

A new species of *Amblydromalus* Chant & McMurtry (Acari: Phytoseiidae), with notes on occurrence of genus in South America

Peterson Rodrigo Demite^a, José Marcos Rezende^b, Priscila Carvalho Dahmer^c, Ana Cristina C. Cavalcante^c, Antonio Carlos Lofego^b

^a Instituto de Biociências, Universidade Federal de Mato Grosso, Cuiabá, Mato Grosso, Brazil.

^b Departamento de Zoologia e Botânica, Instituto de Biociências, Letras e Ciências Exatas, Universidade Estadual Paulista, UNESP, São José do Rio Preto, São Paulo, Brazil.

^c Instituto de Ciências Exatas e Tecnologia, Universidade Federal do Amazonas, UFAM, Itacoatiara, Amazonas, Brazil.

Original research

ABSTRACT

A new species, *Amblydromalus amazonicus* n. sp. is described and illustrated based on adults of both sexes. Individuals were found in association with plants in natural vegetation (Amazon Forest), on uncultivated plants in guarana crops, and on exotic fruit (residential area), in states of Amazonas and Mato Grosso, Brazil. The type material of *A. akiri* Nuvoloni, Lofego, Rezende & Feres was re-examined and the number of setae as well as the chaetotaxy of genu III is corrected. Notes on the occurrence of *Amblydromalus* in South America and a key to species of genus for this subcontinent is provided.

Keywords Amazon Biome; Amblyseiinae; Euseiini; South America

Zoobank <http://zoobank.org/0C03B33C-20A4-47E1-AB84-509B598E10A2>

Introduction

The genus *Amblydromalus* Chant & McMurtry (Acari: Phytoseiidae) belongs to the tribe Euseiini Chant & McMurtry, subtribe Typhlodromalina Chant & McMurtry, with 23 valid species, the majority recorded in the Neotropical Region (Chant and McMurtry 2005, 2007, Demite *et al.* 2021). To date, all species of this genus are characterized by having 33 pairs of setae, with female idiosomal setal pattern 10A:9B/JV-3:ZV, the most common for Amblyseiinae (Chant and McMurtry 2005). Twelve species have been recorded from Brazil, being six of them recorded from the Brazilian Amazon region, namely *Amblydromalus akiri* Nuvoloni, Lofego, Rezende & Feres, *A. insolitus* Nuvoloni & Lofego, *A. itacoatiarensis* Demite, Cavalcante & Lofego, *A. manihoti* (Moraes), *A. villacarmelensis* (Moraes) and *A. zannoui* Famah Sourassou, Sarmento & Moraes (Moraes *et al.* 1994, Navia *et al.* 2005, Nuvoloni *et al.* 2015a, b, Vasconcelos and Silva 2015, Cruz *et al.* 2019, Demite *et al.* 2019). Additionally, Gondim Jr. *et al.* (2012) identified two morphospecies (*Amblydromalus* aff. *arawak* and *Amblydromalus* sp.) in the state of Roraima, however, their observation based on a few specimens.

This study aims to describe a new species of the genus *Amblydromalus*, the first of its kind which presents *J1* setae, associated with plants in the states of Amazonas and Mato Grosso, Brazil.

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Corresponding author
Peterson Rodrigo Demite:
peterson_demite@yahoo.com.br

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Material and methods

Mites were collected from leaf samples from six native plants and one exotic fruit (rambutan) in two states from Brazil (Amazonas and Mato Grosso). In the state of Amazonas, the samplings were carried out in municipalities of Itacoatiara, Maués, Parintins, and Silves (east region of the state). Natural vegetation and residential area were sampled in the first three municipalities and in the last, respectively. In the state Mato Grosso, the samplings were carried out in Cotriguaçu municipality (north region of the state) in natural vegetation. All areas are within the domain of the Amazon Forest biome.

The phytoseiid specimens were sorted under a stereomicroscope (40x) and subsequently mounted on microscope slides in Hoyer's medium. They were examined under phase-contrast microscopy (Zeiss Axio Imager M3). The new species was illustrated using a drawing tube attached to the microscope; the images were processed with the software Adobe Illustrator CS6. Measurements of taxonomically relevant structures were done with the use of a graded eye-piece. The measurements of the holotype (female) are given in bold, followed by the average measurement and then by minimum and maximum values (in parentheses) for the holotype and paratypes.

