

First record of the mite family Ctenobelbidae (Acari, Oribatida) from Turkey: *Ctenobelba (Ctenobelba) ayyildizi* sp. nov.

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Abstract: The family Ctenobelbidae (Acari, Oribatida) is recorded for the first time from Turkey. A new species of genus *Ctenobelba*, *Ctenobelba (Ctenobelba) ayyildizi* sp. nov., is described based on the specimens collected from chestnut forest in the province of Manisa, Turkey. An identification key to the known subgenera of the genus is given. Scanning electron microscopy photographs of the newly described species are also provided. The new species differs from the related species by anteriorly diverging lamellae.

Key words: Acari, Oribatida, Ctenobelbidae, new species, Turkey

Introduction

Until today, 76 genera included in 44 families belonging to the oribatid mites were recorded from Turkey (Özkan et al., 1988; Özkan et al., 1994; Erman et al., 2007; Baran et al., 2010; Baran, 2010). This is the first record of family Ctenobelbidae Grandjean, 1965 from Turkey.

The species of family Ctenobelbidae are rarely found (Woas, 2002). The family Ctenobelbidae has a genus and 3 subgenera (Subias, 2010). The genus *Ctenobelba* was erected by Balogh (1943) with the type species *Eremobelba pectinigera* Berlese, 1908 and is characterized by 1) granulated cerotegument body surface, 2) well-developed lamellar costulae, 3) pectinate sensillus, 4) 10 pairs of notogastral setae, and 5) ventral plate with neutrichy (Mahunka, 1964; Choi, 2005). In this paper, a new species, *Ctenobelba (Ctenobelba) ayyildizi* sp. nov., is described and investigated by scanning electron microscopy (SEM).

Materials and methods

Mites were collected from soil and litter samples in Manisa Province and extracted using a Berlese funnel apparatus. They were stored in 70% ethanol. Mites were sorted from the samples under a stereomicroscope and mounted on slides in modified Hoyer's medium or 35% lactic acid. Drawings were made with the aid of a camera lucida attached to a compound microscope.

The terminology used in this paper follows that of Grandjean (1965) and Balogh (1983). All measurements are given in micrometers (µm). Of the examined materials, holotype ♀ and 1 ♂, 1 ♀ paratypes were deposited in the Acarological Collection of the author, Sakarya University, and paratype 1 ♀ was deposited in the Acarological Collection of Erciyes University.

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Results

Genus *Ctenobelba* Balogh, 1943

Key to the subgenera of the genus *Ctenobelba*

- (1) (2) Sensillus bifurcate..... *Bifurcobelba*
Subias and Shtanchaeva 2010
- (2) (1) Sensillus nate.....3
- (3) (4) Body surface has granulated cerotegument
and *Ctenobelba* Balogh, 1943
- (4) (3) Body surface reticulated, without
cerotegument.....*Caucasiobelba*
Subias and Shtanchaeva 2010

Ctenobelba (Ctenobelba) ayyildizi sp. nov.

Description

Material examined

The examined material was collected by the author from Salihli, Manisa Province, Turkey, 38°96'N, 28°48'E, 07.09.2009 (adults, holotype ♀ and 1 ♂, 2 ♀ paratypes).

Measurements: Body length 340–369 µm, width 169–182 µm, setae *ro* 42–44 µm, *le* 37–39 µm, *in* 30–31 µm, *ex* 29–30 µm, *ta* 25–27 µm, and *ss* 79 µm (n = 4).

Prodorsum: Figures 1–3. Rostrum conical, without tooth-like tubercles, rostral setae thick, curved to each other (Figures 1 and 2). Lamellae distinct, weakly diverging anteriorly and posteriorly starting from the upper level of setae *ex*, far from the bothridia and anteriorly reaching to insertion point of setae *le* (Figure 2). Lamellar setae thick and close to rostral one. Interlamellar and exobothridial setae thin and short with respect to other prodorsal setae. Ratio of prodorsal setae as setae *ro* > *le* > *in* = *ex*. Surface of prodorsum finely granulated (Figures 1 and 2). Bothridia dorsally opened, *ss* with 13–15 short pectinations (Figure 3).

