

Universidade de São Paulo
Escola Superior de Agricultura “Luiz de Queiroz”

**A new species of *Antennoseius* (*Antennoseius*) Berlese
(Mesostigmata: Ascidae) from Brazil and a key to the world
species of the subgenus**

JOÃO PEDRO IGNEZ MARTIN

Orientador: Prof. Dr. Raphael Campos Castilho

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A new species of *Antennoseius* (*Antennoseius*) Berlese (Mesostigmata: Ascidae) from Brazil and a key to the world species of the subgenus

JOÃO P. I. MARTIN¹, ÁVYLA R. A. BARROS¹, RAPHAEL C. CASTILHO¹

¹*Escola Superior de Agricultura Luiz de Queiroz (ESALQ), Universidade de São Paulo (USP), 13418-900 Piracicaba, São Paulo, Brazil. E-mail: joao.ignez@usp.br; avyla@usp.br; raphael.castilho@usp.br*

Abstract

Antennoseius (*Antennoseius*) **sp. nov.** is described based on the morphology of adult females collected from soil-litter of pasture of the Caatinga biome, in Alagoas state, Northeastern Brazil. A key for the separation of females of the 40 recognizable world species of *Antennoseius* (*Antennoseius*) is provided.

Key words: Ascoidea, soil mites, taxonomy

Introduction

Antennoseius Berlese is the most diverse genus of the family Ascidae (Mesostigmata), with 60 species described (Moraes *et al.* 2016; Kazemi 2018; Long *et al.*, 2021; Santos *et al.* 2022). The genus is divided into two subgenera, *Antennoseius* (*Antennoseius*) Berlese, with 39 species, and *Antennoseius* (*Vitzthumia*) Thor, with 20 species, in addition to a species without subgeneric status, *Antennoseius australis* Balogh, 1963.

The identification of *Antennoseius* (*Antennoseius*) species in relation of other subgenus is made by the absence of pretarsus and claws on the first pair of legs. The species of *Antennoseius* (*Antennoseius*) were described mainly from countries in Asia and Europe. No *Antennoseius* species have been described from Brazil. The aim of this paper

are to provide the description of the first *Antennoseius* (*Antennoseius*) species from that country, and a key to the world species of this subgenus.

Materials and methods

Litter/soil samples were collected from a pasture cultivation of the Caatinga biome (Alagoas state), Brazil. Climate of the region is classified as type BSh according to Köppen-Geiger climate classification (Köppen 1948; Peel *et al.* 2007). This climatic type is characterized by relatively high temperature (annual average nearly 26.5 °C) and low rainfall (annual average nearly 520 mm). In 2019, when most of the study was conducted, the average temperature, and total rainfall were respectively 25.9 °C (19-34 °C) and 643 mm (Clima Tempo 2021).

Mites were extracted from samples using Berlese-Tullgren funnels in the laboratory, preserved in 70% ethanol and subsequently mounted in Hoyer's medium on microscope slides for examination under phase contrast microscopy (Nikon, Eclipse 80i). Ascids were separated into genera based on their morphological characteristics, using the key of Moraes *et al.* (2016). The specimens were compared with the original descriptions and redescrptions of the species of the family, leading to the conclusion that some of the collected specimens belonged to a new species of *Antennoseius* (*Antennoseius*), here described.

Illustrations of taxonomically relevant structures were done using a digital camera attached to the microscope and measured with a graded ocular. In the subsequent description, measurements of each structure are given in micrometers, with the average measurement for the individuals examined followed (in parentheses) by the respective range, for variable measurements. The length of shields was measured along the midline from anterior to posterior margins, and the width, at the broadest level. Leg lengths were measured from the base of the coxa to the apex of tarsus, excluding pretarsus. Nomenclature of idiosomal setae is based on Lindquist & Evans (1965), leg chaetotaxy is based on Evans (1963) and pore-lyrifissure notation is based on AthiasHenriot (1975).

The key provided for the separation of the world species of *Antennoseius* (*Antennoseius*) was prepared based on the original descriptions and available redescrptions of the concerned species. The species included were those whose adult

females have been described and that were reported in Moraes *et al.* (2016), as no other species have been placed in this subgenus since that publication.

Results

Antennoseius Berlese, 1916: 303.

Type species: *Antennoseius delicatus* Berlese, 1916, by original designation.

Antennoseius. — Vitzthum 1941: 765; Lindquist & Moraza 2009: 11; Moraes *et al.* 2016: 65.

Antennoseius (Antennoseius).— Bregetova 1977: 245; Lindquist & Walter 1989: 1293; Lindquist & Moraza 2009: 11; Moraes *et al.* 2016: 65.

Vitzthumia Thor, 1930: 114 (Synonymy by Ryke 1962: 657).

Type species: *Vitzthumia oudemansi* Thor, 1930, by original designation.

Antennoseius (Vitzthumia).— Bregetova 1977: 245; Lindquist & Walter 1989: 1293; Lindquist & Moraza 2009: 11; Moraes *et al.* 2016: 65.

Diagnosis. The diagnosis of this genus was recently presented by Moraes *et al.* (2016).

Antennoseius (Antennoseius) sp. nov.

