

ISSN 1687- 4633

ACARINES



Vol.18, 2024

Diversity of erythraeid mite species (Erythraeidae, Trombidiformes) in Syria

Daher A., Kanouh M. & Basheer A.

Department of Plant Protection, Faculty of Agriculture, Damascus University, P.O. Box 77, Masaken Barza St.,

Damascus, Syria. Email: ammardaher88@gmail.com, ORCID <https://orcid.org/0009-0008-5845-5493>; e-mail:

Kanouhmohamad@gmail.com., ORCID <https://orcid.org/0009-0009-7638-2205>; e-mail: Basherofckey11@gmail.com,

ORCID <https://orcid.org/0009-0007-7323-6128>

ABSTRACT

Mites belonging to the family Erythraeidae were collected from three governorates: Al-Hasakeh from Al-Dabbaghiya village during 2022, Damascus governorate from Abu Jarsh farm, and Hama governorate from an olive field in Masyaf area during 2023/2024. Eleven erythraeid species were collected from their larval stages. Ten of them pertaining to the genus *Erythraeus*: *Erythraeus* (*Erythraeus*) *adanaensis*, *Erythraeus* (*Zaracarus*) *chrysoperlae*, *Erythraeus* (*Erythraeus*) *hilariae*, *Erythraeus* (*Erythraeus*) *hypertrichotus*, *Erythraeus* (*Zaracarus*) *kurdistaniesis*, *Erythraeus* (*Erythraeus*) *loomerus*, *Erythraeus* (*Erythraeus*) *phalangoides*, *Erythraeus* (*Erythraeus*) *pistacicus*, *Erythraeus* (*Erythraeus*) *populi*, *Erythraeus* (*Erythraeus*) *soleimanii*, and a single species belonging to the genus *Leptus*: *Leptus horiacus*. These species are the first recorded in Syria except for *Erythraeus* (*Erythraeus*) *phalangoides*, *Erythraeus* (*Erythraeus*) *adanaensis* and *Leptus horiacus* that have been previously recorded.

Keywords: *Erythraeus*, *Leptus*, Erythraeidae, mites, Syria.

INTRODUCTION

The Erythraeidae family is one of the most important mite species of great importance in the biological control, which has not received sufficient environmental and biological studies in Syria. Many of species are still being identified every day. Some species belonging to the erythraeid genera have proven to be effective in controlling some arthropods (Barbar 2018). Although more than 900 species have been recorded worldwide, the number of species recorded in Syria exceed ten (Goldarazena et al. 2000; Gerson et al. 2003; Chhillar et al. 2007; Krantz and Walter 2009; Barbar 2018; Barbar et al. 2023; Ebrahim and Barbar 2023). Species belonging to the Erythraeidae family, in both the nymph and adult stages, attack many arthropods, such as: phytophagous mites and insects. As larvae, they are ectoparasite on many arthropods including aphids, mosquitoes, leaf-hoppers, thrips, spider mites, and bugs (Southcott 1961, 1991; Baker and Selden 1997; Goldarazena et al. 2000; Deborah and Richard 2002). Members of this family are distributed worldwide except Antarctica (Karakurt 2023). The aim of the current study is to classify some of the erythraeid mite species extracted from the studied areas. Several species were classified from neighboring

countries, and eight species of erythraeid mite species have been recorded for the first time in the studied areas, which may form a preliminary basis on which future research can be conducted that will contribute to reduce the damage caused by many harmful pests.

MATERIAL AND METHODS

Studied areas:

Erythraeid mites were collected from three localities during the years 2022–2024: Al-Dabbaghiya (36°33'22"N 40°38'55"E; 355 m a.s.l.), Al-Hasakeh governorate; Abu Jarsh farm (33°31' 56"N 36°17'25"E; 750 m a.s.l.), Damascus governorate; and Masyaf (35°03'N 36°20'E; 450 m a.s.l.), Hama Governorate.

