

## A New Species of Genus *Erythraeus* (Acari: Erythraeidae) From Punjab, Pakistan

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**Abstract.-** A new species *Erythraeus* (*Erythraeus*) *layyahensis* (Acari: Erythraeidae) is described from larvae collected from weed plants *Setaria viridis* L. from district Layyah, Punjab, Pakistan. This new species belongs to species group of subgenus *Erythraeus* (*Erythraeus*) having 3-3-3 basifemoral setal formula.

**Key words:** *Erythraeus*, *Erythraeus layyahensis* new species, Layyah.

### INTRODUCTION

Genus *Erythraeus* (Erythraeidae) was erected by Latreille in 1806. Southcott (1995) classified genus *Erythraeus* into two subgenera viz., *Zaracarus* and *Erythraeus*. In subgenus *Erythraeus*, 40 species are known hitherto, most of them reported from Europe and Asia and have been described from larvae (Beron, 1982; Haitlinger, 1987, 1994, 1995, 1997, 2000, 2002, 2003, 2004, 2006, 2007, 2009a, b, 2010, 2011; Haitlinger and Saboori, 1996; Saboori *et al.*, 2004a,b; Saboori and Cobanoglu, 2010). Larvae of this genus parasitize different insects *i.e.*, bugs and aphids etc. or live freely on different plants (Goldarazena and Zhang, 1998; Saboori and Babolmorad, 2000; Saboori and Nowzari, 2001; Khanjani *et al.*, 2007).

Up till two species of genus *Erythraeus* viz. *Erythraeus* (*Zaracarus*) *perpusillus* Kamran, Afzal, Raza, Irfanullah, Bashir & Ahmad, 2009 and *Erythraeus* (*Erythraeus*) *walii* Kamran, Afzal, Raza, Bashir & Salman, 2011, have been described from Pakistan (Kamran *et al.*, 2009, 2011). In present paper, one new species *Erythraeus layyahensis* Kamran, Afzal & Bashir is described and illustrated from larvae, collected from weed plants from Punjab, Pakistan. *Erythraeus* (*E.*) *layyahensis* n. sp. belong to species group of subgenus *Erythraeus* (*Erythraeus*) with basifemoral setal formula 3-3-3.

### MATERIALS AND METHODS

Larvae of erythraeid mites were collected from two grassy plants *Setaria viridis* L. and *Sorghum halepense* L. from district Layyah and Bakhar respectively. Leaves of these grasses were shaken on a piece of paper, mites larvae were picked with help of fine brush from the paper and preserved in 70% ethyl alcohol covered with few drops of glycerin in small vials. Mite specimens were mounted on glass slides using Hoyer's medium and were examined under higher power phase contrast microscope. The drawings of different body parts of mite specimens were made by using camera lucida. The specimens were identified with the help of published literature and diagnostic keys. Measurements were shown in micrometers ( $\mu\text{m}$ ). Name of new species were selected according to the rules of International Code of Zoological Nomenclature. The terminology and abbreviations were adopted from Haitlinger and Saboori (1996) and Goldarazena and Zhang (1998). Measurements of the holotype and 3 paratypes are presented in Table I.

*Erythraeus* (*Erythraeus*) *layyahensis*, new species  
(Fig. 1)

#### Description of holotype larva

##### Dorsum

Idiosoma ovoid, smooth, 500  $\mu\text{m}$  long, 350  $\mu\text{m}$  wide, total length of body from tips of chelicerae to posterior pole of idiosoma 650  $\mu\text{m}$ . Scutum present dorsally on idiosoma, wider than