The setal nomenclature adopted was that of Lindquist and Evans (1965) and Lindquist (1994), as adapted by Rowell *et al.* (1978) for the dorsum and by Chant and Yoshida-Shaul (1991) for the venter of the phytoseiids. The idiosomal setal pattern follows Chant and Yoshida-Shaul (1992). The notation of gland pores (solenostomes) or lyrifissures (poroids) is based on Athias-Henriot (1975). Terminology for the spermathecal apparatus follows that described by Beard (2001).

The analyses on *A. akiri* were done studying specimens of the type series, deposited in the collection of Acari of the Departamento de Zoologia e Botânica, da UNESP, Campus de São José do Rio Preto, São Paulo, Brazil.

The studies that report the occurrence of *Amblydromalus* species in South America (previous records) were obtained from the Phytoseiidae Database (Demite *et al.* 2021; <http://www.lea.esalq.usp.br/phytoseiidae/>). Records of species of the genus that contained “cf.” or “af.” were not considered for this study. The records of *A. horatii* (De Leon) in Brazil, Guyana, and Suriname by Byrne *et al.* (1983) and Murphy (1984) were considered as *Amblydromalus arawak* (De Leon), since that this species is a junior synonym of *A. arawak* (Denmark *et al.* 1999).

Sytematics

Amblydromalus amazonicus n. sp. Demite, Rezende & Lofego

Zoobank: 6F1500CC-5935-41BA-A5F3-AA18B70EFD0F

(Figure 1)

Diagnosis

Female with dorsal shield smooth, only with some striae, mainly in anterolateral region; all dorsal setae smooth and pointed, except Z5 slightly serrated; with seta *J1* present. Sternal shield smooth, except lateral striae, with posterior margin trilobate; genital and ventrianal shields smooth; ventrianal shield vase-shaped, with a pair of crescentic preanal pores; all ventral setae smooth. Calyx tubular; atrium widening next to major duct and with forked aspect; major duct with thick wall next to the atrium. Macrosetae smooth with knobbed tips, present on genua of all legs, tibiae of legs III and IV and basitarsus of leg IV.

Female (n= 14)

Dorsum — (Figure 1A). Idiosomal setal pattern 10A: 10B/JV-3:ZV. Dorsal shield mostly smooth, only with some striae, mainly in the anterolateral region; **320** 302 (280–323) long