Notogaster: Figures 1 and 4. Surface of notogaster with granulation (Figure 4). Anterior border of notogaster nearly straight with a pair of condyles at corners. Ten pairs of notogastral setae present; setae *p1*, *p2*, and *p3* are shorter than the others (Figure 1). Cerotegumental granule of notogaster arranged irregularly and condensed in anterolateral parts (Figure 4).

Venter: Figures 5–8. Epimeral surface finely granulated. Epimeral borders are not visible, sejugal

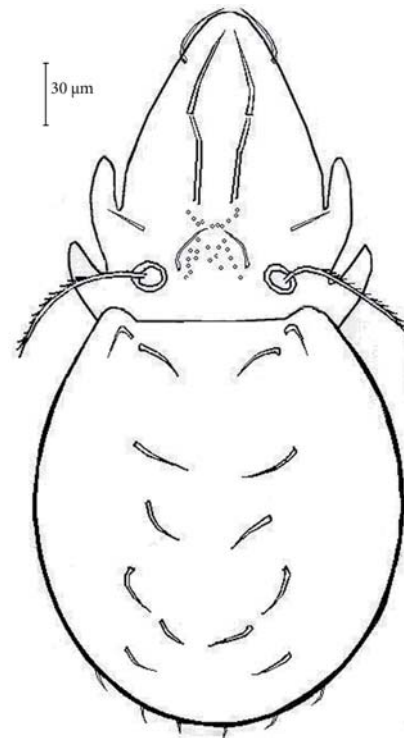


Figure 1. *Ctenobelba (C.) ayyildizi*.sp. nov., dorsal view.

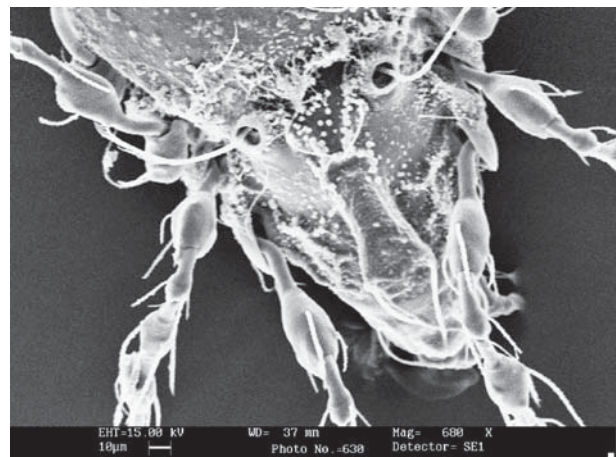


Figure 2. *Ctenobelba (C.) ayyildizi* sp. nov., prodorsal region (SEM photograph).

apodema weakly developed. Distance between anal and genital plates slightly greater than length of anal plate (Figures 5 and 6). Epimeral setal formula 3 : 1 : 3 : 3. All epimeral setae very thin and short except *1b*, *1c*, *3c*, and *4c*. With 6 pairs of short and thick genital setae (Figure 7) and 3 pairs of aggenital, 2 pairs anal, and 3 pairs adanal setae (Figures 5 and 8). Adanal and anal setae simple.

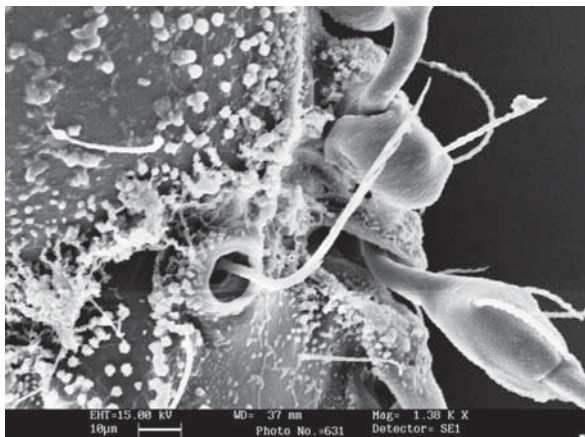


Figure 3. *Ctenobelba (C.) ayyildizi* sp. nov., sensillus (SEM photograph).

