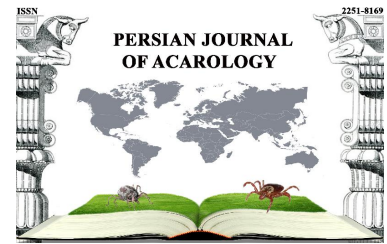




Persian J. Acarol., 2018, Vol. 7, No. 1, pp. 41–49.
<http://dx.doi.org/10.22073/pja.v1i1.34679>
Journal homepage: <http://www.biotaxa.org/pja>



<http://zoobank.org/urn:lsid:zoobank.org:pub:E80F3B9A-A823-466D-8E10-F6B68A12A3E3>

Article

New morphological data and new host record of *Lasioerythraeus saboorii* (Trombidiformes: Erythraeidae) from Iran

Masoud Hakimitabar^{1*}, Alireza Saboori² and Hossein Mokhtari Saaveh³

1. Department of Horticulture and Plant Protection, College of Agriculture, Shahrood University of Technology, Shahrood, Iran; E-mail: hakimitabar@yahoo.com
2. Jalal Afshar Zoological Museum, Department of Plant Protection, College of Agriculture, University of Tehran, Karaj, Iran; E-mail: saboori@ut.ac.ir
3. Department of Plant Protection, College of Agriculture, Jahrom Branch, Islamic Azad University, Jahrom, Iran; E-mail: hossein_mokhtari17@yahoo.com

* Corresponding Author

ABSTRACT

Lasioerythraeus saboorii Khanjani, Raisi & Izadi was described and illustrated based on larvae ectoparasitic on *Aphis punicae* (Passerini) (Hemiptera: Aphididae) from Boshrouyeh, Ferdows city, South Khorasan Province, Iran. In this paper, additional specimens were collected on unknown species of Chloropidae (Diptera) as host from Mahvelat City, Khorasan Razavi Province and additional metric data are provided. A revised key to world larval species of *Lasioerythraeus* is presented. Chloropidae is reported as a new host for the genus.

KEY WORDS: Acari; Acariformes; Prostigmata; Mahvelat City; Khorasan Razavi Province.

PAPER INFO.: Received: 3 December 2017, Accepted: 28 December 2017, Published: 15 January 2018

INTRODUCTION

Only six species of the genus *Lasioerythraeus* Welbourn & Young, 1987 were known hitherto: *L. whitcombi* (Smiley, 1964) from USA (Arkansas), based on postlarval stages; *L. shirleyanneae* (Mc Daniel & Bolen, 1981), from USA, based on larva from herbaceous plant; *L. johnstoni* Welbourn & Young, 1987 from USA (Mississippi) and the Dominican Republic, based on postlarval and larval stages from Hemiptera and Homoptera; *L. cardonensis* Haitlinger, 2008 from Venezuela, based on larva from herbaceous plant; *L. saboorii* Khanjani, Raisi & Izadi, 2011 from Iran, based on larva from *Aphis punicae* (Homoptera: Aphididae) and *L. setarius* Kamran and Bashir, 2013 from Pakistan, based on larva from weeds (Smiley 1964, 1966; Mc Daniel and Bolen 1981; Welbourn and Young 1987). In this study, *L. saboorii* is recorded from unknown species of Chloropidae and new morphological data is given. Some mistakes in figures (position of setae on tarsus I–III and number of setae) of the original paper (Khanjani *et al.* 2011) are corrected in new drawings. Also, we examined an additional specimen of *L. johnstoni* in South Australian Museum (SAM), Adelaide, Australia and present some new data which was not presented in the original description (Tables 1, 2).

MATERIAL AND METHODS

The specimens were collected by H. Mokhtari Saaveh, ectoparasitic on an unidentified Chloropidae (Diptera) (Fig. 14). The specimens (ARS-20111001-a & b) were collected in Mehneh village, Mahvelat City, Razavi Khorasan Province, Northeastern Iran (35° 16' N, 59° 12' E, 983 m a.s.l.), 25 May 2009. Two specimens were attached on abdomen of one fly (Fig. 14), detached by minute pin, preserved in 75% ethanol, cleared in Nesbitt's fluid and mounted on microscope slides using Faure medium. Figures were drawn and measurements were calculated using a BX 51 Olympus microscope equipped with a drawing tube. The specimens are deposited in the Acarological Collection, Jalal Afshar Zoological Museum (JAZM), College of Agriculture, University of Tehran, Karaj, Iran. For *L. johnstoni*, we examined one additional specimen deposited in SAM.

