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Subscriptions: Year 2021 (Volume 61): 450 €

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Previous volumes (2010-2020): 250 € / year (4 issues)

Acarologia, CBGP, CS 30016, 34988 MONTFERRIER-sur-LEZ Cedex, France

ISSN 0044-586X (print), ISSN 2107-7207 (electronic)

The digitalization of Acarologia papers prior to 2000 was supported by Agropolis Fondation under the reference ID 1500-024 through the « Investissements d'avenir » programme (Labex Agro: ANR-10-LABX-0001-01)

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Phytoseiid mites of the French Guiana (Acari: Mesostigmata)

Serge Kreiter^a, Martial Douin^a

^a Institut Agro (Montpellier SupAgro), UMR CBGP INRA/ IRD/ CIRAD/ IA (SupAgro), 755 Avenue du Campus Agropolis (Baillarguet), CS 30016, 34988 Montferrier-sur-Lez cedex, France.

Original research

ABSTRACT

Only little information is available of the diversity of Phytoseiidae in French Guiana. So far, only one mite species of the family Phytoseiidae have been actually recorded, *Amblydromalus limonicus*. We report in this paper the results of a small survey conducted at the end of October / Mid November 2001 in French Guiana, during which 5 species have been newly recorded, one being re-described in this paper.

Keywords survey; collection; taxonomy; systematics; predatory mites

Introduction

Mites of the family Phytoseiidae are known mostly for their predatory habit on phytophagous mites and small insects, like thrips and whiteflies, on cultivated plants and plants of the natural vegetation.

Several species are biological control agents commercialized for the control of pest organisms in both open and protected crops all around the world (McMurtry and Croft 1997; McMurtry *et al.* 2013; Knapp *et al.* 2018).

This family is widespread, present on all continents except Antarctica, and it consists of about 2,500 valid species in 94 genera and three subfamilies (Demite *et al.* 2021).

Biodiversity surveys in poorly investigated areas is still an urgent need and might result in the discovery of additional species potentially useful for biological control as well as in the acquisition of information on the biodiversity of these areas (Kreiter *et al.* 2018a, b, c, 2020a, b, c, d, 2021a, b, c; Ferragut and Baumann 2019, 2020, 2021; Döker *et al.* 2020; Kreiter and Abo-Shnaf 2020a, b; Fang *et al.* 2020; Demite *et al.* 2021; Toldi *et al.* 2021).

Located close to Amazonas, Guianas constitutes one of the world's highest biodiversity places. The concept of biodiversity hotspot was defined by Myers (1988) in order to identify the most immediately important areas for biodiversity conservation. These hotspots hold high endemism levels and have lost at least 70% of their original natural vegetation (Myers *et al.* 2000). Knowledge about the phytoseiid diversity in these areas may contribute to future establishment of conservation programs.

Located in South America, in the North Atlantic Ocean Coast, at more than 7000 km from Paris, French Guiana is one of the Guianas and the only one territorial collectivity of France in this area. It borders Brazil to the east and south (State of Amapá) and Suriname to the west.

Only one phytoseiid species has been recorded until now from this large geographical area, *Amblydromalus limonicus* (Garman and McGregor), recorded by Murphy (1984).

The objective of this paper is to present the phytoseiid species recorded during a small survey conducted at the end of 2001 in some localities of French Guianas.

Received 07 April 2021

Accepted 01 May 2021

Published 18 May 2021

Corresponding author

Serge Kreiter:

serge.kreiter@supagro.fr

Academic editor

Tixier, Marie-Stéphane

DOI

10.24349/acarologia/20214441

ISSN 0044-586X (print)

ISSN 2107-7207 (electronic)

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Material and methods

The survey took place in October – November, 2001, collecting the phytoseiid mites found on leaves of cultivated and wild plants examined in the field and transferring them to vials containing 70% ethanol. All collections were made by Cécile Rault (Sud-Agro Formation, Bordeaux, France).

The mites were then mounted in Hoyer's medium (Walter and Krantz 2009) for later examination and identification using a phase and interferential contrast microscope (DMLB, Leica Microsystems SAS, Nanterre, France). Characters of specimens were measured using a graded eyepiece.