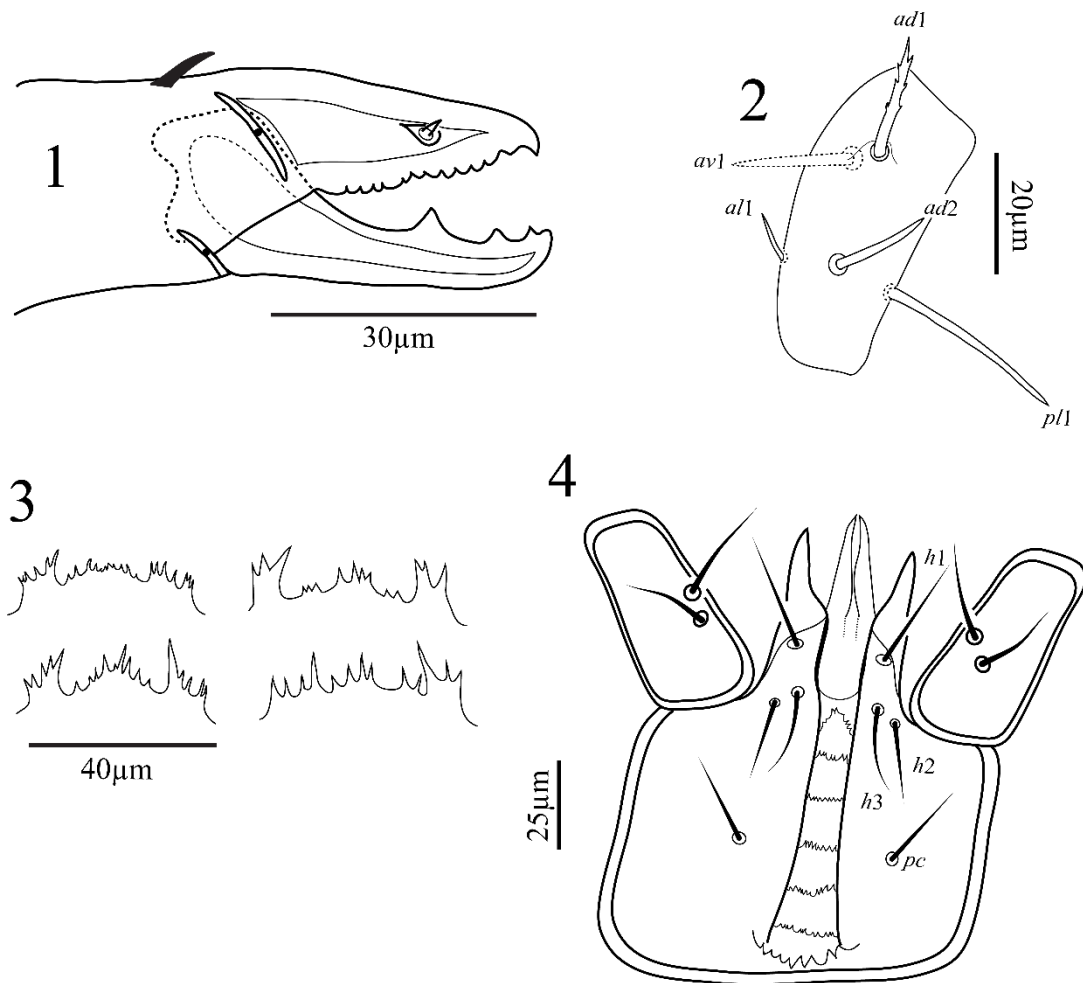
Material examined. Four specimens from litter/soil and litter of a pasture at Olho d'Água das Flores (9°32'02.9"S 37°16'33.0"W; 287m above sea level), Alagoas state, Brazil, December 2018, collected by A.R.A. Barros. In addition, two specimens from litter/soil of a rice cultivation at Igreja Nova (10°7'13"S 36°39'39"O), Alagoas state, Brazil were examined. All specimens deposited in the Departamento de Entomologia e Acarologia, Escola Superior de Agricultura “Luiz de Queiroz” (ESALQ), Universidade de São Paulo (USP), Piracicaba, São Paulo state, Brazil.

Diagnosis. All dorsal setae feather-shaped, except *j1* arborescent to leaf shape and with denticulate margin; opisthonotal shield with two pairs of extra setae and two unpaired setae in the series *J*; unsclerotized cuticle along lateral margins of opisthonotal shield with at least 27 pairs of setae; with one pair of presternal platelets; with anal shield; unsclerotized cuticle along lateral margins of anal shield with at least 12 pairs of setae (in addition to *Jv1–Jv4* and *Zv1–Zv3*); leg I longer than the idiosoma; legs I–IV with barbed setae.

Morphological characterization

Adult female (Figures 1–11) – Four specimens measured.

Gnathosoma. Fixed cheliceral digit 30 long from apex to dorsal lyrifissure, with 12 teeth in addition to the apical tooth and a setiform *pilus dentilis* (Figure 1); movable cheliceral digit 40 (36–43) long, with three teeth in addition to the apical tooth; arthrodial process of chelicerae indistinct; antiaxial and dorsal lyrifissures as well as dorsal setae distinct. Number of setae on palp trochanter–tarsus: 2-5-6-14-15; setae aciculate and smooth, except palpfemoral seta *ad*, barbed (Figure 2); apotele 2-tined. Epistome with anterior region strongly denticulate (Figure 3). Deutosternum delimited by lateral lines, flaring slightly posteriorly (Figure 4), with eight roughly transverse lines, the most distal smooth and concave, the second convex and denticulate with 8 denticles, followed by six lines with 7–12 denticles, the last convex. Internal malae totally separated from each other; outer and inner margins smooth. Corniculi horn-like, 28 (25–30) long and 7 wide. Setae *h3* longitudinally aligned with *h1* and anteromedial of *h2*. Measurements of setae: *h1* 29 (27–30), *h2* 19 (17–20), *h3* 22 (20–25) *e pc* 24 (21–25); all aciculate and smooth.