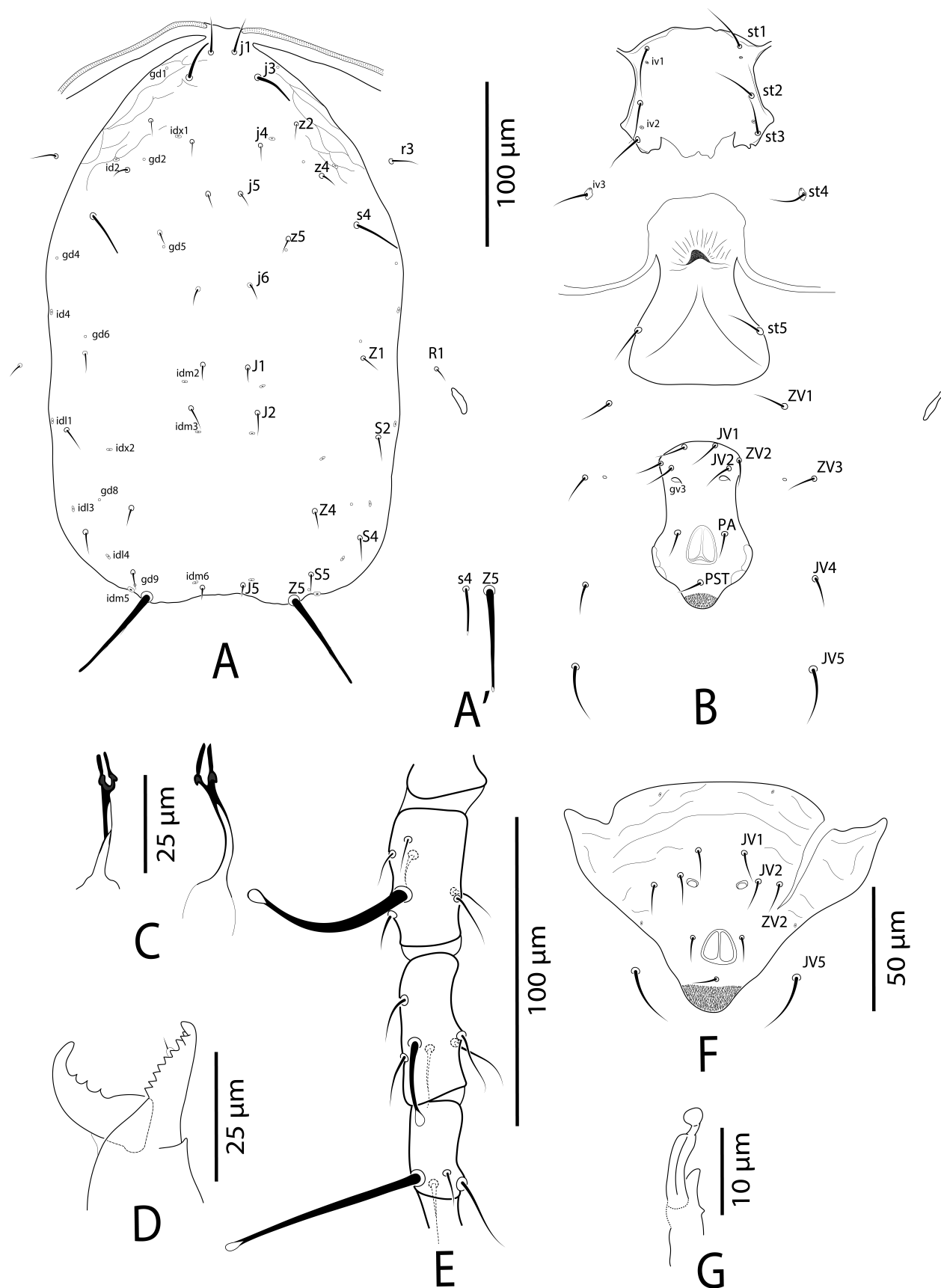


Figure 1 *Amblydromalus amazonicus* n. sp., female: A – Dorsal idiosoma; B – Ventral idiosoma; C – Spermatheca; D – Chelicera; E – Genu, tibia and basitarsus of leg IV. Male: F – Ventrianal shield; G – Spermatodactyl.

from anterior to posterior margins along midline, **195** 198 (190–210) wide at level of *s4*; with 18 pairs of setae on dorsal shield; setae *r3* and *R1* inserted in the unsclerotized cuticle; with 11 pairs of lyrifissures and seven pairs of gland pores; setae lengths: *j1* **20** 20 (17–23), *j3* **25** 23 (21–26), *j4* **10** 9 (7–10), *j5* **9** 8 (7–9), *j6* **10** 9 (8–10), *J1* **11** 10 (8–11), *J2* **12** 10 (9–12), *J5* **7** 7 (5–7), *z2* **12** 10 (9–12), *z4* **10** 10 (8–11), *z5* **9** 8 (6–9), *Z1* **12** 11 (10–12), *Z4* **11** 10 (9–12), *Z5* **60** 57 (53–62), *s4* **26** 22 (20–26), *S2* **14** 13 (10–15), *S4* **14** 12 (10–14), *S5* **10** 10 (9–10), *r3* **15** 13 (11–15), *R1* **10** 9 (8–10). All dorsal setae smooth, except *Z5* slightly serrated; in some specimens *Z5* and *s4* with tips ending in a small membrane (Figure 1A').

