**Gracilentulus species of "gracilis" group**  
*Protura, Berberentomidae*  

Andrzej SZEPTYCKI  

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Abstract. *Gracilentulus gracilis* (BERL.) is redescribed, *G. europaeus, americanus, orousseti, hyleus, corsicanus, catulus, fjellbergi*, and *atlantidis* are described as new species. Pores on laterotergites and on lateral membranae are described and used as taxonomically important characters. The key for species of *Gracilentulus* is given.

Key words: *Protura, Gracilentulus, taxonomy, porotaxy, Europe, North America.*

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**I. INTRODUCTION**

The genus *Gracilentulus* was created by TUXEN (1963) for *Acerentulus gracilis* BERLESE, 1908. After later revisions (TUXEN & IMADATÉ 1975; TUXEN 1981) and descriptions it comprises 8 species (NOSEK 1979; YIN & IMADATE 1979; TUXEN 1981; IMADATÉ 1982; YIN 1984). Among them *G. gracilis* is characterised by the presence of foretarsal sensilla $b'$, sensilla $d$ situated distally to the level of sensillae $b$ and $c$, sensilla $f$ situated half way between $e$ and $g$, and the long sensilla $b$ (TUXEN & IMADATÉ 1975).

An abundant material from various areas allowed me to establish that the foretarsal characters mentioned above are common to a group of species (here called "gracilis" group). They differ in some distinct features of the body porotaxy and lineation as well as in some biometrical characters. The differences in foretarsal morphology are, on the other hand, rather subtle and in many cases hardly visible.

The material described here was collected in Poland (mostly by Prof. Dr J. RAFALSKI and his co-workers), Austria (Dr E. CHRISTIAN), France and Corsica (Dr J. BOUDINOT and Mr J. OROUSSET), Portugal (by Prof. Dr W. NIEDBAŁA) and Canary Islands (Dr A. FIELBERG). Some material from United States (collected by Prof. Dr J. RAFALSKI) is included too.

The holotypes of *G. corsicanus* and *orousseti* are preserved in the Museum National d'Histoire naturelle, Paris. Some paratypes of the taxa just named and all the material of the remaining species are kept in the Institute of Systematics and Evolution of Animals, Kraków.
I owe my very cordial thanks to Prof. Dr J. RAFALSKI, Dr A. FJELLBERG, Dr E. CHRISTIAN, Prof. Dr W. NIEDBAŁA, Mr J. OROUSSET and Dr J. BOUDINOT for the presenting me the rich material of Gracilentulus; to Prof. Dr R. DALLAI and Dr G. Del BENE for making it possible for me to study of BERLESE’s original specimens, to Dr B. POKRYSZKO who corrected the English text, and to Miss M. BIENIEK for her assistance during the preparation of this paper.

II. CHARACTERS OF THE "GRACILIS" GROUP

The head chaetotaxy (Fig. 4) is uniform in all the species studied – additional setae are always lacking. The pseudoculus, mouthparts and filamento di sostegno (Figs 5, 6) are the same as in the other species of the genus (comp. TUXEN 1964; 1981; NOSEK 1973; 1978a). The metric characters of the head (length of the head, pseudoculus and filamento) in most specimens are impossible to measure precisely, so the indices based on them (PR and CF) are of no taxonomical value (at last on the specific level). In all the species they vary between 12-20 and 7-10, respectively.

The general arrangement of foretarsal sensillae is exactly as in G. gracilis s.l. (comp. TUXEN 1964; NOSEK 1973). Sensilla b is always longer than half of c, sensillae d, f and g are always thin, seta-like, subequal in shape to c. Species differ in the length and thickness of sensillae a, b, c and e, the length and shape of a’, and the shape of t1. The latter is always more or less "fusiform" (TUXEN, 1977b) but its "head" can be more (in fjellbergi, atlantidis and orousseti) or less (in other species) distinctly delimited. The setae β1 and δ5 are similar in shape (at last in the light-microscope) to setae δ1-δ4.

Development of the foretarsus does not differ from that in many other acerentomoid genera. In larva I sensillae c' and b' are lacking, the former arises in larva II, the latter in maturus junior.

The length of foretarsus and claw (and the index TR) are sometimes taxonomically useful. The empodial appendage is always very short (the index EU is 0.1-0.2). The position of sensilla t1 is variable, so the index BS (varying between 0.4-0.5) is useless for discrimination between species.

The body chaetotaxy (Table I, II) is nearly identical in all the species studied - only the presence or absence of seta A5 on urotergite I and the number of setae "A" on urotergite VII and VIII are in some cases important. All accessory setae are setiform, uniform over all body, shorter and thinner (more "hair-like") than the principal setae.

The variability of chaetotaxy is slight. The lack of individual setae, the presence of asymmetrical setae and other irregularities are relatively rare. Setae of the row "A" on urotergite VII and seta M1 on VIII are more variable. In all the species except catulus the row "A" on urotergite VII contains 7 setae (Ac, A2, A4 and A5). Seta Ac is mostly asymmetrically situated (specimens with right and left position of it are found in nearly equal numbers). Only in about 1/3 specimens it is situated medially and specimens with two setae (A1+A1) instead of Ac are the rarest. On urotergite VIII the chaetotaxy M1+M1 is the commonest, but in some species there exist adult specimens with chaetotaxy of maturus junior (seta Mc instead of M1+M1).
**Table I**

Dorsal chaetotaxy of *Gracilentulus europaeus* sp. n.

<table>
<thead>
<tr>
<th>Composition of setae</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lv1</td>
</tr>
<tr>
<td>Th I</td>
<td>1, 2</td>
</tr>
<tr>
<td>Th II-II</td>
<td>M, A2, A4</td>
</tr>
<tr>
<td></td>
<td>P1, P1a, P2, P2a, P3, P3a, P4, P5</td>
</tr>
<tr>
<td>Abd I</td>
<td>A1, A2, A3</td>
</tr>
<tr>
<td></td>
<td>P1, P2, P2a, P3, P4</td>
</tr>
<tr>
<td>Abd II-VI</td>
<td>A1, A2, (A4), A5</td>
</tr>
<tr>
<td></td>
<td>P1, P2, P2a, P3, P4, P4a, P5</td>
</tr>
<tr>
<td>Abd VII</td>
<td>A4, (A2), A4, A5</td>
</tr>
<tr>
<td></td>
<td>P1, P1a, P2, P2a, P3, P4, P4a, P5</td>
</tr>
<tr>
<td>Abd VIII</td>
<td>A1, A3, A5</td>
</tr>
<tr>
<td></td>
<td>(MI)², P1, P1a, P2, P2a, P3, P3a, P5</td>
</tr>
<tr>
<td>Abd IX</td>
<td>1, 1a, 2, 2a, 3, 3a, 4</td>
</tr>
<tr>
<td>Abd XI</td>
<td>1, (1a), 2, (2a), 3, 4</td>
</tr>
<tr>
<td>Abd XII</td>
<td>9</td>
</tr>
</tbody>
</table>

**bold print** – prelarval and primary setae; normal print – secondary setae; *italics* – tertiary setae; *(in brackets)* – complementary setae.

