



**UNIVERSIDADE FEDERAL DO OESTE DO PARÁ
INSTITUTO DE CIÊNCIAS E TECNOLOGIA DAS ÁGUAS
PROGRAMA DE PÓS-GRADUAÇÃO EM BIODIVERSIDADE**

SUZANE EVARISTO DOS SANTOS

**GERROMORPHA (INSECTA: HEMIPTERA: HETEROPTERA) DA REGIÃO
METROPOLITANA DE SANTARÉM, PARÁ, BRASIL**

Dissertação apresentada ao Programa de Pós-Graduação em Biodiversidade da Universidade Federal do Oeste do Pará, como requisito para obtenção de grau de Mestre em Biodiversidade.

**SANTARÉM – PA
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Orientadora: Profa. Dra. Sheyla Regina Marques Couceiro

Coorientador: Prof. Dr. Felipe Ferraz Figueiredo Moreira

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SHEYLA REGINA MARQUES COUCEIRO

Orientadora

SUZANE EVARISTO DOS SANTOS

Discente

Ao meu amado esposo Carlos, e filhos Kaike e Davi, por todo o amor, apoio e compreensão durante esta jornada.

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“Escute os sábios e procure entender o que eles ensinam. Sim, peça sabedoria e grite pedindo entendimento. Procure essas coisas, como se procurasse prata ou um tesouro escondido.”
Provérbios (2, 2-4) - Bíblia Sagrada.

RESUMO

Gerromorpha (Insecta: Hemiptera: Heteroptera) compreende percevejos semiaquáticos, predadores, que habitam tanto ambientes lênticos quanto lóticos, geralmente deslizando ou caminhando sobre as águas ou plantas aquáticas. Mundialmente, são descritas mais de 2100 espécies, das quais 236 estão registradas no Brasil, com ocorrência de 126 dessas espécies na região Norte e 85 espécies no estado do Pará. Esses números, para o Brasil, e especialmente para a região Norte e Pará, demonstram que o conhecimento sobre a diversidade e distribuição de Gerromorpha é ainda insuficiente, considerando a enorme extensão territorial da região. No Pará, ainda existem áreas necessitando de levantamentos faunísticos, como por exemplo, a região metropolitana de Santarém, a qual até então não existe um inventário para diversos grupos de insetos aquáticos, incluindo Gerromorpha e, que vem perdendo recursos naturais mediante às atividades humanas. Nosso objetivo foi diminuir o desconhecimento (*déficits Wallaceano e Linneano*) sobre esse grupo, inventariando a fauna de Gerromorpha da região metropolitana de Santarém. Para isso, foram realizadas coletas manuais com auxílio de redes aquáticas em 33 ecossistemas aquáticos, abrangendo igarapés, cachoeiras, poças, fitotelmas e lagos, entre os meses de julho de 2019 a outubro de 2020. Como resultados, apresentamos uma lista comentada e ilustrada das espécies de Gerromorpha ocorrentes na área de estudo, novos registros, ampliamos as áreas de distribuição geográfica de espécies conhecidas e, descrevemos novas espécies. Foram coletadas 44 espécies de Gerromorpha, sendo três novas espécies do gênero *Microvelia* Westwood, 1834: *M. sp. nov. 1*, *M. sp. nov. 2* e *M. sp. nov. 3*; realizado dois novos registros para o Brasil: *Microvelia aschnakiranae* Makhan, 2014 e *Rhagovelia graziae* Galindo-Malagón, Morales & Moreira, 2021; dois novos registros para o estado do Pará: *Microvelia longipes* Uhler, 1894 e *Paravelia dilatata* Polhemus & Polhemus, 1984 e; 15 novos registros para a região metropolitana de Santarém: *Brachymetra lata* Shaw, 1933, *B. shawi* Hungerford & Matsuda, 1957, *Tachygerris adamsoni* (Drake, 1942), *Microvelia pulchella* Westwood, 1834, *Rhagovelia brunae* Magalhães & Moreira, 2016, *R. evidis* Bacon, 1948, *R. jubata* Bacon, 1948, *Callivelia conata* (Hungerford, 1929a), *Oiovelia cunucunumana* Drake & Maldonado-Capriles, 1952, *Paravelia bullialata* Polhemus & Polhemus, 1984, *Stridulivelia alia* (Drake, 1957), *S. stridulata* (Hungerford, 1929b), *S. strigosa* (Hungerford, 1929b), *S. tersa* (Drake & Harris, 1941b) e *S. transversa* (Hungerford, 1929b). Esses resultados ampliam em 8% o conhecimento sobre Gerromorpha no estado do Pará e em 100% o conhecimento para a região metropolitana de Santarém; e demonstram a importância e a necessidade de estudos faunísticos e taxonômicos para o real conhecimento de nossa

biodiversidade. Assim, como podem subsidiar estudos ecológicos entre outros pela nomeação e entendimento da distribuição das espécies.

Palavras-Chave: Amazônia. Distribuição. Insetos aquáticos. Percevejos semiaquáticos. Sistemática. Taxonomia.

ABSTRACT

Gerromorpha (Insecta: Hemiptera: Heteroptera) comprises semiaquatic, - predatory stink bugs, that inhabit both lentic and lotic environments, usually gliding or walking on water or aquatic plants. Worldwide, more than 2100 species are described, of which 236 are registered in Brazil, with 126 of these species occurring in the North and 85 species in Pará state. These numbers, for Brazil, and especially for the North region and Pará, demonstrate that the knowledge about the diversity and distribution of Gerromorpha is still insufficient, considering the enormous territorial extension of the region. In Pará, there are still areas in need of fauna surveys, such as the metropolitan region of Santarém, which, so far, does not have an inventory for several groups of aquatic insects, including Gerromorpha -, which has been losing natural resources through human activities. Our objective was to reduce the lack of knowledge (*Wallacean* and *Linnean* deficits) about this group, inventorying the Gerromorpha fauna of the metropolitan region of Santarém. For this, manual collections were carried out with the aid of aquatic nets in 33 aquatic ecosystems, covering streams, waterfalls, pools, phytotelmata and lakes, between the months of July 2019 and October 2020. As results, we presented a commented and illustrated list of Gerromorpha species occurring in the study area, new records, we expanded the geographic distribution areas of known species and, we described new species. 44 species of Gerromorpha were collected, three new species of the genus *Microvelia* Westwood, 1834: *M. sp. nov. 1*, *M. sp. nov. 2* and *M. sp. nov. 3*; two new records were made for Brazil: *Microvelia aschnakiranae* Makhan, 2014 and *Rhagovelina graziae* Galindo-Malagón, Morales & Moreira, 2021; two new records for Pará state: *Microvelia longipes* Uhler, 1894 and *Paravelia dilatata* Polhemus & Polhemus, 1984, and; 15 new records for the metropolitan region of Santarém: *Brachymetra lata* Shaw, 1933, *B. shawi* Hungerford & Matsuda, 1957, *Tachygerris adamsoni* (Drake, 1942), *Microvelia pulchella* Westwood, 1834, *Rhagovelina brunae* Magalhães & Moreira, 2016, *R. evidis* Bacon, 1948, *R. jubata* Bacon, 1948, *Callivelina conata* (Hungerford, 1929a), *Oiovelina cunucunumana* Drake & Maldonado-Capriles, 1952, *Paravelia bullialata* Polhemus & Polhemus, 1984, *Stridulivelina alia* (Drake, 1957), *S. stridulata* (Hungerford, 1929b), *S. strigosa* (Hungerford, 1929b), *S. tersa* (Drake & Harris, 1941b) and *S. transversa* (Hungerford, 1929b). These results expand the knowledge about Gerromorpha in Pará state by 8% and the knowledge for the metropolitan region of Santarém by 100%; and demonstrate the importance and the need for fauna and taxonomic studies for the real knowledge of our biodiversity, as they can subsidize ecological studies, among others, by naming and understanding the distribution of species.

Keywords: Amazon. Aquatic insects. Distribution. Semiaquatic bugs. Systematics. Taxonomy.

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LISTA DE SIGLAS

Capes – Coordenação de Aperfeiçoamento de Pessoal de Nível Superior

CEIOC – Coleção Entomológica do Instituto Oswaldo Cruz

CNPq – Conselho Nacional de Desenvolvimento Científico e Tecnológico

FAPERJ – Fundação Carlos Chagas Filho de Amparo à Pesquisa do Estado do Rio de Janeiro

Fapespa – Fundação Amazônia de Amparo a Estudos e Pesquisas do Estado do Pará

Fiocruz – Fundação Oswaldo Cruz

Flona – Floresta Nacional do Tapajós

ICTA – Instituto de Ciências e Tecnologia das Águas

IOC – Instituto Oswaldo Cruz

Letia – Laboratório de Ecologia e Taxonomia de Invertebrados Aquáticos

Ufopa – Universidade Federal do Oeste do Pará

PEEX – Programa Institucional de Ensino, Pesquisa e Extensão

PPGBees – Programa de Pós-graduação em Biodiversidade

LISTA DE SÍMBOLOS

♀ – fêmea

♂ – macho

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Percevejos semiaquáticos da região metropolitana de Santarém, Pará, Brasil

1 INTRODUÇÃO GERAL

1.1 Qual é o problema da pesquisa?

Gerromorpha (Insecta: Hemiptera) compreende os percevejos semiaquáticos, aqueles que se locomovem sobre a superfície da água ou plantas aquáticas, habitando tanto ambientes lênticos como lagos, quanto lóticos como igarapés e ambientes marinhos.

No Brasil o conhecimento sobre Gerromorpha está em crescimento, com descrições e redescrições de espécies. Até então, a maioria dos estudos foram realizados nas regiões Norte e Sudeste do país, que, conseqüentemente, apresentam o maior número de espécies descritas.

Apesar do conhecimento crescente, especialmente na região Norte, acredita-se que há muito ainda a se conhecer, visto os estudos pontuais sobre o grupo na região. No estado do Pará, por exemplo, os estudos se concentraram nos municípios de Tailândia, Paragominas e Parauapebas. Áreas como a região metropolitana de Santarém, no Oeste do estado, sequer foram inventariadas. Cabe ainda salientar que os recursos hídricos em Santarém e arredores estão sendo alterados por atividades humanas, especialmente aquelas associadas ao plantio de culturas, criação de gado e crescimento populacional nas regiões urbanas. Esses impactos alcançam os sistemas aquáticos, modificando suas margens (perda da mata ciliar), assoreando e eutrofizando as águas, o que leva à perda da biodiversidade e de habitats.

Essas perdas se refletem tanto nas espécies já conhecidas como aquelas ainda não descritas, impossibilitando o conhecimento real sobre a biodiversidade (*Déficit Linneano*) e distribuição das espécies (*Déficit Wallaceano*) na região. O conhecimento sobre a biodiversidade e sobre a distribuição das espécies é essencial para a conservação biológica. A correta nomeação das espécies auxilia os estudos ecológicos como estabelecimento de padrões de distribuição, estabelecimento de espécies como indicadoras de impactos, em estudos de evolução e outros. Por esse motivo, tornam-se necessários estudos de levantamento de fauna, inclusive de Gerromorpha, em áreas ainda carentes de estudos sobre a biodiversidade.

1.2 Como a pesquisa foi realizada?

Coletas foram realizadas em 33 ecossistemas aquáticos (dois lagos; dois fitotelmos, poça e caixa d'água; duas cachoeiras; 25 igarapés e duas nascentes) localizados na região metropolitana de Santarém, no período de julho de 2019 a outubro de 2020. Os espécimes foram coletados com auxílio de uma rede aquática em “D” (rapiché) ou uma peneira, na superfície dos corpos aquáticos, incluindo áreas de corredeiras, remansos, vegetação marginal, raízes em barrancos e espuma. Os espécimes obtidos foram preservados em potes de plástico contendo álcool etílico a 70%, devidamente etiquetados e, transportados ao laboratório. Fizemos também levantamento bibliográfico para saber quais espécies já haviam sido registradas para a região e analisamos espécimes depositados no Letia (Laboratório de taxonomia e ecologia de invertebrados aquáticos) da UFOPA (Universidade Federal do Pará), provenientes de coletas anteriores.

No laboratório, os espécimes foram visualizados à seco em microscópio estereoscópico Leica M205C. Quando necessário, as terminálias de machos foram destacadas do abdômen com auxílio de pinças e estiletos, colocadas em lâminas escavadas com glicerina e, examinadas sob microscópio óptico. Após o estudo, essas estruturas foram acondicionadas em microtubos com glicerina e guardadas juntamente com os espécimes dos quais foram retiradas. A identificação de gênero ou espécie baseou-se em chaves de identificação como as de Polhemus (1997), Pereira et al. (2007) e Moreira et al. (2018), em descrições ou redescritões de espécies, além de consultas a especialista no grupo, Dra. Juliana Mourão dos Santos Rodrigues.

Fotografias das espécies foram realizadas com auxílio de uma câmera digital Leica DMC 2900 acoplada ao microscópio estereoscópico Leica M205C, utilizando o programa Leica Application Suite (Version 2019). Para a edição das fotografias foi utilizado o programa Adobe Photoshop® CS6 (Version 13.0 x 32 Extended).

1.3 Qual a importância da pesquisa?

Estudos sobre a diversidade e distribuição das espécies são imprescindíveis para o estabelecimento de áreas prioritárias para a conservação. Não se pode preservar ou utilizar o que se desconhece. Levantamentos faunísticos possibilitam o conhecimento sobre quais e onde estão as espécies já descritas, e, também, a descoberta de novas espécies, ampliando o conhecimento sobre a biodiversidade de uma região.

Os sistemas aquáticos são sensíveis aos impactos antrópicos, resultando em perdas de espécies, muitas ainda desconhecidas para a Ciência. Muitos representantes de Gerromorpha requerem habitats específicos e são vulneráveis à perda de integridade física, química e/ou biológica dos ecossistemas aquáticos. Por serem também de fácil coleta e identificação frente a outros grupos,

a fauna de Gerromorpha pode auxiliar estudos que visem a conservação, atuando como bioindicadores da saúde e integridade desses ecossistemas. Entretanto, a restrição de conhecimento relacionado a diversidade, a identificação e as distribuições espaciais das espécies dificultam sua utilização.

Gerromorpha são também importantes elos das cadeias tróficas aquáticas. Tanto os imaturos quanto adultos são predados por peixes, mas também predam alevinos e controlam populações de invertebrados prejudiciais à saúde humana, como mosquitos. Para entendermos como os ecossistemas funcionam e como se mantêm precisamos identificar as espécies envolvidas, visto que cada espécie tem um papel ecológico único

Este estudo é o primeiro levantamento de Gerromorpha para a região metropolitana de Santarém, região ainda pouco estudada para diversos grupos de insetos aquáticos. Há um incremento de 100% sobre o conhecimento da fauna de Gerromorpha para a região metropolitana de Santarém, visto que ainda não havia sido inventariada para este grupo.

1.4 Autores e Instituições financiadoras

Suzane Evaristo dos Santos^{1,2,3}, Sheyla Regina Marques Couceiro^{1,2}, Felipe Ferraz Figueiredo Moreira^{3,4,5}.

