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Correspondence

The first report on the Bdelloidea and Raphignathoidea mites (Acari: Trombidiformes: Prostigmata) from the heights of Damavand Mountain, Iran

Saeid Paktinat-Saeij^{1,3*}, Mohammad Reza Damavandian² and Hossein Ziaei-rad²

1. Department of Plant Protection, Faculty of Agriculture, University of Tehran, Karaj, Iran; E-mail: saeedpaktinat@yahoo.com

2. Department of Plant Protection, Faculty of Crop Sciences, Sari Agricultural Sciences and Natural Resources University, Sari, Iran; E-mails: damavandianm@gmail.com; h.ziaee64@gmail.com

3. Department of Agricultural Engineering, Technical and Vocational University (TVU), Tehran, Iran.

* Corresponding author

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Mount Damavand is the highest elevation, about 5628 m a.s.l., in Iran. It is an inactive volcanic mountain which was active in Quaternary Period. It has numerous thermal springs. The peak of Damavand is covered with snow during the entire year. The Flora and fauna of the area are very rich and include about 2000 plant species. Damavand is in the middle of the Alborz range, and near the southern coast of the Caspian Sea, in Amol County, Mazandaran Province.

Prostigmata is the larger of the two suborders within the order Trombidiformes, which belongs to the mite superorder Acariformes. Many groups of Prostigmata are known or suspected to contain species that act as natural enemies of harmful organisms, including arthropods and nematodes. The prostigmatid mites are a large assemblage of morphologically, biologically and ecologically diverse group comprising 36 superfamilies (Hernandes *et al.* 2015).

We still have only modest knowledge of the prostigmatic mites in the highland zones. Thor (1931) reported *Neomolgus lacustris* (Hull, 1915) from an altitude of 4,000 m in Italy. *Cyta latirostris* (Hermann, 1804) was found in the Swiss Alps at an altitude of 3,600 m (Willmann 1951). Also, Willmann (1951) recorded *Cyta coerulipes* (Dugès, 1834), *Bdella iconica* Berlese, 1923, *B. subulirostris* Berlese, 1923 and *Neomolgus monticola* Willmann, 1951 in the Grossglockner, Alps, Austria at elevation about 3,000 m. Chen *et al.* (2021) reported *Armascirus yulongensis* Chen & Jin, 2021 from Yulong Snow Mountain, China of elevation of 3,230 m. However, little scientific research has been carried out on high altitudes, as they are difficult to sample.

Because of diversity of the Bdelloidea and Raphignathoidea mites in the different alpine habitats and altitudinal zones and the fact that Damavand mountain has not been studied until now, the purpose of this investigation was to identify assemblages of these mites within the mentioned area.

To determine the prostigmatic mites of Damavand mountain, samples of soil and leaf litter were taken from different heights and were processed in a Berlese-Tullgren funnel, with AGA solution as the collecting fluid (Smiley 1992). The collected specimens were cleared in Lactic Acid fluid, mounted in Hoyer's medium (Walter and Krantz 2009), and examined under a phase contrast

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microscope.

This work is a part of the mite fauna of Damavand mountain, Mazandaran province (Iran) and includes data on the superfamilies Bdelloidea and Raphignathoidea (Acari, Prostigmata). In the study, 14 species from six families were collected from different heights of Damavand. The list of the collected species are presented.

Bdelloidea **Family Bdellidae**

***Bdella muscorum* Ewing, 1909**

Bdella muscorum Ewing, 1909: 124.

Distribution – Cosmopolitan (Hernandes *et al.* 2016).

Material examined – One female and three tritonymphs at 3500 m a.s.l., 23 August 2018, one tritonymph at 3700 m a.s.l., 3 July 2018, one deutonymph at 4200 m a.s.l., 17 July 2018 were collected from soil and litter by Mohammad Reza Damavandian.

***Biscirus iranensis* Paktinat-Saeij & Bagheri, 2015**

Biscirus iranensis Paktinat-Saeij and Bagheri, 2015: 520.

Distribution – Iran (Paktinat-Saeij *et al.* 2015), Syria (Barbar and Ueckermann 2017).

Material examined – One male at 3500 m a.s.l., 23 August 2018 was collected from soil and litter by Mohammad Reza Damavandian.

Family Cunaxidae

***Cunaxa gordeevae* Sergeyenko, 2009**

Cunaxa gordeevae Sergeyenko, 2009: 2.

Distribution – Crimea (Sergeyenko 2009), Slovakia (Kalúz 2016), Iran (Paktinat-Saeij *et al.* 2017).

Material examined – Two females at 3700 m a.s.l., 3 July 2018, one female at 4200 m a.s.l., 17 July 2018, one male at 3700 m a.s.l., 3 July 2018, one male at 4200 m a.s.l., 17 July 2018, one male at 3500 m a.s.l., 23 August 2018, were collected from soil and litter by Mohammad Reza Damavandian.