Isolated individuals from insects, leaves, or soil were mounted on glass slides using Hoyer's medium. Individuals were mounted with the dorsal side of the body facing up, and the specimen number, collection date, plant, and collection site were written on the slide. They were then electro-dried at 45°C for two days, and classified using a light microscope to the genus level according to specialized taxonomic keys, and to the species level using scientific references related to the original description of the species, the slides were stored in sealed wooden specimen boxes (Haitlinger 1994;

Khanjani and Ueckermann 2005; Kamaran 2009; Haitlinger 2010; Khanjani et al. 2010; Saboori and Çobanoğlu 2010; Khanjani et al. 2012; Stålstedt et al. 2016; Haitlinger et al. 2016).

RESULTS AND DISCUSSION

The classification results showed the presence of 11 species, ten of them were of the genus *Erythraeus*: nine species belong to the subgenus (*Erythraeus*) one species to the subgenus (*Zaracarus*). While one species was found to belong to the genus *Leptus*.

Family Erythraeidae Oudemans, 1902

Genus *Erythraeus* Latreille

Sub- Genus *Erythraeus* (*Erythraeus*) Southcott

Erythraeus (*Erythraeus*) *adanaensis* Saboori & Çobanoğlu

Materials examined: Three larvae were collected from plant debris in an olive orchard, Masyaf, Hama governorate, May, 2023.

This species was first collected from Adana region of Turkey on an unidentified insect in a citrus orchard (Saboori and Çobanoğlu 2010). It was first recorded in Syria by Barbar (2018) on eggplant leaves.

Erythraeus (*Erythraeus*) *chrysoperlae* Khanjani, Mirmoayedi, Fayaz and Sharifian, 2012

Materials examined: Three larvae of this species were collected as an outsider on an indeterminate species of aphid and on *Tetranychus urticae* Koch in a nearby eggplant field on *Malva parviflora* L. (Malvales: Malvaceae), Al-Dabbaghiya, Al-Hasakeh governorate, June 2023.

This is the first record of this species from Syria. It was first recorded in Iran as an ectoparasite on the lion aphids *Hrysoperla kolthoffi* Navas (Neuroptera: Chrysopidae), (Khanjani et al. 2012).

Erythraeus (*Erythraeus*) *hilariae* Haitlinger, 2010

Materials examined: Three ectoparasitic larvae were recorded on an unidentified species of grasshopper (Acrididea), Abu Jarsh farm, Damascus governorate, April 2023.

This is the first record of this species from Syria. Turkey is known for its distribution where

it has been isolated from herbaceous plants (Haitlinger 2010).

Erythraeus (*Erythraeus*) *hypertrichotus* Saboori, Goldarazena & Khajeali, 2004.

Materials examined: Three larvae were collected from soil, Al-Dabbaghiya, Al-Hasakeh governorate, May 2023.

This is the first record of this species from Syria. It has been recorded in western Iran, where it was first described in Tabriz on an unidentified species of aphid (Saboori et al., 2004).

Erythraeus (*Erythraeus*) *loomerus* Kamran, 2009

Materials examined: Three larvae were collected from *Aphis gossypii* Glov (Hemiptera: Aphidae) on cotton, Al-Dabbaghiya, Al-Hasakeh governorate, August 2023, and three others were collected on *Anthocomus rufus* Herbst (Coleoptera: Malachiidae), Abu Jarsh farm, Damascus governorate, April 2024.

This is the first record of this species from Syria. It was recorded from Punjab region of Pakistan, and was collected as an ectoparasitic larva on an unidentified species of bed bug on the foxtail plant, *Setaria viridis* L (Poaceae). (Kamran 2009).

Erythraeus (*Erythraeus*) *phalangoides* (De Geer, 1778)

Materials examined: A single ectoparasitic larva on *Sminthurus viridis* L. found on herbs of Poaceae, Abu Jarsh farm, Damascus governorate, April, 2023.

This species was first recorded in Syria on an unidentified aphid (Barbar 2018). The species is distributed worldwide except Antarctica (Makol and Wohltmann 2012). In the present study, this species was recorded as ectoparasitic larvae on *Sminthurus viridis* Linnaeus, 1758.

Erythraeus (*Erythraeus*) *pistacicus* Haitlinger, Mehrnejadm & Šundić, 2016

Materials examined: A single larva was collected from plant debris under an olive tree, Masyaf, Hama governorate, May 2023.