1- Universidade Federal do Oeste do Pará - UFOPA, Instituto de Ciências e Tecnologia das Águas – ICTA, Programa de Pós-graduação em Biodiversidade – PPGBEES, Laboratório de Ecologia e Taxonomia de Invertebrados Aquáticos – LETIA.

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1.5 Sugestões de leitura

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CAPÍTULO ÚNICO

Gerromorpha (Hemiptera: Heteroptera) from the metropolitan region of Santarém, Brazil, including three new species of *Microvelia* Westwood, 1834 (Veliidae: Microveliinae)¹

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Abstract

Background

Gerromorpha (Hemiptera: Heteroptera) comprises more than 2100 species of semiaquatic bugs, most of which have the ability to walk on the surface of the water. So far, 238 species have been recorded from Brazil, but several portions of the country remain poorly explored. The Metropolitan Region of Santarém (MRS), Pará State, Brazil, lacks faunistic and taxonomic studies concerning this group and the local fauna is under threat due to human actions.

New information

Aiming to fill gaps concerning the diversity and distribution of Gerromorpha in the Amazon, a survey of the semi-aquatic bugs from the MRS is presented. Collections were made in 33 aquatic ecosystems in the different phytophysionomies within this area from July 2019 to October 2020. As a result, a checklist with 44 species recorded from the three municipalities of the MRS is presented. Furthermore, three new species of the genus *Microvelia* Westwood, 1834 (*M. sp. nov. 1*, *M. sp. nov. 2* and *M. sp. nov. 3*) are described, two species are recorded

¹ O artigo apresentado foi redigido conforme as diretrizes de submissão da revista **Biodiversity Data Journal**, exceto pela inserção das figuras e legendas ao longo do texto. As normas indicadas para a redação de artigos pela revista estão disponíveis no link: <https://bdj.pensoft.net/about#Forauthors>.

for the first time from Brazil (*Microvelia aschnakiranae* Makhan, 2014 and *Rhagovelia graziae* Galindo-Malagón, Morales & Moreira, 2021), two from Pará State (*Microvelia longipes* Uhler, 1894 and *Paravelia dilatata* Polhemus & Polhemus, 1984) and 15 from the MRS (*Brachymetra lata* Shaw, 1933, *B. shawi* Hungerford & Matsuda, 1957, *Tachygerris adamsoni* (Drake, 1942), *Microvelia pulchella* Westwood, 1834, *Rhagovelia brunae* Magalhães & Moreira, 2016, *R. evidis* Bacon, 1948, *R. jubata* Bacon, 1948, *Callivelia conata* (Hungerford, 1929), *Oiovelia cunucunumana* Drake & Maldonado-Capriles, 1952, *Paravelia bullialata* Polhemus & Polhemus, 1984, *Stridulivelia alia* (Drake, 1957), *S. stridulata* (Hungerford, 1929), *S. strigosa* (Hungerford, 1929), *S. tersa* (Drake & Harris, 1941) and *S. transversa* (Hungerford, 1929)).

Keywords

Amazon, aquatic ecosystems, aquatic insects, distribution, diversity, semiaquatic bugs, systematics, taxonomy.

Introduction

Gerromorpha (Hemiptera: Heteroptera) is an infra-order of predatory, semi-aquatic bugs, most of which live on the surface of the water or amongst floating plants (Nieser and Melo 1997). Contrary to the Nepomorpha, or truly aquatic bugs, their antennae are long and plainly visible dorsally, inserted in front of the eyes. The body is 1.0 to 36.0 mm long and usually velvety, covered with a double layer of micro- and macrotrichia (Andersen 1982). The legs are usually narrow, with apical or pre-apical pretarsal claws (Ribeiro et al. 2019).

More than 2100 species have been described in Gerromorpha, distributed in eight families: Gerridae, Hebridae, Hermatobatidae, Hydrometridae, Macroveliidae, Mesoveliidae, Paraphrynoveliidae and Veliidae. In the Neotropical Region, the infra-order is represented by more than 45 genera and 500 species (Polhemus and Polhemus 2008), of which 238 species have been recorded from Brazil (Moreira 2021a, Moreira 2021b, Moreira 2021c, Moreira 2021d, Moreira 2021e).

Despite the number of recorded species, semi-aquatic bugs are still poorly known in several portions of the country, whereas the south-eastern region and the central Amazon are better explored (Moreira et al. 2011). Aiming to fill gaps concerning the diversity and distribution of Gerromorpha in the Amazon (Nessimian et al. 2019), we present a survey of the semi-aquatic

bugs from the Metropolitan Region of Santarém (MRS), Pará State, Brazil. The area lacks faunistic and taxonomic studies and the local fauna is under threat due to human actions (Couceiro and Hamada 2011).

Materials and methods

We collected in the MRS, western Pará State, Brazil (Fig. 1). The region includes the Municipalities of Belterra, Mojuí dos Campos and Santarém, with an area of 27,285.426 km (Prefeitura Municipal de Santarém 2017). The climate type is Am, tropical, with average annual rainfall of 2000 mm (Rodrigues 2001). We sampled in 33 aquatic ecosystems in the different phytophysionomies within the area, including natural lakes, temporary pools, waterfalls, rivers, streams and springs (Figs 2, 3; Table 1). We used a GARMIN eTrex 30 GPS receiver to georeference the sampling stations. We obtained specimens with aquatic D-nets and sieves on the surface of the water bodies, including riffles, pools, marginal vegetation and foam. We then fixed and preserved the material in 70% ethanol and labelled it with locality, date and collector data.

Table 1. Collection localities of Gerromorpha in aquatic environments of the metropolitan region of Santarém, Pará, Brazil, from July 2019 to October 2020.

Municipality	Water body	Geographic coordinates	Abiotic variables						Note
			pH	Conductivity (µS/s)	Salinity (ppm)	OD (ml/L)	Turbidity (mtv)	Temperature (°C)	
Belterra	Igarapé Aramanáí	02°42'56"S; 54°59'59"W	4,61	18,5	0,01	2,4	0,58	26,4	
Belterra	Igarapé Coronel Batista	02°37'50"S; 54°58'12"W	4,83	12,2	0,00	3,9	1,29	26,6	
Belterra	Igarapé do Ailton	02°35'36"S; 54°57'48"W	4,81	22,1	0,01	1,3	0,32	28,7	
Belterra	Igarapé Jatuarana	03°15'44"S; 54°56'37"W	6,53	13,0	0,00	8,9	3,68	26,2	
Belterra	BR-163, Km-115, Igarapé	03°17'34"S; 54°52'45"W	4,25	18,9	-	-	-	26,3	
Belterra	Floresta Nacional do Tapajós, Igarapé	03°03'02"S; 54°55'30"W	4,20	13,3	-	-	-	26,7	
Mojuí dos Campos	Igarapé Água Fria, nascente	02°47'19"S; 54°38'40"W	6,50	29,1	0,00	2,0	1,61	26,4	
Mojuí dos Campos	Igarapé Antonio Leite	03°09'06"S; 54°50'28"W	4,40	11,4	-	-	-	26,0	
Mojuí dos Campos	Igarapé do Manel	02°25'06"S; 54°44'26"W	6,88	10,6	0,00	3,9	14,05*	27,9	*Rainy day; close to the bridge

Municipality	Water body	Geographic coordinates	Abiotic variables						Note
			pH	Conductivity (µS/s)	Salinity (ppm)	OD (ml/L)	Turbidity (mtv)	Temperature (°C)	
Mojuí dos Campos	Igarapé Mojuí dos Caboclos	02°42'03"S; 54°41'01"W	5,78	13,2	0,00	10,2	3,05	27,5	
Mojuí dos Campos	Igarapé Santa Júlia	02°40'19"S; 54°43'06"W	5,37	13,4	0,00	4,2	3,17	27,2	
Mojuí dos Campos	Igarapé Terra de Areia	02°47'58"S; 54°38'15"W	6,58	13,5	0,01	5,3	2,28	29,3	
Mojuí dos Campos	Igarapé Terra Preta	02°43'09"S; 54°40'20"W	5,25	18,8	0,00	2,9	2,54	30,8	
Santarém	Cachoeira da Cavada	02°35'48"S; 54°31'47"W	4,77	13,80	0,00	3,3	-	27,2	
Santarém	Cachoeira da Rocha Negra	02°29'48"S; 54°45'13"W	4,38	11,4	0,00	8,9	2,12	26,6	
Santarém	Caixa d'água	02°27'31"S; 54°44'49"W	-	-	-	-	-	-	
Santarém	Igarapé Cajutuba II	02°27'39"S; 54°46'53"W	-	-	-	-	-	-	
Santarém	Igarapé da Débora, nascente	02°44'27"S; 54°26'01"W	4,5	17,6				26,0	
Santarém	Igarapé das bananeiras	02°30'52"S; 54°54'20"W	-	-	-	-	-	-	
Santarém	Igarapé Diamantino	02°30'16"S; 54°39'32"W	4,56	12,6	0,00	-	1,42	27,1	
Santarém	Igarapé do Rai	02°35'35"S; 54°30'18"W	4,67	12,3	0,00	3,7	1,23	26,7	
Santarém	Igarapé Guaraná	02°46'25"S; 54°23'20"W	-	-	-	-	-	-	
Santarém	Igarapé Jatobá	02°34'17"S; 54°51'36"W	-	-	-	-	-	-	
Santarém	Igarapé Mararú	02°29'35"S; 54°40'06"W	4,92	10,4	0,00	2,1	5,86	28,3	
Santarém	Igarapé Mutunuy	02°28'53"S; 54°41'45"W	-	-	-	-	-	-	
Santarém	Ponte do Juá	02°26'40"S; 54°47'21"W	6,17	11,03	0,00	5,5	-	26,0	
Santarém	Igarapé São Braz	02°29'07"S; 54°49'41"W	5,36	20,7	0,01	-	1,55	26,2	
Santarém	Igarapé Sonrizal	02°32'13"S; 54°55'26"W	5,8	15,1	0,00	-	2,12	25,6	
Santarém	Igarapé Urumari	02°28'25"S; 54°41'52"W	-	-	-	-	-	-	
Santarém	Igarapé Vila Nova	02°30'50"S; 54°49'29"W	-	-	-	-	-	-	
Santarém	Lago Mapiiri	02°25'28"S; 54°44'47"W	6,4	23,26		4,4	10,05	30,8	
Santarém	Puddle	02°27'32"S; 54°44'48"W	-	-	-	-	-	-	
Santarém	Lago do Juá	02°25'57"S; 54°46'55"W	6,0	9,2	-	4,9	14,13	28,6	

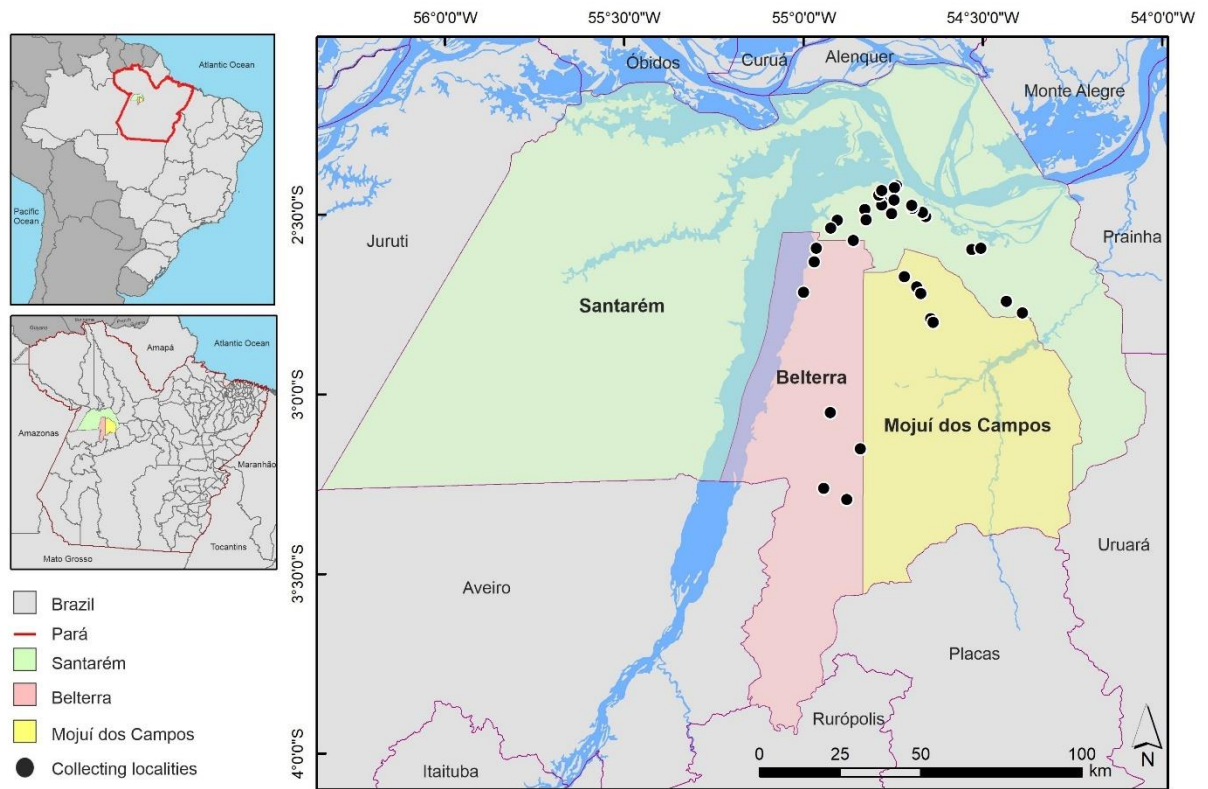


Figure 1. Collecting localities of *Gerromorpha* in the MRS, Pará State, northern Brazil.