Chant and McMurtry's (1994, 2007) concepts of the taxonomy of the family Phytoseiidae for identification and the world catalogue database of Demite *et al.* (2014, 2021) for distribution and information on descriptions and re-descriptions were used. The setal nomenclature system adopted was that of Lindquist & Evans (1965) and Lindquist (1994) as adapted to the phytoseiids by Rowell *et al.* (1978) and Chant & Yoshida-Shaul (1989) for the dorsal surface and by Chant & Yoshida-Shaul (1991) for the ventral surface. Pore (= solenostome) and poroid (= lyrifissure) notations are that of Athias-Henriot (1975). Macrosetal notation (**Sge** = genual macroseta; **Sti** = tibial macroseta; **St** = tarsal macroseta) are that of Muma and Denmark (1970). Numbers of teeth on the fixed and movable cheliceral digits do not include the respective apical tooth. Setae not referred to in the result section should be considered as absent. All measurements are given in micrometres and presented with the mean in bold followed by the range in parenthesis. Type of spermatheca or insemination apparatus are that of Denmark and Evans (2011). Only some species with only few measurements mentioned in the literature are provided in this paper. Classification of plants follows the APG IV classification of 2016 (ex. Byng *et al.* 2018).

Specimens of each species are deposited in the mite collections of Montpellier SupAgro conserved in UMR CBGP INRA/IRD/CIRAD/SupAgro/University of Montpellier.

The following abbreviations are used in table 1 of this paper for morphological characters: **dsl** = dorsal shield length just anterior of *j1* to just posterior of *J5* in the middle line; **dsw** = dorsal shield width at the level of *s4*; **Z4 ser.**, **Z5 ser.** = *Z4*, *Z5* serrated (if *Z4* and *Z5* without ser. = not serrated); **gensl** = genital shield length; **gensw st5** = genital shield width at level of stae *st5*; **gensw post. cor.** = genital shield width at level of posterior corners; **lisl** = primary or largest inguinal sigilla (= "metapodal plate") length; **lisw** = primary or largest inguinal sigilla (= "metapodal") width; **sisl** = secondary or smallest inguinal sigilla (= "metapodal") length; **vsl** = ventrianal shield length; **gv3 – gv3** = distance between centers of solenostomes *gv3* on the ventrianal shield; **vsw ZV2 & vsw anus** = ventrianal shield width at *ZV2* level and at paranal setae level; **scl** = calyx total length; **scw** = calyx widest width; **Fdl** = fixed digit length; **Mdl** = movable digit length; **Nb teeth Fd** = number of teeth on the fixed digit; **Nb teeth Md** = number of teeth on the movable digit; **Shaft** = length of the shaft of spermatodactyl; **toe** = length of the toe; **BCA** = Biological control agent; **aasl** = altitude above sea level; **imm.**: immature.

The following abbreviations are used in this paper for institutions: **CBGP** = Centre de Biologie pour la Gestion des Populations; **CIRAD** = Centre International de Recherche Agronomique pour le Développement; **IA** = Institut Agro; **INRAE** = Institut National de Recherche pour l'Agriculture, l'Alimentation et l'Environnement; **INRAPE** = Institut National de Recherche pour l'Agriculture, la Pêche et l'Environnement; **IRD** = Institut de Recherche pour le Développement; **MSA** = Montpellier SupAgro, France; **UMR** = Unité Mixte de Recherche; **UR** = Unité de Recherche.

Results and discussion

A total of **five** species have been recorded.

Subfamily Amblyseiinae Muma

Amblyseiinae Muma 1961: 273.

Tribe Typhlodromipsini Chant & McMurtry

Typhlodromipsini Chant & McMurtry 2005b: 318.

Genus *Typhlodromips* De Leon

Typhlodromipsini Chant & McMurtry 2005b: 318; 2006: 137; 2007: 55.

Typhlodromips scleroticus De Leon

Typhlodromips scleroticus De Leon, 1966: 96; Moraes *et al.* 1986: 147, 2004: 223; Chant & McMurtry 2005b: 327, 2007: 63.

This species was described by De Leon (1966) from the Nature Reserve of Bartica at Mazaruni Potaro, in British Guyana, on *Pouteria* sp. (Sapotaceae). It belongs to the *ariri* species group of the genus *Typhlodromips* as seta *J1* is absent and spermatheca has calyx cup- or bell-shaped or saccular. Its biology is totally unknown and this is the first record of that species for French Guiana.

