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Previous volumes (2010-2018): 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 *EUSEIUS* WAINSTEIN  
(ACARINA: PHYTOSEIIDAE) FROM PAKISTAN

**By Amjed PARVEZ, Shamshad AKBAR & Wali Muhammad CHAUDHRI**

**Summary:** Three new species of the genus *Euseius* i.e. *E. lucidus*, *E. ziai* and *E. lubricus* are described from Pakistan. Key to the species of this genus, so far collected from Pakistan has also been prepared.

**Introduction.**

The genus *Euseius* was erected by WAINSTEIN (1962), who designated *Seiulusfinlandicus* Oudemans as the type species. This genus includes predatory mites of economic importance. They play an important role in controlling harmful mites and soft bodied insects (MORAES & McMURTRY, 1983). The setal nomenclature followed in this manuscript is that of ROWELL et al. (1978), modified by DENMARK (1992) and KOLODOCHKA & DENMARK (1996). Some taxonomic research work on these mites has been reported from Pakistan, where CHAUDHRI (1979), AHMAD et al. (1987), KHAN & CHAUDHRI (1991) and KHAN et al. (1992) described a total of 12 new species. The present paper adds three new species thus raising the total to 15 species of this genus from Pakistan.

**Key to Pakistan species of *Euseius* (Females):**

1. Dorsal shield reticulated ........................................ 2
   - Dorsal shield smooth ....................................... 5
2. Ventrianal shield wider than genital shield .......... 3
   - Ventrianal shield not wider than genital shield .... 4
3. Dorsal shield with 4 pairs of visible pores; ventrianal shield smooth. *E. plaza* Ahmad, Yasmin & Chaudhri
   - Dorsal shield without visible pores; ventrianal shield reticulated . . *E. vitrum* Ahmad, Yasmin & Chaudhri
4. Dorsal shield with 4 pairs of visible pores ..............
   - Dorsal shield with 6 pairs of visible pores ..............
   - Dorsal shield with 8 pairs of visible pores ..............
   - Dorsal shield with 10 or more pairs of visible pores ...
5. Dorsal shield with pores ........................................ 6
   - Dorsal shield without pores ................................
   - Dorsal shield with more than 1 pair of pores .......... 8
6. Dorsal shield with 1 pair of pores ......................... 7
   - Dorsal shield with more than 1 pair of pores .......... 8
7. Dorsal shield sole-shaped; cheliceral movable digit without teeth ......................................................... *E. lucidus* n. sp.
   - Dorsal shield pear-shaped; cheliceral movable digit with 1 tooth ............ *E. badius* Khan & Chaudhri
8. Dorsal shield with 3 pairs of visible pores ............. 9
   - Dorsal shield with more than 3 pairs visible pores .... 10
9. Cheliceral movable digit with 1, fixed digit with 2 subapical teeth, membranous fold present between genital and ventrianal shields ......................................................... *E. terenos* Ahmad, Yasmin & Chaudhri
   - Cheliceral movable digit with 2, fixed digit with 3 subapical teeth; no membranous fold between genital and ventrianal shields ......................................................... *E. lubricus* n. sp.
10. Dorsal shield lateral margin rounded near R1 .......... 11
    - Dorsal shield convex near R1 ............................ 11
11. Dorsal shield with 5 pairs of pores .......... 12
- Dorsal shield with more than 5 pairs of pores ... 14
12. Peritreme reaching to seta z2; Cheliceral movable digit without teeth, fixed digit with 2 teeth .......... 13
- Peritreme reaching past seta z2; Cheliceral movable digit with 1 tooth, fixed digit with 4 teeth .......... E. obtexus Khan, Chaudhri & Khan
13. Membranous fold between genital and ventrianal shields absent; seta $\beta_3>\beta_3-z_2$ .......... E. ziai, n.sp.
- Seta $\beta_3=\beta_3-z_2$, membranous fold between genital and ventrianal shields present . E. septicus Chaudhri
14. Dorsal shield with 6 pairs of pores; macroseta on genu IV absent ...... E. orcula, Khan, Chaudhri & Khan
- Dorsal shield with 7 pairs of pores; macroseta on genu IV present .......... E. mediocris Chaudhri, Akbar & Rasool.

