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Previous volumes (2010-2020): 250 € / year (4 issues)
Acarologia, CBGP, CS 30016, 34988 MONTFERRIER-sur-LEZ Cedex, France
ISSN 0044-586X (print), ISSN 2107-7207 (electronic)

The digitalization of Acarologia papers prior to 2000 was supported by Agropolis Fondation under the reference ID 1500-024 through the « Investissements d’avenir » programme (Labex Agro: ANR-10-LABX-0001-01)

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THREE NEW SPECIES OF THE GENUS PROZERCON SELLNICK
(ACARI, ZERCONIDAE) FROM TURKEY

by Raşit URHAN * and Nusret AYYILDIZ **

ABSTRACT: Three new species, Prozercon (Prozercon) turcicus, P. (P.) luxtoni and P. (P.) boyacii, are described from Turkey.

The genus Prozercon Sellnick, 1943 is considered to be Holarctic in distribution (Balan, 1992). Of the 23 species known, only one, Prozercon (P.) tragardhi, has previously been recorded from Turkey (URHAN & AYYILDIZ, 1992).

In this paper, three new species of Prozercon are described from the material collected during the course of a study on the zerconid mites of Artvin province, Turkey. Morphological terminology follows that used by Sellnick (1958) and Blaszak (1974). Type material is deposited in the senior author’s collection.

LIST OF LOCALITIES

08-03-04: Turkey, Artvin, Arhavi, 10 m, 28 July 1993. — Sample from moss pads on tree in garden (mostly Corylus avellana).
08-03-15: Turkey, Artvin, about 10 km W Arhavi, 10 m, 28 July 1993. — Sample from litter and soil underlying Dryopteris sp. in garden.
08-03-29: Turkey, Artvin, Arhavi, Derecik village, 190 m, 28 July 1993. — Sample from litter and soil underlying Corylus avellana in garden.
08-04-16: Turkey, Artvin, Borçka, Demirciler district, 150 m, 17 June 1993. — Sample from litter and soil from a mixed forest (mostly Picea orientalis and Castanea sativa).
08-05-21: Turkey, Artvin, Hopa, Sarp village, 60 m, 27 July 1993. — Sample from litter and soil underlying Ulmus glabra.

Under the species descriptions, only the sample code number is given, except in the case of the type locality.

Family ZERCONIDAE Berlese, 1892
Genus Prozercon Sellnick, 1943

Key to the known species of the genus Prozercon:

2 (3). All podonotal setae smooth except i1 and i5; seta S1 smooth .......... P. lutulentus Halaskova, 1963.
3 (2). All podonotal setae plumose except i5; seta S1 plumose ............ P. halaskovae Petrova, 1977.

* Department of Biology, Kazım Karabekir Education Faculty, Atatürk University, 25240 Erzurum, Turkey.
** Department of Biology, Faculty of Science and Letters, Atatürk University, 25240 Erzurum, Turkey.

Acarologia, t. XXXVII, fasc. 4, 1996.
4 (1). On the peritremal shield seta p1 smooth. 

5 (6). The two marginal cavities are much larger than those in the middle. - P. sellnickii Halaska, 1963.

6 (5). All cavities of same size.

7 (18). All podonotal setae plumose, except i2.

8 (13). Seta R1 plumose.


10 (9). Setae R2-R8 plumose.

11 (12). Distance between setae L1-L4 twice that between L1-L2; pore P0 lies outside the line connecting setae Z3-Z4, shifted towards seta Z4; dorsal cavities distinct. - P. ornatus (Berlese, 1904).

12 (11). Distance between setae L1-L4 almost equal or a little longer than L1-L2; pore P0 lies inside the line connecting setae Z3-Z4, shifted towards seta Z4; dorsal cavities indistinct. - P. escolai Moraza, 1988.

13 (8). Seta R1 smooth.


15 (14). Seta S1 plumose.