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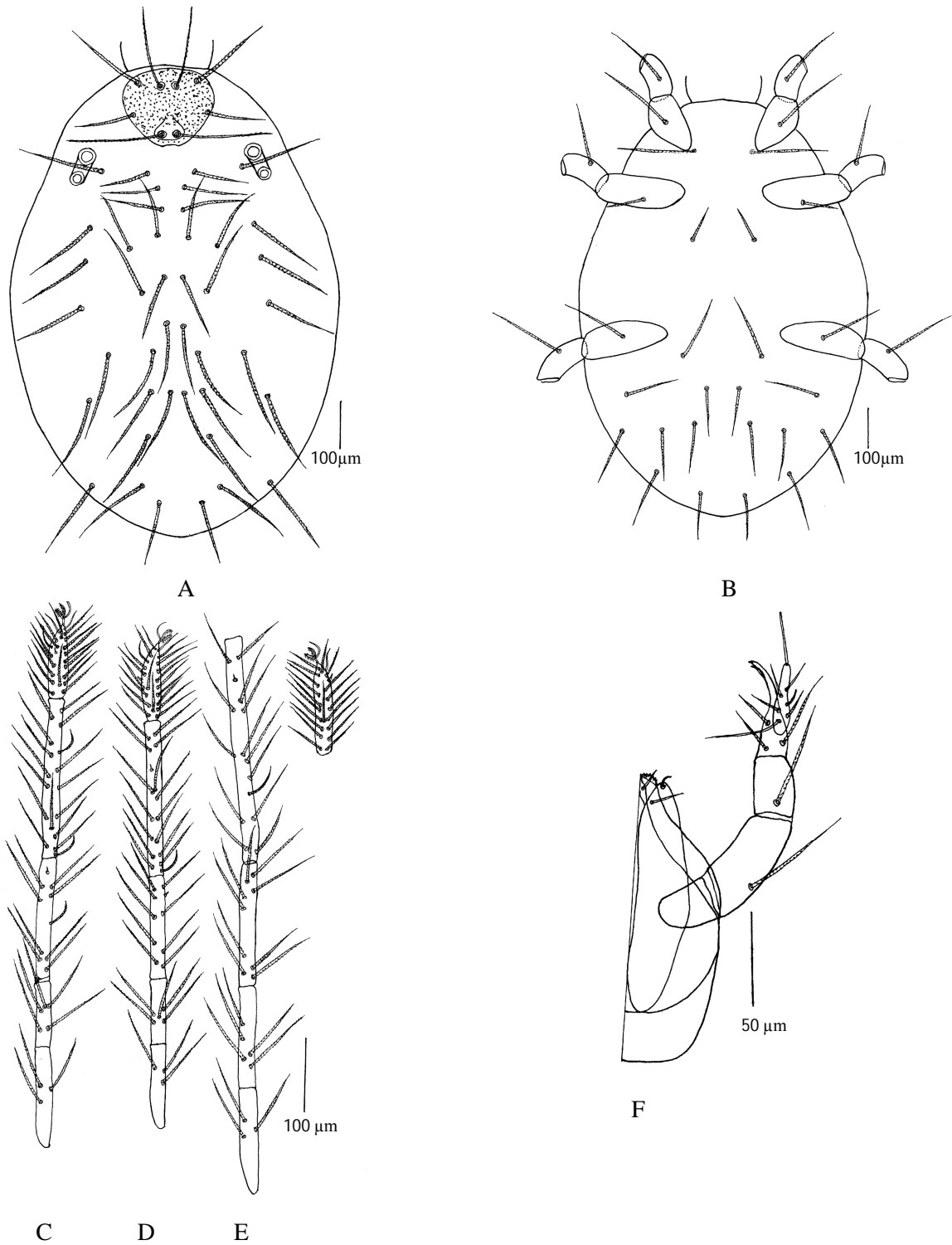


Fig.1. *Erythraeus (Erythraeus) layyahensis*, new species (larva), A, dorsal view; B, ventral view; C, leg I (femur & tarsus); D, leg II (femur-tarsus); E, leg III (femur & tarsus); F, Gnathosoma.

