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Discovery of A New Larval Erythraeid Mite (Acari: Erythraeidae: Erythraeinae) From Punjab, Pakistan

Muhammad Kamran*, Muhammad Afzal, Abubakar Muhammad Raza, Muhammad Irfanullah, Muhammad Hamid Bashir and Salman Ahmad

University college of Agriculture, University of Sargodha, Sargodha (MK, MA, AMR, MI, SA) and Department of Agri. Entomology, University of Agriculture, Faisalabad (MHB)

Abstract.- *Erythraeus* (*Zaracarus*) *perpusillus,* new species is described and illustrated from a larva ectoparasitic on *Pyrilla perpusilla* (Homoptera) collected from district Okara, Punjab, Pakistan. This genus has been recorded for the first time from Pakistan.

Keywords: *Erythraeus*, *Zaracarus*, ectoparasite, mite, *Pyrilla perpusilla,* Okara.

INTRODUCTION

The octopod adults and nymphs of *Erythraeus* are free-living predators on plant and in the soil while hexapod larvae are ectoparasites on variety of insects (Southcott, 1961). The postlarval instars of the subgenus *Zaracarus* are unknown and the 15 known species are only larvae: *E*.(*Z.*) *elenorae* Haitlinger, 1987 from Poland; *E*. (*Z*.) lancifer Southcott, 1995, *E*. (*Z*.) *preciosus* Goldarazena and Zhang, 1998, both from Spain; *E*. (*Z*.) *tehranicus* Haitlinger and Saboori, 1996, *E*. (*Z*.) *rajabii* Saboori, 2000, *E*. (*Z*.) *kharrazii* Saboori, 2000, *E*. (*Z.*) *longipedus* Saboori and Nowzari, 2001, and *E*. (*Z*.) *iranicus* Saboori and Akrami, 2001, all from Iran; *E*. (*Z*.) *fabiolae* Haitlinger, 1997 from Canary Islands; *E*. (*Z*.) *budapestensis* Fain and Ripka, 1998, from Hungary; *E*. (*Z*.) *didonae* Haitlinger, 2000, *E*. (*Z*.) *aydinicus* Saboori *et al*., 2004, both from Turkey; *E*.(*Z*.) *passidonicus* Haitlinger, 2006, *E*.(*Z*.) *kastaniensis* Haitlinger, 2006, both from Samos Greece and *E. (Z.) sibuljinicus* Haitlinger, 2004 from Croatia (Southcott, 1995; Haitlinger, 1987,1997, 2000, 2004, 2006; Fain and Ripka, 1998; Goldarazena and Zhang, 1998; Haitlinger and Saboori, 1996; Saboori, 2000; Saboori and Akrami, 2001; Saboori and Nowzari, 2001; Saboori *et al*., 2004). Up till there was no report of this genus from Pakistan. Present authors have reported this genus from Punjab, Pakistan for first time and described a new species of subgenus *Erythraeus (Zaracarus)* from a larva collected from *Pyrilla perpusilla* (Lophopidae: Homoptera).

MATERIALS AND METHODS

Parasitic larvae were found on bodies of sugarcane plant hopper (*P. perpusilla*). Specimens of sugarcane plant hopper were captured in a sweep net, killed with potassium cyanide and preserved in 70% ethyl alcohol having few drops of glycerin. Parasitic mites were detached from the sugarcane plant hoppers and were permanently mounted on glass slides using Hoyer's medium (Chhillar *et al*., 2007). Permanent slides of mite specimens were examined under higher power phase contrast microscope. The drawings of different body parts of mite specimens were made by using an ocular grid. Measurements were taken in micrometres (μm). Magnification scale is given along with each drawing. Name of new species were selected from source book of Biological Names and Terms (Jaeger, 1959) following the name of host, according to the rules of International Code of Zoological Nomenclature (1999). The terminology and abbreviations were adopted from Haitlinger and Saboori (1996) and Goldarazena and Zhang (1998). Measurements of the holotype and three paratypes are presented in Table I.

* Corresponding authors: Email: kamran1513@gmail.com
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Table I.- Metric data of *Erythraeus (Z.) perpusillus* new species larvae.