FIGURES 1-4. *Antennoseius* (*Antennoseius*) **sp. nov.** Adult female. 1. Lateral (antiaxial) view of chelicera; 2. palp femur; 3. Epistome; 4. Hypostome.

Dorsal idiosoma (Figure 5). Podonotal and opisthonotal shields strongly ornate with irregular reticulate of granular lines. Unsclerotized cuticle along lateral margins of podonotal and opisthonotal shield with small and numerous granules. Podonotal shield 269 (257–282) long and 262 (250–275) wide at level of *r*₂; with 19 pairs of setae (*j*₁–*j*₆, *z*₁–*z*₆, *s*₁–*s*₆ and *r*₂), five pairs of distinguishable lyrifissures and one pair of distinguishable gland pores; *j*₁ and *z*₁ inserted in the anterior margin of shield. Unsclerotized cuticle along lateral margins of podonotal shield with four pairs of setae (*r*₃–*r*₆). Opisthonotal shield 237 (200–262) long and 203 (187–212) wide at level of *S*₁, tapered in the posterior third of shield; with 15 pairs de setae (*J*₁–*J*₅, *Z*₁–*Z*₅ and *S*₁–*S*₅), two pairs of extra setae and two unpaired setae in the series *J*, four pairs of distinguishable lyrifissures and one pair of distinguishable gland pores. Unsclerotized cuticle along lateral margins of opisthonotal shield hypertrichous (approximately 27–31 setae). Measurements of setae: *j*₁ 31 (30–32), *j*₂ 21 (20–22), *j*₃ 23 (20–25), *j*₄ 24 (20– 26), *j*₅ 24 (22–25), *j*₆ 22

(16–26), *z1* 21 (18–22), *z2* 20 (20–25), *z3* 23 (20–24), *z4* 25 (23–25), *z5* 23 (20–25), *z6* 23 (20–26), *s1* 21 (20–22), *s2* 24 (22–25), *s3* 25 (23–25), *s4* 25 (24–25), *s5* 25 (24–25), *s6* 24 (20–25), *r2* 24 (20–25), *r3* 23 (22–25), *r4* 25 (23–25), *r5* 24 (22–25), *r6* 22 (21–25), *J1* 22 (20–25), *J2* 20 (20–21), *J3* 22 (20–25), *J4* 22 (20–25), *J5* 23 (22–25), *Z2* 23 (22–25), *Z3* 23 (20–25), *Z4* 24 (21–25), *Z5* 20 (20–21), *S1* 21 (20–23), *S2* 21 (20–23), *S3* 23 (20–25), *S4* 23 (20–25), *S5* 23 (20–25). All dorsal setae feather-shaped, except *j1* arborescent to leaf shape and with denticulate margin.

Venter idiosoma (Figure 6). Base of tristosternum 18 (16–20) long and 19 (15–20) wide proximally (Figure 7), laciniae 109 (100–115) long, separated for about 80% of their total length, pilose. With one pair of presternal platelets smooth, wider than long, 11 (10–12) long and 43 (40–45) wide. Sternal shield mostly smooth, with few faint striate along lateral margins; anterior margin with incision in the middle region; approximately 144 (140–150) long and 86 (82–90) wide; with three pairs of setae (*st1*–*st3*) and three pairs of lyrifissures; posterior margin concave, with two small incisions. Setae *st4* on unsclerotized cuticle. Section of endopodal plate laterad of coxae III–IV represented by a triradiate fragment. Genital shield smooth, with two depression lines; posterior margin rounded; bearing *st5*. Lyrifissure *iv5* on unsclerotized cuticle, posterolaterad of *st5*. Unsclerotized cuticle behind genital shield with a striated depression, bearing setae *Jv1* and *Zv1*. Anal shield subtriangular, reticulate and granulate; 77 (70–87) long and 72 (70–75) wide. Cribum in a plate just behind the posterior margin of anal shield composed of irregular lines of spicules. Unsclerotized cuticle anterior to anal shield with five pairs of setae (*Jv2*–*Jv4* and *Zv2*–*Zv3*). Unsclerotized cuticle along lateral margins of anal shield hypertrichous (approximately 12–16 setae). Exopodal plate fused to peritrematic plate extending from posterior margin of coxae IV to the margin posterior of coxae I. With one pair of metapodal plates ellipsoidal and granulated. Measurements of setae: *st1* 35 (33–36), *st2* 30 (28–33), *st3* 25, *st4* 19 (16–20), *st5* 21 (20–22), *Jv1* 20 (18–22), *Jv2* 17 (15–20), *Jv3* 17 (15–20), *Jv4* 16 (15–17), *Zv1* 23 (20–25), *Zv2* 16 (15–16), *Zv3* 17 (17–18), para-anal 16 (14–20), post-anal 13 (10–15). Setae *st1*–*st3*, *Jv1*–*Jv4* and *Zv1*–*Zv3*, aciculate and smooth; setae along lateral margins of anal shield, feather-shaped.

