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Article

New records of the microdispid mites (Acari: Heterostigmata: Microdispidae) associated with ants with a review of the family in Iran

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ABSTRACT

Two genera and four species of myrmecophilous microdispid mites (Acari: Heterostigmata: Microdispidae), associated with various ants (Hymenoptera: Formicidae), are recorded from northwestern Iran: *Unguidispus japonicus* Kurosa, 1979 phoretic on *Lasius obscuratus* Stitz, 1930, *Caesarodispus samsinaki* (Mahunka, 1967) on *Formica* sp., *C. modestus* (Berlese, 1903) on *Messor* sp. and *C. minutus* Sevastianov, 1981 on *Tetramorium* sp. The species *C. samsinaki* and *U. japonicus* are recorded for mite fauna of Iran for the first time. A new ant host record is also documented for *U. japonicus*. The world distributions of the recorded mites are presented. Moreover, all Iranian microdispid records, along with their host/habitat are reviewed and a key to their genera and species is provided.

KEY WORDS: *Formica*; Formicidae; *Lasius*; *Messor*; phoretic mites; *Tetramorium*.

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INTRODUCTION

The family Microdispidae Cross, 1965 (Acari: Heterostigmata: Pygmephoroidae) includes 25 described genera and more than 120 species (Khaustov 2017; Azhari *et al.* 2018) that are mostly fungivorous, inhabiting soil, litter, mosses, decaying plant material and some associated with various arthropods (Rack 1979; Kaliszewski *et al.* 1995; Walter *et al.* 2009; Hajiqanbar *et al.* 2012a). At least three microdispid genera (*Myrmecodispus*, *Unguidispus*, *Caesarodispus*) are exclusively associated with various ants (Hymenoptera: Formicidae). However, there are some other generic records like *Microdispus* Paoli, 1911 that include some ant-associate members (see Table 2 in Hajiqanbar and Hosseininaveh 2014). Thus far, six genera including *Premicrodispus* Cross, 1965, *Caesarodispus* Mahunka, 1970, *Unguidispus* Mahunka, 1970, *Paramicrodispus* Khaustov, 2009, *Neomicrodispus* Hajiqanbar and Hosseininaveh, 2014 and *Punicodoxa* Mahunka, 1978 have been recorded from Iran (Rahiminejad *et al.* 2010; Abbasi-Moghadam *et al.* 2014; Hosseininaveh *et al.* 2015; Hajiqanbar & Hosseininaveh 2014; Hajiqanbar *et al.* 2012a; Loghmani *et al.* 2014b; Azhari *et al.* 2018). During a survey on insect-associate heterostigmatic mite fauna in northwestern Iran, we found four species of two myrmecophilous microdispid genera, *Caesarodispus* (with three species) and *Unguidispus* (with one species). The aims of this article are to report these microdispid mites and to provide a review on host/habitat of Iranian microdispids and world distribution of all collected mites. In addition, a key to all Iranian microdispid genera and species is provided.

MATERIAL AND METHODS

All four species of mites presented here were collected from various ants (Hymenoptera: Formicidae). The ant specimens were collected directly from their nests and were preserved in vials with 96% ethanol. Thereafter, ants and alcohol sediments were inspected for phoretic mites under a stereomicroscope (Olympus SZX9, Tokyo, Japan). The mite specimens were cleared in lacto-Nessbitt's solution (50:50, v/v) and mounted in Hoyer's medium. The morphology of mites was studied using a phase contrast compound microscope (Olympus BX51, Tokyo, Japan). The geographical coordinates of sampling places were recorded using a GPS mobile device. The terminology follows that of Lindquist (1986). Ants were identified with the help of Drs. Bernhard Seifert (Department of Entomology, Senckenberg Museum für Naturkunde, Berlin, Germany) and Alexander Radchenko (I.I. Schmalhausen Institute of Zoology, Kiev, Ukraine). All collected material including ants and mites are deposited in the Acarological Collection, Department of Entomology, Faculty of Agriculture, Tarbiat Modares University, Tehran, Iran.

SYSTEMATICS

Family Microdispidae Cross, 1965

Genus *Caesarodispus* Mahunka, 1977

Type species: *Caesarodispus gaius* Mahunka, 1977, by original designation.