¹In maturi juniores – Mc

The development of the chaetotaxy seems to be identical with that in *Acerentulus* (cf. Szeptycki 1991), but the prelarva remains unknown. The larval seta disappears mostly in larva II, in *gracilis* it vanishes in maturus junior.

The most important character of the chaetom is the length of principal and accessory setae – here the length of the setae *P1, P1a* and *P2* on mesonotum is used.
Table II
Ventral chaetotaxy of *Gracilentulus europaeus* sp.n.

<table>
<thead>
<tr>
<th>Composition of setae</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lv1</td>
</tr>
<tr>
<td>Th I</td>
<td>A1, A2, M1, M2</td>
</tr>
<tr>
<td></td>
<td>P1, P2, P3</td>
</tr>
<tr>
<td>Th II</td>
<td>Ac, A2, A3, M1</td>
</tr>
<tr>
<td></td>
<td>P2, P3</td>
</tr>
<tr>
<td>Th III</td>
<td>Ac, A2, A3, A4, M1</td>
</tr>
<tr>
<td></td>
<td>P2, P3</td>
</tr>
<tr>
<td>Abd I</td>
<td>Ac, A2</td>
</tr>
<tr>
<td></td>
<td>P1</td>
</tr>
<tr>
<td>Abd II-III</td>
<td>Ac, A2</td>
</tr>
<tr>
<td></td>
<td>Pc, Pla, P2</td>
</tr>
<tr>
<td>Abd IV-VII</td>
<td>Ac, A2</td>
</tr>
<tr>
<td></td>
<td>P1, Pla, P2, P3</td>
</tr>
<tr>
<td>Abd VIII</td>
<td>1, 2</td>
</tr>
<tr>
<td>Abd IX</td>
<td>1, 2</td>
</tr>
<tr>
<td>Abd X</td>
<td>1, 2</td>
</tr>
<tr>
<td>Abd XI</td>
<td>0</td>
</tr>
<tr>
<td>Abd XII</td>
<td>2</td>
</tr>
</tbody>
</table>

1 In *G. gracilis*, larvae seta present
Gracilentulus of 'gracilis' group

The dorsal porotaxy is uniform in all the group. The formula is as follows:

<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-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-VII</td>
<td>2+2</td>
<td>(psm, al)</td>
</tr>
<tr>
<td>Abd. VIII</td>
<td>1+1</td>
<td>(psm)</td>
</tr>
<tr>
<td>Abd. IX-XII</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

In contradistinction to the genera described previously (SZEPTYCKI 1988, 1991) the pore \( psl \) is lacking on all tergites and the medial pore on urotergite XII is absent.

The lateral porotaxy comprises pores on laterotergite VI and VII (laterotergal pores – \( lt \)) and pores situated on the lateral membranae between the tergite and sternite V and VI (membranal pores – \( mb \)). The presence or absence of individual pores on the laterotergite and membranae, as well as the position of pores \( lt \) are very important taxonomical features (Figs 1-3).

The sternal porotaxy (Figs 28, 29) is identical in all the group. Pores exist on urosternites V-VII and XII only. On urosternites V-VII they are situated near the hind margin of sternite and are distributed mostly according to the formula /1+1/2+2/1+1+1/. Their distribution and number are more or less variable – specimens with formula 3+1 on urosternite VI and 1+0+2 on VII are very common. In \( G. europaeus \), \( corsicanus \) and \( orousseti \) there exists a sexual dimorphism in the number of pores on urosternite VI. In females there are not more than 4 pores (sporadically even less) while in males there exist 5 or even 6 pores, mostly distributed according to the formula 2+3 (or 3+3).

On urosternite XII two pores are present, situated in the antero-lateral portion of the sternite. In imagines they are situated close to its anterior margin and mostly are hardly visible.

In larva I pore \( psm \) exists on urotergites VII-VIII only (on the former it is sometimes lacking), \( al \) and \( lt \) are lacking, the ventral porotaxy comprises only pores on urosternite XII. No larvae I of the species with membranal pores present are actually known. In larvae \( II \) \( psm \) is present on urotergites V-VII (on V it is variable), \( al \) – on urotergite II-VII (as in the subsequent instars), \( lt \) is lacking, membranal pores are present (at last in some specimens – the pores in younger instars are hardly visible). Sternal pores exist on urosternite V-VII, though on V they are variable and their number is lower than in the older instars (they are mostly distributed according to the formula /1+0/1+1/1+0+0/). In maturi juvenes pore \( psm \) is present on urotergite I-VII (as in imago), pore \( lt \) exists in most species (in \( europaeus \) it is absent), and the number of sternal pores on urosternite VII is still lower than in adults, the most common formula being /1+1/1+1//1+0+1 or 2+0+0/.

The lineation of most tergites and sternites is uniform, on urosternites IV-VII it is the same in all the species studied. Only the lineation of urosternites II-III and urotergite VII is sometimes important. Two anterior lines on urosternites II-III may be continuous (Fig. 20) or interrupted (Fig. 13) – in some species this character can be variable (e. g. in \( fjellbergi \)). Two anterior lines on urotergite VII can be medially connected (Fig. 19) or not connected (Fig. 49). Sometimes the shape of the lateral line on urosternite VII is taxonomically useful.
Fig. 4-8. *Gracilentulus europaeus*. 4 – head; 5 – mouthparts, lateral view; 6 – pseudoculus and filamento di sostegno; 7 – comb VIII; 8 – penis (4-7 – holotype, 8 – paratype from Poznań).

The shape of comb VIII (Fig. 7) is uniform in all the group and has no taxonomical value.

The female squama genitalis is of normal accentomoid type. The acro styli are pointed. Penis (Figs 8, 43, 58) is of normal type, with no additional setae and no distinct specific characters.