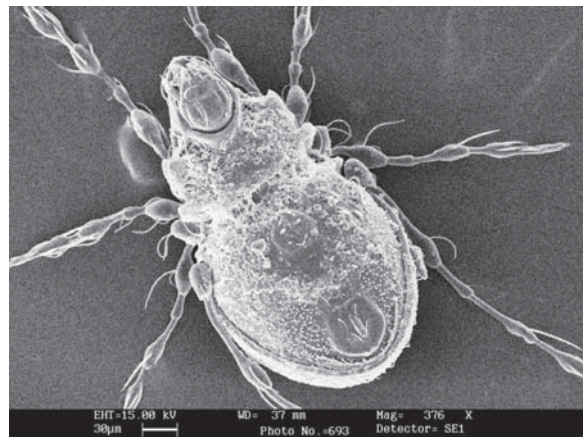


Figure 6. *Ctenobelba (C.) ayyildizi* sp. nov., ventral view of adult (SEM photograph).

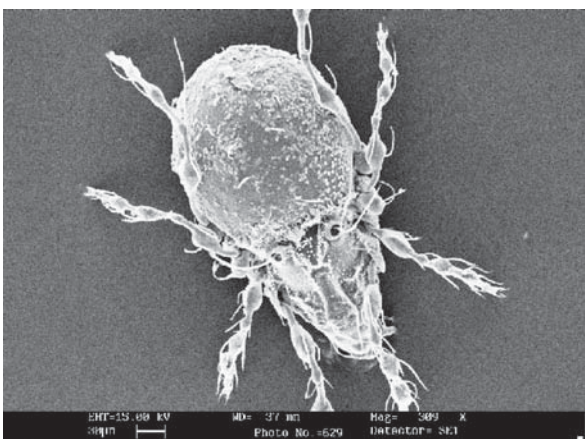


Figure 4. *Ctenobelba (C.) ayyildizi* sp. nov., dorsal view of adult (SEM photograph).

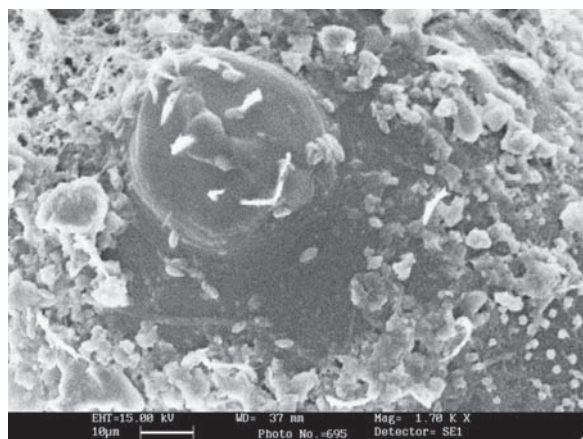


Figure 7. *Ctenobelba (C.) ayyildizi* sp. nov., genital plate (SEM photograph).

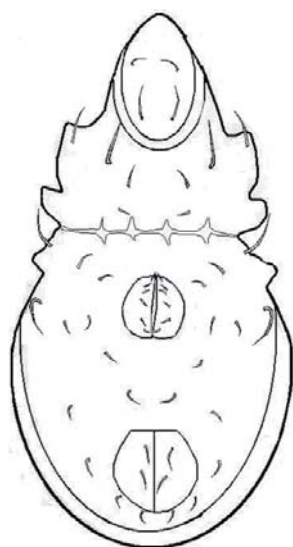


Figure 5. *Ctenobelba (C.) ayyildizi* sp. nov., ventral view.