16 (17). Pore P0 lies outside the line connecting setae S1-Z2; seta Z2 not reaching margin of opisthontum. - P. tragarthi (Halbert, 1923).

17 (16). Pore P0 lies inside the line connecting setae Z1-Z2; seta Z2 reaching margin of opisthontum. - P. sataplae Petrova, 1977.

18 (7). Majority of the podonotal setae of rows i, z and ss smooth.

19 (32). Podonotal setae in rows i, z and ss smooth except i2.

20 (27). Seta S3 smooth.


22 (21). Setae R1-R2 plumose. - P. boyacii sp. n.

23 (24). Setae I1-I4 and Z1-Z4 long; pore P0 lying on line connecting setae Z4-S2, shifted towards setae Z4. - P. carpathicus Halaska, 1963.

24 (23). Setae I1-I4 and Z1-Z4 short; pore P0 lying on line connecting setae Z4-I2, shifted towards setae Z4. - P. luxtoni sp. n.


26 (25). Setae I1-I2 and Z1-Z2 plumose; pore P0 lying on line connecting setae Z3-I5. - P. tureicus sp. n.

27 (20). Seta S4 smooth.


32 (19). In addition to i1, one or more pairs of podonotal setae in i, z, and s rows plumose.


34 (33). Seta R1 smooth.

35 (38). Lateral ends of peritremal shield reaching setae R3 or R4.


37 (36). Seta i2 plumose; setae S2-S4 similar in length. - P. carpathicus Balan & Sergienko, 1990.


39 (40). Seta S1 smooth. - P. fimbriatus (C. L. Koch, 1839).

40 (39). Seta S1 plumose.


42 (41). Seta s4 plumose; base of seta Z1 nearer to anterior edge of opisthontum than seta S1.


Prozercon (Prozercon) tucicus sp. nov. 

(Fig. 1 A–F)

Female (Fig. 1 A, B). — Length of idiosoma (excluding gnathosoma) in holotype 340 μm, width 265 μm. Measurement of 61 paratypes; length 338 (333–347) μm, width 265 (262–269) μm. Dorsal setae (Fig. 1 A). — On the podonotum setae i1, r1–r7 are plumose, setae s5 and z2 are delicately pilose. Remaining setae of the podonotum short and smooth. Opisthontum with all setae of I row plumose. Setae I1–I2 do not reach the insertion of next setae. Setae I5 lie 75 μm from one another. Setae Z1–Z4 similar to seta I1, not reaching insertion.
FIG. 1: Prozercon (P.) tureius sp. nov.
A, B. — Female idiosoma, dorsum (A) and venter (B). C, D. — Male idiosoma, dorsum (C) and venter (D). E. — Deutonymph idiosoma, dorsum. F. — Protonymph idiosoma, dorsum.
of next setae. Seta $Z_2$ short and smooth. Distance between seta $Z_5$ and $I_6$ 31 μm. Setae $S_1$-$S_3$ short and smooth. Setae $S_3$ and $S_4$ similar to seta $I_6$ and extending by more than half of its length over the margin of the opisthonotum. All marginal setae of opisthonotum short and thorn-like. Lengths of opisthonotal setae and distance between setae within longitudinal rows as follows:

<table>
<thead>
<tr>
<th>Seta</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>$S_1$</td>
<td>16 $Z_1$-20</td>
</tr>
<tr>
<td>20</td>
<td>24 58</td>
</tr>
<tr>
<td>$S_2$</td>
<td>24 $Z_2$-20</td>
</tr>
<tr>
<td>41</td>
<td>27 24</td>
</tr>
<tr>
<td>$S_3$</td>
<td>24 $Z_3$-20</td>
</tr>
<tr>
<td>41</td>
<td>24 17</td>
</tr>
<tr>
<td>$S_4$</td>
<td>31 $Z_4$-17</td>
</tr>
<tr>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>$Z_5$</td>
<td>14 $I_5$-14</td>
</tr>
</tbody>
</table>

