Systematic & Applied Acarology 31(2): 249–278 (2026)
https://doi.org/10.11158/saa.31.2.7

ISSN 1362-1971 (print)
ISSN 2056-6069 (online)

Article

Some Phytoseiidae (Parasitiformes: Mesostigmata) from Argentina: new records, complementary descriptions, and an updated key to the species known from the country

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Abstract

Phytoseiid mites (Parasitiformes: Mesostigmata) are key natural enemies of phytophagous mites and other small arthropods, playing an important role in the biological control of pests in crops and natural plants. Despite their ecological importance, the knowledge of this family in Argentina remains incomplete, regarding taxonomy and distribution. In this study, we present a survey of phytoseiid mites on native plants from Argentina. The phytoseiid mites were collected from different plant species and localities, mainly in Santa Fe province. As a result, a total of nine species from seven genera were recorded. Among these, *Euseius sibelius* (De Leon), *Galendromimus* (*Galendromimus*) *paulista* Zacarias & Moraes, and *Metaseiulus* (*Metaseiulus*) *eiko* (El-Banhawy) are new records for Argentina. Complementary descriptions are provided for the three newly recorded species as well as for *E. inouei* (Ehara & Moraes). An updated dichotomous key to the phytoseiid species currently known from Argentina is also presented.

Keywords: Acari, predatory mites, taxonomy, natural vegetation, Espinal, Santa Fe

Introduction

Phytoseiidae is a diverse family of mites that have been extensively studied because of their importance in the biological control of crop pests (Moraes & Flechtmann 2008; McMurtry *et al.* 2013; Demite *et al.* 2014, 2017, 2021, 2025a; Rossetti *et al.* 2025). However, the taxonomy of this family remains challenging due to frequent synonymies, incomplete original descriptions, and the continuous discovery of undescribed species (Döker *et al.* 2025a). In addition, most studies on Phytoseiidae fauna have been conducted in agroecosystems, with comparatively less exploration of natural vegetation remnants, habitats that often harbor high species diversity, including undescribed taxa (Araújo & Daud 2017; Pallini *et al.* 2007). These issues emphasize the need for comprehensive faunistic surveys and more detailed taxonomic work, particularly in countries where natural habitats have been less systematically sampled (Guanilo *et al.* 2008a).

In Argentina, several taxonomic studies have been carried out on Phytoseiidae since the early 20th century (Berlese 1914; 1916a, b; Cunliffe & Baker 1953; Chant 1959; González & Schuster 1962; Sheals 1962; Athias-Henriot 1967; Karg 1979; Alzuet 1970; Herrero 1984; Fernández *et al.* 1988; Herrero *et al.* 1990; Monetti & Fernández 1995; Lemme *et al.* 1996; Müther 1998; Cédola 1999; Ruiz *et al.* 2005; Furtado *et al.* 2007; Guanilo *et al.* 2008a). Despite these contributions, the

diversity of Phytoseiidae remains poorly known or even entirely undocumented in some regions of the country, such as the Espinal phytogeographic province.

The Espinal phytogeographic province belongs to the Chaqueño domain and is characterized by polymorphic vegetation that includes deciduous and xerophilous forests, grasslands, palm groves, savannas, and shrub steppes (Cabrera 1976; Álvarez 2019). The climate is predominantly continental, with moderate rainfall, mild winters, and warm summers. The forests are mainly dominated by leguminous trees (Magnoliopsida: Fabaceae), such as *Prosopis alba* Griseb. (white algarrobo) and *Prosopis nigra* (Griseb.) Hieron (black algarrobo) (Cabrera 1976; Álvarez 2019).

Given the limited knowledge of the phytoseiid fauna in this region, our aim was to investigate the diversity of phytoseiid mites associated with native vegetation in the Espinal phytogeographic province. This study expands the knowledge of mite diversity in poorly surveyed regions of Argentina, provides three new records for the country, and includes complementary descriptions of four species to facilitate their identification. In addition, an updated dichotomous key to all Phytoseiidae species currently known from Argentina is also provided.

Materials and methods

Samplings was conducted in the natural vegetation of the Espinal region, located in Santa Fe and Entre Ríos provinces, Argentina, during July 2025. During the surveys, 20 leaves were collected from the mid-canopy of different native trees, or from all parts of the plant in the case of herbaceous species. Subsequently, the leaves were examined under a stereomicroscope, and all phytoseiid mites found were mounted on slides using Hoyer's medium (Moraes & Flechtmann 2008).

All diagnostic morphological characters used in phytoseiid mite taxonomy were examined and measured with an Olympus® CX-41 microscope equipped with a calibrated eyepiece reticle. Illustrations were prepared using a camera Lucida and subsequently digitalized and edited in Adobe Photoshop CS6. Species identification was based on several dichotomous keys (Lofego *et al.* 2024; Ferragut & Navia 2024), as well as on original descriptions, redescriptions, and taxonomic revisions of phytoseiid species.

The classification system adopted in this study follows Chant & McMurtry (2007). The nomenclature of dorsal idiosomal setae follows Lindquist & Evans (1965), as modified for phytoseiids by Rowell *et al.* (1978). The terminology for ventral setae is based on Chant & Yoshida-Shaul (1991). The interpretation of adenotaxy, poroidotaxy, and sigillotaxy follows Athias-Henriot (1971, 1975). Leg chaetotaxy is based on Evans (1963), whereas the terminology for macrosetae (e.g., *SgeIV*, *StiIV*) follows Athias-Henriot (1957). As proposed by Athias-Henriot (1975), the term *solenostome* in this study refers specifically to gland openings.

Measurements are given in micrometers (μm) and presented as means, followed by minimum and maximum values in parentheses. The length of the dorsal shield was measured along the midline, from the anterior to the posterior margins. The length of the ventrianal shield includes the cribrum and was measured along the midline. Leg lengths were measured from the base of the coxa to the tip of the tarsus, excluding the ambulacrum. All specimens were collected by the first author and are deposited in the Zoological Collection of the Department of Ecology, Universidade Federal de Goiás (ZUFG), Goiânia, Goiás, Brazil, and in the Acarology Laboratory, Department of Plant Protection, Çukurova University, Adana, Türkiye.

Results

We sampled nine phytoseiid species belonging to seven genera on 11 native plants from the provinces of Santa Fe and Entre Ríos, Argentina (Figure 1, Table 1). The most frequently sampled species was *Phytoseius guianensis* De Leon, followed by *Euseius concordis* (Chant) and *Euseius sibelius* (De Leon). The host plant with the highest richness was *Croton urucurana* Baillon. (Euphorbiaceae), with seven species sampled. Three species are new records for Argentina, namely, *E. sibelius*, *Galendromimus* (*Galendromimus*) *paulista* Zacarias & Moraes, and *Metaseiulus eiko* (El-Banhawy). In the following, we present a species list of Phytoseiidae reported from the provinces of Santa Fe and Entre Ríos, Argentina, and provide complementary descriptions for the three newly recorded species as well as for *E. inouei* (Ehara & Moraes).

TABLE 1. Abundance of phytoseiid mite species recorded on different native plant species in the natural vegetation of the Espinal region, Argentina, during July 2025.

Phytoseiid Species	Host Plant Species	Total
Euseius concordis (Chant)	*Bauhinia forficata*	1
	Celtis tala	4
	Croton urucurana	11
	Lantana sp.	13
	Psidium guajava	21
Euseius inouei (Ehara & Moraes)	*Vachellia caven*	3
	Enterolobium contortisiliquum	3
	Psidium guajava	1
	Schinus molle	1
Euseius sibelius (De Leon)	*Croton urucurana*	20
Galendromimus (*G.*) *paulista* Zacarias & Moraes	*Croton urucurana*	4
Galendromus (*G.*) *annectens* (De Leon)	*Croton urucurana*	1
Metaseiulus (*M.*) *eiko* (El–Banhawy)	*Croton urucurana*	1
Neoseiulus tunus (De Leon)	*Abutilon grandiflorum*	1
	Croton urucurana	12
	Lantana sp.	2
	Lippia alba	1
Phytoseius guianensis De Leon	*Abutilon grandiflorum*	16
	Croton urucurana	14
	Lippia alba	12
	Trixis praestans	19
Typhlodromalus peregrinus (Muma)	*Abutilon grandiflorum*	1
	Lantana sp.	1
	Total	163

Family: Phytoseiidae Berlese, 1916
Subfamily: Amblyseiinae Muma, 1961
Tribe: Euseiini Chant & McMurtry, 2005
Subtribe: Euseiina Chant & McMurtry, 2005
Genus: *Euseius* Wainstein, 1962

1. *Euseius concordis* (Chant)

Typhlodromus (*Amblyseius*) *concordis* Chant, 1959: 69.

Material examined

Four females from *Celtis tala* Gillies ex Planch. (Cannabaceae), 21 females from *Psidium guajava* L. (Myrtaceae), Arroyo Leyes, Santa Fe, Argentina, 29 July 2025, 31˚ 34' 5.79" S, 60˚ 30' 52.11" W, 18 meters above sea level (a.s.l); one female from *Bauhinia forficata* Link (Fabaceae), Reserva de la Ciudad Universitaria, Santa Fe, Santa Fe, Argentina, 25 July 2025, 31˚ 38' 12.07" S, 60˚ 40' 32.49" W, 25 meters a.s.l; 11 females from *C. urucurana*, 13 females on *Lantana* sp. (Verbenaceae), Reserva de la Ciudad Universitaria, Santa Fe, Santa Fe, Argentina, 25 July 2025, 31˚ 38' 9.18" S, 60˚ 40' 21.93" W, 25 meters a.s.l.

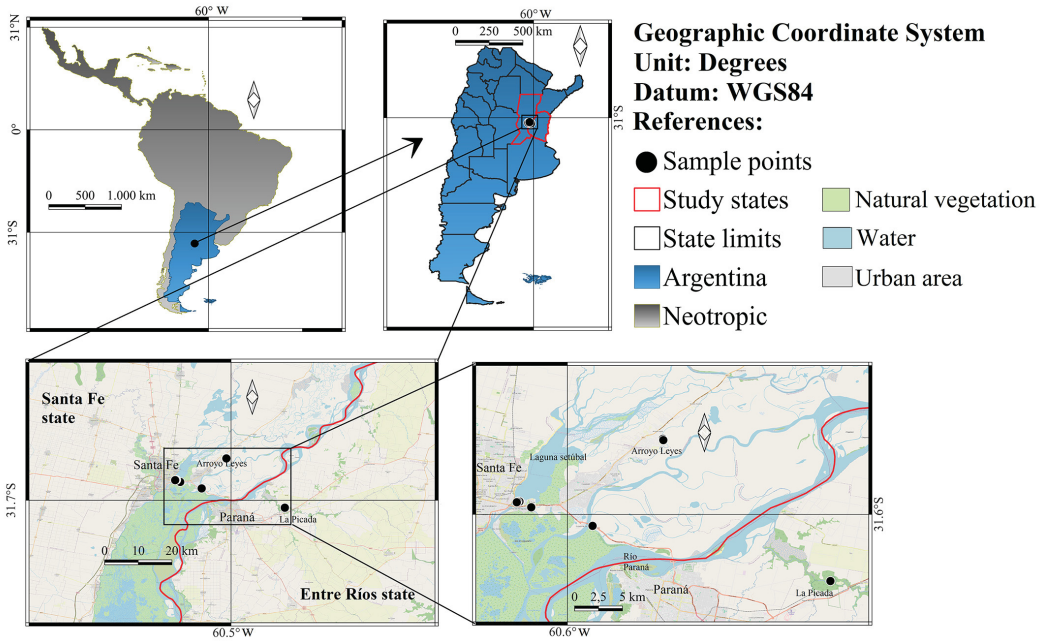

FIGURE 1. Location of sampling sites in natural vegetation in the provinces of Santa Fe and Entre Ríos, Argentina.

Remarks

Euseius concordis was originally described from Concordia, Entre Ríos, Argentina, based on specimens collected from *Citrus* sp. (Rutaceae) by Chant (1959). It is a widespread South American species, reported from a total of 15 countries, mainly in South America (Demite *et al*. 2025b). The morphological characters and measurements of the specimens examined in this study fit well with the original description and subsequent redescriptions (McMurtry 1983; Moraes & McMurtry 1983; Guanilo *et al.* 2008a, b; Lopes *et al.* 2015; Demite *et al.* 2017; Castro *et al.* 2024; Lofego *et al.* 2024).

2. *Euseius inouei* (Ehara & Moraes)

Amblyseius (*Euseius*) *inouei* Ehara & Moraes, 1998: 59.

(Figures 2–3)

Material examined

Three females, *Vachellia caven* (Mol.) Seigler & Ebinger (Fabaceae), three females, *Enterolobium contortisiliquum* (Vell.) Morong (Fabaceae), Santa Fe, Santa Fe, Argentina, 6 July

2025, 31˚ 38' 31.9" S, 60˚ 39' 35.2" W, 25 meters a.s.l.; one female, *P. guajava*, Arroyo Leyes, Santa Fe, Argentina, 29 July 2025, 31˚ 34' 5.79" S, 60˚ 30' 52.11" W, 18 a.s.l.; one female, *Schinus molle* L. (Anacardiaceae), La Picada, Entre Ríos, Argentina, 31 July 2025, 31˚ 43' 24.1" S, 60˚ 19' 50.2" W, 32 meters a.s.l.

