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NEW AND UNRECORDED OPPIOID MITES (ACARI: ORIBATIDA) FROM YOZGAT PINE GROVE NATIONAL PARK, TURKEY

BY A. TOLUK & N. AYYILDIZ

(Accepted August 2008)

SUMMARY: Ten oppioid mites are reported from the Yozgat Pine Grove National Park of Turkey included two new species. These are Ramusella (Insculp-toppia) salmani n. sp., Oxyoppia (Dzarogneta) baranae n. sp., Berniniella (Berniniella) serratiostris hauseri, Moritzoppia (Moritzoppia) escotata esco-tata, Moritzoppia (Moritzoppia) problematica, Micropoppia arcuata, Moritzoppia (Moritzoppia) keilbachi, Rhinoppia trilobata and Ramusella (Ramusella) sengbuschi sengbuschi of the family Oppiidae and Autogneta (Autogneta) parva of the family Autognetidae. Habitat and distribution for each species are given. Oppioid mites were collected from soil and litter under pine forest (Pinus nigra J. F. Arnold subsp. pallasiana (Lamb.) Holmboe), lichen and moss using Berlese funnels.

INTRODUCTION

The superfamily Oppioidea comprises 1100 species, 158 genera and 40 subgenera in 12 families (Subias, 2007). They are worldwide in distribution, abundant in most of the geographical regions. Oppioid mites are most abundantly represented by species and individuals. They occur in almost all terrestrial habitats, especially in soil and litter.

In Turkey, research on the oppioid mites has also increased. To date, 23 species belonging 5 families viz. Autognetidae Grandjean, 1960, Epimerellidae Ayyildiz and Luxton, 1989, Machuellidae Balogh, 1983, Quadroppiidae Balogh, 1983, Oppiidae Sellnick, 1937 have been recorded from Turkey (ÖZKAN et al., 1994; ERMAN et al., 2007). The number of recorded oppioid mites from Turkey has risen from 23 to 33 by this study. This paper reports on mites of the superfamily Oppioidea, collected from Yozgat Pine Grove National Park in Turkey. Ten species are reported herein, eight of which are new records, two as a new species.

MATERIALS AND METHODS

Soil, litter, lichen and moss samples taken from Yozgat Pine Grove National Park (YÇMP) were brought to the laboratory in nylon bags. Mites were extracted from these samples using Berlese funnels and stored in 70% ethanol for microscopic study. They were cleared in 35% lactic acid and mounted on microscopic slides in modified HOYER’s medium. Drawings were made using a camera lucida attached to a compound microscope. Specimens for scanning electron microscopy were cleaned in Terg-a-zyme solution for 12 h, followed by brief (1-2 s) submer-sion in an ultrasonic bath. Specimens mounted on

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Fig. 1: *Ramusella (Insculptoppia) salmani* n. sp. A. — Dorsal view; B. — Ventral view (scale bar for all figures = 100).

Fig. 2: *Ramusella (Insculptoppia) salmani* n. sp. A. — Dorsal view; B. — Prodorsum; C. — Rostrum; D. — Sensillus.
Fig. 3: *Ramusella (Insculptoppia) salmani* n. sp. A. — Leg I; B. — Leg II (scale bar for all figures = 40)

Fig. 4: *Ramusella (Insculptoppia) salmani* n. sp. A. — Leg III; B. — Leg IV (scale bar for all figures = 40)
Al-stubs with double-sided sticky tape, and gold-coated. Terminology follows Grandjean (see Travé and Vachon, 1975), Balogh (1983) and Subias and Balogh (1989). All measurements are given in micrometers (μm). The type materials are deposited in the Acarological Collection of the Zoological Museum, Erciyes University, Kayseri, Turkey.

Superfamily Oppioidea Sellnick, 1937
Family Oppiidae Sellnick, 1937

*Ramusella (Insculptoppia) salmani* n. sp.
(Figs. 1-4)

**Diagnosis** — Rostral setae arched; lamellar setae smooth; lamellar lines extend as evident near the lamellar setae, then faint to translamellar line; translamellar line faint; sensilli bilaterally ciliate; the setae *lm* arise before the setae *la*.