Venter — (Figure 1B). Sternal shield smooth, except lateral striae, with three pairs of setae and two pairs of lyrifissures (*iv1* and *iv2*); distances between *st1*–*st3* **52** 52 (49–60), *st2*–*st2* **64** 63 (59–68); *st4* and one lyrifissure (*iv3*) on metasternal plate. Genital shield smooth, distance between *st5*–*st5* **70** 65 (59–73). With two pairs of metapodal plates. Ventrianal shield vase-shaped, smooth; **98** 91 (83–98) long, **50** 50 (45–54) wide at level of *ZV2* and **60** 57 (52–64) at level of anus; with three pairs of pre-anal setae (*JV1*, *JV2* and *ZV2*) and a pair of crescentic pores (*gv3*) posterior to *JV2*. Four pairs of opisthogastric setae on unsclerotized cuticle (*JV4*, *JV5*, *ZV1* and *ZV3*). Seta *JV5* **40** 35 (30–40). All ventral setae smooth.

Peritreme — Extending to level of *j1*.

Spermatheca — (Figure 1C). Calyx tubular, **27** 23 (18–27) (for some mounted specimens the calyx is visually bent); atrium widening next to major duct and with forked aspect; major duct with thick wall next to atrium.

Chelicera — (Figure 1D). Fixed digit **26** 26 (23–30) long, with **9** 9 (8–10) teeth in addition to apical hook and *pilus dentilis*; movable digit, **28** 24 (23–28), with **3** 4 (3–5) teeth in addition to apical hook.

Legs — (Figure 1E). Macrosetae smooth with knobbed tips; lengths: *SgeI* **27** 27 (25–28), *SgeII* **27** 27 (25–30), *SgeIII* **36** 36 (34–39), *StiIII* **23** 23 (21–25), *SgeIV* **53** 53 (51–55), *StiIV* **27** 28 (24–30), *StIV* **63** 61 (55–63). Chaetotactic formula of genu II: 2-2/0-2/0-1 and genu III: 1-2/1-2/0-1.

Male (n= 4)

Dorsum — Dorsal shield ornamentation as in female, **224** (220–225) long, **155** (146–170) wide at level of *s4*; setae lengths: *j1* **17** (16–18), *j3* **21** (19–22), *j4* **8** (8–9), *j5* **6** (6–7), *j6* **8** (7–8), *J1* **8** (7–10), *J2* **9** (8–10), *J5* **5** (5–6), *z2* **8**, *z4* **9** (8–9), *z5* **7** (6–7), *Z1* **9** (8–10), *Z4* **9** (8–10), *Z5* **42** (40–45), *s4* **17** (17–18), *S2* **10** (9–10), *S4* **9** (8–10), *S5* **7** (7–8), *r3* **9** (8–10), *R1* **7** (7–8). Setae *r3* and *R1* on dorsal shield. All dorsal setae smooth, except *Z5* serrate.

Venter — (Figure 1F). Sternogenital shield smooth; ventrianal shield subtriangular, with striation anteriorly and laterally to pores; **94** (87–97) long and **128** (120–132) wide at anterior corners, with three pairs of pre-anal setae (*JV1*, *JV2* and *ZV2*), two pairs of lyrifissures and one pair of pores postero-mesad of *JV2*; *JV5* **23** (22–24). All ventral setae smooth.

Peritreme — Extending to level of *z2*.

Chelicera — Fixed digit **20** long, with nine teeth in addition to hook and *pilus dentilis*; movable digit **17** long, with four teeth in addition to hook. *Spermatodactyl* (Figure 1G) with shaft **18** (16–19) long.

Legs — Macrosetae smooth with knobbed tips, except *SgeI* smooth and pointed; lengths: *SgeI* **20**, *SgeII* **19** (18–20), *SgeIII* **22** (20–23), *StiIII* **18**, *SgeIV* **36** (34–37), *StiIV* **22** (21–24), *StIV* **45** (43–47). Chaetotactic formulae of genu II and genu III as female.