Diagnosis

Idiosomal setal pattern 10A: 9B/14:*JV–3:ZV* (*r3* and *R1* off shield). Dorsal shield strongly reticulated with five pairs of solenostomes (*gd2*, *gd4*, *gd6*, *gd8* and *gd9*); *gd3* on soft integument. Dorsal setae smooth, except *Z5* slightly serrated and *J5* with one barb. All ventral shields smooth. Ventrianal shield vase-shaped, with preanal setae clustered in anterior part; one pair of large crescentic solenostomes. Fixed digit of chelicera with five to six subapical teeth and movable digit with one tooth. Spermatheca with calyx long, tubular, atrium large nodular attached to calyx, neck absent. Trochanter I with five (1 0/1 0/2 1) and genu II with seven setae (2 2/0 2/0 1). Setae *al* on trochanter I subulate. Macrosetae present on all legs, except leg I. All macrosetae capitate, except *SgeII* blunt in some specimens.

Complementary description

Female (n=5)

(Figures 2–3)

Dorsal idiosoma (Figure 2A). Dorsal setal pattern 10A: 9B (*r3* and *R1* off shield). Dorsal shield sclerotized, reticulated; with five pairs of solenostomes (*gd2*, *gd4*, *gd6*, *gd8*, and *gd9*), with *gd3* on soft integument at level of *gd4*; muscle marks (sigilla) mostly visible on podosoma. Length of dorsal shield 352 (345–357), width at level of *s4* 229 (225–234), width at level of *S2* 237 (230–243). Dorsal setae smooth, except *Z5* slightly serrated and *J5* with one barb. Measurements of dorsal setae as follows: *j1* 32 (30–33), *j3* 30 (27–32), *j4* 15 (15–16), *j5* 16 (15–16), *j6* 19 (17–20), *J2* 20 (20–21), *J5* 8 (7–8), *z2* 21 (20–22), *z4* 23 (21–25), *z5* 17 (16–17), *Z1* 19 (18–20), *Z4* 24 (23–25), *Z5* 69 (68–70), *s4* 37 (34–39), *S2* 25 (23–26), *S4* 30 (28–31), *S5* 31 (30–32), *r3* 18 (16–19) and *R1* 16 (15–16).

Peritrematal shield. Peritrematal shield slightly sclerotized and fused with dorsal shield at level of seta *j3*. Peritremes stippled type with three to four lines of microvilli; extending bases of setae *j1*.

Ventral idiosoma (Figure 2B). Ventral setal pattern 14:*JV–3:ZV*. Sternal shield slightly sclerotized with three pairs of setae (*ST1–ST3*) and two pairs of poroids (*iv1* and *iv2*); distance between *ST1–ST3* 61 (60–62), distance between setae *ST2* 69 (68–70); metasternal setae *ST4* on soft integument, metasternal platelets and poroid *iv3* not visible. Genital shield smooth, posteriorly truncate, with one pair of setae *ST5*; 79 (77–81) width at level of *ST5*; one pair of para–genital poroids *iv5* on soft cuticle. Ventrianal shield vase-shaped, smooth with three pairs of preanal setae (*JV1*, *JV2* and *ZV2*) clustered in anterior part. One pair of para–anal setae *PA*, unpaired post–anal seta *PST*, and a pair of large crescentic preanal solenostomes (*gv3*) posteromesad *JV2*, distance between solenostomes 27 (25–30). Length of ventrianal shield 107 (105–110), width at level of *ZV2* 62 (61–63), width at level of muscle–marks 81 (80–82). Four pairs of caudoventral setae (*ZV1*, *ZV3*, *JV4* and *JV5*) and four pairs of poroids (three pairs of *ivo*, and *ivp*) on soft cuticle surrounding ventrianal shield. Setae *JV5* smooth, 42 (40–45) in length.

Gnathosoma (Figure 2C). Subcapitulum sclerotized, with three pairs of hypostomal setae *h1* 21 (21–22), *h2* 22 (21–23), and *h3* 20 (19–20) in length, and with one pair of palp coxal seta *pc* 29 (28–30) in length; internal malae paired, not extending tip of corniculi; deutosternal groove wide 7–8 in width, with seven transverse rows of denticles, each row with two lateral denticles. Second segment of chelicera 77 (76–79) in length. Antiaxial poroid and external arthrodial brush visible. Fixed digit 25 (24–26) long, with five to six subapical teeth, and pilus dentilis; movable digit 24 (24–25) long, with one tooth.

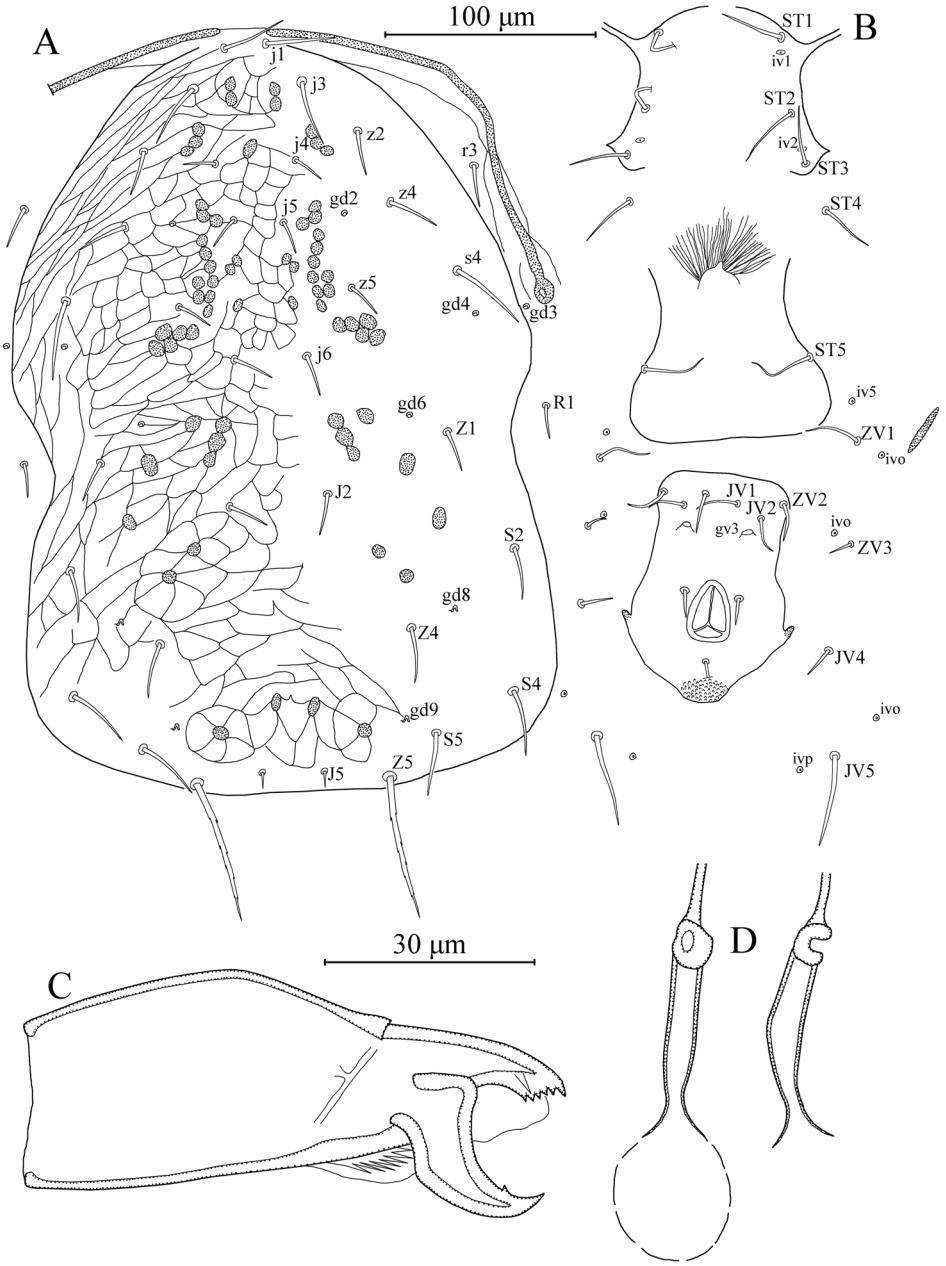

FIGURE 2. *Euseius inouei* (Ehara & Moraes, 1998), female. A. Dorsal idiosoma; B. Ventral idiosoma; C. Chelicera; D. Spermathecae.

Spermatheca (Figure 2D). Calyx long and tubular with parallel sides, flaring distally, 24 (24–25) long, 3–4 wide; atrium large nodular, slightly wider than base of calyx, attached to calyx, neck absent; major duct broad, minor duct not visible.

Legs (Figures 3A–E). Length of legs I–IV 363 (355–370), 297 (285–305), 307 (295–315), and 383 (375–390), respectively. Chaetotaxy of legs as follows; leg I: coxa 0 0/1 0/1 0, trochanter 1 0/1 0/2 1, femur 2 3/1 2/2 2, genu 2 2/1 2/1 2, tibia 2 2/1 2/1 2. Leg II: coxa 0 0/1 0/1 0, trochanter 1 0/1 0/2 1, femur 2 3/1 2/1 1, genu 2 2/0 2/0 1, tibia 1 1/1 2/1 1. Leg III: coxa 0 0/1 0/1 0, trochanter 1

1/1 0/1 1, femur 1 2/1 1/0 1, genu 1 2/1 2/0 1, tibia 1 1/1 2/1 1. Leg IV: coxa 0 0/1 0/0 0, trochanter 1 1/1 0/1 1, femur 1 2/1 1/0 1, genu 1 2/1 2/0 1, tibia 1 1/1 2/0 1. Seta *al* on trochanter I subulate. Macrosetae present on all legs, except leg I. Macrosetae capitate, except *SgeII* (*pd1*) blunt in some specimens. Measurements of macrosetae as follows: *SgeII* (*pd1*) 23 (22–25), *SgeIII* (*ad1*) 33 (32–34), *StiIII* (*ad*) 24 (23–25), *SgeIV* (*ad1*) 44 (43–44), *StiIV* (*ad*) 32 (31–33), and *StIV* (*pd3*) 55 (55–56). Distance between macroseta *StIV* and dorsal slit organ 42.

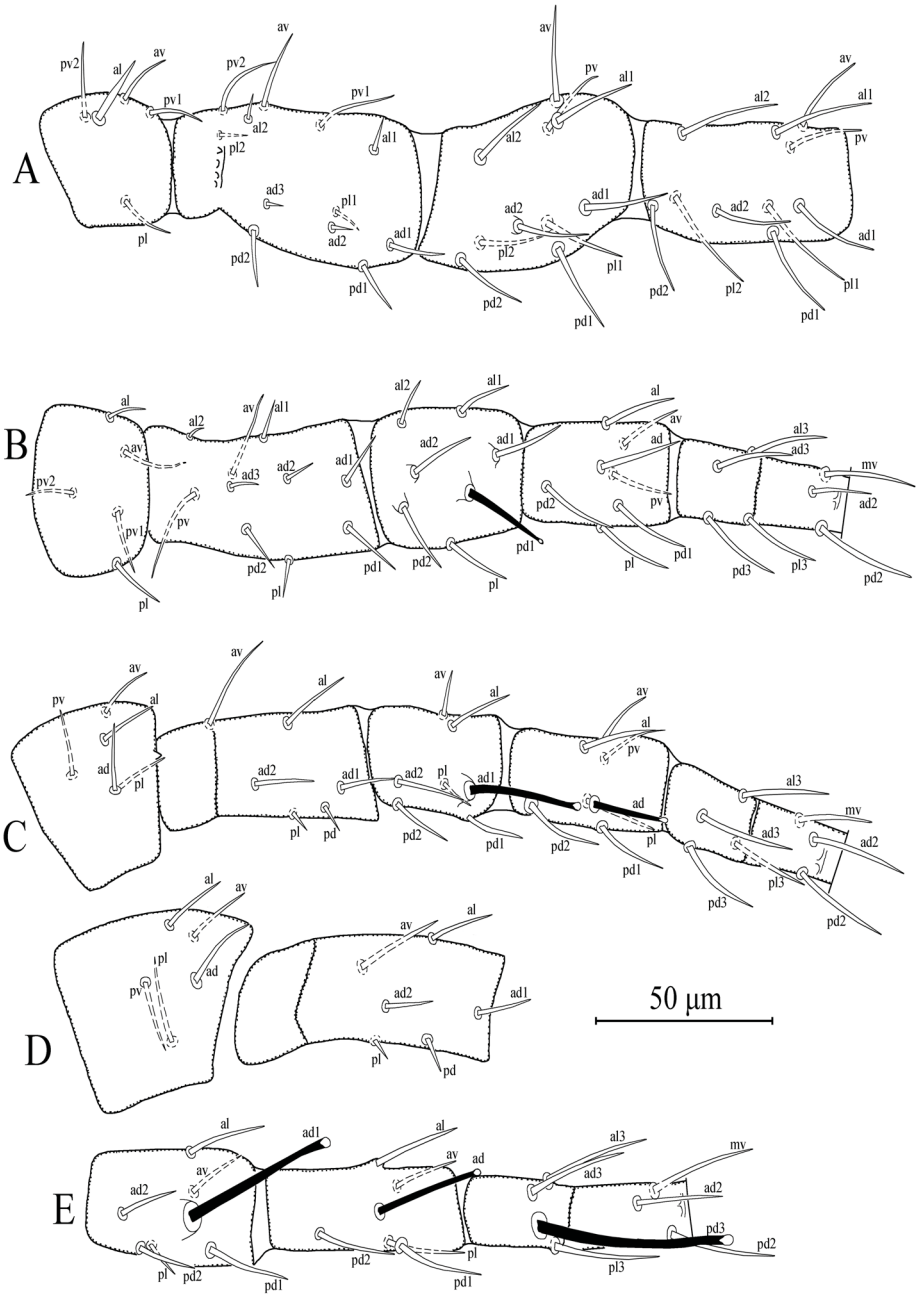

FIGURE 3. *Euseius inouei* (Ehara & Moraes, 1998), female right legs. A. Leg I (trochanter–basitarsus); B. Leg II (trochanter–basitarsus); C. Leg III (trochanter–basitarsus); D. Leg IV (trochanter–femur); E. Leg IV (genu–basitarsus) (macrosetae drawn in solid black for clarity).

