

## Description of new records of the family Digamasellidae (Acari: Mesostigmata) from Kızılırmak Delta, Samsun Province, Turkey\*

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**Abstract:** *Dendrolaelaps casualis* Huhta & Karg, 2010 and *Multidendrolaelaps putte* Huhta & Karg, 2010 are recorded for the first time from Turkey. Both species were collected from household poultry manure in the Kızılırmak Delta, Samsun Province, Turkey, during a survey in 2013 and 2014. The morphological characters of these species are described with figures and a key for adult females is provided.

**Key words:** Digamasellid mites, *Dendrolaelaps*, *Multidendrolaelaps*, Kızılırmak Delta, Turkey

### 1. Introduction

The mesostigmatid mites, which exhibit predatory, parasitic, and phoretic behavior, have a wide range of habitats that include soil, litter, compost, carrion, animal dung, house dust, bird nests, and poultry litter. The members of the family Digamasellidae are distributed worldwide and are predaceous. They are commonly found in decomposed material, litter, manure, galleries of beetles, decaying wood, and soil (Karg, 1993; Walter and Proctor, 1999; Lindquist et al., 2009; Hofstetter et al., 2013). Madej et al. (2011) reported the importance of microhabitats for the preservation of species diversity in mesostigmatid mites. They reported that *Dendrolaelaps* spp. from stable and unstable microhabitats such as *Pohlia nutans* (Hedw.) (moss patches), *Fagus sylvatica* L. (freshly fallen leaves), *Betula pendula* Roth (second-stage decomposed branches), *Acer platanoides* L. (third-stage decomposed branches and rotten stumps), *Pinus sylvestris* L. (fallen logs, rotten branches, bark lying on the soil surface, and fragment of the trunk of a wind-thrown tree), *Salix* sp. (fragment of the trunk of a wind-thrown tree), and *Larix decidua* Mill. (seed cones). They feed on small insects, nematodes, fungi, and the early stages (eggs and larvae) of arthropods (Lindquist et al., 2009). Wang et al. (2002) reported *Dendrolaelaps* sp. associated with *Reticulitermes flavipes* (Kollar) in Washington, USA. Other studies on digamasellid mites from different parts of the world include those of Barilo

(1989), Wiśniewski and Hirschmann (1989, 1991), Ma and Lin (2005, 2007), Faraji et al. (2006), Ma and Bai (2009), Huhta and Karg (2010), and Ma et al. (2003, 2014), but these mites are poorly known from Turkey. According to Erman et al. (2007), only two species (*Dendrolaelaps zwoelferi* Hirschmann, 1960 and *Digamasellus presepeum* (Berlese, 1918)) were previously reported from Turkey (Çobanoğlu et al., 2003; Bayram and Çobanoğlu, 2005).

This study was carried out to explore the mite fauna from household poultry cages in Samsun Province, Turkey.

### 2. Materials and methods

The survey was conducted in 2013 and 2014 to investigate the mite fauna of poultry cages in seven locations in Samsun Province, Turkey. Samples were collected at 2-week intervals in spring, summer, and autumn and monthly in winter from three sites in the Kızılırmak Delta (Doğanca village of Bafra District) with irregular sampling from the remainder of the district. Digamasellid mites were found from 32 of the 91 samples collected.

Samples of litter from each site (100 g) were processed through a Berlese funnel. Mites were mounted in Hoyer's medium before examination under a phase-contrast Olympus BX51 microscope for separation on the basis of morphological characters. The mites were identified using the works of Karg (1993), Gwiazdowicz (2004), and Huhta

\* This study is a part of the first author's PhD thesis work, and a short summary of the study was presented as a poster presentation at the 14th International Congress of Acarology, Kyoto, Japan, 14–18 July 2014.

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and Karg (2010) and were illustrated. All measurements are given in micrometers. The specimens were collected by the first author and are held at Ondokuz Mayıs University, Faculty of Agriculture, Department of Plant Protection, Acarology Laboratory, Samsun, Turkey.

### 3. Results and discussion

*Dendrolaelaps casualis* Huhta & Karg, 2010 and *Multidendrolaelaps putte* Huhta & Karg, 2010 of Digamasellidae were found from the Kızılırmak Delta and its vicinity in the Bafra District of Samsun Province, Turkey, during the study.

