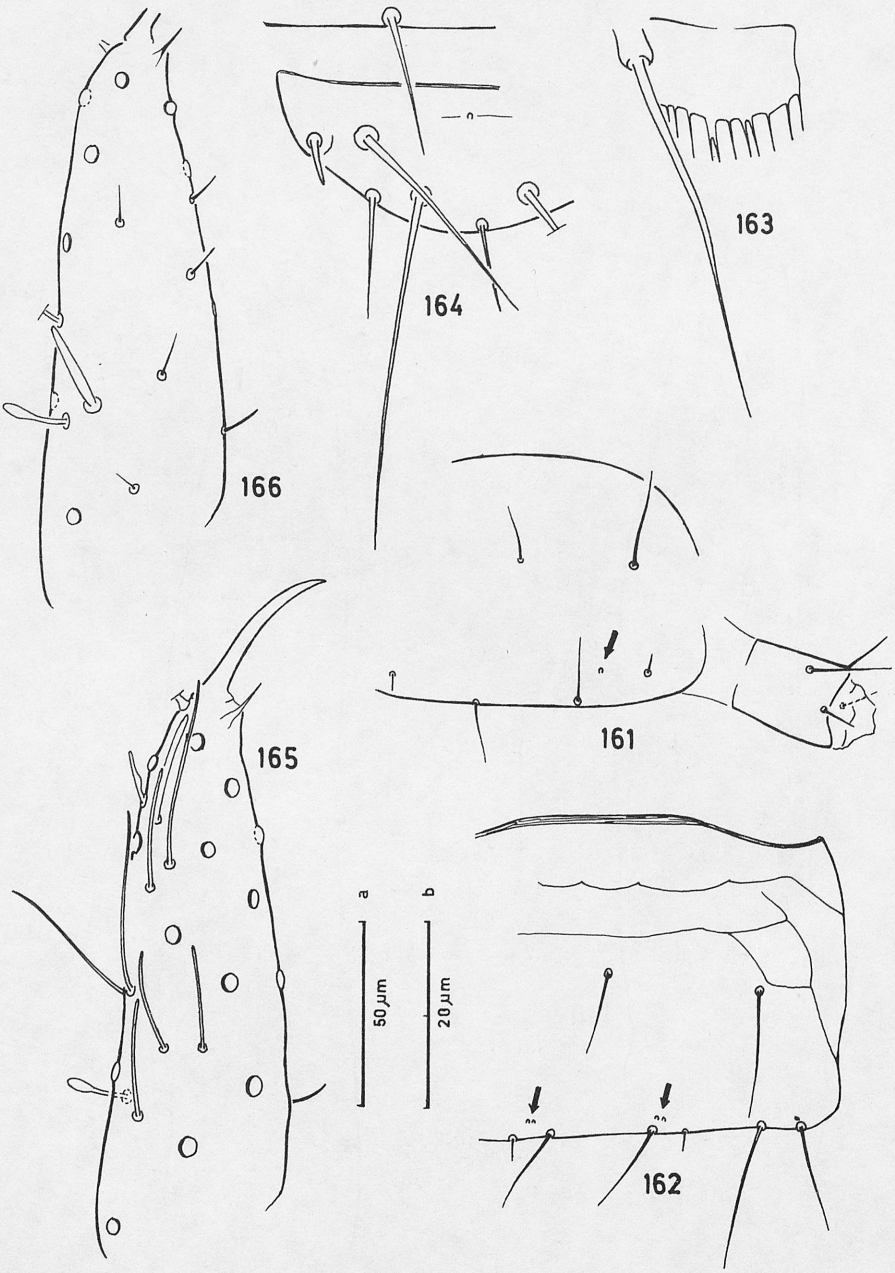

Fig. 161-166. *Acerentulus cunhai* CONDÉ. 161 - urosternite I; 162 - urosternite VI (arrows - pores, c - connecting line); 163 - comb VIII; 164 - urotergite XII; 165 - foretarsus of larva I, exterior view (161,162 - magnification a, others - b)