Remarks

Euseius inouei was originally described from Salto, Uruguay, based on specimens collected from *Citrus* sp. (Rutaceae) by Ehara & Moraes (1998). It has been reported only three South American countries: Argentina, Brazil, and Uruguay (Demite *et al*. 2025b). The morphological characters and measurements of the specimens examined in this study fit well with the original description and subsequent redescriptions (Guanilo *et al.* 2008a; Castro *et al.* 2024; Lofego *et al.* 2024). Ehara & Moraes (1998) noted a variation in the number of metapodal plates, and Lofego *et al.* (2024) illustrated two pairs of metapodal plates. All specimens examined in this study possess a single pair of metapodal plates.

Our examination also revealed that the anterolateral seta on trochanter I is consistently modified into a subulate form, as previously reported for several species belonging to the genera *Euseius* Wainstein and *Neoseiulella* Muma (Döker *et al.* 2024; 2025a, b; Tsolakis & Ranja-William 2025; Dayoub *et al.* 2025). In addition, we report for the first time the presence of *gd3* solenostomes in this species, which are consistently located on the soft integument on both sides of all specimens examined. This solenostome is usually situated on the peritrematal shield in most phytoseiid mites, while its position is known to be variable among *Euseius* species, sometimes located on the dorsal shield near *gd4*, sometimes at the shield margin, and sometimes on the soft integument (Ferragut & Baumann 2021; Döker *et al.* 2024; 2025a, b; Dayoub *et al.* 2025).

3. *Euseius sibelius* (De Leon)

Amblyseius (*Typhlodromalus*) *sibelius* De Leon, 1962: 21.

(Figures 4–5)

Material examined

19 females, *C. urucurana*, Santa Fe, Argentina, 10 July 2025, 31˚ 39' 45.6" S, 60˚ 35' 32.3" W, 18 meters a.s.l.; one female same host, Reserva de la Ciudada Universitaria, Santa Fe, Argentina, 25 July 2025, 31˚ 38' 9.29" S, 60˚ 40' 20.05" W, 25 meters a.s.l.

Diagnosis

Idiosomal setal pattern 10A: 9B/14:*JV–3:ZV* (*r3* and *R1* on shield). Dorsal shield strongly reticulated with six pairs of solenostomes (*gd2*, *gd3*, *gd4*, *gd6*, *gd8* and *gd9*). Dorsal setae smooth, except *Z5* slightly serrated and *J5* with one barb. All ventral shields smooth except some patches of posterior reticulations on ventrianal shield. Ventrianal shield vase–shaped, with preanal setae clustered in anterior part; one pair of large crescentic solenostomes. Fixed digit of chelicera with five to six subapical teeth and movable digit with one tooth. Spermatheca with calyx long, tubular, atrium large nodular attached to calyx, neck absent. Setae *al* on trochanter I subulate. Trochanter I with five (1 0/1 0/2 1) and genu II with seven setae (2 2/0 2/0 1). Macrosetae present only on leg IV, all capitate.

Complementary description

Female (n=5)

(Figures 4–5)

Dorsal idiosoma (Figure 4A). Dorsal setal pattern 10A: 9B (*r3* and *R1* on shield). Dorsal shield sclerotized, reticulated; with six pairs of solenostomes (*gd2*, *gd3*, *gd4*, *gd6*, *gd8*, and *gd9*); muscle marks (sigilla) mostly visible on podosoma. Length of dorsal shield 293 (290–300), width at level of *s4* 175 (170–180), width at level of *S2* 163 (158–170). Dorsal setae smooth, except *Z5* slightly serrated and *J5* with one barb. Measurements of dorsal setae as follows: *j1* 27 (25–28), *j3* 25 (23–26), *j4* 20 (19–21), *j5* 20 (20–21), *j6* 22 (21–24), *J2* 24 (23–25), *J5* 8 (7–9), *z2* 25 (24–26), *z4* 27 (25–

28), *z5* 21 (20–23), *Z1* 22 (20–24), *Z4* 24 (23–25), *Z5* 59 (56–60), *s4* 31 (30–32), *S2* 23 (22–25), *S4* 23 (22–23), *S5* 23 (22–23), *r3* 24 (24–25) and *R1* 17 (17–18).

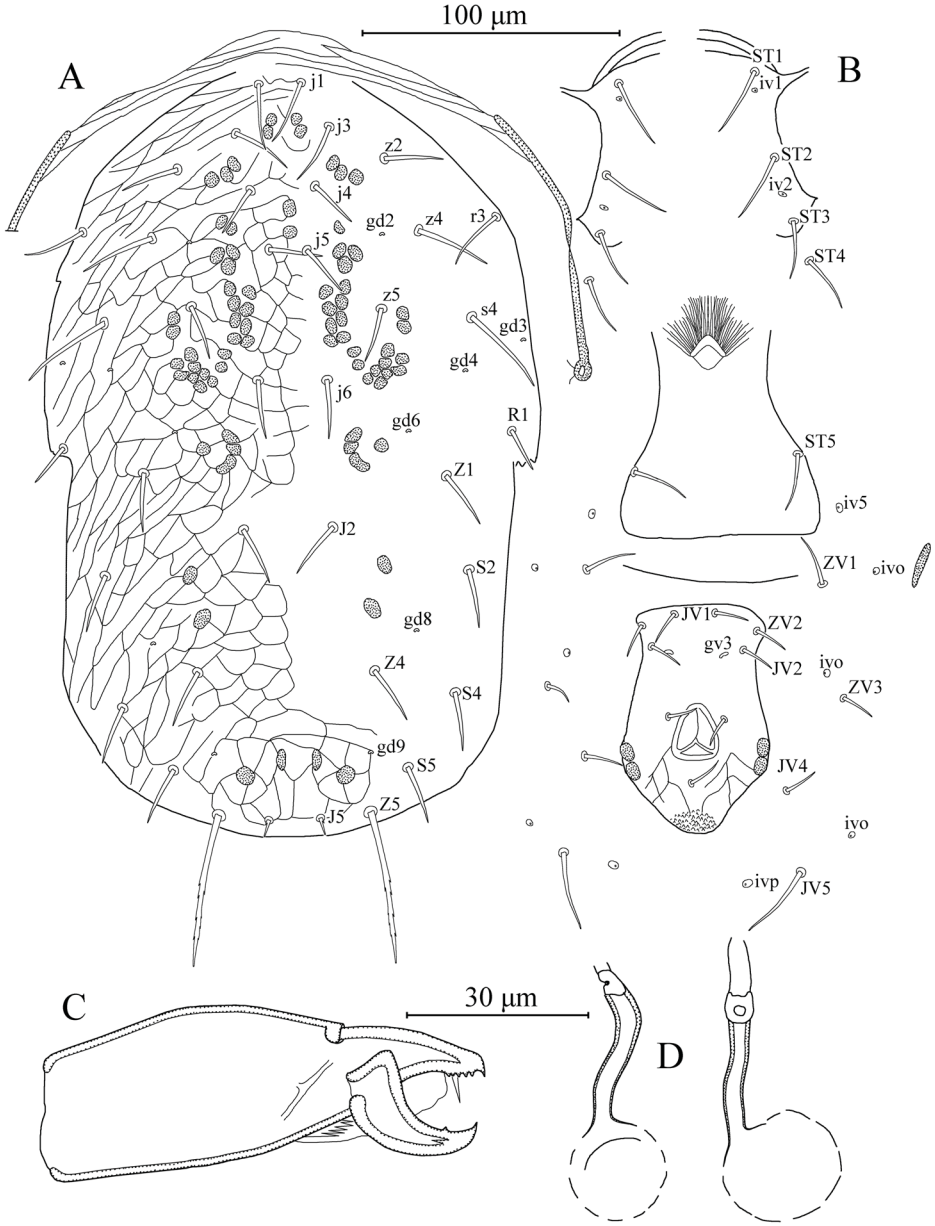

FIGURE 4. *Euseius sibelius* (De Leon, 1962), female. A. Dorsal idiosoma; B. Ventral idiosoma; C. Chelicera; D. Spermathecae.

Peritrematal shield. Peritrematal shield slightly sclerotized and fused with dorsal shield at level of seta *j1*. Peritremes stippled type with three to four lines of microvilli; extending between setae *j3* and *z2*.

Ventral idiosoma (Figure 4B). Ventral setal pattern 14:*JV–3:ZV*. Sternal shield slightly sclerotized with three pairs of setae (*ST1–ST3*) and two pair of poroids (*iv1* and *iv2*); distance between *ST1–ST3* 58 (57–60), distance between setae *ST2* 64 (63–65); metasternal setae *ST4* on soft

integument, metasternal platelets and poroid *iv3* not visible. Genital shield smooth, posteriorly truncate, wider than ventrianal shield, with one pair of setae *ST5*; 64 (58–68) width at level of *ST5*; one pair of para-genital poroids *iv5* on soft cuticle. Ventrianal shield vase-shaped, smooth except some patches of reticulations between the cribrum and the anal opening with three pairs of preanal setae (*JV1*, *JV2* and *ZV2*) clustered in anterior part. One pair of para-anal setae *PA*, unpaired post-anal seta *PST*, and a pair of large crescentic preanal solenostomes (*gv3*) posteromesad *JV2*, distance between solenostomes 20 (18–22). Length of ventrianal shield 90 (85–93), width at level of *ZV2* 47 (45–50), width at level of muscle-marks 57 (55–59). Four pairs of caudoventral setae (*ZV1*, *ZV3*, *JV4* and *JV5*) and four pairs of poroids (three pairs of *ivo*, and *ivp*) on soft cuticle surrounding ventrianal shield. Setae *JV5* smooth, 30 (30–31) in length.

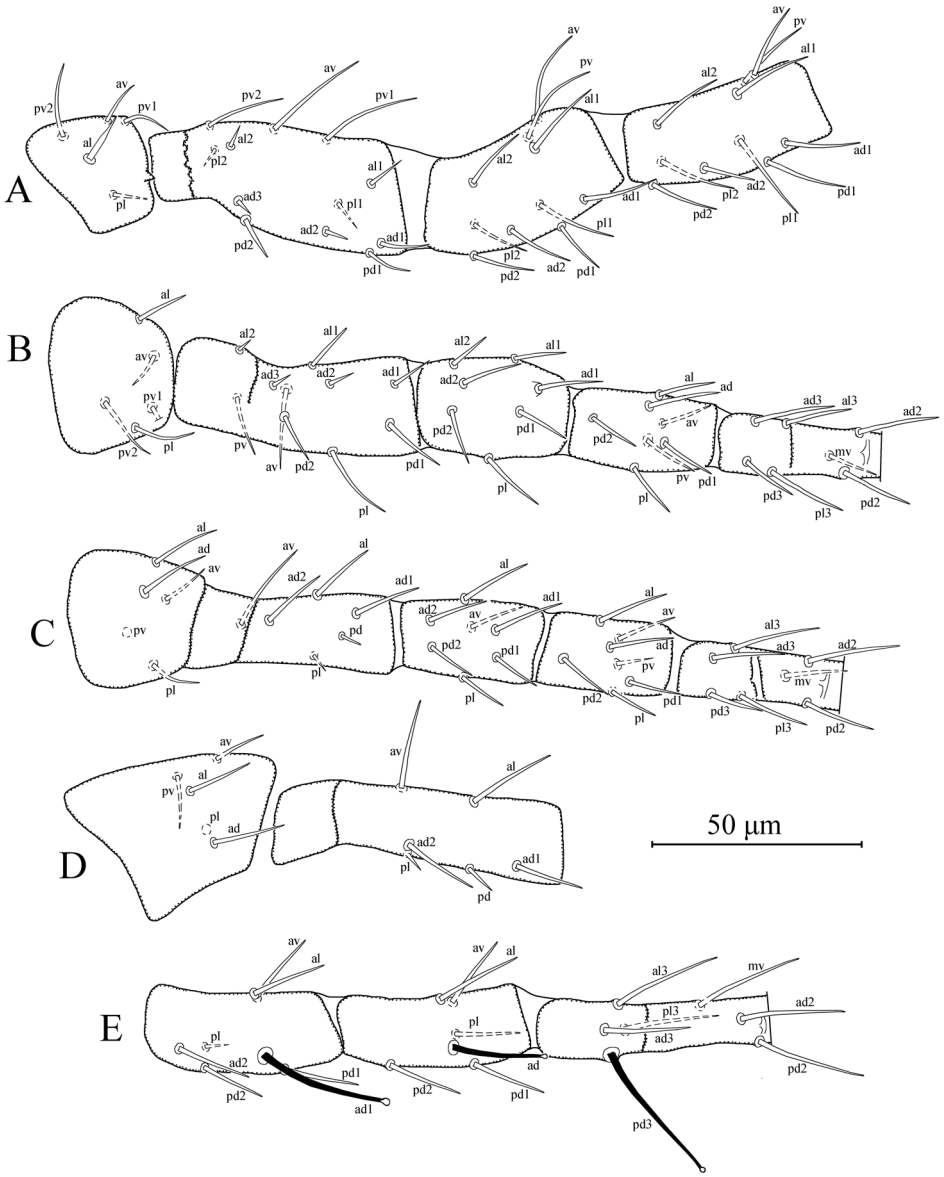

FIGURE 5. *Euseius sibelius* (De Leon, 1962), female right legs. A. Leg I (trochanter–basitarsus); B. Leg II (trochanter–basitarsus); C. Leg III (trochanter–basitarsus); D. Leg IV (trochanter–femur); E. Leg IV (genu–basitarsus) (macrosetae drawn in solid black for clarity).