Type specimens

Holotype female, three paratype females and three paratype males on *Nephelium lappaceum* L. (Sapindaceae), in Silves (02°54'49"S, 58°26'15"W), Amazonas state, 27 October 2019, R.B. Souza collector; two paratype females and one paratype male on *Hymenaea* sp. (Leguminosae) in Contriguaçu (09°51'00"S, 58°14'00"W), Mato Grosso state, 15 January 2015, J.M. Rezende

& A.C. Lofego collectors; one paratype female on *Pauroma guianensis* Aubl. (Urticaceae), Itacoatiara (3°5'37"S, 58°27'31"W), Amazonas state, 24 November 2017, P.R. Demite & A.C.C. Cavalcante collectors; one paratype female on *Hevea brasiliensis* (Willd. ex A.Juss.) Müll.Arg. (Euphorbiaceae), Itacoatiara (2°59'41"S, 58°27'12"W), Amazonas state, 25 June 2019, A.C.C. Cavalcante, P.C. Dahmer & R.B. Souza collectors; one paratype female on *Pouteria caimito* (Ruiz & Pav.) Radlk. (Sapotaceae), in Itacoatiara (2°59'41"S, 58°27'12"W), Amazonas state, 26 September 2019, R.B. Souza collector; one paratype female on *Bertholletia excelsa* Bonpl. (Lecythidaceae), Parintins (2°40'20"S, 56°46'24"W), Amazonas state, 2 January 2020, M.P. Duque collector; three paratype females, one paratype male and one deutonymph on Leguminosae unidentified, Itacoatiara (03°00'46.8"S, 58°26'58.9"W), Amazonas state, 06 January 2020, P.C. Dahmer collector; one paratype female on *Oenocarpus bacaba* Mart. (Arecaceae), Maués (3°26'06"S, 57°50'51"W), Amazonas state, 08 March 2020, P.C. Dahmer collector. All type specimens are deposited in the collection of Acari of the Departamento de Zoologia e Botânica, da UNESP, Campus de São José do Rio Preto, São Paulo, Brazil.

Differential diagnosis

Amblydromalus amazonicus **n. sp.** is more similar to *Amblydromalus akiri* Nuvoloni, Lofego, Rezende & Feres, 2015b, by the atrium format, widening next to major duct and macroseta *SgeIV* knobbed. Also is similar to *A. insolitus* Nuvoloni & Lofego in Nuvoloni *et al.* (2015a), *A. itacoatiarensis* Demite, Cavalcante & Lofego, 2019 and *A. zannoui* Famah Sourassou, Sarmiento & Moraes, 2017 by atrium shape. In addition, *A. akiri* differs from *A. amazonicus* **n. sp.** by having *s4* about 45% longest and *StiV* and *StiIV* with blunt tips; *A. insolitus* differs by having *j3* and *s4* about 40% and 70% longest, respectively; *A. itacoatiarensis* by having *j3*, *s4*, *SgeI* and *StiIV* about 50%, 150%, 50% and 40% longest, respectively; *A. zannoui* by having *j1*, *j3*, *s4*, *SgeI*, *SgeII*, *StiIV* and *StiIV* about 40%, 65%, 70%, 40%, 40%, 200% and 65%, respectively. Additionally, *A. insolitus*, *A. itacoatiarensis* and *A. zannoui* differs of *A. amazonicus* **n. sp.** by having all macrosetae pointed. *Amblydromalus amazonicus* **n. sp.** differs from all species of genus by the presence of seta *J1*.

Etymology

The specific name “amazonicus” refers to Amazon Forest biome.

