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Orijinal araştırma (Original article)

A new species of *Rhynchobelba* Willmann, 1953 (Acari: Oribatida: Suctobelbidae) from Turkey[1]

Türkiye'den *Rhynchobelba* Willmann, 1953 (Acari: Oribatida: Suctobelbidae)'ün yeni bir türü

Eda SARIAL[2] **Şule BARAN[2*]**

Summary

In the present study, a new species of *Rhynchobelba, R. ozkani* n. sp., is described and investigated by scanning electron microscopy. Also, a new locality and redescription of *Nanhermannia nana* (Nicolet, 1855) is given.

The new species *Rhynchobelba ozkani* n. sp. differs from the other species of the genus *Rhynchobelba* by the shape of rostrum, body dimensions, length and shape of sensillus and type of rostral seta.

Key words: Acari, Oribatida, *Rhynchobelba*, new species, Turkey

Özet

Bu çalışmada *Rhynchobelba* cinsine ait *R. ozkani* n. sp., tanımlanmış ve elektron mikroskobu ile incelenmiştir. Aynı zamanda *Nanhermannia nana* (Nicolet, 1855) için yeni lokalite bildirilmiş ve yeniden tanımı yapılmıştır.

Yeni tür *Rhynchobelba ozkani* n. sp. *Rhynchobelba* cinsine ait diğer türlerden rostrumun şekli, vücut büyüklüğü, sensillusun uzunluğu ve şekli ve rostrum kılının şekli ile ayırt edilir.

Anahtar sözcükler: Acari, Oribatida, *Rhynchobelba*, yeni tür, Türkiye

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[2] Sakarya University, Department of Biology 54187 Sakarya
[*] Sorumlu yazar (Corresponding author) e-mail: sbaran@sakarya.edu.tr
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Introduction

Mites are described as hemiedaphic in terrestrial ecosystems; in other words, they are one of the organisms living in organic matter and raw humus and providing partial decomposition of these organic matters (Wallwork, 1967).

Oribatid mites are one of the richest groups of Acari with approximately 10.000 described species around the world (Subías, 2012). Approximately 150 species of oribatid mites have been recorded from Turkey (Özkan et al., 1988; 1994; Erman et al., 2007). They live in forest, desert, tundra, freshwater and sea, and play an important role in decomposition, nutrient cycling, soil formation and dispersion of fungal spores (Schantz and Behan-Pelletier, 2008; Ocak et al., 2008).

The Family Suctobelbidae had 22 genera, 5 subgenera and 323 species (Subías, 2012) which increases to 324 species with this study. To date, 2 genera (*Suctobelba* and *Suctobelbella*) and 5 species [*Suctobelba trigona* (Michael, 1888), *Suctobelba atomaria* Moritz, 1970, *Suctobelba beringiana* Krivolutsky, 1974, *Suctobelbella sarekensis* (Forsslund, 1941) and *Suctobelbella subcornigera* (Forsslund, 1941)] have been assigned to the family Suctobelbidae from Turkey (Özkan et al., 1988, 1994; Erman et al., 2007). The genus *Rhynchobelba* in the family Suctobelbidae is newly recorded from Turkey.

The members of *Rhynchobelba* are characterized by the anterior margin of notogaster without crista; with long or medium length notogastral setae, one pair of aggenital, 2 pairs of anal and 3 pairs of adanal setae; granulated or tuberculated prodorsum; and prodorsal length more than prodorsal width. Prior to this study there were 6 known species of the genus *Rhynchobelba* worldwide, and no record for the Turkish fauna.

The genus *Nanhermannia* in Nanhermanniidae has 33 known species worldwide (Subías, 2012). To date, only the species *Nanhermannia nana* ofthis family has been recorded from Turkey and that was from Samsun Province (Ayyıldız et al., 1996). *Nanhermannia* is characterized by a curved scissure between the genital and anal plates, interrupted in the middle; long, setiform or thick notogastral setae. A redescription of *Nanhermannia nana* is provided with SEM photographs in this study.

Material and Methods

Mites were collected in soil and litter samples from Düzce province between October 2009 and February 2011 and extracted with 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 (Olympus CX41). The scanning electron microscope preparation procedure followed that of Behan-Pelletier and Walter (2007). All measurements are given in micrometers (µm). Body dimensions of paratypes are given in brackets. Types and examined materials are deposited in the Acarological Collection of the author at Sakarya University, Turkey.