Gnathosoma (Figure 4C). Subcapitulum sclerotized, with three pairs of hypostomal setae *h1* 19 (18–20), *h2* 19 (17–20), and *h3* 17 (16–18) in length, and with one pair of palp coxal seta *pc* 24 (23–25) in length; internal malae paired, not extending tip of corniculi; deutosternal groove wide 7–8 in width, with seven transverse rows of denticles, each row with two lateral denticles. Second segment of chelicera 69 (66–70) in length. Antiaxial poroid and external arthrodial brush visible. Fixed digit 23 (22–24) long, with five to six subapical teeth, and pilus dentilis; movable digit 23 (22–24) long, with one tooth.

Spermatheca (Figure 4D). Calyx long and tubular with parallel sides, flaring distally, 21 (19–22) long, 3–4 wide; atrium large nodular, as wide as or slightly wider than base of calyx, attached to calyx, neck absent; major duct broad, minor duct not visible.

Legs (Figures 5A–E). Length of legs I–IV 313 (310–315), 245 (240–250), 242 (240–245), and 347 (335–355), respectively. Chaetotaxy of legs as follows; leg I: coxa 0 0/1 0/1 0, trochanter 1 0/1 0/2 1, femur 2 3/1 2/2 2, genu 2 2/1 2/1 2, tibia 2 2/1 2/1 2. Leg II: coxa 0 0/1 0/1 0, trochanter 1 0/1 0/2 1, femur 2 3/1 2/1 1, genu 2 2/0 2/0 1, tibia 1 1/1 2/1 1. Leg III: coxa 0 0/1 0/1 0, trochanter 1 1/1 0/1 1, femur 1 2/1 1/0 1, genu 1 2/1 2/0 1, tibia 1 1/1 2/1 1. Leg IV: coxa 0 0/1 0/0 0, trochanter 1 1/1 0/1 1, femur 1 2/1 1/0 1, genu 1 2/1 2/0 1, tibia 1 1/1 2/0 1. Seta *al* on trochanter I subulate. Macrosetae present only leg IV all capitate. Measurements of macrosetae as follows: *SgeIV* (*ad1*) 30 (28–32), *StiIV* (*ad*) 20 (20–21), and *StIV* (*pd3*) 36 (35–38). Distance between macroseta *StIV* and dorsal slit organ 37 (36–39).

Remarks

Euseius sibelius was originally described from Florida, USA based on specimens collected from different host plants by De Leon (1962). It is also a widespread South American species, reported from 16 countries, mainly in South America. This is the first report of this species from Argentina (Demite *et al.* 2025b).

The morphological characters and measurements of the specimens examined in this study fit well with the original description and subsequent redescriptions (Lofego *et al.* 2004, 2009, 2024; Ferragut *et al.* 2011; Demite *et al.* 2017; Muma & Denmark 1970; Kreiter *et al.* 2018; Guanilo *et al.* 2008c; Castro *et al.* 2024). Similar to *E. inouei*, our examination also revealed that the anterolateral seta on trochanter I is consistently modified into a subulate form in this species. In addition, *gd3* solenostomes are located near lateral margin (posterolateral to *s4*) of the dorsal shield without any variation.

Subtribe: Typhlodromalina Chant & McMurtry, 2005
Genus: *Typhlodromalus* Muma, 1961

4. *Typhlodromalus peregrinus* (Muma)
Typhlodromus peregrinus Muma, 1955: 270.

Material examined

One female, *Abutilon grandiflorum* G.Don (Malvaceae), Reserva de la Ciudad Universitaria, Santa Fe, Argentina, 25 July 2025, 31˚ 38' 8.96" S, 60˚ 40' 24.33" W, 25 meters a.s.l.; one female, *Lantana* sp., Reserva de la Ciudad Universitaria, Santa Fe, Argentina, 25 July 2025, 31˚ 38' 9.18" S, 60˚ 40' 21.93" W, 25 meters a.s.l.

Remarks

Typhlodromalus peregrinus was originally described from Florida, USA based on specimens collected from orange by Muma (1955). This species has been reported in approximately 20

countries, including those in South America (Demite *et al.* 2025b). The morphological characters and measurements of the specimens examined in this study fit well with the original description and subsequent redescriptions (McMurtry 1983; Moraes & Mesa 1988; Guanilo *et al.* 2008a, c; Demite *et al.* 2017; Kreiter *et al.* 2018; Demard *et al.* 2021; Lofego *et al.* 2024).

Tribe: Neoseiulini Chant & McMurtry, 2003
Genus: *Neoseiulus* Hughes, 1948

5. *Neoseiulus tunus* (De Leon)
Typhlodromips tunus De Leon, 1967: 29.

Material examined

One female, *Lippia alba* (Mill.) N.E.Br. Ex Britton & P.Wilson (Verbenaceae), Arroyo Leyes, Santa Fe, Argentina, 29 July 2025, 31˚ 34' 1.12" S, 60˚ 30' 53.58" W, 18 meters a.s.l.; one female, *A. grandiflorum*, Reserva de la Ciudad Universitaria, Santa Fe, Argentina, 25 July 2025, 31˚ 38' 8.96" S, 60˚ 40' 24.33", 25 meters a.s.l.; 8 females and 4 males, *C. urucurana*, Reserva de la Ciudad Universitaria, Santa Fe, Argentina, 25 July 2025, 31˚ 38' 9.29" S, 60˚ 40' 20.05", 25 meters a.s.l.; two females, *Lantana* sp., Reserva de la Ciudad Universitaria, 25 July 2025, 31˚ 38' 9.18" S, 60˚ 40' 21.93", 25 meters a.s.l.

Remarks

Neoseiulus tunus was originally described from Trinidad based on specimens collected from guava by De Leon (1967). It was reported from a total of nine countries in South America (Demite *et al.* 2025b). The morphological characters and measurements of the specimens examined in this study fit well with the original description and subsequent redescriptions (Moraes *et al.* 2000; Guanilo *et al.* 2008a, c; Cavalcante *et al.* 2017; Demite *et al.* 2017; Kreiter *et al.* 2018; Ferragut & Navia 2022; Castro *et al.* 2024; Lofego *et al.* 2004, 2024). However, genu II consistently bears eight setae as reported by Ferragut & Navia (2022) with formula 2 2/1 2/0 1, without variation.

Subfamily: Phytoseiinae Berlese, 1913
Genus: *Phytoseius* Ribaga, 1904

6. *Phytoseius guianensis* De Leon
Phytoseius (*Pennaseius*) *guianensis* De Leon, 1965a: 18.

Material examined

Ten females and two males, *L. alba*, Arroyo Leyes, Santa Fe, Argentina, 29 July 2025, 31˚ 34' 1.12" S, 60˚ 30' 53.58" W, 18 meters a.s.l.; one female, *C. urucurana*, Santa Fe, Argentina, 10 July 2025, 31˚ 39' 45.60" S, 60˚ 35' 32.26" W, 18 meters a.s.l.; 11 females and two males, *C. urucurana*, Reserva de la Ciudad Universitaria, Santa Fe, Argentina, 25 July 2025, 31˚ 38' 9.29" S, 60˚ 40' 20.05" W, 25 meters a.s.l.; 16 females, *A. grandiflorum*, Reserva de la Ciudad Universitaria, 25 July 2025 31˚ 38' 8.96" S, 60˚ 40' 24.33" W, 25 meters a.s.l.; 19 females, *Trixis praestans* (Vell.) Cabrera (Asteraceae), Reserva de la Ciudad Universitaria, 25 July 2025, 31˚ 38' 9.66" S, 60˚ 40' 29.55" W, 25 meters a.s.l.

Remarks

Phytoseius guianensis was originally described from Guyana based on specimens collected from *Pueraria phaseoloides* (Roxb.) Benth. (Fabaceae) by De Leon (1965a). The species was

reported in five countries of South America (Demite *et al.* 2025b). The morphological characters and measurements of the specimens examined in this study fit well with the original description and subsequent redescriptions (Denmark 1966; Guanilo *et al.* 2008a, b; Demite *et al.* 2017; Castro *et al.* 2024; Ferragut & Navia 2024).

Subfamily: Typhlodrominae Wainstein, 1962
Tribe: Galendromimini Chant & McMurtry, 1994
Genus: *Galendromimus* Muma, 1961

7. *Galendromimus* (*Galendromimus*) *paulista* Zacarias & Moraes
Galendromimus (*Galendromimus*) *paulista* Zacarias & Moraes, 2001: 97.
(Figures 6–8)

Material examined

Three females and one male, *C. urucurana*, Santa Fe, Argentina, 10 July 2025, 31˚ 39' 45.60" S, 60˚ 35' 32.26" W, 18 meters a.s.l.

Diagnosis

Idiosomal setal pattern 11D: 5C/13:*JV-4:ZV-3* (*r3* on shield). Dorsal shield strongly reticulated with five pairs of solenostomes (*gd2*, *gd4*, *gd6*, *gd8* and *gd9*). Dorsal setae thick, thorn–like, arising from tubercles, serrated, except *j4*, *j5*, *j6* and *z5* minute and smooth and *J5* with one or two barbs. Solenostome *gd3* present on peritrematal shield. Genital shield smooth as wide as ventrianal shield. Ventrianal shield subrectangular, longer than wide, smooth except some patches of reticulations visible at level of anal opening; with four pairs of preanal setae (*JV1*, *JV2*, *JV3* and *ZV2*); one pair of large crescentic solenostomes. Fixed digit of chelicera with three subapical teeth and movable digit with one tooth. Spermatheca with calyx long, narrow, slightly inflated at base, atrium nodular attached to calyx, neck absent. Trochanter I with five (1 0/1 0/2 1) and genu II with eight setae (2 2/ 1 2/0 1) or seven setae (2 2/0 2/0 1). Legs without macrosetae. Male ventrianal shield with four pairs of preanal setae; spermatodactyl L-shaped with toe well developed.

Complementary description

Female (n=3)
(Figures 6–7)

Dorsal idiosoma (Figure 6A). Dorsal setal pattern 11D: 5C (*r3* on shield). Dorsal shield sclerotized, reticulated; with five pairs of solenostomes (*gd2*, *gd4*, *gd6*, *gd8*, and *gd9*); muscle marks (sigilla) mostly visible on podosoma. Length of dorsal shield 321 (318–325), width at level of *s4* 153 (150–155), width at level of *Z1* 159 (158–162). Dorsal setae thick, thorn-like, arising from tubercules, serrated, except *j4*, *j5*, *j6* and *z5* minute and smooth and *J5* with one or two barbs. Measurements of dorsal setae as follows: *j1* 23 (21–25), *j3* 16 (15–17), *j4* 8 (7–8), *j5* 8 (7–8), *j6* 9 (8–9), *J5* 8, *z2* 34 (32–35), *z4* 50 (48–52), *z5* 8, *Z1* 74 (72–75), *Z4* 80 (77–82), *Z5* 80 (75–85), *s4* 51 (50–52), *s6* 59 (58–60), *S5* 17 (16–18), and *r3* 29 (27–30).

Peritrematal shield. Peritrematal shield fused with dorsal shield at level of seta *j1* except one specimen at level of *z2* in left side. Peritremes stippled type with three to four lines of microvilli; extending bases of setae *j1*. Solenostomes *gd3*, and poroid *id3* in association with *gd3* visible. Solenostome *gdp* large inserted posterior to stigmatic opening, solenostome *gv2* inserted near posterior corners of shield.

Ventral idiosoma (Figure 6B). Ventral setal pattern 13:*JV-4:ZV-3*. Sternal shield not sclerotized, probably with two pairs of setae (position of *ST3* in relation to *ST1* and *ST2* in left side of illustrated

specimen), sternal poroids *iv1* and *iv2*, not visible; distance between *ST1–ST2* 31 (30–32), distance between setae *ST2* 67 (65–70); metasternal setae *ST4* on soft integument, metasternal platelets and poroid *iv3* not visible. Genital shield smooth, as wide as ventrianal shield, with one pair of setae *ST5*; 68 (66–70) width at level of *ST5*; one pair of para-genital poroids *iv5* on soft cuticle. Ventrianal shield subrectangular, longer than wide, smooth except some patches of reticulations visible at level of anal opening; with four pairs of preanal setae (*JV1*, *JV2*, *JV3*, and *ZV2*), one pair of para-anal setae *PA*, unpaired post-anal seta *PST*, and a pair of large crescentic preanal solenostomes (*gv3*) posteromesad *JV2*, distance between solenostomes 13 (12–14). Length of ventrianal shield 101 (100–102), width at level of *ZV2* 71 (69–72), width at level of para-anal setae 71 (69–72). Two pairs of caudoventral setae (*ZV1*, and *JV5*) and four pairs of poroids (three pairs of *ivo*, and *ivp*) on soft cuticle surrounding ventrianal shield. Setae *JV5* serrated, 28 (25–30) in length.