**Family:** Digamasellidae Evans, 1957

**Genus:** *Dendrolaelaps* Halbert, 1915

**Species:** *Dendrolaelaps casualis* Huhta & Karg, 2010

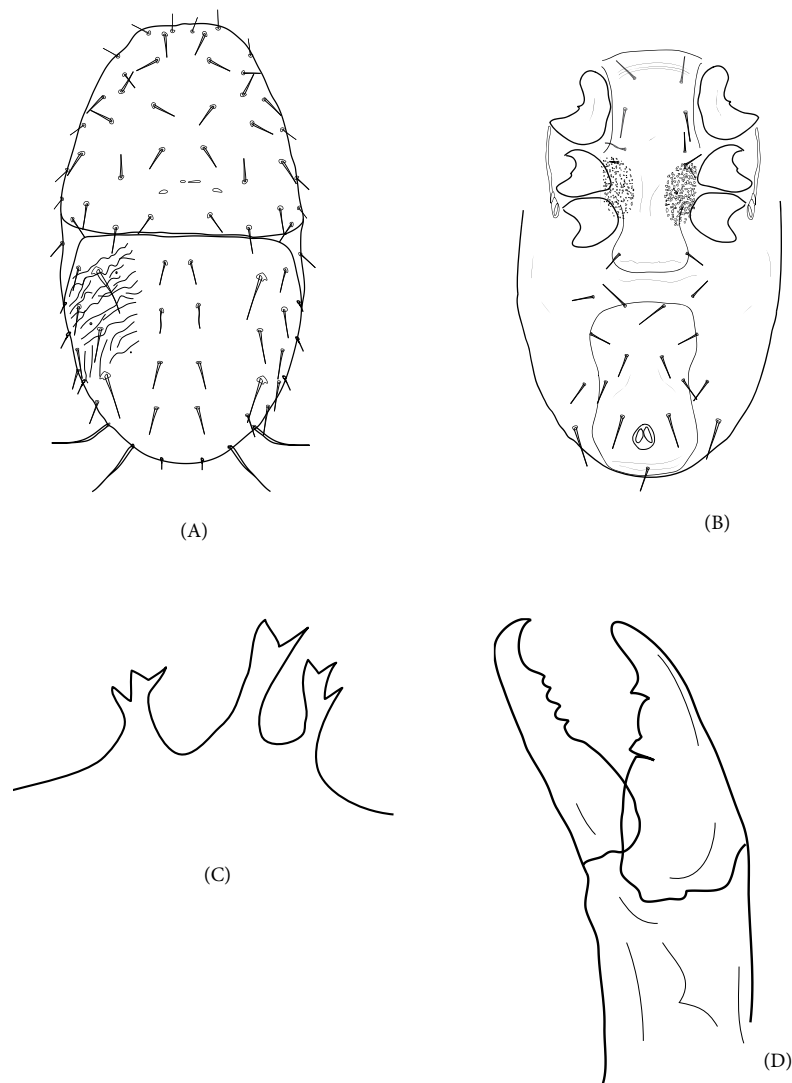
**Description of female (Figures 1A–1D):** Idiosomal measurement 333 (323–348) length, 187 (185–192) width.

**Gnathosoma:** Tectum with three projections, each one distally furcated and equal in length to others (Figure 1C). Chelicerae normal, moveable digit with 4 teeth and a large terminal hook (Figure 1D).

**Dorsum:** Setae j and J series 18 (18–21) except shorter j1, z series and Z2 19 (19–21), Z1 40 (40–43), Z3 42 (42–48), Z5 and S5 44 (43–46). Anterolateral region of the postdorsum with slightly structural pattern and incisions (Figure 1A).

**Venter:** Sternal shield weakly sclerotized. Ventrianal shield 123 (121–125) long, 76 (73–75) wide, and distinctly narrow at the middle level (50 at the level of Vi3). It carries the setae Vi1, Vi2, Vi3, Vi5, and Vz2. Setae Vi5 and Vz4 24 (21–25), other V-setae 14 (13–15). Peritremes reduced, reaching distally the level of St2–St3 (Figure 1B).

**Legs:** All setae of the legs simple, smooth. Gonoporus opening at the proximal lyrifissure of femur III.



**Figure 1.** *Dendrolaelaps casualis* (female): dorsal (A); ventral (B); tectum (C); chelicera (D).

**Specimens examined:** Two females from Doğanca, Bafra, Samsun Province, Turkey (Site-1) (41°39'05"N, 36°01'10.9"E), 18 November 2013; six females from Doğanca, Bafra, Samsun Province (Site-2) (41°39'13.8"N, 36°00'45.7"E), 1 April 2014; three females from Site-2, 16 June 2014; five females from Doğanca, Bafra, Samsun Province (Site-3) (41°39'08.7"N, 35°59'59.2"E), 18 November 2013; 2 females from Site-3, 16 June 2014.