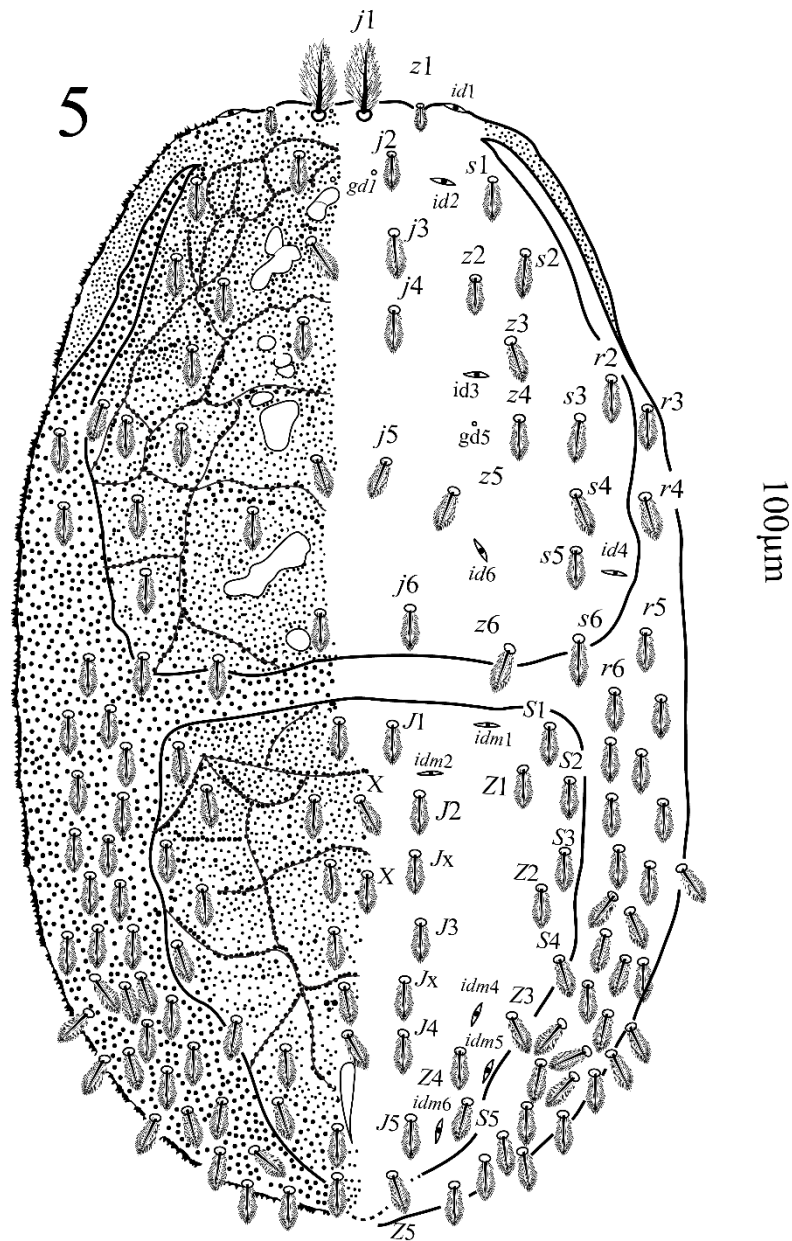
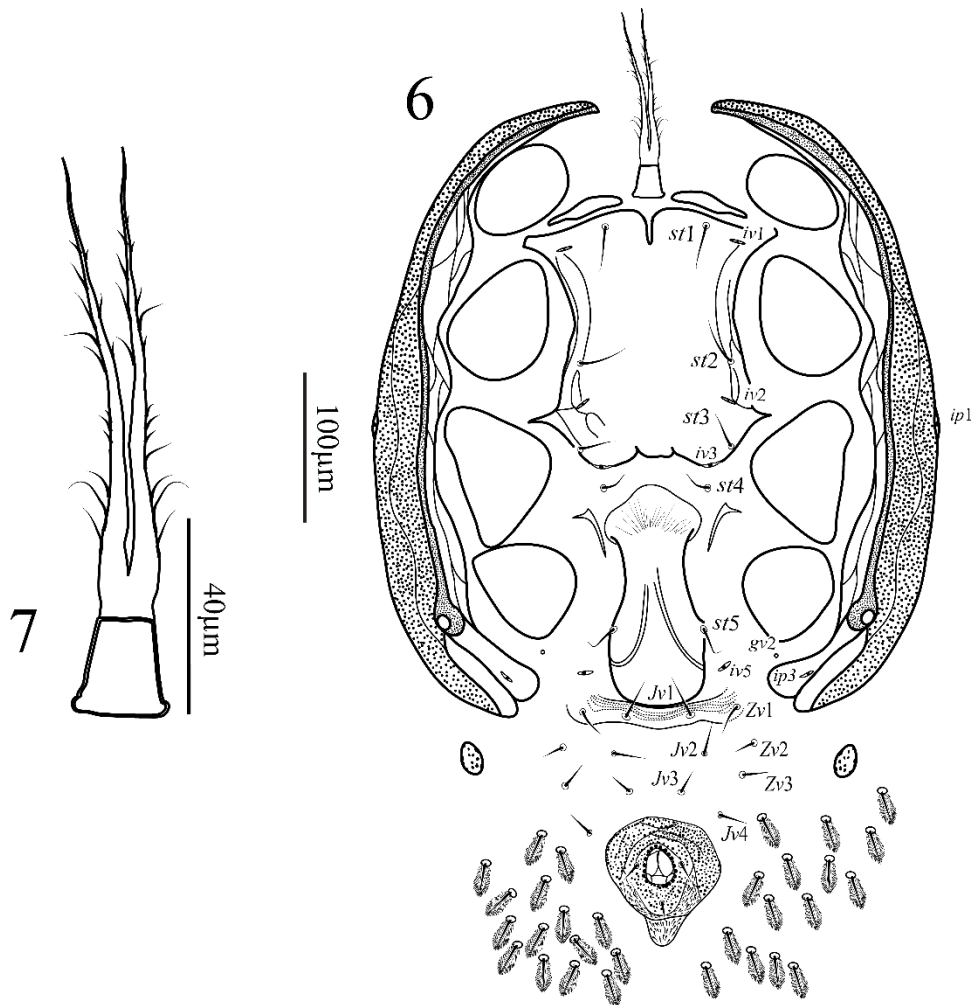


FIGURE 5. *Antennoseius* (*Antennoseius*) **sp. nov.** Adult female. Dorsal idiosoma.