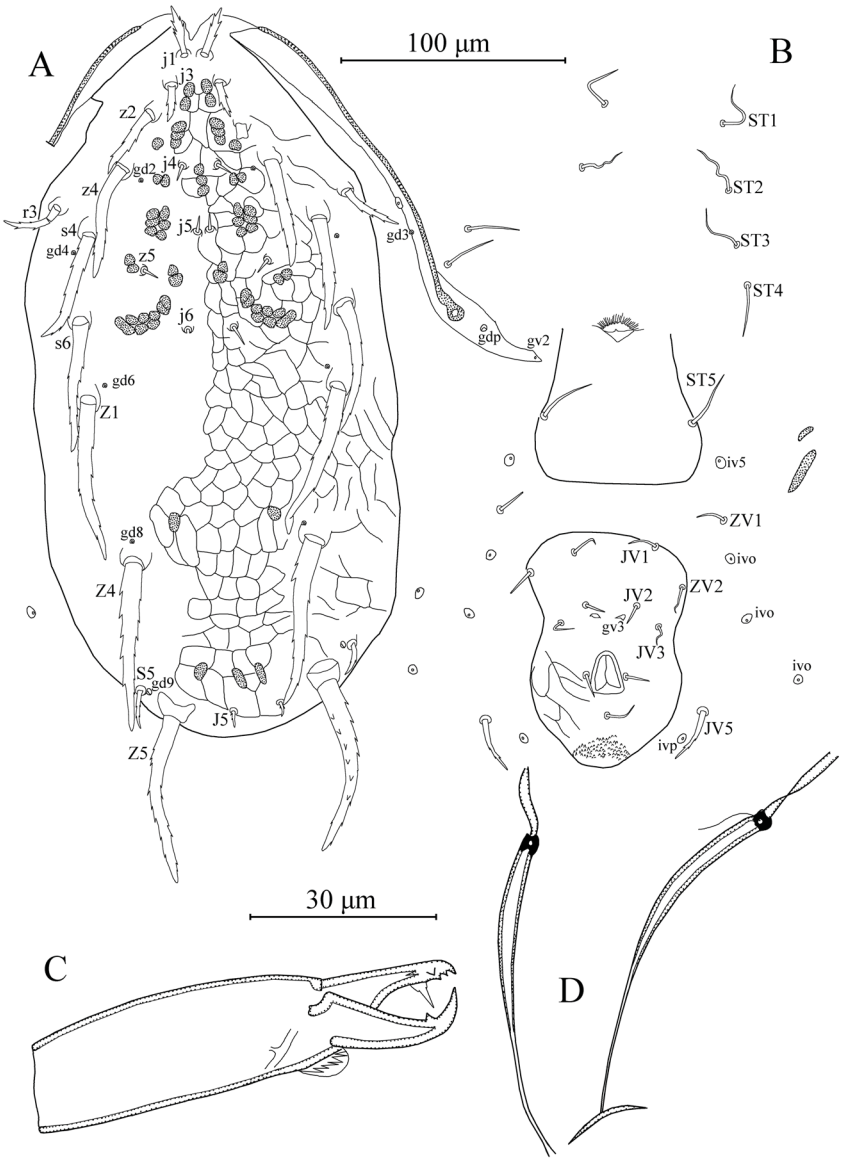

FIGURE 6. *Galendromimus* (*Galendromimus*) *paulista* Zacarias & Moraes, 2001, female. A. Dorsal idiosoma; B. Ventral idiosoma; C. Chelicera; D. Spermathecae.

Gnathosoma (Figure 6C). Subcapitulum slightly sclerotized, with three pairs of hypostomal setae *h1* 19 (18–21), *h2* 19 (18–21), and *h3* 18 (18–20) in length, and with one pair of palp coxal seta *pc* 18 (18–20) in length; internal malae paired, not extending tip of corniculi; deutosternal groove narrow 3–4 in width, with seven transverse rows of denticles, each row with two lateral denticles. Second segment of chelicera 72 (70–74) in length. Antiaxial poroid and external arthrodial brush visible. Fixed digit 24 (22–25) long, with three subapical teeth, and pilus dentilis; movable digit 23 (22–24) long, with one tooth.

Spermatheca (Figure 6D). Calyx long, slightly inflated at base, then narrowing apically, 50 (49–53) long, 4 wide at widest point; atrium nodular attached to calyx, neck absent; major duct broad, minor duct not visible.

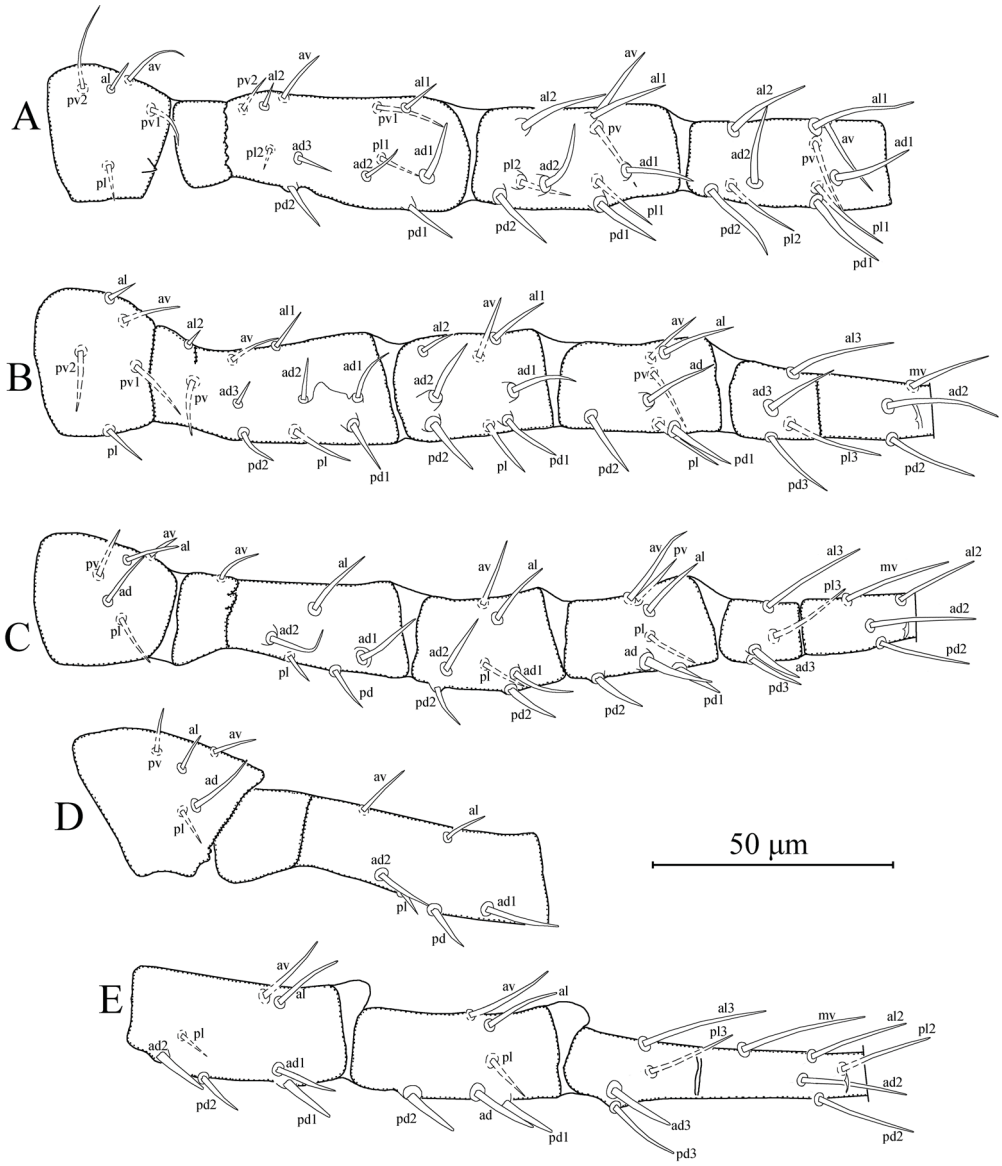

FIGURE 7. *Galendromimus* (*Galendromimus*) *paulista* Zacarias & Moraes, 2001, female right legs. A. Leg I (trochanter–basitarsus); B. Leg II (trochanter–basitarsus); C. Leg III (trochanter–basitarsus); D. Leg IV (trochanter-femur); E. Leg IV (genu–basitarsus).

Legs (Figures 7A–E). Length of legs I–IV 294 (290–298), 255 (250–260), 250 (245–255), and 326 (320–335), respectively. Chaetotaxy of legs as follows; leg I: coxa 0 0/1 0/1 0, trochanter 1 0/1 0/2 1, femur 2 3/1 2/2 2, genu 2 2/1 2/1 2, tibia 2 2/1 2/1 2. Leg II: coxa 0 0/1 0/1 0, trochanter 1 0/1 0/2 1, femur 2 3/1 2/1 1, genu 2 2/1 2/0 1, tibia 1 1/1 2/1 1. Leg III: coxa 0 0/1 0/1 0, trochanter 1 1/1 0/1 1, femur 1 2/1 1/0 1, genu 1 2/1 2/0 1, tibia 1 1/1 2/1 1. Leg IV: coxa 0 0/1 0/0 0, trochanter 1 1/1 0/1 1, femur 1 2/1 1/0 1, genu 1 2/1 2/0 1, tibia 1 1/1 2/0 1. Number of setae on genu II variable; eight in both side of illustrated specimen, seven in right side in one specimen and seven in the left side of other specimen. In case of seven setae, formula 2 2/0 2/0 1, *av* absent. Legs without macrosetae. Most dorsal setae and some lateral setae are thick, thorn-like, arising from tubercles.

Male (n=1)
(Figure 8)

Dorsal idiosoma (Figure 8A). Dorsal setal pattern 11D: 5C (*r3* on shield). Dorsal shield sclerotized, reticulated; with five pairs of solenostomes (*gd2*, *gd4*, *gd6*, *gd8*, and *gd9*); muscle marks (sigilla) mostly visible on podosoma. Length of dorsal shield 245, width at level of *s4* 136, width at level of *Z1* 135. Dorsal setae thick, thorn-like, arising from tubercules, serrated, except *j4*, *j5*, *j6* and *z5* minute and smooth, and *S5* and *J5* with one barb. Measurements of dorsal setae as follows: *j1* 18, *j3* 14, *j4* 6, *j5* 5, *j6* 7, *J5* 8, *z2* 25, *z4* 35, *z5* 6, *Z1* 46, *Z4* 44, *Z5* 47, *s4* 35, *s6* 37, *S5* 13, and *r3* 20.

Peritrematal shield. Peritrematal shield fused with dorsal shield at level of seta *z2*. Peritremes stippled type with three to four lines of microvilli; extending between setae *j3* and *z2*. Solenostomes *gd3* not visible either on soft cuticle or dorsal shield, and poroid *id3* visible. Solenostome *gdp* inserted posterior to stigmatic opening, solenostome *gv2* not visible.

Ventral idiosoma (Figure 8B). Ventral setal pattern 12:*JV-4:ZV1–3*. Sternogenital shield not sclerotized, probably with five pairs of setae (*ST1–ST5*); sternogenital poroids *iv1–iv3*, not visible; distance between *ST1–ST5* 98, distance between setae *ST3* 61. Ventrianal shield triangular, smooth except some patches of reticulations around anal opening; with four pairs of preanal setae (*JV1*, *JV2*, *JV3*, and *ZV2*), one pair of para-anal setae *PA*, unpaired post–anal seta *PST*, and a pair of large crescentic preanal solenostomes (*gv3*) posteromesad *JV2*, distance between solenostomes 8. Length of ventrianal shield 94, width at level of anterior corners 144. One pair of caudoventral seta *JV5* and two pairs of poroids (pair of *ivo*, and *ivp*) on soft cuticle surrounding ventrianal shield. Setae *JV5* smooth 12 in length.

Chelicera (Figure 8C). Second segment of chelicera 62 in length. Antiaxial poroid not visible, external arthrodial brush visible. Fixed digit 19 long, with three subapical teeth, and pilus dentilis; movable digit 19 long, with one tooth. Spermatodactyl L-shaped with toe well developed, shaft 20 in length.

Legs. Length of legs I–IV 253, 220, 220, and 278, respectively. Chaetotaxy of legs as in female, except genu II with seven setae both sides, formula genu 2 2/0 2/0 1. Legs without macrosetae.

Remarks

Galendromimus (*Galendromimus*) *paulista* was originally described by Zacarias & Moraes (2001) based on specimens collected from *Croton floribundus* Spreng. (Euphorbiaceae) in Piracicaba, São Paulo, Brazil. The species is known only from the original description; therefore, this study represents the first record of *G*. (*G*.) *paulista* for the Argentinian fauna. Although the original description is quite detailed, it still lacks several characters that are currently considered essential for species differentiation within Phytoseiidae, such as complete leg chaetotaxy and dorsal solenostomes.

In addition, an important difference was detected between the original description and the present specimens. While all three females examined here bear one tooth on the movable digit of the

chelicera, the original description reports the movable digit as smooth. We contacted Dr. Raphael Castilho (ESALQ/USP, Piracicaba, Brazil) for re-examination of the type material. He was able to access some paratype specimens and confirmed that at least two paratypes also possess one tooth on the movable digit of the chelicera, consistent with the Argentinian specimens examined in this study.