**Table I.-** Metric data of *Erythraeus (Erythraeus) layyahensis* new species larva.

Character	Holotype	Paratypes			Character	Holotype	Paratypes		
		1	2	3			1	2	3
IL	500	506	498	505	Ti I	212	210	208	213
IW	350	345	349	353	Ge I	162	164	159	160
L	87	81	85	88	Tfe I	87	89	88	89
W	100	102	100	104	Bfe I	137	135	138	136
AW	70	69	73	70	Tr I	50	51	50	52
PW	80	83	79	83	Cx I	75	73	74	76
Sba	12.5	12.5	12	12.5	Leg I	835	831	830	836
SBp	12.5	12	12.5	12	Ta II(L)	113	110	112	111
ISD	50	47	52	49	Ta II(H)	20	22	21	21
AP	38	37	40	36	Ti II	205	204	200	206
AL	90	93	89	88	Ge II	137	134	139	136
PL	63	60	59	61	Tfe II	87	85	88	88
AM	92	91	93	90	Bfe II	112	109	113	108
S	100	102	100	98	Tr II	62	63	65	63
DS	57-92	58-90	55-90	55-92	Cx II	100	101	102	105
PDS	70-92	71-90	71-93	72-92	Leg II	816	806	819	817
1a	90	93	88	89	TaIII (L)	137	134	133	138
2a	45	43	44	47	TaIII (H)	20	22	21	22
Coxala I	95	93	91	96	Ti III	310	308	311	312
Hy	16	17	18	18	Ge III	162	165	161	160
GL	125	127	122	127	Tfe III	136	130	131	132
PaScFed	60	62	61	62	Bfe III	136	130	133	135
PaScGed	59	56	61	62	Tr III	75	72	76	77
Ta I(L)	112	109	113	110	Cx III	106	108	105	103
Ta I(H)	25	26	25	27	Leg III	1062	1047	1050	1057

Abbreviations used: H, Holotype; P, Paratype; IL, L. length of body without gnathosoma; IW, W. width of body; L. Length of scutum; W, width of scutum; AW, distance between centers of bases of AL scutalae; PW, distance between centres of bases of PL scutalae; AA, distance between centres of external orifices of scutal anterior sensillae; SB, distance between centers of external orifices of posterior sensillae; ISD, inter sensillary distance between levels of centres of anterior and posterior sensillary setae of scutum; AP, distance between centres of bases of AL and PL scutalae; AL, anterolateral scutala; PL, Posterolateral scutala; AM, anterior sensillary seta of dorsal scutum; S, Posterior sensillary seta of dorsal scutum; DS, length of dorsal idiosomal setae; PDS, length of posterior dorsal setae of idiosoma; St, length of setae between coxae I and coxae II on ventral surface of idiosoma; GL, length of gnathosoma measured between bases of palp coxae and tip of chelicerae; PaScFed, length of seta on dorsal surface of palpfemur; PaScFev, length of seta on ventral surface of palpfemur; PaScGed, length of seta on dorsal surface of palpgenu; PaScGev, length of seta on ventral surface of palpgenu; NDV, total number of dorsal and ventral setae; fD, number of dorsal setae; fV, number of ventral setae. N, nude setae; B, barbed setae; Hy, length of posterior hypostomala; Ta (L), length of tarsus; Ta (H), height of tarsus; Ge, length of genu; Tf, length of telofemur; Bf, length of basifemur; Tr, length of trochanter; Cx, length of coxa.

long, 100  $\mu\text{m}$  wide, 87  $\mu\text{m}$  long, densely punctate entirely, somewhat rounded and carries two pairs of sensillae and two pairs of scutalae. Both sensillae (AM and S) very finely barbed (ciliated) on their entire lengths and with pointed ends. Posterior pair of sensillae (S) slightly longer than anterior pair of sensillae (AM); ASE 92  $\mu\text{m}$  and PSE 100  $\mu\text{m}$  long. Cuticular lines surround posterior pair of sensillae in shape of flask. AA=12.5  $\mu\text{m}$ , SB=12.5  $\mu\text{m}$ , ISD=50  $\mu\text{m}$ . AL scutalae longer than PL scutalae, AL 90  $\mu\text{m}$ , PL 63  $\mu\text{m}$ , both very finely barbed with pointed tips. AL scutalae lie slightly anterior to the level of