**Prodorsum** (Figs. 1A, 2) — Rostrum rounded. Rosstral setae ciliated arched inward, 16 in length. Lamellar setae smooth, 10 in length and situated closer to interlamellar setae than to rostral setae. Lamellar lines extend as evident near the lamellar setae and then faint to translamellar line; translamellar line faint. Interlamellar setae minute, 2 in length. Three pairs of bright spot situated between interlamellar setae. Bothridia round with small opening. Sensilli long, fusiform-clavate; its head with long cilia and with some short cilia on the stalk.

**Notogaster** (Figs. 1A, 2A) — Oval. Ten pairs of notogastral setae smooth. The setae *lm* arises before the setae *la*.

**Ventral side** (Fig. 1B) — Epimeral borders easily visible and strongly sclerotized. Epimeral regions with internal muscle sigilla. Epimeral setal formula 3-1-3-3. Genital plates with five pairs of setae, 22 in length, 18 in width. Anal plates with two pairs of setae, 36 in length, 34 in width. Distance between genital and anal plates 48. One pair of aggenital; three pairs of adanal setae present. Lyrifissures *iad* situated paranal. The adanal setae are situated as follows: *ad₁* — postanally, *ad₂* — paranally, *ad₃* — preanally.

**Legs** — Formula of leg setation (trochanter to tarsus): I (1-5-1+1-4+2-19+1); II (1-5-1+1-4+1-13+2); III (2-3-2-3+1-13); IV (1-2-1-3+1-10). Structure and setation of legs as shown in Figs. 3 & 4.

**Material examined** — Holotype (ZMEU: 77) and 16 paratypes (ZMEU: 78 and 79), one of them was mounted on aluminum stubs and gold-coated for scanning electron microscopy, collected from soil N 39°48.122′, E 034°48.653′, 1577 m, 18.IV.2006; 8 paratypes, grassy soil N 39°48.132′, E 034°48.651′, 1574 m, 18.IV.2006; 6 paratypes, soil under *Pinus nigra pallasiana*, N 39°48.561′, E 034°49.624′, 1430 m, 25.IV.2007.

**Etymology** — This species is named for Prof. Dr. Selahattin SALMAN, Entomologist and Rector, Ahi Evran University, Turkey.

**Remarks** — *Ramusella (Insculptoppia) salmani* n. sp. is close morphologically to *Ramusella (Insculptoppia) paolii* Ivan & Vasiliu, 1999. The characters differentiating these species are given in Table 1.

**Oxyoppia (Dzarogneta) baranae** n. sp.
(Figs. 5-8)

**Diagnosis** — Rostral and lamellar setae ciliate; sensilli reach to the middle of the costulae; all notogastral setae sparsely barbed.

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**Table 1**: The characters differentiating *Ramusella (Insculptoppia) salmani* n. sp. and *Ramusella (Insculptoppia) paolii* Ivan & Vasiliu, 1999.

<table>
<thead>
<tr>
<th></th>
<th><em>R. (1.) salmani</em> n. sp.</th>
<th><em>R. (1.) paolii</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Lamellar setae</td>
<td>smooth</td>
<td>ciliate</td>
</tr>
<tr>
<td>Lamellar lines</td>
<td>extend as evident near</td>
<td>extend as evident near</td>
</tr>
<tr>
<td></td>
<td>the lamellar setae, then</td>
<td>the lamellar setae, then</td>
</tr>
<tr>
<td></td>
<td>faint to translamellar</td>
<td>faint to translamellar</td>
</tr>
<tr>
<td></td>
<td>line; translamellar line</td>
<td>line; translamellar line</td>
</tr>
<tr>
<td></td>
<td>faint</td>
<td>faint</td>
</tr>
<tr>
<td>Sensilli</td>
<td>bilaterally ciliate</td>
<td>unilaterally ciliate</td>
</tr>
<tr>
<td>Setae <em>lm</em></td>
<td>The setae <em>lm</em> arise</td>
<td>The setae <em>lm</em> arise</td>
</tr>
<tr>
<td></td>
<td>before the setae <em>la</em></td>
<td>behind the setae <em>la</em></td>
</tr>
</tbody>
</table>