Character	Holotype	Paratypes			Character	Holotype	Paratypes		
		1	2	3			1	2	3
IL	350	340	345	352	Ti I	190	196	192	188
IW	260	255	258	260	Ge I	137	135	137	138
L	100	96	102	100	Tfe I	100	99	101	102
W	152	151	154	150	Bfe I	105	106	102	104
AW	87	85	85	88	Tr I	48	50	46	48
PW	116	117	120	114	Cx I	63	60	65	62
SBa	20	21	20	22	Leg I	775	780	773	777
SBp	17	17	16	17	Ta II(L)	137	135	140	141
ISD	62	61	63	63	Ta II(H)	15	14	15	15
AP	47	49	50	48	Ti II	188	190	190	185
AL	130	128	126	131	Ge II	125	120	123	126
PL	74	76	75	72	Tfe II	87	85	89	85
ASE	28	26	29	30	Bfe II	100	99	102	103
PSE	70	68	72	73	Tr II	50	48	52	50
DS	50-60	50-60	51-60	50-60	Cx II	75	73	74	76
PDS	50-60	50-60	51-60	50-60	Leg II	762	750	770	766
1a	40	42	41	38	Ta III(L)	154	155	157	150
2a	32	30	33	31	Ti III	275	273	271	278
Cox. l	32	32	33	32	Ge III	150	154	153	150
Hy	25	26	25	26	Tfe III	125	123	120	126
GL	133	130	126	133	Bfe III	127	129	130	125
PaScFed	62	60	65	62	Tr III	50	51	53	55
PaScGed	75	74	73	75	Cx III	80	82	84	78
Ta I(L)	132	134	130	135	Leg III	961	967	968	962

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

Erythraeus (Zaracarus) perpusillus, new species (Fig. 1)

Description of holotype larva

Dorsum

Idiosoma oval in shape, smooth, 350µm long, 260µm wide. Total length from tips chelicerae to posterior pole of idiosoma 490µm. Prodorsal sclerite wider than long, 100µm long, 152µm wide, densely punctate entirely, convex anteriorly and posteriorly slightly concave and carries two pairs of trichobothria and two pairs of setae. Posterior pair of trichobothria (PSE) more than twice the length of anterior trichobothria (ASE); ASE 28µm long, PSE 70µm; ASE have strong cuticular structers at the bases, with long setules on their entire lengths and with pointed ends. PSE smooth (without setules), with pointed tips and lies at posterior pole of scutum. Cuticular lines surround the the posterior pair of trichobothria (PSE) in shape of flask. AL setae enlarged near bases and much longer than PL setae, 130µm; PL 74µm long, both with long dense setules on their entire lengths and blunt ended. AL lies at the level of ASE bases (Fig.1).

