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Previous volumes (2010-2017): 250 € / year (4 issues)
Acarologia, CBGP, CS 30016, 34988 MONTFERRIER-sur-LEZ Cedex, France

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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AUSTROTENERIFFIA KHORRAMABADIENSIS N. SP. (ACARI: TENERIFFIIDAE): A NEW SPECIES FROM SOUTHWESTERN IRAN, WITH A DESCRIPTION OF THE MALE

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(Received 26 August 2013; accepted 23 October 2013; published online 28 March 2014)

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ABSTRACT — A new mite species belonging to the family Teneriffiidae, Austroteneriffia khorramabadiensis n. sp., from southwestern Iran (Khorramabad vicinity, Lorestan province) is described and illustrated based on females and males sampled from the soil and litter associated with oak trees. A key to adult females of the genus Austroteneriffia is also provided based on the original description and the literature.

KEYWORDS — Trombidiformes; Anystoidea; soil mite; predatory mite; oak; Iran

INTRODUCTION

The genus Austroteneriffia was described by Womersley (1935) with type species A. hirsti Womersley, from Australia. This genus is one of the eight genera belonging to the family Teneriffiidae. The members of Austroteneriffia are free living in soil, sand, under rocks, leaf litters under oak trees, and on ground pearls, Porphyrophora tritici (Bodenheimer) (Margarodidae) (Sayer et al. 1992; Judson 1995; Ueckermann and Khanjani 2002; Khanjani et al. 2011; 2013). Up to now nine species were recorded, namely: A. hirsti Womersley, 1935; A. japonica (Ehara 1965); A. tadzikistanica Wainstein 1969; A. hojoensis (Shiba and Furukawa 1975) [suspected junior synonym of A. japonica (Ehara 1965) by Judson 1995]; A. littorina Shiba and Furukawa 1975; A. leei Judson, 1994; A. kamalii Ueckermann and Khanjani 2002; A. zamani Khanjani et al. 2011; A. shiraziensis Khanjani et al. 2013. This paper presents the description of a new species, A. khorramabadiensis, as tenth species of the genus.

MATERIAL AND METHODS

Mites were extracted from soil and litter under oak trees, from Khorramabad vicinity, Lorestan province using Tulgren funnels. The obtained mites were mounted directly on slides in Hoyer’s medium. The slides were dried in an oven with 50 °C, covered with nail polish and examined under an Olympus BX51 phase contrast and a Differential Interference Contrast microscope. Drawings were made with a camera Lucida. The notation of the idiosomal setae follows that of Kethley (1990) and the notation of the cupules and female and male genitalia that of Judson (1995). All measurements are given in micrometers (µm) and the holotype measurements (female) are followed by the range of the
Genus diagnosis — Color orange to red in life, body oval; aggenital chaetotaxy holotrichous; claws of legs I-II large, strongly pectinate; prodorsal shield with four pairs of setae (vi, ve, sci, sce), opisthosome with seven pairs of setae (c1, c2, d1, e1, f1, h1, h2), of which seta c2 is the longest; palp genu with or without oncophysis; gnathosoma with four pairs of setae: three pairs of adoral setae (or1-3), and one pair of subcapitular setae (m) [Based on Womersley (1935) and Judson (1995)].

Key to species of Austroteneriffia of the world (Females)

1. Palpal oncophysis present ...................... 4
   —Palpal oncophysis absent ...................... 2

2. Prodorsal shield poorly defined; seta c2 almost extending to base of seta d......................... A. littorina Shiba & Furukawa
   —Prodorsal shield distinct; seta c2 reaching to over the base of setae e or f ...................... 3

3. Basifemur I with five setae, tibia II nine setae...... A. zamanani Khanjani, Asali Fayaz & Ueckermann
   —Basifemur I with four setae, tibia II 10 setae .............. A. kamalii Ueckermann & Khanjani

4. Genu IV with a solenidion ...................... 5
   —Genu IV lacking a solenidion ...................... 6

5. Basifemur I with five setae; telofemur III with five setae; prodorsal shield without distinct pores...................... A. hiristi Womersley
   —Basifemur I with four setae; telofemur III with four setae; prodorsal shield with distinct pores.......................... A. leei Judson

6. Basifemur III with four setae...................... 7
   —Basifemur III with five setae.............................. A. tadjikistanica (Wainstein)

7. Trochanter IV with 2 setae ...................... 8
   —Trochanter IV with 3 setae............................. A. shiraziensis Khanjani, Yazdanpanah & Asali Fayaz

8. Telofemora III-IV with 5 setae, telotarsi III-IV with 7-6 (7) setae............................. A. japonica (Ehara) / A. hojoensis (Shiba & Furukawa)
   —Telofemora III-IV with 4 setae, telotarsi III-IV with 8-8 setae ............. A. khorramabadiensis n. sp.