Results

***Rhynchobelba ozkani* n. sp.**

Measurements and color: Body length 560 (495-564), body width 298 (237-298), notogastral length 431 (405-433), notogastral width 137 (114-138) (n=4). Reddish brown.

Type materials: Holotype ♀ and three paratypes ♀♀ from the Düzce province, Fındıklı village in soil with *Rhododendion poticum* litter, and in soil under *Betula alba*, 13. 01. 2010.

Holotype Female.

Prodorsum (Figures 1A and 2): Rostrum without teeth, becoming narrower anteriorly. Median and lateral sides of prodorsum covered with large tubercles. Sclerite distinct in bothridial region. Sensillus long, lanceolate and apically pointed. Sort descending of prodorsal setae according to their lengths: *le* > *ro* > *ex* > *in*. Rostral setae filiform and originated from dorsal side of prodorsum.

Notogaster (Figures 1A and 3): Anterior margin of notogaster narrow, smooth and connected with interbothridial tubercles. 10 pairs of smooth notogastral setae in approximately 30 length. Surface of notogaster smooth.

Ventral region (Figures 1B, 4 and 5): Genital plate small and away from the anal plate. Genital plate with 6 pairs of setae. Epimeral setal formula: 3.1.3.3. *ad1* and *ad2* longer than *ad3.*

Legs: All legs monodactylous, Formula of leg setation; I (1-5-2-4-17); II (1-5-2-4-13); III (2-3-1-3-12); IV (1-2-2-2-10).

Etymology: The new species is named in honour of Prof. Dr. Muhlis ÖZKAN (Uludağ University, Turkey).

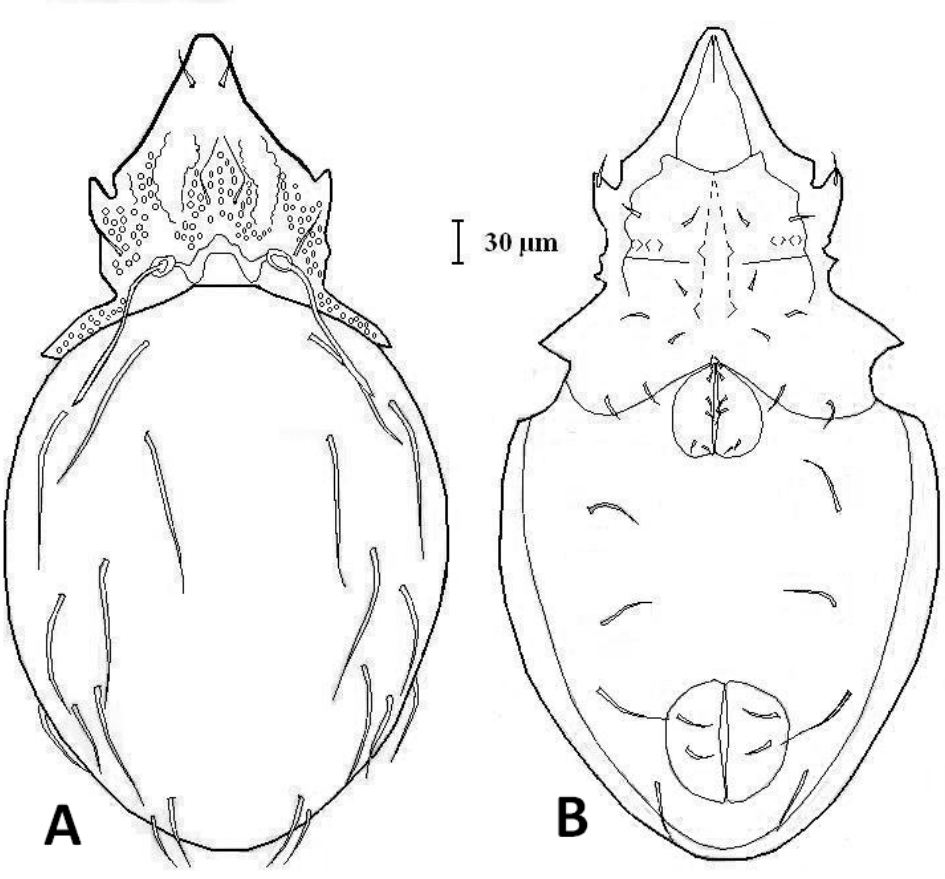

Figure 1. *Rhynchobelba ozkani* n. sp. (female) A) dorsal view of adult, B) ventral view of adult.