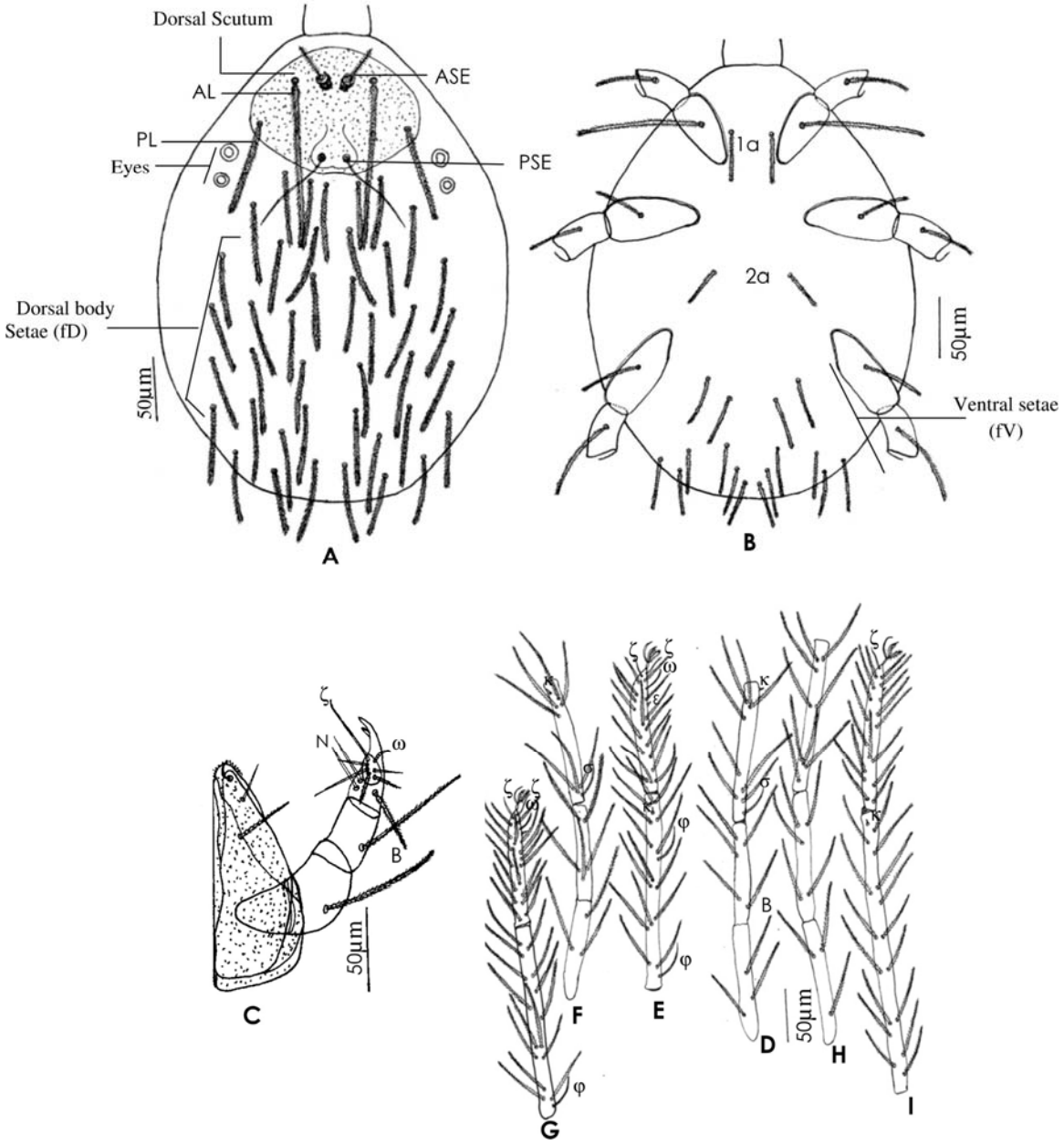

Fig. 1. *Erythraeus* (*Z.*) *perpusillus*, new species (larva) A, diosoma (dorsal view); B, Idiosoma (ventral view); C, gnathosoma; D, legI (femur and genu); E, legI (tibia and tarsus); F, legII (femur and genu); G-legII (tibia& tarsus); H-legIII (femur and genu); I, legIII (tibia and tarsus).

Two pairs of eyes present on idiosoma on each lateral side of scutum, anterior eye 17 µm across, at the level of PSE bases, posterior eye 12 µm across. Dorsal setae on idiosoma, 21 pairs, all with long setules on their entire lengths and ranging in lengths from 50-60 µm, fD=42 (Fig. 1A).

Venter

Idiosoma ventrally bears the 1a setae between coxae I, 40µm long; the 2a setae between the coxae II-III, 32µm long; 8 pairs of setae behind the coxae III. All ventral setae with long dense setules and terminally blunt. fV=16; NDV=42+16=58.

Coxae I-III each with one seta, all coxal setae blunt and with long setules. Seta on coxa leg I 2 to 2.5 times longer than the setae on coxae of legs II and III (Fig.1B).

Gnathosoma

Gnathosoma cone shaped and compact with flask shape in outline and densely punctate dorsally. Galaelae simple, 25µm long and Hypostomalae 33µm, finely barbed, supercoxalae absent. Palpfemur robust with one (densely setulose) seta; palpgenu with one barbed and blunt seta; palptibia with 2 nude and one barbed setae. Palptibial claw bifurcate with peg like accessory claw. Palptarsus with 7 setae including one eupathidium, one solenidion and one long seta (Fig.1C).