Austroteneriffia khorramabadiensis n. sp.
(Figs. 1-3)

Diagnosis — This species is close to A. japonica but differs by having 8 setae on the telotarsus III instead of 7 for A. japonica and by having 4 setae on the teleforma III-IV instead of five; palpal oncophysis present; trochanter IV with two setae; basifemura and telofemora III-IV each with four setae, telotarsi III-IV with 8-8 setae; genu IV without a solenidion; dorsal seta c2 reaching over the base of seta h1.

Female (n= 3): Color orange in life. Idiosoma oval. Body length (base of palp tibial claw to terminal body) 868 (915 – 930), excluding gnathosoma 588 (610 – 633); width 485 (458 – 470) at level of seta c2.

Dorsum — (Figs. 1A-D). Prodorsal shield almost oval, 333 (320 – 330) long, 210 (210 – 217) wide at level of setae sce, with two pairs of eyes between setae sce and c2, anterior and posterior pairs 25 (20 – 21) and 31 (35 – 37) in diameter, respectively (Fig. 1A). Hysterosoma with three pairs of cupules (ia, im and ip) near setae d1, f1and h1 (Fig. 1A). Prodorsal shield with four pairs of setae of which two pairs trichobothria (sci and vi); opisthosome striated, bearing seven pairs of barbed setae (c1, c2, d1, e1, f1, h1, h2). Stigmatic opening anterior to setae vi and near to base of chelicera (Fig. 1A), with about 9 rows of
et al.

**Figure 2:** *Austroteneriffia khorramabadiensis* n. sp. (Female): A – Basifemur-tibia I, B – Basifemur-tibia II, C – Basifemur-tibia III, D – Basifemur-tibia IV.

<table>
<thead>
<tr>
<th>Lengths</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>vi 102</td>
<td>(103 – 105)</td>
</tr>
<tr>
<td>ve 143</td>
<td>(138 – 145)</td>
</tr>
<tr>
<td>sci 153</td>
<td>(152 – 154)</td>
</tr>
<tr>
<td>sce 203</td>
<td>(185 – 206)</td>
</tr>
<tr>
<td>c1 153</td>
<td>(141 – 157)</td>
</tr>
<tr>
<td>c2 296</td>
<td>(298 – 315)</td>
</tr>
<tr>
<td>d1 167</td>
<td>(148 – 168)</td>
</tr>
<tr>
<td>e1 182</td>
<td>(165 – 175)</td>
</tr>
<tr>
<td>f1 190</td>
<td>(170 – 186)</td>
</tr>
<tr>
<td>h1 146</td>
<td>(134 – 142)</td>
</tr>
<tr>
<td>h2 100</td>
<td>(101 – 106)</td>
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Venter — (Figs. 1G-H). Ventral cuticle striated. Coxisternal shields smooth, bearing 14 pairs of setae (1a, 1b, 1c, 1d, 2a, 2b, 2c, 3a, 3b, 3c, 3d, 4a, 4b and 4c); coxisternal shield of legs I and II is fused, separated from legs III and IV (Fig. 1G). Aggential area with six pairs of setae (ag1-6), genital valves with six pairs of genital setae (g1-6) (one side of...
genital valve in holotype specimen with five setae), four pairs of eugenital setae (eug1-4), three pairs of papillae-associated setae (k1-3), and three pairs of genital papillae (Fig. 1H); anal valves with three pairs of pseudanal setae (ps1-3). Measurements of setae: g1 26 (18 – 27), g2 24 (21 – 24), g3 20 (19 – 21), g4 19 (16 – 19), g5 20 (17 – 18), g6 21 (20 – 21); ag1 53 (45 – 51), ag2 42 (39 – 40), ag3 41 (39 – 40), ag4 50 (47 – 49), ag5 57 (52 – 56), ag6 54 (50 – 52), k1 7 (5 – 9), k2 5 (6 – 5), k3 5 (5), eug1 18 (22 – 23), eug2 12 (9) and eug3 15 (14 – 15), eug4 5 (4 – 5), ps1 40 (44 – 45), ps2 40 (422 – 46), ps3 48 (46 – 48). Distances between setae: g1-g1 10 (7 – 11), g2-g2 17 (13 – 15), g3-g3 22 (20 – 21), g4-g4 23 (22 – 24), g5-g5 20 (20 – 22), g6-g6 20 (20 – 22); g1-g2 12 (10 – 12), g2-g3 12 (9 – 10), g3-g4 13 (10 – 12), g4-g5 12 (10 – 11), g5-g6 11 (8 – 12); ag1-ag1 105 (93 – 102), ag2-ag2 75 (73 – 74), ag3-ag3 90 (85 – 94), ag4-ag4 138 (148 – 150), ag5-ag5 130 (121 – 128), ag6-ag6 58 (50 – 61), ag1-ag2 29 (37 – 43), ag2-ag3 25 (23 – 25), ag3-ag4 33 (30 – 33), ag4-ag5 60 (57 – 59), ag5-ag6 51 (52 – 56), ps1-ps1 58 (76 – 80), ps2-ps2 78 (85 – 88), ps3-ps3 75 (80 – 83). Setae ps1-3 fine and barbed.

