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New and known records of oribatid mites (Acari) from the Yedigöller National Park (Bolu, Turkey)[1]

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ÖZ

Yedigöller Milli Parkı'ndan (Bolu, Türkiye) oribatid akarların (Acari) yeni ve bilinen kayıtları

Türkiye oribatid akar faunasına katkı sağlamak amacıyla Bolu ilinden toplanan *Hypochthoniella minutissima* (Berlese, 1903), *Oribatella (Oribatella) heterodentata* Karppinen ve Shtanchaeva 1987, *Tectocepheus alatus* Berlese, 1913, *Dissorhina ornata ornata* (Oudemans, 1900) ve *Moritzoppia escotata escotata* (Subías ve Rodríguez, 1986) taksonomik bakımdan değerlendirildi. Bunlardan *H. minutissima* ve *O. heterodentata* Türkiye faunası için yeni kayıt olarak belirlendi. Ayrıca, bu taksonların dağılımı ve tanıtıcı morfolojik özellikleri de sunuldu.

Anahtar kelimeler: Acari, Oribatida, yeni kayıtlar, Yedigöller Milli Parkı, Türkiye.

ABSTRACT

Hypochthoniella minutissima (Berlese, 1903), *Oribatella (Oribatella) heterodentata* Karppinen and Shtanchaeva, 1987, *Tectocepheus alatus* Berlese, 1913, *Dissorhina ornata ornata* (Oudemans, 1900) and *Moritzoppia escotata escotata* (Subías and Rodríguez, 1986) collected from Bolu province are evaluated from systematic viewpoint to contribute to the knowledge of the Turkish oribatid mite fauna. Of these, *H. minutissima* and *O. heterodentata*

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are new records for the Turkish fauna. Their distribution and diagnostic morphological characteristics are also presented.

Keywords: Acari, Oribatida, new records, Yedigöller National Park, Turkey.

INTRODUCTION

Oribatida mites are small chelicerate arthropods and important representatives of mites. They comprise more than 10.000 named species representing 172 families (Krantz and Walter 2009). Oribatid mites have successfully invaded all compartments of the biosphere (Bernini 1986). They constitute the main component of acarine populations in the soil. They are not confined to the soil, however, and may occur in considerable numbers in the above ground parts of vegetation, house dust, stored food, the marine littoral zone, and among aquatic plants. Temperate forests with well-developed surface organic layers and a predominance of fungal over bacterial decomposition are home to the highest diversities of oribatids (Skubala 2004). They play an important role in decomposition of organic matter, nutrient cycling and soil formation (Smith et al. 1998)

In this study, the oribatid mites inhabiting in the Yedigöller National Park are evaluated from the taxonomic point of view with the aim of contributing to the oribatid fauna of Turkey.

MATERIAL AND METHOD

The examined materials were collected from the Yedigöller National Park in 2014. Mites were extracted with the help of a Berlese-Tullgren funnel extractor from soil and litter collected from the investigation area. Extracted mites were killed, fixed and stored in 80% ethanol. The light and scanning electron microscopes (SEM) were used to examine mites. The compound microscopic examinations of specimens were made in lactic acid, mounted in temporary cavity slides. Terminology follows that of Norton and Behan-Pelletier (2009).

RESULTS AND DISCUSSION

Eniochthoniidae Grandjean, 1947

Hypochthoniella Berlese, 1910

Hypochthoniella minutissima (Berlese, 1903)

Body yellowish brown in color. Rostrum rounded. All prodorsal setae setiform. Sensilli long, setiform and with long barbs. Notogaster with16 pairs of smooth setae. Epimeral setal formula: 3-1-3-4. Genito-anal setal formula: 10-1-2-3.

Material examined: Turkey, **Bolu**, the Yedigöller National Park, N: 40°56.407', E: 031°44.727', 803 m, 25.V.2014, collected in litter, 6 exs.

Distribution: Cosmopolitan (except Antarctica) (Subías 2004, updated 2016, Weigmann 2006).

This species is recorded for the first time in Turkey.

