

A New Species of the Genus *Euseius* Wainstein (Acari: Phytoseiidae) and Re-Description of *Euseius septicus* Chaudhri *et al.*, 1979 From Pakistan

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Abstract.- *Euseius* is the only genus reported in the tribe Euseiini of the subfamily Amblyseinae from Pakistan. A new species, *Euseius pakistanensis* n.sp., is described from Pakistan, where it was collected from *Cynodon dactylon* (L.). This paper also re-describes *Euseius septicus* Chaudhri *et al.*, 1979 with its improved characters, because original description was found inadequate. Nineteen paratypes of *Euseius septicus* Chaudhri *et al.*, 1979 were examined along with collected material. These two species depict different morphological characters. Both the species are described and illustrated along with a key to Pakistani species of genus *Euseius*.

Key words: Phytoseiidae, *Euseius pakistanensis*, *Cynodon dactylon* (L.), *Euseius septicus*.

INTRODUCTION

Phytoseiidae is a well known group of predatory mites documented from all over the world. Amblyseinae Muma (1961) is the largest subfamily of this family, comprising most of the species that have been used for applied biological control of pest mites. Members of this subfamily are characterized by the absence of setae *z3* and *s6* (Chant and McMurtry, 2007; Krieter *et al.*, 2010; Moraes *et al.*, 2004; Prasad, 2012). About 102 species of Amblyseinae have been reported from Pakistan (Demit *et al.*, 2014; Afzal *et al.*, 2010).

The tribe Euseiini subfamily Amblyseinae was proposed by Chant and McMurtry (2005) on the basis of the presence of a posterior projection on the posterior margin of the sternal shield and on the forward migration of preanal setae *JV2* and *ZV2*. They included *Euseius* Wainstein and nine other genera in this group.

About 37 species of genus *Euseius* Wainstein have been reported from Pakistan (Demit *et al.*, 2014). Within the Euseiini, this genus is diagnosed on the basis of different characters, including the reduced, vase shaped or ovoid female ventrianal shield; peritreme usually short, not reaching to level of setae *j3*; chelicera reduced, with small teeth on

fixed digit clustered apically and with inner margin strongly concave, and movable digit with one or no tooth.

This paper describes a new species *Euseius pakistanensis* n.sp. and improved description of *Euseius septicus* Chaudhri *et al.*, 1979 which were collected from Punjab, Pakistan. Nineteen female paratypes of *Euseius septicus* Chaudhri *et al.*, 1979 deposited in Acarology Research Laboratory, Department of Entomology, University of Agriculture, Faisalabad, Pakistan were also examined and authors found that original illustrations of *Euseius septicus* lacks some characters which were not shown in its original illustrations. It may be due to the fact that the said species was described 35 years ago and numbers of different body characters which are considered very important at present were not in consideration in designation of species within phytoseiidae at that time. It is evident round the world that knowledge about taxonomy of family phytoseiidae has been updated since some decades. Keeping in view about this fact, authors re-examined the paratypes of *Euseius septicus* and re-described this species with inclusion of different body characters to make it useful in identification.

This paper re-describes *Euseius septicus* Chaudhri *et al.* (1979) with its improved characters along with new species *Euseius pakistanensis* n.sp. These two described species depicts different body characters from each other.

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MATERIALS AND METHODS

Different host plants were sampled for predatory mites. The collected specimens were cleared in Nesbitt's solution, mounted in Hoyer's medium on glass slides. The specimens were examined under a phase-contrast microscope (MT4210H, Meiji Techno®, Japan). Illustrations were drawn with pencil by using an ocular grid. Final processing of drawings was done in Adobe Illustrator (Adobe Systems Incorporated, USA). Identification was carried out according to Chant and McMurtry (2007). The terminology used in this study follows that of Rowell *et al.* (1978) and Chant and Yoshida-Shaul (1991) for dorsal and ventral chaetotaxy respectively. All measurements are given in micrometers. The range of different body characters of measured specimens are given in brackets with mean value of each character prevailing outside it.