The terminology and abbreviations are adapted from Wohltmann *et al.* (2006) and Saboori *et al.* (2009), and measurements are given in micrometers (μm).

Lasioerythraeus saboorii Khanjani, Raisi & Izadi, 2011 (Figs. 1–13)

Diagnosis: fn Ge: 9–9–8, Ti III > 280, PSens > 100, fV = 18.

Morphological data (based on new larval materials of L. saboorii)

Idiosoma – Oval, dorsal surface with 40 normal setae. All dorsal idiosomal setae barbed and blunted. Dorsal propodosoma with a quadrangular shape scutum; scutum punctate, wider than long with a concavity behind PL bases. Anterior margin of scutum straight, lateral margins convex (Fig. 1). Scutum with 2 pairs of scutalae, AL longer than PL, both fully barbed and pointed. Anterior and posterior pairs of sensilla (ASens and PSens) with fine barbs throughout the length. PSens slightly longer than ASens (Fig. 1). Two eyes present on each side of scutum, circular, not on platelets; anterior eye 20, posterior one 12 across.

Ventral surface of idiosoma bearing 4 sternalae (1a and 3a), 18 barbed and pointed setae behind coxae III. Sternala 1a longer than sternala 3a, both barbed and pointed. Coxae I–III each with one seta; coxala 1b longer than other coxalae; coxala 3b longer than coxala 2b; all coxalae barbed and pointed (Fig. 2). NDV = 40 + 18 = 58.

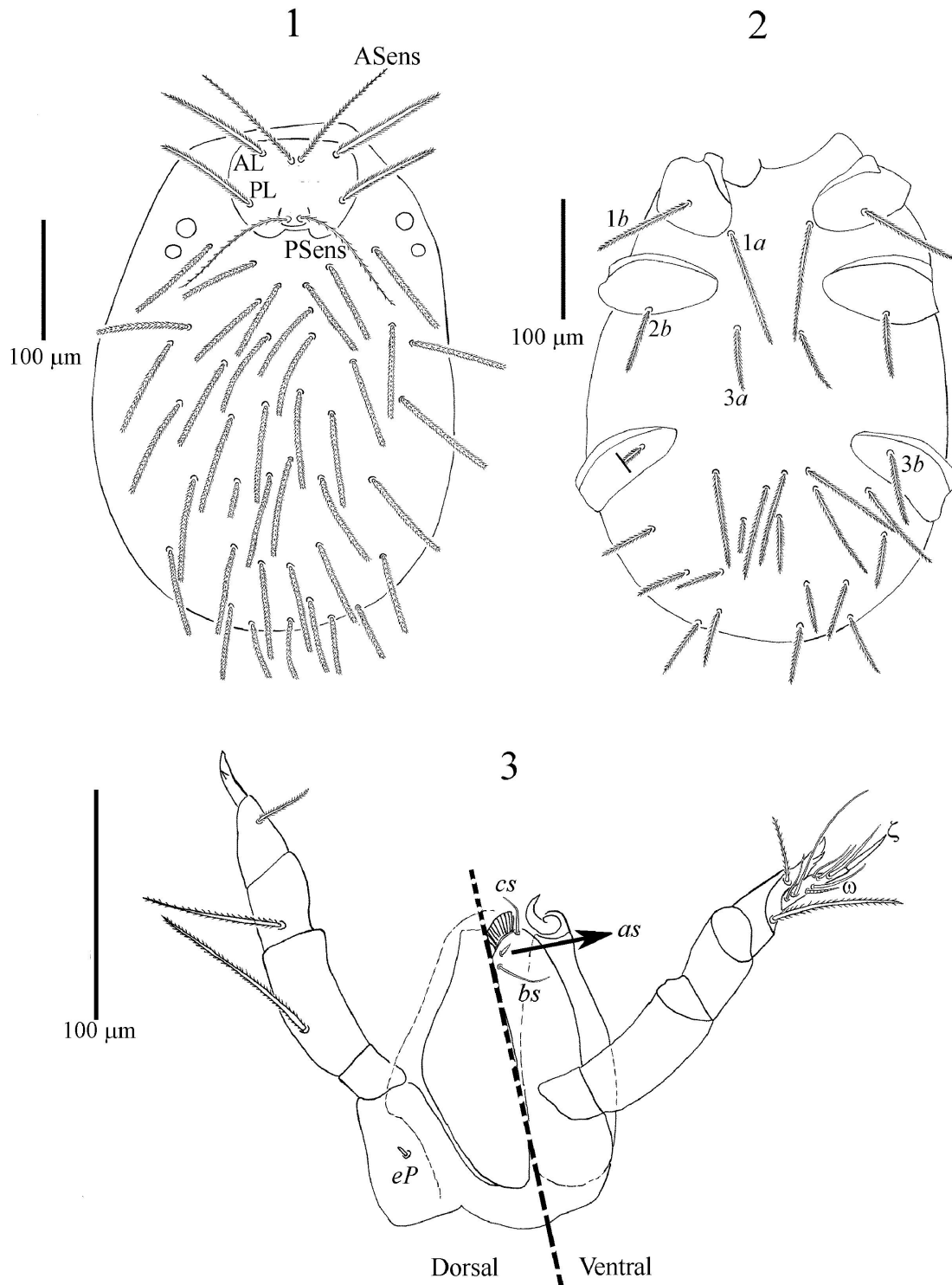
Gnathosoma with smooth galealae (*cs*) and two hypostomalae, anterior hypostomalae (*as*) minute and posterior hypostomalae (*bs*) long and nude (Fig. 3). Palpal femur and genu each with 1 barbed seta (Fig. 3), tibia with three barbed setae, palpal tibial claw bifurcate with unequal prongs. Palpal tarsus with 8 setae including a solenidion and an eupathidium; one seta long (Fig. 3). fPp = 0-B-B-BBB₂-6N ω ζ . Supracoxal setae (*eP*) minute (4 μm) and peg-like.