***Cunaxoides croceus* Koch, 1838**

Eupalus croceus Koch, 1838: 20.

Distribution – Europe (Smiley 1992), Iran (Kamali *et al.* 2001).

Material examined – One female at 3500 m a.s.l., 23 August 2018 was collected from soil and litter by Mohammad Reza Damavandian.

***Cunaxoides shahriari* Bagheri, Paktinat-Saeij & Castro, 2016**

Cunaxoides shahriari Bagheri, Paktinat-Saeij & Castro, 2016: 2.

Distribution – Iran (Bagheri *et al.* 2016).

Material examined – Six females at 3500 m a.s.l., 23 August 2018 were collected from soil and litter by Mohammad Reza Damavandian.

Raphignathoidea
Family Caligonellidae

***Molothrognathus azizi* Ueckermann & Khanjani, 2003**

Molothrognathus azizi Ueckermann & Khanjani, 2003: 295.

Distribution – Iran (Ueckermann and Khanjani 2003).

Material examined – One female and one deutonymph at 3600 m a.s.l., 24 July 2019 were collected from soil and litter by Hossein Ziaei-rad.

***Neognathus terrestris* (Summers & Schlinger, 1955)**

Stigmagnathus terrestris Summers & Schlinger, 1955: 547.

Distribution – Canada, Hungary, Iran, Russia, Turkiye, USA (Khaustov 2022).

Material examined – One female at 4200 m a.s.l., 7 August 2018 was collected from soil and litter by Mohammad Reza Damavandian.

***Caligonella haddadi* Bagheri & Maleki, 2013**

Caligonella haddadi Bagheri & Maleki, 2013: 632.

Distribution – Iran (Bagheri *et al.* 2013), Turkiye (Doğan *et al.* 2021).

Material examined – One female at 4200 m a.s.l., 17 July 2018 was collected from soil and litter by Mohammad Reza Damavandian.

Family Cryptognathidae

***Cryptognathus lagena* Kramer, 1879**

Cryptognathus lagena Kramer, 1879: 154.

Distribution – Cosmopolitan (Doğan 2008).

Material examined – One female at 3700 m a.s.l., 3 July 2018 was collected from soil and litter by Mohammad Reza Damavandian.

***Favognathus hyrcanensis* Shirinbeik Mohajer & Bagheri, 2014**

Distribution – Iran (Shirinbeik Mohajer *et al.* 2014).

Material examined – Two females at 4200 m a.s.l., 17 July 2018 were collected from soil and litter by Mohammad Reza Damavandian.

***Favognathus pongolensis* Meyer & Ueckermann, 1989**

Distribution – South Africa (Meyer & Ueckermann 1989), Iran (Bagheri *et al.* 2013).

Material examined – One female at 3700 m a.s.l., 3 July 2018, one female at 4200 m a.s.l., 7 August 2018 were collected from soil and litter by Mohammad Reza Damavandian.

Family Raphignathidae

***Raphignathus bathursti* Meyer & Ryke, 1960**

Raphignathus bathursti Meyer & Ryke, 1960: 228.

Distribution – South Africa, Turkiye (Akyol and Koç 2010), Iran (Damavandian and Paktinat-Saeij 2022).

Material examined – One female at 3600 m a.s.l., 9 July 2019 was collected from soil and litter by Hossein Ziaei-rad.

***Raphignathus gracilis* (Rack, 1962)**

Acheles gracilis Rack, 1962: 281.

Distribution – Cosmopolitan (Fan and Zhang 2005).

Material examined – One female at 3600 m a.s.l., 9 July 2019 was collected from soil and litter by Mohammad Reza Damavandian.

Family Stigmaeidae

***Eustigmaeus segnis* (Koch, 1836)**

Caligönus segnis Koch, 1836: 5(10).

Distribution – Cosmopolitan (Fan *et al.* 2016).

Material examined – One female at 3700 m a.s.l., 3 July 2018 was collected from soil and litter by Mohammad Reza Damavandian.

***Ledermuelleriopsis zahiri* Khanjani & Ueckermann, 2002**

Ledermuelleriopsis zahiri Khanjani & Ueckermann, 2002: 327.

Distribution – Iran (Khanjani and Ueckermann 2002).

Material examined – Three females at 3500 m a.s.l., 23 August 2018 were collected from soil and litter by Mohammad Reza Damavandian.