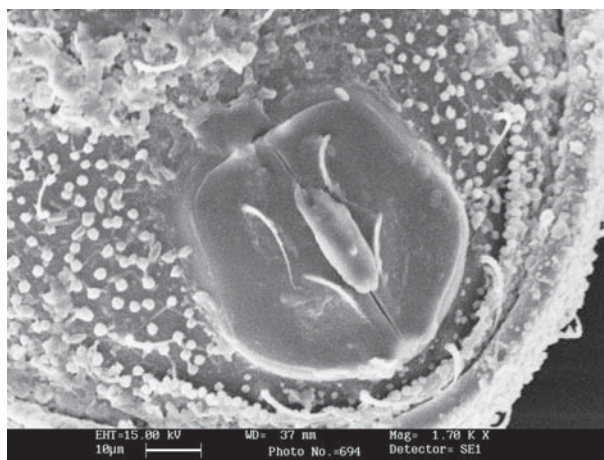


Figure 8. *Ctenobelba (C.) ayyildizi* sp. nov., anal plate (SEM photograph).

Legs: Legs are smooth and not bearing granulation; having all legs monodactylous is typical for the genus.

Etymology: The name of the new species is derived from Prof Dr Nusret Ayyıldız.

Discussion

The new species differs from the other species of the genus *Ctenobelba* by the shape of the lamellae, which is weakly diverging anteriorly.

Ctenobelba (*C.*) *ayyildizi* sp. nov. also differs from *C. brevopilosa*, *C. foliata*, *C. heterosetosa*, *C. leei*, *C. longisetosa*, *C. mahnerti*, *C. parafoliata*, *C. pilosella*, *C. polysetosa*, *C. pulchellula*, *C. serrata*, *C. nakatamarii*, and *C. soloduchi* by shape and length of the notogastral setae.

The new species is similar to *C. pectinigera* Berlese, 1908, but differs from it by having 13–15 short pectinations on the sensillus, longer exobothridial setae, anteriorly weakly diverging lamellae, small body, short lamellae (posteriorly not reaching to level of setae *ex*), different position of notogastral crista and setae, and different position of setae *ad3*.

The new species also differs from *C. perezinigo* Moraza, 1985 by having weak interlamellar setae, 13–15 short pectinations on sensillus, small body

dimensions, 340–369 / 182–169 µm in the new species, 526 / 296 µm in *Ctenobelba perezinigo*, shape of rostrum and bothridia, position of setae *ad3*.

The new species differs from *C. apatomorpha* Iturrondobeitia, Saloña, Andrés & Caballero, 1998 by the shape of the sensillus and the shape and position of the lamellae.

Ctenobelba (*C.*) *ayyildizi* sp. nov. also differs from *C. csiszarae* Mahunka, 1977 by short and anteriorly diverging lamellae, granulated interbothridial and adanal regions, and shape of notogastral setae.

The new species is similar to *C. translamellata* Iordansky, 1990 but differs from it by the position of setae *ad2* and *ad3* (in the new species *ad2* postanal, *ad3* paraanal), short lamellae, weak interlamellar setae and bearing of one pair of condyles at the anterior border of notogaster, and small body dimensions.

The new species differs from *C. marcuzzii* Mahunka, 1974 by the number and the position of aggenital setae, shape of lamellae and sensillus, and small body dimensions.

Ctenobelba (*C.*) *ayyildizi* sp. nov. also differs from *C. simplex* (Willmann, 1940) by short and weak lamella and differs from *C. grancanariae* Pérez-Íñigo y Peña, 1997 by posterior end of lamella that is not divided into 2 branches.

