



### Full Length Article

## First record of *Macrocheles matrius* (Hull, 1925) (Acari: Macrochelidae) from Turkey

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### Abstract

Poultry manure is common microhabitat of mites, especially for macrochelid mites. *Macrocheles matrius* was recorded as a new report for the Turkish mite fauna. The morphological characters of this species are presented with description, diagnosis and original figures from Turkish specimens. In addition, a key of poultry manure-inhabiting adult (females) of known species from Samsun, Turkey is provided. © 2016 Friends Science Publishers

**Keywords:** Acari; Macrochelidae; Poultry cages; New record; *M. matrius*; Turkey

### Introduction

Macrochelidae was established by Vitzthum (1930). The family includes about 480 species and 20 genera in the world (Emberson, 2010). Macrochelids are predatory mites that are found in soil and richness organic matter, especially in manure (Bregetova and Koroleva, 1960; Krantz, 1962; Hyatt and Emberson, 1988; Karg, 1993; Halliday, 2000; Mašán, 2003). Fauna of Turkey represent with 25 species that are identified from six genera: *Macrocheles* Valle, 1953; *Glyptolaspis* Filipponi and Pegazzano, 1960; *Longicheles*, *Nothrolaspis* Berlese, 1918; *Neopodicinum*; *Geholaspis* Berlese, 1918 (Ekiz and Urhan, 2002; Bayram and Çobanoğlu, 2005; Kılıç *et al.*, 2012; Özbek *et al.*, 2015; Özbek and Halliday, 2015).

*Macrocheles* is poorly identified from the Turkey with only 9 species: *M. merdarius* (Berlese, 1889) by Kılıç *et al.* (2012); *M. muscaedomesticae* (Scopoli, 1772) by Göksu and Güler (1968); *M. robustulus* (Berlese, 1904) by Bayram and Çobanoğlu (2005); *M. glaber* (Müller, 1860) by Çobanoğlu and Kırız (2001); *M. punctatissimus* Berlese 1918 by Bayram and Çobanoğlu (2005); *M. vernalis* (Berlese, 1887) by Evans and Hyatt (1963); *M. scutatus* (Berlese, 1904); *M. subbadius* and *M. perglaber* Filipponi and Pegazzano (1962) by Özbek *et al.* (2015).

*M. matrius* is found in litter, dropping of small animals (rabbits and rats etc), manures (cow, horse, poultry) and insects (Dipterans) and show phoretic behaviour with flies and beetles. The aim of the study is to addition of *M. matrius* into Turkish mite fauna from poultry manure with detail description and distribution.

### Materials and Methods

Surveys were conducted in 2013–2014 to investigate the mite fauna from poultry cages in seven locations in Samsun Province, Turkey. A total of seventy-five samples out of ninety-one samples were collected from which macrochelid mites found in poultry litters/manure. The specimens were collected after every two weeks in spring, summer and autumn, while the winter collection was made on monthly basis from three sites of Kızılırmak Delta (Doğanca) in the Bafra District. The rest of the sites were sampled irregularly.

Hundred gram samples of the poultry manure were processed through a Berlese funnel. The mites were cleared with lacto-phenol and dissected to separate dorsal and ventral shield for clear identification. Mites were examined by phase-contrast microscope [MT4210H, Meiji Techno® (Japan)] after mounted in Hoyer's medium. All the diagrams were made with help of Adobe Illustrator® and colour diagrams were taken at 10X by carry a camera (Figs. 8–9).

The specimens were collected by the first author and deposited in the Acarology Laboratory, Department of Plant Protection, Agriculture Faculty, Ondokuz Mayıs University, Samsun, Turkey as well as Department of Entomology, University of Agriculture, Faisalabad, Pakistan. All the measurements of are taken in µm (micrometres).

### Results

During the investigation period, *M. matrius* (Hull, 1925)

was collected, identified and described from Samsun Province, Turkey as a new record.

Family: Macrochelidae Vitzthum (1930).

Genus: *Macrocheles* Latreille (1829).

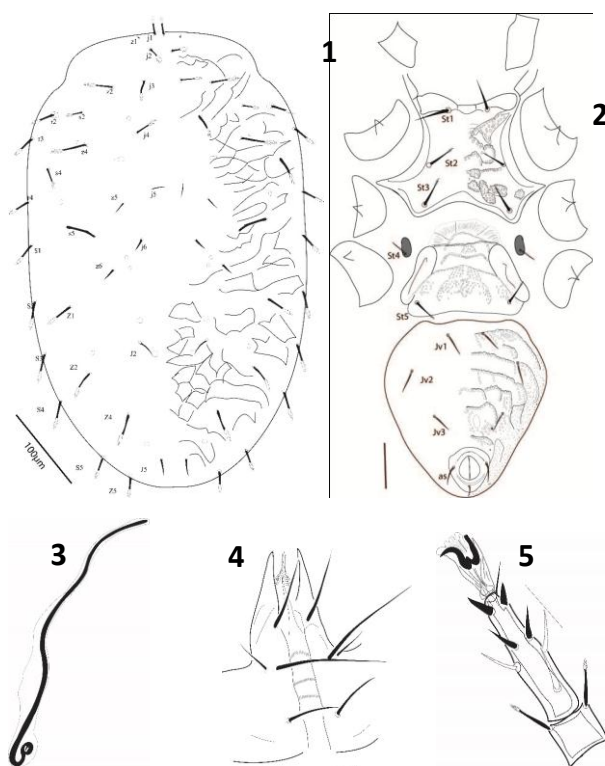
### *M. matrius* (Hull, 1925)