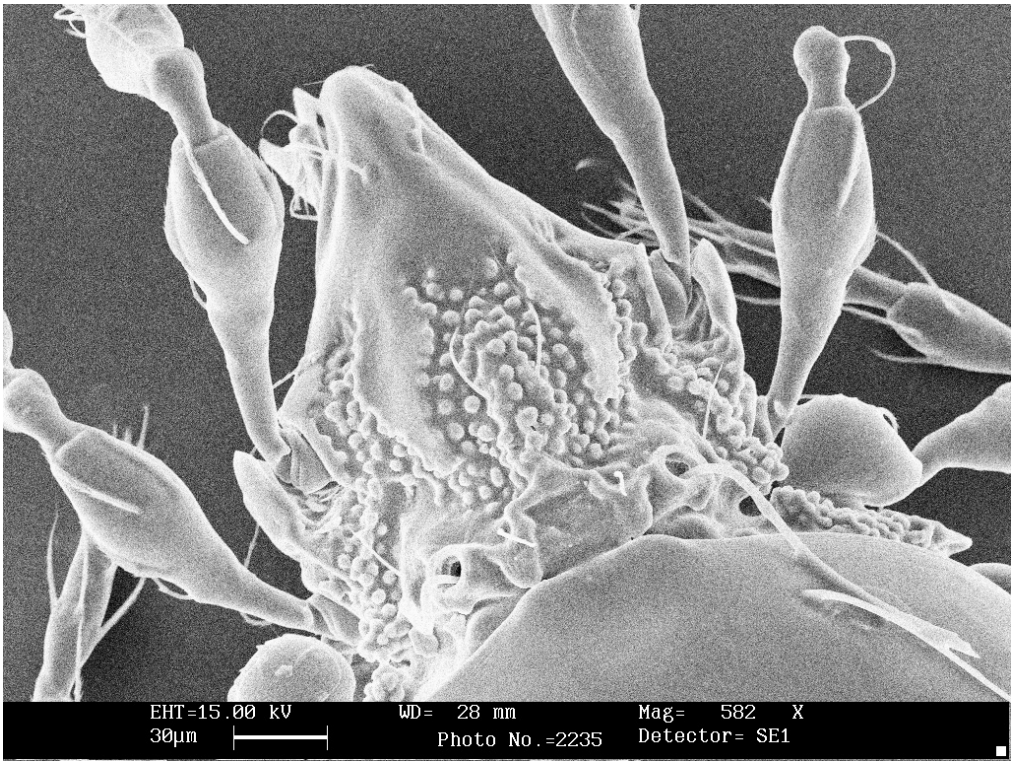

Figure 2. *Rhynchobelba ozkani* n. sp. (female) Prodorsum.