Remarks

According to Chant and McMurtry (2005) mites of the genus *Amblydromalus* have the ratio *s4*: *Z1* > 3: 1. The ratio between these two setae in *Amblydromalus amazonicus* **n. sp.** was lower, being the type series average 2: 1 (2.2: 1 in the holotype; 1.8–2.4 in the type series specimens), what could lead this species to be classified as *Ueckermannseius* according to the definition of Chant and McMurtry (2007). However, the *s4*: *Z1* < 3: 1 ratio has also been observed in other species classified as *Amblydromalus*: *Amblydromalus tigrus* (Denmark & Evans) (2.1: 1; holotype; Denmark *et al.* 1999); *Amblydromalus ntandu* (Pritchard & Baker) (2.1: 1; paratype; Moraes *et al.* 2006); *Amblydromalus manihoti* (Moraes) (2.7: 1; holotype; Moraes *et al.* 1994); *Amblydromalus akiri* (2.9: 1; type series; Nuvoloni *et al.* 2015b) and *Amblydromalus arawak* (De Leon) (2.9: 1; holotype; Moraes *et al.* 1994). In addition, in other populations of two of these species, different from what was observed in the type series, was observed ratio greater than 3: 1 between *s4* and *Z1*. In material collected from *A. ntandu* from Cameroon and DR Congo the ratio was 3.1: 1 (Moraes *et al.* 2006). In the case of *A. manihoti*, a species frequently collected in South America, the *s4*: *Z1* ratio ranged from 1.8: 1 (Rocha *et al.* 2015) to 4.1: 1 (Guanilo *et al.* 2008, Demite *et al.* 2017). In this way, the *s4* / *Z1* ration seems to be an unstable character and, therefore, would not be the best character to separate two genera. So, we consider this new species within the genus *Amblydromalus*, despite the *s4*: *Z1* < 3: 1 ratio, due it be morphologically closer to some *Amblydromalus* species, as indicated in differential diagnosis, than any other *Ueckermannseius* species. We believe that molecular studies or even

integrative taxonomy should be performed to verify the phylogenetic relationships within the Typhlodromalina subtribe, and verify if *Amblydromalus* and *Ueckermannseius* are in fact two valid clades or if constitute a single natural group.

Within *Amblydromalus*, only for a single specimen, collected in Cameroon, was reported the presence of seta *J1*. This specimen was identified as *A. swaga* (Pritchard & Baker) by Moraes *et al.* (2006), although for others four specimens analyzed in the same study, including holotype, the presence of *J1* was not observed, indicating that the presence of this seta may be an anomaly in *A. swaga*. Differently in *A. amazonicus* **n. sp.** the presence of *J1* is a stable character, present in all specimens found, including females, males and deutonymph. *Amblydromalus amazonicus* **n. sp.** belongs to the *limonicus* species group, by having *Z4* much shorter than 40% of the distance between its base and that of seta *Z5*, and shorter than the distance between its base and that of seta *S4* (Chant and McMurtry 2005). Despite the presence of seta *J1* on dorsal shield we decided to include *A. amazonicus* **n. sp.** within the *limonicus* species group than creating a new one. Within of Euseiini tribe, the seta *J1* is recorded in *Typhlodromalus fragosoi* (Yoshida-Shaul and Chant 1991).

New morphological information on *Amblydromalus akiri* Nuvoloni, Lofego, Rezende & Feres

In the original description of *A. akiri* the chaetotactic formula annotate to genu III is 1-2/2-2/0-1, with a total of eight setae (Nuvoloni *et al.* 2015b). However, an observation on specimens of

Table 1 Occurrence of *Amblydromalus* species in countries of South America.

Species	BOL	BRA	COL	ECU	FGU	GUY	PAR	PER	SUR	VEN
<i>Amblydromalus amazonicus</i> n. sp.		X ¹								
<i>Amblydromalus akiri</i>		X ²								
<i>Amblydromalus arawak</i>		X ³	X ⁴			X ⁵			X ⁶	
<i>Amblydromalus congeae</i>		X ⁷								
<i>Amblydromalus insolitus</i>		X ⁸								
<i>Amblydromalus itacoatiarensis</i>		X ⁹								
<i>Amblydromalus laetus</i>		X ¹⁰								
<i>Amblydromalus limonicus</i>	X ¹¹	X ¹²	X ¹³	X ¹⁴	X ¹⁵	X ¹⁶			X ¹⁷	X ¹⁸
<i>Amblydromalus macroatrium</i>		X ¹⁹								
<i>Amblydromalus manihoti</i>	X ²⁰	X ²¹	X ²²	X ²³			X ²⁴	X ²⁵	X ²⁶	X ²⁷
<i>Amblydromalus rapax</i>		X ²⁸	X ²⁹	X ³⁰				X ³¹		
<i>Amblydromalus villacarmelensis</i>		X ³²	X ³³					X ³⁴		
<i>Amblydromalus zannoui</i>		X ³⁵								