In the rich material of *Gracilentulus* only few males were found. They exist only in three species (*europaeus*, *corsicanus* and *orouseti*). It is thus possible that most species of "gracilis" group are parthenogenetic. Even in *europaeus* males were found only in some samples – a facultative parthenogenesis is also possible.
III. KEY TO THE SPECIES OF *GRACILENTULUS TUX.*

1. Foretarsal sensilla b' absent ........................................... 2
   – Foretarsal sensilla b' present .................................... 5
2. Sensilla c and d subequal to b .......................... *floridanus* (EWING, 1924)
   – Sensilla c and d shorter than b .......................... 3
3. Sensilla e longer than f .............................. *shipingensis* YIN, 1984
   – Sensilla e shorter than f .................................. 4
4. Sensilla f subequal to g, not reaching base of claw ........... *aokii* IMADATÉ, 1982
   – Sensilla f longer than g, exceeding base of claw ....... *maiijawensis* YIN, IMADATÉ, 1979
5. Sensilla f situated on level with e ......................... *sachikoae* IMADATÉ, 1965
   – Sensilla f situated half way between e and g ........... 6
6. Sensilla b shorter than half of c .............................. 7
   – Sensilla b longer than half of c (*"gracilis"* group) .... 8
7. Sensilla a reaching level of e; t1 with short, distinct head .... *meridianus* (CONDÉ, 1945)
   – Sensilla a exceeding level of e; t1 with long, indistinct head ... *sardinianus* NOSEK, 1979
8. Pore on laterotergite VII situated half way between A5 and P5 .... *atlantidis* sp. n.
   – Pore on laterotergite VII situated near A5 or anterior to it ... 9
9. Membrana between sternite and tergite VI with at least one pore .......... 10
   – Membrana between tergite and sternite VI with no pores ....... 14
10. Membrana between tergite and sternite VI with two pores (anterior and posterior); sensilla a' parallel-sided .................. *fjellbergi* sp. n.
    – Membrana between sternite and tergite VI with one pore (posterior); sensilla a' basally dilated .......................... 11
11. Urotergite VII with 7 (or 8), VIII with 6 anterior setae (Ac and A2 present); pore on laterotergite VII situated anteriorly to A5 ................. 12
    – Urotergite VII and VIII with 4 anterior setae (Ac and A2 absent); pore on laterotergite VII situated nearly on level of A5 ............... *catulus* sp. n.
12. Seta A5 on urotergite I absent .............................. *corsicanus* sp. n.
    – Seta A5 on urotergite I present ................................ 13
13. Anterior lines on urotergite VII not connected; foretarsal sensilla e distinctly thicker than f and g .......................... *hyleus* sp. n.
    – Anterior lines on urotergite VII connected; foretarsal sensilla e slightly thicker than f and g .................................. *orosusetti* sp. n.
14. Laterotergite VI with pore (anterior to level of A5) ....... *americanus* sp. n.
    – Laterotergite VI with no pores ................................ 11
15. Pore on laterotergite VII situated anteriorly to level of A5; anterior lines on urosternite II and II continuous .................. *europaeus* sp. n.
    – Pore on laterotergite VII situated on level of A5; anterior lines on urosternite II and III interrupted ...................... *gracilis* (BERL.)
IV. DESCRIPTIONS

Gracilentulus gracilis (Berlese 1908)

(Figs 10 - 17)

Acerentulus gracilis: Berlese 1908
Acerentulus gracilis: Tuxen 1956

Diagnosis. G. gracilis is very similar to europaecus, but differs from it in the position of laterotergal pore VII, shape of anterior lines on urosternite II and III, presence of laterotergal pore in maturus junior and the presence of larval seta in larva II.

Description. Foretarsal sensillae of external side slightly differentiated: d, e and f thinner than the remaining ones. Sensilla a long, reaching level of e; b and c subequal, slightly exceeding level of e. Sensilla t1 with elongated, indistinct head; t2 long. Sensilla a’ very long, exceeding level of α4, parallel-sided; b’ and c’ long. Seta β1 and δ5 subequal to δ2 and δ4. Claw I relatively long, TR 3.3-3.6.

Principal setae relatively long, accessory short; length ratio of P1 : P1a : P2 on mesonotum 3.2-4.0 : 1 : 4.6-5.5. Urotergite I with seta A5, VII with Ac and A2, VIII with A1.

Anterior lines on urotergite VII connected medially, on urosternite II and III distinctly interrupted. Lateral line on urosternite VII nearly straight, indistinct.

Pore on laterotergite VI absent, on VII situated nearly on level of A5. Membranal pores absent.

Comb VIII with 6-11 (mostly 8-10) teeth. Acrostyli as in Fig 15, males unknown.

Maturus junior with pore on laterotergite VII situated as in imago. Larva II with long foretarsal sensilla a, parallel-sided sensilla a’; long principal and short accessory setae; no membranal pores, and larval seta on urosternite XII present. Larva I unknown.

Dimensions (in μm)

<table>
<thead>
<tr>
<th></th>
<th>imago</th>
<th>mat.jun.</th>
<th>larva II</th>
</tr>
</thead>
<tbody>
<tr>
<td>foretarsus</td>
<td>75-79</td>
<td>63-67</td>
<td>50-55</td>
</tr>
<tr>
<td>claw</td>
<td>21-23</td>
<td>19-20</td>
<td>ca 17</td>
</tr>
<tr>
<td>pseudoculus</td>
<td>7-8</td>
<td>6-8</td>
<td>6-7</td>
</tr>
<tr>
<td>filamento di sostegno</td>
<td>11-16</td>
<td>10-12</td>
<td>10-11</td>
</tr>
<tr>
<td>mesonotal P1</td>
<td>19-23</td>
<td>19-21</td>
<td>15-17</td>
</tr>
<tr>
<td>mesonotal P1a</td>
<td>ca 6</td>
<td>ca 6</td>
<td>ca 6</td>
</tr>
<tr>
<td>mesonotal P2</td>
<td>27-32</td>
<td>22-27</td>
<td>19-21</td>
</tr>
<tr>
<td>maximum body length</td>
<td>1070</td>
<td>820</td>
<td>670</td>
</tr>
<tr>
<td>no of specimens studied</td>
<td>16</td>
<td>6</td>
<td>4</td>
</tr>
</tbody>
</table>
Chaetal variability. Imagines (16 specimens). Urotergite VII – presence of A1+A1 instead of Ac (1 sp-n), asymmetrical lack of A2 (1 sp-n); uroterg. VIII – Mc instead of M1+M1 (2 sp-ns)

Maturi juniores (6 sp-ns). Urotergite VI – Ac instead of A1+A1 (1 sp-n); uroterg. VII – asymmetrical presence of A2 and asymmetrical lack of A4 (1 sp-n); asymmetrical lack of A2 on urotergite V and its asymmetrical presence on VII (1 sp-n).