This is the first record of this species from Syria. It was first collected in Iran on *Pistacia atlantica* (Anacardiaceae) (Haitlinger et al. 2016). The host of this mite is unknown, but three individuals of this species were collected in May 2016 as an ectoparasite on *Agonosцена*

pistaciae Burckhardt & Lauterer 1989 (Hemiptera: Aphalaridae) (Haitlinger et al. 2016).

***Erythraeus (Erythraeus) populi* Khanjani, Mirmoayedi, Fayaz & Sharifian, 2012**

Materials examined: A single larva was collected from *Stephanitis pyri* F. (Heteroptera: Tingidae) on an apple tree, *Malus domestica* Borkh (Rosaceae), on Abu Jarsh farm, Damascus governorate, June 2023.

This is the first record of this species from Syria. It is widespread in Iran and has been recorded as an ectoparasitic larvae on the pear tiger, *Stephanitis pyri* F. (Heteroptera: Tingidae) on the poplar, *Populus nigra* L (Salicaceae). (Malpighiales: Salicaceae) (Khanjani, Mirmoayedi, Fayaz and Sharifian 2012).

***Erythraeus (Erythraeus) soleimanii* Khanjani, Mirmoayedi, Nahad & Fayaz, 2010**

Materials examined: Two externally parasitic larvae were recorded on unidentified species of aphid, Abu Jarsh farm, Damascus governorate, May 2023.

This is the first record of this species from Syria. This species was recorded in western Iran where it was first described in Hamathan province as an ectoparasite on *H. kolthoffi* (Khanjani et al. 2010).

Sub- Genus *Erythraeus (Zaracarus)*:

***Erythraeus (Zaracarus) kurdistaniesis* Khanjani & Ueckermann, 2005**

Materials examined: Two larvae of this species were isolated from an ant nest next to a cotton field, Al-Dabbaghiya, Al-Hasakeh governorate, June 2023.

This is the first record of this species from Syria. It was first described in western Iran where it was isolated from soil (Khanjani and Ueckermann 2005).

Genus *Leptus* Latreille

***Leptus horiacus* Haitlinger, 1994**

Materials examined: Three ectoparasitic larvae, one on *Musca domestica* L. and two on an unidentified species of grasshopper, Abu Jarsh farm, Damascus governorate, May 2023.

This species has been reported from Syria as some ectoparasitic larvae on *Adesmia carinata* Solier (Coleoptera: Tenebrionidae) (Haitlinger 1994).

ACKNOWLEDGEMENTS

The authors would like to thank the Faculty of Agricultural, Damascus, Syria for the logistical support provided during the current study.

REFERENCES

- Baker AS, Selden PA. 1997. New morphological and host data for ectoparasitic larva of *Leptus hidakai* Kawashima (Acari: Acariforms, Erythraeidae). *Systematic Parasitology*, 36, 183–191. DOI: 10.1023/A:1005757014689
- Barbar Z. 2018. New records of three larval species of Erythraeidae (Acari: Trombidiformes) in a citrus orchard in Latakia, Syria. *Syrian Journal of Agricultural Research*, 5(1), 183–190.
- Barbar Z, Ebrahim W. 2023. Mite fauna on *Dittrichia* species (Asteraceae) in Syrian coastal region: new records and primary observations on the behavior of *Typhloseiella isotricha* (Athias- Henriot) (Mesostigmata: Phytoseiidae). *Acarologia*, 63(2), 529–538. DOI: 10.24349/ma1r-li1n
- Barbar Z, Parker BL, Skinner M. 2023. New records of Erythraeidae mites (Acari: Trombidiformes) from Syria with additional morphological data on some species, *Persian Journal of Acarology*, 12(2), 363–370. DOI: 10.22073/pja.v12i2.79548
- Chhillar BS, Gulati R, and Bhatnagar P. 2007. *Agricultural Acarology*. Daya. Publ. House, Delhi, 355 pp.
- Deborah LAC, Richard IS. 2002. Natural enemies of Chinch bug, *Blissus antillus* (Leonard) (Hemiptera: Lygaeidae: Blissinae), pasture pest in Rio de Janeiro State, Brazil. *Neotropical Entomology*, 31(1), 165–167. DOI: 10.1590/S1519-566X2002000100024
- Gerson UL, Smiley R., Ochoa R. 2003. Mites (Acari) for pest control, Blackwell Science Ltd, Malden, MA, USA, 539 p.
- Goldarazena A., Z-Q. Zhang and R. Gordana. 2000. A new species and a new record of

ectoparasite mites from thrips in Turkey (Acari: Trombidiidae and Erythraeidae *Systematic Parasitology*, 45, 75–80. DOI: 10.1023/A:1006289526619