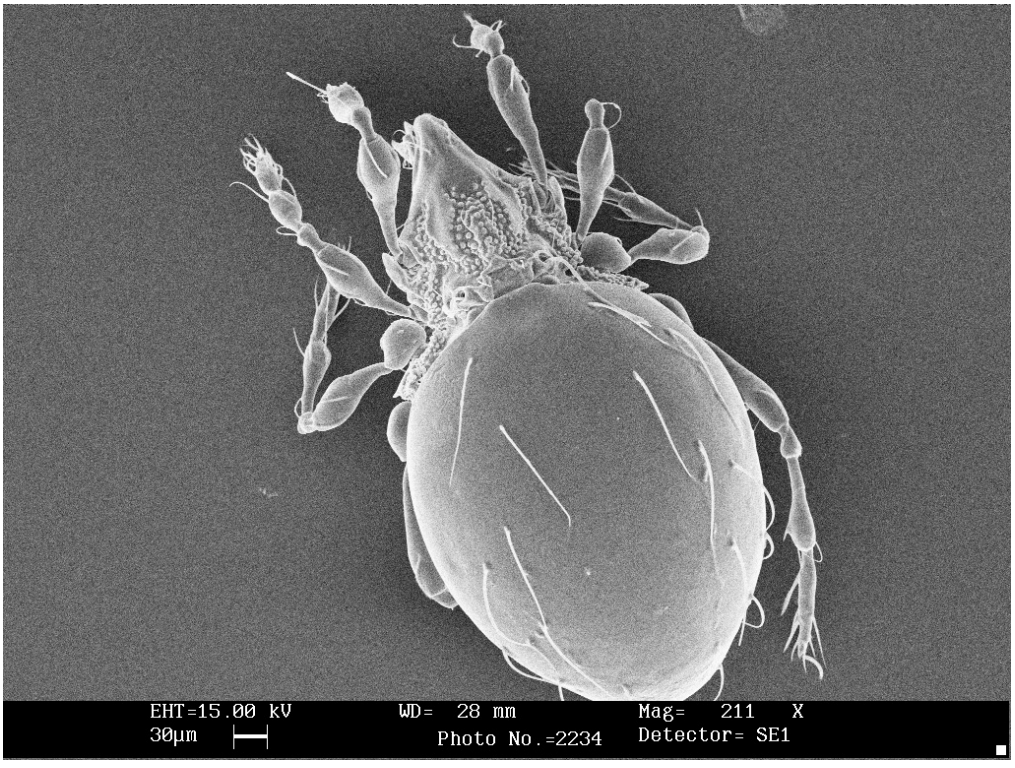

Figure 3. *Rhynchobelba ozkani* n. sp. (female) Dorsal view of adult.

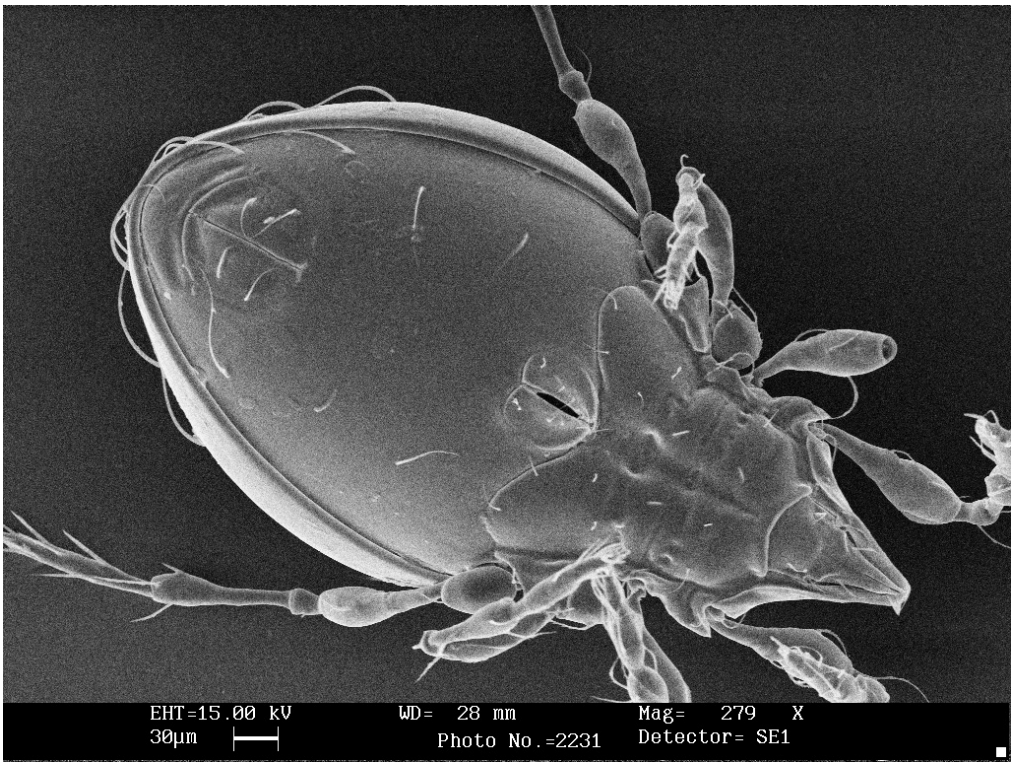

Figure 4. *Rhynchobelba ozkani* n. sp. (female) Ventral.