Pore $p_{o_1}$ is located posterior to the insertion of seta $s_1$. Pore $p_{o_3}$ lies posterior to a line connecting setae $i_4$-$s_3$. Pore $p_{o_4}$ lies anterior to the insertion of seta $Z_1$. Pore $p_{o_2}$ lies on the line connecting setae $S_1$-$Z_2$. Pore $p_{o_3}$ lies on the line connecting setae $Z_3$-$I_5$, nearer to $Z_3$. Pore $p_{o_4}$ lies on the line connecting setae $Z_4$-$S_4$.

Ornamentation of dorsal shields as shown in Fig. 1 A.

Chaetotaxy and shape of peritremal shield typical of genus. Adgenital shields and pores $g v_2$ absent. Two setae located on the anterior margin of ventro-anal shield (Fig. 1 B).

**Male** (Fig. 1 C, D). — Idiosoma (excluding gnathosoma) in 32 specimens 272 (265-276) μm long, 218 (215-220) μm wide. Setae, pores and sculpturing pattern on podo- and opisthonotum as in female. Distances between setae $I_4$-$I_6$ and $Z_5$-$I_6$ are 58 μm and 24 μm, respectively. Lengths of opisthonotal setae and distance between setae within longitudinal rows as follows:

<table>
<thead>
<tr>
<th>Seta</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>$S_1$</td>
<td>16 $Z_1$-14</td>
</tr>
<tr>
<td>20</td>
<td>19 42</td>
</tr>
<tr>
<td>$S_2$</td>
<td>10 $Z_2$-14</td>
</tr>
<tr>
<td>31</td>
<td>19 19</td>
</tr>
<tr>
<td>$S_3$</td>
<td>25 $Z_3$-12</td>
</tr>
<tr>
<td>35</td>
<td>18 14</td>
</tr>
<tr>
<td>$S_4$</td>
<td>25 $Z_4$-10</td>
</tr>
<tr>
<td>32</td>
<td>15</td>
</tr>
<tr>
<td>$Z_5$</td>
<td>12 $I_5$-12</td>
</tr>
<tr>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>$I_6$</td>
<td>26</td>
</tr>
</tbody>
</table>

**Deutonymph** (Fig. 1 E). — Length of idiosoma (excluding gnathosoma) in 6 paratypes 288 (286-289) μm, width 225 (218-231) μm. Podonotum with setae $i_1$, $i_3$, $r_1$, $r_4$, $r_6$ and $r_7$ plumose. Remaining setae of podonotum short and smooth. Opisthonotal setae $I_4$-$I_6$, $Z_2$ and $R_1$-$R_5$ short and smooth; remaining setae of opisthonotum long and plumose. Seta $I_4$ lie 60 μm from one another. Seta $Z_4$ extending beyond margin of opisthonotum. Distance between seta $Z_4$ and $I_6$ 21 μm. Setae $S_2$-$S_4$ similar to seta $I_6$. Position of pores on the podo- and opisthonotum same as in adult stage. Lengths of opisthonotal setae and distance between setae within longitudinal rows as follows:

<table>
<thead>
<tr>
<th>Seta</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>$S_1$</td>
<td>16 $Z_1$-12</td>
</tr>
<tr>
<td>20</td>
<td>22 37</td>
</tr>
<tr>
<td>$S_2$</td>
<td>27 $Z_2$-14</td>
</tr>
<tr>
<td>31</td>
<td>24 19</td>
</tr>
<tr>
<td>$S_3$</td>
<td>29 $Z_3$-17</td>
</tr>
<tr>
<td>39</td>
<td>21 17</td>
</tr>
<tr>
<td>$S_4$</td>
<td>29 $Z_4$-29</td>
</tr>
<tr>
<td>29</td>
<td>22</td>
</tr>
<tr>
<td>$Z_5$</td>
<td>7 $I_5$-7</td>
</tr>
<tr>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>$I_6$</td>
<td>26</td>
</tr>
</tbody>
</table>

