Persian J. Acarol., 2023, Vol. 12, No. 1, pp. 157–159.
https://doi.org/10.22073/pja.v12i1.77793
Journal homepage: http://www.biotaxa.org/pja

Correspondence

First record of *Eupodes hawaiiensis* (Trombidiformes: Eupodidae) from Iran

Milad Davari[1], Masoud Hakimitabar[1*] and Maryam Darbemamieh[2]

1. *Department of Plant Protection, College of Agriculture, Shahrood University of Technology, Shahrood, Iran; E-mails*: *hakimitabar@yahoo.com*; *hakimitabar@shahroodut.ac.ir; miladdavari1985@gmail.com*
2. *Department of Plant Protection, Faculty of Agriculture, Campus of Agriculture and Natural Resources, Razi University, Kermanshah, Iran; E-mail*: *m.darbemamieh@razi.ac.ir*

* Corresponding author

PAPER INFO.: Received: 18 October 2022, Accepted: 28 November 2022, Published: 15 Juanary 2023

The superfamily Eupodoidea Koch, consists of cosmopolitan, phytophagous, fungivorous or predatory mites of family Eupodidae Koch accompanied by eight other families (Jesionowska 2010; Walter *et al*. 2009). The classification of this superfamily suffers from unstability (Baker and Lindquist 2002). The family Eupodidae is divided into two subfamilies: Benoinyssinae Fain and Eupodinae Koch by Fain (1958). This family includes at least 10 genera and 80 species of mites which live in soil, compost, grasslands, lichen and moss in tropical, subtropical, northern and polar latitudes. These mites occupy habitats from sea level to high altitudes (2200 m.s.l). Some are found in coasts and intertidal places and some are present in caves, under stones and nests (Walter *et al*. 2009). Some of these mites are found in relation with Agaricales and sampled on mushrooms.

Although the eupodid mites are very common, they are still poorly studied and the systematic parameters of the family are unclear with uncertain intrafamilial relationships with its genera (Szudarek–Trepto *et al*. 2020). The genera *Cocceupodes* Thor, 1934 and *Linopodes* Koch, 1835, which were previously placed in the family Eupodidae, were recently transferred to the separate family Cocceupodidae (Jesionowska 2010); and the genus *Hawaiieupodes* Strandtmann & Goff, 1978 was transferred to the family Penthalodidae (Jesionowska 2008). Taxonomy of this family was subsequently reviewed by Khaustov (2014). He moved some genera from Cocceupodidae to Eupodidae. Molecular phylogeny of Eupodidae (Szudarek–Trepto *et al*. 2020) was in contrast with Khaustov's suggestion and confirmed separation of those genera from Eupodidae and into the family Cocceupodidae by Jesionowska (2010).

Reports of Eupodidae in Iran are very rare. First studies mentioned three genera of this family; among them only the genus *Eupodes* was studied at species level (Kamali *et al*. 2001). After some scattered studies, Darbemamieh *et al*. (2013) published the checklist of Iranian Eupodoidea and listed three species in the reports for the genus *Eupodes* in Iran. Then they studied Eupodoidea of Kermanshah province (Darbemamieh 2015). Knowledge of the Eupodidae in Iran is rudimentary and more studies can facilitate understanding of their diversity, abundance and feeding habits in agricultural ecosystems.

In this paper, 11 specimens of *Eupodes hawaiiensis* Strandtmann and Goff, 1978 were collected by using Berlese-Tulgren funnel as follows: one (ARS-20221015-1a) of them collected on 23 June

How to cite: Davari, M., Hakimitabar, M. & Darbemamieh, M. (2023) First record of *Eupodes hawaiiensis* (Trombidiformes: Eupodidae) from Iran. *Persian Journal of Acarology*, 12(1): 157–159.