World distribution: Guyana (British Guyana).

Specimens examined: A single ♀ collected during this study. **Saint-Laurent-du-Maroni**, Chemin de Mana (20 m aasl, lat. 5°29'18" N, long. 53°58'02" W), 1 ♀ on *Mangifera indica* (Anacardiaceae), 27/X/2001.

Remarks: the description of this species is very concise, including small illustrations. A complementary and more detailed description is presented, with measurements of our single specimen (in bold) compared to those of the original description (between parenthesis).

Adult female (Figs. 1a – e)

Dorsum (Fig. 1a) — Dorsal shield fused, smooth except for scant reticulation near the anterolateral margins of the dorsal shield, **270** (271) long and **173** (181) wide, with **five** solenostomes (*gd1*, *gd5*, *gd6*, *gd8*, and *gd9*, *gd1* and *gd9* being crateriform, others being oblong), only **10** pairs of poroids visible, **17** pairs of dorsal setae and **two** pairs of sub-lateral setae off the dorsal shield: *j1* **15** (15), *j3* **15** (15), *j4* **9** (11), *j5* **10** (7), *j6* **8** (7), *J2* **9** (7), *J5* **7** (7), *z2* **8** (7), *z4* **13** (14), *z5* **8** (7), *Z1* **9** (10), *Z4* **35** (32), *Z5* **40** (36), *s4* **15** (15), *S2* **10** (9), *S4* **6** (5), *S5* **5** (5), *r3* **10**, *R1* **9**. All setae smooth except *Z4* and *Z5* which are serrated and all setae sharp-tipped except *z4*, *s4*, *Z4*, *Z5* and *JV5* which are knobbed, *Z4* and *Z5* being also serrated.

Peritreme and peritrematal plate (Fig. 1a) — Reaching the level between insertion of setae *j1*; peritrematal plate fused with dorsal shield at level of *j1*.

Venter (Fig. 1b) — All ventral shields mostly smooth. Sternal shield with few striae, three pairs of setae and two pairs of lyrifissures; metasternal seta (*st4*) on large metasternal plates that also bear a large poroid; posterior margin of the sternal shield straight to slightly concave. Distances between *st1-st1* **54**, *st2-st2* **60**, *st3-st3* **65**, *st1-st3* **50**, *st4-st4* **68**. Genital shield length **90**, width at the level of *st5* **63**, width at the level of the posterior corners **75**, distance *st5-st5* **56**. Two pairs of metapodal plates, the larger **13** long and **2** wide, the smaller **8** long and **2** wide. Ventrianal shield with three pairs of preanal setae (*JV1*, *JV2* and *ZV2*), two small oblong pre-anal solenostomes **20** apart. Cribrum spicules on three lines. Membrane surrounding ventrianal shield with four pairs of setae (*ZV1*, *ZV3*, *JV4* and *JV5*), and seven pairs of round to oblong poroids around genital/ventrianal shields; ventrianal shield **80** (80) long, **80** (76) wide at level of anterior corners (*ZV2*), and **60** wide at level of anus. *JV5* knobbed but smooth **23** (24) long.

Chelicera (Fig. 1c) — Chelicerae regular size for phytoseiids. Fixed digit **35** (27) long with **9** (8-9) teeth and a pilus dentilis; movable digit **38** long with **3** (3) teeth.

Spermatheca (Fig. 1d) — Spermatheca saccular, with a moderately elongate calyx **13** (4.5) long and **5** (4.2) wide at maximum, slightly wider next to the vesicle; atrium distinct, although not enlarged.

Legs (Fig. 1e) — Macrosetae on all legs, all knobbed; one on genu of leg I, II and III, one on tibia III and three on leg IV, with one on each of genu, tibia and basitarsus: *Sge1* **15** (15),

Kreiter S. and Douin M. (2021), *Acarologia* 61(2): 468-478; DOI 10.24349/acarologia/20214441

SgeII 13 (13), *SgeIII* 14 (14), *Sti III* 12, *SgeIV* 29 (29), *StiIV* 15 (14), *StIV* 25 (24). Genu II and III with seven setae each, chaetotactic formula of genu II: 2-2/0, 2/0-1; genu III: 1-2/1, 2/0-1.