Gnathosoma — (Figs. 1E-G). Palp five seg-
mented, palp tarsus reduced, with eight setae plus one solenidion 4 (5) long; palp tibia with one robust terminal spur (or1) 52 (51 – 52), two subterminal spurs (or2-3), 20 (18 – 20) and 17 (15) long, plus one serrated seta; palp femur and genu each with one seta, 118 (110 – 112) and 75 (74 – 76) long, respectively; oncophysis on distal end of genu 13 (11 – 12) long (Fig. 1F). Chelicerae 185 (190), movable digit 30 (34 – 37), with setae long (Fig. 1F). Chelicerae 185 (190), movable digit 30 (34 – 37), with setae long (Fig. 1F). Chelicerae 185 (190), movable digit 30 (34 – 37), with setae long (Fig. 1F).

MALE (n= 5): Color in life orange, Idiosoma oval. Length of total body (base of palp tibial claw to terminal body) 540 – 628, excluding gnathosoma 465 – 530; width 340 – 430 at level of seta c2.

Dorsum — (Figs. 4A-D). Prodorsal shield oval, 295 – 305 long, 190 – 200 wide, two longitudinal rows (5-6) of small oval pores between setae sce-c1 on prodorsal shield and two pairs of eyes between level of setae sce and c2, anterior and posterior pairs 18 – 20 and 23 – 26 in diameter, respectively (Fig. 4A). Hysterosoma with three pairs of cupules (ia, im and ip) near setae d1 and f1 (Fig. 4A). Prodorsal shield with four pairs of setae (vi, ve, sci and sce), two pairs of ordinary setae, sce, ve and two pairs of trichobotria, sci and vi; opisthosoma striated, bearing seven pairs of setae (c1, c2, d1, e1, f1, h1, h2). Stigmatic opening anterior to setae vi and base of chelicera, with about 11 rows of elongate alveoli at opening of peritremes (Fig. 4B). Dorsal setae serrated (Figs. 4A,C,D). Setae c2 longest, 330 – 383 long; versus h2 shortest, 80 – 105 long. Lengths of dorsal setae as follows: vi 92 – 101, ve 123 – 130, sci 142 – 150, sce 178 – 193, c1 130 – 138, c2 259 – 300, d1 125 – 139, e1 137 – 153, f1 148 – 151, h1 116 – 125, h2 78 – 89; distances between dorsal setae: vi-vi 30 – 45, ve-ve 148 – 155, sci-sce 125 – 135, sce-sce 171 – 180, vi-ve 63 – 68, sci-ve 13 – 15, sce-sci 61 – 66, sce-c1 150 – 163, c1-c1 123 – 136, c1-c2 45 – 53, c2-c2 215 – 235, c1-d1 56 – 63, d1-d1 130 – 143, d1-e1 42 – 55, e1-e1 108 – 110, e1-f1 69 – 83, f1-f1 70 – 80, f1-h1 58 – 65, h1-h1 33 – 38, h1-h2 50 – 63, h2-h2 125 – 143, vi-ve 2.24 – 3.06; ve-ve 0.83 – 0.84, sci-sci 1.1 – 1.13, c1/c1 1.01 – 1.05, c2/c2 1.2 – 1.27, d1/d1 1.26 – 1.39, f1/f1 1.8 – 2.1, h1/h1 3.3 – 3.5; vi-vi: ve-ve: sci-sci: sce-sce: c1-c1: c2-c2: d1-d1: e1-e1: f1-f1: h1-h1: h2-h2 = (0.42 – 0.56): (1.93 – 2.1): (1.68 – 1.78): (2.25 – 2.4): (1.75 – 1.75): (1.78 – 1.85): (2.20 – 2.60): (1.54 – 1.37): (1.10 – 1.0): (0.47 – 0.48): (1.78 – 1.79).