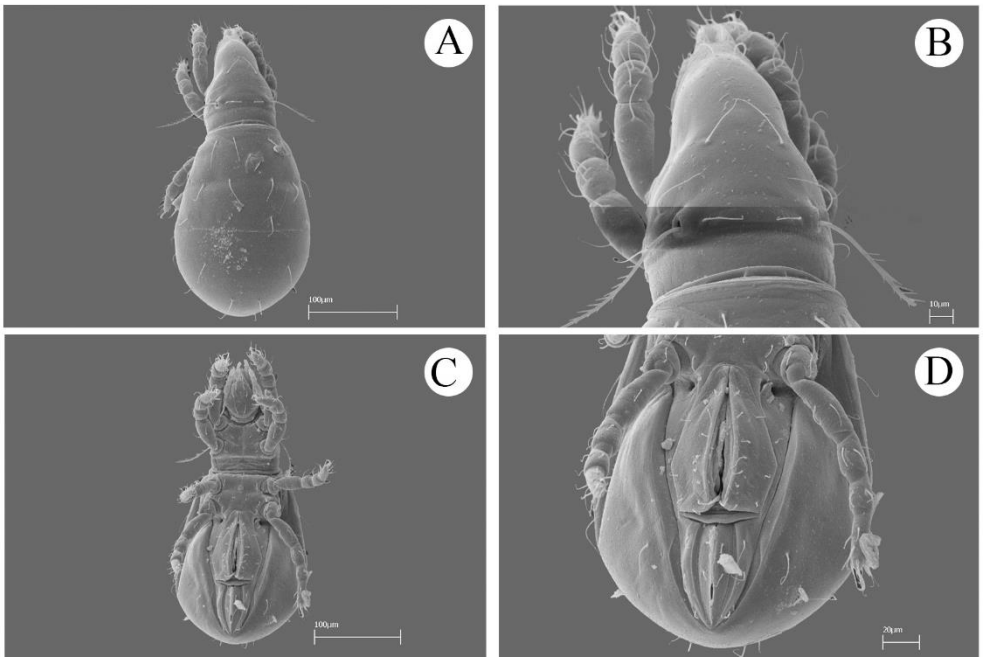

Figure 1. *Hypochthoniella minutissima* (Berlese, 1903). A-Dorsal view, B-Prodorsum. C-Ventral view, D-Genito-anal plate.

Oribatellidae Jacot, 1925

Oribatella (Oribatella) Banks, 1895

Oribatella (Oribatella) heterodentata Karppinen and Shtanchaeva, 1987

Rostrum pointed. Inner teeth of cuspids thrice as long as outer teeth, differing in shape. Translamella absent. Sensilli setae-like, nearly smooth. Notogaster with 10 pairs of setae, smooth and very short. In dorsal view, the setae c_2, *la*, *lm*, *lp*, and h_3 not reaching margin of notogaster. Epimeral setal formula: 2–4–2–2. Genito-anal setal formula: 6-1-2-3. Legs monodactylous.

Material examined: Turkey, **Bolu**, The Yedigöller National Park, N: 40°56.575', E: 031°44.867', 798 m, 25.V.2014, collected in litter, 6 exs.

Distribution: Caucasus (Subías 2004, updated 2016).

This species is recorded for the first time in Turkey.