Larvae II (4 sp.) – asymmetrical lack of larval seta on urosternite XII (1 sp-n).

Material. Poland. Jarecko near Chojnice. Remnant of abandoned garden on a clearing in an oak-beech forest, rotten wood and plant debris from an old log of apple tree, 23 V 1979, 6 φ, leg. J. RAVALSKY. Rogalin near Poznań. Abandoned part of the park, in deep layer of litter, 18 IV 1972, 1 φ, leg. J. RAVALSKY. Czernia near Krzeszowice. Young beech forest with pine, linden etc. near the walls of a monastery, soil with roots. 28 IX 1978, 1 φ, leg. J. RAVALSKY.

Austria. Vienna: Leopoldsberg. Litter under Quercus pubescens, 11 V 1987. 8 φ, 6 mj, 4 lv2, leg. E. CHRISTIAN.

Remarks. G. gracilis was described by BERLESE (1908) under the name Acerentulus gracilis. It was redescribed by TUXEN (1956) (lectotype designation: TUXEN 1960). The characters of the lectotype (nr 3.5 of Berles’s collection in the Instituto di Entomologia Agraria in Firenze) agree well with the redescription given above. At present the species is known from Italy, Austria and Poland. Other data from many European countries (ALDABA 1985; CONDE 1980; CASSAGNNU & NOSEK 1969; NOSEK 1973; 1978b; TUXEN 1964; 1982), Moroccan (NOSEK 1973), Cape Province (CONDE 1955; TUXEN 1977a), Australia (TUXEN 1967) and New Zealand (TUXEN 1985); should be revised in the future. The present paper contains the revision of the Polish data (SZEPTYCKI 1969a; b) only.

Gracilentulus europaeus sp. n.

(Figs 4 - 8, 18 - 31)

Gracilensulus gracilis: Szepycki 1969a
Gracilensulus gracilis: Nosek 1973 (Polish data, partim)

Diagnosis – see gracilis.

Description. Foretarsal sensillae of external side slightly differentiated: a, c and e slightly thicker than the remaining ones. Sensilla a very long, reaching nearly base of f; b long, reaching level of β5; c slightly longer than b, exceeding base of f. Sensilla t1 with elongated, indistinct head; τ2 long. Sensilla a’ short, not reaching level of α4, parallel-sided; b’ and c’ long. Seta β1 and δ5 longer than δ2 and δ4. Claw I relatively long, TR 3.0-3.6.

Principal setae relatively long, accessory short; length ratio of P1 : P1a : P2 on mesonotum 2.8-4.8 : 1 : 3.7-6.3. Urotergite I with seta A5, VII with Ac (or A1+A1) and A2, VIII with A1.

Anterior lines on urotergite VII connected medially, on urosternite II and III continuous. Lateral line on urosternite VII straight, distinct.

Pore on laterotergite VI absent, on VII situated anterior to level of A5. Membranal pores absent.

Comb VIII with 7-13 (mostly 9-11) teeth. Squama genitalis φ as in fig. 22, penis as in Fig. 8.
Maturus junior with no pore on laterotergite VII. Larva II with long foretarsal sensilla $a$; relatively short, parallel-sided sensilla $a'$; long principal and short accessory setae, and larval seta absent. Larva I with larval seta.

### Dimensions (in $\mu$m)

<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>foretarsus</td>
<td>71-85</td>
<td>ca 72</td>
<td>66-92</td>
<td>55-58</td>
<td>45-49</td>
</tr>
<tr>
<td>claw</td>
<td>22-28</td>
<td>?</td>
<td>20-23</td>
<td>19-21</td>
<td>15-18</td>
</tr>
<tr>
<td>pseudoculus</td>
<td>6-9</td>
<td>ca 6</td>
<td>6-8</td>
<td>5-7</td>
<td>5-6</td>
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<tr>
<td>filamento di sostegno</td>
<td>11-16</td>
<td>ca 11</td>
<td>9-14</td>
<td>9-13</td>
<td>9-10</td>
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<tr>
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<td>ca 21</td>
<td>17-23</td>
<td>15-19</td>
<td>11-13</td>
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<tr>
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<td>ca 5</td>
<td>4-8</td>
<td>6-8</td>
<td>---</td>
</tr>
<tr>
<td>meso notal $P2$</td>
<td>29-35</td>
<td>ca 30</td>
<td>22-29</td>
<td>18-23</td>
<td>14-17</td>
</tr>
<tr>
<td>maximum body length</td>
<td>1180</td>
<td>?</td>
<td>1040</td>
<td>780</td>
<td>600</td>
</tr>
<tr>
<td>no of specimens studied</td>
<td>118</td>
<td>2</td>
<td>18</td>
<td>23</td>
<td>5</td>
</tr>
</tbody>
</table>

### Chaeta l variability. Imagines (118 sp-ns). Urotergite II - asymmetrical lack of $A4$ (1 sp-n); uroterg. III - asymmetrical lack of $A1$ (1 sp-n), and $A4$ (1 sp-n); uroterg. V - asymmetrical lack of $A4$ (2 sp-ns) and of $A5$ (1 sp-n); uroterg. VII - presence of $A1+A1$ instead of $Ac$ (5 sp-ns), asymmetrical lack of $A2$ (2 sp-ns), symmetrical lack of $A2$ (1 sp-n), asymmetrical lack of $A4$ (2 sp-ns); additional, asymmetrical seta on uroterg. II,III, VII and urostern. VIII (1 sp-n); $Ac$ instead of $A1+A1$ on uroterg. II, central seta instead of $I+1$ on uroterg. IX, $Pc$ on uroterg. VII and $Ia$ on urostern. VIII (1 sp-n).

Maturi juniores (19 specimens). Urotergite VI - asymmetrical presence of $A4$ (1 sp-n); uroterg. VII - asymmetrical presence of $A2$ (6 sp-ns), asymmetrical lack of $A4$ (1 sp-n); uroterg. VIII - asymmetrical lack of $A1$ (1 sp-n); urostern. VIII - presence of $Pc$ (1 sp-n).