Peritreme and peritrematic plate. Peritreme extending forward to level of setae z1. Peritrematic plate fused with dorsal shield at level of s1, extending posteriorly behind coxae IV fusing with the exopodal plate at level of coxae IV; with a lyrifissure (*ip1*) at level between coxae II–III and with a pair of lyrifissures (*ip3* and *ip4*) and a gland pore (*gp2*) behind each stigma.

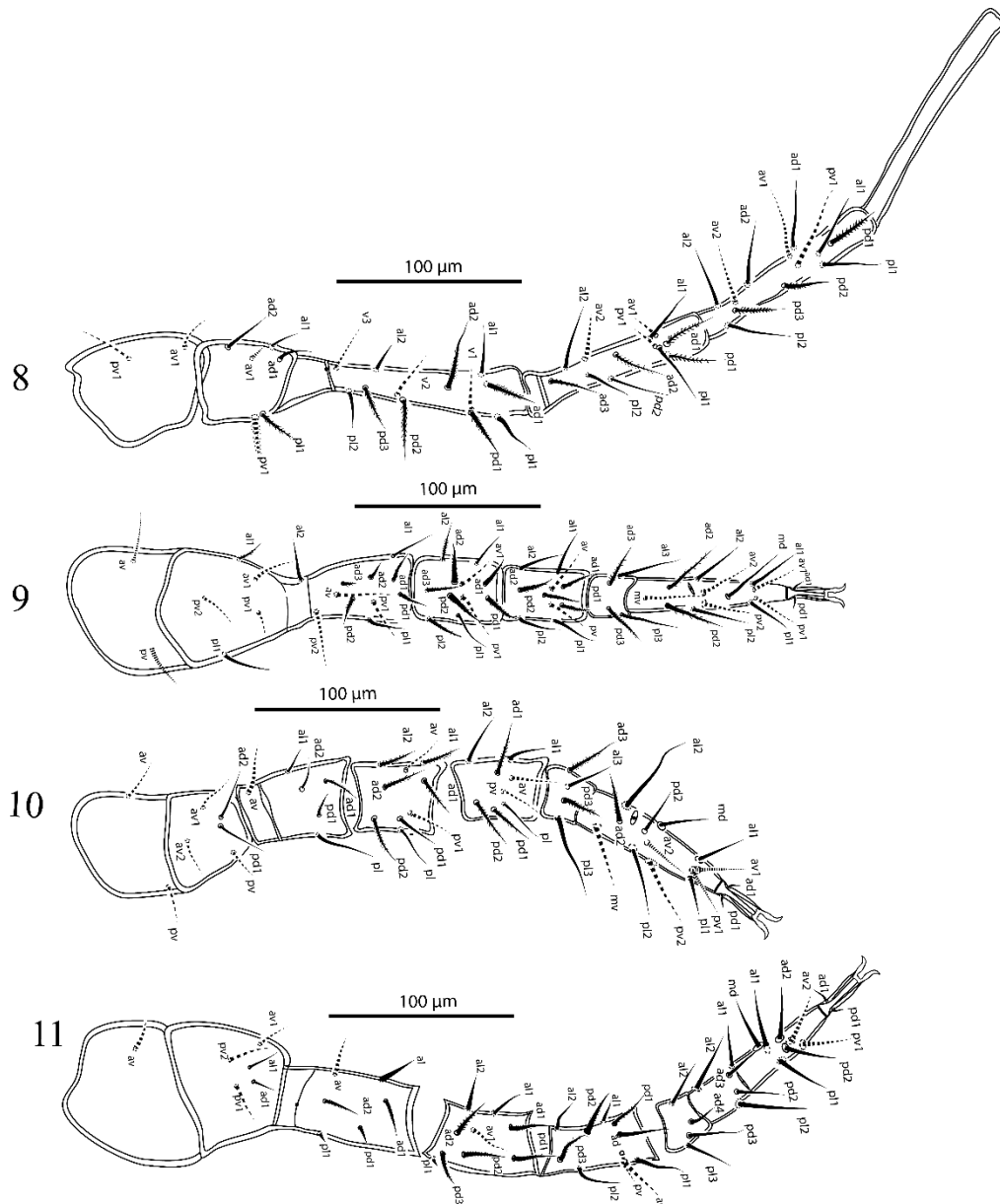
Spermathecal apparatus: Not distinguishable.



FIGURES 6-7. *Antennoseius* (*Antennoseius*) **sp. nov.** Adult female. 6. Ventral idiosoma; 7. Tritosternum.

Legs (Figures 8–11). Leg lengths: I: 590 (585–600), II—355 (312–387), III—331 (312–337), IV—404 (365–450). Chaetotaxy: leg I—coxae 0–0/1, 0/1–0, trochanter 1–2/1, 0/1–1, femur 2–2/3, 3/0–2, genu 2–3/2, 2/1–2, tibia 2–2/2, 3/0–2; leg II – coxae 0–0/1, 0/1–0, trochanter 1–0/1, 0/2–1, femur 2–3/1, 2/2–1, genu 2–3/1, 2/1–2, tibia 2–2/1, 2/1–2; leg III – coxae 1–0/0, 0/1–0, trochanter 0–1/2, 1/1–0, femur 1–2/1, 1/0–1, genu 2–2/1, 2/1–1, tibia 2–1/1, 2/1–1; leg IV – coxae 0–0/1, 0/0–0, trochanter 1–1/1, 0/2–0, femur 1–0/2, 1/0–1, genu 2–2/1, 3/0–0, tibia 2–1/1, 3/1–2; tarsi: I: not counted; II: 18; III: 18; IV: 18. Trochanter I with 2 setae stout and barbed (*pl1* e *pv1*); femur I with 6 setae barbed (*ad1*–2, *pd1*–3); genu I with 6 setae barbed (*ad1*–3, *pd1*–2); tibia I with 3 setae barbed (*pd1*–3); femur II with 4 setae barbed (*ad1*, *ad3*, *pd1*–2); genu II with 7 setae barbed (*ad1*–3; *al2* e *pd1*–2; *pl2*); tibia II with 4 setae barbed (*ad1*–2; *pd1*–2); tarsus II with 4 setae barbed (*ad2*–3, *pd2*–3); femur III com 2 setae barbed (*ad1*, *pd1*); genu III with 5 setae barbed