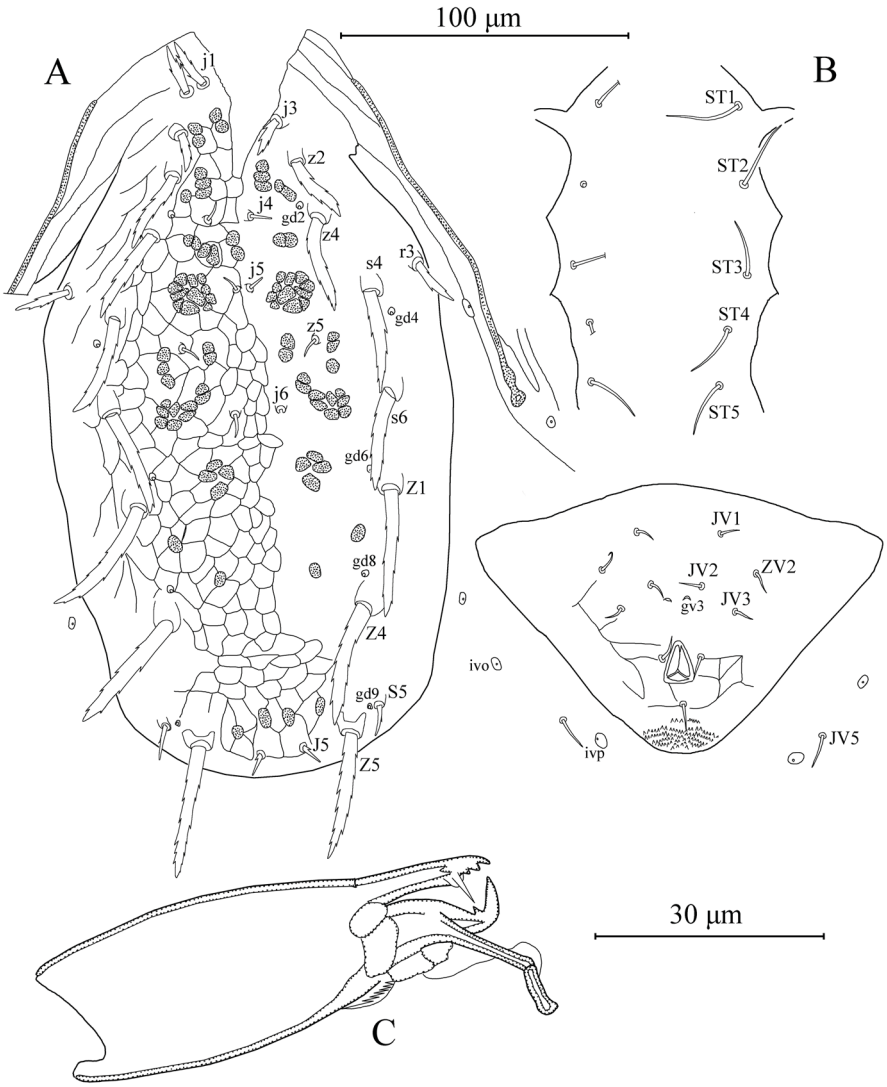

FIGURE 8. *Galendromimus* (*Galendromimus*) *paulista* Zacarias & Moraes, 2001, male. A. Dorsal idiosoma; B. Ventral idiosoma; C. Chelicera.

Tribe: Metaseiulini Chant & McMurtry
Genus: *Galendromus* Muma, 1961

8. Galendromus (Galendromus) annectens (De Leon)
Typhlodromus annectens De Leon, 1958: 75

Material examined

One female, *C. urucurana*, Santa Fe, Argentina, 10 July 2025, 31˚ 39' 45.60" S, 60˚ 35' 32.26" W, 18 meters a.s.l.

Remarks

Galendromus (*Galendromus*) *annectens* was originally described from Florida, USA based on specimens collected from *Trema floridanum* Britton ex Small (Cannabaceae) by De Leon (1958). This species was reported in 16 countries mainly in Central and South America (Demite *et al.* 2025b). The morphological characters and measurements of the specimen examined in this study fit well with the original description and subsequent redescriptions (Chant & Yoshida-Shaul 1984a; Moraes & Mesa 1988; Demite *et al.* 2017; Guanilo *et al.* 2008a, b).

Genus: *Metaseiulus* Muma, 1961

9. *Metaseiulus* (*Metaseiulus*) *eiko* (El-Banhawy)

(Figures 9–10)

Typhlodromus eiko El–Banhawy, 1984: 138.

Material examined

One female, *C. urucurana*, Reserva de la Ciudada Universitaria, Santa Fe, Argentina, 25 July 2025, 31˚ 38' 9.29", S 60˚ 40' 20.05" W, 25 meters a.s.l.

Diagnosis

Idiosomal setal pattern 12A: 6B/14:*JV–4:ZV* (*r3* off shield, *R1* on shield). Dorsal shield reticulated with five pairs of solenostomes (*gd2*, *gd4*, *gd6*, *gd8* and *gd9*). Dorsal simple, smooth, except *Z4* and *Z5* serrated and *J5* with one barb. Solenostome *gd3* present on peritrematal shield. All ventral shields smooth, except ventrianal shield with some patches of reticulations around anal opening. Ventrianal shield elongated, longer than wide; with four pairs of preanal setae (*JV1*, *JV2*, *JV3* and *ZV2*); one pair of crescentic solenostomes. Fixed digit of chelicera with two subapical teeth and movable digit with one tooth. Spermatheca with calyx long, trumpet-shaped, atrium large nodular attached to calyx, neck absent. Trochanter I with five (1 0/1 0/2 1) and genu II with seven setae (2 2/0 2/0 1). Legs without macrosetae.

Complementary description

Female (n=1)

(Figures 9–10)

Dorsal idiosoma (Figure 9A). Dorsal setal pattern 12A: 6B (*r3* off shield and *R1* on shield). Dorsal shield sclerotized, reticulated; with five pairs of solenostomes (*gd2*, *gd4*, *gd6*, *gd8*, and *gd9*); 13 pairs of poroids (sensillae) (*id1*, *id2*, *id4*, *id5*, *id6*, *idm2*, *idm4*, *idm5*, *idm6*, *is1*, *idl1*, *idl3*, and *idl4*). Muscle marks (sigilla) mostly visible on podosoma. Length of dorsal shield 315, width at level of *s4* 166, width at level of *R1* 174. Dorsal setae simple, smooth, except *Z4* and *Z5* serrated, and *J5* with one barb. Measurements of dorsal setae as follows: *j1* 20, *j3* 21, *j4* 16, *j5* 15, *j6* 17, *J2* 20, *J5* 11, *z2* 20, *z3* 23, *z4* 24, *z5* 17, *Z4* 35, *Z5* 50, *s4* 24, *s6* 26, *S5* 26, *r3* 25 and *R1* 28.

Peritrematal shield. Peritrematal shield fused with dorsal shield at level of seta *j1*. Peritremes stippled type starting with three to four lines of microvilli continue with two lines to apex; extending bases of setae *j1*. Solenostomes *gd3*, and poroid *id3* in association with *gd3* visible. Solenostome *gdp* large, inserted posterior to stigmatic opening, solenostome *gv2* inserted near posterior corners of shield.

Ventral idiosoma (Figure 9B). Ventral setal pattern 14:*JV–4:ZV*. Sternal shield broken, slightly sclerotized, with two pairs of setae (*ST1–ST2*), setae *ST3* on separate platelets attached to shield, sternal poroids *iv1* and *iv2* visible; distance between *ST1–iv2* 58, distance between setae *ST2* 50; metasternal setae *ST4* and poroid *iv3* on metasternal platelets. Genital shield smooth, as wide as

ventrianal shield, with one pair of setae *ST5*; 56 width at level of *ST5*; one pair of para-genital poroids *iv5* on soft cuticle. Ventrianal shield elongated, much longer than wide, smooth except some patches of reticulations around anal opening; with four pairs of preanal setae (*JV1*, *JV2*, *JV3*, and *ZV2*), one pair of para-anal setae *PA*, unpaired post-anal seta *PST*, and a pair of crescentic preanal solenostomes (*gv3*) posteromesad *JV2*, distance between solenostomes 11. Length of ventrianal shield 104, width at level of *ZV2* 64, width at level of para-anal setae 64. Three pairs of caudoventral setae (*ZV1*, *ZV2* and *JV5*) and five pairs of poroids (four pairs of *ivo*, and *ivp*) on soft cuticle surrounding ventrianal shield. Setae *JV5* smooth, 32 in length.

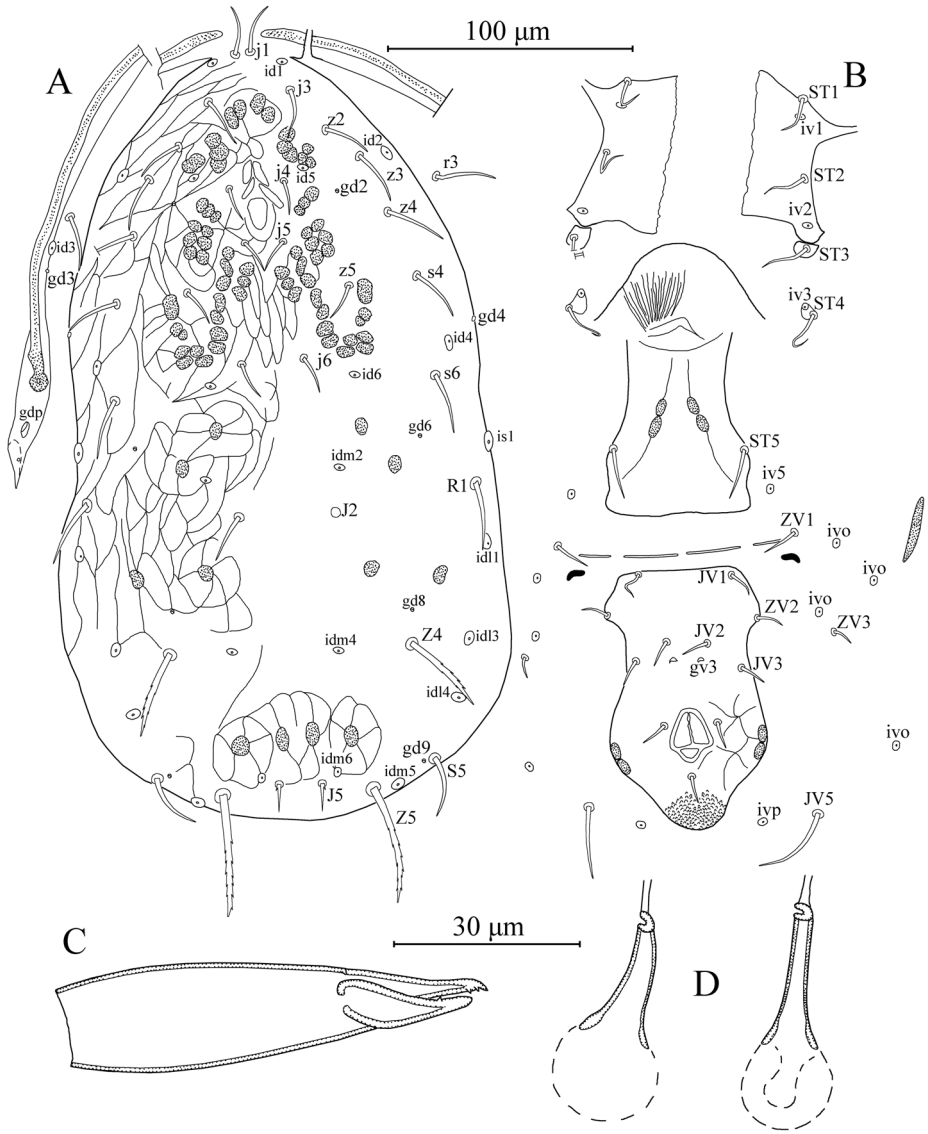

FIGURE 9. *Metaseiulus* (*Metaseiulus*) *eiko* (El-Banhawy, 1984), female. A. Dorsal idiosoma; B. Ventral idiosoma; C. Chelicera; D. Spermathecae.

Gnathosoma (Figure 9C). Subcapitulum slightly sclerotized, with three pairs of hypostomal setae *h1* 18, *h2* 16, and *h3* 19 in length, and with one pair of palp coxal seta *pc* 19 (18–20) in length; internal malae paired, not extending tip of corniculi; deutosternal groove narrow 3 in width, with

seven transverse rows of denticles, each row with two lateral denticles, except basal row consisted 2–3 denticles vertically aligned each side. Second segment of chelicera 68 in length. Antiaxial poroid and external arthrodial brush not visible. Fixed digit 24 long, with two subapical teeth, and pilus dentilis; movable digit 23 long, with one tooth.

Spermatheca (Figure 9D). Calyx long, trumpet-shaped, flaring distally, 19 long, 3–4 wide at widest point; atrium nodular attached with calyx; major duct broad, minor duct not visible.