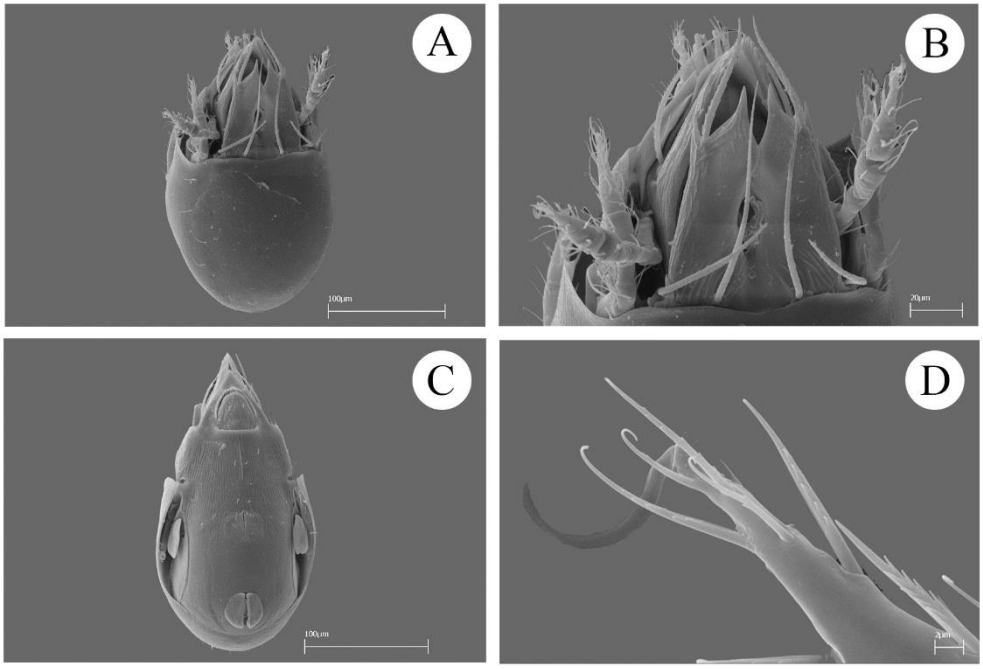

Figure 2. *Oribatella (Oribatella) heterodentata* Karppinen and Shtanchaeva, 1987. A-Dorsal view, B-Prodorsum, C- Ventral view, D-. Leg claw.

Tectocepheidae Grandjean, 1954

Tectocepheus Berlese, 1896

Tectocepheus alatus Berlese, 1913

The color of body light dark-brown. Prodorsal surface with round pattern. The rostrum rounded, slightly with 3-lobed. Lamellae long and extending from base of prodorsum to rostrum. Lamellae with translamella. Dorsosejugal suture medially interrupted. Notogaster with 10 pairs of setae. Genito-anal setal formula: 6-1-2-3.

Material examined: Turkey, **Bolu**, the Yedigöller National Park, N: 40°56.407', E: 031°44.727', 803 m, 25.V.2014, collected in litter, 6 exs.

Distribution: Palaearctic Region (Subías 2004, updated 2016).

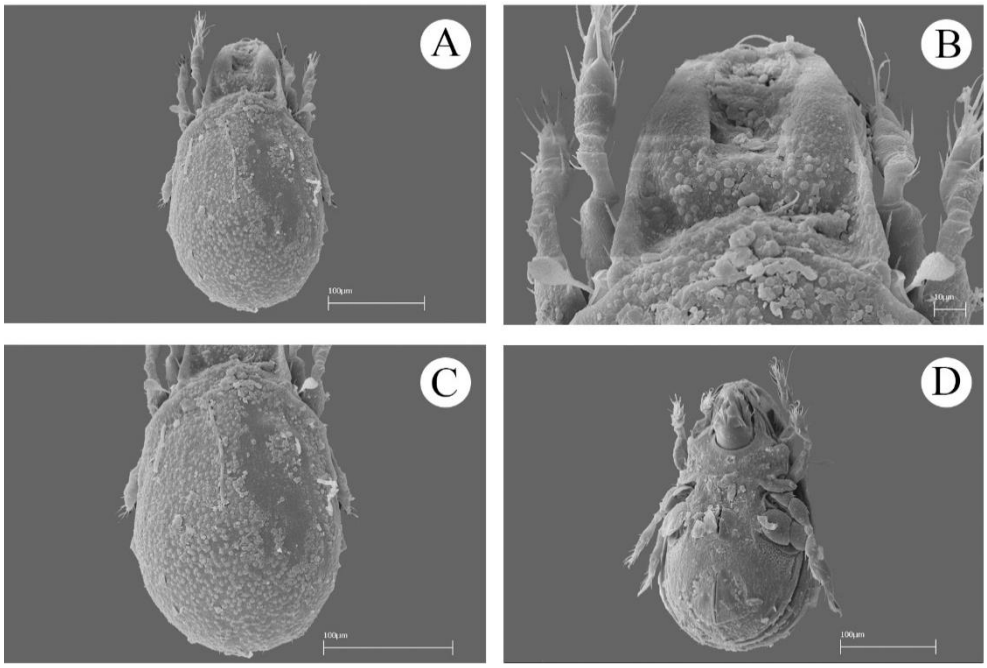

Figure 3. *Tectocepheus alatus* Berlese, 1913. A-Dorsal view, B-Prodorsum, C-Notogaster, D-Ventral view.