Caesarodispus modestus (Berlese, 1903)

Pediculoides modestus: Berlese, 1903: 25.

Pyemotes modestus: Krczal, 1959: 458.

Material examined – The species was obtained during sampling directly from nest of ants in Koli Olia village, near Meshguin shahr, Ardabil Province, northwestern Iran, 38° 24' 36.0" N 47° 33' 00.0" E, three females phoretic on *Messor* sp., 25 May 2016, leg. M. Sobhi.

Distribution – Italy, from the ants *Messor barbarus* (Linnaeus, 1767); Crimea, on *M. rufitarsus* (Fabricius, 1804) (Khaustov 2009); Iran from unidentified ants (Badoodam 2014), and from nest of ants of *Messor* sp. (current study).

Caesarodispus samsinaki (Mahunka, 1967)

Pygmephorus samsinaki Mahunka, 1967, p. 241, Fig. 1.

Brennandania samsinaki: Mahunka 1972: 82.

Petalomium samsinaki: Sevastianov 1978: 37.

Material examined – The species was obtained during sampling directly from nest of ants in fruit orchards of Kangarlo village, vicinity of Gara Sou river, near Meshguin shahr, Ardabil province, northwestern Iran, 38° 21' 00.0" N 47° 28' 12.0" E. One female were removed from a vial containing more than 25 ants of *Formica* sp., 15 July 2015, leg. M. Sobhi.

Distribution – Czech Republic, Ukraine, Belarus, Russia, all associated with *Formica rufa* Linnaeus, 1761, *F. pratensis* Retzius, 1783, and *F. polyctena* Forster, 1850 (Mahunka 1967; Sevastianov 1978; Khaustov 2014; Khaustov and Tolstikov 2016); Iran, associated with *Formica* sp. (current study).

Remarks – This species was originally described by Mahunka (1967) from Czech Republic. Mahunka (1967) described this species in the genus *Pygmephorus* Kramer (Pygmephoridae). Subsequently, he placed it in the genus *Brennandania* Sasa, 1961 (Microdispidae) (Mahunka 1972).

Later on, Sevastianov (1978) transferred this species in the genus *Petalomium* Cross, 1965 (Neopygmephoridae), whereas, finally, Khaustov (2014) accommodated it in the genus *Caesarodispus*. This is a new record for the mite fauna of Iran.

***Caesarodispus minutus* (Sevastianov, 1981)**

Microdispus minutus Sevastianov, 1981, p. 29, Fig. 5.

Caesarodispus minutus: Khaustov 2008: 390.

Material examined – This species was collected directly from nest of ants in Gooshe Olia village, vicinity of Meshguin shahr, Ardabil province, northwestern Iran, 38° 26' 24.0" N 47° 33' 36.0" E. Four females were removed from a vial containing more than 20 ants of *Tetramorium* sp., 12 May 2016, leg. M. Sobhi.

Distribution – Ukraine, described originally by Sevastianov (1981) associated with ant *Tetramorium caespitum* (Linnaeus, 1758); Russia (Siberia), from *Lasius flavus* (Fabricius, 1782) (Khaustov and Tolstikov 2016); Iran, from *Temnothorax* sp. (Loghmani *et al.* 2014b) and associated with *Tetramorium* sp. (current study).

Genus *Unguidispus* Mahunka, 1970

Type species: *Unguidispus stammeri* Mahunka, 1970, by original designation.

***Unguidispus japonicus* Kurosa, 1979**

Unguidispus japonicus Kurosa, 1979, p. 64, Figs 1–2.

Material examined – The species was obtained during sampling directly from nest of ants in summering of Sabalan Mountain, near Meshguin shahr, Ardabil Province, northwestern Iran, 38° 12' 36.0" N 47 °32' 24.0" E. One female was removed from a vial containing many ants of the species *Lasius obscuratus* Stitz, 1930, 25 May 2016, leg. M. Sobhi.

Distribution – Japan, Russia, associated with *Lasius niger* (Linnaeus, 1758) (Kurosa 1979; Khaustov 2014); Iran, associated with *L. obscuratus* (current study).

Remarks – The species *Unguidispus japonicus* is recorded from Iran for the first time. Moreover, the association between this mite and ants of the species *Lasius obscuratus* is new.