REFERENCES

- Akyol, M. & Koç, K. (2010) Contributions to the raphignathoid fauna of Turkey, with description of a new species of *Cryptognathus* Kramer (Acari: Actinedida: Raphignathoidea). *Turkish Journal of Zoology*, 34: 159–167.
- Bagheri, M., Maleki, N. & Changizi, M. (2013) On caligonellid mites (Acari: Trombidiformes: Caligonellidae) of Iran: description of two new species. *International Journal of Acarology*, 39(8): 632–637. DOI: [10.1080/01647954.2013.864331](https://doi.org/10.1080/01647954.2013.864331)
- Bagheri, M., Paktinat-Saeij, S., Castro, T.M.M.G. de & Moraes, G.J. de (2016) A new species of *Cunaxoides* (Acari: Trombidiformes: Cunaxidae) from Iran. *Persian Journal of Acarology*, 5 (1): 1–8.
- Bagheri, M., Paktinat Saeij, S. & Shirinbeik Mohajer, S. (2013) New species and records of family Cryptognathidae (Acari: Prostigmata: Raphignathoidea) from Iran. In: Joharchi, O. & Saboori, A. (Eds.), *Abstract Book of the 2nd International Persian Congress of Acarology*, 29–31 August 2013, Karaj, Iran, p. 6.
- Barbar, Z. & Ueckermann, E.A. (2017) Two new species and a new record of Bdellidae (Acari: Trombidiformes) from Syria. *Acarologia*, 57(4): 1089–1102. DOI: [10.24349/acarologia/20174221](https://doi.org/10.24349/acarologia/20174221)
- Berlese, A. (1923) Centuria sesta di Acari nuovi. *Redia*, 15: 1–240.

- Chen, J.X., Yi, T.C., Guo, J.J. & Jin, D.C. (2021) Two new species of *Armascirus* (Trombidiformes: Cunaxidae) from China. *Acarologia*, 61: 453–467.
- Damavandian, M.R. & Paktinat-Saeij, S. (2022) Taxonomic study of the superfamilies Paratydeoidea and Raphignathoidea (Acari: Trombidiformes: Prostigmata) in the western region of Mazandaran Province, Iran. In: Hakimitabar, M. & Sazmand, A. (Eds.), *Abstract Book of the 4th International Persian Congress of Acarology*, 28–30 July 2022, Mashhad, Iran, p. 26.
- Doğan, S. (2008) A catalogue of cryptognathid mites (Acari: Prostigmata, Cryptognathidae) with the description of a new species of *Favognathus* Luxton and newly discovered male of *F. amygdalus* Doğan and Ayyildiz from Turkey. *Journal of Natural History*, 42: 1665–1686. DOI: [10.1080/00222930802109132](https://doi.org/10.1080/00222930802109132)
- Doğan, S., Doğan, S. & Kabasakal, B. (2021) Peritrematal variations in *Caligonella haddadi* Bagheri & Maleki (Acariformes: Caligonellidae). *Systematic & Applied Acarology*, 26(6): 1021–1025. DOI: [11158/saa.26.6.1](https://doi.org/10.11158/saa.26.6.1)
- Dugès, A. (1834) Recherches sur l'ordre des Acariens en générale et la famille des Trombidiés en particulier. *Annales des Sciences Naturelles*, 2: 5–46.
- Ewing, H.E. (1909) Three new species of the genus *Bdella* (mites). *Canadian Entomologist*, 41(4): 124–125.
- Fan, Q.-H., Flechtmann, C.H.W. & Moraes, G.J. de (2016) Annotated catalogue of Stigmaeidae (Acari: Prostigmata), with a pictorial key to genera. *Zootaxa*, 4176(1): 1–199.
- Fan, Q.-H. & Zhang, Z.-Q. (2005) *Raphignathoidea* (Acari: Prostigmata). Fauna of New Zealand 52. Manaaki Whenua Press, 400 pp.
- Hermann, J.F. (1804) III Ciron (*Scirus*). *Mémoire Aptérologique*, 12: 60–62.
- Hernandes, F.A., Castro, T.M.M.G. & Venancio, R. (2015) Prostigmata (Acari: Trombidiformes) as biological control agents. In: Carillo, D., Moraes, G.J. de & Peña, J.E. (Eds.), *Prospects for biological control of plant feeding mites and other harmful organisms*. Springer, Berlin, pp. 151–184.
- Hernandes, F.A., Skvarla, M.J., Fisher, J.R., Dowling, A.P.G., Ochoa, R., Ueckermann, E.A. & Bauchan, G.R. (2016) Catalogue of snout mites (Acariformes: Bdellidae) of the world. *Zootaxa*, 4152(1): 1–83. DOI: [10.11646/zootaxa.4152.1.1](https://doi.org/10.11646/zootaxa.4152.1.1)
- Hull, J.E. (1915) Snout mites: an introduction to the British Bdellidae. *The Vasculum*, 1: 117–123.
- Kalúz, S. (2016) Contribution to the knowledge on the predatory mite family Cunaxidae (Acari: Prostigmata) in Slovakia. *Entomofauna carpathica*, 28(1): 37–57.
- Kamali, K., Ostovan, H. & Atamehr, A. (2001) *A catalog of mites and ticks (Acari) from Iran*. Islamic Azad University, Scientific Publication Center, Tehran, Iran, 192 pp.
- Khanjani, M. & Ueckermann, E.A. (2002) The stigmaeid mites of Iran (Acari: Stigmaeidae). *International Journal of Acarology*, 28(4): 317–339. DOI: [10.1080/01647950208684309](https://doi.org/10.1080/01647950208684309)
- Khaustov, A.A. (2022) Two new species of Caligonellidae (Acari: Raphignathoidea) from Western Siberia, Russia. *Acarologia*, 62(1): 99–112. DOI: [10.24349/1dwx-x5h2](https://doi.org/10.24349/1dwx-x5h2)
- Koch, C.L. (1836) Deutschlands Crustaceen, Myriapoden und Arachniden. *Regenshurg*, 4(9): 1–40.
- Koch, C.L. (1838) Deutschlands Crustaceen, Myriapoden und Arachniden (D.C.M.A.). *Ein Beitrag zur Deutschen Fauna*, 20.21, 20.22, 20.23 and 20.24.
- Kramer, P. (1879) Über die milbengattungen *Leptognathus* Hodge; *Raphignathus* Dug.; *Caligonus* Koch, und die neue Gattung *Cryptognathus*. *Archivs Für Naturgeschichte, Neue Folge*, 49: 142–157.