RESULTS AND DISCUSSION

KEY TO SPECIES OF GENUS *EUSEIUS* WAINSTEIN FROM PAKISTAN

- | | | | |
|-----|---|--|--|
| 1. | Dorsum reticulated.....2 | | |
| - | Dorsum smooth or with light striations 15 | | |
| 2. | Setae j1 > j33 | | |
| - | Setae j1 = j3 or j1 < j3 7 | | |
| 3. | Ventrianal shield with preanal setae short or reaching to the level of posterior pores4 | | |
| - | Ventrianal shield with preanal setae reaching beyond the level of posterior pores5 | | |
| 4. | Setae Z1 anterior in position with setae R1; peritreme reaching between setae z4 and z2; genital shield wider than sternal shield; ventrianal shield ovate; calyx tubular <i>petacis</i> Qayyum, Pervez, Akbar and Afzal | | |
| - | Setae Z1 posterior in position with setae R1; peritreme reaching to setae j3; genital shield = ventrianal shield in width; ventrianal shield ovoid, wider posteriorly; calyx bell shaped <i>odoratus</i> Khan and Chaudhri | | |
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..... <i>latro</i> (Shahid, Siddiqui and Chaudhri) | | |
| - | Peritreme reaching to setae z26 | | |
| 6. | Sternal setae long, reaching to base of next setae in line; membranous infold present between genital and ventrianal shield; spermatheca tubular, atrium indistinct <i>relictus</i> Chaudhri, Akbar and Rasool | | |
| - | Sternal setae short, not reaching to base of next setae in line; membranous infold absent between genital and ventrianal shield; genital shield wider than sternal and ventrianal shield.....
..... <i>pluvia</i> Qayyum, Pervez, Akbar and Afzal | | |
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| - | Ventrianal shield ovoid; chelicera fixed digit with 3 sub apical teeth; setae r3 = R1 in length
..... <i>omentum</i> Qayyum, Afzal and Ahmadi | | |
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*septicus* Chaudhri, Akbar and Rasool
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 *ziai* Parvez, Akbar and Chaudhri
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29. Dorsum wider anteriorly, rounded posteriorly; setae j3 and z4 long, reaching beyond the base of next setae in line; setae Z4 long, reaching base of setae S5; distance between S2-S4 = distance between S4-S5; chelicera fixed digit with 3 small teeth
*lucidus* Parvez, Akbar and Chaudhri
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 *amabilis* Khan, Chaudhri and Khan
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 *caricus* Afzal, Ali and Akbar

***Euseius pakistanensis*, new species**

Adult female (Fig. 1: A-E) (n= 7)

Dorsum (Fig. 1A)

Dorsal shield 330 (300-350) long and 220 (200-250) wide, smooth. Setae *j1* 33 (25-38), *j3* 35 (28-40), *j4* 15 (13-20), *j5* 15 (13-18), *j6* 25 (25-28), *J2* 25 (25-28), *J5* 10 (8-10), *z2* 35 (30-38), *z4* 40 (33-45), *z5* 15 (13-15), *Z1* 23 (20-25), *Z4* 28 (25-28), *Z5* 63 (53-73), *s4* 58 (55-63), *S2* 28 (23-33), *S4* 25 (23-28), *S5* 28 (28-33), *r3* 18 (13-23), *R1* 13 (10-18), on lateral integument. Peritreme extending to level of setae *z2*.

Venter (Fig. 1B)

Sternal shield 85 (78-88) long, 83 (78-95) wide with median lobe lightly sclerotized on posterior

margins bearing three pairs of setae (*ST1- ST3*). Setae *ST1* 35 (28-38), *ST2* 33 (30-43) and *ST3* 25 (25-28). Metasternal shield with setae *ST4* 28 (25-30). Genital shield 70 (60-80) long, 95 (88-100) wide with one pair of setae, posterior margin slightly concave; *ST5* 28 (25-33) long. Membranous infold present between genital and ventrianal shield. Ventrianal shield 95 (88-105) long and 75 (70-80) wide, with anterior margin convex and constriction laterally at level of setae *JV2* bearing three pairs of preanal setae (*JV1*, *ZV2*, *JV2*), *JV1* 25 (23-28), *ZV2* 23 (18-25) and *JV2* 25 (23-25) with a pair of elliptical preanal pores posteromesad of *JV2*, in addition to circumanal setae. Opisthogastric membrane with four pairs of setae (*JV4*, *JV5*, *ZV1*, *ZV3*) *JV4* 13 (10-15), *JV5* 30 (28-33), *ZV1* 28 and *ZV3* 13 (10-13) respectively.