2020 from Siyahkhani forest, north region of Damghan city, Semnan province (36° 29′ 56″ N, 54° 04′ 23″ E, 2100 m a.s.l.), five (ARS-20221015-1b–1f) on 5 July 2020 from Mirafzal forest, north region of Damghan city, Semnan province (36° 08′ 18″ N, 53° 39′ 03″ E, 2000 m a.s.l.), three (ARS-20221015-1g–1i) on 27 July 2020 from Hirkani Glougah forest, north region of Damghan city, Semnan province (36° 37′ 44″ N, 53° 02′ 17″ E, 1280 m a.s.l.) and clarified in lactic acid and mounted using Faure liquid (Walter and Krantz 2009). They are deposited in the Acarological Collection, Jalal Afshar Zoological Museum, Faculty of Agriculture, University of Tehran, Karaj, Iran.

The specimens were in different ontogenic stages of nymphs, males and females. Bodies were medium size, length ranged between 320–464 micrometers based on gender and stage. This mite was first described from Hawaii, USA, and can be distinguished by following characters: leg I slightly longer than body; genital setae 6 + 6 (one pair more lateral); paragenital setae 5 + 5; body and legs setae long; caudal setae (*f*, *h* and *ps* setae series) clustered at posterior end of opisthosoma and slenderer than dorsals and humerals. Tarsus I with two subequal, tandem rhagidial organs, subtended by a stellate seta consisting of a few (3–5) rays and a central, rod-like core; tibia I with a tibial organ consisting of a small rhagidial organ with apical spine; tibia with one proximal small solenidion; tarsus II with two rhagidial organs. Pedipalp tarsus about ½ length of palp tibia, with nine setae and a small, midlateral solenidion located in depression (Fig. 1).