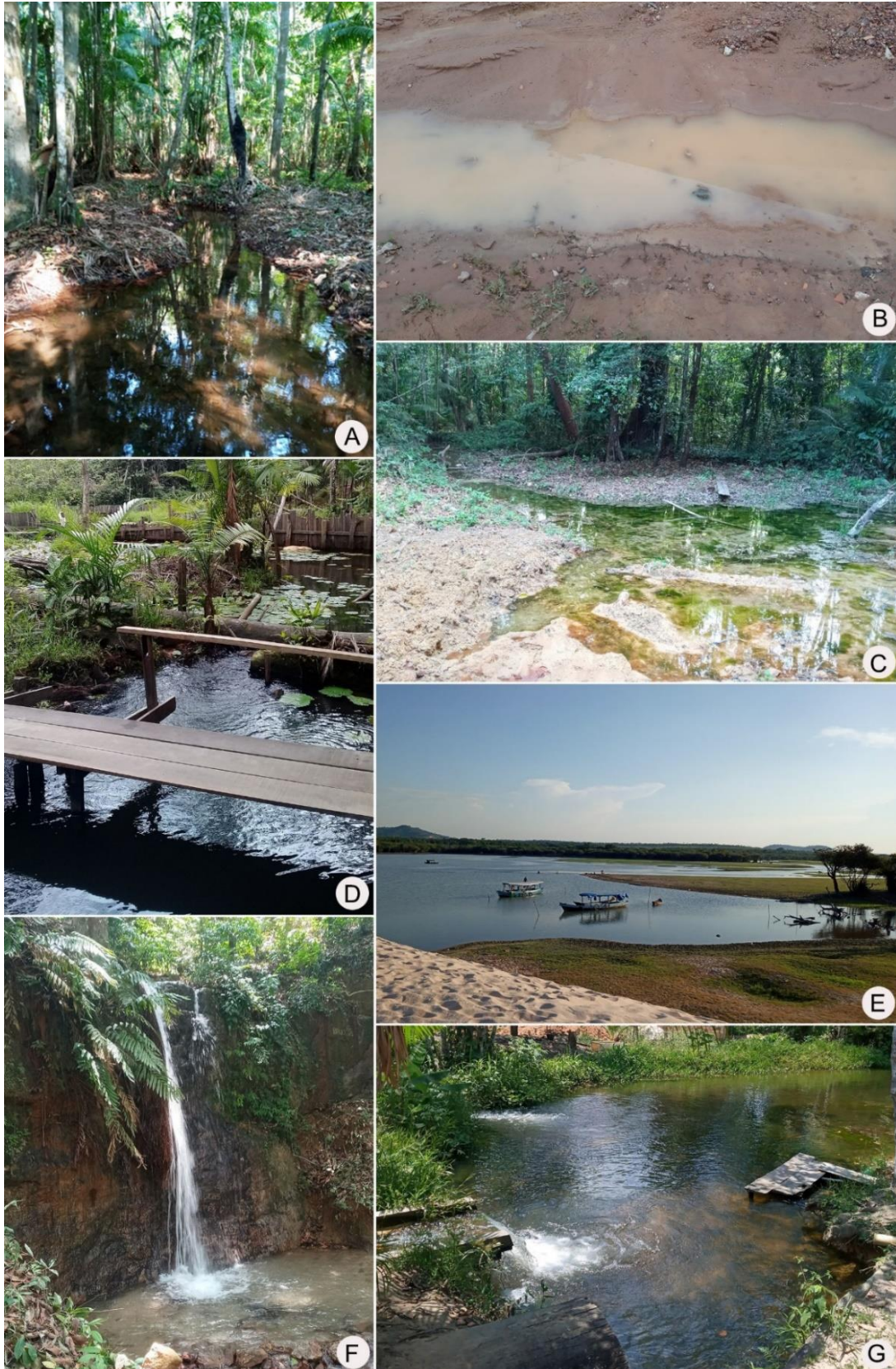


Figure 2. Photographs of some collecting localities. A. Igarapé Cajutuba II, Santarém; B. Temporary puddle, Santarém; C. Nascente, Igarapé Água Fria, Mojuí dos Campos; D. Igarapé Guaraná, Santarém; E. Lago do Juá, Santarém; F. Cachoeira Rocha Negra, Santarém; G. Igarapé Jatobá, Santarém.



Figure 3. Photographs of some collecting localities. A. Cachoeira da Cavada, Santarém; B. Igarapé do Ailton, Belterra; C. Igarapé Aramañá, Belterra; D. Igarapé Coronel Batista, Belterra; E. Igarapé do Rai, Santarém; F. Igarapé, BR-163, Km-115, Belterra.

To identify the specimens, we used information available in Bacon (1956), Spangler (1990), Nieser (1994), Nieser and Melo (1997), Polhemus (1997), Moreira and Barbosa (2013), Makhan (2014), Rodrigues et al. (2014a), Rodrigues et al. (2014b), Floriano et al. (2016b), Floriano et al. (2016a), Floriano et al. (2017), Magalhães et al. (2016), Cordeiro (2017), Moreira et al. (2018), Galindo-Malagón et al. (2021). Type-specimens are deposited in the Coleção Entomológica do Instituto Oswaldo Cruz, Fundação Oswaldo Cruz, Rio de Janeiro,

Brazil (CEIOC). Other specimens are deposited in the Laboratório de Ecologia e Taxonomia de Invertebrados, Universidade Federal do Oeste do Pará, Santarém, Brazil (LETIA). Distribution data presented for each species are based on Moreira (2021a), Moreira (2021b), Moreira (2021c), Moreira (2021d), Moreira (2021e).

We made descriptions and photographs, based on dry specimens. All measurements are given in millimetres and abbreviated as follows: body length (BL), head length (HL), head width (HW), minimum head width between the eyes (INT), length of antennomeres I–IV (ANT I, ANT II, ANT III, ANT IV), width of eye (EYE), pronotum length on mid-line (PL), pronotum width (PW), length of femur (FEM), length of tibia (TIB) and length of tarsomeres I–II (TAR I, TAR II).

Taxon treatments

***Brachymetra lata* Shaw, 1933**

Nomenclature

Brachymetra lata – see Shaw (1933): 227, pl. XX, fig. 4. **Materials**

- a. country: Brazil; stateProvince: Pará; municipality: Belterra; locality: Floresta Nacional do Tapajós; verbatimLatitude: 03°03'02.6"S; verbatimLongitude: 54°55'30.1"W; verbatimEventDate: 20.I.2020; habitat: igarapé; sex: 3 apterous ♂, 5 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- b. country: Brazil; stateProvince: Pará; municipality: Belterra; locality: BR-163, km-115; verbatimLatitude: 03°17'34.8"S; verbatimLongitude: 54°52'45.6"W; verbatimEventDate: 23.XI.2019; habitat: igarapé; sex: 10 apterous ♂, 7 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- c. country: Brazil; stateProvince: Pará; municipality: Belterra; locality: Igarapé do Ailton; verbatimLatitude: 02°35'36.7"S; verbatimLongitude: 54°57'48.4"W; verbatimEventDate: 06.XI.2019; sex: 2 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen

- d. country: Brazil; stateProvince: Pará; municipality: Belterra; locality: Igarapé Coronel Batista; verbatimLatitude: 02°37'50.6"S; verbatimLongitude: 54°58'12.4"W; verbatimEventDate: 08.XI.2019; sex: 2 apterous ♂, 2 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- e. country: Brazil; stateProvince: Pará; municipality: Mojuí dos Campos; locality: Igarapé do Manel; verbatimLatitude: 02°25'06.3"S; verbatimLongitude: 54°44'26.3"W; verbatimEventDate: 24.II.2020; sex: 8 apterous ♂, 3 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- f. country: Brazil; stateProvince: Pará; municipality: Mojuí dos Campos; locality: Igarapé Antonio Leite; verbatimLatitude: 03°09'06.2"S; verbatimLongitude: 54°50'28.7"W; verbatimEventDate: 18.X.2019; sex: 1 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- g. country: Brazil; stateProvince: Pará; municipality: Mojuí dos Campos; locality: Igarapé Terra Preta; verbatimLatitude: 02°43'09.1"S; verbatimLongitude: 54°40'20.7"W; verbatimEventDate: 10.II.2020; sex: 1 apterous ♂, 4 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- h. country: Brazil; stateProvince: Pará; municipality: Mojuí dos Campos; locality: Igarapé Terra Preta; verbatimLatitude: 02°43'09.1"S; verbatimLongitude: 54°40'20.7"W; verbatimEventDate: 24.II.2020; sex: 1 apterous ♂; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- i. country: Brazil; stateProvince: Pará; municipality: Mojuí dos Campos; locality: Igarapé Terra de Areia; verbatimLatitude: 02°47'58.7"S; verbatimLongitude: 54°38'15.6"W; verbatimEventDate: 24.I.2020; sex: 1 apterous ♂; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- j. country: Brazil; stateProvince: Pará; municipality: Mojuí dos Campos; locality: Igarapé Água Fria; verbatimLatitude: 02°47'19.7"S; verbatimLongitude: 54°38'40.9"W; verbatimEventDate: 24.IX.2020; sex: 2 apterous ♀; recordedBy:

- S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- k. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Jatobá; verbatimLatitude: 02°34'17.9"S; verbatimLongitude: 54°51'36.8"W; verbatimEventDate: 10.X.2020; sex: 1 apterous ♂, 1 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- l. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Cachoeira da Rocha Negra; verbatimLatitude: 02°29'48.5"S; verbatimLongitude: 54°45'13.3"W; verbatimEventDate: 25.IX.2020; sex: 10 apterous ♂, 8 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- m. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Cajutuba II; verbatimLatitude: 02°27'39.2"S; verbatimLongitude: 54°46'53.4"W; verbatimEventDate: 10.X.2020; sex: 1 apterous ♂, 1 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- n. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Sonrizal; verbatimLatitude: 02°32'13.6"S; verbatimLongitude: 54°55'2.6"W; verbatimEventDate: 09.VIII.2019; sex: 1 apterous ♂, 5 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- o. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Cachoeira da Cavada; verbatimLatitude: 02°35'48.9"S; verbatimLongitude: 54°31'47.3"W; verbatimEventDate: 21.X.2019; sex: 1 macropterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- p. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé das Bananeiras; verbatimLatitude: 02°30'52"S; verbatimLongitude: 54°54'20"W; verbatimEventDate: 20.X.2019; sex: 1 apterous ♂, 1 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- q. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Diamantino; verbatimLatitude: 02°30'16.2"S; verbatimLongitude:

54°39'32.9"W; verbatimEventDate: 06.IX.2019; sex: 11 apterous ♂, 18 apterous ♀, 1 macropterous ♂; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen

r. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé do Rai; verbatimLatitude: 02°35'35.3"S; verbatimLongitude: 54°30'18.1"W; verbatimEventDate: 13.XI.2019; sex: 1 macropterous ♂, 4 macropterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen

Distribution

Brazil (Amapá, Amazonas, Maranhão, Mato Grosso, Pará, Rondônia, Roraima), Colombia, Ecuador, French Guyana, Suriname, Venezuela (Moreira 2021a).

Notes

First records from the study area.

Photograph

Fig. 4a

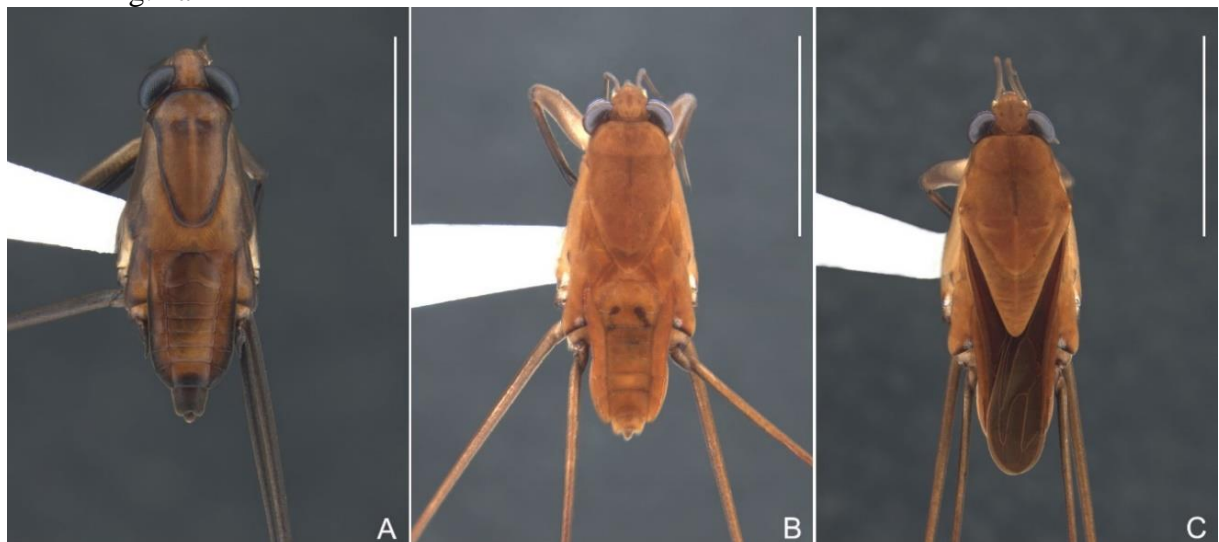


Figure 4. *Brachymetra* spp., habitus, dorsal view. Scale bars: 2 mm. a: *B. lata*, apterous male; b: *B. shawi*, apterous male; c: *B. shawi*, macropterous male.

***Brachymetra shawi* Hungerford & Matsuda, 1957**

Nomenclature

Brachymetra kleopatra – see Shaw (1933): 226, pl. XX, fig. 5 (misidentification).

Brachymetra shawi – see Hungerford & Matsuda (1957): 22, pl. I–II.

Materials

- a. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé da Débora; verbatimLatitude: 02°44'27.7"S; verbatimLongitude: 54°26'01.2"W; verbatimEventDate: 21.X.2019; sex: 3 apterous ♂, 1 apterous ♀, 5 macropterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- b. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Cachoeira da Rocha Negra; verbatimLatitude: 02°29'48.5"S; verbatimLongitude: 54°45'13.3"W; verbatimEventDate: 25.IX.2020; sex: 5 macropterous ♂; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- c. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Caixa d'água; verbatimLatitude: 02°27'31.7"S; verbatimLongitude: 54°44'49.4"W; verbatimEventDate: 10.IX.2020; sex: 1 macropterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen

Distribution

Bolivia, Brazil (Amazonas, Mato Grosso, Pará, Rondônia), Colombia, French Guiana, Guyana, Suriname, Trinidad & Tobago (Moreira 2021a).

Notes

First records from the study area.

Photograph

Fig. 4b, c

***Cylindrostethus drakei* Floriano, Paladini & Cavichioli, 2016**

Nomenclature

Cylindrostethus linearis – see Drake & Harris (1934): 220, pl. XXV; Nieser (1970): 120, figs 157–158; Moreira *et al.* (2011b): 274, figs 8–9 (misidentification).

Cylindrostethus drakei – see Floriano *et al.* (2016): 460, figs 1, 7–9 and 13–15.

Distribution

Brazil (Amazonas, Pará, Rondônia), Peru (Moreira 2021a)

Notes

Previously recorded from Santarém (Nieser 1970; misidentified as *C. linearis*), but absent from our samples.

***Cylindrostethus palmaris* Drake & Harris, 1934**

Nomenclature

Cylindrostethus linearis – see Drake & Harris (1930): 238; Drake & Harris (1941a): 240 (partim; misidentification).

Cylindrostethus palmaris – see Drake & Harris (1934): 222.