AM bases. PL scutalae lie far off distance anterior to the level of PSE bases. AW=70  $\mu\text{m}$ , PW=80  $\mu\text{m}$ , AP=38  $\mu\text{m}$  (Fig.1A).

Two pairs of eyes present on each side of idiosoma dorsally on separate platelets far behind from scutum, anterior pair, 12  $\mu\text{m}$ , posterior pair 10  $\mu\text{m}$  across.

Dorsal setae on idiosoma, 21 pairs, all with pointed tips very finely barbed and ranging in lengths from 57-92  $\mu\text{m}$ , PDS=70-92, fD=42 (Fig.1A).

### Venter

Idiosoma ventrally with one pair of finely barbed sternalae 1a between coxae I, 90  $\mu\text{m}$  long; one pair of sternalae 2a slightly behind the coxae II, 45  $\mu\text{m}$  long; eight pairs of setae behind the coxae III. All ventral setae finely barbed and with pointed tips.  $fV=16$ ;  $NDV=42+16=58$ .

Coxae I-III each with one coxalae; all coxalae finely barbed and having pointed tips; coxalae I the longest one, 95  $\mu\text{m}$  long, more than twice the length of coxalae II and 1.2 times longer than coxalae III. Coxalae II and coxalae III, 40  $\mu\text{m}$  and 75  $\mu\text{m}$  long respectively (Fig. 1B).

### Gnathosoma

Gnathosoma cone shaped and compact with simple (smooth) galaelae and hypostomalae, 12  $\mu\text{m}$  and 16  $\mu\text{m}$  long respectively; palpfemur and palpgenu each with one barbed and pointed tipped setae; palplibia with three barbed setae; palptarsus with one apical eupathidium, one solenedion, one long nude basal seta, two short nude setae and two barbed setae. Palp tibial claw bifurcate (Fig. 1C).

### Palp setal formula

fPp: 0-B-B-BBB-  $\omega\zeta$ NNN BB

### Legs

Legs three pairs, all legs longer than body length; leg III the longest one, legs I-III measuring 835  $\mu\text{m}$ , 816  $\mu\text{m}$  and 1062  $\mu\text{m}$  long, respectively.  $IP=835+816+1062=2713$  (Fig. 1D-F).

### Leg setal formula

Leg I: Ta-1 $\omega$ , 1 $\epsilon$ , 2 $\zeta$ , 18B; Ti-2 $\phi$ , 1k, 15B; Ge-1 $\sigma$ , 1k, 9B; Tfe-5B; Bfe-3B; Tr-1B; Cx-1B

Leg II: Ta-1 $\omega$ , 1 $\epsilon$ , 2 $\zeta$ , 18B; Ti-2 $\phi$ , 1k, 14B; Ge-1k, 9B; Tfe-5B; Bfe-3B; Tr-1B, Cx-1B

Leg III: Ta-1 $\omega$ , 20B; Ti-1 $\phi$ , 1k, 13B; Ge-9B; Tfe-5B; Bfe-3B; Tr-1B; Cx-1B

### Etymology

Name of this new species is named on the name of locality (Layyah) from where holotype larva was collected.

### Type

Holotype larva was collected from chak no.