DISCUSSION

Taking the two aforementioned new records of micodispids into account, hitherto, 23 microdispid species have been recorded from Iran (see Table 1). These species are distributed in six genera: *Premicrodispus* (10 species), *Caesarodispus* (seven species), *Unguidispus* (two species), *Paramicrodispus* (two species), *Neomicrodispus* (one species), and *Punicodoxa* (one species). The genera *Caesarodispus* and *Unguidispus* are myrmecophilous, and *Punicodoxa* is phoretic on termites. Except for two species of the *Premicrodispus* recorded from soil, all representatives of other three genera are associated with the three beetle families Scarabaeidae, Lucanidae, and Tenebrionidae.

Table 1. Iranian microdispid records with their host/habitat.

Genus and species	Host/Habitat	Reference
<i>Premicrodispus brevisetus</i> Khaustov, 2006	<i>Oxythyrea cinctella</i> Schaum; <i>Oryctes nasicornis</i> L. (Col.: Scarabaeidae)	Rahiminejad <i>et al.</i> (2010); Katlav <i>et al.</i> (2015)
<i>Premicrodispus lineatus</i> (Mahunka, 1986)	Soil (vineyards)	Hajiqanbar <i>et al.</i> (2012b)
<i>Premicrodispus krczali</i> Khaustov, 2006	<i>Oxythyrea cinctella</i> Schaum (Col.: Scarabaeidae)	Loghmani <i>et al.</i> (2014a)
<i>Premicrodispus akermanae</i> (Sevastianov & Al Douri, 1988)	<i>Oryctes nasicornis</i> L. (Col.: Scarabaeidae)	Hosseininaveh <i>et al.</i> (2013)
<i>Premicrodispus longicaudus</i> Khaustov, 2006	Soil (pomegranate orchards)	Filekesh <i>et al.</i> (2014)
<i>Premicrodispus paramaevi</i> (Hosseininaveh & Hajiqanbar, 2015)	<i>Lucanus ibericus</i> Motschulsky (Col.: Lucanidae)	Hosseininaveh <i>et al.</i> (2015)
<i>Premicrodispus spinosus</i> (Hosseininaveh & Hajiqanbar, 2015)	<i>Corticeus unicolor</i> (Col.: Tenebrionidae)	Hosseininaveh <i>et al.</i> (2015)
<i>Premicrodispus turkmenus</i> (Badooam & Hajiqanbar, 2015)	<i>Lucanus ibericus</i> Motschulsky (Col.: Lucanidae)	Badooam <i>et al.</i> (2015)
<i>Premicrodispus rackae</i> Khaustov, 2006	<i>Oryctes nasicornis</i> L. (Col.: Scarabaeidae)	Badooam <i>et al.</i> (2015)
<i>Premicrodispus acuitisetus</i> Khaustov, 2009	<i>Pleurophorus anatolicus</i> Petrovitz (Col.: Scarabaeidae)	Badooam <i>et al.</i> (2015)
<i>Caesarodispus shandizensis</i> Loghmani & Hajiqanbar, 2014	<i>Temnothorax</i> sp. (Hym.: Formicidae)	Loghmani <i>et al.</i> (2014b)
<i>Caesarodispus minutus</i> (Sevastianov, 1981)	<i>Temnothorax</i> sp.; <i>Tetramorium</i> sp. (Hym.: Formicidae)	Loghmani <i>et al.</i> (2014b); current study
<i>Caesarodispus modestus</i> (Berlese, 1903)	Unidentified ant; <i>Messor</i> sp. (Hym.: Formicidae)	Badooam (2014); current study
<i>Caesarodispus khaustovi</i> Rahiminejad & Hajiqanbar, 2015	<i>Tetramorium</i> sp. (Hym.: Formicidae)	Rahiminejad <i>et al.</i> (2015)
<i>Caesarodispus pheidolei</i> Rahiminejad & Hajiqanbar, 2015	<i>Pheidole</i> sp. (Hym.: Formicidae)	Rahiminejad <i>et al.</i> (2015)
<i>Caesarodispus nodijensis</i> Rahiminejad & Hajiqanbar, 2015	<i>Tetramorium</i> sp. (Hym.: Formicidae)	Rahiminejad <i>et al.</i> (2015)
<i>Caesarodispus samsinaki</i> (Mahunka, 1967)	<i>Formica</i> sp. (Hym.: Formicidae)	Current study
<i>Paramicrodispus scarabidophilus</i> Hajiqanbar & Rahiminejad, 2012	<i>Oryctes nasicornis</i> L.; <i>Gnorimus subcostatus</i> (Menetries) (Col.: Scarabaeidae); <i>Dorcus parallelus</i> (Say) (Col.: Lucanidae)	Hajiqanbar <i>et al.</i> (2012a); Badooam <i>et al.</i> (2015); Katlav <i>et al.</i> (2015)
<i>Paramicrodispus crenulatus</i> (Savulkina, 1978)	<i>Lucanus ibericus</i> Motschulsky (Col.: Lucanidae)	Hajiqanbar <i>et al.</i> (2012a)
<i>Neomicrodispus iranicus</i> Hajiqanbar & Hosseininaveh, 2014	<i>Oryctes nasicornis</i> L. (Col.: Scarabaeidae)	Hajiqanbar & Hosseininaveh (2014)
<i>Unguidispus okumurai</i> Kurosa, 1979	<i>Lasius emarginatus</i> (Hym.: Formicidae)	Abbasi-Moqadam <i>et al.</i> (2014)
<i>Unguidispus japonicus</i> Kurosa, 1979	<i>Lasius obscuratus</i> Stitz (Hym.: Formicidae)	Current study
<i>Punicodoxa termitophila</i> Azhari & Hajiqanbar, 2018	<i>Anacanthotermes</i> sp. (Isoptera: Hodotermitidae)	Azhari <i>et al.</i> (2018)

