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

Andrzej SZEPTYCKI

Accepted for publication: May, 1991


Abstract. Acerentulus alni, silvanus and collaris are described as new to science; exiguis, carpathicus, xerophilus, tuxeni, rafalskii, cunhaii 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.

Andrzej SZEPTYCKI, Polish Academy of Science, Institute of Systematics and Evolution of Animals, Sławkowska 17, 31-016 Kraków, Poland

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

The coordinates of localities are given in UTM grid. The following abbreviations for developmental instars are used: pm - premago, 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. exigua, carpaticus and ruseki was possible due to the kindness of Dr B. HAUSER (Genève) and Dr H. ENGHOF (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 development from larva I.

Foretarsus. The taxonomical importance of the length and shape of foretarsal sensillae has been well known since long ago. The setae β7 and δ4 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 non-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

<table>
<thead>
<tr>
<th>IMADATÉ’s system</th>
<th>Proposed system</th>
<th>IMADATÉ’s system</th>
<th>Proposed system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dorsal side</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Th. II - III</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$P5$</td>
<td>$P4a$</td>
<td>$P5$</td>
<td>$P4$</td>
</tr>
<tr>
<td>$P5a$</td>
<td>$P5$</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Abd. VIII</th>
<th>Abd. IX - X</th>
</tr>
</thead>
<tbody>
<tr>
<td>$M2$</td>
<td>$P1$</td>
</tr>
<tr>
<td>$P2$</td>
<td>$P1a$</td>
</tr>
<tr>
<td>$M3$</td>
<td>$P2$</td>
</tr>
<tr>
<td>$P3$</td>
<td>$P2a$</td>
</tr>
<tr>
<td>$P4$</td>
<td>$P3a$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ventral side</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Th. II - III</td>
<td>Abd. I - III</td>
</tr>
<tr>
<td>$P1$</td>
<td>$P2$</td>
</tr>
<tr>
<td>$P2$</td>
<td>$P1a$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Abd. VIII</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P$</td>
</tr>
</tbody>
</table>

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>$1a$</td>
</tr>
</tbody>
</table>
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. exiguis, xerophilus, cunhai, traergardhi and (partly) taxeni. It is very similar in all the species studied and it is summed up in Table II and III. The differences in the time of origin of individual setae concern only seta A4 on urotergite VI (but the time of its origin can vary individually), PIa on urosternite I and Ia 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 identical in all species of the genus. Setae PIa, P2a, and P5 on notula and P2a on urotergite I are in the shape of very small, rounded or conical sensillae. Seta P4a on metanotum, A2 and M2 on thoracic 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 PIa and P3a on urotergite I-VII and seta I 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 SZETYCKI 1988):

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Th. I</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Th. II</td>
<td>2 + 2</td>
<td>al, l</td>
</tr>
<tr>
<td>Th. III</td>
<td>1 + 1</td>
<td>l</td>
</tr>
<tr>
<td>Abd. I</td>
<td>1 + 1</td>
<td>psm</td>
</tr>
<tr>
<td>Abd. II-V</td>
<td>2 + 2</td>
<td>psm, al</td>
</tr>
<tr>
<td>Abd. VI-VII</td>
<td>3 + 3</td>
<td>psm, psl, al</td>
</tr>
<tr>
<td>Abd. VIII</td>
<td>1 + 1</td>
<td>psm</td>
</tr>
<tr>
<td>Abd. IX-XI</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Abd. XII</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

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 PI 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):

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Th. I</td>
<td>0</td>
<td>(single pore situated on medial line)</td>
</tr>
<tr>
<td>Th. II-III</td>
<td>1</td>
<td>(single pore asymmetrically situated)</td>
</tr>
<tr>
<td>Abd. I</td>
<td>1 + 0</td>
<td>(single pores symmetrically situated)</td>
</tr>
<tr>
<td>Abd. II-III</td>
<td>0</td>
<td>(groups of pores symmetrically situated)</td>
</tr>
<tr>
<td>Abd. IV-V</td>
<td>1 + 1</td>
<td></td>
</tr>
<tr>
<td>Abd. VI</td>
<td>n + n</td>
<td></td>
</tr>
<tr>
<td>Abd. VII</td>
<td>1 + 0</td>
<td></td>
</tr>
<tr>
<td>Abd. VIII-XI</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Abd. XII</td>
<td>1 + 1</td>
<td></td>
</tr>
</tbody>
</table>
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. SZETYCKI 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 φ 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 Acerentomon (SZETYCKI 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; SZETYCKI 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.

<table>
<thead>
<tr>
<th></th>
<th>composition of setae</th>
<th>formula</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>THORAX</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>1 2</td>
<td>0 4 4 4 4</td>
</tr>
<tr>
<td>II-III</td>
<td>A2 A4 M P1 P1a P2 P2a P3 P4 P4a P5</td>
<td>0 4 6 6 6 10 10 14 16 16</td>
</tr>
<tr>
<td><strong>ABDOMEN</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>A1 A2 A5 P1 (P1a) P2 P2a P3 P4</td>
<td>0 0 0 6 6 8 8 10 10-12 10-12</td>
</tr>
<tr>
<td>II</td>
<td>A1 A2 A5 P1 (P1a) P2 P2a P3 P4 P4a P5</td>
<td>0 0 0 6 6 8 10 14 14-16 14-16</td>
</tr>
<tr>
<td>III-V</td>
<td>A1 A2 A5 P1 (P1a) P2 P2a P3 P3a P4 P4a P5</td>
<td>0 0 0 6 6 8 10 14 14-16 14-18</td>
</tr>
<tr>
<td>VI</td>
<td>A1 A2 A4 A5 P1 (P1a) P2 P2a P3 P3a P4 P4a P5</td>
<td>0 0 0 6-8 8 8 10 14 14-16 14-18</td>
</tr>
<tr>
<td>VII</td>
<td>(A1) A2 (A4) A5 P1 (P1a) P2 P2a P3 P3a P4 P4a P5</td>
<td>0 0 0 6-8 6-8 8 10 14 16-18 16-18</td>
</tr>
<tr>
<td>VIII</td>
<td>A1 A3 A5 M1 P1 P1a P2 P2a P3 P3a P5</td>
<td>0 0 2 6 6 6 12 14 15 16</td>
</tr>
<tr>
<td>IX</td>
<td>1 1a 2 2a 3 4</td>
<td></td>
</tr>
<tr>
<td>X</td>
<td>1 1a 2 2a 3 4</td>
<td></td>
</tr>
<tr>
<td>XI</td>
<td>(1) (3) (4)</td>
<td></td>
</tr>
<tr>
<td>XII</td>
<td>2 6 6 6 6</td>
<td></td>
</tr>
</tbody>
</table>