Euseius lucidus n. sp.
(Fig. 1)

Female. Dorsal shield smooth, sole-shaped, broadly narrowing beyond seta RI; 337 μm long, 238 μm wide; 17 pairs setae and 10 pairs visible pores (6 pairs rounded, 4 pairs elliptical) (Fig. 1, A). Chelicera 26 μm long, movable digit without teeth, fixed digit with 3 subapical teeth (Fig. 1, B). All dorsal shield setae smooth except Z5 serrate. Dorsal shield setae: j1 34 μm; j3 36 μm; j4 12 μm; j5 14 μm; j6 & j2: 22 μm; j5 5 μm; z2 31 μm, z4 43 μm, z5 12 μm, Z1 19 μm; Z4 26 μm, Z5 65 μm; s4 55 μm, S2 24 μm; S4 22 μm; S5 34 μm; r3 17 μm, RI 12 μm (both on membrane). Seta $\beta_3>\beta_3-z_2$, z2 < z2 — z4, z4 > z4 — s4; seta Z4 anterior to S4, 36 μm and 38 μm apart from S4 and S5 setae, respectively (Fig. 1, A). Peritreme reaching seta z2, tip bluntly rounded. Peritremal shield base ribbon-like, 60 μm long, 3 processes on lower side (1 large pointed, 2 small), 4 processes on upper side (2 large pointed, 2 small), straight posteriorly (Fig. 1, D). Sternal shield smooth, obscure posteriorly, slightly convex anteriorly, 72 μm long, 621 μm wide, 3 pairs of setae, 1 pair of pores, Seta St1 greater than the distance between the bases of seta St1 & St2, St2 shorter than the distance between the bases of seta St2 & St3. (Fig. 1, C). Metasternal setae 1 pair, on membrane. Genital shield, 89 μm wide, 1 pair of setae. Genital shield wider than ventrianal shield. Genital and ventrianal shields 31 μm apart; membranous fold absent between genital and ventrianal shields. Ventrianal shield smooth, 94 μm long, 79 wide; 3 pairs of preanal setae and 1 pair of elliptical pores. Four pairs of setae, including 1 pair JV5 34 μm long and 2 pairs of pores on membrane surrounding ventrianal shield. Metapodal platelets, 2 pairs; primary pair, 24 μm long; secondary 7 μm long (Fig. 1, C). Leg IV with 1 macroseta each on genu, tibia and basitarsus, measuring 60 μm, 34 μm, and 70 μm in length, respectively (Fig. 1, F). Spermatheca cervix fundibuliform, slightly flared posteriorly, 34 μm long; atrium 5 μm long, attached to cervix; major-duct tubular; vesicle oval (Fig. 1, E).

Male : Not came in collection.

Holotype female, 1 Km E. Dera Ismail Khan, from “Guara,” (Cyamopsis tetragondobia) 8 Oct. 1992, Amjed, paratypes: 10 females with same data, deposited in Acarology Research Laboratory, Department of Agri. Entomology, University of Agriculture, Faisalabad, Pakistan.

Remarks. Euseius lucidus, n.sp., E. ziai, n.sp. and E. septicus Chaudhri, Akbar & Rasool are included in that group of species having cheliceral movable digit without teeth, smooth dorsal shield, peritreme reaching up to seta z2, genital shield wider than ventrianal shield, elliptical preanal pores, seta $z_2>z_2-z_4$ and longest macroseta on leg IV basitarsus. The following characters separate Euseius lucidus n.sp. from E. septicus and E. ziai, n.sp.:

1. Cheliceral fixed digit with 3 teeth in lucidus, n.sp.; 2 teeth each in septicus and ziai, n.sp.
2. Dorsal shield with 10 pairs visible pores in lucidus, n.sp.; 5 pairs of visible pores in septicus and ziai, n.sp.
3. Seta $j_3>j_3-z_2$ in lucidus, n.sp.; seta $j_3=j_3-z_2$ both in septicus and ziai, n.sp.
4. The shape of spermatheca differs in all the three species.