All the genera and species of Microdispidae recorded thus far from Iran can be identified using the following key.

Key to genera and species of the family Microdispidae recorded from Iran

1. Tibiotarsus I with claw *Unguidispus* 2

- Tibiotarsus I without claw 3
- 2. Dorsal setae of hysterosoma spatulate with dense barbs *U. japonicus*
- Dorsal setae of hysterosoma simple, smooth or weakly barbed *U. okumurai*
- 3. Posterior margin of posterior sternal plate entire 4
- Posterior margin of posterior sternal plate tripartite 13
- 4. Pseudanal segment with three pairs of setae; tibia IV with three setae
..... *Neomicrodispus* *N. iranicus*
- Pseudanal segment with two pairs of setae; tibia IV with four setae 5
- 5. Tibiotarsus I with three solenidia and 14 setae; pharyngeal pump III much larger than pump I
..... *Paramicrodispus* 6
- Tibiotarsus I with four solenidia and 16 setae; pharyngeal pumps I and III reduced, subequal
..... *Caesarodispus* 7
- 6. Setae c_1 shorter than distance c_1-c_2 ; setae e and f subequal; setae e not reaching to bases of setae
 h_1 *P. scarabidophilous*
- Setae c_1 subequal to distance c_1-c_2 ; setae e longer than f ; setae e reaching to bases of setae h_1
..... *P. crenulatus*
- 7. Hysterosomal tergites not reticulated; femur II with three setae 8
- Hysterosomal tergites distinctly reticulated; femur II with two setae *C. samsinaki*
- 8. Tibia IV seta d heavily barbed, reaching beyond tip of pretarsus IV 9
- Tibia IV seta d smooth or weakly barbed, not reaching beyond tip of pretarsus IV 11
- 9. Seta d of femur IV longer than tc'' of tarsus IV; minute setae ps_2 present *C. modestus*
- Seta d of femur IV shorter than tc'' of tarsus IV; minute setae ps_2 absent 10
- 10. Distance h_1-h_2 and h_1-h_1 usually subequal; posterior part of aggenital plate smooth
..... *C. nodijensis*
- Distance h_1-h_2 about 2.5 times longer than h_1-h_1 ; posterior part of aggenital plate distinctly
reticulated *C. pheidolei*
- 11. Posterior part of aggenital plate distinctly reticulated *C. shandizensis*
- Posterior part of aggenital plate smooth 12
- 12. Distance h_1-h_2 clearly about 2.5 times longer than h_1-h_1 *C. khaustovi*
- Distance h_1-h_2 and h_1-h_1 subequal *C. minutus*
- 13. Seta s of tibiotarsus I present; two pairs of cheliceral setae *Punicodoxa* *P. termitophila*
- Seta s of tibiotarsus I absent; usually one pair of cheliceral setae *Premicrodispus* 14
- 14. Setae $4a$ present 15
- Setae $4a$ absent 16
- 15. Bases of setae f associated with well-developed oblique ridges *P. lineatus*
- No ridges near the bases of setae f *P. paramaevi*
- 16. Setae ps_2 present 17
- Setae ps_2 absent 19
- 17. Setae h_1 and h_2 subequal; tarsi and tibiae II and III with spine-like setae *P. spinosus*
- Setae h_2 distinctly shorter than h_1 ; tarsi and tibiae II and III with no spine-like seta 18
- 18. Tibiotarsus I with four solenidia; seta ps_3 longer than h_1 ; setae e and h_1 subequal *P. turkmenus*
- Tibiotarsus I with three solenidia; seta h_1 distinctly longer than ps_3 and e *P. akermanae*
- 19. Setae sc_2 and d subequal *P. acutisetosus*
- Setae sc_2 distinctly longer than d 20
- 20. Setae ps_3 distinctly longer than ps_1 *P. longicaudus*
- Setae ps_1 and ps_3 subequal 21
- 21. No ridges near the bases of setae e *P. krczali*
- Bases of setae e associated with well developed oblique ridges 22
- 22. Setae sc_2 and c_1 subequal; setae c_2 and c_1 situated almost at the same level *P. rackae*
- Setae sc_2 distinctly longer than c_1 ; setae c_2 situated distinctly anterior to c_1 *P. brevisetus*