O - prelarval setae, I - primary setae, II - secondary setae, III - tertiary setae, IV - complementary setae, (in brackets) - setae lacking in some species.
### Ventral chaetotaxy of *Acerentulus* sp. sp.

#### Table III

<table>
<thead>
<tr>
<th></th>
<th>Composition of setae</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td><strong>Thorax</strong></td>
<td></td>
<td>pl</td>
</tr>
<tr>
<td>I</td>
<td>A1 A2 M1 M2</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>P1 P2 P3</td>
<td>0</td>
</tr>
<tr>
<td>II</td>
<td>Ac A2 A3 M</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>P2 P3</td>
<td>0</td>
</tr>
<tr>
<td>III</td>
<td>Ac A2 A3 A4 M</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>P2 P3</td>
<td>0</td>
</tr>
<tr>
<td><strong>Abdomen</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>Ac A2</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>P1 P1 a</td>
<td>0</td>
</tr>
<tr>
<td>II-III</td>
<td>Ac A2</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Pc P1 a P2</td>
<td>0</td>
</tr>
<tr>
<td>IV-VI</td>
<td>Ac A2</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>P1 P1 a P2 P3</td>
<td>2</td>
</tr>
<tr>
<td>VII</td>
<td>Ac A2</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>(Pc) P1 P1 a P2 P3</td>
<td>2</td>
</tr>
<tr>
<td>VIII</td>
<td>1 2</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>1a</td>
<td>0</td>
</tr>
<tr>
<td>IX</td>
<td>1 2</td>
<td></td>
</tr>
<tr>
<td>X</td>
<td>1 2</td>
<td></td>
</tr>
<tr>
<td>XI</td>
<td>1 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2)</td>
<td></td>
</tr>
<tr>
<td>XII</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
</tr>
</tbody>
</table>

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 ...... carpathicus
    -- Sensilla a' short, dilated; mesonotal seta P2 shorter than 37 μm .... exigius

IV. DESCRIPTIONS OF SPECIES

Acerentulus exigius CONDÉ, 1944
(Figs 16-36)

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

Diagnosis. A. exigius belongs to a group of species with long foretarsal sensilla a,
sensilla b of medium length, the lineation of sternites of "exigius" 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, carpathicus, alni and confinis.
It differs from occultus in the position of sensilla a’, from carpathicus 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.

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 thoracic sterna and M2 on pro sternum billet-like. Thoracic sterna with no pores.

Foretarsus with long sensilla a, reaching level of γ3; 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 β1 slightly shorter than δ4. 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; accessory setae billet-like. Urotergite VII with 3+3 anterior setae (A2, A4, A5); seta P1a presents, 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. 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 1a. Urotergite XI with 3+3 setae, seta 1a 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 acrostylius. 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):

<table>
<thead>
<tr>
<th></th>
<th>imago</th>
<th>preim.</th>
<th>mat.jun</th>
<th>larva II</th>
<th>larva I</th>
</tr>
</thead>
<tbody>
<tr>
<td>head</td>
<td>115-147</td>
<td>96-126</td>
<td>99-121</td>
<td>88-107</td>
<td>82</td>
</tr>
<tr>
<td>pseudoculus</td>
<td>7-10</td>
<td>6-9</td>
<td>7-9</td>
<td>6-7</td>
<td>ca 7</td>
</tr>
<tr>
<td>filamento di sostegno</td>
<td>22-37</td>
<td>17-29</td>
<td>17-31</td>
<td>15-21</td>
<td>ca 16</td>
</tr>
<tr>
<td>mesonotal P1</td>
<td>20-28</td>
<td>16-22</td>
<td>13-20</td>
<td>10-14</td>
<td>7-9</td>
</tr>
<tr>
<td>mesonotal P2</td>
<td>28-37</td>
<td>22-28</td>
<td>19-28</td>
<td>13-21</td>
<td>13-14</td>
</tr>
<tr>
<td>foretarsus</td>
<td>86-100</td>
<td>77-87</td>
<td>63-82</td>
<td>54-63</td>
<td>ca 51</td>
</tr>
<tr>
<td>claw</td>
<td>23-27</td>
<td>20-24</td>
<td>19-24</td>
<td>17-19</td>
<td>?</td>
</tr>
<tr>
<td>empodial appendage</td>
<td>2-5</td>
<td>3-5</td>
<td>2-4</td>
<td>2-4</td>
<td>?</td>
</tr>
<tr>
<td>maximum body length</td>
<td>1460</td>
<td>1240</td>
<td>1130</td>
<td>840</td>
<td>610</td>
</tr>
</tbody>
</table>

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 view; 3 - ditto, ventro-internal view (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 - abdominal 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 P1α (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 P1α (4 sp.); urotergite VIII: lack of Mc (1 sp.); urosternite VIII: asymmetrical lack of la (1 sp.)

