

Orijinal araştırma (Original article)

**A checklist and key to the Ascoidea and
Phytoseioidea (except Phytoseiidae) species of
Turkey with three new species records
(Acari: Mesostigmata)**

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Summary

A checklist and a key are provided for 20 species of Ascoidea and Phytoseioidea (except Phytoseiidae) of Turkey. Three species namely *Proctolaelaps cossi* (Duges) (Melicharidae), *Lasioseius lacunosus* Westerboer and *Lasioseius ometes* (Oudemans) (Blattisociidae) that collected from chesnut trees in Aydin are new records to the fauna of Turkey. *Proctolaelaps scolyti* Evans (Melicharidae) is recorded from a new habitat and location in Turkey.

Key words: Ascoidea, Mesostigmata, new records, Phytoseioidea

Anahtar sözcükler: Ascoidea, Mesostigmata, yeni kayıt, Phytoseioidea

Introduction

The Gamasina comprises most of the described species of Mesostigmata and includes the most common families of soil predators, biocontrol agents, and vertebrate parasites. It is considered to comprise four sub-chorts and 10 superfamilies. The superfamily Ascoidea is richly represented in tropical, temperate, and arctic alpine regions, where many of its members are free-living predators of nematodes and microarthropods in soil or humus and suspended arboreal litter habitats. Others are adapted to more specialized niches, where they feed on fungi, pollen, or nectar. The superfamily Phytoseioidea includes predatory, parasitic, fungivorous, and pollenophagous species found in both

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ground and aerial habitats (Krantz & Walter, 2009). These diverse life styles resulted in considerable interest in the ecology and taxonomy of these two superfamilies worldwide. Recently, Faraji et al. (in press) dealt with the Phytoseiidae of Turkey by providing a key and a checklist to the species. However, the data to the other families of Ascoidea and Phytoseioidea (except Phytoseiidae) of Turkey are scattered and there was a need to gather them in a paper. In this work, we present a checklist and a key to the 20 species of the Ascoidea and Phytoseioidea (except Phytoseiidae) species of Turkey. By examining the specimens in the mite collection of I. Cakmak, we found that three species are new records to the fauna of Turkey, which are given in this paper.

Material and Methods

Specimens were mounted in Hoyer's medium on microscope slides. The classification systems to the genera follow those of Halliday et al. (1998) and Lindquist et al. (2009). The voucher specimens were deposited in the mite collection of I. Cakmak at the Department of Plant Protection, Faculty of Agriculture, Adnan Menderes University, Aydin, Turkey

A checklist of the Turkish Ascoidea and Phytoseioidea (except Phytoseiidae)

Notes: Under the species name, only the name of the original designation is given. Only the distribution of species within Turkey is provided.

Superfamily Ascoidea

Family Ameroseiidae

Genus *Ameroseius* Berlese

***Ameroseius corbiculus* (Sowerby)**

Acarus corbiculus Sowerby, 1806

Record: Çobanoğlu & Özman (2002)

Habitats: *Corylus avellana*

Distribution: Samsun.

***Ameroseius plumigera* (Oudemans)**

Kleemannia plumigera Oudemans, 1930

Record: Genç & Özar (1986)

Habitats: Wheat straw

Distribution: İzmir.

Ameroseius plumosus (Oudemans)

Seiulus plumosus Oudemans, 1902

Record: Özer et al. (1986, 1989); Çobanoğlu & Özman (2002); Bayram & Çobanoğlu (2005)

Habitats: *Corylus avellana*, *Dahlia hybrida*, stored rice

Distribution: Ankara, Black Sea Region, İzmir.

Family Ascidae

Genus Arctoseius Thor

Arctoseius semiscissus (Berlese)

Laelaps semiscissus Berlese, 1892

Records: Çobanoğlu (2001); Bayram & Çobanoğlu (2005); Kumral (2005)

Habitats: *Canna indica*, *Cerasus avium*, *Crocus biflorus*, *Iris* sp., *Malus communis*, Mushroom compost, *Narcissus pseudonarcissus*, *Ranunculus damascenus*.

Distribution: Ankara, Bursa.

Genus Asca von Heyden

Asca bicornis (Canestrini & Fanzago)

Gamasus (Sejus) bicornis Canestrini & Fanzago, 1876

Records: Çobanoğlu (2001); Bayram & Çobanoğlu (2005)

Habitats: *Gagea villosa*, *Pinus* sp., wild mushrooms.

Distribution: Ankara.