Key to the known species of *Ctenobelba* (*Ctenobelba*)

- 1 (2) Notogastral setae extremely long and winding.....*Ctenobelba* (*C.*) *mahnerti* Mahunka, 1974
- 2 (11) Notogastral setae extremely long and setiform
- 3 (8) Ventral plate with many ramifying setae
- 4 (5) Sensillus finely barbed but not pectinated.....*Ctenobelba* (*C.*) *nakatamarii* Aoki, 2007
- 5 (4) Sensillus pectinated
- 6 (7) Rostrum rounded without tubercles.....*C.* (*C.*) *soloduchi* Pankow, 1988
- 7 (6) Rostrum with a pair of tooth-like tubercles.....*C.* (*C.*) *polysetosa* Aoki and Yamamoto, 2000
- 8 (3) Ventral plate with many setaceous setae
- 9 (10) Small body dimensions (≤600 µm), epimeral setal formula 3 – 1 – 3 – 3.....*C.* (*C.*) *leei* Choi, 2005
- 10 (9) Large body dimensions (>700 µm), epimeral setal formula 3 – 1 – 4 – 4.....
.....*C.* (*C.*) *longisetosa* Suzuoka and Aoki, 1980
- 1 (2) Notogastral setae medium or short
- 12 (13) Heteromorphic notogastral setation present.....
.....*Ctenobelba* (*C.*) *heterosetosa* Murvanidze y Weigmann, 2007

- 13 (12) All notogastral setae in the same form
- 14 (19) Notogastral setae leaf-like (phylliform)
- 15 (18) Interlamellar setae smooth
- 16 (17) Interlamellar setae short (half of lamellar setae)...*Ctenobelba* (C.) *pulchellula* Gil-Martín y Subías, 1997
- 17 (16) Interlamellar setae longer than lamellar one..... *Ctenobelba* (C.) *foliata* Hammer, 1961
- 18 (15) Interlamellar setae not smooth..... *C. (C.) parafoliata* Pérez-Íñigo Jr, 1991
- 19 (20) Notogastral setae serrate..... *Ctenobelba* (C.) *serrata* Mahunka, 1964
- 20 (25) Notogastral setae barbed
- 21 (22) Seven pairs of aggenital setae resent.....*Ctenobelba* (C.) *marcuzzii* Mahunka, 1974
- 22 (21) Three pairs of aggenital setae present
- 23 (24) Rostrum trapezial, sensillus with 4–5 pectinations..... *Ctenobelba* (C.) *perezinigo* Moraza, 1985
- 24 (23) Rostrum conical, sensillus with 7–8 pectinations.....*Ctenobelba* (C.) *pilosella* Jeleva, 1962
- 25 (20) Notogastral setae setiform
- 26 (27) Lamella weak and short (1/3 of prodorsal length).....*Ctenobelba* (C.) *simplex* (Willmann, 1940)
- 27 (26) Lamella strong and long (at least 1/2 of prodorsal length)
- 28 (31) Notogastral setae short
- 29 (30) Sensillus 12–16 very short pectinations, all notogastral setae the same length.....
.....*Ctenobelba* (C.) *brevipilosa* Mahunka, 1964
- 30 (29) Sensillus 9–10 medium pectinations, not all notogastral setae the same length
.....*Ctenobelba* (C.) *csiszarae* Mahunka, 1977
- 31 (28) Notogastral setae medium
- 32 (33) Prodorsum with translamella.....*Ctenobelba* (C.) *translamellata* Iordansky, 1990
- 33 (32) Prodorsum without translamella
- 34 (35) Posterior end of lamella divided into 2 branches that surround the insertion point of interlamellar setae..... *Ctenobelba* (C.) *grancanariae* Pérez-Íñigo y Peña, 1997
- 35 (35) Posterior end of lamella not divided into 2 branches
- 36 (37) Small body dimensions (<370), small and anteriorly diverging lamellae.....
.....*Ctenobelba* (C.) *ayyildizi* sp. nov.
- 37 (37) Large body dimensions (<400), long and parallel lamellae
- 38 (39) Reticulate area present between the interlamellar setae, interbothridial region without
..... *Ctenobelba* (C.) *apatomorpha* Iturrondobeitia, Saloña, Andrés y Caballero, 1998
- 39 (38) Without reticulate area between the interlamellar setae, interbothridial region with tuberculation..... *Ctenobelba* (C.) *pectinigera* (Berlese, 1908)

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