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REFERENCES

- Abbasi-Moqadam, F., Hajiqanbar, H. & Katlav, A. (2014) First record of *Unguidispus okumurai* (Acari: Microdispidae), as a new genus and species to mite fauna of Iran. *In: Rahimian, H. (Ed.), Abstract book of the 21th Iranian Plant Protection Congress, Urmia, Iran*, p. 959.
- Azhari, Sh., Hajiqanbar, H. & Talebi, A.A. (2018) First record of the rare genus *Punicodoxa* (Acari: Microdispidae) from Asia, with description of a new species phoretic on termites (Insecta: Isoptera). *Systematic and Applied Acarology*, 23(3): 468–476.
<http://dx.doi.org/10.11158/saa.23.3.6>
- Badoodam, S. (2014) *Heterostigmatic mites (Acari: Heterostigmata) associated with insects in East of Golestan Province* [M.Sc. Thesis]. Tarbiat Modares University, Tehran, Iran, 87 pp.
- Badoodam, S., Hajiqanbar, H. & Talebi, A.A. (2015) New species and records of the family Microdispidae (Acari: Prostigmata) from Golestan province, Iran. *International Journal of Acarology*, 41(7): 600–605.
<http://dx.doi.org/10.1080/01647954.2015.1084047>
- Berlese, A. (1903) Diagnosi di alcuni nuove specie di Acari italiani, mirmecofili e liberi. *Zoologischer Anzeiger*, 27: 12–28.
- Filekesh, M., Hajiqanbar, H. & Jabaleh, I. (2014) New records of three species of the superfamily Pygmephoroida (Acari: Heterostigmata) from Asia. *Persian Journal of Acarology*, 3: 277–283.
<http://dx.doi.org/10.22073/pja.v3i4.10170>
- Hajiqanbar, H. & Hosseininaveh, F. (2014) A new genus and species of the family Microdispidae (Acari: Prostigmata) associated with *Oryctes nasicornis* (Coleoptera: Scarabaeidae) and redescription of the monotypic genus *Vietodispus* Mahunka, 1975. *Zoological Studies*, 53: 58.
<http://dx.doi.org/10.1186/s40555-014-0058-7>
- Hajiqanbar, H., Rahiminejad, V. & Fathipour, Y. (2012) New insect host records for mites of the family Microdispidae (Acari: Heterostigmata), with description of a new species of the genus *Paramicrodispus*. *Entomological Science*, 15(3): 309–313.
<https://doi.org/10.1111/j.1479-8298.2012.00515.x>
- Hajiqanbar, H., Salarzahi, S., Olyaie Torshiz, A. & Noei, J. (2012) First record of the *Premicrodispus lineatus* (Mahunka, 1986) (Acari: Heterostigmata, Microdispidae) from Iran. *Persian Journal of Acarology*, 1 (2): 157–158.
<http://dx.doi.org/10.1111/j.1479-8298.2012.00515.x>
- Hosseininaveh, F., Hajiqanbar, H. & Talebi, A.A. (2013) First record of the *Premicrodispus akermanae* (Sevastianov and Al Douri, 1988) (Acari: Microdispidae) from Iran. *In: Joharchi, O. & Saboori, A. (Eds.), Abstract book of the 2nd International Persian Congress of Acarology, Tehran, Iran*, p. 15.
- Hosseininaveh, F., Hajiqanbar, H. & Talebi, A.A. (2015) Two new species of the genus *Premicrodispus* (Acari: Microdispidae) associated with beetles (Coleoptera: Lucanidae: Tenebrionidae), with a key to Palaearctic species of the genus. *Journal of Natural History*, 49: 915–931.
<http://dx.doi.org/10.1080/00222933.2014.953225>
- Kaliszewski, M., Athias-Binche, F. & Lindquist, E.E. (1995) Parasitism and parasitoidism in Tarsonemina (Acari: Heterostigmata) and evolutionary consideration. *Advances in Parasitology*, 35: 335–367.
[http://dx.doi.org/10.1016/S0065-308X\(08\)60074-3](http://dx.doi.org/10.1016/S0065-308X(08)60074-3)