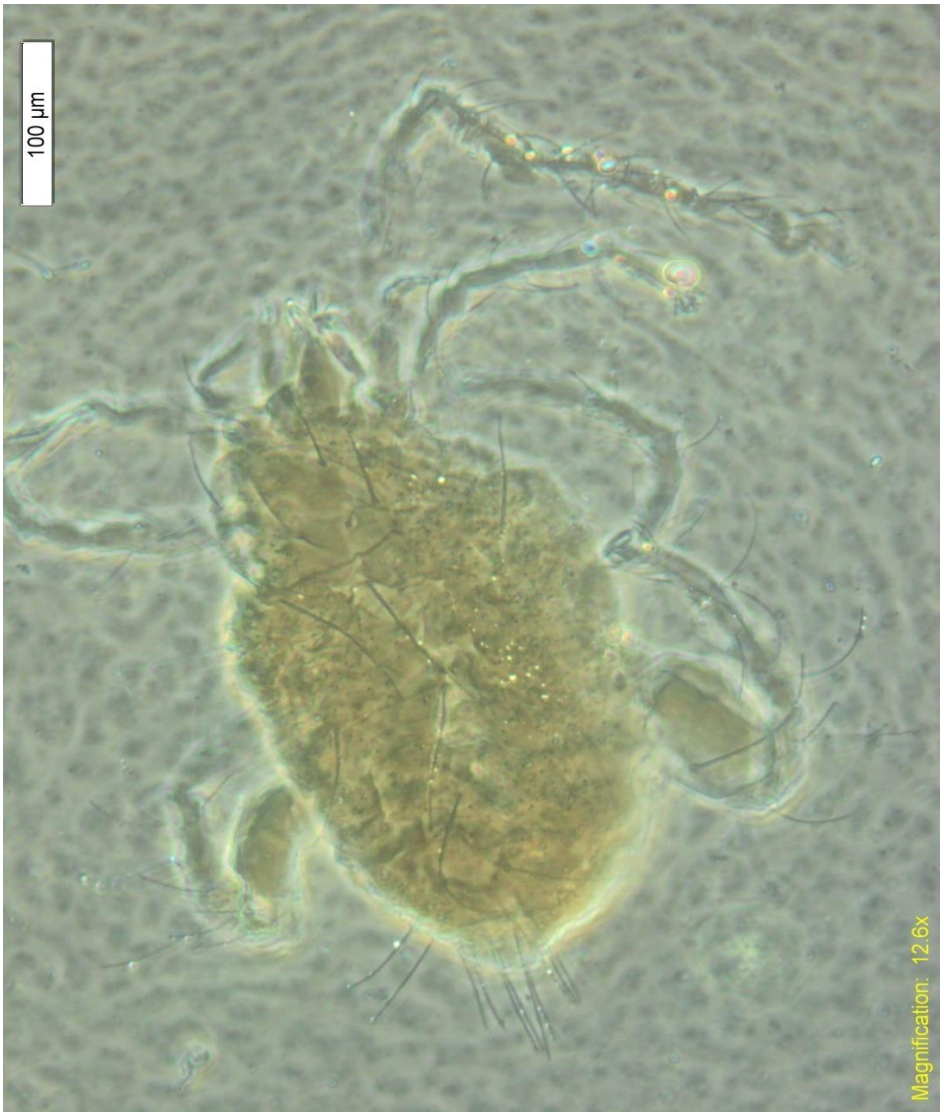

Figure 1. *Eupodes hawaiiensis* Strandtmann & Goff, 1978 (male) – General view of body.

REFERENCES

Baker, A.S. & Lindquist, E.E. (2002) *Aethosolenia laselvensis* gen. nov., sp. nov., a new eupodoid mite from Costa Rica (Acari: Prostigmata). *Systematic and Applied Acarology Special Publications*, 11: 1–11.

Fain, A. (1958) Un nouvel acarien trombidiforme parasitant les fosses nasales d'un serpent au Ruanda-Urundi. *Revue de Zoologie et de Botanicue africaines*, 57: 177–183.

Darbemamieh, M. (2015) *Systematic of the two superfamilies Tydeoidea and Eupodoidea (Acari: Prostigmata) in Kermanshah province, Iran*. Ph. D. dissertation, Tarbiat Modares University, Tehran, Iran, 167 pp.

Darbemamieh, M., Hajiqanbar, H. & Khanjani, M. (2013) A checklist of Iranian Eupodoidea (Acari: Prostigmata). *Journal of Crop Protection*, 2(4): 453–460.

Jesionowska, K. (2008) Redescription of *Hawaiieupodes termophilus* Strandtmann et Goff, 1978 (Acari: Prostigmata: Eupodoidea: Penthalodidae) from Hawaii, with a discussion of the systematic status of the taxon. *Annales Zoolgici*, 58(2): 337–346. DOI: 10.3161/000345408X326654

Jesionowska, K. (2010) Cocceupodidae, a new family of eupodoid mites, with description of a new genus and two new species from Poland. Part I. (Acari: Prostigmata: Eupodoidea). *Genus*, 21(4): 637–658.

Kamali, K., Ostovan, H. & Atamehr, A. (2001) *A catalogue of mites and ticks (Acari) of Iran*. Islamic Azad University Scientific Publication Center, 192 pp.

Khaustov, A.A. (2014) A new genus and species in the mite family Eupodidae (Acari, Eupodoidea) from Crimea. *ZooKeys*, 422: 11–22. DOI: 10.3897/zookeys.422.7802

Strandtmann, R.W. & Goff, M.L. (1978) The Eupodoidea of Hawaii (Acarina: Prostigmata). *Pacific Insects*, 3–4: 121–143.

Szudarek–Trepto, N., Kaźmierski, A., Dabert, M. & Dabert, J. (2020) Molecular phylogeny of Eupodidae reveals that the family Cocceupodidae (Actinotrichida; Eupodoidea) and its genus *Filieupodes* are valid taxa. *Experimental Applied Acarology*, 80(4): 43–57. DOI: 10.1007/s10493–019–00455–4

Walter, D.E. & Krantz, G.W. (2009) Collection, rearing and preparing specimens. *In*: Krantz, G.W. & Walter, D.E. (Eds.), *A manual of acarology*. 3rd Edition. Texas Tech University Press, Lubbock, Texas, USA, pp. 83–96.

Walter, D.E., Lindquist, E.E., Smith, I.M., Cook, D.R. & Krantz, G.W. (2009) Order Trombidiformes. *In*: Krantz, G.W. & Walter, D.E. (Eds.), *A manual of acarology*. 3rd Edition. Texas Tech University Press, Lubbock, Texas, USA, pp. 233–420.