283/T.D.A., 22 km east of district Layyah (Punjab) on 09-07-2007 (Muhammad Kamran) from foxtail grass (*Setaria viridis* L.). Paratypes 5 larvae, collection data of 3 larvae same as holotype while 2 paratypes were collected from baru grass (*Sorghum halepense* L.) on 15-07-2012. All specimens have been deposited in Acarology Laboratory, Department of Agri. Entomology, University of Agriculture, Faisalabad, Pakistan

### Remarks

In subgenus *Erythraeus* (*Erythraeus*), 40 species have been described hitherto. *Erythraeus* (*E.*) *layyahensis* n. sp. differs from all other species of subgenus *Erythraeus* by having very long anterior sensillae (ASE) 92  $\mu\text{m}$ ,  $fD=42$ ,  $fV=16$ . It closely resembles with *Erythraeus* (*E.*) *elwirae* Haitlinger, 1987 but both are different on the basis of following characters.

AP (38 vs. 88; ISD (50 vs. 94);  $fD$  (42 vs. 36);  $fV$  (16 vs. 18);  $TiI$  (212 vs. 384); ASE & PSE (finely barbed on their lengths vs. ciliated only on top portions).

It can also be distinguished from *Erythraeus* (*E.*) *monikae* Haitlinger, 1987 by  $fD$  (42 vs. 38); AP (38 vs. 74); ISD (50 vs. 90); AL (90 vs. 150);  $TiI$  (212 vs. 312) DS (57-92 vs. 102-110).

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## REFERENCES

- BERON, P., 1982. duxieme contribution al'etude des Erythraeidae (Acariformes) larvaires de Bulgaire. *Acta Zoologica Bulgairica*, **19**: 46-56.
- GOLDARAZENA, A. AND ZHANG, Z-Q., 1998. New *Erythraeus* larvae (Acari :Erythraeidae) ectoparasitic on Aphidoidea (Homoptera) and Anthocoridae (Heteroptera). *Syst. appl. Acarol.*, **3**: 149-158.
- HAILLINGER, R., 1987. The genus *Erythraeus* Latreille, 1806 (Acari, Prostigmata, Erythraeidae) in Poland (larvae). *Pol. Pism. Ent.*, **57**: 725-734.
- HAILLINGER, R., 1994. Two new larval mites (Acari:

- Trombidiidae: Erythraeidae) from Switzerland. *Mitteil. Schweiz. Ent. Gesellsch.*, **67**: 405-410.
- HAITLINGER, R., 1995. New mites (Acari: Astigmata: Canestriniidae; Prostigmata; Erythraeidae, Trombidiidae, Microtrombidiidae) for the fauna of Austria, Germany and Hercegovina with description of four new species. *Linz. Biol. Beitr.*, **27**: 259-272.
- HAITLINGER, R., 1997. New larval mites (Acari: Prostigmata: Erythraeidae, Trombidiidae) from Canary Islands. *Zool. Baet.*, **8**: 123-132.
- HAITLINGER, R., 2000. New larval mites (Acari: Prostigmata: Erythraeidae, Microtrombidiidae, Trombidiidae) from Turkey, Peru and Poland. *Wiad. Parazyt.*, **46**: 379-396.
- HAITLINGER, R., 2002. Erythraeidae and Trombidiidae (Allothrombiinae) (Acari: Prostigmata) from Mallorca (Balearic Islands), with description of two new species. *Boll. Soc. Hist. Nat. Balears*, **45**: 191-197.
- HAITLINGER, R., 2003. Four new larval erythraeidae (Acari, Prostigmata) from Rhodes, Greece. *Biologia, Bratislava*, **58**: 133-146.
- HAITLINGER, R., 2004. New records of mites (Acari: Prostigmata: Erythraeidae) from Cambodia and Myanmar, with a description of *Erythraeus (Erythraeus) kacperi* sp. nov. *Syst. appl. Acarol.*, **9**: 157-161.
- HAITLINGER, R., 2006. Eight new species and new record of mites (Acari: Prostigmata: Erythraeidae, Trombidiidae, Johnstonianidae) from China including Macao. *Syst. appl. Acarol.*, **11**: 83-105.
- HAITLINGER, R., 2007. New records of mites (Acari: Prostigmata: Erythraeidae, Trombidiidae, Eutrombidiidae) from France, Liechtenstein and Switzerland, with description of three new species. *Syst. appl. Acarol.*, **12**, 55-72.
- HAITLINGER, R., 2009a. Three new species of mites (Acari: Prostigmata: Erythraeidae) from the Republic of Cape Verde. *Biologia*, **64**: 1156-1160.
- HAITLINGER, R., 2009b. New records of mites (Acari: Prostigmata: Erythraeidae, Eutrombidiidae, Microtrombidiidae, Podothrombidiidae, Trombidiidae) from Bulgaria, Macedonia and Romania. *Zesz. Nauk. Up Wroc., Biol. Hod. Zwierz.*, LVIII, **572**: 49-60
- HAITLINGER, R., 2010. New records of mites (Acari: Prostigmata, Erythraeidae, Trombidiidae) from Turkey, with description of four new species. *Zesz. Nauk. UP. Wroc., Biol. Hod. Zwierz.*, LX, **577**: 49-62.
- HAITLINGER, R., 2011. Two new species of larval *Erythraeus (Erythraeus)* (Acari: Prostigmata: Erythraeidae) from Sicily, Italy. *Syst. appl. Acarol.*, **16**: 291-297.
- HAITLINGER, R. AND SABOORI, A., 1996. Seven new larval mites (Acari: Prostigma Erythraeidae) from Iran. *Misc. Zool.*, **19**: 177-131.
- KAMRAN, M., AFZAL, M., RAZA, A.B., IRFANULLAH, M., BASHIR, M.H. AND AHMAD, S., 2009. Discovery of a new larval erythraeid mite (Acari: Erythraeidae: Erythraeinae) from Punjab, Pakistan. *Pakistan J. Zool.*, **41**: 357-361.
- KAMRAN, M., AFZAL, M., RAZA, A.B., BASHIR, M.H. AND AHMAD, S., 2011. Discovery of subgenus *Erythraeus* (Acari: Erythraeidae, *Erythraeus*) from Punjab, Pakistan. *Pakistan J. Zool.*, **43**: 1055-1059.
- KHANJANI, M. UECKERMANN, E.A. AND HASSAN, M 2007. A new species of genus *Erythraeus* (Acari: Erythraeidae) from Iran. *Pak. Entomol.*, **29**: 51-56.
- LATREILLE, P.A., 1806. *Genera crustaceorum et insectorum*, Vol. 1, p. 146.
- SABOORI, A. AND BABOLMORAD, M., 2000. A new larval mite (Acari: Erythraeidae) ectoparasite on *Monosteira unicostata* (Hemiptera: Tingidae) from Iran. *Sys. appl. Acarol.*, **5**: 119-123.
- SABOORI, A. AND COBANOGLU, S., 2010. A new species of larval *Erythraeus* and a new record of larval *Grandjeanella* (Acari: Erythraeidae) from Turkey. *Int. J. Acarol.*, **36**: 249-253.
- SABOORI, A., COBANOGLU, S. AND BAYRAM, S., 2004a. A new species of larval *Erythraeus (Erythraeus)* (Acari: Erythraeidae) from Turkey. *Int. J. Acarol.*, **30**: 137-142.
- SABOORI, A., GOLDARAZENA, A. and KHAJEALI, J., 2004b. Two new species of larval *Erythraeus* (Acari: Erythraeidae) from Iran with remarks on differential diagnosis. *Syst. appl. Acarol.*, **9**: 163-178.
- SABOORI, A. AND NOWZARI, J., 2001. A new larval erythraeine mite (Acari: Erythraeidae) from Iran. *Int. J. Acarol.*, **27**: 229-233.
- SOUTHCOFF, R.V., 1995. A new larval Erythraeinae mite (Acarina: Erythraeidae) from Spain. *Acarologia*, **36**: 223-228.

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