Larva II (15 specimens). Mesonotum: asymmetrical lack of A2 (1 sp.); metanotum: asymmetrical lack of P1α (2 sp.); urotergite VI: asymmetrical lack of P2α (1 sp.); urotergite VII: asymmetrical lack of P2α (1 sp.). Beside, in one specimen seta P2α is asymetrically lacking on urotergite I, II and IV, and in the second one seta A4 is asymmetrically lacking on metanotum and seta P2α is symmetrically lacking on urotergite I and asymmetrically 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 opportunity to study one specimen of A. confinis from Italy (Piemonte, Colle San Bernardino, Guarese-Cueno). Besides the differences in chaetotaxy (the presence of A1 and P3α on urotergite VII) it differs from exiguus by much longer notal setae, longer foretarsal sensilla a' and in the shape of squama genitalis q - in confinis the prolongation of stylus is short and acrostylus is long, but not forked.

General distribution. 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 "Wawóz Myśliborski" reserve, deciduous forest, 18 VI 1985, 1 pm (Pm). WT 99. Woodland east of Opalenica, near
Mogielnica Stream, decaying wood and plant-debris from the stump of cutten spruce, 28 IX 1964, 1 σ (R). WU 72. Gorzyckie Lake, old alder forest with *Ribes rubra* and rich undergrowth, litter, soil, decaying wood, 16 VIII 1985, 6 φ, 2 σ, 1 pm, 2 mj, 2 12 (R). WU 83. "Buki nad jez. Lutomskim" reserve, old beech forest, litter, roots etc. near decaying logs, 17 IX 1985, 1 φ (R). WU 93. Winnogóra, soil of the lucerne field, 24 VI 1968, 1 φ (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 overgrown with *Impatiens parviflora* and *Urtica dioica*, 26 VI 1975, 1 φ, 1 σ, 1 pm, 1 mj (R); in the soil and rotten wood from the huge stump of poplar, 11 III 1977, 2 φ, 1 mj (R). XT 17. Racot, soil and litter from abandoned old park, 6 VIII 1975, 1 φ, 2 mj (R). XT 19. Trzebaw - Rosnówko, from decayed *Salix alba* near a lake, 17 IX 1969, 1 σ (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 φ, 6 σ, 1 11 (R); decaying wood, pieces of bark, rest of mycelium under the base of a dead tree in dense forest,
18 VIII 1986, 1 σ, 1 pm, 4 mj, 1 11 (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 φ, 5 σ, 4 pm, 8 mj, 1 12 (R). XU 21. Poznań - Sołacki Park (SZEPTYCKI 1969a); Poznań - Botanical Garden, soil and litter under Impatiens parviflora, 3 VIII 1976, 1 mj (R); Poznań - Szelał, abandoned park, decaying wood (with roots) from a huge stump of a poplar, 11 III 1983, 3 φ, 2 pm, 1 12 (R). XU 31. Poznań - Cybina Valley (SZEPTYCKI 1969a); Poznań - Gólecin, abandoned park, soil and litter in the base of horse chestnut-tree, 8 IX 1977, 1 σ (R); decaying leaves, soil and plant debris, 21 X 1977, 1 φ, 1 σ (R). XU 41. Promno, decaying wood (with ants) from apple-tree, 20 VIII 1964, 2 φ, 2 σ, 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 φ, 1pm, 1 12 (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. Lubostron, decaying wood (nearly dry), from small hollow in an old poplar, 11 VI 1982, 7 φ, 2 σ, 2 pm, 1 mj (R). XV 88. Wdzynie Lake near a mouth of Wda River, decaying wood from old Salix alba, hollow about 120 cm up, 24 V 1979, 2 φ (R). YT 05. Gołuchów, Arboretum, wet litter under Lonicer a and Symphoricarpus bushes, 20 VIII 1977, 1 φ, 1 σ (R). CA 67. Gołonóg, young cultivated forest with larch, pine, oaks, 21 IX 1974, 14 φ, 15 σ, 8 pm, 5 mj, 212 11 (Bl). CA 76. "Ostra Góra" reserve, brushwood under scattered old beeches, litter and soil with roots, 28 IV 1979, 10 φ, 6 σ, 2 pm, 1 mj, 1 12 (R). CB 72. "Zielona Góra" reserve, beech forest with hornbeam and oak, litter, 10 VIII 1979, 1 φ (ZM). CB 81. Potok Zloty, palace park, rotten bark from a log with rest of fungi, mosses and decaying wood, 18 X 1982, 1 φ (R). CD 20. Lubstów, park, decaying wood, plant debris etc. from a huge stump of a linden, 2 X 1971, 1 φ, 1 σ (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, xerothermal calcareous rock with scattered bushes (mostly Rosa sp.), Saxifraga aizoon, Sempervivum soboliferum etc., mosses and plant-debris from rock-crevices, 1 VII 1964, 1 φ (Da and R). DV 57. Pieniny National Park, petrophilous turfs: Trzy Korony Mt, S of main peak, 18 III 1972, 4 φ, 5 σ, 1 mj (We) and 12 XI 1972, 1 φ, 1 pm, 2 12 (We), Sobczanński Gorge, 4 IV 1972, 7 φ, 1 σ, 1 mj (We), Gosczyński Gorge, 13 XI 1976, 1 12 (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 σ (We); Czubata Rock, exposition SW, mosses and plant debris from rock-shelves with Saxifraga aizoon, Sempervivum soboliferum etc., 24 IX 1974, 1 φ, 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 φ, 6 σ, 1 pm, 2 mj (R). DA 08. Smoleń, mosses from shadowed rocks under the castle, 25 VIII 1971, 1 φ (R); northern foot of castle-hill, beech forest, litter, 12 VIII 1987, 2 φ, 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 φ, 1 mj (R). DA 16. Ojców National Park - Origano-Brachypodietum on limestone rocks: above Cienna Cave, 1 VII 1964, 1 φ (Rj), lower part of Rękawica Rock, 2 φ, 5 σ, 2 pm, 1 mj (Rj), rocks near Cienna Cave, 7 VII 1964, 2 φ, 1 σ (Sz); Origano-Brachypodietum on deforested slopes: Grodzisko, 7 VII 1964, 7 φ, 2 σ, 3 mj, 1 12 (Sz) and slope of Prądnik Valley ca 1.5 km N of Ojców, 18 VII 1964, 1 φ (Sz); xerophilous hazel brushwood: rocks between Koronna Mt
and Rękawica Rock, 13 VI 1964, 112 (Sz), southern slope of Koronna Mt, 13 VI 1964, 1 σ (Sz) and 14 VI 1964, 1 φ, 2 σ, 1 mj (Rj), slope near a chapel, 15 VI 1964, 4 φ, 2 σ (Rj), slope above old path to Skała Town, 18 VII 1964, 1 φ, 1 pm (Sz); brushwood of Cerastus fruticosus: Grodzisko, 5 VI 1964, 1 σ, 1 mj (Sz); mosses on shadowed limestone rocks: valley under Koziamoń Cave, 1 VII 1964, 1 mj (Sz); Tilio-Carpinetum: Koronna Mt, 2 VI 1964, 2 σ, 2 pm, 2 mj (Rj). DA 21. Alder forest near Tyczyna Stream above Lubień, from decaying Salix alba, 13 IX 1973, 2 φ, 1 σ, 2 mj (R). DA 47. "Đąbie" reserve, high hazel bushes with admixture of other shrubs and old pines above xerothermic slope, litter, 26 VI 1977, 1 φ, 1 pm, 1 mj (R). DB 60. Kopernia, xerothermic slope above the village, mosses, soil and plant debris, 10 VIII 1980, 10 φ, 5 σ, 1 pm, 2 mj (Pn). DC 99. Warszawa-Wrzeciono, soil of a lawn, various dates, 7 φ, 5 σ, 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 σ (IZ) and 9 VII 1980, 2 φ, 1 mj (IZ). EC 09. Warszawa - Lasek Bielański, hornbeam forest, leaves, plant debris, decaying wood and mosses near decaying log, 13 VIII 1984, 1 σ, 2 l2 (R). FB 41. Zwierzyniec (SZEPTYCKI 1969a). FB 76. "Stawska Góra" reserve, xerothermic grassland, soil, mosses and plant-debris, 19 IX 1976, 3 φ, 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 _φ_ 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 carpathicus* NOSEK (ca), *cunhai* CONDÉ (cu), *occultus* SZEPTYCKI (oc.), *collaris* sp.n. (cl) and *tuxenii* 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 carpathicus* NOSEK, 1967
(Figs 40 - 54)