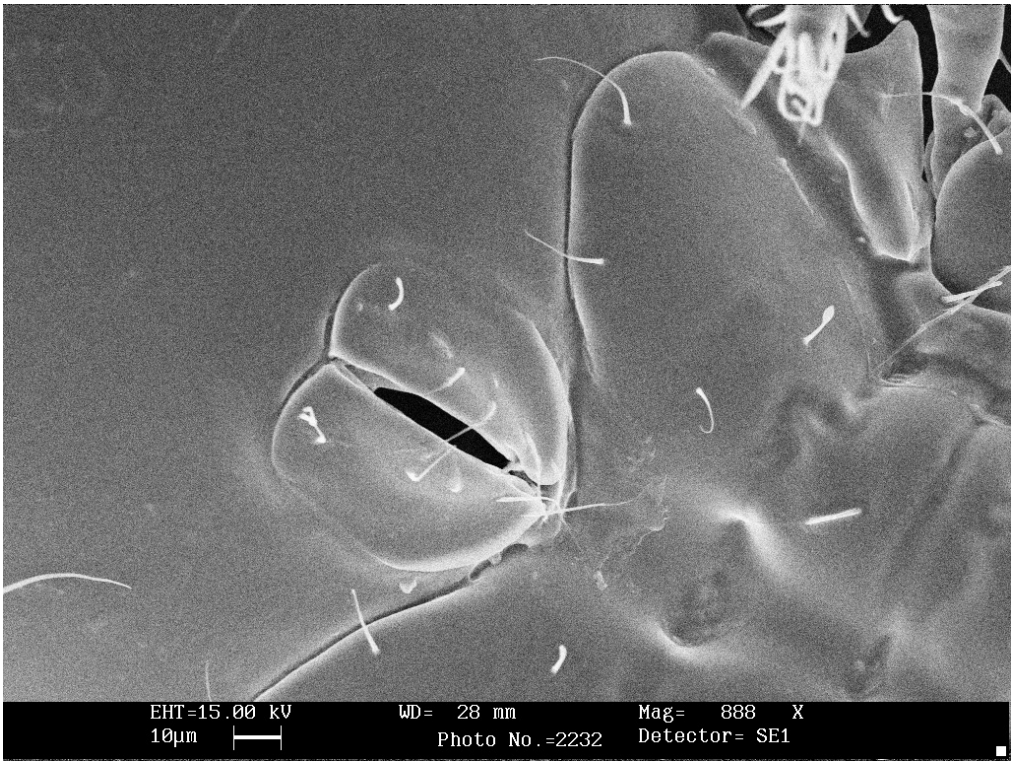

Figure 5. *Rhynchobelba ozkani* n. sp. (female) Genital plate.

Key to Known species of *Rhynchobelba*

1- Eleven pairs of notogastral setae…….. *R. simplex* (Fujikawa, 1972)

2- Ten pairs of notogastral setae 3

3- Rostrum with teeth or lateral process 7

4- Rostrum without teeth or lateral process 5

5- Small body dimensiones (<230) ..... *R. planeta* (Fujikawa, 2004)

6- Medium body dimensiones (between 495-564) ..... *R. ozkani* n. sp.

7- Genital plate with six pairs of genital setae 9

8- Genital plate with five pairs of genital setae ..... *R. altaica* (Krivolutsky, 1971)

9- Medium body dimensiones (between 525-580) 11

10- Big body dimensiones (>950), rostrum with two pairs of large protuberance .....
..... *R. inexpectata* (Willmann, 1953)

11- Rostral setae elbowed and spinose at edge, rostrum with two lateral process .....
..... *R. machadoi* (Pérez-Iñigo, 1976)

12- Rostral setae not elbowed and completely spinose, rostrum with two lateral teeth .....
..... *R. ornithorhyncha* (Willmann, 1953)

Discussion

The genus *Rhynchobelba* is differentiated from the related genera by long or medium length notogastral setae; anterior margin of notogaster without crista; 1 pair of aggenital, 2 pairs of anal and 3 pairs of adanal setae; and prodorsum with granulation or tuberculation.

The new species *R. ozkani* differs from the type species *R. inexpectata* (Willmann, 1953) by small body dimension, shape of rostrum and long sensillus. Whereas the average body dimensions of new species were 560/298, they were 960/525 in *R. inexpectata*. While the rostrum anteriorly become narrow and without rostral teeth in the new species, the rostrum is duck bill-shaped in *R. inexpectata*. Also, in *R. inexpectata* the sensillus is short (not reaching to tip of seta *in*, in new species *ss* long; reaching to tip of *in*.)

The new species IS similar to *R. ornithorhyncha* (Willmann, 1953), but in the new species the rostrum is without teeth, two pairs of rostral teeth in. While seta *ro* is smooth in the new species, seta *ro* is spinose in *R. ornithorhyncha*.

Rhynchobelba altaica (Krivolutsky, 1971) and the new speciesare also similar to each other but the new species differs from *R. altaica* inthe number of genital setae (6 pairs of genital setae in the new species; 5 pairs in *R. altaica*), and rostrum without teeth. More details are given in Table 1.