**Protonymph** (Fig. 1 F). — Length of idiosoma (excluding gnathosoma) in 2 paratypes 223 (201-245) μm, width 167 (153-180) μm. Podonotum with setae $i_1$, $i_3$, $s_4$, $s_5$, and $r_3$ plumose; remaining setae of podonotum short and smooth. Opisthonotal setae $I_4$-$I_6$, $Z_3$-$Z_5$, and $Z_5$ short and smooth; remaining setae of opisthonotum plumose. Distance between setae $I_4$-$I_6$ 50 μm. Lengths of opisthonotal setae and distance between setae within longitudinal rows as follows:
Material examined. — Holotype: female. No. 08-05-21: Turkey, Artvin, Hopa, Sarp Village, 60 m, 27 July 1993. Sample from litter and soil underlying Ulmus glabra. Paratypes 9 females, 8 males, 4 deutonymphs, 2 protonymphs, from same sample; other paratypes from: 08-03-15, 40 females, 18 males, 2 deutonymphs: 08-03-29, 3 females, 4 males; 08-04-16, 9 females, 2 males.

Remarks. — This new species is closely related to Prozercon (Prozercon) ukrainicus Balan, 1991, from which it can be easily distinguished by the following features:

Prozercon (P.) turcicus sp. nov.
1. Setae z₂ and s₃ delicately pilose.
2. Seta r₂ plumose.
3. Setae I₁-I₂ and Z₁-Z₂ plumose.
4. Seta Z₃ smooth.
5. Pore Po₃ lying on line connecting setae Z₃-I₃.
6. Pore Po₄ lying on line connecting setae Z₄-S₄.
7. Lateral ends of peritremal shield reaching seta R₄.

Prozercon (P.) ukrainicus Balan, 1991.
1. Setae z₂ and s₃ smooth.
2. Seta r₂ smooth.
4. Seta Z₃ plumose.
5. Pore Po₃ lying outside line connecting setae Z₃-Z₄.
6. Pore Po₄ situated inside to the insertion of seta S₄.
7. Lateral ends of peritremal shield reaching seta R₇ or R₈.

Etymology. — The species is named after the country in which it was found, Turkey.

Prozercon (Prozercon) luxtoni sp. nov.

(Fig. 2 A–E)

Female (Fig. 2 A, B). — Length of idiosoma (excluding gnathosoma) in holotype 316 μm, width 242 μm. Measurement of 9 paratypes: length 313 (310–316) μm, width 238 (228–245) μm. Dorsal setae (Fig. 2 A). — Podonotal setae i₂, r₁–r₇ long and plumose, seta r₂ shorter and more delicately plumose than others. Remaining setae of podonotum short and smooth. Opisthonotum with setae I₁–I₅ pilose, not reaching insertions of next setae. Setae I₆ long and plumose, 68 μm from each other. Setae Z₁–Z₄ similar to seta I₁. Seta Z₅ plumose, distance between Z₅ and I₅ is 27 μm. Setae S₁–S₄ short and smooth. Setae S₅–S₄ similar to I₆, extending by more than half of their length over the margin of the opisthonotum. All marginal setae of opisthonotum short and thorn-like. Length of opisthonotal setae and distances between setae within longitudinal rows as follows:

Pore Po₁ lies under the insertion of seta s₁. Pore Po₂ lies posterior to line connecting setae i₁–s₃. Pore Po₃ lies inside the line connecting setae s₄–s₅. Pore Po₄ lies anterior to insertion of seta Z₁. Pore Po₅ lies on line connecting setae S₁–Z₁ nearer to S₁. Pore Po₆ lies on line connecting setae Z₄–I₂, nearer to Z₄. Pore Po₇ is situated interior to insertion of seta S₄.

Ornamentation of dorsal shields as shown in Fig. 2 A.
Fig. 2: *Prozercon* (P.) *luxtoni* sp. nov.