Leg segmentation formula: 7–7–7. Leg setal formula: Leg I: Ta- 1 ω , 1 ϵ , 2 ζ , 1Cp, 24n; Ti- 2 ϕ , 1 κ , 15n; Ge- 1 σ , 1 κ , 9n; TFe- 5n; BFe- 4n; Tr- 1n; Cx- 1n (Figs. 4–6). Leg II: Ta- 1 ω , 2 ζ , 1Cp, 23n; Ti- 2 ϕ , 15n; Ge- 1 κ , 9n; TFe- 5n; BFe- 4n; Tr- 1n; Cx- 1n (Figs. 7–9). Leg III: Ta- 1 ζ , 22n; Ti- 1 ϕ , 15n; Ge- 9n; TFe- 5n; BFe- 3n; Tr- 1n; Cx- 1n (Figs. 10–13).

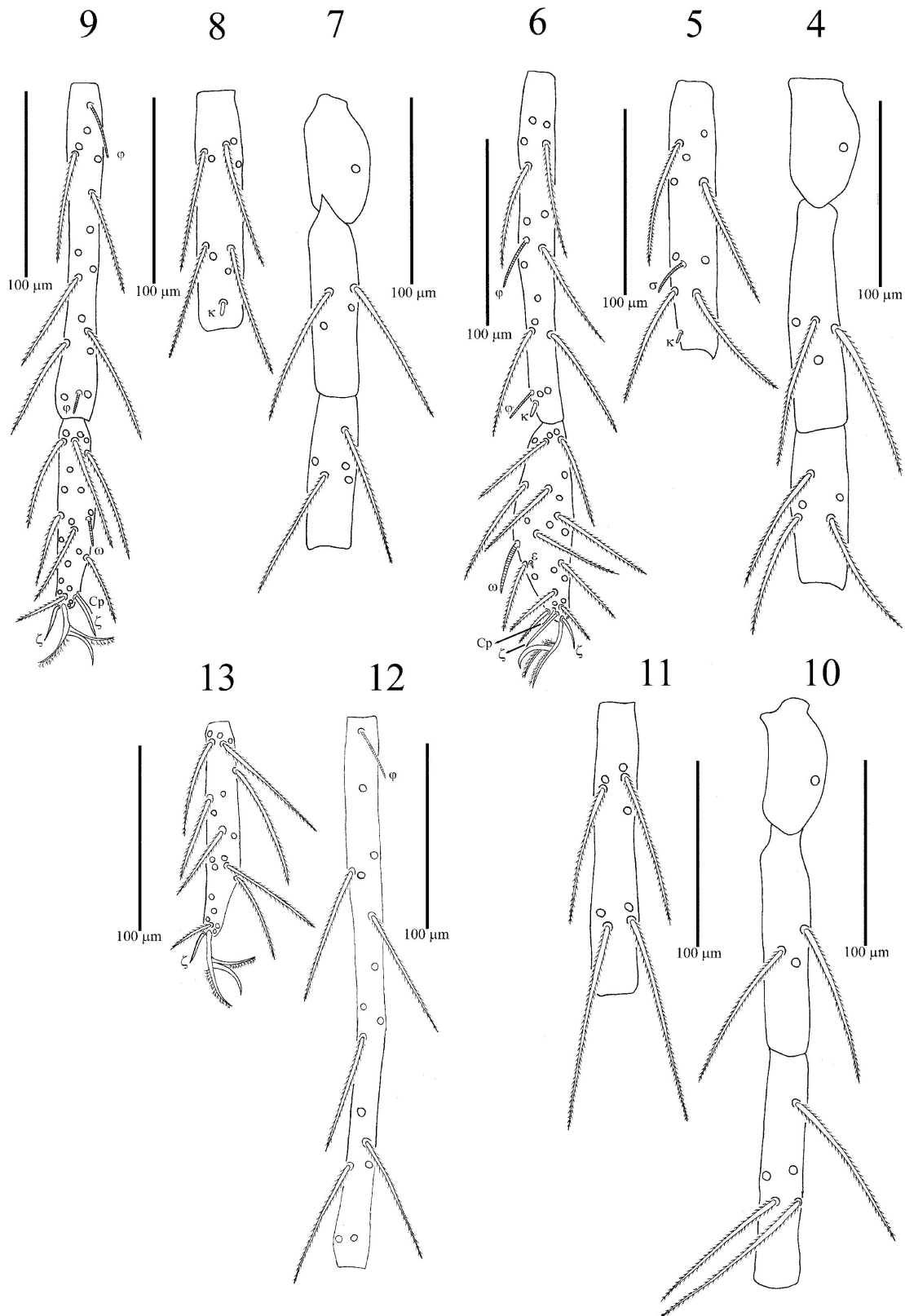
Remarks (based on additional data)

Lasioerythraeus saboorii differs from *L. shirleyanneae* by shorter SD (82–87 vs. 98), longer AW (64–71 vs. 58), AL (83–99 vs. 78), PL (79–87 vs. 65), ASens (93–101 vs. 55), PSens (104–107 vs. 67), Ti III (287–304 vs. 269) and number normal setae on Ge I–III (9–9–8 vs. 8–8–8); from *L. johnstoni* by shorter SD (82–87 vs. 94–105), ISD (45–52 vs. 71–80), longer ASens (93–101 vs. 54–65), PSens (104–107 vs. 67–84), fD (40 vs. 43–45) and number normal setae on Ge I–III (8–8–8 vs. 9–9–8); from *L. cardonensis* by shorter AW (64–71 vs. 104), PW (73–82 vs. 126), AL (83–99 vs. 112), PL (75–87 vs. 142), SD (82–87 vs. 130), W (90–111 vs. 178), GL (141 vs. 184), Ti III (287–304 vs. 350), PSens (104–107 vs. 80), fD (40 vs. 120), number normal setae on Ge I–III (8–8–8 vs.

9–9–8), and from *L. setarius* by longer PSens (104–107 vs. 90–93), SD (82–87 vs. 62–63), W (90–111 vs. 80–82), *1a* (90–106 vs. 78–80), Ti III (287–304 vs. 200–205) and fV (18 vs. 12).



Figures 1–3. *Lasioerythraeus saboorii* (larva) – 1. Dorsal view of idiosoma; 2. Ventral view of idiosoma; 3. Gnathosoma.