Larvae II (23 sp-ns). Urosternite XII - asymmetrical presence of larval seta (1 sp-n).

Larvae I (5 sp-ns) - not observed.

**Holotype** (nr. 3800): **Poland.** Gólucho. Park – Arboretum, wet litter (mostly leaves) on sandy soil under dense shrubs of *Symphoricarpus* and *Lonicera*, 20 VIII 1977, leg. J. RAFALSKI.

mixed forest, wet rotten wood with leaves from old stump of an oak; 12 XIV 1984, 1 q, leg. J. RAFLSKY. 
Zawiszę near Tychy. Old park of a sanatorium, rotten wood, plant debris, remnants of fungi under the trunk of 
very old maple tree; 22 V 1986, 7 q, 2 mj, leg. J. RAFLSKY. Murcki near Katowice. Park-forest, nest of mole 
built of decaying leaves 50-60 cm deep; 21 V 1986, 9 q, 1 mj, leg. J. RAFLSKY. Katowice-Ligota. Park of the 
Franciscans monastery, litter, soil and plant-debris; 9 IV 1987, 1 q and 27 IV 1987, 1 σ, 3 q, leg. J. RAFLSKY. 

**France.** Forêt de Fontainebleau, Plaine de Chamfroy; 22 VIII 1990, 5 q, 1 mj, leg. J. BOUDINOT. 

**Portugal.** Porto. Hills S of the town, mixed forest; 27 X 1983, 7 q, 2 mj, leg. W. NIEDBALA. 

**USA.** Delaware, Willmington. Valley Garden Park, mixed forest with many climbers, litter, 8 VII 1984, 
1 q, leg. J. RAFLSKY. 

### Gracilentulus americanus sp. n. 

(Figs 32 - 36) 

**Diagnosis.** The species is very similar (in the lack of membranal pores and in the 
proportion of body setae) to gracilis and europaeus. It differs from all the species of the 
group in the presence of pore on laterotergite VI. 

**Description.** Foretarsal sensillae of external side slightly differentiated: d, e and 
* thinner than the remaining ones. Sensilla a long, reaching base of e; b reaching level of 
e; c distinctly longer than b, exceeding base of f. Sensilla t with elongated, indistinct head; 
t2 long. Sensilla a short, not reaching level of α, distinctly dilated in proximal half; b' 
and c' long. Seta βl and δ5 shorter than δ2 and δ4. Claw I relatively long; TR about 3.3. 

Principal setae relatively long, accessory short; length ratio of P1 : P1a : P2 on 

Anterior lines on urotergite VII connected medially, on urosternite II-III continuous. 
Lateral line on urosternite VII slightly flexed, distinct. 

Pore on laterotergite VI and VII present, situated anterior to level of A5. Membranal 
pores absent. 

Comb VIII with 9-10 teeth. Acrostyli (in single specimen) invisible, males and younger 
instars unknown. 

**Dimensions (in μm):** foretarsus 79, claw 24, mesonotal P1 24, P1a 5, P2 32. Body 
length about 1030. Other dimensions not taken. 

**Holotype ﬁ (nr 3925):** USA. Delaware, Willmington, Clifton Park. Old deciduous forest with oak, beech, 
Sassafras, maple, hazel. Sample of soil and litter, 24 VI 1984. leg. J. RAFLSKY. 

Only the holotype is known. 

### Gracilentulus orouseti sp. n. 

(Figs 37 - 44) 

**Diagnosis.** The species is similar to other species with one membranal pore 
(hyleus, corsicanus and catulus) but differs from them in the slightly differentiated 
foretarsal sensillae and relatively longer setae (Fig. 9).
**Description.** Foretarsal sensillae of external side slightly differentiated: \(b\), \(c\) and \(e\) slightly thicker than the remaining ones. Sensilla \(a\) long, reaching level of \(e\); \(b\) and \(c\) nearly subequal, reaching level of \(\alpha5\). Sensilla \(t1\) with short, distinct head, \(t2\) long. Sensilla \(a'\) short, not reaching level of \(\alpha4\), slightly dilated basally; \(b'\) and \(c'\) long. Setae \(\beta1\) and \(\delta5\) subequal to \(\delta2\) and \(\delta4\). Claw I relatively long, TR 2.8-3.2.

Principal and accessory setae long; length ratio of \(P1 : P1a : P2\) on mesonotum 3.0-3.5 : 1 : 4.2-4.5. Urotergite I with seta \(A5\), VII with \(Ac\) and \(A2\), VIII with \(A1\).

Anterior lines on urotergite VII connected (anterior one sometimes hardly visible), on urosternite II-III continuous. Lateral line on urosternite VII straight, distinct.

Pore on laterotergite VI absent, on VII situated slightly anterior to level of \(A5\). Membrana between urosternites and urotergites V and VI with one (posterior) pore.

Comb VIII with 7-11 teeth, acrostyli as in fig. 43, penis as in Fig. 44.

Younger instars unknown.

**Chaetal variability** – not observed.

**Dimensions** (in \(\mu m\)) (in brackets – dimensions of single specimen of preimagio): foretarsus 67-71 (64), claw 22-24 (20), pseudoculus 7-9 (8), filamento di sostegno 11-13 (10), mesonotal seta \(P1\) 21-23 (20), \(P1a\) 6-7 (6), \(P2\) 25-31 (26), maximum body length about 970 (770).

**Holotype**: Corsica. Muracciole, H-te Corse, between Vivario et Muracciole: entrance of the tunnel of Muracciole. litter and soil along the wall, 600 m asl, 5 X 1984., leg. J. OROUSSET.

**Paratypes**: Together with holotype; 2 \(\sigma\), 3 \(\varphi\), 1 pm.

**Derivatio nominis**: named in honour of Mr. J. OROUSSET, the co-worker of the Museum national d’Histoire Naturelle and eminent collector of the soil fauna.

*Gracilentulus hyleus* sp. n.

(Figs 45 - 51)

*Gracilentulus gracilis* Szeptycki 1969b (partim)

*Gracilentulus gracilis* Nosek 1973 (Polish data, partim)

**Diagnosis.** In the presence of one membranal pore and the strongly differentiated foretarsal sensillae the species in question is most similar to *corsicanus*. It differs from it in relatively shorter setae (Fig. 9) and the presence of seta \(A5\) on urotergite I.