Venter — (Fig. 4G). Ventral cuticle striated. Coxisternal shields smooth, longitudinally striated between coxa I-IV; coxisternal shields II-III separated by transverse striations; coxisternal shields bear 14 pairs of coxal setae: 1a 59 – 63, 1b 73 – 75, 1c 82 – 88,
**Figure 5**: *Austrotenerifia khorramabadiensis* n. sp. (Male): A – Basifemur-tibia I, B – Basifemur-tibia II, C – Basifemur-tibia III, D – Basifemur-tibia IV.


\[ \text{ag3-ag4 45 – 50, ag4-ag5 53 – 59, ag5-ag6 65 – 69, ps1-ps1 71 – 75, ps2-ps2 70 – 80, ps3-ps3 63 – 78, ps1-ps2 20 – 28, ps2-ps3 13 – 18.} \]

Male genitalia — (Fig. 4H). With eight pairs of eugenital setae [I 28, 2 15, 3 18, 4 25, 5 35, 6 10, 7 25, 8 30, 9 21 and one spine like seta x 5] (Fig. 4H).

Gnathosoma — (Figs. 4E-G). Palp five segmented, palp tarsus reduced to circular plate, with eight setae (three long and serrated, two short and serrated, two short and smooth, one duplex seta and one solenidion (\(\omega\)) 6 – 8 long; palp tibia with one robust terminal spur (\(\omega 1\)) 40 – 51 long, two sub-terminal spurs (\(\omega 2-3\)) 16 – 20 and 15 – 17 long, plus one serrated seta; oncosphysis on genu distally, 10 – 14 long, palp genu and femur each with one seta, 67 – 76 and 107 – 118 long, respectively (Fig. 4F). Chelicerae 160 – 175, movable digit 23 – 26, with two setae cha 35 – 42 and chb 60 – 71 (Fig. 4E). Subcapitulum with one pair of setae \(m\), 50 – 60, three pairs of adoral setae: \(or 1\) 13 – 16, \(or 2\) 11 – 13, \(or 3\) 54 – 57;
Legs — (Figs. 5-6). Leg IV is much longer than total length of body. Each side of claws on tarsi I-IV with 13-15 pectinations and tarsi III-IV with one median empedumum. Measurements of leg segments as follows: Ta I 172 – 182, Ti I 138 – 150, Ge I 96 – 106, TF I 173 – 84, BF I 99 – 109, Tr I 180 – 84, Cx I 120 – 245, leg I 880 – 960; Ta II 181 – 193, Ti II 138 – 150, Ge II 89 – 102, TF II 82 – 90, BF II 90 – 101, Tr II 83 – 90, Cx II 225 – 240, leg II 880 – 966, Ta III 241 – 252, Ti III 160 – 178, Ge III 92 – 103, TF III 80 – 90, BF III 85 – 96, Tr III 83 – 91, Cx III 185 – 198, leg III 926 – 1000; Ta IV 295 – 313, Ti IV 194 – 213, Ge IV 109 – 115, TF IV 94 – 105, BF IV 94 – 103, Tr IV 106 – 113, Cx IV 195 – 208, leg IV 1087 – 1170, IP 3773 – 4096. Setal formulae of leg segments as follows (solenidia in parentheses): coxae 4-3-4-3; trochanters 1-2-2-2; basifemora 5-6-4-4; telofemora 5-5-4-4, genua 8(1σ)-8(1σ)-7(1σ)-7; tibiae 12(1ϕ)-12(1ϕ)-12(1ϕ)-12(1ϕ); tarsi 27(3ω)-27(2ω)-23+1tric-23(2ω)-1tric (Figs. 5-6). ω I 11-13, ω2 I 19-21, ω3 I 16-18, ω1 II 11-12, ω2 II 15-18, ω3 II 10-11, ω1 IV 19-21, ω2 IV 14-17, δ Ti I 8-10, φ I 25-30, φII 23-26, φIII 21-24, φIV 18-22, σ I 25-29, σII 23-25, σIII 25-29. Tarsi III-IV with long trichobothrium each 113 – 124 and 145 – 161 long respectively and almost same in length of female (Figs. 6C-D).