Figures 4–13. *Lasioerythraeus saboorii* (larva) – 4. Trochanter-Telofemur I; 5. Genu I; 6. Tibia and Tarsus I; 7. Trochanter-Telofemur II; 8. Genu II; 9. Tibia and Tarsus II; 10. Trochanter-Telofemur II; 11. Genu III; 12. Tibia III; 13. Tarsus III.



Figure 14. Dorsal view of host fly (Chloropidae) and larval *Lasioerythraeus saboorii* (orange points).

Table 1. Meristic data of five species of the genus *Lasioerythraeus*.

Character	<i>L. shirleyanneae</i>	<i>L. johnstoni</i>	<i>L. cardonensis</i>	<i>L. saboorii</i>	<i>L. setarius</i>
Cx I	1	1	1	1	1
Cx II	1	1	1	1	1
Cx III	1	1	1	1	1
Tr I	1	1	1	1	1
Tr II	1	1	1	1	1
Tr III	1	1	1	1	1
BFe I	4	4	4	4	4
BFe II	4	4	4	4	4
BFe III	3	3	3	3	3
TFe I	5	5	5	5	5
TFe II	5	5	5	5	5
TFe III	5	5	5	5	5
Ge I	8	8	8	9	9
Ge II	8	8	8	9	9
Ge III	8	8	8	8	8
Ti I	15	15	15	15	15 ^c
Ti II	15	15	15	15 ^b	15
Ti III	15	15	15	15	15 ^c
Ta I	—	24 ^a	24	24 ^b	24 ^c
Ta II	22	23 ^a	22	23 ^b	23 ^c
Ta III	20	22 ^a	25	22 ^b	22 ^c
CpφTi I	0	0 ^a	—	0	0

Table 1. Continued.

Character	<i>L. shirleyanneae</i>	<i>L. johnstoni</i>	<i>L. cardonensis</i>	<i>L. saboorii</i>	<i>L. setarius</i>
Cpζ Ta I	1	1 ^a	–	1	1 ^c
Cpζ Ta II	1	Not clear	–	1	0
ζTa I	2	2	1	2	2
ζTa II	2	2	1	2	2
ζTa III	1	1	0	1 ^b	1 ^c
εTa I	1	1 ^a	–	1	1
εTa II	0	0 ^a	–	0 ^b	1
κGe I	1	1	1	1	1
κGe II	1	1	0	1	1
κTi I	Not visible	1	1	1	1
κTi II	0	0	0	0	0 ^c
σGe I	1	1	1	1	1
σGe II	0	0	0	0	0 ^c
σGe III	0	0	0	0	0
φTi I	2	2	2	2	2
φTi II	2	2	2	2	2
φTi III	1	1	1	1	1
ωTa I	1	1	1	1	1
ωTa II	1	1	1	1	1
ωTa III	0	0	0	0	0
Palpaltibia	–	3	3	3	3
Palpalgen	–	1B	1B	1B	1B
Palpalfem	–	1B	1B	1B	1B
fD	38	44 (43–45 in paratypes)	~120	40	42
fV	15	15	~18	18	12

^a Data from our study in SAM

^b Data corrected by study on Mahvelat specimens for *L. saboorii*

^c Data corrected by Kamran (Personal communication)

Table 2. Measurements, distribution, date, and host/habitat of five species of the genus *Lasioerythraeus*.

Character	<i>L. shirleyanneae</i>	<i>L. johnstoni</i>	<i>L. cardonensis</i>	<i>L. setarius</i>	<i>L. saboorii</i>	<i>L. saboorii</i>
AW	58	60–68	104	58–61	65–70	64–71
PW	84	81–95	126	69–71	73–75	82
AA	12	11–16	10	9	12–13	8–10
SB	14	14–20	14	10	15–18	12
AP	36	33–41	34	25–27	34–36	40–42
AL	78	76–90	112	80–84	83–85	97–99
PL	65	60–73	142	80–84	75–78	79–87
ASens	55	54–65	–	90–93	93–98	99–101
PSens	67	67–84	80	90–93	106–107	104–106
SD	98	94–105	130	62–63	82	87
W	115	118–139	178	80–82	90–100	109–111
ISD	73	71–80	72	47–49	45–46	50–52
GL	–	–	184	123–127	–	141
1a	–	57*	76	78–80	90–92	104–106
1b	–	74*	114	82–83	74–88	89–90
2b	–	46*	56	–	45–48	52–57
3b	–	47*	58	–	60–61	64–74
PaScFed	–	73*	94	64–66	70–73	79
PaScGed	–	54*	84	68–70	65–74	62–64

Table 2. Continued.