#### Specimens Examined

**All specimens collected from different sites of Samsun Province, Turkey:** Five females from Doğanca, 41° 39' 05" N, 36° 01' 10.9" E (Site-1), 18 November 2013; eleven females from Site-1, 01 April 2014; six females and one male from Doğanca, Bafra (Site-2), 41° 39' 13.8" N, 36° 00' 45.7" E, 01 April 2014; five females from Site-2, 16 June 2014; seven females and three males were examined from Doğanca (Site-3), 41° 39' 08.7" N, 35° 59' 59.2" E, 18 November 2013; two females from Site-3, 01 April 2014; 2 males from site-3, 16 June 2014; Twenty females and three males examined from Kuşcular Village, Bafra, 41° 35' 16.8" N, 35° 52' 19.3" E, 19 May 2014; three females and one male from Kavak, 41° 4' 25" N, 36° 2' 25" E, 16 February 2014; two female from Vezirköprü (Site-1), 41° 7' 59.9" N, 35° 27' 00" E, 18 December 2013; two female from Tekkeköy, 41° 6' 57.22" N, 36° 25' 14.9" E, 16 March, 2014; three females from Çarşamba (Site-1), 41° 7' 32.2356" N, 36° 41' 52.7244" E, 28 April, 2014; two females from Çarşamba (Site-2), 41° 1' 45.714" N, 36° 41' 21.3144" E, 28 April, 2014; one female from Terme, 41° 4' 22.1916" N, 36° 56' 35.9304" E, 09 May, 2014; three females from Salıpazarı, 41° 4' 18.7356" N, 36° 49' 14.3688" E, 24 May, 2014; five females and one male from Havza (Site-1), 40° 57' 57.762" N, 35° 35' 57.0084" E, 19 July, 2014; three females from Havza (Site-2), 40° 54' 54" N, 35° 42' 33" E, 19 July, 2014; one female from Ladik, 40° 53' 24" N, 35° 56' 9" E, 23 July, 2014 and two females from Vezirköprü (Site-2), 41° 14' 42" N, 35° 4' 53" E, 06 June, 2014.

**Description of female: Dorsum** (Fig. 1). Dorsal shield with longer, 832 (795–799) than wide, 530 (513–534). Dorsal shield with 28 pairs of setae, most setae distally pilose; setae j1, j6, J2, J5, z1, z5, z6 smooth and needlelike. Dorsal seta z2 have longer than other setae and z4, Z2, Z4, s4, s5 and S4 almost equal in length. Length of setae: j1 18 (18–19); j2 24 (23–25); j3 33 (33–34); j4 45 (45–46); j5 24 (23–24); j6 17 (16–18); J2 23 (23–24); J5 22 (22–23); z1 21 (21–23); z2 49 (48–49); z4 47 (46–47); z5 22 (22–24); z6 20 (19–20); Z1 44 (43–44); Z2 46 (46–47); Z4 46 (46–47); Z5 47 (46–47); s2 36 (35–36); s4 46 (46–47); s5 47 (46–47); s6 37 (36–37); S1 24 (23–24); S2 32 (30–33); S4 47 (46–47); S5 42 (41–42); r2 42 (41–42); r3 43 (41–43); r4 45 (44–45).

**Venter** (Fig. 2). Sternal shield is 165 (159–170) long, 162 (161–164) wide at the level coxae II and bearing three pairs of pilose setae and two pairs of pores: *linea angulata* and *linea arcuata* slightly curved with punctates,



**Figs. 1-5:** *M. matrius*: (1) Dorsal shield (♀); (2) Ventral shields (♀); (3) Peritreme (♀); (4) Hypostome (♀) and (5) Tarsus II (♀). All the scale are 100 µm

*linea arcuata* “M-shaped” with punctures; *linea obiligue* anterior with a smooth curved line; *linea media transversa* slightly curved, having small punctured on posterior; *linea obiligue posterior* curved interiorly with punctures. Genital shield ornamented with punctures and lines and having a pair of distally pilose setae. Ventrianal shield wider than length, 288 (286–288) wide, 278 (275–279) long reticulated with punctuation on lateral surface and with three pairs of smooth and needle-like setae. Length of setae: st1 50 (49–50); st2 50 (49–51); st3 40 (39–40); st4 34 (33–34); st5 49 (49–50); Jv1 39 (38–40); Jv2 26 (25–26); Jv3 19 (18–20).