Remarks — Austrotenereffia khorramabadiensis n. sp. closely resembles A. japonica (Ehara) in that basifemor III has 4 setae, trochanter 2 setae, genu IV is without solenidion and palpal oncophyxis present. However, it differs that in: 1) Trochanter II with 2 setae instead of 3 setae; 2) Telofemora III-IV each with 4 setae in the former instead of 5 each in the latter; 3) Genua I-IV with 8(1σ)-8(1σ)-7(1σ)-7 in new species opposed to 7-7-6-6 in A. japonica; 4) Telotarsi III-IV with 8-8 setae in A. khorramabadiensis n. sp. whereas 7-6-7 (7) in A. japonica; 5) tibiae formula I-III 12(1ϕ+1κ)-12(1ϕ)-12(1ϕ) versus 14 (1ϕ+1κ)-13 or 14 (1ϕ)-13 or 14 (1ϕ); 6) seta c2 long and reaching to setal base of h2 in the former whereas short and almost reaching ω1 in A. japonica; 7) dorsal setae c1, d1, e1 and fl long and reaching pass bases of setae c1, fl, h1 and h1 respectively in the former but short and not reaching to the setae next behind in the latter; 8) length of dorsal setae vi 102 – 105, ve 138 – 145, sci 152 – 154, sce 185 – 206, c1 141 – 157, c2 296 – 315, d1 148 – 168, e1 165 – 182, fl 170 – 186, h1 134 – 146, h2 100 – 106 versus vi 57, ve 96, sci 102, sce 148, c1 61, d1 178, d1 77, e1 77, f1 90, h1 87, h2 72. Also Austrotenereffia khorramabadiensis n. sp. closely resembles A. shiraziensis Khanjani et al. 2013 from Iran in having the same femoral formula and palpal oncophyxis present but differs by: 1) Trochanter IV with 2 setae in the new species opposed to 3 in A. shiraziensis; 2) Genua formula I-IV with 8(1σ)-8(1σ)-7(1σ)-7 in the former opposed to 7(1σ)-7(1σ)-6(1σ)-6 in the later; 3) Tibia IV with 12 (1ϕ) in the former whereas 12 (3ϕ) in the latter; 4) Basitarsus III with 15(1ω)+1tric in A. khorramabadiensis whereas 15(2ω)+1tric in A. shiraziensis; 5) Telotarsi III with 8 setae instead of 9; 6) Male genitalia setae 7 and 9 with three rami in the former opposed to two rami in the latter.

Etymology — This species is named in honor of the city of Khorramabad, capital of Lorestan province, where the new species was collected.

Type materials — The holotype female and two paratype females and five allotype males were collected from soil and litter under oak trees, Quercus brantii Lindl. (Fagaceae), Kaka Reza region, Khorramabad vicinity, Lorestan province (33°56'N, 48°39'E, a.s.l. 1703 m), 19 xi 2011, by Mohammad Ahmad Hoseini. The holotype female and two paratype females and five allotype males were collected from soil and litter under oak trees, Quercus brantii Lindl. (Fagaceae), Kaka Reza region, Khorramabad vicinity, Lorestan province (33°56'N, 48°39'E, a.s.l. 1703 m), 19 xi 2011, by Mohammad Ahmad Hoseini. The holotype female and one paratype female, four allotype males are deposited in the Collection of the Acarology Laboratory, University of Bu-Ali Sina, Hamedan, Iran. One paratype female, one male slide is deposited in the mite Section of National Collection of Arachnida, Plant Protection Research Institute, Pretoria, South Africa.

REFERENCES


Judson M. 1994 — Studies on the morphology and systematics of the Teneriffiidae (Acari: Prostigmata). 1:
a new species of Neoteneriffiola from Namibia — Acarologia, 35: 115-134.


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