BOL: Bolivia; BRA: Brazil; COL: Colombia; ECU: Ecuador; FGU: French Guiana; GUY: Guyana; PAR: Paraguay; PER: Peru; SUR: Suriname; VEN: Venezuela; References: 1. This study; 2. Nuvoloni *et al.* (2015b); 3. Byrne *et al.* (1983), Murphy (1984); 4. Moraes *et al.* (1994); 5. De Leon (1966), Byrne *et al.* (1983), Murphy (1984), Moraes *et al.* (1994); 6. Byrne *et al.* (1983), Murphy (1984); 7. Castro and Moraes (2010); 8. Nuvoloni *et al.* (2015a), Demite *et al.* (in press); 9. Demite *et al.* (2019); 10. Castro and Moraes (2010), Moraes *et al.* (2013); 11. Reis (1979), Samways and Ciociola (1980), Farias *et al.* (1981), Murphy (1984); 12. Moraes *et al.* (1993, 1994), Collier *et al.* (2004), Ferla *et al.* (2007), Silva *et al.* (2010), Furtado *et al.* (2006, 2014), Mendonça *et al.* (2019), Toldi *et al.* (2021); 13. Yaseen and Bennett (1976), Moraes *et al.* (1982), Murphy (1984), Noronha and Mesa (1990); 14. Murphy (1984); 15. Murphy (1984); 16. Byrne *et al.* (1983), Murphy (1984); 17. Murphy (1984); 18. Aponte and McMurtry (1993), Murphy (1984); 19. Moraes *et al.* (2013); 20. Moraes *et al.* (1994); 21. Farias *et al.* (1981)*, Noronha and Moraes (1989)*, Moraes *et al.* (1990*, 1993*, 1994), Bakker *et al.* (1993)*, Braun *et al.* (1993)*, Bonato *et al.* (1999), Gondim Jr. and Moraes (2001), Zacarias and Moraes (2001), Collier *et al.* (2004), Noronha *et al.* (2004), Navia *et al.* (2005), Buosi *et al.* (2006), Vasconcelos *et al.* (2006), Feres *et al.* (2007), Fiaboe *et al.* (2007), Demite *et al.* (2009, 2011, 2013, 2017), Castro and Moraes (2010), Silva *et al.* (2010), Eichelberger *et al.* (2011), Gonçalves *et al.* (2013), Moraes *et al.* (2013), Nuvoloni *et al.* (2015a, b), Rocha *et al.* (2015), Vasconcelos and Silva (2015), Sousa *et al.* (2015), Souza *et al.* (2015), Famah Sourassou *et al.* (2017); 22. Noronha and Mesa (1990)*, Bakker *et al.* (1993)*, Moraes *et al.* (1994); 23. Moraes *et al.* (1994); 24. Moraes *et al.* (1994); 25. Moraes *et al.* (1994), Guanilo *et al.* (2008); 26. Moraes *et al.* (1994); 27. Bakker *et al.* (1993)*, Moraes *et al.* (1994); 28. Ferla and Moraes (2002); 29. Yaseen and Bennett (1976), Murphy (1984), Moraes *et al.* (1994); 30. Braun *et al.* (1993)*, Moraes *et al.* (1994); 31. Moraes *et al.* (1994), Guanilo *et al.* (2008); 32. Zacarias and Moraes (2001b), Castro and Moraes (2010), Moraes *et al.* (2013), Nuvoloni *et al.* (2015b), Mendonça *et al.* (2019); 33. Moraes *et al.* (1994); 34. Moraes *et al.* (1994); 35. Famah Sourassou *et al.* (2017), Cruz *et al.* (2019), Miranda *et al.* (2021); *. Mentioned as *Amblyseius limonicus*, *Amblyseius limonicus* sl. or *Typhlodromalus limonicus* sl. (Moraes *et al.* 1994).

types series (holotype and paratypes) revealed that the specimens actually have seven setae. The chaetotactic formula should be correct as 1-2/1-2/0-1. The same difference on chaetotaxy was observed also on another species, *A. insolitus* Nuvoloni & Lofego described with eight setae on genu III (Nuvoloni *et al.* 2015a) and then Demite *et al.* (in press) verified that in fact these species bear seven setae on this leg segment, as in type series as on specimens collected in the municipality of Poconé (Pantanal biome), Mato Grosso state, Brazil.