Palp setal formula

fPp: 0-B-B-BNN-ωζNNNBB

Legs

Legs three pairs, all legs longer than body length; leg III the longest one, legs I-III measuring 775µm, 762µm and 961µm long, respectively. IP = 775 + 762 + 961 = 2498 (Fig.1D-I).

Leg setal formula

Leg I: Ta-1ω, 1ε, 2ζ, 17B; Ti-2φ, 1κ, 15B; Ge-1 σ,1κ, 9B; Tfe-5B; Bfe-3B; Tr-1B; Cx-1B

Leg II: Ta-1ω,1ε, 2ζ, 17B; Ti-1φ, 1κ, 15B; Ge-1 σ,1κ , 7B; Tfe-5B; Bfe-3B; Tr-1B, Cx-1B

Leg III: Ta-1ε , 1ζ,17B; Ti –1κ, 16B; Ge-9B; Tfe-5B; Bfe-3B; Tr–1B; Cx-1B

Etymology

Name of this new species is derived from host insect *Pyrilla perpusilla* (Lophopidae: Homoptera)

Type

Holotype larva was collected from chak no. 7/4L, 5km south of district Okara (Punjab) on August 13, 2005 (Muhammad Kamran) parasitizing *Pyrilla perpusilla* (Lophopidae: Homoptera) infesting sugarcane crop. Paratypes 10 larvae, collection data of three larvae same while two paratypes were collected from University of Agriculture, Faisalabad from undetermined bug (Hemiptera) and 5 from sugarcane plants (*Saccharum officinarum* L.) from district Toba Take Singh on September 10, 2006. All specimens have been deposited in Acarology Research Labortory, Departrment of Agri. Entomology, University of Agriculture, Faisalabad.

Remarks

Subgenus *Zaracarus* (*Erythraeus*) is characterized by having cuticular lines near bases of ASE and AL setae enlarged near bases. Fifteen species have been described in subgenus *Zaracarus. Erythraeus (Zaracarus) perpusillus* sp. nov. belongs to a group of 8 species with 3 setae on the basifemur of legs I-III This group includes *E*. (*Z*.) *lancifer* Southcott, 1995 from Spain, *E*. (*Z*.) *fabiolae* Haitlinger, 1997 from Canary Island, *E*. (*Z*.) *rajabii* Saboori, 2000, *E*. (*Z*.) *longipedus* Saboori and Nowzari, 2001 both from Iran, *E*. (*Z*.) *sibulijinicus* Haitlinger, 2004 from Croatia, *E*. (*Z*.) *aydinicus* Saboori *et al.*, 2004 from Turkey, *E*. (*Z*.) *kastaniensis* Haitlinger, 2006 and *E*. (*Z*.) *passidonicus* Haitlinger, 2006 from Greece (Southcott, 1995; Haitlinger, 1997; Saboori, 2000; Saboori and Nowzari, 2001; Haitlinger, 2004; Saboori *et al.*, 2004; Haitlinger, 2006)