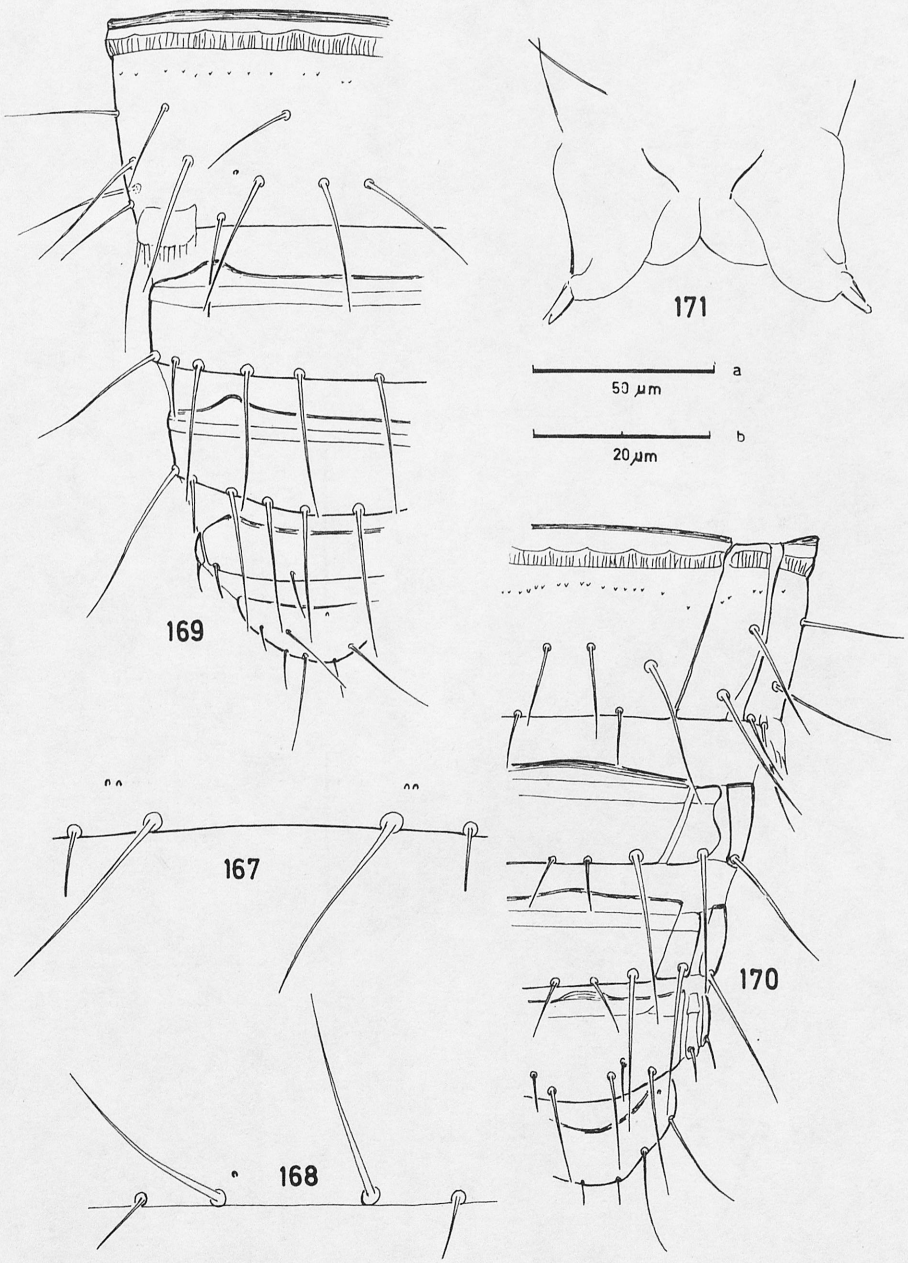

Fig. 167-171. *Acerentulus cunhai* CONDÉ. 167 - hind margin of urosternite VI; 168 - ditto, of urosternite VII; 169 - urotergite VIII-XII; 170 - urosternite VIII-XII; 171 - squama genitalis ♀ (169-170 - magnification a, others - b)