A, B. — Female idiosoma, dorsum (A) and venter (B). C, D. — Male idiosoma, dorsum (C) and venter (D). E. — Deutonymph, dorsal idiosoma.
Chaetotaxy and shape of peritremal shield typical of genus. Adgenital shields and pores gv2 absent. Two setae located on anterior margin of ventral anal shield (Fig. 2 B).

**Male** (Fig. 2 C, D). — Idiosoma (excluding gnathosoma) in 7 specimens 260 (252–272) μm long, 202 (197–211) μm wide. Setae, pores and sculpturing pattern on the podo- and opisthonotum as in female. Setae I₆ lying 60 μm distant from one another. Distance between seta Z₅ and I₆ 20 μm.

Length of opisthonotal setae and distances between setae within longitudinal rows as follows:

<table>
<thead>
<tr>
<th>S1-4</th>
<th>Z1-10</th>
<th>I1-10</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>27</td>
<td>42</td>
</tr>
<tr>
<td>S2-7</td>
<td>Z2-10</td>
<td>I2-10</td>
</tr>
<tr>
<td>31</td>
<td>18</td>
<td>17</td>
</tr>
<tr>
<td>S3-23</td>
<td>Z3-7</td>
<td>I3-10</td>
</tr>
<tr>
<td>31</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>S4-23</td>
<td>Z4-7</td>
<td>I4-7</td>
</tr>
<tr>
<td>20</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Z5-10</td>
<td>I5-7</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I6-20</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Deutonymph** (Fig. 2 E). — Length of idiosoma (excluding gnathosoma) in 1 paratype 255 μm, width 214 μm. Podonotal setae i₁, r₁ and r₅-r₇ plumose, seta r₃ shorter and more delicately plumose than others; remaining setae of podonotum short and smooth. Opisthonotum with setae I₆, Z₃ and S₇-S₉ long and plumose, remaining setae short and smooth. Distances between setae I₁-I₄ and Z₅-I₆ are 58 μm and 20 μm, respectively. Lengths of opisthonotal setae and distances between setae within longitudinal rows as follows:

<table>
<thead>
<tr>
<th>S1-4</th>
<th>Z1-7</th>
<th>I1-10</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>34</td>
<td>34</td>
</tr>
<tr>
<td>S2-27</td>
<td>Z2-7</td>
<td>I2-7</td>
</tr>
<tr>
<td>31</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>S3-27</td>
<td>Z3-7</td>
<td>I3-7</td>
</tr>
<tr>
<td>31</td>
<td>14</td>
<td>10</td>
</tr>
<tr>
<td>S4-27</td>
<td>Z4-7</td>
<td>I4-7</td>
</tr>
<tr>
<td>14</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Z5-10</td>
<td>I5-7</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I6-20</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Material examined.** — Holotype: female. No. 08-05-21: Turkey, Artvin, Hopa, Sarp Village, 60 m, 27 July 1993. Sample from litter and soil underlying Ulmus glabra. Paratypes: 9 females, 7 males, 1 deutonymph, from same sample.

**Remarks.** — This new species is closely related to Prozercon (Prozercon) carsticus Halaskova, 1963, from which it can be easily distinguished by the following features:

- Prozercon (P.) luxtoni sp. nov.
  1. Seta r₂ delicately plumose.
  2. Seta Z₁ is nearer to anterior edge of opisthonotum than seta S₁.
  3. All the setae in rows I and Z are short.
  4. Pore Po₁ lies nearly above the insertion of seta Z₁.
  5. Pore Po₂ lies on line connecting setae S₁-Z₁.
  6. Pore Po₃ lies on line connecting setae Z₁-I₂ nearer to Z₄.
  7. Opisthonotum covered with small, distinct spots.