Character	<i>L. shirleyanneae</i>	<i>L. johnstoni</i>	<i>L. cardonensis</i>	<i>L. setarius</i>	<i>L. saboorii</i>	<i>L. saboorii</i> (new data)
Ta I (L)	118*	140*	140	109–113	103–107	111–114
Ta I (H)	–	–	–	–	29–30	32–35
Ti I	193*	180*	210	204–205	189–203	191–193
Ge I	168*	132*	164	148–151	138–143	148–149
TFe I	84*	88*	90	89–95	77	87
BFe I	101*	80*	104	125–126	112–116	126–130
Tr I	59*	56*	74	50–51	59	69
Cx I	59*	69*	80	62–63	58–64	67–82
Leg I	782*	745*	862	793–798	746	805–818
Ta II (L)	134*	129*	134	99–102	99–107	104–109
Ta II (H)	–	–	–	–	27–29	20–25
Ti II	185*	160*	210	193–198	188–196	183–186
Ge II	160*	108*	146	128–130	114–122	129–131
TFe II	92*	68*	100	80–83	70–74	87–89
BFe II	97*	84*	110	100–103	93–99	104–106
Tr II	67*	60*	70	52–55	54–62	68–69
Cx II	92*	91*	106	100–102	83–90	97–98
Leg II	827*	700*	876	757–767	709–742	778–782
Ta III (L)	160*	171*	174	115–117	118–123	121–124
Ta III (H)	–	–	–	–	24–30	20–22
Ti III	269*	260*	350	200–205	287–303	292–304
Ge III	185*	132*	168	161–165	143	158–161
TFe III	109*	104*	144	125–126	113–123	126
BFe III	143*	112*	150	115–126	109–114	126
Tr III	76*	64*	84	62–63	48–51	71–73
Cx III	92*	97*	126	87–88	83–85	89–99
Leg III	1034*	940*	1196	874–886	903	986–1010
IP	2643*	2385*	2934	2427–2451	2427	2573–2606
Distribution	USA	USA	Venezuela	Pakistan	Iran	Iran
Host/habitat	Unknown	Hemiptera	Unknown	Unknown	Aphididae	Chloropidae

*Data are obtained from original paper

Key to species of *Lasioerythraeus* of the world (larva)

1. fn Ge I–III 8–8–8 2
- fn Ge I–III 9–9–8 4
2. Ti III > 340, fD ~120 *L. cardonensis*
- Ti III < 270, fD 38–45 3
3. Scutum with large and sparse punctation, Ge III/Ti III > 0.65 *L. shirleyanneae*
- Scutum with small and dense punctation, Ge III/Ti III < 0.51 *L. johnstoni*
4. Ti III > 280, PSens > 100, fV = 18 *L. saboorii*
- Ti III < 210, PSens < 95 and fV = 12 *L. setarius*

ACKNOWLEDGEMENTS


This research was partly supported by a grant from “Department of Plant Protection, Faculty of Agriculture, University of Tehran, Karaj, Iran, which is greatly appreciated. We are grateful to Dr. Saeed Mohammadzade for identification of Diptera and thank Dr. Peter Hudson, Collection Manager

in Entomology of South Australian Museum, for permitting us to check the *L. johnstoni* specimen and also from Dr. M. Kamran for sending some data of *L. setarius*.