Materials

- a. country: Brazil; stateProvince: Pará; municipality: Belterra; locality: BR-163, Km-115; verbatimLatitude: 03°17'34.8"S; verbatimLongitude: 54°52'45.6"W; verbatimEventDate: 23.XI.2019; habitat: igarapé; sex: 2 macropterous ♂, 2 macropterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- b. country: Brazil; stateProvince: Pará; municipality: Belterra; locality: Igarapé Coronel Batista; verbatimLatitude: 02°37'50.6"S; verbatimLongitude: 54°58'12.4"W; verbatimEventDate: 08.XI.2019; sex: 1 apterous ♂, 1 apterous ♀, 1 macropterous ♂, 1 macropterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- c. country: Brazil; stateProvince: Pará; municipality: Belterra; locality: Igarapé do Ailton; verbatimLatitude: 02°35'36.7"S; verbatimLongitude: 54°57'48.4"W;

- verbatimEventDate: 06.XI.2019; sex: 1 apterous ♂, 2 apterous ♀, 1 macropterous ♂, 1 macropterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- d. country: Brazil; stateProvince: Pará; municipality: Belterra; locality: Igarapé do Ailton; verbatimLatitude: 02°35'36.7"S; verbatimLongitude: 54°57'48.4"W; verbatimEventDate: 06.XI.2019; sex: 1 apterous ♂, 2 apterous ♀, 1 macropterous ♂, 1 macropterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- e. country: Brazil; stateProvince: Pará; municipality: Mojuí dos Campos; locality: Igarapé do Manel; verbatimLatitude: 02°25'06.3"S; verbatimLongitude: 54°44'26.3"W; verbatimEventDate: 24.II.2020; sex: 11 apterous ♂, 7 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- f. country: Brazil; stateProvince: Pará; municipality: Mojuí dos Campos; locality: Igarapé Terra Preta; verbatimLatitude: 02°43'09.1"S; verbatimLongitude: 54°40'20.7"W; verbatimEventDate: 10.II.2020; sex: 2 apterous ♂, 1 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- g. country: Brazil; stateProvince: Pará; municipality: Mojuí dos Campos; locality: Igarapé Santa Júlia; verbatimLatitude: 02°40'19.7"S; verbatimLongitude: 54°43'06.9"W; verbatimEventDate: 09.XII.2019; sex: 2 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- h. country: Brazil; stateProvince: Pará; municipality: Mojuí dos Campos; locality: Igarapé Antonio Leite; verbatimLatitude: 03°09'06.2"S; verbatimLongitude: 54°50'28.7"W; verbatimEventDate: 18.X.2019; sex: 1 macropterous ♂, 1 macropterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- i. country: Brazil; stateProvince: Pará; municipality: Mojuí dos Campos; locality: Igarapé Mojuí dos Caboclos; verbatimLatitude: 02°42'03.0"S; verbatimLongitude: 54°41'01.0"W; verbatimEventDate: 21.I.2020; sex: 2 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen

- j. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Guaraná; verbatimLatitude: 02°46'25.9"S; verbatimLongitude: 54°23'20.6"W; verbatimEventDate: 06.III.2020; sex: 22 apterous ♂, 14 apterous ♀, 1 macropterous ♂; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- k. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé São Braz; verbatimLatitude: 02°29'07.0"S; verbatimLongitude: 54°49'41.9"W; verbatimEventDate: 26.VII.2019; sex: 1 apterous ♂; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- l. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Diamantino; verbatimLatitude: 02°30'16.2"S; verbatimLongitude: 54°39'32.9"W; verbatimEventDate: 06.IX.2019; sex: 1 apterous ♂, 1 apterous ♀, 2 macropterous ♂, 1 macropterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- m. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Cachoeira da Rocha Negra; verbatimLatitude: 02°29'48.5"S; verbatimLongitude: 54°45'13.3"W; verbatimEventDate: 25.IX.2020; sex: 2 macropterous ♂, 1 macropterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- n. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Jatobá; verbatimLatitude: 02°34'17.9"S; verbatimLongitude: 54°51'36.8"W; verbatimEventDate: 10.X.2020; sex: 1 apterous ♂, 1 apterous ♀, 1 macropterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen

Distribution

Argentina, Bolivia, Brazil (Amapá, Bahia, Amazonas, Espírito Santo, Goiás, Maranhão, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Pará, Rio de Janeiro, Rio Grande do Norte, Rondônia, Roraima, São Paulo), Colombia, Ecuador, French Guiana, Guyana, Peru, Suriname, Trinidad & Tobago, Venezuela (Moreira 2021a).

Notes

Previously recorded from Santarém (Kuitert 1942); first records from Belterra and Mojuí dos Campos.

Photograph

Fig. 5

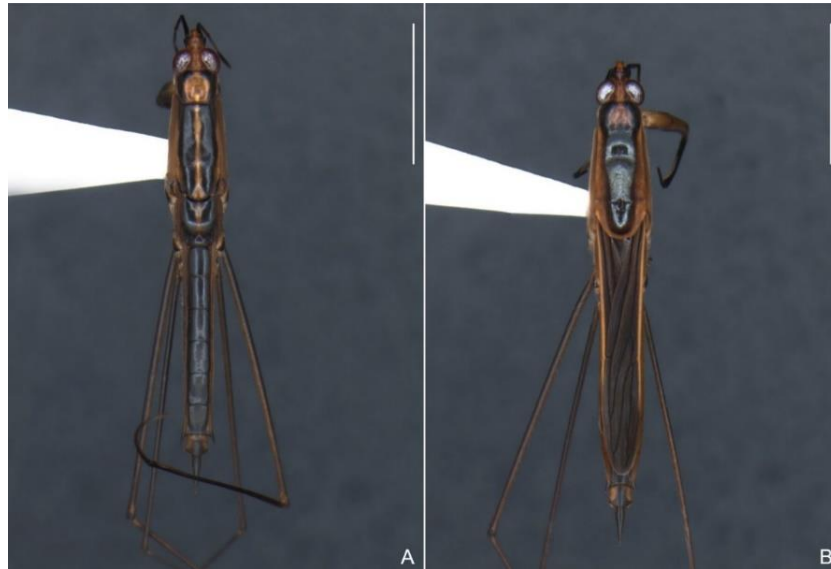


Figure 5 – *Cylindrostethus palmaris*, habitus, dorsal view. A. Apterous male; B. Macropterous male. Scale bars: 2 mm.

Limnogonus aduncus aduncus Drake & Harris, 1933

Nomenclature

Limnogonus aduncus – see Drake & Harris (1933): 110.

Limnogonus aduncus aduncus – see Kuitert (1942): 130.

Limnogonus recurvus – Mascarenhas (1979): 763, figs 1–3 (misidentification).

Tenagogonus spinulosus – see Poisson (1955): 68, figs 6, 7 (syn. by Andersen (1995): 115).

Materials

- a. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Cachoeira da Cavada; verbatimLatitude: 02°35'48.9"S; verbatimLongitude: 54°31'47.3"W; verbatimEventDate: 13.XI.2019; sex: 3 macropterous ♂, 1 macropterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen

- b. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Jatobá; verbatimLatitude: 02°34'17.9"S; verbatimLongitude: 54°51'36.8"W; verbatimEventDate: 10.X.2020; sex: 1 apterous ♂, 1 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- c. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé do Rai; verbatimLatitude: 02°35'35.3"S; verbatimLongitude: 54°30'18.1"W; verbatimEventDate: 13.XI.2019; sex: 5 apterous ♂, 2 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- d. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Diamantino; verbatimLatitude: 02°30'16.2"S; verbatimLongitude: 54°39'32.9"W; verbatimEventDate: 06.IX.2019; sex: 1 macropterous ♂; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen

Distribution

Argentina, Bolivia, Brazil (Amazonas, Bahia, Espírito Santo, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Pará, Paraná, Pernambuco, Rio de Janeiro, Roraima, Santa Catarina, São Paulo), Colombia, Ecuador, Guyana, Panama, Paraguay, Peru, Suriname, Trinidad & Tobago, Venezuela (Moreira 2021a).

Notes

Previously recorded from Santarém (Nieser 1970).

Photograph

Fig. 6a



Figure 6. Gerrinae spp., habitus, dorsal view. Scale bars: (A–E) 2 mm, (F) 1 mm. a: *Limnogonus aduncus aduncus*, apterous male; b: *L. recurvus*, apterous male; c: *Neogerris genticus*, apterous male; d: *Neogerris lubricus*, apterous male; e: *N. visendus*, macropterous male; f: *Tachygerris adamsoni*, macropterous male.

Limnogonus recurvus Drake & Harris, 1930

Nomenclature

Limnogonus recurvus Drake & Harris, 1930: 236.

Material

- a. bcountry: Brazil; stateProvince: Pará; municipality: Belterra; locality: Igarapé Jaturana; verbatimLatitude: 03°15'44.7"S; verbatimLongitude: 54°56'37.5"W; verbatimEventDate: 11.II.2020; sex: 1 apterous ♂; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen

- b. country: Brazil; stateProvince: Pará; municipality: Mojuí dos Campos; locality: Igarapé Terra Preta; verbatimLatitude: 02°43'09.1"S; verbatimLongitude: 54°40'20.7"W; verbatimEventDate: 10.II.2020; sex: 1 apterous ♂, 1 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- c. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé do Rai; verbatimLatitude: 02°43'09.1"S; verbatimLongitude: 54°40'20.7"W; verbatimEventDate: 13.XI.2019; sex: 3 apterous ♂, 3 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- d. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Guaraná; verbatimLatitude: 02°46'25.9"S; verbatimLongitude: 54°23'20.6"W; verbatimEventDate: 06.III.2020; sex: 2 apterous ♂; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- e. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Mararú; verbatimLatitude: 02°29'35.9"S; verbatimLongitude: 54°40'06.6"W; verbatimEventDate: 23.VIII.2019; sex: 2 macropterous ♂; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- f. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Jatobá; verbatimLatitude: 02°34'17.9"S; verbatimLongitude: 54°51'36.8"W; verbatimEventDate: 10.X.2020; sex: 6 apterous ♂, 2 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- g. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Mutunuy; verbatimLatitude: 02°28'53.1"S; verbatimLongitude: 54°41'45.9"W; verbatimEventDate: 17.X.2015; sex: 1 macropterous ♂; recordedBy: M. Galúcio; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen

Distribution.

Bolivia, Brazil (Amazonas, Bahia, Maranhão, Mato Grosso, Minas Gerais, Pará, Pernambuco, Rondônia, São Paulo) (Moreira 2021a).

Notes

Previously recorded from Santarém (Kuitert 1942); first records from Belterra and Mojuí dos Campos.

Photograph

Fig. 6b

Neogerris genticus* (Drake & Harris, 1934)*Nomenclature**

Limnogonus genticus – see Drake & Harris (1934): 213.

Neogerris genticus – see Andersen (1975): 8.

Materials

- a. country: Brazil; stateProvince: Pará; municipality: Belterra; locality: Igarapé Aramanaí; verbatimLatitude: 02°42'56.8"S; verbatimLongitude: 54°59'59.3"W; verbatimEventDate: 07.XI.2019; sex: 1 apterous ♂, 1 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen

Distribution

Brazil (Mato Grosso, Pará) (Moreira 2021a).

Notes

Described from Santarém (Drake & Harris 1934); first record from Belterra.

Photograph

Fig. 6c

Neogerris lotus* (White, 1879a)*Nomenclature**

Limnogonus lotus – see White (1879a): 488.

Neogerris lotus – see Andersen (1975): 8.

Distribution

Brazil (Amazonas, Distrito Federal, Mato Grosso, Pará), Colombia, Guyana, Suriname, Trinidad & Tobago (Moreira 2021a).

Notes

Previously recorded from Santarém (Drake & Harris 1930), but absent from our samples.

Neogerris lubricus* (White, 1879)*Nomenclature**

Limnogonus lubricus – see White (1879a): 489.

Neogerris lubricus – see Andersen (1975): 8.

Neogerris celeris – see Nieser & Alkins-Koo (1991): 71, figs 172 and 174 (misidentification).

Neogerris lotus – see Cabette et al. (2010): 120 (misidentification).

Materials

- a. country: Brazil; stateProvince: Pará; municipality: Belterra; locality: Igarapé do Ailton; verbatimLatitude: 02°35'36.7"S; verbatimLongitude: 54°57'48.4"W; verbatimEventDate: 06.XI.2019; sex: 1 apterous ♂, 3 apterous ♀, 1 macropterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- b. country: Brazil; stateProvince: Pará; municipality: Mojuí dos Campos; locality: Igarapé Água Fria; verbatimLatitude: 02°47'19.7"S; verbatimLongitude: 54°38'40.9"W; verbatimEventDate: 24.IX.2020; sex: 2 apterous ♂, 3 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen

- c. country: Brazil; stateProvince: Pará; municipality: Mojuí dos Campos; locality: Igarapé Antonio Leite; verbatimLatitude: 03°09'06.2"S; verbatimLongitude: 54°50'28.7"W; verbatimEventDate: 18.X.2019; sex: 1 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- d. country: Brazil; stateProvince: Pará; municipality: Mojuí dos Campos; locality: Igarapé Terra Preta; verbatimLatitude: 02°43'09.1"S; verbatimLongitude: 54°40'20.7"W; verbatimEventDate: 10.II.2020; sex: 3 apterous ♀, 3 macropterous ♂, 1 macropterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- e. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Sonrizal; verbatimLatitude: 02°32'13.6"S; verbatimLongitude: 54°55'26.6"W; verbatimEventDate: 09.VIII.2019; sex: 1 apterous ♀, 1 macropterous ♂, 1 macropterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- f. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Jatobá; verbatimLatitude: 02°34'17.9"S; verbatimLongitude: 54°51'36.8"W; verbatimEventDate: 10.X.2020; sex: 1 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- g. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Diamantino; verbatimLatitude: 02°30'16.2"S; verbatimLongitude: 54°39'32.9"W; verbatimEventDate: 06.IX.2019; sex: 1 apterous ♂; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen

Distribution

Argentina, Bolivia, Brazil (Amapá, Amazonas, Bahia, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Pará, Piauí, Rio de Janeiro, Rondônia, São Paulo), Colombia, Costa Rica, Ecuador, French Guiana, Guyana, Panama, Paraguay, Peru, Suriname, Trinidad & Tobago (Moreira 2021a).

Notes

Previously recorded from Santarém (Kuitert 1942; Nieser 1970); first records from Belterra and Mojuí dos Campos.

Photograph

Fig. 6d

Neogerris visendus (Drake & Harris, 1934)

Nomenclature

Limnogonus visendus – see Drake & Harris (1934): 215.

Neogerris lubricus – see Andersen (1975): 8.

Materials

- a. country: Brazil; stateProvince: Pará; municipality: Belterra; locality: Igarapé Aramanaí; verbatimLatitude: 02°42'56"S; verbatimLongitude: 54°59'59"W; verbatimEventDate: 07.XI.2019; sex: 3 apterous ♂; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- b. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Diamantino; verbatimLatitude: 02°30'16"S; verbatimLongitude: 54°39'32"W; verbatimEventDate: 06.IX.2019; sex: 1 macropterous ♂, 1 macropterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- c. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Jatobá; verbatimLatitude: 02°34'17"S; verbatimLongitude: 54°51'36"W; verbatimEventDate: 10.X. 2020; sex: 6 macropterous ♂, 4 macropterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen

Distribution

Brazil (Amazonas, Mato Grosso, Pará, Roraima), Colombia, Peru, Suriname, Venezuela (Moreira 2021a).

Notes

Previously recorded from Belterra (Nieser 1970); first records from Santarém.

Photograph

Fig. 6e

Tachygerris adamsoni* (Drake, 1942)*Nomenclature**

Tenagogonus adamsoni – see Drake (1942): 108.

Tenagogonus duolineatus – see Kuitert (1942): 133, pl. X, figs 4 and 4a (syn. by Drake 1957b: 193).