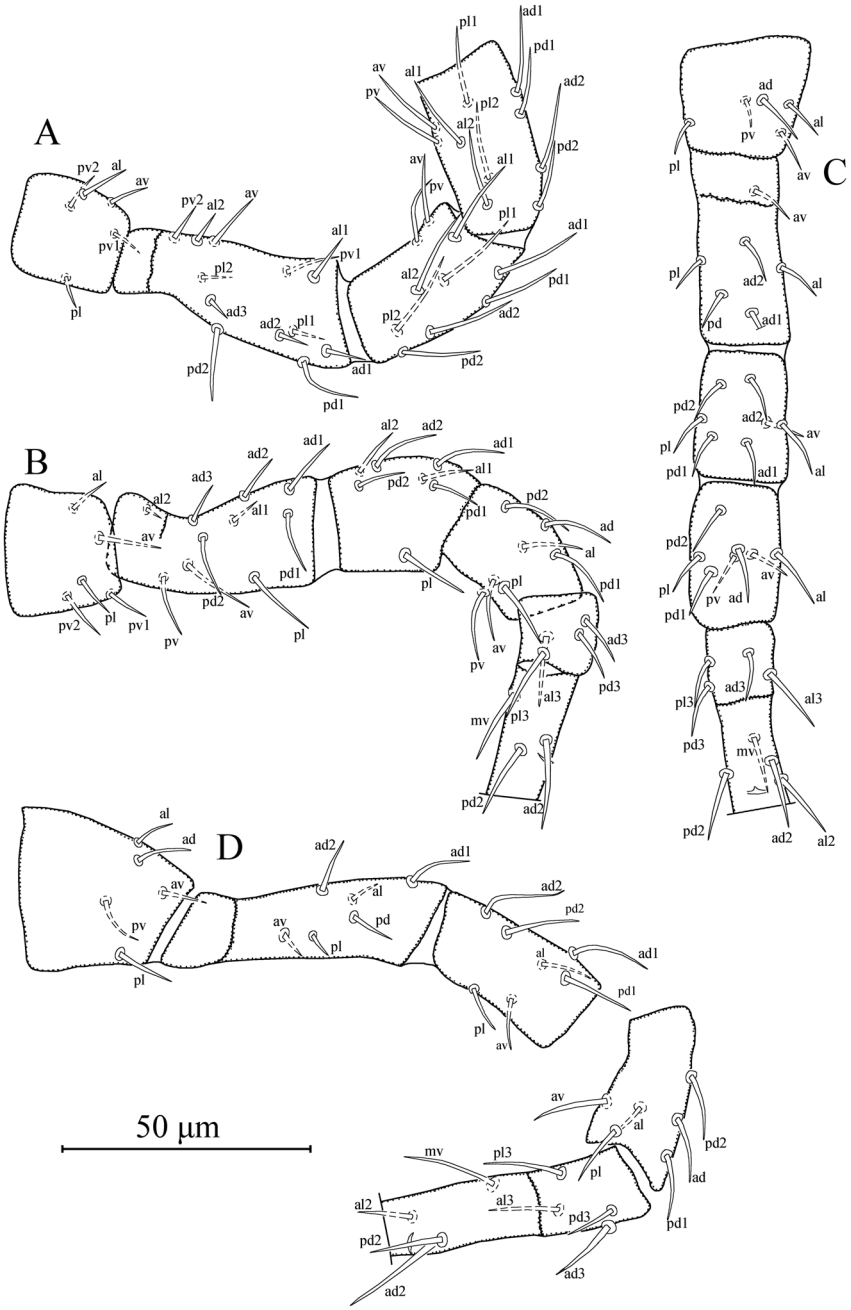

FIGURE 10. *Metaseiulus* (*Metaseiulus*) *eiko* (El-Banhawy, 1984), female right legs. A. Leg I (trochanter–basitarsus); B. Leg II (trochanter–basitarsus); C. Leg III (trochanter–basitarsus); D. Leg IV (trochanter–basitarsus).

Legs (Figures 10A–D). Length of legs I–IV 255, 218, 200, and 263, respectively. Chaetotaxy of legs as follows; leg I: coxa 0 0/1 0/1 0, trochanter 1 0/1 0/2 1, femur 2 3/1 2/2 2, genu 2 2/1 2/1 2, tibia 2 2/1 2/1 2. Leg II: coxa 0 0/1 0/1 0, trochanter 1 0/1 0/2 1, femur 2 3/1 2/1 1, genu 2 2/0 2/0 1, tibia 1 1/1 2/1 1. Leg III: coxa 0 0/1 0/1 0, trochanter 1 1/1 0/1 1, femur 1 2/1 1/0 1, genu 1 2/1 2/0 1, tibia 1 1/1 2/1 1. Leg IV: coxa 0 0/1 0/0 0, trochanter 1 1/1 0/1 1, femur 1 2/1 1/0 1, genu 1 2/1 2/0 1, tibia 1 1/1 2/0 1. Legs without macrosetae.

Remarks

Metaseiulus (*Metaseiulus*) *eiko* was originally described from Brazil by El-Banhawy (1984). The species has been known only from the Brazilian fauna; therefore, this study represents the first record of *M*. (*M*.) *eiko* from Argentina. Although the original description and subsequent redescriptions are quite detailed, they still lack several characters that are currently considered essential for species differentiation within Phytoseiidae, such as the presence and position of dorsal solenostomes. The morphological characters and measurements of our specimen are consistent with those given in the original description, the redescription of the holotype by Chant & Yoshida-Shaul (1984b), and the complementary description provided by Castro *et al.* (2024). However, the setal measurements of our single specimen are 4–5 µm longer than those reported by El-Banhawy (1984) and Chant & Yoshida-Shaul (1984b), but closer to those reported by Castro *et al.* (2024). Moreover, while El-Banhawy (1984) reported three setae on the sternal shield, it was not clear from Chant & Yoshida-Shaul (1984b) whether the sternal seta *ST3* was located on the sternal shield, due to the unsclerotized condition of the shield in the holotype. In our specimen, however, it was clearly observed that the sternal seta *ST3* is situated on a small platelet attached to the sternal shield.

Discussion

Nine phytoseiid species were recorded in the present survey of the Espinal region. Three of these species, *E. sibelius*, *G*. (*G*.) *paulista*, and *M*. (*M*.) *eiko*, represent new records for Argentina. The remaining species have been reported previously in various provinces, primarily in northwestern Argentina such as Tucumán, Jujuy and Salta, and to a lesser extent in the Litoral and Patagonian regions (Herrero 1984; Fernández *et al*. 1988; Furtado *et al*. 2007; Guanilo *et al*. 2008a; Ferragut & Navia 2015).

Guanilo *et al*. (2008a) provided the most comprehensive previous contribution to Argentinian phytoseiid taxonomy, reporting 22 species, 10 of which were new records, and describing new taxa such as *Neoseiulus argentinus* Guanilo & Moraes. However, no studies had specifically targeted the natural vegetation of the Espinal phytogeographic province. Our study addresses this gap by focusing on native vegetation, mainly in Santa Fe province, and contributes additional records for the country as well as complementary descriptions of four species to facilitate their identification. The findings of this study emphasize the need for further faunistic surveys in poorly sampled ecoregions, as natural habitats may harbor undescribed species and unique assemblages. Understanding the diversity and distribution of phytoseiid mites in native vegetation is critical not only for taxonomic and ecological knowledge but also for potential applications in biological control and for the conservation of the natural ecosystems of the Espinal phytogeographic province.

An updated key to Argentinian species of Phytoseiidae

1. Dorsal setae *z3* and *s6* absent . . . . . **subfamily Amblyseiinae Muma** 2
- Either or both of dorsal setae *z3* and *s6* present 50

2. Preanal setae are clustered on the anterior one-third of the ventrianal shield, with forward migration of preanal setae *JV2* and *ZV2* 3
- Preanal setae are more widely separated forming a triangular pattern. 11
3. Chelicera reduced in size, stubby, with a group of small teeth clustered subapically on the fixed digit . . . . **Subtribe Euseiina Chant & McMurtry** . . . . **Genus *Euseius* Wainstein** 4
- Chelicera normal in size and shape, with prominent teeth evenly distributed along fixed digit . . . . . **Subtribe Typhlodromalina Chant & McMurtry** . . . . **Genus *Typhlodromalus* Muma** 10
4. Sublateral setae *r3* and *R1* inserted on dorsal shield; macrosetae present only on leg IV . . . . . ***Euseius sibelius* (De Leon)**
- Sublateral setae *r3* and *R1* inserted on soft integument; macrosetae present at least on leg III in addition to leg IV 5
5. Dorsal shield reticulated. 6
- Dorsal shield generally smooth except a few anterolateral reticulations or striations 8
6. Peritreme long extending level of seta *j1*; solenostome *gd3* inserted on soft integument . . . . . ***Euseius inouei* (Ehara & Moraes)**
- Peritreme short at most extending seta level of *j3*; solenostome *gd3* inserted on dorsal shield, posterolateral to seta *s4* 7
7. Dorsal seta *z4* short, not reaching the base of seta *s4*. . . . . ***Euseius citrifolius* Denmark & Muma**
- Dorsal seta *z4* long, reaching the base of seta *s4* . . . . . ***Euseius hibisci* (Chant)**
8. Dorsal setae *z4* short about half-length between its base and the base of seta *s4* . . . . . ***Euseius mesembrinus* (Dean)**
- Dorsal setae *z4* longer than half-length between its base and the base of seta *s4* 9
9. Macrosetae on leg IV distinctly capitate distally . . . . . ***Euseius concordis* (Chant)**
- Macrosetae on leg IV blunt distally . . . . . ***Euseius fructicolus* (Gonzalez & Schuster)**
10. Dorsal seta *z4* long about twice as long as *z2*. . . . . ***Typhlodromalus aripo* De Leon**
- Dorsal seta *z4* short, at most 1.4 times as long as seta *z2*. . . . . ***Typhlodromalus peregrinus* (Muma)**
11. Dorsal seta *S4* absent 12
- Dorsal seta *S4* present. 15
12. Some dorsolateral setae arising from tubercles; ventrianal shield long and narrow with three pairs of preanal setae; 10 setae on tibia I with formula (2 2/1 2/1 2). . . . . **Tribe Kampimodromini Kolodochka** . . . . **Subtribe Paraphytoseiina Chant & McMurtry** . . . . **Genus *Paraphytoseius* Swirski & Schechter** . . . . ***Paraphytoseius orientalis* (Narayanan, Kaur & Ghai)**
- Dorsolateral setae not arising from tubercles; ventrianal shield reduced, ovoid, with 0-1 pair of preanal setae; 11 setae on tibia I with formula (2 2/1 2/2 2). . . . . **Tribe Phytoseiulini Chant & McMurtry** . . . . **Genus *Phytoseiulus* Evans** 13
13. Dorsal setae *S5* absent; sternal shield with two pairs of setae (*ST1–ST2*) . . . ***Phytoseiulus longipes* Evans**
- Dorsal setae *S5* present; sternal shield with three pairs of setae (*ST1–ST3*) 14
14. Calyx of spermatheca wide, saccular; dorsocentral setae *j4*, *j5*, and *j6* smooth; setae *j4* and *j5* short subequal to seta *z5* . . . . . ***Phytoseiulus fragariae* Denmark & Schicha**
- Calyx of spermatheca inflated at base where it connects atrium then narrowing apically; dorsocentral setae *j4*, *j5*, and *j6* serrated; setae *j4* and *j5* longer, at least three times longer than seta *z5* . . . . . ***Phytoseiulus macropilis* (Banks)**
15. Ratio setae *s4*: *Z1* < 3.0: 1.0 16
- Ratio setae *s4*: *Z1* > 3.0: 1.0 . . . . . **Tribe Amblyseiini Muma** 29
16. Leg IV with three macrosetae; fixed digit of chelicera with more than six teeth . . . . . **Tribe Typhlodromipsini Chant & McMurtry** 17
- Leg IV without or with only one macroseta; fixed digit of chelicera with six or less teeth . . . . . **Tribe Neoseiulini Chant & McMurtry** 18
17. Dorsal shield mostly striated with some patches of reticulations; spermatheca with atrium slightly forked at juncture with major duct, or atrium appearing thick-walled, vacuolated. . . . . ***Typhlodromips fissuratus* Ferragut**
- Dorsal shield smooth; spermatheca with atrium knobbed not forked at juncture with major duct, nor appearing thick-walled, vacuolated . . . . . ***Typhlodromips valdivianus* Ferragut**