REFERENCES

- Haitlinger, R. (2008) *Lasioerythraeus cardonensis* sp. n., a new larval mites from Venezuela (Acari: Prostigmata: Erythraeidae). *Zeszyty Naukowe Uniwersytetu Przyrodniczego We Wroclawiu*, 566: 45–49.
- Kamran, M. & Bashir, M. (2013) On a new species of genus *Lasioerythraeus* and new record of *Pollux workandae* Southcott (Prostigmata: Erythraeidae) from Pakistan. *Pakistan Journal of Zoology*, 45(3): 721–725.
- Khanjani, M., Raisi, H. & Izadi, H. (2011) A new record of the genus *Lasioerythraeus* Welbourn and Young (Acari: Erythraeidae) from Iran and description of a new species. *International Journal of Acarology*, 37: 544–549.
- Mc Daniel, B. & Bolen, E. G. (1981) A new species of *Bochartia* Oudemans from Texas (Acari: Erythraeidae: Erythraeinae). *Proceedings of the Entomological Society of Washington*, 83(1): 40–43.
- Saboori, A., Khaustov, A., Hakimitabar, M. & Hajiqanbar, H. (2009) A new genus and species of larval Erythraeinae (Acari: Prostigmata: Erythraeidae) from Ukraine and the taxonomic state of *Zhangia*. *Zootaxa*, 2203: 22–30.
- Smiley, R.L. (1964) Two new erythraeids predaceous upon cotton bollworm eggs. *Proceedings of the Entomological Society of Washington*, 66(2): 25–28.
- Smiley, R.L. (1966) Further descriptions of two erythraeids predaceous upon cotton bollworm eggs. *Proceedings of the Entomological Society of Washington*, 68(1): 25–28.
- Welbourn, W.C. & Young, O. P. (1987) New genus and species of Erythraeinae (Acari: Erythraeidae) from Mississippi with a key to the genera of North American Erythraeidae. *Annals of the Entomological Society of America*, 80(2): 230–242.
- Wohltmann, A., Gabryś, G. & Małkol, J. (2006) [2007] Terrestrial Parasitengona inhabiting transient biotopes. In: Gerecke, R. (Ed.), *Süßwasserfauna Mitteleuropas, Vol. 7/2–1, Chelicerata, Acari I*. 2007. Spektrum Elsevier, München, pp. 158–240.

COPYRIGHT

 Hakimitabar et al. Persian Journal of Acarology is under a free license. This open-access article is distributed under the terms of the Creative Commons-BY-NC-ND which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original author and source are credited.

اطلاعات ریخت‌شناسی و گزارش میزبان جدید برای *Lasioerythraeus saboorii* (Trombidiformes: Erythraeidae) از ایران

مسعود حکیمی تبار^{۱*}، علیرضا صبوری^۲ و حسین مختاری صعوه^۳

۱. گروه باغبانی و گیاهپزشکی، دانشکده کشاورزی، دانشگاه صنعتی شاهرود، شاهرود، ایران؛ رایانامه: hakimitabar@yahoo.com
۲. موزه جانورشناسی استاد جلال افشار، گروه گیاهپزشکی، پردیس کشاورزی و منابع طبیعی، دانشگاه تهران، کرج، ایران؛ رایانامه: saboori@ut.ac.ir
۳. گروه گیاهپزشکی، دانشکده کشاورزی، دانشگاه آزاد اسلامی واحد جهرم، جهرم، ایران؛ رایانامه: hossein_mokhtari17@yahoo.com

* نویسنده مسئول

چکیده

گونه *Lasioerythraeus saboorii* Khanjani, Raisi & Izadi (Hemiptera: Aphis punicae (Passerini) (Aphididae) از منطقه بشرویه شهر فردوس استان خراسان جنوبی توصیف و ترسیم شد. در مقاله حاضر، نمونه‌های دیگری از این گونه از روی گونه‌ای شناسایی نشده از مگس‌های خانواده Chloropidae از شهر مه‌ولات استان خراسان رضوی جمع‌آوری و داده‌های متریک اضافی ارائه می‌شود. کلید شناسایی بازبینی شده گونه‌های لاروی جهان آورده شده است. خانواده Chloropidae به عنوان میزبان جدید برای این جنس محسوب می‌شود.

واژگان کلیدی: کنه؛ Acariformes؛ پیش‌استیگمایان؛ شهر مه‌ولات؛ استان خراسان رضوی.

اطلاعات مقاله: تاریخ دریافت: ۱۳۹۶/۹/۱۴، تاریخ پذیرش: ۱۳۹۶/۱۰/۷، تاریخ چاپ: ۱۳۹۶/۱۰/۲۵