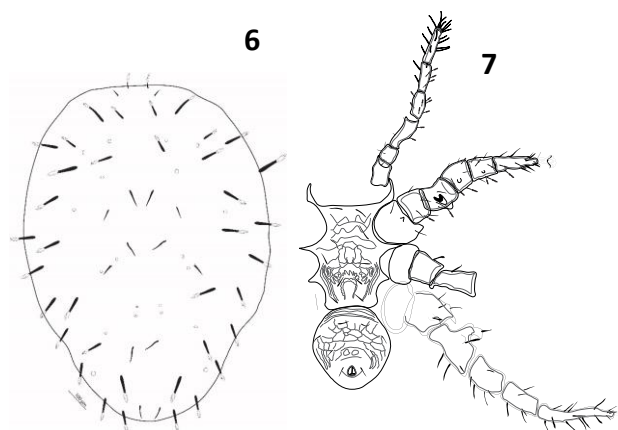
Peritreme as in Fig. 3. Ventral surface of gnathosoma with four pairs of setae, setae h3 longest; setae pc and h1 longer than h2 (Fig. 4).

**Legs.** Tarsus II as shown in Fig. 5.

**Description of male: Dorsum** (Fig. 6). Dorsal chaetotaxy and ornamentation similar to female specimens.

**Venter** (Fig. 7). Holoventral shield ornamented with punctates and lines and sculptured laterally. Sternal setae st1, st2, st3, st4 and pre-anal setae Jv1-Jv3 pilose, st4 smooth and needle-like, setae st1-st3 equal in length and clearly longer than other setae on holoventral shield. Length of setae: st1 and st2 52 (50–54), st3 45 (45–49), st5 32 (30–33), Jv1 39 (38–40), Jv2 26 (25–30) and Jv3 18 (18–20).

Gnathosoma similar to that of female. Moveable digit of chelicera with a spermatodactyl.



**Figs. 6-7:** *M. matrius*: (6) Dorsal shield (♂); (7) Ventral shield (♂). All the scales are 100 µm



**Figs. 8-9:** *M. matrius*: (8) Ventral shield (♀); (9) Ventral shield (♂)

**Leg.** Ventral surface of femur II with spur like projection. Trochanter and femur of leg IV with spur (Fig. 7).

**Distribution:** *M. matrius* is native and extensively reported from the European peninsula as well as found from all continents of the world except the Australia (Halliday, 2000). This species found from various habitats and host from different geographical regions. It is newly recorded from Turkey.

## Discussion

During survey of household poultry manure-inhabiting mite fauna, *M. matrius* (Hull, 1925) was commonly found from the territory of the Samsun Province, Turkey.

The most important character for the identification of male is spur prominent on the leg IV and bearing the pectinate setae on the femur and trochanter. Hull (1925) reported that leg II has no spur, while Turkish specimens have a small projection on femur of leg II. All other taxonomists did not mention detailed description of male.

Most of the morphological characters of the Turkish

specimens are same as the Slovakian species (Mašán, 2003) with slighter variations.

## Key to Poultry Manure inhabiting *Macrocheles* genus (Females) mites from Turkey

1. All dorsal setae are smooth and J5 needle like usually fine pilose; sternal shield with sculptured ----- 2
  - Some dorsal setae are pilose; sternal shield with or without sculptured ----- 3
2. Genu IV with 7 setae -----
  - *M. subbadius* (Berlese, 1904)
  - Genu IV with 6 setae -----
    - *M. merdarius* (Berlese, 1889)
3. Sternal shield with or without thin sculptures with puncture ----- *M. robustulus* (Berlese, 1904)
  - Sternal shield with sculptured ----- 4
4. Most of the dorsal setae plumose, pilose or serrate -----
  - *M. matrius* (Hull, 1925)
  - Most or some dorsal setae simple, smooth and thick ----- 5
5. Mostly dorsal setae pilose; j5 simple smooth and needle like -----
  - *M. muscaedomesticae* (Scopoli, 1772)
  - Mostly dorsal setae simple, smooth and needlelike; j5 broadened, plumose and brush-shaped ----- 6
6. Lateral setae plumose distally -----
  - *M. vernalis* (Berlese, 1887)
  - Lateral and dorsal setae smooth and needle-like ----- 7
7. Ventrianal shields well sculptured and ornamented -----
  - *M. punctatissimus* Berlese, 1918
  - Ventrianal shields with or with sculptured and not fully ornamented ----- 8
8. *Linea arcuata* on sternal shield short and more or less straight with end directed laterally or posteriorly -----
  - *M. glaber* (Muller, 1860) ----- *M. perglaber* Fillipponi and Pegazzano, 1962
  - *Linea arcuata* on sternal shield longer and strongly concave with end directed anteriorly -----
    - *M. scutatus* (Berlese, 1904)

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## Technical Note

The first author Ph.D. thesis comprises of research work from Pakistan and Turkey. This manuscript is prepared with all supervisory committee as per corresponding author university requirement.

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