Table 1. Comparison of *Rhynchobelba ozkani* with the other species of the genus *Rhynchobelba*

	Rostrum	Body Dimensions	Sensillus	Number of Notogastral setae	Seta *ro*	Number of genital setae
R. planeta	Without teeth	207-229/121-136	Spinose, long lanceolate	10	Elbowed, spinose at edge	6
R. simplex	Without teeth	640/310	Barbed, short lanceolate	11	Weakly curved inwards	6
R. inexpectata	Beak like, flat	960/525	Short lanceolate	10	Straight	*
R. ornithorhyncha	2 lateral process present	525/310	Long, lanceolate	*	Spinose	*
R. altaica	With teeth	540-560	Long, lanceolate	10	Straight	5
R. machadoi	With teeth	564-576/324-348	Short, lanceolate	10	Elbowed, Spinose at edge	6
R. ozkani n. sp.	Without teeth	495-564/237-298	Long, lanceolate	10	Straight	6

* There is no information about this character in the original description.

***Nanhermannia (N.) nana* (Nicolet, 1855)**

Measurements and color: body length 573- 583, body width 255-268 (n=4). Reddish brown.

Material examined: Soil and litter samples were collected from Sakarya and Düzce provinces.

Four specimens ♀♀ from Düzce Province, Fındıklı village in soil with *Rhododendion poticum* litter, and in soil under *Betula alba*, 13.01. 2010.

Prodorsum (Figures 6 and 7): Rostrum rounded, rostral setae smooth. Median protuberance of prodorsum becoming wider anteriorly and its anterio-lateral sides not parallel to each other. It runs out at the lateral sides of rostrum.

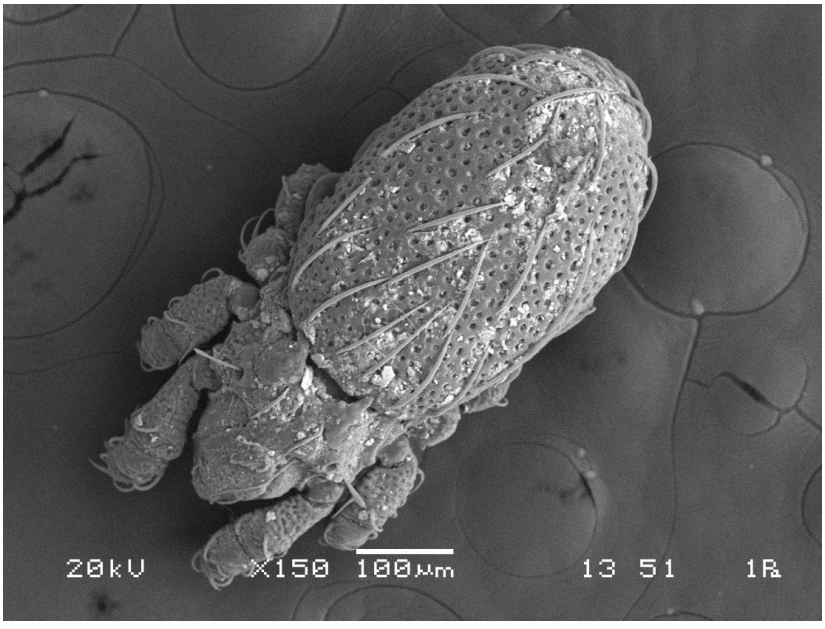

Figure 6. *Nanhermannia nana* (female) Dorsal view of adult.