Remarks: this species is distinguished from other *Typhlodromips* by the following characteristics: *z4*, *s4*, *Z4*, *Z5* and *JV5* and macrosetae of all legs knobbed, *Z5* slightly longer than *Z4*, *gv3* adjacent to insertion of *JV2*.

It is most similar to *Typhlodromips igapo* Nuvoloni, Lofego, Rezende and Feres (Nuvoloni *et al.* 2015) and *T. sabaculus* Denmark and Muma (Denmark and Muma 1973).

Typhlodromips igapo has longer *Z5* (62) and leg macrosetae longer (*SgeIV* and *StIV*: 32).

Typhlodromips sabaculus has longer *Z4* (48) and *Z5* (79), macrosetae longer (*SgeIV* and *StIV* 38 and 46 respectively).

In the latter two species, *z4*, *s4*, *Z4* and *Z5* are not knobbed and *gv3* relatively far from the insertion of *JV2*.

Tribe Amblyseiini Muma

Amblyseiini Muma 1961: 268.

Sub-tribe Amblyseiina Muma

Amblyseiina Muma 1961: 269.

Genus Amblyseius Berlese

Amblyseius Berlese 1914: 143.

Amblyseius anacardii De Leon

Amblyseius anacardii De Leon 1967: 23; Moraes *et al.* 1986: 7; 1991: 117, 2000: 238, 2004: 14; Kreiter *et al.* 2006: 3, Chant & McMurtry 2004: 203, 2007: 75.

Amblyseius (Amblyseius) anacardii, Denmark & Muma 1989: 17.

This species belongs to the *obtus* species group of the genus *Amblyseius* and to the *aerialis* species subgroup. *Amblyseius anacardii* is frequent in Antilles (Moraes *et al.* 2000, Kreiter *et al.* 2006) and in Central America. Its biology remains unknown. This is the first record in French Guiana.

World distribution: Colombia, Ecuador, Guadeloupe, Les Saintes, Marie-Galante, Martinique, Saint-Martin, Trinidad.

Specimens examined: four specimens (2 ♀♀, 1 ♂, 1 imm.) collected during this study. **Saint-Laurent-du-Maroni**, Chemin de Mana (20 m aasl, lat. 5°29'18" N, long. 53°58'02" W), 1 ♀ and 1 imm. on *Citrus limon* (L.) Burman (Rutaceae), 1 ♂ on *Cocos nucifera* L. (Arecaceae) and 1 ♀ on *Hibiscus rosa-sinensis* L. (Malvaceae), 27/X/2001.

Remarks: morphological and morphometric characters and all measurements fit well the measurement given by De Leon (1967), Denmark and Muma (1989) and Moraes *et al.* (2000).

Genus Amblyseius largoensis (Muma)

Amblyseiopsis largoensis Muma 1955: 266.

Typhlodromus (Amblyseius) largoensis, Chant 1959: 96.

Amblyseius (Amblyseialus) largoensis, Muma 1961: 287.

Typhlodromus largoensis, Hirschmann 1962: 2.

Amblyseius (Amblyseius) largoensis, Ehara, 1966: 22.

Amblyseius largoensis, Swirski & Golan 1967: 225, Moraes *et al.* 1986: 17, 2004: 33, Chant & McMurtry 2004: 208, 2007: 78.

Amblyseius magnolia, Muma 1961: 289 (Synonymy according to Denmark & Evans 2011).

Amblyseius sakalava, Blommers 1976: 96 (Synonymy according to Ueckermann & Loots 1988).

Amblyseius amtalaensis, Gupta 1977: 53 (Synonymy according to Gupta 1986).

Amblyseius largoensis belongs to the *largoensis* species group and to the *largoensis* species subgroup. It is widespread in tropical and subtropical regions of the world and was the most abundant species collected by Moraes *et al.* (2000) in French Caribbean Islands and an important species in La Réunion Island (Moraes *et al.* 2012).

Using morphometric analyses of 36 characters, molecular analyses and crossing tests, Navia *et al.* (2014) studied specimens collected in Brazil, La Réunion Island and Trinidad and Tobago to determine whether *A. largoensis* populations from different geographic origins belong to the same taxonomic entity. Though differences in the lengths of some setae were observed, molecular analyses and crossing experiments indicated that populations from Indian Ocean and America were conspecific. This is its first record in French Guiana.