- Haitlinger R. 1994. Two new species of *Leptus* Latreille, 1796 (Acari: Prostigmata: Erythraeidae) associated with Tenebrioniidae (Insecta: Coleoptera), *Entomology*, 28, 139–149.
- Haitlinger R. 2010. New records of mites (Acari: Prostigmata: Erythraeidae, Trombidiidae) from Turkey, with descriptions of four new species, *Biologia i Hodowla Zwierzat*, 577, 49–62.
- Haitlinger R, Mehrnejad R and M Šundic. 2016. *Erythraeus* (*Erythraeus*) *pistacicus* sp. n. (Trombidiformes: Erythraeidae) from southern Iran, and notes on other *Erythraeus* spp., *Biologia*, 71(7), 804–808. DOI: 10.1515/biolog-2016-0092
- Kamran M. 2009. *Systematics of Larval Erythraeidae (Acarina) of Punjab, Pakistan*. University of Agriculture, Faisal Abad, Pakistan, 199 pp.
- Karakurt I. 2023. New records of erythraeid mites (Acari: Erythraeoidea) from northeastern Turkiye, *Turkish Journal of Entomology*, 47(1), 31–42. DOI: 10.16970/entoted.1191066
- Khanjani, M. and A Ueckermann. 2005. A new larval species of *Erythraeus* (*Zaracarus*) (Acari: Erythraeidae) from West Iran, *International Journal of Acarology*, 31(2), 1–7. DOI: 10.1080/01647950508683662
- Khanjani M., Mirmoayedi A., Asalifayazi B and T Sharifian. 2012. Two new larval species of the genus *Erythraeus* (*Erythraeus*) (Acari: Erythraeidae) from Iran, *Zootaxa*, 3479, 52–68.
- Khanjani M, Mirmoayedi A, Nahad A R. and B A Fayaz. 2010. Two new larval species of *Erythraeus* (*Zaracarus*) (Acari: Erythraeidae) from western Iran, *Zootaxa*, 2537, 19–32.
- Krantz GW, Walter DE. 2009. *A Manual of Acarology*. Texas Tech Univ. Press, 807 pp.
- Mağol J, Wohltmann A. 2012. An annotated checklist of terrestrial Parasitengona (Actinotrichida: Prostigmata) of the World, excluding Trombiculidae and Walchiidae. *Annales Zoologici*, 62, 359–562. DOI: 10.3161/000345412X656671
- Oudemans AC. 1902. Acarologische Aanteekeningen. *Entomologische Berichten* 1(6), 36–39.
- Saboori A, Çobanoğlu S. 2010. A new species of larval *Erythraeus* and a new record of larval *Grandjeanella* (Acari: Erythraeidae) from Turkey. *International Journal of Acarology*, 36 (3), 249–253. DOI:10.1080/01647951003636405
- Saboori A, Goldarazena A, Khajeali J. 2004. Two new species of larval *Erythraeus* (Acari: Erythraeidae) from Iran with remarks on differential diagnosis, *Systematic & Applied Acarology*, 9, 163–178. DOI: 10.11158/saa.9.1.22
- Southcott RV. 1961. Studies on systematic and biology of Erythraeoidea (Acarina), with critical revision of genera and subfamilies. *Australian Journal of Zoology*, 9, 367–610. DOI: 10.1071/ZO9610367
- Southcott RV. 1991. A further revision of *Charletonia* (Acarina: Erythraeidae) based on larvae, protonymphs and deutonymphs, *Invertebrate Taxonomy*, 5(1), 61–131. DOI: 10.1071/IT9910061
- Stålstedt J, Wohltmann A, Bergsten J, Mağol J. 2016. Towards resolving the double classification in *Erythraeus* (Actinotrichida: Erythraeidae): matching larvae with adults using 28S sequence data and experimental rearing, *Organisms Diversity Evolution*, 16, 761–790. DOI: 10.1007/s13127-016-0283-5