*Acerentulus carpathicus*: 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
Polish Acerentulus

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

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 thoracic sterna and M2 on pro sternum billet-like. Thoracic 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; accessory 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 φ with very long distal prolongation of stylum 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 φ (Pn). EV 99. Orle Ms. - at foot of the hill 376 m, border of forest, near a stream, 8 VI 1960, 1 φ, 1 σ, 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 γ3; 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 β1 evidently shorter and thinner than δ4. 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 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. Interegmental 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 setae on urosternite XII.

Body dimensions (in µm):

<table>
<thead>
<tr>
<th></th>
<th>imago</th>
<th>preim.</th>
<th>mat.jun.</th>
<th>larva II</th>
</tr>
</thead>
<tbody>
<tr>
<td>head</td>
<td>151-169</td>
<td>139</td>
<td>81-100</td>
<td>73</td>
</tr>
<tr>
<td>pseudoculus</td>
<td>9-10</td>
<td>8</td>
<td>7-8</td>
<td>7</td>
</tr>
<tr>
<td>filamento di sostegno</td>
<td>33-37</td>
<td>?</td>
<td>24-28</td>
<td>?</td>
</tr>
</tbody>
</table>
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 σ (specimen nr 3396). EV 08. Uście Gorlickie, slope above Ropa River, border of hornbeam forest with hazel, 24 IV 1959 (Pn).

Paratypes. DV 27. Szafary, 1954, 1 σ (sp. nr 3397) (St). DV 47. Czorsztyn, alder forest on the bank of Dunajec River, 29 IV 1972, 1 σ, 1 pm, 1 12 (sp. nrs 3398-3400) (We) and gravel terrace of Dunajec River, in tussocks of grass, 10 XI 1986, 1 σ (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. Kalvaria Paławska, 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 φ. It is much smaller than silvanus, differs also in relatively shorter foretarsal sensilla a'.

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 thoracic sterna and M2 on prosternum billet-like. Thoracic 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 I, on X shorter. Urotergite XI with 3+3 setae, seta I very long. Hind margin setae of urotergite XII long, medial seta longer than sublateral ones. Urosternite XI with 3+3 setae.