Euseius ziai, n. sp.
(Figs. 2 & 3)

Female. Dorsal shield smooth; concave near RI; 373 μm long, 242 μm wide; 17 pairs of setae and 5 pairs of visible elliptical pores (Fig. 2 A). Chelicera 24 μm long, movable digit without teeth, 2 subapical teeth on fixed digit (Fig. 2 B). All dorsal shield setae smooth, except Z5 serrate. Dorsal shield setae: j1
34 µm, j3 38 µm; j4=j5=17 µm; j6 29 µm, J2 31 µm, J5 5 µm, z2 31 µm, z4 38 µm; z5 14 µm, Z1 19 µm, Z4 34 µm, Z5 62 µm, s4 60 µm, S2 31 µm, S4 24 µm, S5 31 µm, r3 19 µm, R1 12 µm (both on membrane). Seta j3 > j3 — z2, z2 < z2 — z4, z4 < z4 — s4; seta Z4 anterior to s4; seta Z4 38 µm and 43 µm apart from S6 and S5, respectively (Fig. 2, A). Peritreme reaching seta z2, tip slightly pointed. Peritremal shield base ribbon-like, 3 convex areas on dorsal side, ventral side smooth. Sternal shield margins not clear. Metasternal setae 1 pair, on membrane. Genital shield 86 µm wide, 1 pair of setae, wider than ventri­nial shield. Genital and ventri­nial shields 43 µm apart, without membranous fold in-between. Ventri­nial shield quadrate, smooth, 106 µm long, 82 µm wide, 3 pairs of preanal setae and 1 pair of elliptical pores, slightly convex anteriorly (Fig. 2, C). Four pairs of setae, JV5 31 µm long, 2 pairs of pores on membrane surrounding ventri­nial shield. Metapodal platelets 2 pairs, primary pair 36 µm long; secondary pair 12 µm long (Fig. 2, C). Leg IV with 1 macroseta, each on genu, tibia and basitarsus, measuring 53, 36, and 67 µm in length, respectively (Fig. 2, F). Spermatheca cervix tube-like, gradually flared posteriorly, 53 µm long; atrium attached to cervix, wider than cervix-base; major-duct tubular (Fig. 2, E).
Male. Dorsal shield smooth, 248 μm long, 198 μm wide; 17 pairs of setae and 5 pairs of visible pores (2 pairs round, 3 pairs elliptical) (Fig. 3, G). All dorsal shield setae smooth except Z5 serrate. Dorsal shield setae: j1 14 μm, j3 22 μm, j4 = j5 = 10 μm, j6 = J2 = 12 μm; J5 5 μm, z2 = 22 μm, z4 29 μm, z5 10 μm Z1 12 μm, Z4 12 μm; Z5 46 μm, s4 38 μm, S2 19 μm, S4 14 μm, S5 22 μm, r3 10 μm, RI 12 μm (both on membrane) (Fig. 3, G.)

Peritreme reaching up to z2. Sternogenital shields fused to form a single shield, 137 μm long, 94 μm wide, with 5 pairs of setae, pores absent (Fig. 3, I). Ventrianal shield conical with rounded margins; smooth; 79 μm long, 86 μm wide; wider than fused shield; 3 pairs of preanal setae and a pair of elliptical pores (Fig. 3 I). Leg IV with 3 macrosetae, 1 seta each on genu, tibia and basitarsus measuring 38 μm, 24 μm and 50 μm, respectively. Spermatodactyl: foot + shaft 17 μm long; toe slightly pronounced, 5 μm long; heel rounded (Fig. 3, H).

Type. Holotype female, Cheechawatni Forests, from “wild ber” (*Zizyphus mauritiana*), 26 Sept.

1990, Amjed; allotype 1 male, same collection data. Both deposited in Acarology Research Laboratory, Department of Agri. Entomology, University of Agriculture Faisalabad Pakistan.