Spermatheca (Fig. 1C)

Spermatheca with calyx elongate, 33 (25-38) long, flaring slightly toward vesicle.

Chelicera (Fig. 1D)

Chelicera fixed digit 25 (25-38) long, with 5 small teeth, movable digit without teeth.

Leg (Fig. 1E)

GenuII and III with one macrosetae each. Leg IV with threemacrosetae on genu 50 (40-55), tibia 43 (38-50) and basitarsus 73 (63-83) long respectively.

Type material

Holotype female and six paratype females collected from *Cynodon dactylon* (L.) at Hafizabad, Punjab, Pakistan, on 05-05-2013; all types deposited in Acarology Research Laboratory, Department of Entomology, University of Agriculture, Faisalabad, Pakistan.

Remarks

This new species *Euseius pakistanensis* n.sp. comes very close to *E. ziai* Parvez, Akbar and Chaudhri but can be distinguished on the basis of following characters; new species exhibits setae *j3*, *z2* and *z4* long, reaching to the base of next setae in line; setae *J2* = *j6* in length; setae *s4* less than 3x length of setae *Z1*; setae *Z4* = *S2* = *S5* in length;

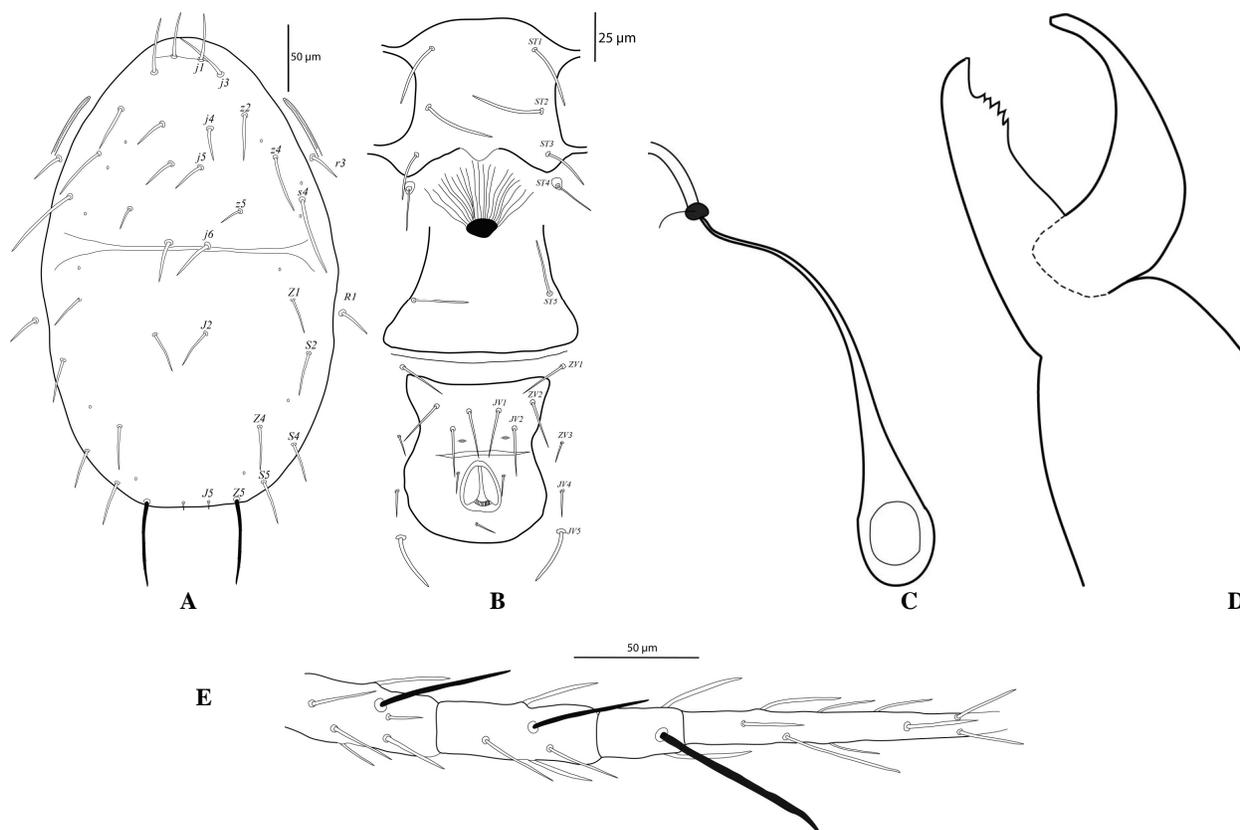


Fig. 1. *Euseius pakistanensis* n.sp.; A, dorsal side; B, ventral side; C, spermatheca; D, chelicera; E, leg IV.