Squama genitalis 9 with long prolongation of stylus and short acrostylistus. 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)

<table>
<thead>
<tr>
<th></th>
<th>imago</th>
<th>preim.</th>
<th>mat. jun.</th>
<th>larva II</th>
<th>larva I</th>
</tr>
</thead>
<tbody>
<tr>
<td>head</td>
<td>117-149</td>
<td>116-131</td>
<td>112-122</td>
<td>97-113</td>
<td>81-90</td>
</tr>
<tr>
<td>pseudoculus</td>
<td>9-11</td>
<td>8-10</td>
<td>8-10</td>
<td>6-9</td>
<td>ca 8</td>
</tr>
<tr>
<td>mesonotal P1</td>
<td>17-23</td>
<td>15-21</td>
<td>14-19</td>
<td>12-14</td>
<td>ca 9</td>
</tr>
<tr>
<td>mesonotal P2</td>
<td>26-33</td>
<td>23-29</td>
<td>21-27</td>
<td>17-20</td>
<td>ca 13</td>
</tr>
<tr>
<td>foretarsus</td>
<td>93-106</td>
<td>80-93</td>
<td>76-84</td>
<td>61-68</td>
<td>52-54</td>
</tr>
<tr>
<td>claw</td>
<td>24-26</td>
<td>22-23</td>
<td>ca 19</td>
<td>ca 19</td>
<td>?</td>
</tr>
<tr>
<td>empodial appendage</td>
<td>3-4</td>
<td>3-4</td>
<td>ca 3</td>
<td>ca 4</td>
<td>?</td>
</tr>
<tr>
<td>maximum body length</td>
<td>1390</td>
<td>1350</td>
<td>1170</td>
<td>942</td>
<td>600</td>
</tr>
</tbody>
</table>

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 AI (1 sp.); X: asymmetrical lack of seta 1a (2 sp.); urosternite VII: lack of seta Pc (4 sp.).
Preimagos (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 localities (Fig. 14, xe). CA 55. Zawiśc - town park, small hollow in linden ca 70 cm up, decaying wood, 22 V 1986, 1 c (R). CA 97. Pomorzany, artificial pine forest on calcereuos hill, 12 VIII 1987,
7 φ, 5 σ, 1 pm, 1 mj (Sz). DA 04. "Kajasówka" reserve, decaying plants, plant-debris and soil from unforested top of rocks, 15 X 1976, 1 φ (R). DA 08. Smoleń, northern base of castle-hill, beech forest, 12 VIII 1987, 1 φ, 2 σ, 2 pm, 1 lj (Sz). DA 16. Ojców National Park, dry grassland: slope under the castle in Pieskowa Skała, 19 VI 1964, 1 σ (Sz); Tilio-Carpinetum: Koronna Mt., 2 VI 1964, 2 φ, 5 σ, 2 pm (Rj), and eastern slope of Złota Mt., 24 VIII 1964, 1 mj, 1 lj (Sz). DC 98. Warszawa - Ogród (=Garden) Saski, 8 X 1976, 1 σ (IZ); lawn near the Institute of Zoology of the Polish Academy of Sciences, 13 X 1977, 1 φ, 1 mj (IZ); Cemetery of Soviet Soldiers, 25 X 1978, 1 σ (IZ). EV 58. Cergowa Mt., deciduous forest at foot of western slope, litter, mould, soil etc., 12 VIII 1983, 1 φ (R). EV 59. Miejsce Piastowe - Winna Mt., hornbeam forest on S and SW slopes, 9 IX 1960, 2 φ (R), and 1 IX 1981, 2 φ, 4 σ, 2 mj, 3 lj (R). FB 76. "Stawiska Mt." reserve (SZEPTYCKI, 1979). FB 7. Świdniki, pine forest with Aster amellus on a chalk hill, 5 X 1958, 1 φ, 3 σ, 1 mj, 1 lj (Dz). FF 11. Turtul, soil of meadow, VIII 1984. 8 φ, 3 σ, 3 pm, 3 mj, 21 l (Ka).

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

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


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'=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 irregular 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 I 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).

Not included into the type material: XT 29. Puszczyków, wet decaying wood from the base of dead willow, 18 X 1986, 1 ♀ (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.

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 thoracic sterna and \(M2\) on prosternum billet-like. Thoracic sterna with no pores.

Foretarsus with very short sensilla \(a\), reaching only base of \(d\); \(b\) short, not reaching level of \(\gamma3\), 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 \(\beta1\) and \(\delta4\) short, \(\delta4\) longer than \(\beta1\). 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 irregularly scattered single granules. Comb VIII with slightly convex hind margin, composed of 8-11 slender teeth. Seta \(Ia\) on urotergite IX subequal to seta \(I\), on \(X\) shorter. Urotergite XI with 3+3 setae, seta \(I\) short. Hind margin setae of urotergite XII short, subequal. Urosternite XI with 3+3 setae.

Squama genitalis \(\delta\) with long prolongation of stylus and long, thick acrostylist. Penis with 6+6 setae.