- Katlav, A., Hajiqanbar, H. & Talebi, A.A. (2015) A contribution to the knowledge of heterostigmatic mites (Acari: Prostigmata) in western Mazandaran Province, Northern Iran. *Acarologia*, 55 (3): 311–320.
<http://dx.doi.org/10.1051/acarologia/20152175>
- Khaustov, A.A. (2009) New and little known species of mites of the genus *Caesarodispus* (Acari, Heterostigmata, Microdispidae) associated with ants (Hymenoptera, Formicidae) from Ukraine. *Vestnik Zoologii*, 43: 388–393.
- Khaustov, A.A. (2014) A review of myrmecophilous mites of the family Microdispidae (Acari: Heterostigmata) of Western Siberia. *ZooKeys*, 454: 13–28.
<http://dx.doi.org/10.3897/zookeys.454.8709>
- Khaustov, A.A. (2017) Contribution to systematics of the Palaearctic Microdispidae (Acari: Pygmephoroida). *International Journal of Acarology*, 43(6): 475–493.
<http://doi.org/10.1080/01647954.2017.1338313>
- Khaustov, A.A. & Tolstikov A.V. (2016) The diversity, mite communities, and host specificity of pygmephoroid mites (Acari: Pygmephoroida) associated with ants in Western Siberia, Russia. *Acarina*, 24(2): 113–136.
<http://doi.org/10.21684/0132-8077-2016-24-2-113-136>
- Krczal, H. (1959) Systematik und Ökologie der Pyemotiden. In: Stammer, H.J. (Ed.), *Beiträge zur Systematik und Ökologie Mitteleuropäischer Acarina*. Akademische Verlagsgesellschaft, Leipzig. Volume 1, Part 2, pp. 1–625.
- Kurosa, K. (1979) Three new species of *Unguodispus* (Acari, Heterostigmata, Microdispidae) from Japan. *Annotationes Zoologicae Japonenses*, 521: 63–71.
- Lindquist, E. E. (1986) The world genera of Tarsonemidae (Acari: Heterostigmata): a morphological, phylogenetic and systematic revision, with a reclassification of familygroup taxa in Heterostigmata. *Memoirs of the Entomological Society of Canada*, 136, 1–517.
<http://dx.doi.org/10.4039/entm118136fv>
- Loghmani, A., Hajiqanbar, H. & Talebi, A.A. (2014a) New records of mites of the superfamily Pygmephoroida (Acari: Heterostigmata) associated with insects from northeastern Iran and new host records. *Systematic and Applied Acarology*, 19: 154–159.
<http://dx.doi.org/10.11158/saa.19.2.5>
- Loghmani, A., Hajiqanbar, H. & Talebi, A.A. (2014b) New species and new record of the genus *Caesarodispus* (Acari: Heterostigmata: Microdispidae) phoretic on *Temnothorax* sp. (Hymenoptera: Formicidae). *Annales Zoologici*, 64: 273–278.
<http://dx.doi.org/10.3161/000345414X680627>
- Mahunka, S. (1967) Beiträge zur Kenntnis der Tschechoslowakischen Tarsonemini-Fauna. *Věstník Československé Společnosti Zoologické*, 31: 240–244.
- Mahunka, S. (1972) *Tetűatkák - Tarsonemina (Magyarország állatvilága – Fauna Hungariae 110.) – XVIII. kötet, 16. füzet (Arachnoidea)*. Akademiai Kiado, Budapest, 215 pp.
- Rack, G. (1979) *Brennandania scolopendrae* sp. n. von *Scolopendra morsitans* L. (Acarina, Tarsonemida, Pygmephoroida, Microdispidae). *Revue de Zoologie et de Botanique Africaines*, 93: 376–381.
- Rahiminejad, V., Hajiqanbar, H. & Fathipour, Y. (2010) First record of phoresy of Microdispidae (Acari: Prostigmata) on Scarabaeidae (Insecta: Coleoptera). In: Manzari, S. (Ed.), *Proceedings of the 19th Iranian Plant Protection Congress, Tehran, Iran*, p. 352.
- Rahiminejad, V., Hajiqanbar, H., Talebi, A.A. (2015) Three new species of the genus *Caesarodispus* (Acari: Microdispidae) associated with ants (Hymenoptera: Formicidae), with a key to species. *Entomological Science*, 18: 461–469.
<http://dx.doi.org/10.1111/ens.12149>
- Sevastianov, V. D. (1978) Tarsonemina. In: Ghilarov, M.S. (Ed.), *Opredelitel pochvoobitayushchikh kleshchey. Trombidiformes*. Nauka, Moscow, pp. 14–90 (In Russian).