Tachygonus adamsoni – see Drake (1957a): 111.

Tachygerris adamsoni – Drake (1957b): 193.

Materials

- a. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Cachoeira da Rocha Negra; verbatimLatitude: 02°29'48.5"S; verbatimLongitude: 54°45'13.3"W; verbatimEventDate: 25.IX.2020; sex: 1 macropterous ♂; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen

Distribution

Bolivia, Brazil (Amazonas, Maranhão, Mato Grosso, Minas Gerais, Pará, Piauí, Rio de Janeiro), Colombia, French Guiana, Paraguay, Peru, Suriname, Trinidad & Tobago, Venezuela (Moreira 2021a).

Notes

First record from the study area.

Photograph

Fig. 6f

Rheumatobates crassifemur esakii* Schroeder, 1931*Nomenclature**

Rheumatobates crassifemur var. *esakii* – see Schroeder (1931): 77, pl. VII, fig. 3, pl. VIII, figs 3, 4.

Rheumatobates esakii – see Drake & Harris (1937): 362.

Rheumatobates crassifemur esakii – Hungerford 1954: 565, pl. XII, fig. 22.

Rheumatobates bonariensis – see Nessimian et al. (2008) (misidentification).

Distribution

Brazil (Amazonas, Pará), Colombia, Ecuador, French Guiana, Guyana, Peru, Suriname, Trinidad & Tobago (Moreira 2021a).

Notes

Previously recorded from Santarém (Hungerford 1954), but absent from our samples.

Rheumatobates klagei* Schroeder, 1931*Nomenclature**

Rheumatobates klagei -see Schroeder (1931): 75, pl. VII, figs 1, 2, pl. VIII, fig. 5, pl. XI, figs 7 and 8.

Distribution

Brazil (Amazonas, Pará), Peru (Moreira 2021a).

Notes

Previously recorded from Santarém (Hungerford 1954; Nieser 1970), but absent from our samples.

Hydrometra argentina Berg, 1879

Nomenclature

Hydrometra argentina – see Berg (1879): 182.

Hydrometra mensor – see White (1879b): 267 (syn. by Drake 1954: 61).

Limnobates chilensis – see Reed (1901): 70 (syn. by Drake 1953: 41).

Hydrometra kirkaldyana – see Torre-Bueno (1926): 111 (syn. by Drake 1953: 41).

Hydrometra husseyi – see Torre-Bueno (1926): 111 (syn. by Drake 1953: 41).

Hydrometra argenitna – see Drake & Lauck (1959): 51 (incorrect subsequent spelling).

Materials

- a. country: Brazil; stateProvince: Pará; municipality: Belterra; locality: BR-163, Km-115; verbatimLatitude: 03°17'34.8"S; verbatimLongitude: 54°52'45.6"W; verbatimEventDate: 25.IX.2020; habitat: igarapé; sex: 1 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- b. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Lago do Juá; verbatimLatitude: 02°25'57.8"S; verbatimLongitude: 54°46'55.0"W; verbatimEventDate: 17.II.2020; sex: 1 apterous ♀; recordedBy: E.C. Oliveira; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen

Distribution

Argentina, Bolivia, Brazil (Amapá, Amazonas, Bahia, Ecuador, Espírito Santo, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Pará, Paraíba, Paraná, Peru, Rio de Janeiro, Rio Grande do Sul, Santa Catarina, São Paulo), Chile, Colombia, Panama, Paraguay, Suriname, Trinidad & Tobago, Uruguay, Venezuela (Moreira 2021c).

Notes

Previously recorded from Santarém (Champion 1898; as *H. mensor*); first record from Belterra.

Photograph

Fig. 7



Figure 7. *Hydrometra argentina*, apterous female. A. Habitus, dorsal view; B. Habitus, ventral view; C. Habitus, lateral view; D. Anterior portion of head, dorsal view; E. Thorax, lateral view; F. Abdomen, lateral view. Scale bars: (A–C, E, F) 2 mm, (D) 0.2 mm.

Mesovelia mulsanti White, 1879

Nomenclature

Mesovelia mulsanti – see White (1879b): 268.

Mesovelia bisignata – see Uhler (1884): 274 (syn. by Champion (1898): 123)).

Mesovelia mulsanti mulsanti – see Jaczewski (1930): 5, pl. III (syn. by Herring (1950): 148)).

Mesovelia mulsanti bisignata – see Jaczewski (1930): 5, pl. I, figs 1–5, pl. II, figs 20 and 21, pl. III (syn. by Herring 1950: 148).

Mesovelia mulsanti meridionalis – see Jaczewski (1930): 6, pl. I, fig. 6, pl. II, fig. 19, pl. III (syn. by Herring 1950: 148).

Mesovelia mulsanti caraiba – Jaczewski 1930: 6, pl. I, fig. 7–16, pl. II, fig. 17, 18, 22, pl. III (syn. by Herring 1950: 148).

Material

- a. country: Brazil; stateProvince: Pará; municipality: Belterra; locality: Igarapé Aramaná; verbatimLatitude: 02°42'56.8"S; verbatimLongitude: 54°59'59.3"W; verbatimEventDate: 07.XI.2019; sex: 1 apterous ♂; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- b. country: Brazil; stateProvince: Pará; municipality: Belterra; locality: Igarapé Jatuarana; verbatimLatitude: 03°15'44.7"S; verbatimLongitude: 54°56'37.5"W; verbatimEventDate: 11.II.2020; sex: 4 apterous ♂, 13 apterous ♀; 1 macropterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- c. country: Brazil; stateProvince: Pará; municipality: Mojuí dos Campos; locality: Igarapé Terra Preta; verbatimLatitude: 02°43'09.1"S; verbatimLongitude: 54°40'20.7"W; verbatimEventDate: 10.II.2020; sex: 4 apterous ♂, 6 apterous ♀, 2 ♀ with broken wings; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- d. country: Brazil; stateProvince: Pará; municipality: Mojuí dos Campos; locality: Igarapé Terra Preta; verbatimLatitude: 02°43'09.1"S; verbatimLongitude: 54°40'20.7"W; verbatimEventDate: 24.II.2020; sex: 1 apterous ♂, 1 apterous ♀, 1 ♂ with broken wings; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- e. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Mararú; verbatimLatitude: 02°29'35.9"S; verbatimLongitude: 54°40'06.6"W; verbatimEventDate: 23.VIII.2019; sex: 1 apterous ♂; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- f. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Diamantino; verbatimLatitude: 02°30'16.2"S; verbatimLongitude: 54°39'32.9"W; verbatimEventDate: 06.IX.2019; sex: 1 apterous ♂, 1 apterous

- ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- g. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé do Rai; verbatimLatitude: 02°35'35.3"S; verbatimLongitude: 54°30'18.1"W; verbatimEventDate: 13.XI.2019; sex: 1 apterous ♂, 1 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- h. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Guaraná; verbatimLatitude: 02°46'25.9"S; verbatimLongitude: 54°23'20.6"W; verbatimEventDate: 06.III.2020; sex: 4 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- i. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Mararú; verbatimLatitude: 02°29'35.9"S; verbatimLongitude: 54°40'06.6"W; verbatimEventDate: 23.VIII.2019; sex: 1 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- j. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Jatobá; verbatimLatitude: 02°34'17.9"S; verbatimLongitude: 54°51'36.8"W; verbatimEventDate: 10.X.2020; sex: 1 apterous ♀, 1 macropterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- k. country: Brazil; stateProvince: Pará; municipality: Santarém; verbatimLatitude: 02°27'32.6"S; verbatimLongitude: 54°44'48.4"W; verbatimEventDate: 14.IV.2020; habitat: puddle; sex: 1 macropterous ♂; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- l. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Lago Mapiri; verbatimLatitude: 02°25'28.5"S; verbatimLongitude: 54°44'47.7"W; verbatimEventDate: 18.II.2020; sex: 4 apterous ♀, 1 macropterous ♀; recordedBy: E.C. Oliveira; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- m. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Vila Nova; verbatimLatitude: 02°30'50.4"S; verbatimLongitude: 54°49'29.7"W;

verbatimEventDate: 10.X.2015; sex: 2 apterous ♂; recordedBy: M. Galúcio;
 type: PhysicalObject; institutionCode: LETIA; basisOfRecord:
 PreservedSpecimen

Distribution

Antigua & Barbuda, Argentina, Aruba, Barbados, Belize, Bolivia, Bonaire, Brazil (Amapá, Amazonas, Bahia, Ceará, Espírito Santo, Goiás, Maranhão, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Pará, Paraná, Pernambuco, Piauí, Rio de Janeiro, Rio Grande do Sul, Rondônia, Santa Catarina, São Paulo), Canada, Colombia, Costa Rica, Cuba, Curaçao, Dominica, Dominican Republic, French Guiana, Grenada, Guadeloupe, Guatemala, Guyana, Hawaiian Islands, Honduras, Jamaica, Klein Curaçao, Mexico, Nicaragua, Panama, Paraguay, Peru, Puerto Rico, St. Kitts & Nevis, St. Lucia, St. Martin, St. Vincent & Grenadines, Trinidad & Tobago, USA, U.S. Virgin Islands, Venezuela (Moreira 2021d).

Notes

Previously recorded from Santarém (Neering 1954); first records from Belterra and Mojuí dos Campos.

Photograph

Fig. 8



Figure 8. *Mesovelia mulsanti*, apterous male, habitus. A. Dorsal view; B. Ventral view. Scale bars: 1 mm.

Mesovelia zeteki* Harris & Drake, 1941c*Nomenclature**

Mesovelia zeteki – see Harris & Drake (1941c): 276.

Distribution

Brazil (Amapá, Amazonas, Pará), Colombia, Panama (Moreira 2021d).

Notes

Previously recorded from Santarém (Moreira *et al.* 2008), but absent from our samples.

Microvelia aschnakiranae* Makhan, 2014*Nomenclature**

Microvelia aschnakiranae – see Makhan (2014): 2, figs 7, 8.

Materials

- a. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Guaraná; verbatimLatitude: 02°46'25.9"S; verbatimLongitude: 54°23'20.6"W; verbatimEventDate: 06.III.2020; sex: 1 macropterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen

Distribution.

Brazil (Pará), Suriname (Makhan 2014).

Notes

First record from Brazil.

Photograph

Fig. 9



Figure 9. *Microvelia aschnakiranae*, macropterous female, habitus. A. Dorsal view; B. Ventral view. Scale bars: 1mm.

Microvelia sp. n. 1

Materials

Holotype:

- a. country: Brazil; stateProvince: Pará; municipality: Belterra; locality: BR-163, Km-115; verbatimLatitude: 03°17'34.8"S; verbatimLongitude: 54°52'45.6"W; verbatimEventDate: 25.IX.2020; habitat: igarapé; sex: apterous ♂; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: CEIOC 81770; basisOfRecord: PreservedSpecimen

Paratype:

- a. country: Brazil; stateProvince: Pará; municipality: Belterra; locality: BR-163, Km-115; verbatimLatitude: 03°17'34.8"S; verbatimLongitude: 54°52'45.6"W; verbatimEventDate: 25.IX.2020; habitat: igarapé; sex: 1 apterous ♂, 3 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: CEIOC 81771; basisOfRecord: PreservedSpecimen

Apterous males: Holotype/Paratype. BL 1.15/1.2, HL 0.22/0.21, HW 0.39/0.38, ANT I 0.14/0.14, ANT II 0.10/0.09, ANT III 0.13/0.13, ANT IV 0.20/0.22, INT 0.18/0.7, EYE 0.09/0.09, PL 0.13/0.14, PW 0.48/0.51; FORELEG: FEM 0.28/0.31, TIB 0.24/0.24, TAR I 0.15/0.15; MIDLEG: FEM 0.36/0.36, TIB 0.29/0.29, TAR I

0.06/0.05, TAR II 0.11/0.11; HINDLEG: FEM 0.42/0.42, TIB 0.42/0.42, TAR I 0.05/0.5, TAR II 0.11/0.11.

Head dark-brown. Antennomere I yellowish, II–IV dark-brown. Eye reddish-brown. Labium yellowish-brown, except apex of article III and entire IV dark-brown. Pronotum with anterior half and lateral margins orange-brown, apical half dark-brown. Meso- and metanota dark brown. Prosternum yellowish brown, darker at middle groove. Meso- and metasterna dark-brown. Pro- and metacetabula with anterior half yellowish-brown and posterior half dark brown. Anterior and posterior coxae and trochanters yellowish-brown. Mesoacetabulum and middle coxa dark-brown. Femora and tibiae yellowish-brown, darker dorsally on the distal third; tarsi dark-brown. Abdominal mediotergites dark-brown. Abdominal laterotergites orange-brown with lateral margins dark. Abdominal sterna dark-brown. Terminalia yellowish-brown.

Head covered with very short setae, longer on clypeus. Antenna covered with short setae. Antennomere I widest, slightly curved laterally, thickened towards apex; II wider than III–IV, thickened towards apex; III cylindrical, thinner than IV; IV fusiform, at middle subequal to II in thickness. Labium reaching base of mesosternum.

Thoracic terga densely covered with moderately long light setae; sides of thorax, prosternum and acetabula with denser, longer setae; meso- and metasterna with short setae. Pronotum with lateral margins bowed; posterior margin sinuous, concave centrally, exposing two rounded lobes of the mesonotum laterally (Fig. 10C). Metanotum exposed as a short central stripe, with posterior margin widely concave. Legs covered with short setae, with some longer setae on dorsal surfaces of femora and tibiae. Femora without spines. Fore tibia straight, enlarged towards apex, with an obtuse, short spine at apex. Hind femur slightly thicker than middle femur. Hind tibia straight.



Figure 10. *Microvelia* **sp. nov. 1**, apterous male, holotype. A. Habitus, dorsal view; B. Habitus, ventral view; C. Head and thorax, dorsal view; D. Abdomen, segments IV–VII and terminalia. Scale bars: (A, B) 1 mm, (C, D) 0.2 mm.

Abdominal mediotergites covered with moderately long setae. Mediotergites III–VI depressed; VI–VII with shiny median stripe; VII with posterior margin slightly concave. Abdominal laterotergites elevated to about 90°. Abdominal sterna covered with short setae, posterior margins concave, without tubercles. Abdominal segment VIII slightly exposed, dorsally more than four times wider than long; dorsum with lateral margins convergent and posterior margin slightly concave (Fig. 10A, 11A); venter strongly sclerotized, with an evident central notch (Fig. 10D, 11B) and three tufts of long setae on each side (well visible in lateral view, Fig. 11C). Proctiger with lateral projections and apical margin rounded (Fig. 11D); parameres symmetrical (Fig. 11E).