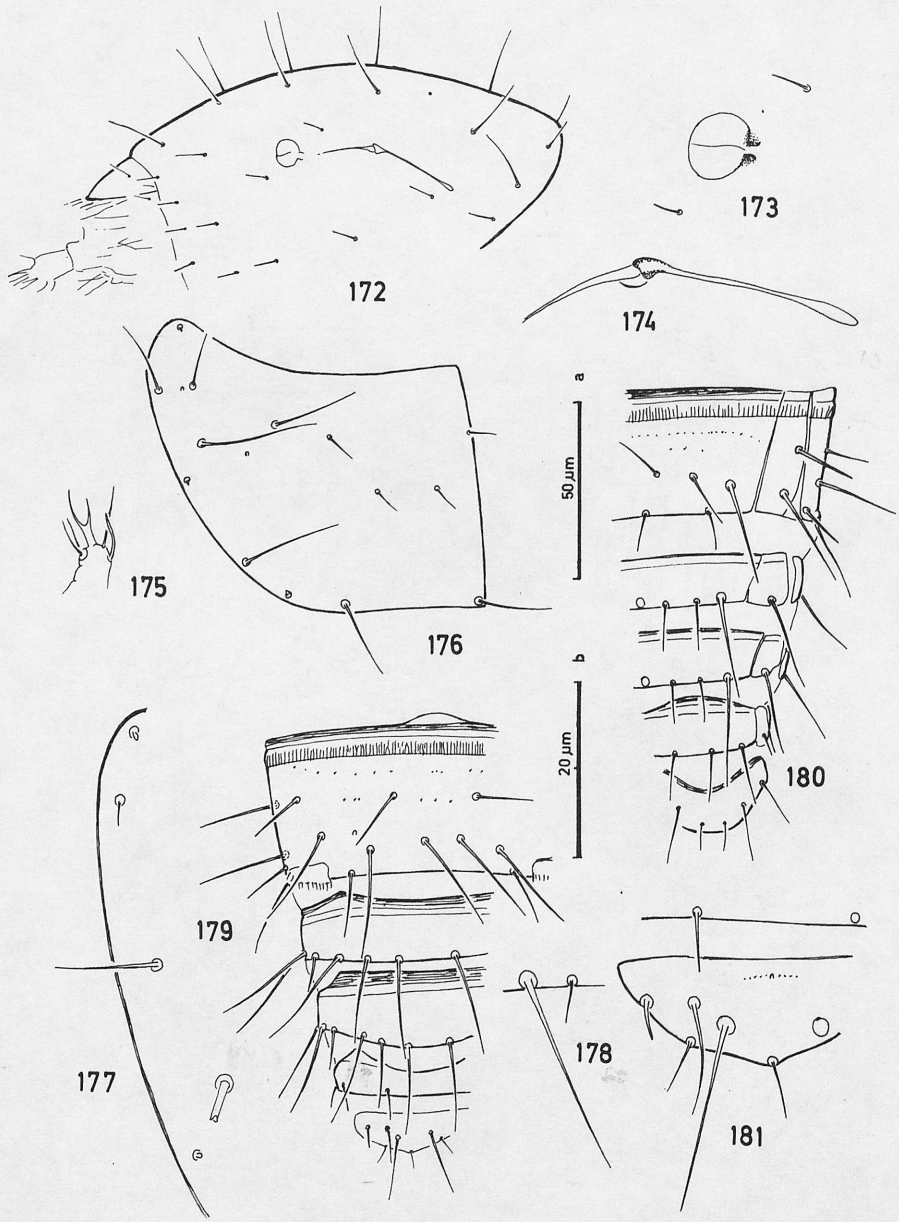

Fig. 172-181. *Acerentulus traegardhi* IONESCU. 172 - head; 173 - pseudoculus; 174 - filamento di sostegno; 175 - labial palp; 176 - mesonotum; 177 - metanotum, antero-lateral margin; 178 - seta *P2* and *P2a* on urotergite IV; 179 - urotergite VIII-XII; 180 - urosternite VIII-XII; 181 - urotergite XII (172,176,179,180 - magnification a, others - b)