- Sevastianov, V.D. (1981) New species of mites of the family Pygmephoridae (Tarsonemina, Trombidiformes). *Vestnik Zoologii*, 6: 25–29 (In Russian).
- Walter, D.E., Lindquist, E.E., Smith, I.M., Cook, D.R. & Krantz, G.W. (2009) Order Trombidiformes. *In*: Krantz, G.W. and D.E. Walter (Eds.), *A manual of acarology*. 3rd ed. Texas Tech University Press, Lubbock, TX, USA, pp. 233–420.

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گزارش‌های جدیدی از کنه‌های مایکرودیسپید (Acari: Heterostigmata: Microdispidae) مرتبط با مورچه‌ها همراه با مروری بر خانواده در ایران

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چکیده

دو جنس و چهار گونه از کنه‌های مورچه دوست خانواده Microdispidae (Acari: Heterostigmata) مرتبط با چندین مورچه (Hymenoptera: Formicidae) از شمال غرب ایران به ثبت می‌رسند: *Unguidispus japonicus* Kurosa, 1979 مرتبط با *Lasius C. modestus* (Berlese, 1903) *Formica* sp. مرتبط با *Caesarodispus samsinaki* (Mahunka, 1967) *obscuratus* Stitz, 1930 مرتبط با *Messor* sp. و *C. minutus* Sevastianov, 1981 مرتبط با *Tetramorium* sp. گونه‌های *C. samsinaki* و *U. japonicus* برای نخستین بار از فون کنه‌های ایران گزارش می‌شوند. میزبانی جدید از مورچه‌ها برای کنه *U. japonicus* نیز گزارش می‌شود. مناطق انتشار جهانی کنه‌های گزارش شده ارایه شده است. همچنین، تمام کنه‌های مایکرودیسپید گزارش شده از ایران همراه با زیستگاه/میزبان آنها مرور و کلیدی برای جنس‌ها و گونه‌های مزبور فراهم شده است.

واژگان کلیدی: *Formica*؛ *Formicidae*؛ *Lasius*؛ *Messor*؛ کنه‌های هم‌سفر؛ *Tetramorium*.

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