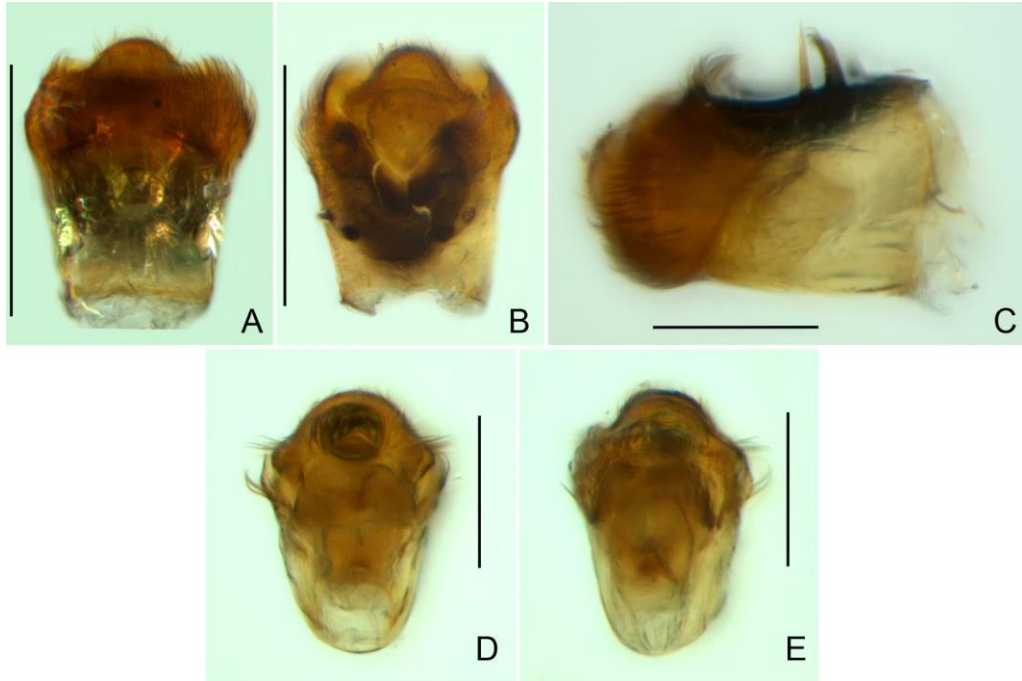


Figure 11. *Microvelia sp. nov. 1*, male terminalia. A. Dorsal view; B. Ventral view [abdominal segment VIII broken]; C. Lateral view; D–E Genital capsule: D. Dorsal view; E. Ventral view. Scale bars: (A, B and E) 0.1 mm, (C and D) 0.2 mm

Apterous females: BL 1.21–1.26, HL 0.22, HW 0.40–0.42, ANT I 0.14, ANT II 0.08–0.10, ANT III 0.12, ANT IV 0.20–0.22, INT 0.18, EYE 0.09–0.10, PL 0.12–0;14, PW 0.54–0.58; FORELEG: FEM 0.30, TIB 0.24, TAR I 0.14–0.16; MIDLEG: FEM 0.36, TIB 0.28–0.30, TAR I 0.06, TAR II 0.12; HINDLEG: FEM 0.40–0.42, TIB 0.40, TAR I 0.06, TAR II 0.12.

Coloration and structure similar to apterous male, but larger and more robust. Fore tibia straight, enlarged towards apex, without apical spine. Abdomen larger than in males, as wide as pronotum (Fig. 12A). Abdominal segment VIII yellowish-brown dorsally and ventrally. Posterior margin of abdominal mediotergite VIII straight. Abdominal laterotergites elevated to about 45°.



Figure 12. *Microvelia* sp. nov. 1, apterous females, paratypes. A. Habitus, dorsal view; B. Habitus, ventral view; C. Habitus, dorsal view; expanded abdomen, probably with eggs. Scale bars: 1 mm.

Diagnosis

This new species can be distinguished from other South American *Microvelia* by the pronotum of the apterous form covering the mesonotum centrally, but exposing it laterally; the metanotum exposed centrally, with the posterior margin widely concave; the abdominal segment VIII of the males slightly exposed dorsally, more than four times wider than long, with the lateral margins convergent and the posterior margin slightly concave, ventrally deeply inserted into the pregenital abdomen, strongly sclerotized, with an evident central notch and three tufts of long setae on each side (only one tuft is visible before dissection); and the male proctiger with small, rounded, lateral projections. Additionally, *M. sp. nov. 1* has the body shorter than 1.30 mm (apterous males 1.15–1.20 mm; apterous females 1.21–1.26 mm).

Microvelia venustatis Drake & Harris, 1933 (Fig. 13A–C; apterous male in Rodrigues *et al.* 2021: fig. 89) and *M. hinei* Drake, 1920 (Fig. 13D–F) are small species that share with *M. sp. nov. 1* the general appearance and the male terminalia strongly inserted into the pregenital abdomen, although more deeply than in the new species and more weakly sclerotized. In contrast, *M. venustatis* displays a thicker antennomere IV and the abdominal sterna of the male bear tufts of setae medially (at least on segments V–VII; Fig. 11B), which are absent in the other two species. *Microvelia hinei* can be distinguished from both by the pronotum of the apterous form completely covering the mesonotum, exposing only the metanotum centrally, the slightly longer body (paratype

apterous male 1.40 mm), the different color pattern, and the posterior margin of the male abdominal segment VIII nearly straight dorsally (vs. concave in *M. sp. nov. 1*).

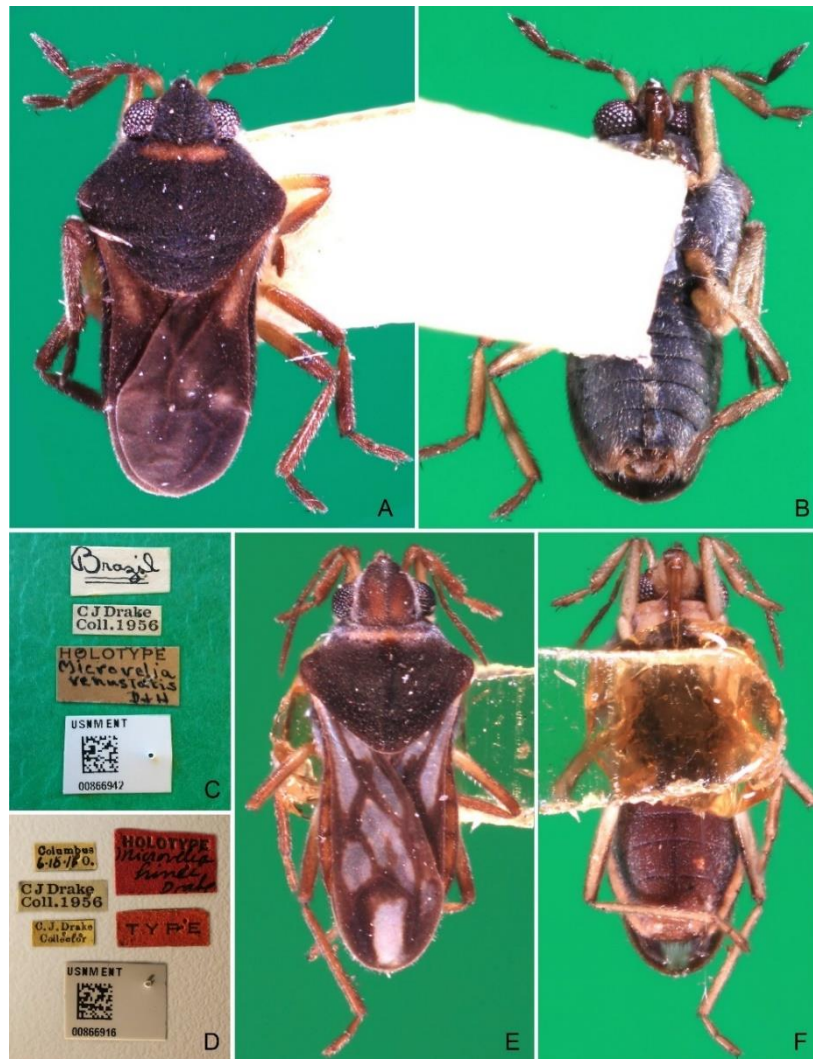


Figure 13. Holotypes deposited in the Entomology Collection of the Smithsonian National Museum of Natural History (NMNH). a: *Microvelia venustatis*, macropterous male, habitus, dorsal view; b: *M. venustatis*, macropterous male, habitus, ventral view; c: *M. venustatis*, labels; d: *M. hinei*, labels; e: *M. hinei*, macropterous male, habitus, dorsal view; f: *M. hinei*, macropterous male, habitus, ventral view.

Microvelia ubatuba Moreira & Barbosa, 2011, in turn, shares with the new species the male abdominal segment VIII notched ventrally. Although *M. ubatuba* is known only from macropterous specimens, it can be distinguished from *M. sp. nov. 1* by the longer and narrower male abdominal segment VIII, dorsally with a distinct concavity at the posterior margin, and ventrally with a strong rounded depression and a smaller and weakly sclerotized notch on the posterior margin (Moreira & Barbosa 2011: 299, figs 7–11).

Finally, the male proctiger with lateral projections was previously reported in two other Neotropical species, *M. mimula* White, 1879 and *M. quieta* Drake & Carvalho, 1954 (Drake & Carvalho 1954: 224, figs 1, 2). Both are easily distinguished from *M. sp. nov. 1* by the longer body and the well-exposed male terminalia.

Etymology

[...]

Microvelia sp. n. 2

Materials

Holotype:

- a. country: Brazil; stateProvince: Pará; municipality: Belterra; locality: BR-163, Km-115; verbatimLatitude: 03°17'34.8"S; verbatimLongitude: 54°52'45.6"W; verbatimEventDate: 25.IX.2020; habitat: igarapé; sex: apterous ♂; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: CEIOC 81767; basisOfRecord: PreservedSpecimen

Paratypes:

- a. country: Brazil; stateProvince: Pará; municipality: Belterra; locality: BR-163, Km-115; verbatimLatitude: 03°17'34.8"S; verbatimLongitude: 54°52'45.6"W; verbatimEventDate: 25.IX.2020; habitat: igarapé; sex: 1 apterous ♂, 1 macropterous ♂, 2 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: CEIOC 81768; basisOfRecord: PreservedSpecimen
 b. country: Brazil; stateProvince: Pará; municipality: Belterra; locality: BR-163, Km-115; verbatimLatitude: 03°17'34.8"S; verbatimLongitude: 54°52'45.6"W; verbatimEventDate: 20.I.2020; habitat: igarapé; sex: 1 macropterous ♂; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: CEIOC 81769; basisOfRecord: PreservedSpecimen

Apterous males: Holotype/Paratype. BL 1.23/1.24, HL 0.22/0.22, HW 0.38/0.38, ANT I 0.16/0.16, ANT II 0.10/0.10, ANT III 0.12/0.12, ANT IV 0.24/0.24, INT 0.18/0.18, EYE 0.09/0.09, PL 0.20/0.20, PW 0.46/0.48; FORELEG: FEM 0.32/0.32, TIB

0.24/0.24, TAR I 0.16/0.16; MIDLEG: FEM 0.40/0.38, TIB 0.28/0.28, TAR I 0.06/0.06, TAR II 0.12/0.12; HINDLEG: FEM 0.40/0.42, TIB 0.40/0.42, TAR I 0.06/0.06, TAR II 0.13/–.

Head black. Antenna dark-brown, proximal half of antennomere I yellowish-brown. Eye reddish-brown. Labium yellowish-brown, except for distal article dark-brown. Pronotum dark-brown with a medially interrupted yellowish-brown transverse band on anterior half. Metanotum black, with posterolateral angles dark-brown. Prosternum yellowish-brown, median groove dark. Meso- and metasterna black. Acetabula brown. Coxae, trochanters and proximal half and venter of femora pale yellow; remainder of legs brown. Abdominal mediotergites black with whitish pruinosity; I with two darker longitudinal spots sublaterally; II–III darker at middle; IV–V dark with whitish pruinosity at median stripe and apical third; VI–VII darker at one/two narrow median stripe(s). Abdominal laterotergites yellowish brown, darker at anterior third, and mesal and lateral margins. Abdominal sterna black. Terminalia yellowish brown.

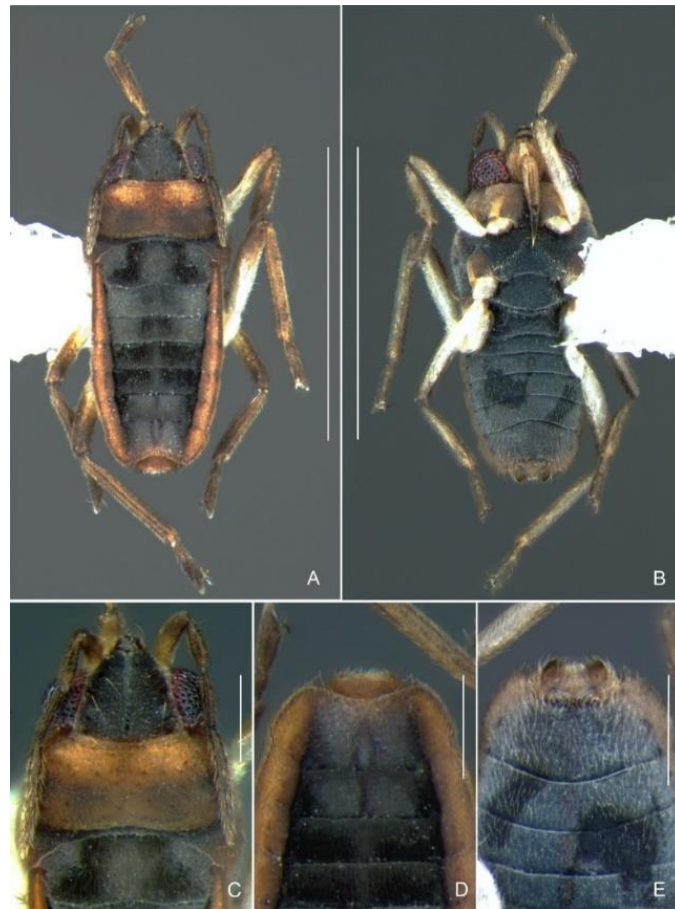


Figure 14. *Microvelia* sp. nov. 2, apterous male, holotype. A. Habitus, dorsal view; B. Habitus, ventral view; C. Head and thorax, dorsal view; D, E Abdomen, segments IV–VII and terminalia: D. Dorsal view E. Ventral view. Scale bars: (A and B) 1 mm, (C–E) 0.2 mm.

Head covered with short setae, longer on clypeus. Antenna reaching apex of metanotum; covered with short setae, longer and denser on article IV. Antennomere I widest, slightly curved laterally, thickened towards apex; II wider than III–IV, thickened towards apex; III cylindrical, thinner than IV; IV fusiform. Labium reaching middle of mesosternum.

Thoracic terga densely covered with very short setae; sides of thorax, prosternum and acetabula with longer setae. Pronotum long, covering mesonotum and most of metanotum; metanotum visible only as a very short central stripe (Fig. 14C). Circular punctures on a centrally interrupted transverse row adjacent to anterior margin of pronotum; another transverse row posterior to yellowish band; several sparse punctures posterior to latter row. Legs covered with short setae, with some longer setae on dorsal surfaces of femora and tibiae. Femora without spines. Fore tibia straight, enlarged towards apex, with an obtuse, short spine at apex. Hind femur thicker than middle femur. Hind tibia straight.