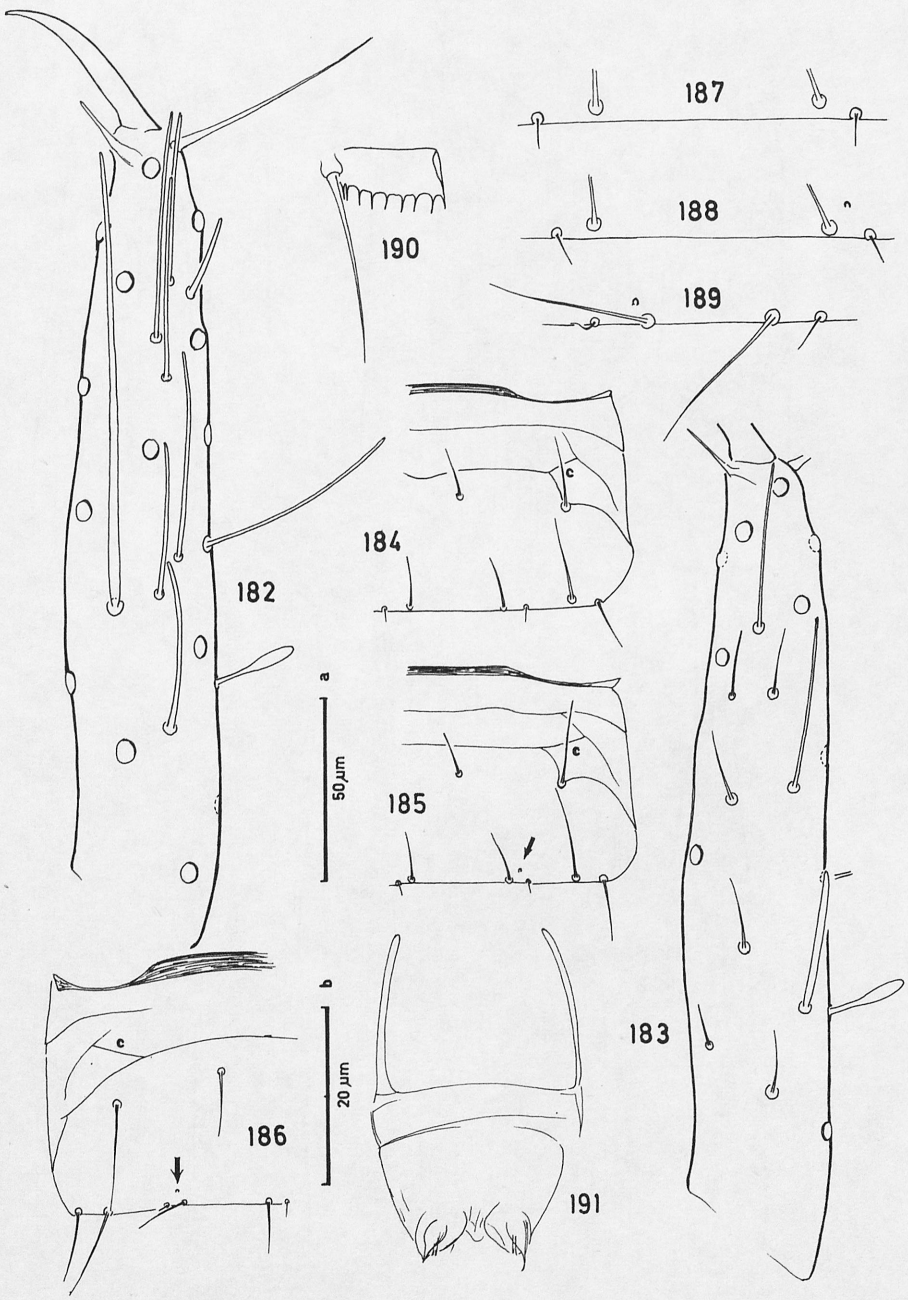

Fig. 182-191. *Acerentulus traegardhi* IONESCU. 182 - foretarsus, exterior view; 183 - ditto, interior view; 184 - urosternite V; 185 - urosternite VI; 186 - urosternite VI of another specimen (arrow - pore, c - connecting line); 187 - hind margin of urosternite V; 188 - ditto, of urosternite VI; 189 - ditto, of urosternite VII; 190 - comb VIII; 191 - squama genitalis ♀ (184-186 - magnification a, others -b)