(*al1–2*, *ad1–2*; *pd2*); tibia III with 3 setae barbed (*ad1*, *pd1–2*); tarsus III with 2 setae barbed (*ad3*, *pd3*) femur IV with 2 setae barbed (*ad1–2*); genu IV with 5 setae barbed (*ad1–2* e *pd1–3*); tibia IV with 3 setae barbed (*pd1–3*). All others setae smooth and aciculate.



FIGURES 8–11. *Antennoseius* (*Antennoseius*) **sp. nov.** Adult female. 8. Leg I, coxatibia, dorsal view; 9. Legs II, dorsal view; 10. Legs III, dorsal view; 11. Legs IV, dorsal view.

Adult male. Not found.

Remarks. *Antennoseius* (*Antennoseius*) **sp. nov.** is most similar to *Antennoseius* (*Antennoseius*) *ghilarovi* Balan, 1988, but females of the latter have unsclerotized cuticle

along lateral margins of opisthonotal shield with at most 20 pairs of setae; without presternal platelets; unsclerotized cuticle along lateral margins of anal shield with at most seven pairs of setae (in addition to *Jv1–Jv4* and *Zv1–Zv3*); leg I shorter than the idiosoma; legs I–IV without barbed setae.

Discussion

The members of the genus *Antennoseius* are commonly found in soil, litter, mosses and in rodent and bird nests (Kazemi 2018). The adult females of this group are also closely associated with carabid beetles, probably a phoretic association used for dispersal (Bregetova 1977; Halliday 1998; Kazemi & Moraza 2013; Moraes *et al.* 2015; Moraes *et al.* 2016; Kazemi 2018; Santos *et al.* 2022).

Little is known about the biology of the species of this genus. Biology studies were carried out to evaluate the development of *Antennoseius (Vitzhumia) janus* Lindquist & Walter, 1989, fed on invertebrate prey, free-living nematodes and collembolan, and with *Antennoseius (Antennoseius) lobocheilus* Halliday, Walter & Lindquist, 1998 using nematodes as prey (Lindquist & Walter 1989; Halliday *et al.* 1998).

The *Antennoseius* species are frequently collected in regions with a temperate climate, such as European and Asian countries (Moraes *et al.* 2016; Santos *et al.* 2022). The record of species of the genus in the neotropical region is uncommon and so far, two species of the genus *Antennoseius* were described from these regions, *Antennoseius australis* Balogh, 1963, in El Bolsón, province of Rio Negro province, and *Antennoseius (Antennoseius) ollalae* Haitlinger, 2011, in Rio Gallegos, Santa Cruz province, both Argentina. However, the climate classification of these regions are BSk (arid and cold) and Csb (temperate and dry warm summer), respectively (Peel *et al.* 2007). In Brazil, specimens of the genus *Antennoseius* have been reported in diversity studies in the northeast of the country (Santos 2013; Barros *et al.* 2021), which correspond to the species being described here. The climate classification for this Brazil region is BSh (hot and dry). This finding is very interesting from an ecological point of view, as it highlights the phenotypic plasticity of the species in adapting to different regions of the globe.

Key to the world species of *Antennoseius* (*Antennoseius*), based on adult females

The main objective of the present key is to help the separation of described species based on what is available in the literature. Sufficient information is presently available in the literature to allow the recognition of all species attributed to *Antennoseius* (*Antennoseius*).

According Kazemi (2018), *Antennoseius* (*Antennoseius*) *alexandrovi* Bregetova, 1977 and *A. (A.) arvensis* Kalúz, 1994 were considered as synonym junior of *A. (A.) avius* Karg, 1977 and *A. (A.) japonicus* Ishikawa, 1979 and *A. (A.) sinicus* Guo e Gu, 1997 as synonym junior of *A. (A.) hispaniensis* Bernhard, 1963.

1. Most podonotal and opisthonotal setae smooth2
- Most podonotal and opisthonotal setae pilose or serrate.....23
2. Seta *st*3 inserted on unsclerotized cuticle3
- Seta *st*3 inserted on sternal shield.....8
3. Podonotal shield with stout setae4
- Podonotal shield without stout setae6
4. Podonotal shield with four pairs of stout setae (*j*2–*j*4 and *z*2)
..... *A. (A.) imbricatus* Ishikawa, 1969; Japan
- Podonotal shield with eight pairs of stout setae (*j*2–*j*5, *z*2–*z*4 and *s*4).....5
5. Coxae I-II without stout setae; tibia I with *al*1 as strongly thickened spin-like setae
..... *A. (A.) gwiazdowiczi* Kavianpour & Nemati in Kavianpour *et al.*, 2013; Iran
- Coxae I-II with one stout setae (*pv*); tibia I with single setae
..... *A. (A.) maltzevi* Eidelberg, 1994; Ukraine
6. Opisthonotal shield with unpaired setae in the series *J*; with ventrianal shield (bearing seta *Jv*3 in addition to circumanal setae).....
..... *A. (A.) olallae* Haitlinger, 2011; Argentina
- Opisthonotal shield without unpaired setae; with anal shield (bearing only circumanal setae).....7
7. Fixed cheliceral digit with 11-13 teeth; setae *J*5, *Z*5 and *S*5 slightly barbed
..... *A. (A.) calathi* Fain, Noti & Dufrêne, 1995; Belgium
- Fixed cheliceral digit with 7-8 teeth; setae *J*5, *Z*5 and *S*5 smooth
..... *A. (A.) rugosus* Mašán, 1997; Slovakia