18. Dorsal seta *J1* present; *R1* absent . . . . . **Genus *Evansoseius* Sheals**
. . . . . ***Evansoseius macfarlanei* Sheals**
- Dorsal setae *J1* absent; *R1* present 19
19. Dorsal seta *z6* present . . . . . **Genus *Chileseius* Gonzalez & Schuster** 20
- Dorsal seta *z6* absent . . . . . **Genus *Neoseiulus* Chant & McMurtry** 21
20. Dorsal seta *J4* present; preanal pores *gv3* widely separated, located posterolateral to setae *JV2*; movable digit of chelicera with two teeth; three macrosetae on leg IV, distinctly capitate . . . . . .
. . . . . ***Chileseius australis* Ferragut**
- Dorsal seta *J4* absent; preanal pores *gv3* close together, located posteromedian to setae *JV2*; movable digit of chelicera with three teeth; one macroseta on leg IV, sharp pointed. . . . . .
. . . . . ***Chileseius paracamposi* Yoshida-Shaul & Chant**
21. Most dorsal setae strongly serrated 22
- Dorsal setae smooth, except *Z4* and *Z5* slightly serrated 23
22. All dorsal setae serrated except *J5* with one barb; genu II with 8 setae; movable digit of chelicera with three teeth; ventrianal shield smooth with a pair of crescentic preanal solenostomes located posteromedian to setae *JV2* . . . . . ***Neoseiulus tunus* (De Leon)**
- Dorsocentral setae *j4*, *j5*, *j6*, *J2*, and *z5* smooth; genu II with 9 setae; movable digit of chelicera with two teeth; ventrianal shield reticulated with a pair of rounded preanal solenostomes located posterior to setae *JV2*, further apart . . . . . ***Neoseiulus argentinus* Guanilo & Moraes**
. . . . . (=*Vikramus cordobus* Denmark & Evans, suspected junior synonymy)
23. Dorsal shield reticulated 24
- Dorsal shield smooth 27
24. Dorsal shield with seven pairs of solenostomes (*gd1*, *gd2*, *gd4*, *gd5*, *gd6*, *gd8* and *gd9*) . . . . . .
. . . . . ***Neoseiulus mapuche* Ferragut**
- Dorsal shield with three or four pairs of solenostomes (*gd8* absent, *gd2* present/ absent) 25
25. Dorsal shield with four pairs of solenostomes (*gd1*, *gd2*, *gd6* and *gd9*) . . . . . .
. . . . . ***Neoseiulus cordobus* Denmark & Evans**
- Dorsal shield with three pairs of solenostomes (*gd1*, *gd6* and *gd9*). 26
26. Calyx short, length and width subequal . . . . . ***Neoseiulus californicus* (McGregor)**
- Calyx elongated, approximately two times longer than width. . . . ***Neoseiulus idaeus* Denmark & Muma**
27. Dorsal shield with five pairs of solenostomes (*gd1*, *gd2*, *gd4*, *gd6* and *gd9*) 28
- Dorsal shield with four pairs of solenostomes (*gd1*, *gd4*, *gd6* and *gd9*) . . . . . ***Neoseiulus barkeri* Hughes**
28. Seta *z2* about two times shorter than seta *Z1* . . . . . ***Neoseiulus transversus* Denmark & Muma**
- Seta *z2* and *Z1* subequal in length . . . . . ***Neoseiulus chascomensis* (Sheals)**
29. Sternal shield narrower, length/width ratio usually ca. 1.0:1.0 (the species in the genus *Chelaseius* are exceptions); female ventrianal shield usually longer than wide, length/width ratio usually greater than 1.0; all shields lightly sclerotized; seta *J2* present; genital shield approximately as wide as ventrianal shield, ratio width genital shield to width ventrianal shield usually approximately 1.0: 1.0 . . . . . .
. . . . . **Subtribe Amblyseiina Muma** 30
- Sternal shield broader, length/width ratio less than 1.0; female ventrianal shield usually broader, length/ width ratio less than 1.0: 1.1; all shields more strongly sclerotized; seta *J2* present/absent; genital shield usually narrower than ventrianal shield, ratio width of genital shield to width of ventrianal shield usually 1.0:1.1–3.9 41
30. Spermatheca with atrium forked at juncture with major duct, or atrium appearing thick-walled, vacuolated
. . . . . **Genus *Graminaseius* Chant & McMurtry**
. . . . . ***Graminaseius sobrinulus* (Athias-Henriot)**
- Spermatheca with atrium not forked at juncture with major duct, nor appearing thick-walled, vacuolated .
. 31
31. Chelicera unusually large, robust with fixed digit much longer than movable digit . . . . . .
. . . . . **Genus *Chelaseius* Muma & Denmark** 32
- Chelicera of normal size, fixed digit not much longer than movable digit . . . . . .
. . . . . **Genus *Amblyseius* Berlese** 33
32. Calyx of spermatheca short cup-or bell-shaped . . . . . ***Chelaseius schusterellus* (Athias-Henriot)**
- Calyx of spermatheca long and narrow . . . . . ***Chelaseius austrellus* (Athias-Henriot)**
33. Female ventrianal shield vase-shaped, wider at level of anus than at level of setae *ZV2* . . . . . .
. . . . . ***Amblyseius herbicolus* (Chant)**

- Female ventrianal shield not vase-shaped, not wider at level of anus than at level of setae *ZV2* 34
34. Dorsal seta *z4* long at least as long as 2/3 distance between its base and that of seta *s4* . . . . . ***Amblyseius fraterculus* Berlese**
- Seta *z4* short/minute, not as long as 2/3 distance between its base and that of seta *s4* 35
35. Spermatheca with calyx swollen basally, bladder-like, then narrowing and finally flaring distally . . . . . ***Amblyseius deleonellus* Athias-Henriot**
- Spermatheca with not as above 36
36. Preanal solenostomes *gv3* small rounded 37
- Preanal solenostomes *gv3* large crescentic 38
37. Preanal pores *gv3* widely separated, located posterolateral to setae *JV2* . . . . . ***Amblyseius pritchardellus* Athias-Henriot**
- Preanal pores *gv3* more closer, located posterior to setae *JV2* . . . . ***Amblyseius franzellus* Athias-Henriot**
38. Spermatheca with calyx short cup- or v-shaped; movable digit of chelicera with three teeth 39
- Spermatheca with calyx tubular elongated; movable digit of chelicera with four teeth . . . . . ***Amblyseius aerialis* (Muma)**
39. Genu II with eight setae . . . . . ***Amblyseius neochiapensis* Lofego, Moraes & McMurtry**
- Genu II with seven setae 40
40. Spermatheca with calyx cup-shaped; atrium knobbed and slightly forked . . . . . ***Amblyseius chiapensis* De Leon**
- Spermatheca with calyx v-shaped; atrium enlarged, not forked . . . . ***Amblyseius swirskii* Athias-Henriot**
41. Dorsal seta *J2* present . . . . . **subtribe Arrenoseiina Chant & McMurtry** 42
- Dorsal seta *J2* absent . . . . . **subtribe Proprioseiopsina Chant & McMurtry** 43
42. Dorsal setae *j3* and *s4* longer than distance between their bases and the bases of setae *j1* and *Z1*, respectively . . . . . ***Arrenoseius grandis* (Berlese)**
- Dorsal setae *j3* and *s4* shorter than distance between their bases and the bases of setae *j1* and *Z1*, respectively . . . . . ***Arrenoseius tucumanensis* (Sheals)**
43. Spermatheca with calyx elongate, tubular . . . . . ***Proprioseiopsis mumaellus* (Athias-Henriot)**
- Spermatheca with calyx short, cup- or bell-shaped or saccular 44
44. Spermatheca with calyx cup-shaped 45
- Spermatheca with calyx bell-shaped or saccular 46
45. Seta *j3* shorter than seta *j1* . . . . . ***Proprioseiopsis edbakeri* (Athias-Henriot)**
- Seta *j3* ca. twice as long as seta *j1* . . . . . ***Proprioseiopsis globosus* (Gonzalez & Schuster)**
46. Dorsal setae *S2* about five times longer than setae *Z1* . . . . . ***Proprioseiopsis campanulus* Karg**
- Dorsal setae *S2* less than two times longer than setae *Z1* 47
47. Spermatheca with calyx punctate in basal half . . . . . ***Proprioseiopsis donchanti* (Athias-Henriot)**
- Spermatheca with calyx smooth not punctate 48
48. Dorsal setae *Z5* long, longer than the distance between their bases; preanal solenostomes *gv3* widely separated, located almost posterior to setae *JV2* . . . . . ***Proprioseiopsis messor* (Wainstein)**
- Dorsal setae *Z5* short, shorter than the distance between their bases; preanal solenostomes *gv3* closer, located between setae *JV2* 49
49. Movable digit of chelicera with three teeth . . . . . ***Proprioseiopsis neotropicus* (Ehara)**
- Movable digit of chelicera with only one tooth . . . . . ***Proprioseiopsis ovatus* (Garman)**
50. Dorsal setae *Z1*, *S2*, *S4* and *S5* absent . . . . . **Subfamily Phytoseiinae Berlese** . . . . . **Genus *Phytoseius* Ribaga** . . . . . ***Phytoseius guianensis* De Leon**
- At least one of dorsal setae *Z1*, *S2*, *S4* or *S5* present . . . . . **Subfamily Typhlodrominae Wainstein** 51
51. Dorsal setae *z3* absent . . . . . **Tribe Galendromimini Chant & McMurtry** 52
- Dorsal setae *z3* present 53
52. Dorsal seta *Z1* absent; seta *R1* present . . . . . **Genus *Silvaseius* Chant & McMurtry** . . . . . ***Silvaseius barretoae* (Yoshida-Shaul & Chant)**
- Dorsal seta *Z1* present; seta *R1* absent . . . . . **Genus *Galendromimus* Muma** . . . . . ***Galendromimus* (*Galendromimus*) *paulista* Zacarias & Moraes**
53. Dorsal seta *z6* present . . . . . **Tribe Paraseiulini Wainstein** . . . . . **Genus *Paraseiulus* Muma** . . . . . ***Paraseiulus talbii* (Athias-Henriot)**
- Dorsal seta *z6* absent 54

54. Setae *S4* present . . . . . **Tribe Typhlodromini Wainstein**
. . . . . **Genus *Typhlodromus* Scheuten**
. . . . . **Subgenus *Anthoseius* De Leon** 55
- Setae *S4* absent . . . . . **Tribe Metaseiulini Chant & McMurtry** 56
55. Ventrianal shield with three pairs of preanal setae (*JV3* absent); sternal shield with median posterior projection; most of dorsal setae serrated with apical knobs; calyx of spermatheca elongated funnel-shaped without neck; dorsal shield with four pairs of solenostomes (*gd2*, *gd6*, *gd8* and *gd9*); genu II with eight setae (2–2/1 2/0–1) . . . . . ***Typhlodromus* (*Anthoseius*) *transvaalensis* (Nesbitt)**
- Ventrianal shield with four pairs of preanal setae (*JV3* present); sternal shield without median posterior projection; most of dorsal setae smooth, except *Z5* serrated, without apical knobs; calyx of spermatheca cup-shaped with a long neck; dorsal shield with six pairs of solenostomes (*gd1*, *gd2*, *gd5*, *gd6*, *gd8* and *gd9*); genu II with seven setae (2–2/0 2/0–1) . . . . . ***Typhlodromus* (*Anthoseius*) *anomalus* Ferragut**
56. Seta *RI* absent; seta *S2* present . . . . . **Genus *Galendromus* Muma**
. . . . . ***Galendromus* (*Galendromus*) *annectens* (De Leon)**
- Seta *RI* present; seta *S2* absent . . . . . **Genus *Metaseiulus* Muma**
. . . . . **Subgenus *Metaseiulus* Chant & McMurtry** 57
57. Genu II with eight setae (2–2/1 2/0–1). 58
- Genu II with seven setae (2–2/0 2/0–1) 59
58. Seta *R1* inserted on dorsal shield . . . . . ***Metaseiulus* (*Metaseiulus*) *brevicollis* Gonzalez & Schuster**
- Seta *R1* inserted on soft integument, out of dorsal shield . . . . . .
. . . . . ***Metaseiulus* (*Metaseiulus*) *arboreus* (Chant)**
59. Spermatheca with calyx short, dish-shaped . . . . . ***Metaseiulus* (*Metaseiulus*) *parabrevicollis* Ferragut**
- Spermatheca with calyx elongated, saccular or trumpet-shaped 60
60. Spermatheca with calyx saccular . . . . . ***Metaseiulus* (*Metaseiulus*) *camelliae* (Chant & Yoshida-Shaul)**
- Spermatheca with calyx trumpet-shaped . . . . . ***Metaseiulus* (*Metaseiulus*) *eiko* (El-Banhawy)**

Notes on the identification key

1. The key was basically constructed and modified from Guanilo *et al.* (2008a) according to the identification system established by Chant & McMurtry (2007).

2. The characters we used in the key are based on the direct examination of the specimens of some species (about 15 species) from Argentina. However, we mostly trust original descriptions or redescriptions of the other species as well as Guanilo *et al*. (2008a).

3. *Euseius ho* (De Leon, 1965b) reported by Cédola (1999) in Argentina, is considered a junior synonym of *E. mesembrinus* (Dean, 1957) as suggested by Lopes *et al*. (2015).

4. *Euseius finlandicus* (Oudemans, 1915) is not included due to uncertainties about its identity in Argentina (Guanilo *et al*. 2008a).

5. *Amblyseius hexagonus* Berlese, 1916 is excluded due to its status as species dubia (Chant 1959).

6. The genus *Vikramus* Denmark & Evans, 2019 is not recognized as valid here. According to Demite *et al*. (2025b), the type species *Vikramus cordobus* is conspecific with *Neoseiulus argentinus* Guanilo & Moraes. Our examination of the character states in their original descriptions supports this interpretation. Comparable inconsistencies in the diagnostic characters of taxa described by Denmark & Evans (2019) were also reported in a previous study (Döker *et al*. 2025c), indicating that some of newly described taxa or genera by them require a careful reconsideration.

7. Uncertain identifications or doubtful records of other species (e.g., *Amblyseius fraterculus* (Berlese, 1916b), *Amblyseius perlongisetus* (Berlese, 1916b)) are not included as also suggested by Guanilo *et al*. (2008a).

Acknowledgements

The first author was supported by CAPES - Programa de Doutorado Sanduíche no Exterior (PDSE-2025) under number of process 88881.126128/2025–01 during his visit in Çukurova University,

Adana, Türkiye. We are grateful to Dr. Hugo Francisco Gutiérrez (UNL - FHUC) for his help with the identification of plant species and for providing space and facilities during the preparation of microscope slides, and to Lic. Leonardo A. Leiva and the Museo Florentino Ameghino, Santa Fe, for providing space for slide preparation. We are also grateful to Prof. Raphael Castilho from the University of São Paulo, ESALQ/USP São Paulo, Brazil for his great help to check type materials of *G*. (*G*.) *paulista*. This study was supported by the Cukurova University Scientific Projects Foundation Units, under grant number FAY-2022-14495.

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Submitted: 1 Dec. 2025; accepted by Shahrooz Kazemi: 23 Jan. 2026; published: 25 Feb. 2026