Genus Gamasellodes Athias-Henriot

Gamasellodes bicolor (Berlese)

Gamasellus (Digamasellus) bicolor Berlese, 1918

Records: Çobanoğlu (2001); Bayram & Çobanoğlu (2005)

Habitats: *Canna indica*, *Crocus ancyrensis*, *Crocus biflorus*, *Iris* sp., *Paeonia officinalis*, *Schoenoplectus locustris*, wild mushroom.

Distribution: Ankara.

Family Melicharidae

Genus *Melichares* Hering

Melichares agilis Hering

Melichares agilis Hering, 1838

Records: Özman & Zdarkova (2000); Çobanoğlu (2008)

Habitats: *Corylus avellana*, stored apricots

Distribution: Black Sea Region, İzmir.

Genus *Proctolaelaps* Berlese

Proctolaelaps ventrianalis Karg

Proctolaelaps ventrianalis Karg, 1971

Records: Çobanoğlu (2001)

Habitats: Tulip and gladiolus bulbs.

Distribution: Edirne.

Proctolaelaps cossi (Duges)

Gamasus cossi Duges, 1834

Material examined: 7 females and one male; collected by I. Cakmak; associated with *Cossus cossus* (Lep.: Cossidae) in chestnut tree, Aydın, Turkey; 04 April 2007

Remarks: This is the first record of this species from Turkey

Proctolaelaps pygmaeus (Müller)

Gamasus pygmaeus Müller, 1859

Records: Özer et al. (1986, 1989); Çobanoğlu & Bayram (1999); Çobanoğlu et al. (2003)

Habitats: *Rosa canina*, *Rosa damascana*, stored wheat, *Viburnum opulus steril*

Distribution: Ankara, İzmir

Proctolaelaps pomorum (Oudemans)

Typhlodromus pomorum Oudemans, 1929

Records: Çobanoğlu & Bayram (1998); Gültekin & Özkan (1999); Bayram & Çobanoğlu (2005)

Habitats: Mushroom, *Ranunculus damascenes*, stored products (wheat, vetch)

Distribution: Ankara, Erzurum.

Proctolaelaps rotunda (Hirschmann)

Garmania (*Garmania*) *rotunda* Hirschmann, 1963 in Westerboer (1963)

Records: Çobanoğlu (2001); Bayram & Çobanoğlu (2005)

Habitats: *Dahlia hybrid*, wild and cultivated roses.

Distribution: Ankara

Proctolaelaps scolyti Evans

Proctolaelaps scolyti Evans, 1958

Material examined: 8 females; collected by I. Cakmak; associated with *Carpophilus hemipterus* (Col.: Nitidulidae) on dried fig in Aydın, Turkey; 14 November 2008

Records: Kılıç (2010); present paper.

Habitats: Fresh onions, fig.

Distribution: Aydın, İzmir.

Superfamily Phytoseioidea

Family Blattisociidae

Genus *Blattisocius* Keegan

Blattisocius mali (Oudemans)

Typhlodromus mali Oudemans, 1929

Records: Özar et al. (1986); Özer et al. (1986, 1989); Çobanoğlu (2008)

Habitats: Stored products (fig, raisin, apricot).

Distribution: Aegean Region, İzmir, Malatya

Blattisocius tarsalis (Berlese)

Lasioseius (*Lasioseius*) *tarsalis* Berlese, 1918

Records: Özar et al. (1986); Özer et al. (1986, 1989); Çobanoğlu (1996), Özman & Çobanoğlu (2001); Akyazı & Ecevit (2003); Bayram & Çobanoğlu (2005; 2007); Çobanoğlu (2008).

Habitats: *Corylus avellana*, *Hyacinthus orientalis*, *Pinus nigra*, stored products (apricot, fig, corn, wheat, barley, oat, bran, raisin, hazelnut, wheat, sunflower),

Distribution: Aegean Region, Ankara, Edirne, İzmir, Malatya, Samsun.

Blattisocius keegani Fox

Records: Özer et al. (1986, 1989); Özman & Zdarkova (2000); Çobanoğlu (2008)

Habitats: *Corylus avellana*, stored products (apricot, cereal, macaroni)

Distribution: Black Sea Region, İzmir, Malatya

Genus *Lasioseius* Keegan

Lasioseius berlesei (Oudemans)

Typhlodromus berlesei Oudemans, 1938

Records: Bayram & Çobanoğlu (2005)

Habitats: *Canna indica*

Distribution: Ankara

Lasioseius lacunosus Westerboer

Lasioseius lacunosus Westerboer, 1963

Material examined: 19 females; collected by I. Cakmak; chestnut; Aydın, Turkey; 18 October 2007