8.	Podonotal shield with at least four pairs of stout setae	9
-	Podonotal shield without stout setae	15
9.	Podonotal shield with six pairs of stout setae.....	10
-	Podonotal shield with 4-5 pairs of stout setae	11
10.	Setae <i>j</i> 5 not stout and <i>j</i> 6 stout; opisthonotal shield with unpaired setae (<i>Jx</i>).....	
	 <i>A. (A.) sabulicola</i> Bregetova, 1977; Uzbekistan	
-	Setae <i>j</i> 5 stout and <i>j</i> 6 not stout; opisthonotal shield without unpaired setae	
	 <i>A. (A.) sharonovi</i> Eidelberg, 1989; Ukraine	
11.	Stout setae only in <i>j</i> series (<i>j</i> 2– <i>j</i> 5); opisthonotal shield without unpaired setae.....	
	 <i>A. (A.) pannonicus</i> Willmann, 1951; Austria	
-	At least one stout setae in the <i>z</i> series (others in <i>j</i> series); opisthonotal shield with unpaired setae (<i>Jx</i>).....	12
12.	Podonotal shield with four pairs of stout setae (<i>j</i> 2– <i>j</i> 4 and <i>z</i> 2)	13
-	Podonotal shield with five pairs of stout setae (<i>j</i> 2– <i>j</i> 4, <i>z</i> 2 and <i>z</i> 4 or <i>z</i> 5)	14
13.	Opisthonotal shield with <i>R</i> 1 inserted on shield; unpaired setae in the series <i>J</i>	
	 <i>A. (A.) bytinskii</i> Costa, 1969; Israel	
-	Opisthonotal shield with <i>R</i> 1 inserted off shield; without unpaired setae in the series <i>J</i>	
	 <i>A. (A.) quadrispinosus</i> Gwiazdowicz & Haitlinger, 2010; Mexico	
14.	Setae <i>z</i> 4 not stout and <i>z</i> 5 stout.....	<i>A. (A.) masoviae</i> Sellnick, 1943; Poland
-	Setae <i>z</i> 4 stout and <i>z</i> 5 not stout.....	<i>A. (A.) ponticus</i> Trach & Makarova, 2008; Ukraine
15.	Without presternal platelets.....	16
-	With presternal platelets	17
16.	Opisthonotal shield with unpaired setae in the series <i>J</i> and two extra setae in the series <i>S</i> (<i>Sx</i>); seta <i>j</i> 1 pilose	<i>A. (A.) matalini</i> Eidelberg, 2001; Moldova
-	Opisthonotal shield without unpaired setae in the series <i>J</i> and without extra setae in the series <i>S</i> ; seta <i>j</i> 1 smooth.....	<i>A. (A.) matsjuki</i> Eidelberg, 2001; Moldova
17.	Opisthonotal shield with unpaired setae in the series <i>J</i>	
	 <i>A. (A.) similis</i> Eidelberg, 2001; Kazakhstan	
	Opisthonotal shield without unpaired setae in the series <i>J</i>	18
18.	Seta <i>j</i> 1 fan-shape, widely expanded, pubescent.....	
	 <i>A. (A.) bullitus</i> Karg, 1969; Germany	

- Seta *j*1 smooth or slightly barbed and cylindrical..... 19
- 19. Setae Z1–Z3 at least as long as distance between its base and the base of Z2–Z4, respectively.....*A. (A.) longisetus* Eidelberg, 2000; Moldova
- Setae Z1–Z3 at most 0.8 times as long as distance between its base and the base of Z2–Z4, respectively20
- 20. Epistome convex; seta *st*1 inserted off sternal shield;
..... *A. (A.) davidovae* Eidelberg, 1994; Russia
- Epistome triramous anteriorly; seta *st*1 inserted on sternal shield21
- 21. Unsclerotized cuticle along lateral margins of opisthonotal shield with at most 10 pairs of setae; seta *j*2 as long as distance between its base and the base of *j*3.....
.....*A. (A.) pseudospinosus* Eidelberg, 1990; Ukraine
- Unsclerotized cuticle along lateral margins of opisthonotal shield with at least ...15 pairs of setae; seta *j*2 at most 0,7 times as long as distance between its base and the base of *j*322
- 22. Setae *r*3 and *r*5 present; setae *J*5 and Z5 slightly barbed.....
..... *A. (A.) belorussicus* Eidelberg, 1990; Belarus
- Setae *r*3 and *r*5 absent; setae *J*5 and Z5 serrated
.....*A. (A.) dargomensis* Barilo, 1987; Uzbekistan
- 23. With anal shield (bearing only circumanal setae) 24
- With ventrianal shield (with 1-3 pairs of setae in addition to circumanal setae)... 29
- 24. Most podonotal and opisthonotal setae serrate; opisthonotal shield without unpaired setae in the series *J*25
- Most podonotal and opisthonotal setae pilose; opisthonotal shield with unpaired setae in the series *J*.....27
- 25. Setae *st*3 and *st*4 inserted on metasternal platelet; setae *j*1 aciculate.....
.....*A. (A.) delicatus*, Berlse, 1916; France
- Setae *st*3 inserted on sternal shield and *st*4 on unsclerotized cuticle; setae *j*1 leaf-shaped.....26
- 26. Unsclerotized cuticle along lateral margins of podonotal, opisthonotal and anal shields granulated; seta *j*1 longest dorsal setae and totally serrated
.....*A. (A.) boskopensis* Ryke, 1962; South Africa