Occurrences of *Amblydromalus* species in South America.

With the description of *A. amazonicus* n. sp., the genus currently has 24 described species. Of these 13 are reported on the South American subcontinent (Table 1). All 13 species are registered in Brazil, five described in the last six years (Nuvoloni *et al.* 2015a, 2015b, Zannou *et al.* 2017, Demite *et al.* 2019 and this study). On the other hand, no species of this genus has been registered in Argentina, Chile and Uruguay. This difference in the number of records between countries is mainly due to the lack of surveys of mites in the countries. The last five described species of this genus were collected in regions hitherto little explored (Central-West, Northeast and North regions of Brazil). In addition, the records indicate a probable preference of these mites for regions of a warmer climate, which could explain the absence of these mites in regions further south of the continent.

Key to *Amblydromalus* species (females) recorded from South America (updated from Demite *et al.* 2019)

1. Seta *Z4* more than 70% as long as distance between its base and that of seta *Z5*, and distinctly longer than *S4* and/or *S5* *congeae* species group ... 2
— Seta *Z4* much shorter than 40% of distance between its base and that of seta *Z5*, and at most as long as *S4* and/or *S5* *limonicus* species group ... 4
2. Seta *Z4* relatively shorter, at most as long as distance between its base and base of *Z5*; insertion of *S4* almost in transverse line with insertion of *Z4* *A. laetus* (Chant & Baker, 1965)
— Seta *Z4* relatively longer, longer than distance between its base and base of *Z5*; insertion of *S4* well posterior to insertion of *Z4* 3
3. Seta *S2* longer than distance between its base and base of *Z1* *A. congeae* (De Leon, 1965)
— Seta *S2* about 0.5 as long as distance between its base and base of *Z1* *A. macroatrium* Moraes, Barbosa & Castro, 2013
4. Seta *J1* present *A. amazonicus* n. sp.
— Seta *J1* absent 5
5. Macrosetae of leg IV capitate (*SgeIV*) or blunt (*StiIV* and *StiV*) *A. akiri* Nuvoloni, Lofego, Rezende & Feres, 2015b
— Macrosetae of leg IV pointed 6
6. Dorsal shield covered mainly by roundish ornamentation (weak), with a few anterolateral striae *A. insolitus* Nuvoloni & Lofego in Nuvoloni *et al.* (2015a)
— Dorsal shield mainly smooth, except a few anterolateral striae 7
7. Preanal seta *JVI* almost in straight line with setae *JV2* and *ZV2*. *A. arawak* (De Leon, 1966)
— Preanal seta *JVI* located anteriorly the setae *JV2* and *ZV2* (mainly) 8

8. Width of major duct when connecting to atrium greater than width of calyx when connecting to atrium 9
— Width of major duct when connecting to atrium equal to or less than width of calyx when connecting to atrium 10
9. Calyx of spermatheca elongate, with a median narrowing, about 24 µm in length
..... *A. zannoui* Famah Sourassou, Sarmento & Moraes, 2017
— Calyx of spermatheca tubular, without a median narrowing, about 14 µm in length *A. itacoatiarensis* Demite, Cavalcante & Lofego, 2019
10. Seta *Z4* about two times longer than *J2* and *Z1*; insertion of *J5* posterior to insertion of *Z5*
..... *A. villacarmelensis* (Moraes) in Moraes *et al.* (1994)
— Setae *J2*, *Z1* and *Z4* sub-equal in length; insertion of *J5* in transverse or little anterior line with insertion of *Z5* 11
11. Setae *j3* and *s4* sub-equal in length *A. manihoti* (Moraes) in Moraes *et al.* (1994)
— Seta *j3* shorter than *s4* in length 12
12. Seta *Z5* longer than *s4*; calyx of spermatheca 15–20 µm; macroseta of tibia IV (*StiIV*) about 45 µm *A. rapax* (De Leon, 1965)
— Seta *Z5* shorter than *s4*; calyx of spermatheca 25–40 µm; macroseta of tibia IV (*StiIV*) longer than 60 µm *A. limonicus* (Garman & McGregor, 1956)

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