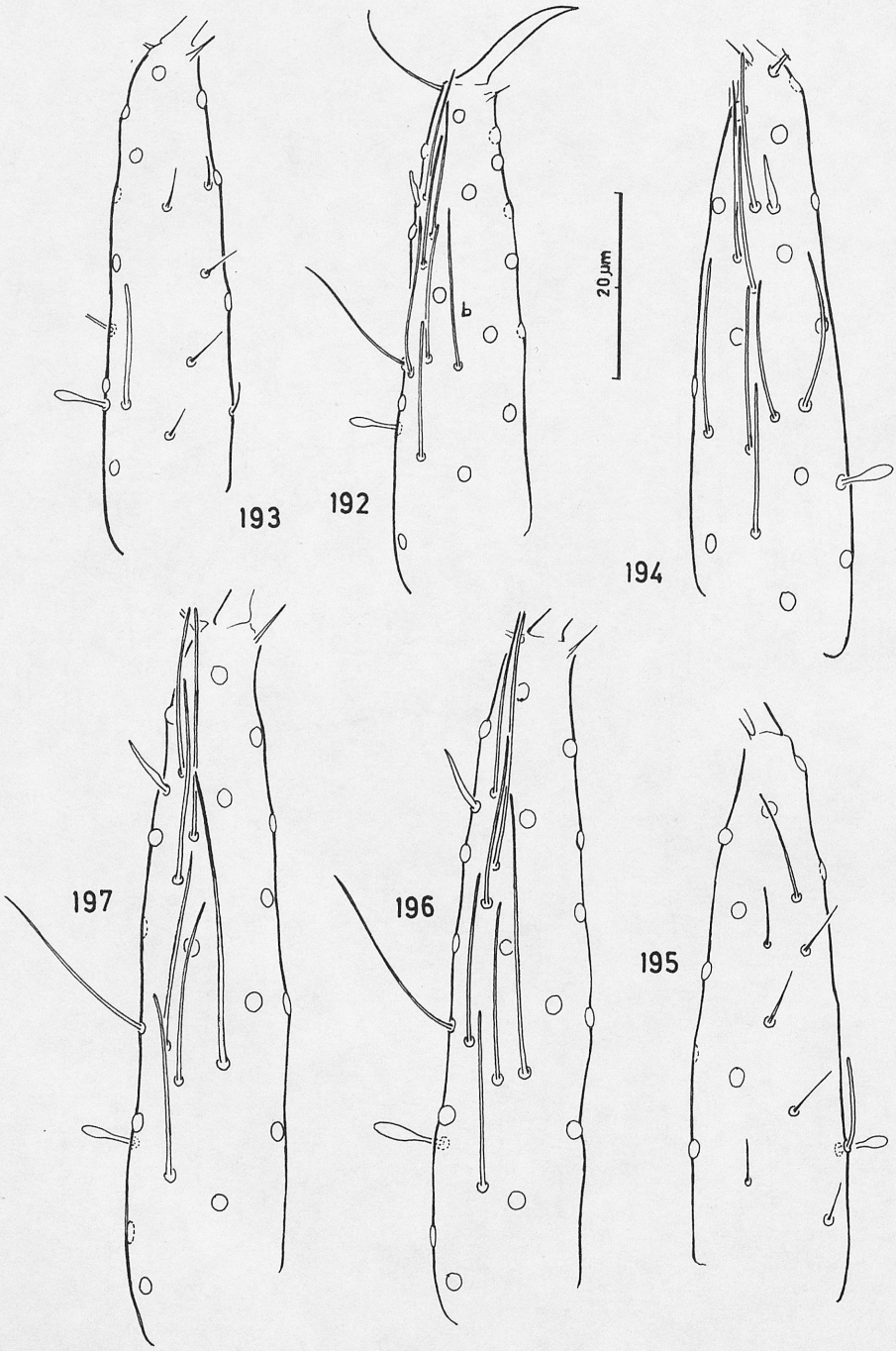

Fig. 192-197. *Acerentulus traegardhi* IONESCU, foretarsus. 192 - larva I, exterior view; 193 - ditto, interior view; 194 - larva II, exterior view; 195 - ditto, interior view; 196 - maturus junior, exterior view; 197 - praeimago, ditto