- Unsclerotized cuticle along lateral margins of podonotal, opisthonotal and anal shields not granulated; seta *j*₁ shortest dorsal setae and distally serrated
..... *A. (A.) chirae* Jordaan, Loots & Theron, 1987; South Africa
- 27 Podonotal shield with *j*₂–*j*₄, *z*₂, *z*₄ and *s*₁ smooth
..... *A. (A.) shcherbakae* Balan, 1988; Tajikistan
- Podonotal shield with *j*₂–*j*₄, *z*₂, *z*₄ and *s*₁ feather-shaped 28
- 28 Unsclerotized cuticle along lateral margins of opisthonotal shield with at most 20 pairs of setae; without presternal platelets; unsclerotized cuticle along lateral margins of anal shield with at most seven pairs of setae (in addition to *J*_{v1}–*J*_{v4} and *Z*_{v1}–*Z*_{v3}); leg I shorter than the idiosoma; legs I–IV without barbed setae
..... *A. (A.) ghilarovi* Balan, 1988; Tajikistan
- Unsclerotized cuticle along lateral margins of opisthonotal shield with at least 27 pairs of setae; with one pair of presternal platelets; unsclerotized cuticle along lateral margins of anal shield with at least 12 pairs of setae (in addition to *J*_{v1}–*J*_{v4} and *Z*_{v1}–*Z*_{v3}); leg I longer than the idiosoma; legs I–IV with barbed setae
..... *A. (A.) n. sp.*, Brazil
- 29 Ventrianal shield with three pairs of setae (*J*_{v2}–*J*_{v4}) in addition to circumanal setae
..... *A. (A.) epicrioides* Schweizer, 1961; Switzerland
- Ventrianal shield 1-2 pairs of setae in addition to circumanal setae 30
- 30 Opisthonotal shield with unpaired setae in the series *J* 31
- Opisthonotal shield without unpaired setae in the series *J* 33
- 31 Most dorsal setae leaf-shaped; opisthonotal shield with five unpaired setae in the series *J*; setae *r*₂ and *r*₄ off podonotal shield
..... *A. (A.) ningxiaensis* Bai & Ma, 2006; China
- Most dorsal setae cylindrical; opisthonotal shield with 3-4 unpaired setae in the series *J*; setae *r*₂ and *r*₄ on the podonotal shield 32
- 32 Opisthonotal shield with three unpaired setae in the series *J*; setae *j*₂–*j*₄ at least 0.6 times as long as distance between its base and the base of *j*₃–*j*₅, respectively
..... *A. (A.) bacatus* Athias-Henriot, 1961; Portugal

- Opisthonotal shield with four unpaired setae in the series *J*; setae *j2–j4* at most 0.5 times as long as distance between its base and the base of *j3–j5*, respectively
.....*A. (A.) bacatosimilis* Karg, 1965; Germany
- 33 Ventrianal shield with one pair of setae (*Jv3*) in addition to circumanal setae.....34
Ventrianal shield with two pair of setae (*Jv2* and *Jv3*) in addition to circumanal setae.....36
- 34 Most podonotal and opisthonotal setae serrate on one side
.....*A. (A.) makarovae* Eidelberg, 1994; Russia
- Most podonotal and opisthonotal setae pilose 35
- 35 Fixed cheliceral digit with 16-18 teeth; epistome triramous anteriorly; with one pair of metapodal platelets; post-anal seta aciculate and smooth
.....*A. (A.) lobocheilus* Halliday, Walter & Lindquist, 1998; Australia
- Fixed cheliceral digit with 7-8 teeth; epistome biramous anteriorly; with two pairs of metapodal platelets; post-anal seta clavate and serrate.....
.....*A. (A.) kurumanensis* Jordaan, Loots & Theron, 1987; South Africa
- 36 Epistome convex; seta *st3* inserted on unsclerotized cuticle
.....*A. (A.) hispaniensis* Bernhard, 1963;France
- Epistome triramous anteriorly; seta *st3* inserted on sternal shield..... 37
- 37. Most podonotal and opisthonotal setae slightly pilose; *j1* aciculate
.....*A. (A.) dungeri* Karg, 1965; Germany
- Most podonotal and opisthonotal setae feather-shaped; seta *j1* fan-shape, widely expanded, pubescent38
- 38. Unsclerotized cuticle along lateral margins of ventrianal shield with setae smooth; setae *st1* inserted on unsclerotized cuticle anterior to sternal shield; leg I considerably longer than idiosoma
.....*A. (A.) borussicus* Sellnick, 1945; Germany and Russia
- Unsclerotized cuticle along lateral margins of ventrianal shield with most setae pilose (*Jv1*, *Jv4* and *Zv1–Zv3* smooth); setae *st1* inserted on sternal shield; leg I conspicuously shorter than idiosoma39

39. Fixed cheliceral digit with 11-12 teeth; ratio palp/idiosoma about 0,35.....
A. (A.) *avius* Karg, 1977; Germany
- Fixed cheliceral digit with 4-5 teeth; ratio palp/idiosoma about 0,35.....
 A. (A.) *longipalpus* Barilo, 1987; Uzbekistan

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