- Meyer, M.K.P. & Ryke, P.A.J. (1960) Mites of the superfamily Raphignathoidea (Acarina: Prostigmata) associated with South African plants. *Annals and Magazine of Natural History*, 13: 209–234.
- Meyer, M.K.P. & Ueckermann, E.A. (1989) African Raphignathoidea (Acari: Prostigmata). *Entomology Memoir. Department of Agriculture and Water Supply, Republic of South Africa*, 74: 1–58.
- Paktinat-Saeij, S., Bagheri, M., Saboori, A. & Ahaniazad, M. (2015) Two new Bdellidae (Trombidiformes: Bdelloidea) from Iran and the status of *Neobiscirus* Gomelauri, 1963. *Zootaxa*, 4013(4): 519–530. DOI: [10.11646/zootaxa.4013.4.3](https://doi.org/10.11646/zootaxa.4013.4.3)
- Paktinat-Saeij, S., Bagheri, M., Castro, T.M.M.G., Saboori, A., Gharekhani, G. & Ghobari, H. (2017) New species and records of Cunaxinae mites (Acari: Trombidiformes: Cunaxidae) from Iran. *Systematic and Applied Acarology*, 22(9): 1277–1294.
- Rack, G. (1962) Milben aus taubennestern mit Beschreibung einer neuen Art, *Acheles gracilis* (Acari: Raphignathidae). *Zoologischer Anzeiger*, 168(7–10): 276–292.
- Sergeyenko, A.L. (2009) New mite species of the genus *Cunaxa* (Acari: Prostigmata: Cunaxidae) from the Crimea, Ukraine. *Zootaxa*, 2161: 1–19.
- Shirinbeik Mohajer, S., Bagheri, M., Yazdanian, M., Saboori, A. & Paktinat Saeij, S. (2014) *Favognathus hyrcanensis* n. sp., a new species of the genus *Favognathus* (Acari: Trombidiformes: Cryptognathidae) from northern Iran. *Acarologia*, 54(2): 193–199. DOI: [10.1051/acarologia/20142127](https://doi.org/10.1051/acarologia/20142127)
- Smiley, R.L. (1992) *The predatory mite family Cunaxidae (Acari) of the world with a new classification*. Indira Publishing House, West Bloomington, Michigan, 356 pp.
- Summers, F.M. & Schlinger, E.I. (1955) Mites of the family Caligonellidae (Acari). *Hilgardia*, 23: 539–561.
- Thor, S. (1931) Bdellidae, Nicoletiellidae, Cryptognathidae. *Das Tierreich*, 56: 87 pp.
- Ueckermann, E.A. & Khanjani, M. (2003) Iranian Caligonellidae (Acari: Prostigmata), with descriptions of two new species and re-description of *Molothrognathus fulgidus* Summers and Schlinger, with a key to genera and species. *Acarologia*, 43(1): 291–298.
- Walter, D.E. & Krantz, G.W. (2009) Collecting, rearing, and preparing specimens. In: Krantz, G.W. & Walter, D.E. (Eds.), *A manual of Acarology*. Third edition. Texas Tech University Press, pp. 83–94.
- Willmann, C. (1951) Die hochalpine Milbenfauna der mittleren Hohen Tauern insbesondere der Großlockner-Gebietes (Acari). *Bonner Zoologische Beiträge*, 2: 141–176.

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