Abdomen covered with short setae. Posterior margin of abdominal mediotergite I with a slight concavity at middle; VII with a pronounced concavity (Fig. 14D). Abdominal laterotergites elevated to about 45°. Abdominal sterna II–IV moderately short, V–VI longer, VII twice as long as II; posterior margins concave, without tubercles, with many long setae (Fig. 14E). Abdominal segment VIII deeply inserted into pregenital abdomen; partially visible dorsally due to the concavity of mediotergite VII; faintly visible ventrally (Fig. 14D, E); posterior margin dorsally concave, ventrally with a weak median notch (Fig. 15C, D). Proctiger without lateral projections (Fig. 15E); parameres symmetrical (Fig. 15G); shape as in Fig. 13 F.

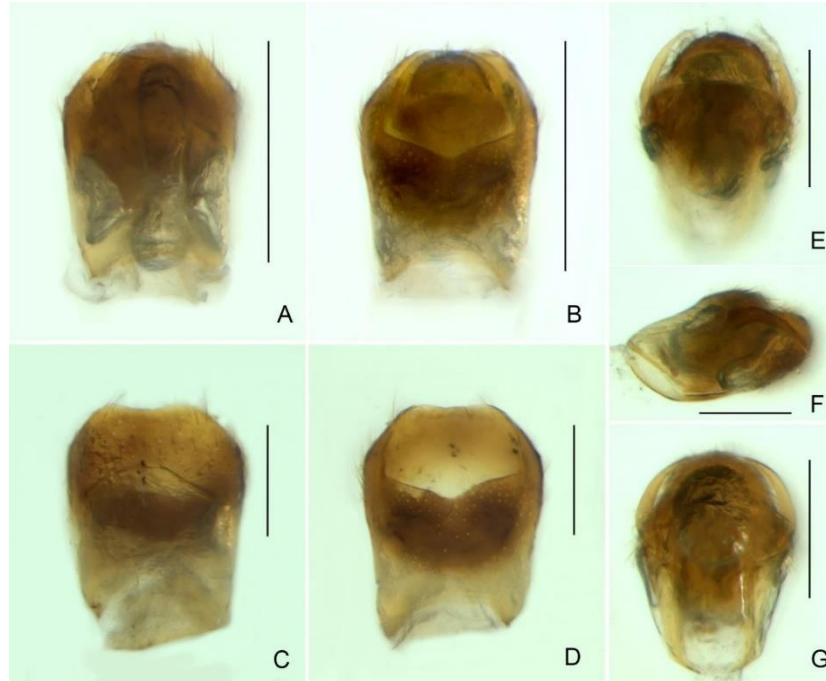


Figure 15. *Microvelia* sp. nov. 2, male terminalia. A. Dorsal view; B. Ventral view; C, D Abdominal segment VIII: C. Dorsal view; D. Ventral view; E–G Genital capsule: E. Dorsal view; F. Lateral view; G. Ventral view. Scale bars: (A and B) 0.2 mm, (C–G) 0.1 mm.

Macropterous males: BL 1.42–1.44, HL 0.22–0.23, HW 0.40, ANT I 0.16, ANT II 0.10, ANT III 0.12, ANT IV 0.24–0.26, INT 0.18, EYE 0.08–0.10, PL 0.46–0.48, PW 0.66; FORELEG: FEM 0.32, TIB 0.24, TAR I 0.16; MIDLEG: FEM 0.38, TIB 0.30, TAR I 0.04–0.06, TAR II 0.12; HINDLEG: FEM 0.42–0.44, TIB 0.44–0.46, TAR I 0.06, TAR II 0.12.

Coloration and structure similar to apterous male. Pronotum long, subpentagonal, completely covering meso- and metanota; posterior margin rounded. Forewings dark brown, with a proximal pair of elongated whitish maculae, a distal pair of rounded whitish maculae and a median whitish macula close to apex; lateral margins with rows of white setae.



Figure 16. *Microvelia* sp. nov. 2, paratypes. A–C Macropterous male: A. Habitus, dorsal view; B. Habitus, ventral view; C. Abdominal segments V–VII and terminalia, ventral view; D–F Apterous females: D. Habitus, dorsal view; E. Habitus, ventral view; F. Habitus, dorsal view; abdomen with different shape, probably with eggs. Scale bars: (A, B and D–F) 1 mm, (C) 0.2 mm.

Apterous females: BL 1.36–1.42, HL 0.22–0.24, HW 0.40, ANT I 0.16, ANT II 0.10, ANT III 0.12, ANT IV 0.26, INT 0.18–0.20, EYE 0.09, PL 0.20, PW 0.52–0.54; FORELEG: FEM 0.34, TIB 0.26, TAR I 0.18; MIDLEG: FEM 0.40, TIB 0.30–0.31, TAR I 0.06, TAR II 0.12; HINDLEG: FEM 0.44, TIB 0.46, TAR I 0.06, TAR II 0.14.

Colouration and structure similar to apterous male, but larger and more robust. Fore tibia straight, enlarged towards apex, without apical spine. Posterior margins of abdominal mediotergite VII and sternum VII straight. Posterior margin of abdominal tergum VIII rounded, with long setae. Abdominal laterotergites elevated to about 90°, slightly bowed on sides of mediotergites II–V, convergent and slightly reflected on sides

of VI–VIII (Fig. 16D). Fecundated females display expanded abdomen with differently shaped laterotergites (Fig. 16 F).

Diagnosis

This new species can be distinguished from other South American *Microvelia* by the pronotum of apterous specimens long, covering the mesonotum and most of the metanotum; the metanotum visible only as a very short central stripe; the posterior margin of the male abdominal mediotergite VII with a pronounced concavity; the male abdominal segment VIII deeply inserted into the pregenital abdomen, with the posterior margin dorsally concave and ventrally with a weak median notch; the shape of the female abdomen, with abdominal laterotergites elevated to about 90°, slightly bowed on the sides of mediotergites II–V, convergent and slightly reflected on the sides of VI–VIII; and by the pattern of whitish maculae on the forewings of macropterous specimens: a proximal pair of elongated maculae, a distal pair of rounded maculae, and a median macula close to apex. Additionally, *M. sp. nov. 2* has the body shorter than 1.50 mm (apterous males 1.23–1.24 mm; macropterous males 1.42–1.44 mm; apterous females 1.36–1.42 mm).

Microvelia sp. nov. 2 is very different from other Neotropical species of *Microvelia* with known apterous forms in which the pronotum covers the mesonotum and the metanotum completely or almost completely (e.g., *M. argentata* Nieser & Alkins-Koo, 1991, *M. digitalis* Padilla-Gil, 2019, *M. hambletoni* Drake, 1951, *M. hormiga* Padilla-Gil, 2019, *M. ioana* Drake & Hottes, 1952, *M. limaiana* Drake, 1951, *M. micra* Padilla-Gil, 2019, *M. nelsoni* Moreira, Barbosa & Ribeiro, 2012, *M. potama* Drake, 1958, *M. recifana* Drake, 1951, and *M. reflexa* Polhemus, 1974), because the general shape is distinct and they all have the male terminalia well-exposed, differently from the new species. The females of *M. ioana*, *M. micra*, and *M. reflexa* share with *M. sp. nov. 2* the abdominal laterotergites reflected over the mediotergites, but the general color of the body and the shape of the pronotum are quite different from the new species.

The macropterous form of the new species can be distinguished from the small South American species with known macropterous forms (e.g., *M. hinei*, *M. lujanana* Drake, 1951, *M. munda* Drake, 1951, *M. pudoris* Drake & Harris, 1936, *M. summersi* Drake & Harris, 1928, and *M. venustatis*) because of the pattern of maculae on the forewings,

together with the strongly inserted male terminalia and the shape of the male pygophore, proctiger and parameres.

Etymology

[...]

Microvelia longipes Uhler, 1894

Nomenclature

Microvelia longipes – see Uhler (1894): 219.

Microvelia modesta – see Uhler (1894): 220 (syn. by Drake 1952: 13).

Materials

- a. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Cachoeira da Cavada; verbatimLatitude: 02°35'48.9"S; verbatimLongitude: 54°31'47.3"W; verbatimEventDate: 13.XI.2019; sex: 1 macropterous ♂; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- b. country: Brazil; stateProvince: Pará; municipality: Santarém; verbatimLatitude: 02°27'32.6"S; verbatimLongitude: 54°44'48.4"W; verbatimEventDate: 14.IV.2020; habitat: puddle; sex: 1 macropterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen

Distribution

Argentina, Aruba, Barbados, Bolivia, Bonaire, Brazil (Amazonas, Bahia, Espírito Santo, Mato Grosso do Sul, Minas Gerais, Rio de Janeiro, Pará, Roraima, Santa Catarina, São Paulo), Colombia, Cuba, Curaçao, Dominican Republic, Ecuador, French Guiana, Grenada, Guyana, Jamaica, Paraguay, Peru, Puerto Rico, St. Barthélemy, St. Eustatius, St. Kitts & Nevis, St. Martin, Trinidad & Tobago, US Virgin Islands, Venezuela (Moreira 2021e).

Notes

First records from Pará state.

Photograph

Fig. 17a

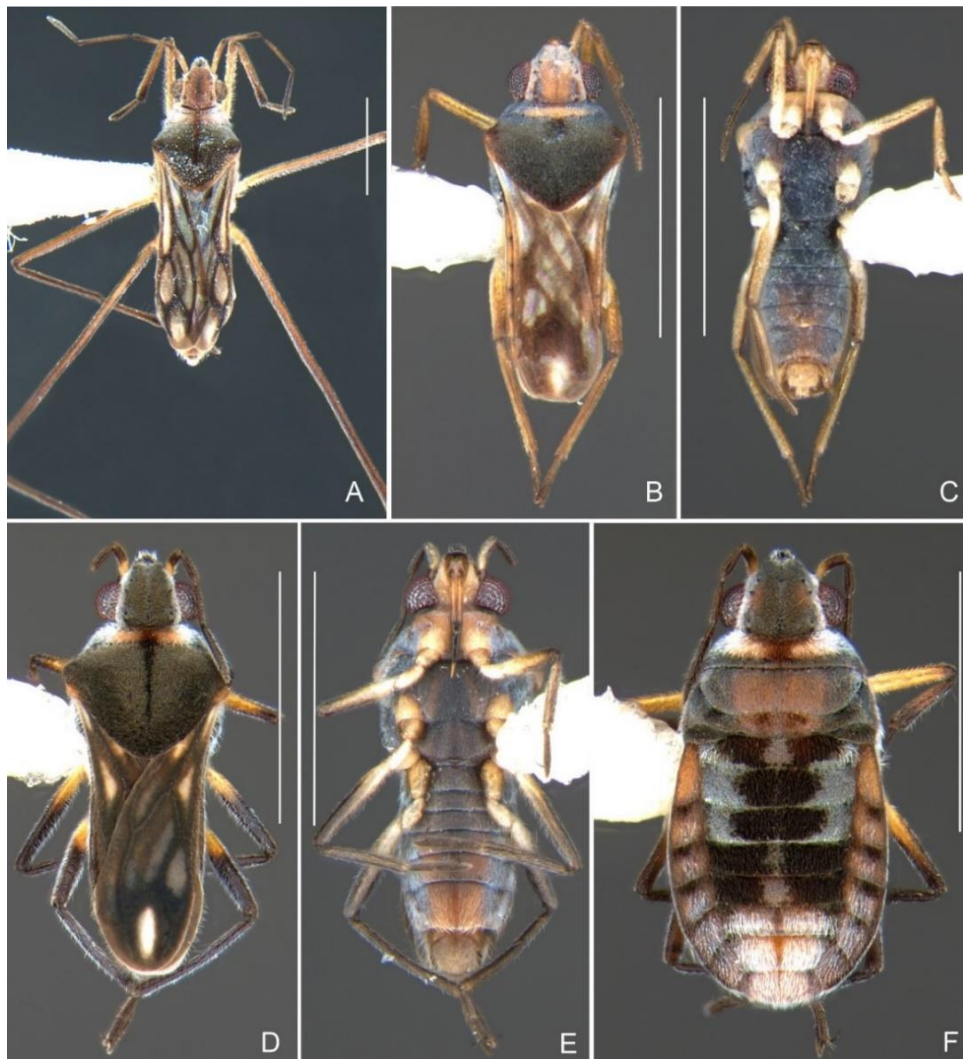


Figura 17. *Microvelia* spp., habitus. Scale bars: 1 mm. a: *M. longipes*, macropterous male, dorsal view; b: *M. mimula*, macropterous male, dorsal view; c: *M. mimula*, macropterous male, ventral view; d: *M. pulchella*, macropterous male, dorsal view; e: *M. pulchella*, macropterous male, ventral view; f: *M. pulchella*, apterous female, dorsal view.

Microvelia mimula White, 1879a

Nomenclature

Microvelia mimula – see White (1879a): 487.

Microvelia capitata – see Uhler (1894): 218 (misidentification).

Microvelia mendozana – see Jensen-Haarup (1920): 220, fig 4 (syn. by Drake and Hussey 1955: 114).

Microvelia myersi – see McKinstry (1937): 32 (syn. by Drake and Hussey 1951: 144).

Microvelia aemulana – see Drake and Plaumann (1955): 23 (syn. by Moreira and Barbosa 2011: 306).

Microvelia amrishi – see Makhani (2014): 2, figs 4–6 (syn. by Aristizábal-García et al. 2015: 596).

Materials

- a. country: Brazil; stateProvince: Pará; municipality: Mojuí dos Campos; locality: Igarapé Mojuí dos Caboclos; verbatimLatitude: 02°42'03.0"S; verbatimLongitude: 54°41'01.0"W; verbatimEventDate: 02.X.2020; sex: 1 macropterous ♂, 1 macropterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- b. country: Brazil; stateProvince: Pará; municipality: Santarém; verbatimLatitude: 02°27'32.6"S; verbatimLongitude: 54°44'48.4"W; verbatimEventDate: 10.IV.2020; habitat: puddle; sex: 2 macropterous ♂, 2 macropterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- c. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Guaraná; verbatimLatitude: 02°46'25.9"S; verbatimLongitude: 54°23'20.6"W; verbatimEventDate: 06.III.2020; sex: 1 macropterous ♂; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen

Distribution

Argentina, Barbados, Brazil (Amazonas, Ceará, Espírito Santo, Maranhão, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Pará, Rio de Janeiro, Santa Catarina, São Paulo), Colombia, Costa Rica, Cuba, Ecuador, French Guiana, Grenada, Panama, Paraguay, Peru, Puerto Rico, St. Vincent & Grenadines, Suriname, Trinidad & Tobago, Uruguay, Venezuela (Moreira 2021e).

Notes

Previously recorded from Santarém (Moreira *et al.* 2011c); first record from Mojuí dos Campos.

Photograph

Fig. 17b, c

Microvelia pulchella Westwood, 1834

Nomenclature

Microvelia pulchella – see Westwood (1834): pl. VI, fig. 5.

Velia (Microvelia) pulchella – see Westwood (1834): 647.

Hydroessa pulchella – see Herrich-Schäffer (1842): 37, pl. CXCIII, fig. 595.

