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First record of *Macrocheles caelatus* Berlese (Mesostigmata, Macrochelidae) from Iran

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The Macrochelidae is a cosmopolitan family of predatory mites that currently comprises approximately 480 described species belonging to 21 genera (Emberson 2010; Krantz 2018). They mostly occur in ephemeral substrates such as animal dung and feed on nematodes and other small invertebrates and after decreasing quality of these habitats they transfer to new suitable habitats using phoretic association with flying hosts (Krantz 1998; Lindquist *et al.* 2009). The genus *Macrocheles* Latreille, 1829 comprises about 320 described species worldwide (Emberson 2010).

Iranian mites of Macrochelidae are relatively poorly known. Kazemi and Rajaei (2013) listed 16 species of the genus *Macrocheles* which were reported from Iran: *M. baliensis* Takaku & Hartini, 2001, *M. cristati* Costa, 1967, *M. glaber* (Müller, 1860), *M. insignitus* (Berlese, 1981), *M. matrius* (Hull, 1925), *M. merdarius* (Berlese, 1889), *M. muscaedomesticae* (Scopoli, 1772), *M. nataliae* (Bergetova & Koroleva, 1960), *M. penicilliger* (Berlese, 1904), *M. peniculatus* Berlese, 1918, *M. perglaber* Filipponi & Pegazzano, 1962, *M. robustulus* (Berlese, 1904), *M. scutatus* (Berlese, 1904), *M. subbadius* (Berlese, 1904), *M. sumbaensis* Hartini & Takaku, 2005, *M. vernalis* (Berlese, 1887). Later, Ahadiyat *et al.* (2013), and Hosseinpour and Latifi (2014) recorded two more species from the country, *M. mammifer* Berlese, 1918 and *M. terreus* Canestrini & Fanzago, 1877, respectively.

In a faunistic survey on edaphic Mesostigmata in some parks in Kerman City, mite specimens were extracted using Berlese-Tullgren funnels, cleared in Nesbitt's fluid and then mounted on microscope slides using Hoyer's medium. Among the collected Mesostigmata, a female specimen of *M. caelatus* Berlese, 1918 was collected which considered as a new record for Iran mite fauna.

Macrocheles caelatus Berlese, 1918

Macrocheles (Coprholaspis) caelatus Berlese (1918): 157.

Macrocheles caelatus Walter & Krantz (1986): 283.

Berlese described the species based on specimens collected in East Africa. Walter & Krantz (1986) redescribed this species based on specimens associated with *Copris* Geoffroy and *Onitis*

Fabricius collected in Zaire and Rwanda, and also presented a key for five complex species for *Macrocheles glaber* group and placed *M. caelatus* in *limue* complex based on the narrow "linea angulata".

Diagnosis

Dorsal shield setae *j1*, *j4* and *z4* pilose distally, *J5* pectinate, *Z4*, *Z5* and *S5* finely barbed in half distal length, other setae smooth; ventrianal shield wider than long; details of sternal shield as Figure 1; other diagnostic characters as Walter & Krantz (1986). Measurements of morphological attributes presented in Table 1.



Figure 1. *Macrocheles caelatus* Berlese (female) – Ventral aspect of body.

Table 1. Measurement of *Macrocheles caelatus* (µm).

Character	Size	Character	Size
Sternal shield length	143	j1	31
Sternal shield width at st2 level	153	j2	49
Sternal shield width (narrowest point, between coxae I-II)	116	J3	43
Sternal shield width (widest point, between coxae II-III)	241	j4	38
Epigynal shield width (at st5 level)	137	j5	40
Epigynal shield length	135	j6	40
Venterianal shield length	200	z1	16
Venterianal shield width (at widest point)	222	z2	44
Dorsal shield length	617	z4	43
Dorsal shield width (at level of setae j6)	362	z5	37
Length of cheliceral fixed digit	171	z6	46
Length of cheliceral movable digit	71	s2	37
Palp length	204	s5	44
Length of leg I	479	s6	41
Length of leg II	432	r2	43
Length of leg III	409	r3	40
Length of leg IV	910	r4	45
pc	24	r5	22
h1	55	J2	50
h2	26	J5	25
h3	66	Z1	54
Jv1	35	Z2	50
Jv2	37	Z4	56
Jv3	29	Z5	34
Para-anal seta	30	S1	49
Postanal seta	24	S2	43
st1	35	S4	41
st2	37	S5	29
st3	31		
st4	31		
st5	37		

Distribution

East and center Africa (Berlese 1918; Walter & Krantz 1986), Iran (this paper).

Material examined

One female, southeastern Iran, Kerman City, Shahid Park, in soil and litter (30° 18' 5" N; 57° 4' 17" E), 07 July 2017, coll. F. Saeed, deposited in the Acarological Collection, Institute of Science and High Technology and Environmental Sciences, Graduate University of Advanced Technology, Kerman, Iran

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