- Prozercon (P.) carsticus Halaskova, 1963.
  1. Seta r₂ smooth.
  2. Seta Z₁ on the same level as seta S₁.
  3. All the setae in rows I and Z are long.
  4. Pore Po₁ lies inside of the insertion seta Z₁.
  5. Pore Po₂ lies on the line connecting setae S₁-Z₂.
  6. Pore Po₃ lies on the line connecting setae Z₂-S₃ nearer to Z₄.
  7. Opisthonotum covered with irregular areas.

**Etymology.** — This species is named in honour of Dr Malcolm LUXTON (Great Britain).

**Prozercon (Prozercon) boyacii** sp. nov.

(Fig. 3 A, B)

**Female.** — Length of idiosoma (excluding gnathosoma) in holotype 306 μm, width 218 μm. Measurements of 2 paratypes: length 292 (280–303) μm, width 228 μm. Dorsal setae (Fig. 3 A). — Podonotum with setae i₁ and r₁-r₇ are plumose, remaining setae smooth. Opisthonotal setae I₁-I₄ and Z₁-Z₄ plumose. Seta I₃ not reaching base of seta I₄. Setae
I6 long and plumose, 65 \( \mu \text{m} \) distant from one another. Seta Z3 not reaching base of seta Z4. Seta Z5 plumose, distance between seta Z5 and I6 24 \( \mu \text{m} \). Setae S1-S4 short and smooth. Seta S4 similar to seta I6. Marginal row of opisthontom with 8 setae; R1-R5 plumose, remaining setae short and thorn-like. Lengths of opisthontal setae and distance between setae within longitudinal rows as follows:

\[
\begin{array}{cccc}
S_1 & Z_1 & 10 & I_1 \\
20 & 37 & 48 \\
S_2 & Z_2 & 10 & I_2 \\
27 & 27 & 24 \\
S_3 & Z_3 & 10 & I_3 \\
21 & 17 & 14 \\
S_4 & Z_4 & 10 & I_4 \\
20 & 10 \\
Z_5 & I_5 & 7 \\
20 & \\
I_6 & 24 \\
\end{array}
\]

Pore p01 located posterior to insertion of seta s1. Pore p02 lies on line connecting setae i4-s3. Pore p03 lies inside line connecting setae s4-s5. Pore Po1 located above the insertion of Z1. Pore Po2 lies on line connecting setae S1-Z2, shifted towards seta S1. Pore Po3 lies on line connecting setae Z4-I2, shifted towards seta Z4. Pore Po4 lies on line connecting setae Z4-Z5.

Ornamentation of dorsal shields as shown in Fig. 3 A.

Chaetotaxy and shape of peritremal shield typical of genus. Adgenital shields and pores gv2 absent. Two setae located on anterior margin of the ventro-anal shield (Fig. 3 B).

Material examined. — Holotype: female. No. 08-03-04: Turkey, Artvin, Arhavi, 10 m, 28 July 1993. Sample from moss pads on tree in garden (mostly Corylus avellana). Paratypes: 2 females from same sample.

Remarks. — This species resembles Prozercon (Prozercon) kochi Sellnick, 1943, from which it differs by the following features:

Prozercon (P.) boyacii sp. nov.
1. Setae R2-R4 plumose.
2. Setae I1-I2 and Z1-Z2 plumose.
3. Seta r2 plumose.
5. Pore Po3 lies on line connecting setae Z4-I2, shifted towards seta Z4.
Prozercon (P.) kochi Sellnick, 1943.

1. Setae R₁-R₅ smooth.
2. Seta I₁-I₂ and Z₁-Z₂ smooth.
3. Seta r₂ smooth.
4. Seta I₃ reaches to base of seta I₄.
5. Pore Po₃ is located outside the insertion of setae Z₄.

Etymology. — This species is named after Yunus Ömer Boyacı (Süleyman Demirel University, Turkey) our friend and colleague.

ACKNOWLEDGEMENTS

This study was supported by the Research Fund of Atatürk University, Project no. 1993/32.

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