World distribution: this species is widely distributed in tropical and subtropical regions of Africa, America, Asia and the Pacific Islands.

Specimens examined: sixteen specimens (13 ♀♀, 1 ♂ and 2 imm.) collected during this study. **Saint-Laurent-du-Maroni**, Chemin de Mana (20 m aasl, lat. 5°29'18" N, long. 52°35'00" W), 1 ♀ and 1 imm. on *Musa parasidiaca* L. (Musaceae), 27/X/2001; **Île du Salut** (3 m aasl, lat. 5°17'01" N, long. 53°58'02" W), 2 ♀♀ on *Cocos nucifera* L. (Arecaceae), 4 ♀♀ on an unknown hostplant, 5 ♀♀ on *M. paradisiaca*, 1/XI/2001, 1 ♀, 1 ♂ and 1 imm. on *Capsicum frutescens* L. (Solanaceae), 2/XI/2001.

Remarks: morphological and morphometric characters and all measurements fit well the measurement given by Navia *et al.* (2014) for specimens from Brazil, La Réunion and Trinidad & Tobago.

Sub-tribe Proprioseiopsina Chant & McMurtry

Proprioseiopsina Chant & McMurtry 2004: 219.

Genus *Proprioseiopsis* Muma

Proprioseiopsis Muma 1961: 277.

Proprioseiopsis neotropicus (Ehara)

Amblyseius neotropicus Ehara 1966: 133, Moraes & Mesa 1988: 79; Moraes *et al.* 1991: 127. *Proprioseiopsis neotropicus*, Moraes *et al.*, 1986: 119; 2004: 183; Gondim & Moraes, 2001: 81; Zacarias & Moraes, 2001: 582, Ferla & Moraes, 2002b: 1019, Lofego *et al.*, 2004: 9; Chant & McMurtry 2005a: 15, 2007: 89; Feres *et al.*, 2005: 4; Guanilo *et al.*, 2008a: 9; 2008b: 12.

Proprioseiopsis neotropicus belongs to the *belizensis* species group. However, the specimens collected differ from other species in this group by having a macroseta on genu I. As the spermatheca of that species is saccular, it belongs to the *belizensis* species subgroup (Chant and McMurtry 2005a). Its biology is totally unknown. This is the first record in French Guiana.

World distribution: Argentina, Brazil, Colombia, Ecuador, Peru.

Specimens examined: two specimens (2 ♀♀) collected during this study. **Île du Salut** (3 m aasl, lat. 5°17'01" N, long. 53°58'02" W), 2 ♀♀ on an unknown species of Melastomataceae, 2/XI/2001.

Remarks: this species was described in detail by Ehara (1966) and there is no need for it to be redrawn in this paper. Morphological and morphometric characters and all measurements of our two specimens agree well with measurement given in the literature for specimens from Argentina, Brazil, Colombia and Peru (Ehara 1966, Moraes and Mesa 1988, Lofego *et al.* 2004, Guanilo *et al.* 2008a, b), especially for specimens from Brazil (Lofego *et al.* 2004).

Proprioseiopsis ovatus (Garman)

Amblyseiopsis ovatus Garman 1958: 78.

Table 1 Character measurements of adult females of *Proprioiseiopsis neotropicus* collected in this study with those in previous studies (localities followed by the number of specimens measured between brackets).