Remarks: This is the first record of this species from Turkey

Lasioseius ometes (Oudemans)

Hypoaspis ometes Oudemans, 1903

Material examined: 2 females; collected by I. Cakmak; chestnut; Aydın, Turkey; 18 October 2007

Remarks: This is the first record of this species from Turkey

Lasioseius thermophilus Willmann

Lasioseius thermophilus Willmann, 1942

Records: Çobanoğlu & Özman (2002); Bayram & Çobanoğlu (2005)

Habitats: *Amaryllis* sp., *Canna indica*, *Corylus avellana*, *Dahlia hybrida*, *Schoenoplectus locustris*.

Distribution: Ankara

Key* to the females of Ascoidea and Phytoseioidea (except Phytoseiidae) of Turkey

- 1 Sternal shield with 2 pairs of setae; caudal setae J₅ and marginal setae R absent; posterior row of deutosternal denticles extending laterally beyond insertions of capitular setae; corniculi often divided **Family Ameroseiidae**
 *Ameroseius* Berlese, 1903 **2**
- Sternal shield with 2–3 pairs of setae; caudal setae J₅ and marginal setae R present; posterior row of deutosternal denticles not extending laterally beyond insertions of capitular setae; corniculi usually entire**4**
- 2 Sternal shield reticulated with an arc-shaped chitinous pattern between st₁ and st₂ setae; dorsal setae leaf-shaped; setae J₂ not reaching insertions of J₄.....*Ameroseius plumosus* (Oudemans, 1902)
- Sternal shield reticulated but without an arc-shaped chitinous pattern; dorsal setae not leaf-shaped; setae J₂ passing insertions of J₄..... **3**
- 3 Setae S₄ long, reaching the insertions of setae S₅; tectum with a sharp prong medially *Ameroseius plumigera* (Oudemans, 1930)
- Setae S₄ short, about one-thirds of distance between S₄ to S₅; tectum without a middle sharp prong.....*Ameroseius corbiculus* (Sowerby, 1806)
- 4 Less than 20 pairs of dorsal shield setae, setae J₁ absent, and with less than 4 pairs of marginal setae on soft integument **Family Phytoseiidae****
- More than 20 pairs of dorsal shield setae, setae J₁ present, and usually with more than 4 pairs of marginal setae on soft integument**5**
- 5 Third pair of sternal poroids on posterolateral corners of sternal shield and with sternal setae st₄ usually free on soft cuticle; movable cheliceral digit usually bidentate..... **Family Ascidae 6**
- Third pair of sternal poroids off sternal shield and associated with sternal setae st₄ usually on metasternal plates or on soft cuticle; movable cheliceral digit with 0 to many teeth, often tridentate**8**
- 6 Dorsal shield completely divided in two.....**7**
- Dorsal shield entire..... *Arctoseius* Thor, 1930
 *Arctoseius semiscissus* (Berlese, 1892)
- 7 Opisthonotal shield with setae Z₄ and S₅ proximal and inserted together on pair of prominent posterolateral tubercles; podonotal shield lacking setae z₁, and with j₂ well behind level of j₁; genu I with 12 setae
 *Asca* von Heyden, 1826
*Asca bicornis* (Canestrini & Fanzago, 1876)