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Fig. 5: Oxyoppia (Dzarogneta) baranae n. sp. A. — Dorsal view; B. — Ventral view (scale bar for all figures = 100)

Fig. 6: Oxyoppia (Dzarogneta) baranae n. sp. A. — Dorsal view; B. — Prodorsum; C. — Rostral and lamellar setae; D. — Sensillus; E. — Notogaster; F. — The setae lm and la.
Fig. 7: *Oxyoppia (Dzarogneta) baranae* n. sp. A. — Leg I; B. — Leg II (scale bar for all figures = 40)

Fig. 8: *Oxyoppia (Dzarogneta) baranae* n. sp. A. — Leg III; B. — Leg IV (scale bar for all figures = 40).
Dimensions — Body length: 328 (300-346), body width: 161 (140-170) (holotype: 346 × 168). Holotype and four paratypes were measured.

Prodorsum (Figs. 5A, 6A-D) — Rostrum rounded. Rostral setae ciliate, 34 in length. Lamellar setae ciliate, 24 in length, situated closer to interlamellar setae than to rostral setae. Interlamellar setae smooth. There are protuberance between bothridia and lamellar setae, Sensilli pectinate, with 13-14 cilia, 24 in length. Three pairs of bright spot present between the interlamellar setae.

Notogaster (Figs. 5A, 6A, E-F) — Oval, with one pair of prominent humeral processes. Ten pairs of notogastral setae sparsely barbed, mean 34 in length.

Ventral side — Epimeral borders easily visible and strongly sclerotized. Epimeral regions with internal muscle sigilla. Epimeral setal formula 3-1-3-3. Genital plates with five pairs of setae, 50 in length, 54 in width. Anal plates with two pairs of setae, 28 in length, 30 in width. One pair of aggenital; three pairs of adanal setae present. Lyrifissures iad situated inverse apoanal. The adanal setae are situated as follows: ad1 — postanally, ad2 — paranally, ad3-preanally.

Legs — Formula of leg setation (trochanter to tarsus): I (1-4-2+1-3+2-18+1); II (1-4-1+1-3+1-17); III (1-3-1+1-3-10); IV (1-2-3-3). Structure and setation of legs as shown in Figs. 7 & 8.

Material examined — Holotype and four paratypes N 39o48.174′, E 034o48.690′, 1547 m, 05.III.2006; one paratype, soil, N 39o48.159′, E 34°48.735′, 1544 m, 12.V.2006; one paratype, soil, N 39o48.136′, E 34°48.749′, 1570 m, 12.V.2006.

Etymology — This species is named for Assist. Prof. Dr. Şule BARAN, Acarologist, Sakarya University, Turkey.

Remarks — Oxyoppia (Dzarogneta) baranae n. sp. is close morphologically to Oxyoppia (Dzarogneta) khosrovica (Khanbekyan & Gordeeva, 1991). The characters differentiating these species are given in Table 2.

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<table>
<thead>
<tr>
<th>O. (D.) khosrovica</th>
<th>O. (D.) baranae</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rostrum and lamellar setae</td>
<td>smooth</td>
</tr>
<tr>
<td>Sensilli</td>
<td>reach to the distal end of the costulae</td>
</tr>
<tr>
<td>Body measurements</td>
<td>507.6 × 272.6 μm</td>
</tr>
<tr>
<td>Notogastral setae</td>
<td>all smooth</td>
</tr>
</tbody>
</table>

Table 2: The characters differentiating Oxyoppia (Dzarogneta) khosrovica (Khanbekyan & Gordeeva, 1991) and Oxyoppia (Dzarogneta) baranae n. sp.

Berniniella (Berniniella) serratiostris hauseri (Mahunka, 1974) (Figs. 9-10)


Distribution — Palaearctic region (Mahanuka, 1974; Subias, 2007).
Fig. 9: *Berniniella (Berniniella) serratiostris hauseri* (Mahunka, 1974). — A) Dorsal view, B) Ventral view (scale bar for all figures= 100).