This species was previously recorded from Turkey (Per et al. 2015).

Oppiidae Sellnick, 1937

Dissorhina Hull, 1916

Dissorhina ornata ornata (Oudemans, 1900)

Rostral apex triangular, conspicuously protruding from the rostral part of prodorsum. Basal costulae narrow, directed laterally. Sensilli gradually dilated distally, with rounded distal end. Anterior part of notogaster well narrowed anteriorly, a short median part straight. Ten pairs of notogastral setae present. Epimeral setal formula: 3-1-3-3. Genito-anal setal formula: 5-1-2-3.

Material examined: Turkey, **Bolu**, the Yedigöller National Park, N: 40°56.443', E: 031°44.867', 816 m, 25.V.2014, collected in litter, 4 exs.

Distribution: Holarctic Region (Subías 2004, updated 2016).

This subspecies was previously recorded from Turkey (Toluk and Ayyıldız 2008a).

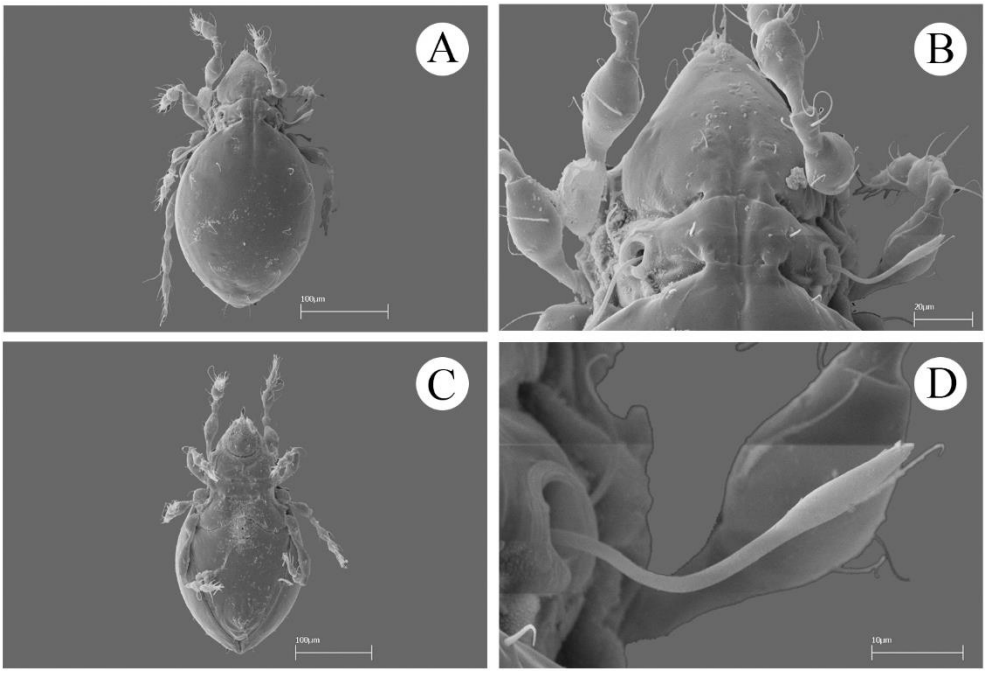

Figure 4. *Dissorhina ornata ornata* (Oudemans, 1900). A-Dorsal view, B-Prodorsum, C-Ventral view, D- Sensillus.