**Distribution:** Finland (Huhta and Karg, 2010). This species is a new record for the Turkish fauna.

**Genus:** *Multidendrolaelaps* Hirschmann, 1974

**Species:** *Multidendrolaelaps putte* Huhta & Karg, 2010

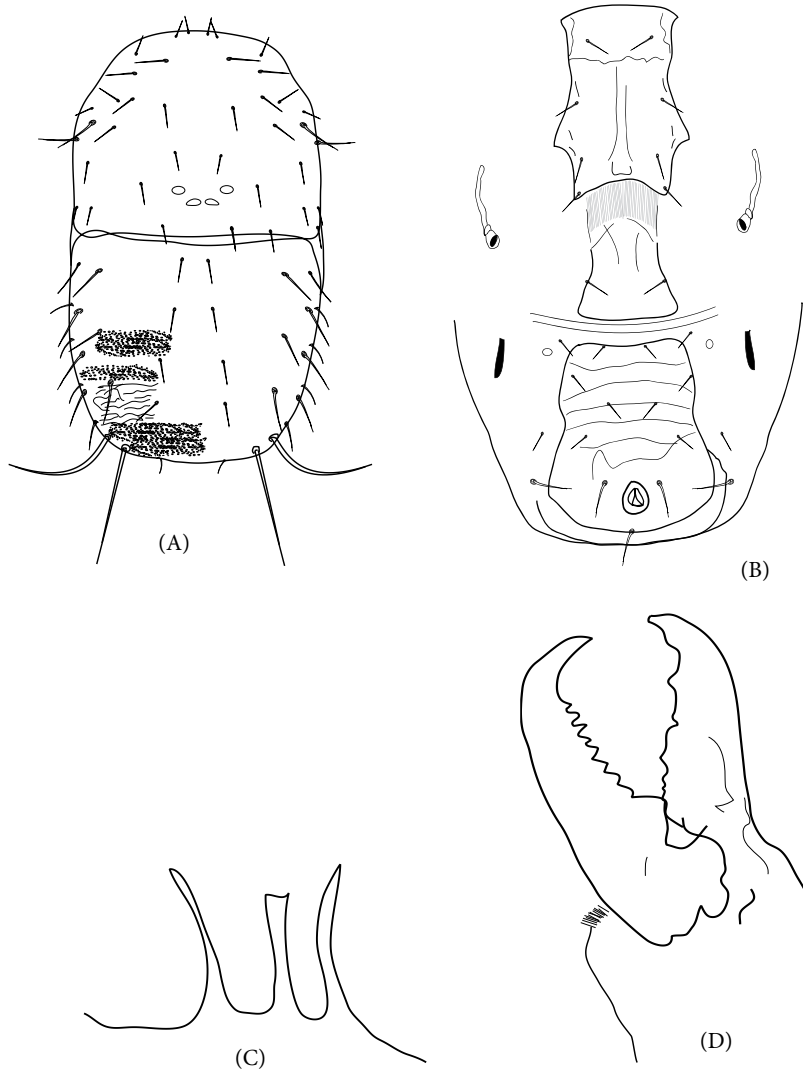
**Description of female (Figures 2A–2D):** Idiosomal measurement 523 (490–590) length, 286 (272–294) width.

**Gnathosoma:** The tectum tripartite. Median process of tectum truncated and shorter than lateral processes

(Figure 2C). Moveable digit with stronger basal teeth and a row of 8 smaller teeth; fixed digit with 4 large and 5 small teeth (Figure 2D).

**Dorsum:** Dorsal setae i3–I3 24–32, i2 36 (35–36) and I4 36 (36–38). Most of the z and Z setae series longer (44–51) than the i and I setae; Z3 62 long. Posterior setae Z5 (156) and S5 (136) distinctly longer than the other dorsal setae. The posterodorsal shield with faint structural pattern in the area of Z3–I4 and slightly punctate behind I4 (Figure 2A).

**Venter:** Sternal shield with a distinct transverse line between setae st1 and st2. Ventrianal shield with a transverse pattern anteriorly and pitted posteriorly, and bearing five pairs of setae (Vi1, Vi2, Vi3, Vi5, and Vz2). Ventrianal shield enlarged posteriorly and having a separated lobe at the posteriolateral margin. Peritremes reduced in length, reaching the level of setae st3 (Figure 2B).



**Figure 2.** *Multidendrolaelaps putte* (female): dorsal (A); ventral (B); tectum (C); chelicera (D).

**Legs:** Normal setae for the family except for the basal dorsal seta on femur IV being stouter than the others.

**Specimens examined:** Five females from Doğanca, Bafra, Samsun Province (Site-1) (41°39'05"N, 36°01'10.9"E), 1 April 2014; seven females, Doğanca, Bafra, Samsun Province (Site-2) (41°39'13.8"N, 36°00'45.7"E), 1 April 2014; three females from Site-2, 16 June 2014; two females, near Kuşcular village, Bafra, Samsun Province (41°35'16.8"N, 35°52'19.3"E), 19 May 2014.

**Distribution:** Finland (Huhta and Karg, 2010). This species is a new record for the Turkish fauna.

**Remarks:** All the morphological characters of both species were close to the species as described by Huhta and Karg (2010).

#### Key for the newly recorded species from Turkey

1. Tibia I with 5 (rarely 4) dorsal setae and sternal shield with 4 pairs of setae ..... Digamasellidae (2)
  - Tibia I with 6 dorsal setae and sternal shield with 3 pairs of setae (st4 in soft cuticle) ..... Ascidae

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2. Caudal setae slightly longer, three ends of the tectum nearly equal and distally split, movable digit of the female chelicerae bearing 4 teeth ..... *Dendrolaelaps casualis* Huhta & Karg, 2010
- Caudal setae much longer, the middle ramus of the tectum shorter and distally split, movable digit of the female chelicerae bearing more than 5 teeth ..... *Multidendrolaelaps putte* Huhta & Karg, 2010

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