Erythraeus perpusillus sp. nov. differs from *E*. (*Z*.) *lancifer* in fD (42 vs. 32), fV (16 vs. 12), IP (2498 vs. 2710) and AW (87 vs. 40-55); from *E*. (*Z*.) *fabiolae* in shorter Ti III (275 vs. 440), IP (2498 vs. 3852), DS (50-60- vs. 70-130), TaI (132 vs. 196), PL (74 vs. 104), fV (16 vs. 12) and palpal femuralae and genualae barbed vs. nude in *E*. (*Z*.) *fabiolae*; from *E*. (*Z*.) *rajabii* in shorter Ti III (275 vs. 375), AL (130 vs. 192), GeIII (150 vs. 204), Ti II (188 vs. 248), fD (42 vs. 26), fV (16 vs. 14) and AW (87 vs. 36); from *E*. (*Z*.) *longipedus* in fD (42 vs. 30), fV (16 vs. 8), IP (2498 vs. 3403), AL (130 vs. 199), AW (87 vs. 41), Ti III (275 vs. 424), Ti II (188 vs. 267), Ti I (190 vs. 272) and Ge I (137 vs. 206); from *E*. (*Z*.) *sibulijinicus* in fD (42 vs. 24), fV (16 vs. 12), AW (87 vs. 42), GL (133 vs. 154) and Ti I (190 vs. 240); from *E*. (*Z*.) *aydinicus* Saboori *et al.*, in fD (42 vs. 32), Ti III (275 vs. 375), AL (130 vs. 167), PaScGed (75 vs. 63), TaI (132 vs. 179) and Ta III (154 vs. 184); from *E*. (*Z*.) *kastaniensis* in fewer fD (42 vs. 54), more fV (16 vs. 14), shorter Ti III (275 vs. 370), ISD (62 vs. 78), GL (133 vs. 170), TaI

(132 vs. 180), IP (2498 vs. 3180) and AL (130 vs. 100) and from *E.* (*Z.*) *passidonicus* in fD (42 vs. 37), fV (16 vs. 14), AL (130 vs. 98), AP (47 vs. 68), Ti III (275 vs. 356), IP (2498 vs. 3002), AW (87 vs. 68) and PW 116 vs. 156).

REFERENCES

CHHILLAR, B.S., GULATI, R. AND BHATNAGAR, P., 2007. *Agricultural acarology*. Daya Publ. House, Delhi, 355pp.

FAIN, A. AND RIPKA, G., 1998. A new larval Erythraeidae (Acari) from Hungery. *Int. J. Acarol*., **24**: 41-44.

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.

HAITLINGER, R., 1987. The genus *Erythraeus* Latreille, 1806 (Acari, Prostigmata, Erythraeidae) in Poland (larvae). *Pol. Pismo Ent.*, **57**: 725-734.

HAITLINGER, R. AND SABOORI, A., 1996. Seven new larval mites (Acari: Prostigma Erythraeidae) from Iran. *Misc. Zool*., **19**: 177-131

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., 2004. New records of mites (Acari: Prostigmata: Erythraeidae, Trombidiidae, Eutrombidiidae) from Croatia, with descriptions of three new species. *Nat. Croat*., **13**: 143-160.

HAITLINGER, R., 2006. New records of mites (Acari: Prostigmata: Erythraeidae, Trombidiidae) from Samos, Greece, with descriptions of six new species. *Syst. appl. Acarol*., **11**, 107-123.

INTERNATIONAL COMMISSION ON ZOOLOGICAL NOMENCLATURE, 1999. *International code on zoological nomenclature*, 4th Edition adopted by the International Union of Biological Sciences.

JAEGER, E.C., 1959. A *source book of biological names and terms*. Charles C. Thomas, Publis., U.S.A., pp. 319.

SABOORI, A., 2000. Two new larval erythraeine mites (Acari: Erythraeidae) from Iran. *Syst. appl. Acarol*., **5**: 125-131.

SABOORI, A., CAKMAK, I. AND NOURI-GOUBALANI, G., 2004. A new species of larval *Erythraeus* (*Zaracarus*) (Acari: Erythraeidae) from Turkey. *Int. J. Acarol*., **30**, 131-136.

SABOORI, A. AND NOWZARI, J., 2001. A new larval erythraeine mite (Acari: Erythraeidae) from Iran. *Int. J. Acarol*., **27**: 229-233.

SABOORI, A. AND AKRAMI, M.A., 2001. A new species of *Erythraeus* larva (Acari: Erythraeidae) from Iran. *Syst. appl. Acarol*., **6**: 159-163

SOUTHCOTT, R.V., 1961. Studies on systematics and biology of Erythraeioidea (Acarina), with critical revision of genra and subfamilies. *Aust. J. Zool*., **9**: 367-610

SOUTHCOTT, R.V., 1995. A new larval Erythraeinae mite (Acarina: Erythraeidae) from Spain. *Acarologia*, **36**: 223-228.

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