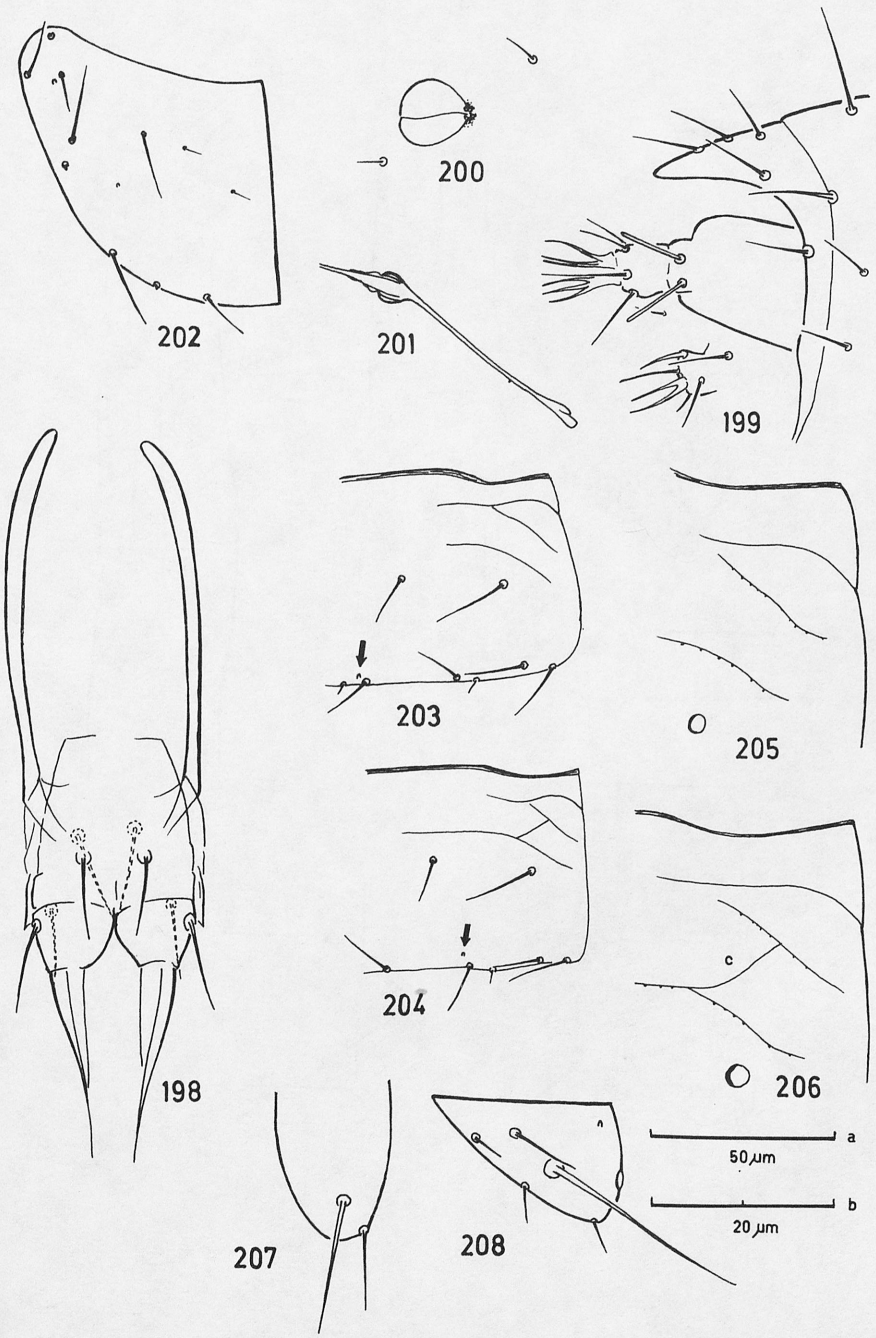

Fig. 198-208. 198 - *Acerentulus traegardhi* IONESCU, penis; 199-208. *Acerentulus collaris* sp. n. (holotype). 199 - mouthpart, lateral view; 200 - pseudoculus; 201 - filamento di sostegno; 202 - mesonotum; 203 - urosternite V; 204 - urosternite VI (arrows - pores, c - connecting line); 205 - anterolateral portion of urosternite V; 206 - ditto, urosternite VI; 207 - abdominal leg II; 208 - urotergite XII (202-204 - magnification a, others - b)