- Opisthonotal shield with setae Z_4 and S_5 well separated, not born on pair of tubercles; podonotal shield with setae z_1 present; j_2 tending to be displaced anteriorly; genu I with 13 setae *Gamasellodes* Athias-Henriot, 1961
..... *Gamasellodes bicolor* (Berlese, 1918)
- 8** Fixed cheliceral digit with pilus dentilis modified to a hyaline flap; movable cheliceral digit usually with a pointed process (mucro) on its mid-ventral face; peritrematic shield free posteriorly or narrowly connected to exopodal plate; with laelapid-type sperm access system, lacking a sclerotized spermathecal calyx and associated minor duct; epigynial shield gently rounded posteriorly, and usually with an oval or elliptical anal shield bearing only 3 anal seta (except *Proctolaelaps ventrianalis* with ventrianal shield bearing two extra pairs of preanal setae)..... **Family Melicharidae 9**
- Fixed cheliceral digit with setiform pilus dentilis; movable cheliceral digit lacking a ventral mucro; peritrematic shield fused posteriorly exopodal plate curving behind coxa IV; with phytoseiid-type sperm access system, including a sclerotized spermathecal calyx and associated minor duct; epigynial shield usually truncate posteriorly, and usually with a ventrianal shield bearing 2–7 preanal setae **Family Blattisociidae 15**
- 9** Soft lateral cuticle with 7–13 pairs of marginal (r–R) setae; opisthonotal region of dorsal shield with 14–15 pairs of setae; metasternal plates lacking ..
..... *Melichares* Hering, 1838
..... *Melichares agilis* Hering, 1838
- Soft lateral cuticle with 1–4 pairs of marginal (R) setae; opisthonotal region of dorsal shield with 18–22 pairs of setae; metasternal plates usually present
..... *Proctolaelaps* Berlese, 1923 **10**
- 10** Ventrianal shield with 2 pairs of preanal setae.....
.....*Proctolaelaps ventrianalis* Karg, 1971
- Anal shield without preanal setae.....**11**
- 11** Tectum with 3 prongs *Proctolaelaps cossi* (Duges, 1834)
- Tectum without prongs, but with numerous teeth (large or tiny)**12**
- 12** Dorsal setae J_1 , J_2 & J_3 reach to insertions of next setae in series.....**13**
- Dorsal setae J_1 , J_2 & J_3 shorter than the distance between setae in series..**14**
- 13** Sternal and genital shields reticulated, tectum with tiny teeth
..... *Proctolaelaps rotunda* (Hirschmann, 1963)
- Sternal and genital shields smooth, tectum with larger teeth.....
.....*Proctolaelaps pygmaeus* (Müller, 1859)

- 14** Fixed digit of chelicera of female with 3 teeth *P. pomorum* (Oudemans, 1929)
- Fixed digit of chelicera of female multidentate
..... *Proctolaelaps scolyti* Evans, 1958
- 15** Corniculi narrowly separated, usually slender; tectum convex, smooth; fixed digit of chelicera with few or no teeth; peritrematal shield slender, barely wider than stigma at level of stigma; female with humeral seta (r3) usually on soft cuticle beside dorsal shield.....*Blattisocius* Keegan, 1944 **16**
- Corniculi well separated, stout; tectum convex or triramous, smooth or denticulate; fixed digit of chelicera usually with many teeth; peritrematal shield clearly wider than diameter of stigma at level of stigma; female with humeral seta (r3) on dorsal shield..... *Lasioseius* Berlese, 1916 **18**
- 16** Peritreme reduced, not extending beyond coxa II; fixed cheliceral digit short, at most extends half the length of movable digit**17**
- Peritreme normal, extending at least to coxa I; fixed cheliceral digit normal, extends as long as movable digit *Blattisocius mali* (Oudemans, 1929)
- 17** Movable digit of chelicera with 3 teeth *Blattisocius tarsalis* (Berlese, 1918)
- Movable digit of chelicera with 1 tooth *Blattisocius keegani* Fox, 1947
- 18** With only one metapodal plate on each side of body behind coxa IV.....
.....*Lasioseius berlesei* (Oudemans, 1938)
- With a pair of metapodal plates on each side of body behind coxa IV**19**
- 19** Ventrianal shield with 6 pairs of setae*Lasioseius lacunosus* Westerboer, 1963
- Ventrianal shield with 5 pairs of setae.....**20**
- 20** Sternal shield with posterior margin deeply excavated at level of setae ST₂; tectum with 3–4 prongs, median one(s) shorter than laterals; idiosoma 560–580..... *Lasioseius ometes* (Oudemans, 1903)
- Sternal shield not excavated; tectum with 3 prongs, median one with pointed tip as long as laterals; idiosoma 435
.....*Lasioseius thermophilus* Willmann, 1942

*Characters to separate families and genera are taken from Lindquist et al. (2009) and Halliday et al. (1998), respectively.

**Not treated in this paper.

Özet

Türkiye Ascoidea ve Phytoseioidea (Phytoseiidae hariç) türlerine ait üç yeni tür kaydıyla birlikte teşhis anahtarı ve tür listesi (Acari: Mesostigmata)

Türkiye’ de Ascoidea and Phytoseioidea (Phytoseiidae hariç) üstfamilyalarına ait saptanan 20 türe ait teşhis anahtarı ve tür listesi verilmiştir. Aydın’ da kestane ağaçlarından toplanan *Proctolaelaps cossi* (Duges) (Melicharidae), *Lasioseius lacunosus* Westerboer and *Lasioseius ometes* (Oudemans) (Blattisociidae) adlı üç tür Türkiye faunası için yeni kayıttır. *Proctolaelaps scolyti* Evans (Melicharidae), Türkiye’de yeni yer ve habittan kaydedilmiştir.

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