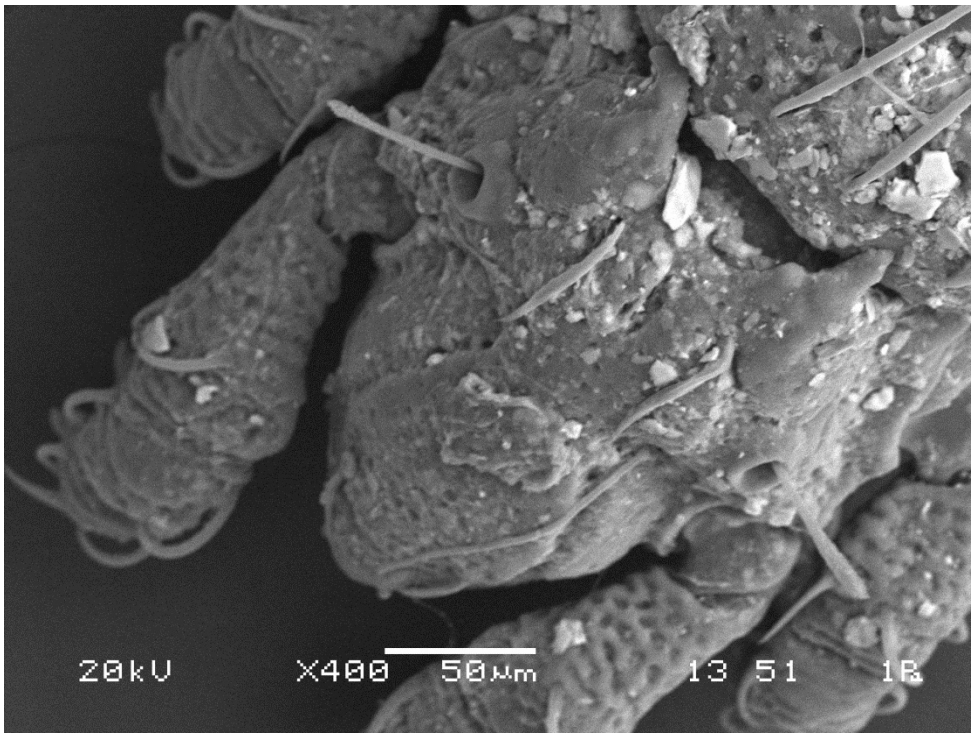

Figure 7. *Nanhermannia nana* (female) Prodorsum.

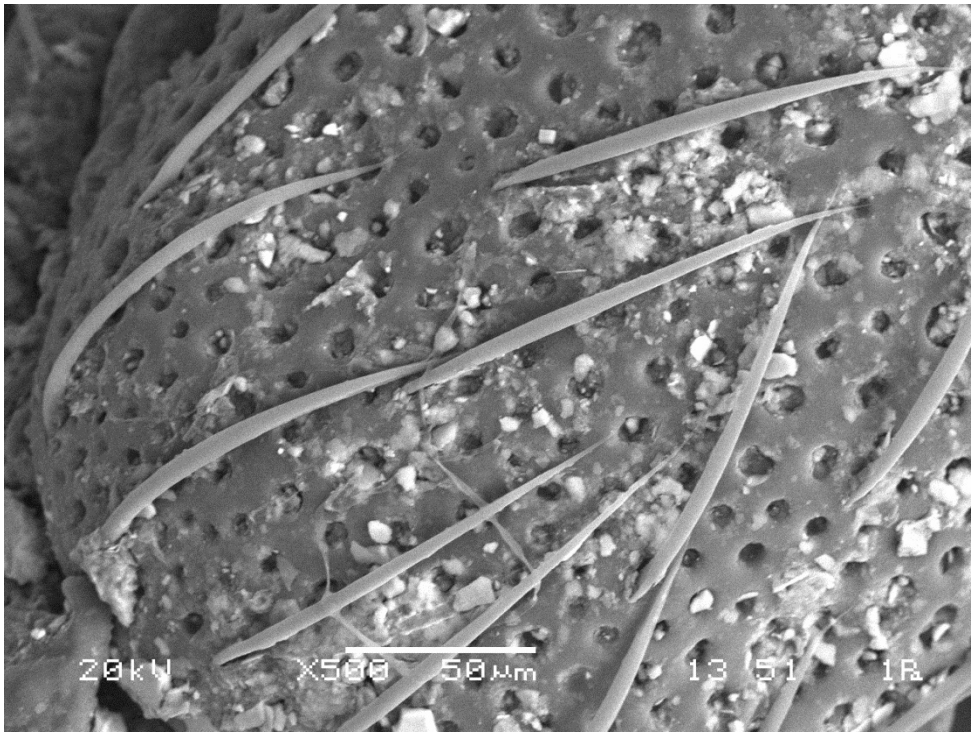

Figure 8. *Nanhermannia nana* (female) Notogastral setae.