Moritzoppia Subías and Rodríguez, 1988

Moritzoppia escotata escotata (Subías and Rodríguez, 1986)

Rostrum tridentate. Costulae present. Sensilli club-shaped, elongated, with minute barbs on the distal part. Notogastral surface smooth. The anterior part of notogaster protruding over the basis of prodorsum, up to the level of bothridia. Ten pairs of notogastral setae thin and smooth. Genito-anal setal formula: 4-1-2-3. The lyrifissure *iad* placed paraanally.

Material examined: Turkey, **Bolu**, The Yedigöller National Park, N: 40°56.418', E: 031°44.737', 801 m, 25.V.2014, collected in soil and litter, 10 exs.

Distribution: Spain, Slovakia, Poland and Turkey (Subías 2004, updated 2016).

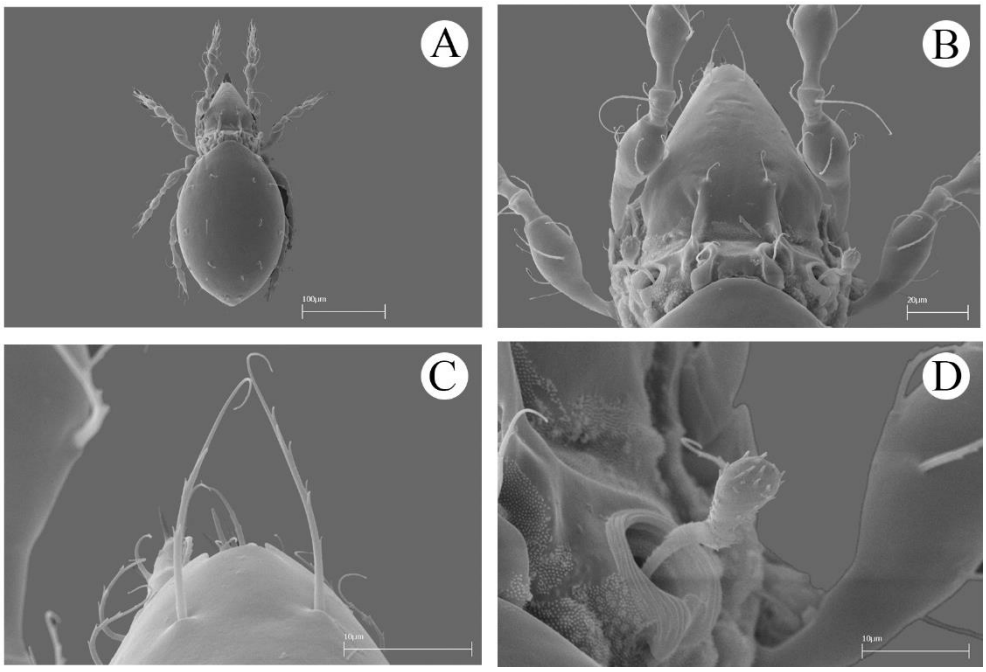

Figure 5. *Moritzoppia escotata escotata* (Subías and Rodríguez, 1986). A-Dorsal view, B-Prodorsum, C-Rostrum, D- Sensillus.

This subspecies was previously recorded from Turkey (Toluk and Ayyıldız 2008b).

In conclusion; total five oribatid mite species and subspecies *viz. Hypochthoniella minutissima* (Berlese, 1903), *Oribatella (Oribatella) heterodentata* Karppinen and Shtanchaeva, 1987, *Tectocepheus alatus* Berlese, 1913, *Dissorhina ornata ornata* (Oudemans, 1900) and *Moritzoppia escotata escotata* (Subías and Rodríguez, 1986) were determined. Of these, *H. minutissima* and *O. heterodentata* are new records for the Turkish fauna. Based on the morphology of adult specimens of the species and subspecies determined in the present study, the Turkish populations of these taxa are similar to that of the European species investigated by Balogh and Mahunka (1983), Bayartogtokh (1998), Karppinen and Shtanchaeva (1987), Per et al. (2015), Pérez-Iñigo (1997), Subías and Arillo (2001), Subías and Balogh (1989), Toluk and Ayyıldız (2008a, b), Weigmann (2006). In biogeography, a taxon (*H. minutissima*) has a cosmopolitan and the others Palaearctic distribution.

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