Characters	French Guiana (2) (this study)	Argentina (3)	Brazil, original description	Brazil (2)	Colombia (6)	Peru (5)
Dsl	375 – 383	404 (383 – 425)	440	388 – 400	374 (365 – 384)	409 (395 – 433)
Dsw	250 – 258	338 (325 – 350)	390	300 – 313	287 (270 – 312)	319 (300 – 350)
j1	33	33 (33 – 34)	32	30 – 35	28 (24 – 31)	32 (30 – 35)
j3	45 – 48	43 (40 – 45)	32	45 – 48	42 (36 – 46)	45 (42 – 47)
j4	5	5 (4 – 5)	4	3	5 (4 – 6)	5
j5	5	4	4	3 – 4	5 (4 – 6)	5 (2–6)
j6	6	5 (5 – 6)	4	3 – 4	5 (4 – 6)	6 (5–6)
J5	5	4 (3 – 5)	4	4 – 5	5 (4 – 6)	5 (4–5)
r3	23 – 25	23 (21 – 25)	15	25	25 (19 – 28)	22 (19–28)
RI	13	9 (8 – 10)	9	13	10 (8 – 11)	8 (7–8)
s4	115 – 118	105 (101 – 110)	106	108 – 118	105 (90 – 132)	112 (105–116)
S2	8	7 (6 – 7)	6 – 7	8	6 (5 – 7)	7 (5–8)
S4	8	6 (6 – 7)	6 – 7	8	6 (5 – 7)	6 (5–6)
S5	8 – 9	8 (7 – 8)	6 – 7	8	6 (5 – 7)	6 (5–7)
z2	20 – 23	27 (27 – 28)	22	23 – 25	20 (19 – 22)	24 (21–28)
z4	18 – 20	23 (22 – 24)	17	13	20 (14 – 23)	24 (20–27)
z5	5	4 (4 – 5)	4 – 5	3	5 (4 – 6)	5
Z1	5	5 (5 – 6)	6 – 7	5 – 6	6 (4 – 7)	6 (5–7)
Z4	115 – 118	105 (100 – 110)	112	113 – 120	106 (98 – 120)	107 (103–110)
Z5	100 – 105	93 (92 – 95)	94	105 – 110	98 (88 – 115)	102 (98–106)
st1-st1	64 – 65	–	–	–	–	–
st2-st2	81 – 83	83	–	88 – 93	83 (81 – 84)	84 (77 – 88)
st3-st3	93 – 95	–	–	–	–	–
st1-st3	60 – 63	64 (63 – 65)	–	63	60 (59 – 61)	65 (64 – 65)
st4-st4	93 – 98	–	–	–	–	–
Gensl	163 – 165	–	–	–	–	–
gensw	125 – 128	–	–	–	–	–
st5-st5	109 – 110	104 (98 – 110)	–	110 – 118	113 (107 – 118)	125 (124 – 125)
Gensw post. corn.	110 – 115	–	–	–	–	–
Lisl	33	–	–	–	–	–
Lisw	5	–	–	–	–	–
Sisl	11 – 13	–	–	–	–	–
Vsl	115 – 118	120 (110 – 130)	–	113 – 115	116 (114 – 120)	116 (113 – 123)
Vsw ZV2	115 – 116	118 (113 – 120)	–	118 – 120	119 (117 – 120)	116 (110 – 123)
Vsw anus	95	85 (80 – 90)	–	110 – 113	96 (86 – 106)	98 (90 – 100)
JV5	88	75 (73 – 76)	78	–	–	76 (73 – 78)
SgeI	29 – 30	32	–	30 – 33	30 (26 – 38)	29 (28–30)
SgeII	30 – 32	33	–	33	31 (27 – 34)	32 (31–34)
SgeIII	35 – 35	34 (33 – 36)	–	35 – 40	35 (29 – 43)	35 (31–38)
StiIII	28 – 30	29 (28 – 30)	–	30	29 (27 – 34)	–
SgeIV	68 – 73	74 (73 – 75)	74	75	69 (60 – 84)	66 (65–66)
StiIV	55 – 58	56 (54 – 58)	59	55 – 58	54 (50 – 60)	58 (56–58)
StIV	65 – 68	65 (61 – 68)	66	63 – 68	59 (55 – 65)	63 (62–64)
Scl	20 – 23	19 (18 – 20)	–	18 – 20	23 (19 – 24)	15 (14 – 17)
Scw	8	–	–	–	–	–
Fdl	38 – 40	43	–	–	35 (34 – 36)	–
No teeth Fd	15	15	–	–	12	–
Mdl	40 – 43	39	–	–	38 (38 – 39)	–
No teeth Md	2	2	–	–	3	–

Sources of measurements – Argentina: Guanilo *et al.* (2008b); Brazil original description: Ehara (1966); Brazil: Lofego *et al.* (2004); Colombia: Moraes & Mesa (1988); Peru: Guanilo *et al.* (2008a); – : not provided.