**Description.** Foretarsal sensillae of external side distinctly differentiated: \(a\), \(c\) and \(e\) much thicker than \(b\); \(b\) thicker than \(d,f\) and \(g\). Sensilla \(a\) long, reaching base of \(e\); \(b\) exceeding base of \(e\); \(c\) distinctly longer than \(b\), exceeding base of \(f\). Sensilla \(t1\) with elongated, indistinct head; \(t2\) long. Sensilla \(a'\) short, not reaching level of \(\alpha4\), distinctly dilated in proximal half. Seta \(\beta1\) and \(\delta5\) shorter than \(\delta2\) and \(\delta4\). Claw I relatively long; TR 3.4-3.7.

Principal setae short, accessory long; length ratio of \(P1 : P1a : P2\) on mesonotum 1.8-2.4 : 1 : 2.7-3.2. Urotergite I with seta \(A5\), VII with \(Ac\) and \(A2\), VIII with \(A1\).
Anterior lines on urotergite VII not connected, on urosternites II-III continuous. Lateral line on urosternite VII straight, in- distinct (in some specimens invisible).

Pore on laterotergite VI absent, on VII situated distinctly anteriorly to level of A5. Membranae between urotergite and urosternite V and VI with one (posterior) pore.

Comb VIII with 6-11 (mostly 8) teeth. Acrostyli as in Fig. 51, males unknown.

Maturus junior with pore on laterotergite VII situated as in imago. Larva II with long foretarsal sensilla a; dilated sensilla a '; short principal and long accessory setae; posterior membranal pore present and no larval seta on urosternite XII. Larva I unknown.

**Dimensions (in μm)**

<table>
<thead>
<tr>
<th>Measurements</th>
<th>Imago</th>
<th>Mat. Jun.</th>
<th>Larva II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foretarsus</td>
<td>74-82</td>
<td>ca 66</td>
<td>ca 56</td>
</tr>
<tr>
<td>Claw</td>
<td>21-24</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td>Pseudoculus</td>
<td>6-9</td>
<td>7-8</td>
<td>ca 6</td>
</tr>
<tr>
<td>Filamento di sostegno</td>
<td>13-15</td>
<td>11-12</td>
<td>10-11</td>
</tr>
<tr>
<td>Mesonotal P1</td>
<td>15-18</td>
<td>15-17</td>
<td>12-14</td>
</tr>
<tr>
<td>Mesonotal P1a</td>
<td>6-9</td>
<td>6-7</td>
<td>6-7</td>
</tr>
<tr>
<td>Mesonotal P2</td>
<td>21-25</td>
<td>19-21</td>
<td>16-17</td>
</tr>
<tr>
<td>Maximum body length</td>
<td>1090</td>
<td>880</td>
<td>?</td>
</tr>
<tr>
<td>No of specimens studied</td>
<td>8</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

**Chaetalar variability.** Imagines (8 specimens). Urotergite V – additional (asymmetrical) seta near A4 (1 sp-n).

Maturi juniores (2 sp-ns). Urotergite VII – asymmetrical presence of A2 (1 sp-n); asymmetrical presence of A2 on urotergite VII and asymmetrical lack of A1 on VIII (1 sp-n).

Larvae II (2 sp-ns) – not observed.

**Holotype**: Poland, Skaliki Kroczyckie near Zawiercie: Kołaczyk. Beech forest with some old trees on stony. W slope, soil and litter; 11 IX 1987, leg. J. RAFAŁSKI.

**Paratypes**: Poland. Together with holotype; 1 q, 1 lv2. "Ostra Góra" reserve near Trzebinia. Stony, calcareous hill with scattered old beeches, soil with roots and litter under shrubs. 28 IV 1979, 4 q, leg. J. RAFAŁSKI. Ojcow National Park: S slope of Koronna Mt., Corylo-Poecidanetum, organic soil, 14 VI 1964, 1 q; Koronna Mt., Tilio-Carpinetum, rough humus, 2 VI 1964, 1 q; E slope of Prądnik valley, Tilio-Carpinetum, soil, 2 VI 1964, 1 mj; Sąspowska Valley, Fagetum carpaticum, litter with humus, 2 VI 1964, 1 mj, 1 lv2, leg. A. Rajska.

**Derivatio nominis**: the species was found in various types of forest, hence hyleus – forest-dwelling.
Fig. 9. Scatter diagram of the length of foretarsus and mesonotal seta P1 (lower) and P2 (upper) in *G. orouseti* (o), *corsicanus* (c) and *hyleus* (h).
Gracilentulus corsicanus sp. n.

(Figs 52 - 60)

Diagnosis – see hyleus

Description. Foretarsal sensilla of external side strongly differentiated; c and e distinctly thicker than a and b, the latter thicker than d, e and f. Sensilla a very long, exceeding level of e; c slightly shorter than b, reaching level of e (b slightly exceeding it). Sensilla t1 with long, indistinct head; t2 short. Sensilla a' long, reaching level of α4, slightly dilated basally, mostly with distinct "fissure" (artefact?). Setae β1 and δ5 subequal to δ2 and δ4. Claw I relatively long, TR 2.8-3.2.

Principal body setae relatively long, accessory short, length ratio of P1 : P1a : P2 on mesonotum 3.4-4.6 : 1 : 4.6-6.0. Seta P1a on nota short. Urotergite I with no seta A5, VII with setae Ac (or A1+A1) and A2, VIII with A1.

Anterior lines on urotergite VII not connected, on urosternites II-III continuous. Lateral line on urosternite VII straight, distinct.

Pore on laterotergite VI absent, on VII situated distinctly anterior to level of A5. Membranae between urotergites and urosternites V and VI with one (posterior) pore.

Comb VIII with 7-11 (mostly 9-10) teeth. Acrostyli as in Fig. 57, penis as in Fig. 58.

Maturi juniores with no setae A5 on urotergite I and with pore on laterotergite VII situated as in imago. Larvae I with long foretarsal sensilla a; thick sensilla c and e; dilated a'; long principal and short accessory setae; posterior membranal pore present and no larval setae. Larvae I unknown.