Maturus junior with seta \(P1a\) on urosternite I and with seta \(Ia\) 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 \(\mu m\)):

<table>
<thead>
<tr>
<th></th>
<th>imago</th>
<th>preim.</th>
<th>mat.jun.</th>
<th>larva II</th>
</tr>
</thead>
<tbody>
<tr>
<td>head</td>
<td>125-149</td>
<td>114-124</td>
<td>114-128</td>
<td>ca 101</td>
</tr>
<tr>
<td>pseudoculus</td>
<td>7-8</td>
<td>7-8</td>
<td>ca 7</td>
<td>6-7</td>
</tr>
<tr>
<td>filamento di sostegno</td>
<td>24-31</td>
<td>ca 25</td>
<td>17-24</td>
<td>ca 19</td>
</tr>
<tr>
<td>mesonotal (P1)</td>
<td>30-38</td>
<td>25-26</td>
<td>22-28</td>
<td>17-21</td>
</tr>
<tr>
<td>mesonotal (P2)</td>
<td>38-45</td>
<td>33-34</td>
<td>28-36</td>
<td>24-28</td>
</tr>
<tr>
<td>foretarsus</td>
<td>97-108</td>
<td>97-104</td>
<td>75-83</td>
<td>65-66</td>
</tr>
<tr>
<td>claw</td>
<td>26-30</td>
<td>ca 25</td>
<td>ca 23</td>
<td>?</td>
</tr>
<tr>
<td>empodial appendage</td>
<td>4-5</td>
<td>3-4</td>
<td>3-4</td>
<td>?</td>
</tr>
<tr>
<td>maximum body length</td>
<td>1410</td>
<td>?</td>
<td>970</td>
<td>880</td>
</tr>
</tbody>
</table>

No of specimens studied

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>head</td>
</tr>
<tr>
<td>pseudoculus</td>
</tr>
<tr>
<td>filamento di sostegno</td>
</tr>
<tr>
<td>mesonotal (P1)</td>
</tr>
</tbody>
</table>

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 \(Ia\) (1 sp.); XI: asymmetrical lack of seta \(I\) (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 q, 1 c, 2 mj (R). WS 74. "Wąwóz Myśliborski" reserve, deciduous forest, 18 VI 1985, 2 q, 1 pm (Pm). WS 93. Książ, decaying wood and plant debris from linden in park, 26 V 1972, 1 q, 2 c, 1 pm, 112 (R). WT 21. Żagań, castle park, litter, soil and moos under bushes of bird cherry under old trees, 30 VIII 1977, 1 q, 2 c, 112 (ZM). BA 96. Krowiarki, abandoned castle park, litter, decaying twigs and moss under old trees between dense scrub of Samb. nigra, 30 V 1980, 4 q, 1 c (R). CA 46. Katowice-Ligota, park of Franciscan Monastery, litter, soil and decaying wood of old stumps, 27 IV 1987, 1 c, 1 mj (R).

Acerentulus rafalskii SZEPTYCKI, 1979
(Figs 131-147)

Acerentulus rafalskii : SZEPTYCKI 1979

Diagnosis. By the short foretarsal sensilla a it belongs to "cunhaii" group of NOSEK. From all the species of this group it differs 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 thoracic sterna and M2 on prosternum billet-like. Thoracic 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 $\phi$ with short prolongation of stylus and short, stump acrostylus. Penis with 6+6 setae.

Younger instars unknown.

Body dimensions (6 imagines) (in $\mu$m): 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 $\mu$m, 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).


---

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 $a$, extremelly long $d$ and thick sensillae $b'$ and $c'$.


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 ti. 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 βI and δ4 short, subequal. BS about 0.5, TR 3.0-3.5, EU 0.1.

Urotergite I with no setae 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 acrostyly. 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):

<table>
<thead>
<tr>
<th></th>
<th>imago</th>
<th>mat. jun.</th>
<th>larva II</th>
<th>larva I</th>
</tr>
</thead>
<tbody>
<tr>
<td>head</td>
<td>139-160</td>
<td>113-131</td>
<td>ca 109</td>
<td>95-109</td>
</tr>
<tr>
<td>pseudoculus</td>
<td>9-10</td>
<td>ca 8</td>
<td>ca 8</td>
<td>ca 6</td>
</tr>
<tr>
<td>filamento di sostegno</td>
<td>37-44</td>
<td>ca 29</td>
<td>ca 28</td>
<td>24-28</td>
</tr>
<tr>
<td>mesonotal P1</td>
<td>24-30</td>
<td>19-24</td>
<td>ca 22</td>
<td>13-14</td>
</tr>
<tr>
<td>mesonotal P2</td>
<td>40-42</td>
<td>33-36</td>
<td>ca 28</td>
<td>17-19</td>
</tr>
<tr>
<td>foretarsus</td>
<td>104-110</td>
<td>80-92</td>
<td>ca 73</td>
<td>57-59</td>
</tr>
<tr>
<td>claw</td>
<td>31-32</td>
<td>ca 26</td>
<td>ca 23</td>
<td>18-21</td>
</tr>
<tr>
<td>empodial appendage</td>
<td>3-5</td>
<td>ca 3</td>
<td>ca 3</td>
<td>ca 2</td>
</tr>
<tr>
<td>maximum body length</td>
<td>1670</td>
<td>1320</td>
<td>980</td>
<td>720</td>
</tr>
</tbody>
</table>

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)


*Acerentulus traegardhi* IONESCU, 1937
(Figs 172-198)

*Acerentulus Trägårdhi* : IONESCU 1937
*Acerentulus tråghårdhi* : 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 symmetric to *ruseki* NOSEK, 1967 (NOSEK 1967b) and *collaris* sp. n. From the both mentioned species it differs in larger body dimension, in thinner 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 thoracic sterna and *M2* on prosternum hair-like. Thoracic 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 < c' < a=a' < b' < d=e=f < t2 < b. Seta b1 and δ4 short, δ4 longer than b1, 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 preceding 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: /0/0/0/0/1+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 I, on X shorter. Urotergite XI with 3+3 setae, seta I 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 γ4. Maturus junior with no seta Pla 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 γ4, larva II mostly with no larval seta on urosternite XII.