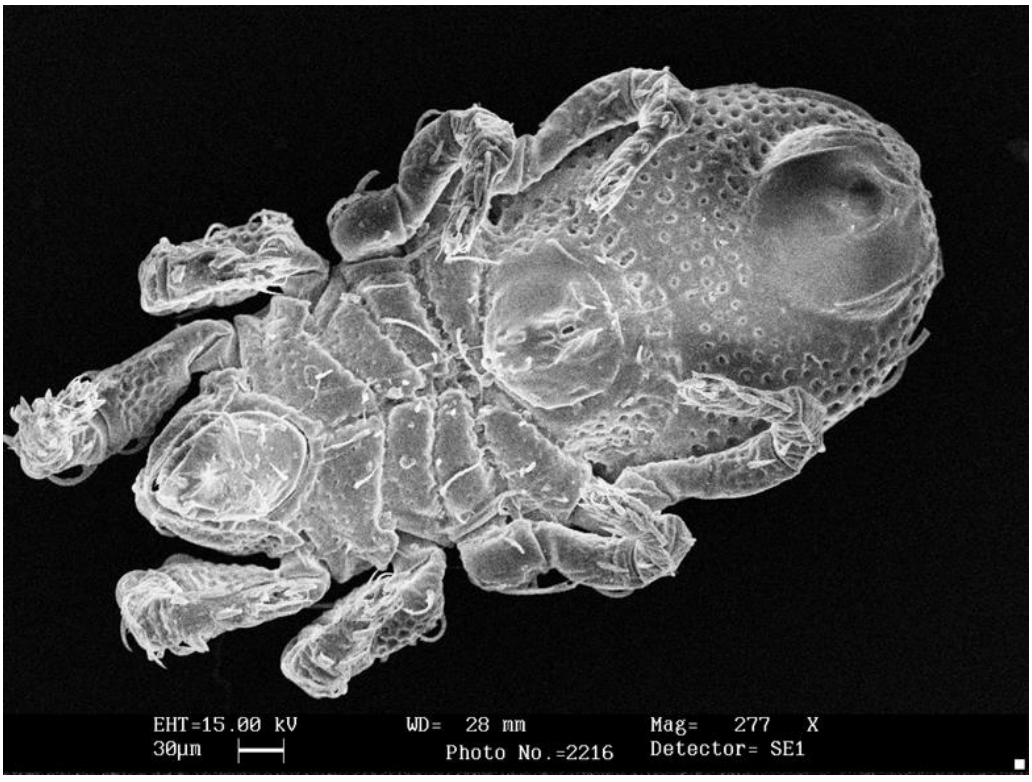

Figure 9. *Nanhermannia nana* (female) Ventral.

Seta in smooth, originating from anterior sides of prodorsal conydyles. Prodorsal conydyles triangular. Lamellar setae smooth, originating laterally and reaching to the anterior margin of rostrum. Prodorsum medially covered with areolar surface, prodorsal condyles triangular, becoming narrowed posteriorly. Ratios of prodorsal setae: *in* ≥ *ss* > *le* > *ro*. Medial length of *in* and *ss* approximately 54. *ss* club shaped and spinose on distal half.

Notogaster (Figures 6 and 8): Oval shaped, 15 pairs of smooth, long and thick notogastral setae present. Surface of notogaster covered with big pores.

Ventral region (Figure 9): Epimeral setal formula: 3:1:3:4. Anal plate with 2 pairs of setae. Genital and anal plates separated from each other, the distance between genital and anal plates as long as genital plate. 9 pairs of genital, 2 pairs of aggenital, 3 pairs of adanal, 2 pairs of anal setae present. A curved scissure between genital and anal plates interrupted medially can be seen under light microscopy. All ventral setae smooth, setae *3b, 3c, 4a, 4c* and *4d* longer than the other epimeral setae.

Distribution

This species is known from Holarctic, Antarctic, Oriental, Australian and Neotropical regions.

Discussion

The Genus *Nanhermannia* is distinguished from the related species by; shape of prodorsal conydyles, shape of rostral setae, length and position of lamellar setae, and length ratios of *ss* and *in*.

Nanhermannia (N.) nana (Nicolet, 1855) can be easily ditinguished from related species by triangular prodorsal conydyles, except for *Nanhermannia (N.) triangula* Fujikawa, *Nanhermannia (N.) elegantula* Berlese, and *Nanhermannia (N.) elegantissima* Hammer (Fujikawa, 1990).

Nanhermannia (N.) nana (Nicolet, 1855) differs from *Nanhermannia (N.) triangula* Fujikawa by smooth rostral setae and differs from *Nanhermannia (N.) elegantissima* Hammer and *Nanhermannia (N.) elegantula* Berlese by lamellar setae orginating near to rosturum and reaching to the rostrumun (Fujikawa, 1990).

The body dimensions of *Nanhermannia (N.) n*ana (Nicolet, 1855) were 550-625 µm (Miko, 2006). The body dimensions of our samples are in accordance with previously known specimens.

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