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>
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<td>73-82</td>
<td>64-70</td>
<td>58-67</td>
<td>50-56</td>
</tr>
<tr>
<td>claw</td>
<td>23-27</td>
<td>23</td>
<td>21-23</td>
<td>?</td>
</tr>
<tr>
<td>pseudoculus</td>
<td>7-9</td>
<td>7-9</td>
<td>6-9</td>
<td>6</td>
</tr>
<tr>
<td>filamento di sostegno</td>
<td>11-14</td>
<td>9-12</td>
<td>11-13</td>
<td>9-10</td>
</tr>
<tr>
<td>mesonotal P1</td>
<td>19-24</td>
<td>17-19</td>
<td>18-21</td>
<td>13-15</td>
</tr>
<tr>
<td>mesonotal P1a</td>
<td>5-6</td>
<td>5-6</td>
<td>4-6</td>
<td>4-5</td>
</tr>
<tr>
<td>mesonotal P2.</td>
<td>30-34</td>
<td>23-28</td>
<td>23-28</td>
<td>18-19</td>
</tr>
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<td>maximum body length</td>
<td>1200</td>
<td>1050</td>
<td>970</td>
<td>650</td>
</tr>
<tr>
<td>no of specimens</td>
<td>18</td>
<td>7</td>
<td>10</td>
<td>3</td>
</tr>
</tbody>
</table>

Maturi juniores (10 sp-ns). Urotergite VII – asymmetrical presence of A2; presence of A1+AI on uroterg. VII and M1+MI on VIII instead of Ac and Mc, respectively (1 sp-n).

Preimagines (7 sp-ns) and larvae II (3 sp-ns) – not observed.

Holotype ♀ (nr 4287): Corsica, Muracciole, H-ile Corse, between Vivario et Muracciole: entrance of the tunnel of Muracciole, litter and soil along the wall, 600 m asl, 5 X 1984., leg. J. OROSSET.

Paratypes: Together with holotype; 4 ♂, 14 ♀, 7 pm, 10 mj, 3 lv2.

Gracilentulus catulus sp. n.

(Figs 61 - 66)

Gracilentulus gracilis: Szeptycki 1969b (partim)
Gracilentulus gracilis: Nosek 1973 (Polish data, partim)

Diagnosis. It differs from other similar species (orosseti, hyleus and corsicanus) in the lack of some "A" setae on urotergites VII and VIII, very short body setae, and the position of laterotergal pore VII.

Description. Foretarsal sensillae of external side distinctly differentiated: c and e thicker than the remaining ones. Sensilla a relatively short, reaching level of γ3; b exceeding level of e, c distinctly longer than b, exceeding level of f. Sensilla \( t' \) with elongated, indistinct head; \( t2 \) long. Sensilla a’ short, not reaching level of α4, dilated basally; b’ and c’ long. Seta β1 shorter than δ2, δ5 subequal to δ4. Claw I relatively long; TR about 3.4.

Principal and accessory setae short, length ratio of \( P1 : P1\alpha : P2 \) on mesonotum 2.9-3.1 : 1 : 3.5-4.2. Urotergite I with seta A5, VII with no setae Ac (or A1) and A2, VIII with no A1.

Anterior lines on urotergite VII connected, on urosternites II-III interrupted. Lateral line on urosternite VII straight, distinct.

Pore on laterotergite VI absent, on VII situated slightly posterior to level of A5. Membranae between urotergite and urosternite V and VI with one (posterior) pore.

Comb VIII with about 10 teeth. Acrostyli as in fig. 66, males unknown.

Younger instars unknown.

Dimensions (in μm): foretarsus 71-75, claw about 22, mesonotal P1 15-18, P1α 5-6, P2 20-21, pseudoculus 7-8, filamento di sostegno 13-14, body length not taken.

Chaetal variability – not observed.

Holotype ♀ (nr 3884): Poland. Wdzydze Lake, shore near the mouth of the channel of Wda, hollow in old Salix alba, rotten wood, 24 V 1979, leg. J. RAFAŁSKI.


Not included into the type material: Zakopane, IV 1928, 1 ♀, leg. J. STACH.

Derivatio nominis: catulus (lat.) – young animal, especially dog or cat.
**Gracilentulus fjellbergi** sp.n.  
(Figs 67 - 75)

**Diagnosis.** The new species differs from all species of the group in the large body dimensions, undifferentiated foretarsal sensillae and the presence of anterior membranal pore.

**Description.** Foretarsal sensillae of external side not differentiated: all sensillae thin. Sensilla a long, reaching base of e; b long, reaching level of e; c distinctly longer than b, reaching level of f. Sensilla t1 with rounded, distinct head; t2 long. Sensilla a' long, reaching nearly level of a4, slender, parallel-sided; b' and c' very long. Setae β1 and δ5 longer than δ2 and δ4. Claw I relatively long; TR 3.1-3.7.

Principal and accessory setae long; length ratio of P1 : P1a : P2 on mesonotum 2.2-2.8 : 1 : 2.5-3.4. Urotergite I with seta A5, VII with Ac (or A1+AI) and A2, VIII with A1. Seta M1 on urotergite VIII very variable.

Anterior lines on urotergite VII not connected, on urosternites II and III mostly continuous (in some specimens interrupted). Lateral line on urosternite VII straight.

Pore on laterotergite VI absent, on VII situated anteriorly to level of A5. Membranae between urotergites and urosternites V and VI with two (anterior and posterior) pores.

Comb VIII with 7-13 (mostly 10-11) teeth. Acrostyli as in Fig. 74, males unknown.

Maturus junior with pore on laterotergite VII situated as in imago. Larva II with long foretarsal sensilla a; long, parallel-sided sensilla a’; long principal and accessory setae, and no larval seta on urosternite XII. Larva I unknown.

**Dimensions** (in μm)

<table>
<thead>
<tr>
<th></th>
<th>imago</th>
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<th>larva II</th>
</tr>
</thead>
<tbody>
<tr>
<td>foretarsus</td>
<td>81-94</td>
<td>73-74</td>
<td>59-62</td>
</tr>
<tr>
<td>claw</td>
<td>24-28</td>
<td>22-23</td>
<td>?</td>
</tr>
<tr>
<td>pseudoculus</td>
<td>6-8</td>
<td>6-7</td>
<td>ca 6</td>
</tr>
<tr>
<td>filamento di sostegno</td>
<td>12-16</td>
<td>ca 13</td>
<td>?</td>
</tr>
<tr>
<td>mesonotal P1</td>
<td>28-35</td>
<td>24-28</td>
<td>ca 21</td>
</tr>
<tr>
<td>mesonotal P1a</td>
<td>11-15</td>
<td>9-13</td>
<td>9-1</td>
</tr>
<tr>
<td>mesonotal P2</td>
<td>35-41</td>
<td>31-34</td>
<td>ca 26</td>
</tr>
<tr>
<td>maximum body length</td>
<td>1180</td>
<td>970</td>
<td>750</td>
</tr>
<tr>
<td>no of specimens studied</td>
<td>43</td>
<td>8</td>
<td>2</td>
</tr>
</tbody>
</table>