peritreme tip slightly rounded; sternal setae long, reaching to base of next setae in line; membranous infold present between genital and ventrianal shield; ventrianal shield 95 (88-105) long and 75 (70-80) wide; ventrianal shield anterior margin convex, setae JV1 posterior in position with respect to setae ZV2; chelicera fixed digit with 5 small teeth; macrosetae on genu 50 (40-55), tibia 43 (38-50) and basitarsus 73 (63-83) long respectively.

Euseius septicus Chaudhri, Akbar and Rasool,
1979

Adult female (Fig. 2: A-E) ($n = 23$)

Dorsum (Fig. 2A):

Dorsal shield 350 (330-360) long and 240 (220-260) wide, with antero-lateral striations and broken striations posteriorly. Setae $j1$ 30 (28-33), $j3$ 38 (30-43), $j4$ 15 (13-20), $j5$ 15 (13-18), $j6$ 28

(25-30), $J2$ 30 (28-35), $J5$ 13 (10-13), $z2$ 38 (33-45), $z4$ 45 (40-50), $z5$ 15 (13-25), $Z1$ 28 (25-30), $Z4$ 28 (25-32), $Z5$ 63 (60-63), $s4$ 65 (63-70), $S2$ 30 (25-35), $S4$ 28 (23-33), $S5$ 33 (30-38), $r3$ 23 (20-28), $R1$ 18 (15-23), on lateral integument. All dorsum setae smooth except $Z5$ slightly serrated. Peritreme extending to level of setae $z2$. Peritremal shield 55 (52-58) long.

Venter (Fig. 2B)

Sternal shield 94 (90-98) long, 110 (100-113) wide and with three pairs of setae ($ST1$ - $ST3$). Setae $ST1$ 30 (30-35), $ST2$ 30 (25-33), $ST3$ 25 (23-28). Metasternal shields with one pair of simple setae $ST4$ 28 (23-28). Genital shield 64 (61-68) long, 107 (100-114) wide with one pair of setae, posterior margin straight; $ST5$ 28 (25-30) long. Ventrianal shield 112 (110-135) long and 75 (70-80) wide, bearing three pairs of pre-anal setae ($JV1$, $ZV2$, $JV2$), $JV1$ 29 (28-32), $ZV2$ 21 (20-21)