Typhlodromus (Amblyseius) ovatus, Chant 1959: 90.
Amblyseiulus ovatus, Muma 1961: 278.
Typhlodromus ovatus, Hirschmann 1962: 2.
Proprioseiopsis (Proprioseiopsis) ovatus, Karg 1989: 208.
Proprioseiopsis ovatus, Moraes *et al.* 1986: 121, 2004: 184; Chant & McMurtry 2005a: 15, 2007: 89.
Proprioseiopsis cannaensis (Muma 1962: 4) (synonymy according to Denmark & Evans 2011).
Proprioseiopsis peltatus (van der Merwe: 1968: 119) (synonymy according to Tseng 1983).
Proprioseiopsis hudsonianus (Chant & Hansell 1971: 723) (synonymy according to Denmark & Evans 2011).
Proprioseiopsis parapeltatus (Wu & Chou, 1981: 274) (synonymy according to Tseng 1983).
Proprioseiopsis antonelli Congdon 2002: 15 (synonymy according to Denmark & Evans 2011).

As reported for the previous species, *P. ovatus* belongs to the *belizensis* species group and to the *belizensis* species subgroup (Chant and McMurtry 2005a). This species is known from Guadeloupe, Marie-Galante and Martinique (Kreiter and Moraes 1997; Moraes *et al.* 2000; Mailloux *et al.* 2010; Kreiter *et al.* 2013, 2018c). It was found in large numbers only in a previous study in Guadeloupe, also in the Caribbean region (Mailloux *et al.* 2010) and in a recent study in La Réunion (Kreiter *et al.* 2020d). In other habitats, it seems to be rare. Similar to *P. mexicanus*, *P. ovatus* seems to be abundant on weeds and other low vegetation (Mailloux *et al.* 2010). Denmark and Evans (2011) indicated that this species is associated with *Oligonychus pratensis* (Banks) and *Brevipalpus* spp. It was also found in association with *Tetranychus evansi* Baker and Pritchard (Furtado *et al.* 2014), but it was mentioned as poor predator of that species by these authors. Despite this information, the biology of *P. ovatus* remains unknown. This is the first record in French Guiana.

World distribution: Argentina, Brazil, Colombia, Costa Rica, Cuba, Ecuador, Egypt, Ghana, Hawaii, Honduras, Japan, Malaysia, Martinique Island, Mozambique, Peru, Philippines, Puerto Rico, La Réunion Island, Saudi Arabia, Sierra Leone, South Africa, Spain, Sri Lanka, Taiwan, Thailand, Turkey, USA, Venezuela.

Specimens examined: A single ♀ collected during this study. **Saint-Laurent-du-Maroni**, Chemin de Mana (20 m aasl, lat. 5°29'18" N, long. 52°35'00" W), 1 ♀ on *Etlingera eliator* (Jack) Smith (Zingiberaceae), 27/X/2001.

Remarks: morphological and morphometric characteristics and all measurements of our single specimen fit well those given Kreiter *et al.* (2020d) and other measurements of the literature mentioned by these authors (van der Merwe 1968, Blommers 1976, Moraes and McMurtry 1983, Moraes *et al.* 2004a, Moraes *et al.* 2007a, Oliveira *et al.* 2012, Kreiter *et al.* 2018c, Kreiter *et al.* 2020d) for specimens from La Réunion and other parts of the world.

Conclusion

A total of five phytoseiid species, all Amblyseiinae, was collected in this study. However, only six species have so far been reported from French Guiana, namely *A. limonicus*, *A. anacardii*, *A. largoensis*, *P. neotropicus*, *P. ovatus* and *T. scleroticus*.

At least two of these species have been mentioned as biological control agents (BCA): *A. largoensis* and *A. limonicus*. In addition ecological interest concerning the determination of the distribution of the phytoseiid mites worldwide, the results of this study also has a pragmatic importance. Given the restrictions imposed by some countries in relation to the transportation of beneficial organisms between different geographic areas for practical use, the determination of the distribution of a species with potential value as biological control agent may allow the selection of local species for that purpose.

French Guiana is the largest French Department, with a territory of comparable size to some European countries. Given its location next to the equator, it is expected that many more phytoseiid species can be found in that region.

This large area belongs to Amazonas biome. So, further surveys and investigations are of great potential interest.

Acknowledgements

To Mrs Cécile Rault (Sud-Agro Formation, Bordeaux, France), the collector of the specimens considered in this study, who made them available to the authors of this publication for identification.

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