**Chaetal variability.** Imagines (44 specimens). Urotergite IV – asymmetrical lack of A4 (2 sp-ns), uroterg. V – ditto (1 sp-n), uroterg. VI – asymmetrical lack of A1 (1 sp-n); uroterg. VII – presence of A1+A1 instead of Ac (9 sp-ns), asymmetrical lack of A2 (2 sp-ns), symmetrical lack of A2 (2 sp-ns); uroterg. VIII – Mc instead of M1+M1 (15 sp-ns), presence of additional seta in row "A" (1 sp-n); asymmetrical lack of A1 on uroterg.
Gracilentulus of "gracilis" group

IV and A2 on VII (1 sp-n); asymmetrical lack of A2 on uroterg. VII and asymmetrical lack of $P2a$ on urostern. VII (1 sp-n).

Maturi junioria (9 sp-n). Urotergite VII – presence of $A1+A1$ instead of $Ac$ (3 sp-n), asymmetrical presence of A2 (2 sp-n).

Larvae II (2 sp-n) – not observed

Paratypes: Portugal. Together with holotype, 23 φ, 7 mj.


Derivation nominis: named in honour of my friend and eminent collembologist, Dr Arne Fjellberg from Tromsø.

Gracilentulus atlantidis sp. n.

(Figs 76 - 84)

Diagnosis. The new species differs from all the species of the group in the peculiar position of laterotergal pore VII, relatively short foretarsal sensillae, and the shape of lateral line on urosternite VII.

Description. Foretarsal sensillae of external side slightly differentiated: $d$, $e$ and $f$ thinner than the remaining ones. Sensilla $a$ short, not reaching level of $\gamma3$; $b$ short, reaching level of $\gamma3$, slightly shorter than $c$; $c$ short, reaching level of $e$. Sensilla $t1$ with rounded, distinct head; $t2$ short. Sensilla $a'$ short, not reaching level of $a4$, distinctly dilated in proximal half; $b'$ and $c'$ short. Seta $\beta1$ and $\delta5$ shorter than $\delta2$ and $\delta4$. Claw I relatively short; TR 3.8-4.4.


Anterior lines on urotergite VII not connected, on urosternites II and III interrupted. Lateral line on urosternite VII strongly flexed, V-shaped, distinct.

Pore on laterotergite VI absent, on VII situated half way between $A5$ and $P5$. Membranae between urotergites and urosternites V and VI with one (posterior) pore.

Comb VIII with 7-11 (mostly 8-10) teeth, acrostyli as in fig. 82. Males unknown.

Maturus junior with pore on laterotergite VII situated as in imago. Larva II with short foretarsal sensilla $a$; dilated sensilla $a'$; short principal and accessory setae; posterior membranal pore present, and with no larval seta on urosternite XII. Larva I unknown.
**Dimensions (in µm)**

<table>
<thead>
<tr>
<th></th>
<th>imago</th>
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<th>larva II</th>
</tr>
</thead>
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<td>66-74</td>
<td>55-58</td>
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<tr>
<td>claw</td>
<td>19-22</td>
<td>17-20</td>
<td>15-17</td>
</tr>
<tr>
<td>pseudoculus</td>
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<td>filamento di sostegno</td>
<td>12-16</td>
<td>11-14</td>
<td>10-12</td>
</tr>
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<td>15-19</td>
<td>14-17</td>
<td>12-15</td>
</tr>
<tr>
<td>mesonotal PIa</td>
<td>6-8</td>
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<td>5-6</td>
</tr>
<tr>
<td>mesonotal P2</td>
<td>23-28</td>
<td>19-25</td>
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<td>no of specimens studied</td>
<td>43</td>
<td>8</td>
<td>6</td>
</tr>
</tbody>
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**Chaetal variability.** Imagines (41 specimens). Urotergite VII — asymmetrical lack of A2 (1 sp-n), lack of Ac and asymmetrical lack of A2 (1 sp-n), additional seta between A4 and A5 (1 sp-n); uroterg. VIII — seta Mc instead of MI+MI (2 sp-ns).

Mature juniories (7 sp-ns). Urotergite VII — lack of Ac and asymmetrical presence of A2 (1 sp-n).

Larvae II (6 sp-ns) — not observed.

**Holotype** ♀ (nr 4000): **Canary Islands**. Tenerife: Mesa de Tejina. Litter and soil under rosettes of big thistles, expanded plateau, 580 m asl; 21 VII 1987, leg. A. Fjellberg.


**Portugal.** Porto. Hills S of the town, mixed forest; 27 X 1983, 1 ♀, 1 ♀, 4 lv2, leg. W. Niedbała.

**Derivatio nominis**: named after the mythical land of Atlantis.

**REFERENCES**


Fig. 10-17. *Gracilentulus gracilis*. 10 – foretarsus, external view; 11 – foretarsus, internal view; 12 – foretarsal sensilla *a*, dorsal view; 13 – anterior lines on urosternite III; 14 – antero-lateral part of abdominal segment VII; 15 – acrostylus; 16 – foretarsus of larva II, external view; 17 – foretarsus of larva II, internal view (10-15 – specimens from Jarczewo, 16-17 – specimen from Vienna).
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Fig. 70-76. *Gracilentulus fjellbergi*. 70 – foretarsus, external view; 71 – foretarsus, internal view; 72 – foretarsal sensilla *a*, dorsal view; 73 – lateral part of abdominal segment VI; 74 – lateral part of abdominal segment VII; 75 – acrostylius; 76 – foretarsus of larva II, external view (69, 70, 72, 73 – holotype, other – paratypes from Porto).
Gracilentulus of "gracilis" group

Fig. 77-85. Gracilentulus atlantidis. 77 – foretarsus, external view; 78 – foretarsus, internal view; 79 – foretarsal sensilla a', dorsal view; 80 – mesonotum; 81 – urotergite VII; 82 – lateral part of abdominal segment VII; 83 – acrostyle; 84 – foretarsus of larva II, external view; 85 – foretarsus of larva II, internal view (76, 77, 79-81 – holotype, other – paratypes from Tenerife).