**Remarks.** *Euseius ziai* n.sp. is closely related to *Euseius septicus* Chaudhri, Akbar and Rasool, but the following characters separate them from each other:

1. Dorsal shield with 5 pairs of rounded pores in *septicus* Chaudhri, Akbar & Rasool; pores elliptical in this new species.
2. Seta z4 > z4 in *septicus*; z4 < z4-s4 in this new species.
3. Membranous fold between genital and ventrional shield present in *septicus*; absent in this new species.
4. Ventrional shield vase-shaped in *septicus*; quadrate in this new species.
5. Pores on membrane surrounding ventrional shield absent in *septicus*; 2 pairs of pores present in this new species.

*E. lubricus* n.sp.
(Fig. 4)

**Female.** Dorsal shield smooth, slightly concave near R1; 342 μm long, 232 μm wide; 17 pairs of setae and 3 pairs of visible pores (2 pairs elliptical, 1 pair round) (Fig. 4, A). Chelicera 29 μm long, movable digit with 2 teeth, fixed digit with 5 subapical teeth (Fig. 4, B). All dorsal shield setae smooth, except S4 serrate. Dorsal shield setae: j1 36 μm; j3 38 μm, j4 14 μm; j5 12 μm, j6 = j2 = 22 μm, j3 5 μm, z2 41 μm, z4 34 μm, z5 10 μm, z1 19 μm, Z4 24 μm, Z5 67 μm,

$s_4$ 50 μm, $S_2$ 29 μm, $S_4$ 24 μm, $S_5$ 26 μm, $r_3$ 18 μm, $R_1$ 12 μm (both on membrane). Seta $J^3 > J^3 - z_2; z_2 > z_2-z_4; z_4 < z_4-s_4$. Seta $Z_4$ anterior to seta $S_4; Z_4$ 36 μm and 41 μm apart from $S_4$ and $S_5$, respectively (Fig. 4, A). Peritreme extends to seta $z_2$ tip blunt. Peritremal shield base ribbon-like, 60 μm (Fig. 4 D). Sternal shield smooth, slightly convex anteriorly, obscure posteriorly, 92 μm long, 72 μm wide; 3 pairs of setae and 2 pairs of pores; 3 broad, concave areas laterally, $St_1 < St_1-St_2$, $St_2 < St_2-St_3$ (Fig. 4, C). Metasternal setae 1 pair, on membrane. Genital shield 103 μm wide, 1 pair of setae, wider than ventriansional shield. Genital and ventriansional shields 41 μm apart, without membranous fold between them. Ventriansional shield vase-shaped, smooth, 127 μm long, 82 μm wide; 3 pairs of preanal setae and a pair of elliptical pores (Fig. 4, C). Four pairs of setae including $J^V^5$ (36 μm) on membrane surrounding ventriansional shield. Metapodal platelets 21 pairs; primary pair 24 μm long; secondary pair 9 μm long. Leg IV with 3 macrosetae, 1 setae each on genu, tibia and basitarus, measuring 55 μm, 36 μm and 72 μm in length, respectively (Fig. 4, F). Spermatheca cervix tube-like, gradually flared posteriorly, 53 μm long; atrium atta-
ched to cervix, wider than cervix base; major-duct tubular (Fig. 4, E).

MALE: Not came in collection.

Holotype female, Daphar Forest Plantations from mulberry (Morus alba), 18 Sept. 1991, Amjed and deposited in Acarology Research Laboratory, Department of Agri. Entomology, University of Agriculture, Faisalabad, Pakistan.

REMARKS: — *Euseius lubricus*, n.sp. is included in the group of species having cheliceral movable digit with teeth (*Euseius serenotus*, *E. terenos*, *E. badius*, *E. orcula* and *E. mediocris*, *E. astur*, *E. subtilus*, *E. shahidai*, *E. gratus*). It also resembles these species in the position of seta Z4 and the smooth ventrianal shield. The following characters separate this species from the others mentioned above.

1. Cheliceral movable digit with 2 teeth in this species; 1 tooth in other species.
2. Dorsal shield with 3 pairs of pores (2 rounded and, 1 elliptical) in this species; number and shape variable in other species.

REFERENCES