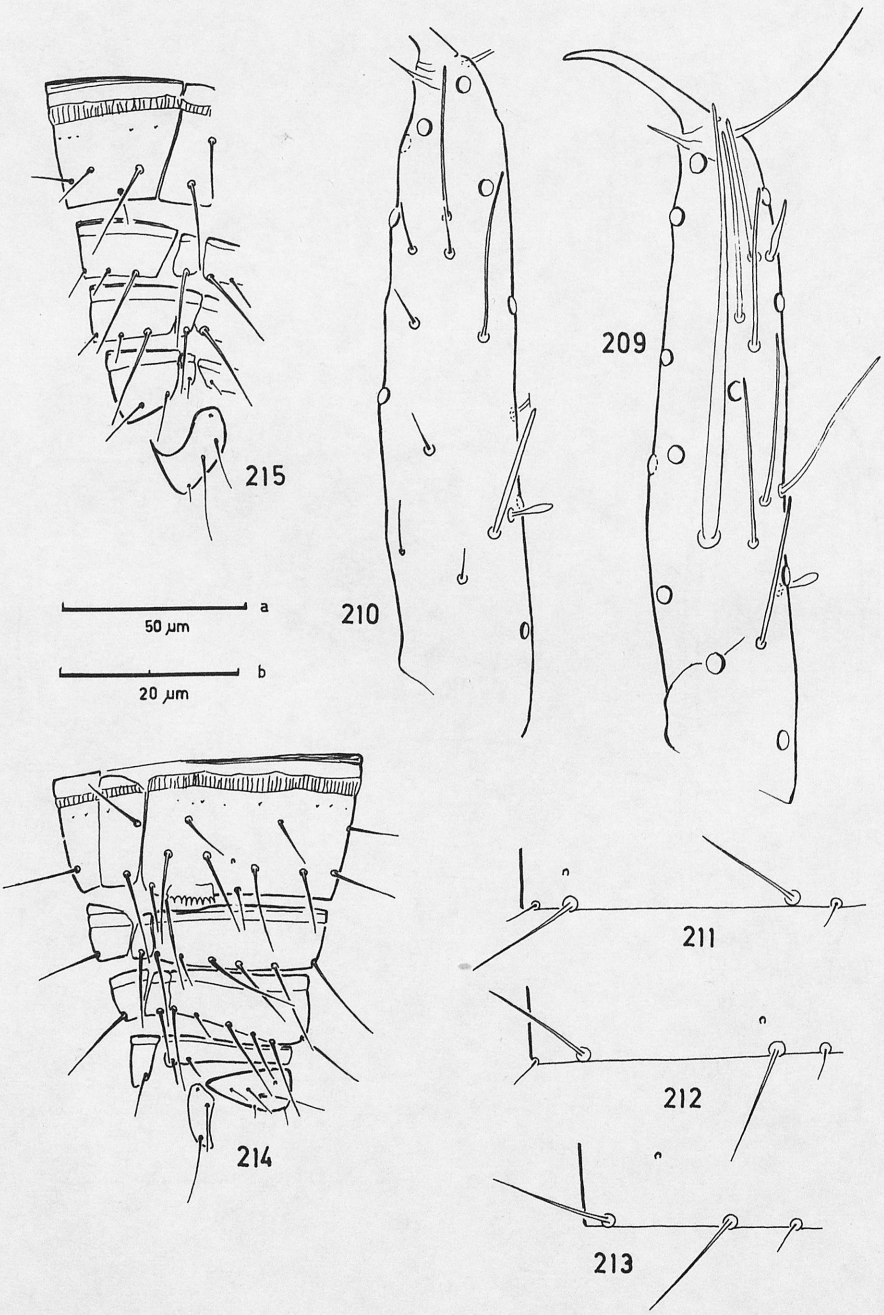

Fig. 209-215. *Acerentulus collaris* sp. n. (holotype). 209 - foretarsus, exterior view; 210 - ditto, interior view; 211 - hind margin of urosternite V; 212 - ditto, of urosternite VI; 213 - ditto, of urosternite VII; 214 - urotergite VIII-XII; 215 - urosternite VIII-XII (214-215 - magnification a, others - b)