Body dimensions (in µm):

<table>
<thead>
<tr>
<th></th>
<th>imago</th>
<th>preim.</th>
<th>mat. jun.</th>
<th>larva II</th>
<th>larva I</th>
</tr>
</thead>
<tbody>
<tr>
<td>head</td>
<td>107-141</td>
<td>104-119</td>
<td>92-120</td>
<td>96-104</td>
<td>83-95</td>
</tr>
<tr>
<td>pseudoculus</td>
<td>6-8</td>
<td>6-8</td>
<td>6-7</td>
<td>5-6</td>
<td>ca 5</td>
</tr>
<tr>
<td>filamento di sostegno</td>
<td>21-34</td>
<td>19-26</td>
<td>16-27</td>
<td>17-24</td>
<td>15-19</td>
</tr>
<tr>
<td>mesonotal PI</td>
<td>17-30</td>
<td>15-23</td>
<td>14-21</td>
<td>11-16</td>
<td>9-13</td>
</tr>
<tr>
<td>foretarsus</td>
<td>75-91</td>
<td>65-76</td>
<td>56-75</td>
<td>54-62</td>
<td>43-51</td>
</tr>
<tr>
<td>claw</td>
<td>20-25</td>
<td>16-21</td>
<td>17-23</td>
<td>15-19</td>
<td>15-16</td>
</tr>
<tr>
<td>empodial appendage</td>
<td>3-6</td>
<td>3-4</td>
<td>2-4</td>
<td>2-5</td>
<td>2-4</td>
</tr>
<tr>
<td>maximum body length</td>
<td>1340</td>
<td>1140</td>
<td>1100</td>
<td>840</td>
<td>630</td>
</tr>
</tbody>
</table>

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 Pla (1 sp.); VII: lack of Ac (1 sp.); VIII: asymmetrical lack of seta I (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 Pla, 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.
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 φ (R). WS 45. Wleń
- Zamkowa Mt., decaying leaves under castle-walls, 20 VI 1976, 4 φ, 1 σ, 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 φ, 2 σ (R). XS 46. Wrocław
- Botanical Garden, compost soil, 13 VI 1975, 1 σ (R). XT 29. Puszczykowo, wet decaying
wood from base of stump of dead willow, 18 X 1986, 2 φ (R); Rogalin (SZEPTYCKI 1969a),
and from thick layer of litter and decaying leaves under timber pieces in abandoned park,
18 IV 1972, 14 φ, 12 σ, 1 mj, 3 l2 (R), and thick layer of wet decaying wood near base of
stump of horse chestnut-tree, 5 IV 1985, 3 φ, 1 σ, 1 pm, 2 mj (R). XU 21. Poznań-Golęcin, abandoned park, soil and litter near base of horse chestnut-tree, 8 IX 1977,
2 φ, 5 σ (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 φ, 1 mj (R). XU 41. Promno, decaying wood (with ants) from apple-tree,
20 VIII 1964, 1 φ, 2 σ (J,R). XU 60. Nekla, old park, soil and decaying wood with remnants
of leaves from old linden, 27 VII 1978, 1 φ, 1 l2 (R). XU 84. Ostrowieckie Lake, dense
hornbeam-oak forest on steep SE slope with rich undergrowth and herb layer, soil and
litter, 11 VI 1981, 1 φ, 3 σ, 1 pm (R). XA 74. Ca 7 km S of Lębork (SZEPTYCKI 1969a).
YS 10. Woodland ca 5 km SE Opole, humid deciduous forest, 28 V 1980, 2 φ (R, Ko). YT 05.
Gołuchów-Aboreum, humid litter under Lonicera and Symphoricarpa bushes, 20 VIII 1977,
2 φ, 1 σ (R). CA 67. Gołonóg, young, cultivated forest with larch, birch, pine, oaks,
21 V 1974, 1 φ, 1 l2 (Bi). CA 97. Pomorzany, dry calcareous rock of southern exposition,
mosses and plant-debris, 12 VIII 1987, 2 φ, 1 pm, 1 l2 (Sz). CB 81. Trzebnów - Kacza
Skala, lower layer of litter from beech forest between calcareous rocks, 19 X 1982, 1 φ, 3 σ,
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 φ, 1 pm, 2 mj
(R). CD 63. "Kulin" reserve (SZEPTYCKI 1969a), and turf of mosses under shrubs in
a gorge, 31 VII 1971, 29 φ, 10 σ, 3 pm, 2 mj (R). CE 25. Łuby, slope above Wda Valley,
mixed forest with pine, oak, linden, hazel etc., 24 V 1979, 13 φ, 1 σ, 1 l2 (R). CE 80.
"Mielowo" reserve, hornbeam-oak forest with beech and pine, dry decaying wood from
old hornbeam, 24 VII 1974, 8 φ, 3 σ, 1 pm (ZM). DV 57. Pieniny National Park
- petrophilous turfs: Głowa Cukru, 28 VI 1976, 1 φ, 4 mj (We), and 26 VIII 1976, 1 l2 (We);
petrophilous pine forest: Macelowa Mt., needles, litter and mosses, 21 VI 1975, 8 φ, 3 σ, 2 mj,
1 l2 (We), and Czerwone Skałki, needles, 10 IV 1976, 2 σ (We); fir-spruce forest, soil: Wawóz
Sobczaniski, 15 I 1977, 1 φ (We); beech forest: Ociemny Potok, 19 III 1972, 1 φ (We);
deciduous forest, litter: Rabsztyn, 25 VIII 1975, 1 φ, 1 mj (We), and Harczygrund, 27 VIII 1975,
1 σ (We), and Ganek by base of Okrąglica Mt., 24 VIII 1976, 13 φ, 5 σ, 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 φ, 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 σ (R). DA 15. Zabierzów, pine-oak
forest, soil and plant debris at foot of calcareous rocks, 28 IV 1979, 2 σ (R). DA 16. Ojców
National Park - petrophilus xerothermic turfs: Rękawica Rock, 14 VI 1964, 1 φ, 2 σ (Rj),
and Grodziisko, slope under the chapel, 7 VII 1964, 2 φ, 1 σ, 1 pm, 1 mj (Sz); Origano-Bra-
chypodietum: lower part of Rękawica Rock, 1 VII 1964, 4 φ, 2 σ, 1 pm, 2 mj (Rj), and slope above Cienna Cave, 1 VII 1964, 1 pm (Rj); Corylo-Peucedanetum: Koronna Mt., 13 VI 1964, 1 σ, 1 pm (Sz); brushwood of Cerasus fruticosa: Grodzisko, 5 VI 1964, 1 12 (Sz); Tilico-Carpinetum: Koronna Mt., 2 VI 1964, 6 φ, 4 σ, 2 mj (Rj). DA 78. Skorocice, upper part of the reserve, xerophilus turf on gypsum rock, 8 V 1980, 1 σ, 1 12 (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 φ (R). DB 47. Modliszewice, plant remnants (mostly dry grasses) from nest of a rodent in small hole in a wall, 24 IX 1984, 1 φ (R). DB 52. Milechowska Mt., mixed forest with many shrubs, litter (mostly under hazel), 25 IX 1984, 1 φ, 1 σ (R). DC 77. Podkowa Leśna, 15 V 1984, 5 φ, 5 σ, 1 pm, 5 mj, 2 12, 1 I1 (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 φ, 9 σ, 1 pm, 4 mj, 712, 4 I1 (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 φ (R). EV 89. Sobień Mt., border between hornbeam forest and bushes on SE slope, litter, decaying grasses etc., 9 VI 1960, 1 φ, 1 12 (R). EB 00. Szydłów, xeromorphic slope above old quarry, mosses and plant debris from a rock, 10 VIII 1979, 5 φ, 1 σ, 1 mj (Kl). EV 14. Gorge of Wołosaty Stream under Bereżki Mt, beech forest with maple on stony slope, 112 (Jaa, R). FB 03. "Góra Chełmowa" reserve, oak-larch forest, litter, pieces of bark etc., under an old larch, 26 IX 1984, 1 φ, 2 σ (R). FB 68. Kazimierz-Męcierz, pine forest, 29 VIII 1972, 5 φ, 3 σ, 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.