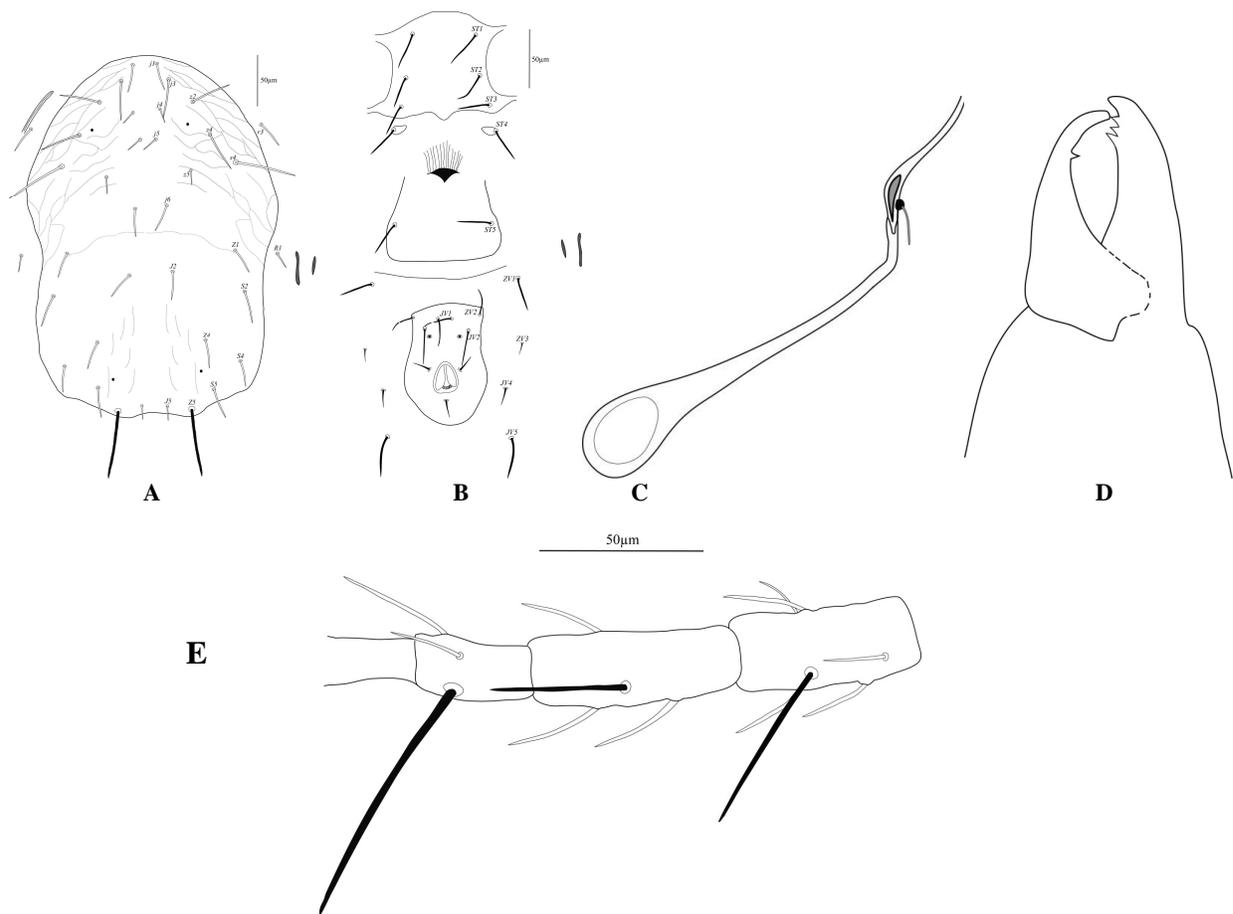


Fig. 2. *Euseius septicus* Chaudhri, Akbar and Rasool; A, dorsal side; B, ventral side; spermatheca; D, chelicera; E, leg IV.

and *JV2* 36 (35-39) with a pair of elliptical pre-anal pores posteromesad of *JV2*, in addition to circumanal setae. Opisthogastric membrane with four pairs of setae (*JV4*, *JV5*, *ZV1*, *ZV3*) *JV4* 13 (11-15), *JV5* 35 (32-39), *ZV1* 25 (23-26) and *ZV3* 11 (10-11) respectively.

Spermatheca (Fig. 2C)

Spermatheca with calyx elongate, 33 (30-36) long, bifurcated at juncture with atrium.

Chelicera (Fig. 2D)

Chelicera fixed digit 22 (20-22) long with three small teeth; movable digit with one tooth only.

Leg (Fig. 2E)

Leg II and III with one macrosetae only. Leg IV with 3 macrosetae on genu 51 (49-52), tibia 35

(34-36) and basitarsus 72 (70-75) long respectively.

Material examined

Nineteen female paratypes from collection of Dr. Wali Muhammad Chaudhri deposited in Acarology Research Laboratory, Department of Entomology, University of Agriculture, Faisalabad, Pakistan; ten adult female specimens collected from *Gossypium hirsutum* at Faisalabad, Punjab, Pakistan on 27-09-2013; all specimens deposited in Acarology Research Laboratory, Department of Entomology, University of Agriculture, Faisalabad, Pakistan.

Remarks

Authors found that original description of *E. septicus* Chaudhri *et al.*, 1979 was inadequate. After examining nineteen female paratypes from

collection of Dr. Wali Muhammad Chaudhri and ten specimens collected at Faisalabad, authors updated following characters; Dorsum paddle shape, with slight striations antero-laterally, broken striations postero-medially, convex area between bases of setae *J5*; distance between *j4-j5* > twice length of setae *j4*; setae *Z1* in straight line with *R1* in position; chelicera fixed digit with three small teeth, movable digit with one tooth only; sternal setae *ST1* not reaching to base of next setae in line; female ventrianal shield anterior margin concave, straight laterally, rounded posteriorly; setae *JV1* < *JV2* in length; spermatheca bifurcated at juncture with atrium.

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