Fig 10: *Berniniella (Berniniella) serratiostris hauseri* (Mahunka, 1974). — A) Dorsal view, B) Rostrum, C) Sensillus, D) Ventral view.
Fig. 11: *Moritzoppia (Moritzoppia) problematica* Mahunka & Mahunka-Papp, 2002 A) Dorsal view, B) Ventral view (scale bar for all figures= 100).

Fig. 12: *Moritzoppia (Moritzoppia) keilbachi* (Moritz, 1969) A) Dorsal view, B) Ventral view (scale bar for all figures= 100).
Fig. 13: *Moritzoppia (Moritzoppia) escotata escotata* (Subias & Rodriguez, 1986) A) Dorsal view, B) Ventral view (scale bar for all figures=100).

Fig. 14: *Moritzoppia (Moritzoppia) escotata escotata* (Subias & Rodriguez, 1986) A) Dorsal view, B) Rostrum, C) Prodorsum, D) Sensillus.
**Moritzoppia (Moritzoppia) problematica**
Mahunka & Mahunka-Papp, 2002
(Fig. 11)

*Material examined* — YÇMP-211: 11.IX.2005, litter and soil, 11 exs.; YÇMP-245: 01.XII.2005, as for the previous sample, 83 exs.; YÇMP-260: 01.XII.2005, as for the previous sample, 8 exs.

*Distribution* — Palaearctic region (Mahunka & Mahunka-Papp, 2002; Subias, 2007).

**Moritzoppia (Moritzoppia) keilbachi**
(Moritz, 1969)
(Fig. 12)


*Distribution* — Palaearctic region (Moritz, 1969; Subias, 2007).

**Moritzoppia (Moritzoppia) escotata escotata**
(Subías & Rodríguez, 1986)
(Figs. 13, 14)


*Distribution* — Palaearctic region (Subías & Rodríguez, 1986; Subías, 2007).

**Microppia arcuata**
Gordeeva & Tarba, 1990
(Figs. 15, 16)


*Distribution* — Palaearctic region (Gordeeva & Tarba, 1990; Subías, 2007).

**Rhinoppia trilobata**
(Khanbekjan & Gordeeva, 1991)
(Figs. 17, 18)


*Distribution* — Palaearctic region (Khanbekjan & Gordeeva, 1991; Subías, 2007).

**Autogneta (Autogneta) parva**
Forsslund, 1947
(Figs. 19, 20)


*Distribution* — Palaearctic region (Forsslund, 1947; Subías, 2007).

**Ramusella (Ramusella) sengbuschi sengbuschi**
Hammer, 1968
(Fig. 21)


*Distribution* — Pantropical (except Etiopia) and subtropical. (Hammer, 1968; Subías, 2007).

**Acknowledgements**

This study was supported by the Erciyes University Scientific Research Project Unit (Project No. FBA-06-20). It is also part of the doctoral thesis of the first author.
Fig. 15: *Microppia arcuata* Gordeeva & Tarba, 1990 A) Dorsal view, B) Ventral view (scale bar for all figures= 100)

Fig 16: *Microppia arcuata* Gordeeva & Tarba, 1990 A) Dorsal view, B) Sensillus, C) Prodorsum, D) setae *la*
Fig. 17: *Rhinoppia trilobata* (Khanbekjan & Gordeeva, 1991) A) Dorsal view, B) Ventral view (scale bar for all figures = 100).

Fig. 18: *Rhinoppia trilobata* (Khanbekjan & Gordeeva, 1991) A) Dorsal view, B) Rostrum, C) Sensillus, D) Ventral view.
Fig. 19: *Autogneta (Autogneta) parva* Forsslund, 1947- A) Dorsal view, B) Ventral view (scale bar for all figures= 100)

Fig. 20: *Autogneta (Autogneta) parva* Forsslund, 1947- A) Dorsal view, B) Prodorsum, C) le and ro setae, D) Sensillus.
REFERENCES


Fig. 21: Ramusella (Ramusella) sengbuschi sengbuschi Hammer, 1968 A) Dorsal view, B) Ventral view (scale bar for all figures= 100)