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 prosthernum hair-like. Thoracal sterna with no pores.

Foretarsus with short sensilla a, reaching base of d; extremely long sensilla b, passing base of claw; c subequal to a; d short, slightly passing base of e; a' short, situated proximally 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: \( t_1 = t_3 < g = a' = c' < a < c = d = e < b' < f = t_2 < b \). Setae \( \beta_1 \) and \( \delta_4 \) 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 \( P_c \) on urosternite VII absent. Sternal porotaxy formula: \( /0/0/0/1+0/1+0/1/ \). Pore on urosternite VII far from its hind border. Connecting line on urosternite IV-V absent, 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 \( I_a \) on urotergite IX and X shorter than seta \( I \). Urotergite XI with 2+2 setae, seta \( I \) absent. Hind margin setae of urotergite XII short, subequal. Urosternite XI with 2+2 setae.

Squama genitalis \( \varphi \) seems to be similar to that in \textit{traegardhi}, but in only one specimen studied it is poorly visible. Males unknown.

Younger instars unknown.

Body dimensions (holotype) (in \( \mu \text{m} \)): head 125, pseudoculus 8, filamento di sostegno 27, mesonotal \( PI \) 14, \( P2 \) 18, foretarsus 74, claw 20, empodial appendage 5, total body length unestablished.

Remarks. The new species differs from all other \textit{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 \( \varphi \) (specimen nr 159): DV 57. Pieniny National Park, Polana (= Glade) Kosarzyska, soil of meadow, 23 VI 1973 (We).

REFERENCES

ALDABA J. 1983. Descripción de una nueva especie de Proturo del País Vasco. Munibe (Cienz. nat.), 35: 45-49
CONDÉ B. 1944b. Sur la faune de Protoures de France. Revue fr. Ent. 11: 36-47
A. SZEPTYCKI


IONESCU M. A. 1937. Contributions à la connaissance de la faune de Protoures de la Suède avec considérations sur les caractères spécifiques des Eosentomides. Ent. Tidskr., 58: 106-114


Fig. 16-23. *Acerentulus exiguis* 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 exiguis* CONDÉ. 24 - foretarsus of imago, exterior view; 25 - ditto, interior view; 26 - foretarsus of larva I, exterior view; 27 - ditto, interior view; 28 - accessory seta of urotergite (left) and urosternite (right) III; 29 - comb VIII
Fig. 30-36. *Acerentulus exiguis* CONDÉ. 30 - urosternite VI (arrows - pores); 31 - hind margin of urosternite VI; 32 - ditto, of urosternite VII; 33 - urotergite XII; 34 - squama genitalis ♀ (a - acrostyles); 35 - penis, dorsal view; 36 - penis, lateral view (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 φ. 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 carpathicus NOSEK. 45 - mesonotum; 46 - foretarsus, exterior view; 47 - ditto, interior view; 48 - squama genitalis φ (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 setae of urotergite (left) and urosternite (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 - paratype nr 3370, 107 - nr 3362). 104 - foretarsus, exterior view; 105 - ditto, interior view; 106, 107 - squama genitalis ♀
Fig. 108-112. Acententulus 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 cunhaini* CONDE: 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 traegardi* 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 traegardi* 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 - praemago, 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)