Microvelia pulchella – see Amyot and Audinet-Serville (1843): 422.

Microvelia capitata – see Guérin-Ménéville (1857): 417 (syn. by Drake and Hussey 1955: 104; Smith and Polhemus 1978: 65).

Rhagovelia incerta – see Kirby (1890): 548 (syn. by Polhemus and Chapman 1979: 53).

Microvelia robusta – see Uhler (1894): 219 (syn. by Drake and Maldonado-Capriles 1954: 219).

Microvelia marginata – see Uhler (1894): 219; Kirkaldy and Torre-Bueno (1909): 207; Torre-Bueno (1910): 150; Banks 1910: 27; Barber 1914: 500; Van Duzee (1917): 433; Hungerford (1920): 127 (partim; misidentification).

Microvelia boreale – see Torre-Bueno (1910): 150 (*nomen nudum*).

Microvelia borealis – see Torre-Bueno (1916): 59 (syn. by Drake and Hussey 1955: 104).

Materials

- a. country: Brazil; stateProvince: Pará; municipality: Mojuí dos Campos; locality: Igarapé Mojuí dos Caboclos; verbatimLatitude: 02°42'03.0"S; verbatimLongitude: 54°41'01.0"W; verbatimEventDate: 02.X.2020; sex: 8 macropterous ♂, 4 macropterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- b. country: Brazil; stateProvince: Pará; municipality: Mojuí dos Campos; locality: Igarapé Terra Preta; verbatimLatitude: 02°43'09.1"S; verbatimLongitude: 54°40'20.7"W; verbatimEventDate: 10.II.2020; sex: 1 macropterous ♂, 3 macropterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen

- c. country: Brazil; stateProvince: Pará; municipality: Mojuí dos Campos; locality: Igarapé Terra Preta; verbatimLatitude: 02°43'09.1"S; verbatimLongitude: 54°40'20.7"W; verbatimEventDate: 24.II.2020; sex: 1 macropterous ♂, 1 macropterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- d. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Guaraná; verbatimLatitude: 02°46'25.9"S; verbatimLongitude: 54°23'20.6"W; verbatimEventDate: 06.III.2020; sex: 1 macropterous ♂, 1 macropterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- e. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Jatobá; verbatimLatitude: 02°34'17.9"S; verbatimLongitude: 54°51'36.8"W; verbatimEventDate: 10.X.2020; sex: 2 apterous ♀, 15 macropterous ♂, 18 macropterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- f. country: Brazil; stateProvince: Pará; municipality: Santarém; verbatimLatitude: 02°27'32.6"S; verbatimLongitude: 54°44'48.4"W; verbatimEventDate: 10.IV.2020; habitat: puddle; sex: 39 macropterous ♂, 34 macropterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- g. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Lago Mapiiri; verbatimLatitude: 02°25'28.5"S; verbatimLongitude: 54°44'47.7"W; verbatimEventDate: 18.II.2020; sex: 1 apterous ♂; recordedBy: E.C. Oliveira; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen

Distribution

Alaska, Anguilla, Argentina, Aruba, Bahamas, Barbados, Bonaire, Brazil (Alagoas, Amazonas, Bahia, Espírito Santo, Maranhão, Mato Grosso do Sul, Minas Gerais, Pará, Pernambuco, Piauí, Rio de Janeiro, Santa Catarina, São Paulo), Canada, Cayman Islands, Colombia, Costa Rica, Cuba, Curaçao, Dominican Republic, Ecuador, French Guiana, Grenada, Guadeloupe, Jamaica, Klein Bonaire, Klein Curaçao, Guatemala, Martinique, Mexico, Panama, Peru, Puerto Rico, Saba, St. Kitts & Nevis, St. Martin, St.

Vincent & Grenadines, Trinidad & Tobago, USA, US Virgin Islands, Venezuela (Moreira 2021e).

Notes

First records from the study area.

Photograph

Fig. 17d, e, f

Microvelia sp. n. 3

Materials

Holotype:

- a. country: Brazil; stateProvince: Pará; municipality: Mojuí dos Campos; locality: Igarapé Água Fria; verbatimLatitude: 02°47'19.7"S; verbatimLongitude: 54°38'40.9"W; verbatimEventDate: 24.IX.2020; sex: apterous ♂; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: CEIOC 81765; basisOfRecord: PreservedSpecimen

Paratype:

- a. country: Brazil; stateProvince: Pará; municipality: Mojuí dos Campos; locality: Igarapé Água Fria; verbatimLatitude: 02°47'19.7"S; verbatimLongitude: 54°38'40.9"W; verbatimEventDate: 24.IX.2020; sex: 1 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: CEIOC 81766; basisOfRecord: PreservedSpecimen

Apterous male: BL 1.62, HL 0.32, HW 0.44, ANT I 0.21, ANT II 0.13, ANT III 0.28, ANT IV 0.42, INT 0.25, EYE 0.09, PL 0.23, PW 0.46; FORELEG: FEM 0.46, TIB 0.34, TAR I 0.18; MIDLEG: FEM 0.54, TIB 0.38, TAR I 0.08, TAR II 0.12; HINDLEG: FEM 0.57, TIB 0.60, TAR I 0.09, TAR II 0.10.

Head dorsally yellowish-brown, lighter on sides and anterior third, dark-brown on insertion of trichobothria; ventrally pale-yellow. Antenna dark-brown, except

antennomere I yellowish-brown. Eye reddish. Labium yellowish-brown, except apex of article III and entire IV dark-brown. Pronotum yellowish-brown, lighter on transverse band on anterior third and on middle of posterior two-thirds, dark-brown around punctures adjacent to anterior margin and between anterior and posterior lobes. Metanotum pale-yellow, darker centrally. Venter of thorax pale-yellow, anterior margins of meso- and metasterna dark-brown. Acetabula, coxae, trochanters, and venter of femora pale-yellow; dorsum of femora pale-yellow basally, dark-yellow towards apex; fore tibia yellowish-brown, dark-brown on apical third; middle and hind tibiae brown, lighter ventrally on the proximal half; tarsi brown. Abdominal mediotergite I yellowish-brown, pale yellow on sides; II dark-brown, yellowish-brown on sides and anterior margin; III yellowish-brown, anterior margin dark brown, small pale-yellow patch on middle; IV yellowish-brown; V and VII yellowish-brown, each with a longitudinal light-yellow band in the middle; VI light-yellow. Abdominal laterotergite II pale-yellow, III–VI yellowish-brown on anterior half, pale-yellow on posterior half; VII yellowish brown. Sides of abdomen yellow, dark-brown around opening of scent glands and on anterior margins of segments II–III. Venter of abdomen yellow, dark-brown on sides of segments I–II. Terminalia yellowish-brown.

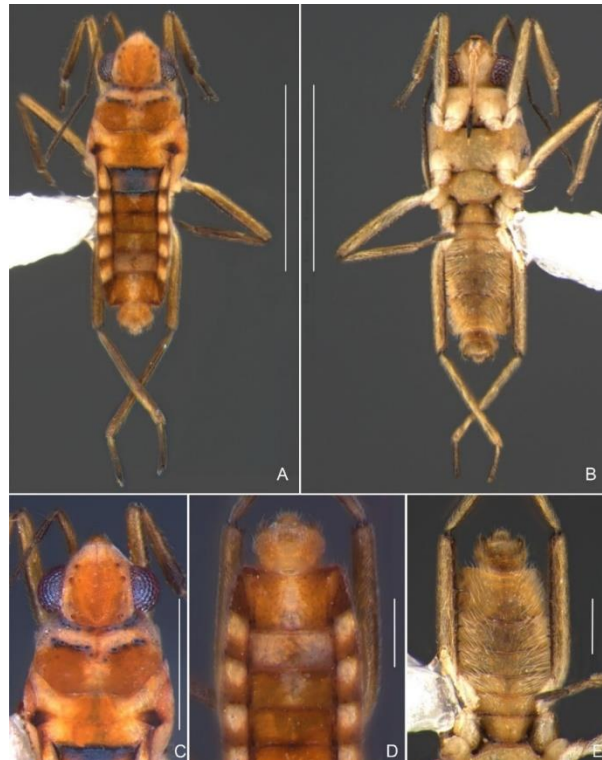


Figure 18. *Microvelia* sp. nov. 3, apterous male, holotype. A. Habitus, dorsal view; B. Habitus, ventral view; C. Head and thorax, dorsal view; D. Abdomen, segments III–VII and terminalia, dorsal view; E. Abdomen and hind femora, ventral view. Scale bars: (A and B) 1 mm, (C) 0.5 mm, (D and E) 0.2 mm.

Head with silvery pubescence adjacent to mesal margins of eyes and on posterior third; impressed median line inconspicuous; clypeus with long setae. Antenna long, reaching abdominal segment I; covered with short brown setae, with longer, lighter setae on antennomere IV. Antennomere I widest, slightly curved laterally, thickened towards apex; II wider than III–IV, thickened towards apex; III cylindrical, thinner than IV; IV fusiform, at middle subequal to II in thickness. Labium reaching middle of mesosternum.

Pronotum completely covering mesonotum, but not metanotum (Fig. 18C); anterolateral angles rounded; anterior third covered with silvery pubescence; circular punctures on a transverse row adjacent to anterior margin; another centrally interrupted transverse row posterior to yellowish band; two submedian punctures posteriorly displaced from latter row; posterior margin slightly concave at middle. Metanotum almost 1/3 as long as pronotum, unpunctured; posterior margin rounded. Propleuron with dense, short, light setae, many small punctures, and a posterior row of larger punctures; meso- and metapleuron unpunctured, without depressions. Venter of thorax without elaborated ornamentation, except two dark punctures on both pro- and mesosternum near coxae. Legs covered with short brown setae, with some longer setae on dorsal surfaces of femora and tibiae. Fore tibia straight, slightly thicker on apex than on base, without apical spine. Hind femur slightly thicker than middle femur, ventrally with a row of distally increasing spines on proximal two-thirds (Fig. 18E). Hind tibia straight.

Abdominal mediotergites covered with short setae. Mediotergite I shorter than II, with posterior margin slightly concave centrally; II with silvery pubescence medially; IV–VII with median line depressed; posterior margins of II–VI straight or almost straight; VII slightly concave (Fig. 18D). Abdominal sterna IV–VII depressed medially, with two longitudinal bands of dense, long setae laterally; posterior margin of VII slightly concave (Fig. 18E). Terminalia well-exposed; abdominal segment VIII dorsally with about two-thirds the length of mediotergite VII; posterior margin concave dorsally (Fig. 19C), ventrally straight, not notched (Fig. 19D). Proctiger exposed dorsally only by apex (Fig. 19A); posterior margin rounded (Fig. 19E). Pygophore convex, posterior margin rounded; parameres symmetrical (Fig. 19G).

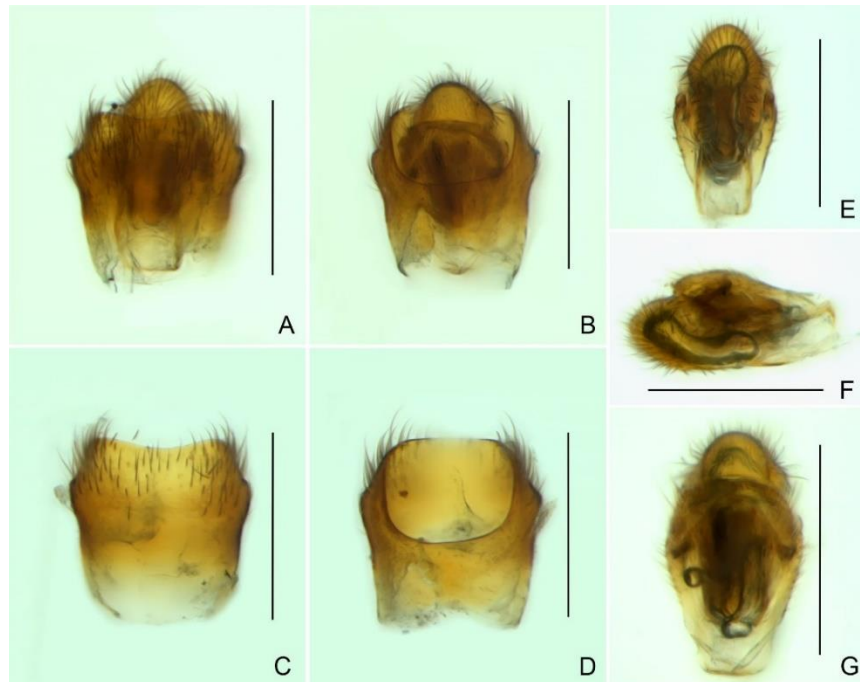


Figure 19. *Microvelia* sp. nov. 3, male terminalia. A. Dorsal view B. Ventral view C, D Abdominal segment VIII: C. Dorsal view; D. Ventral view; E–G Genital capsule: E. Dorsal view; F. Lateral view; G. Ventral view. Scale bars: 0.2 mm.

Apterous female: BL 1.73, HL 0.35, HW 0.47, ANT I 0.19, ANT II 0.12, ANT III 0.26, ANT IV 0.40, INT 0.28, EYE 0.09, PL 0.26, PW 0.56; FORELEG: FEM 0.46, TIB 0.33, TAR I 0.18; MIDLEG: FEM 0.48, TIB 0.37, TAR I 0.07, TAR II 0.13; HINDLEG: FEM 0.54, TIB 0.56, TAR I 0.10, TAR II 0.14.

Coloration and structure similar to apterous male, but larger and more robust. Head dorsally with both sides of the anterior half black. Pronotum with anterior lobe black, except for a transverse pale-yellow band in the middle and a straight yellowish-brown longitudinal band. Venter of thorax pale-yellow, dark at prosternal groove and posterior margin of prosternum. Hind femur without spines. Abdominal mediotergite I with posterior margin straight; II dark-brown, with silvery pubescence; III yellowish-brown, anterior margin and middle patch black with silvery pubescence; VIII yellowish-brown with median pale-yellow band. Mediotergites V–VIII with longitudinal median line depressed, with small transverse grooves. All abdominal laterotergites with anterior half dark-brown and posterior half pale-yellow. Abdominal laterotergites elevated to about 90°. Posterior margin of abdominal mediotergite VIII slightly rounded, with long setae. Abdominal sterna pale-yellow, covered with short setae, with straight median stripe slightly darker on segments IV–VII, sides with a dark-brown longitudinal stripe; silvery pubescence on dark stripe of sterna V–VI. Sterna V–VII slightly depressed at middle.



Figure 20. (A, B) *Microvelia* **sp. nov. 3**, apterous female, paratype. A. Dorsal view B. Ventral view C, D Abdominal segment VIII: C. Dorsal view; D. Ventral view; E–G Genital capsule: E. Dorsal view; F. Lateral view; G. Ventral view. Scale bars: 0.2 mm.

Diagnosis

This new species can be grouped with other South American *Microvelia* in which the pronotum completely or almost completely covers the mesonotum, but not the metanotum, and the terminalia is well-exposed, not deeply inserted into the pregenital abdomen: *M. chilena* Drake & Hussey, 1955, *M. costaiana* Drake & Hussey, 1951, *M. nessimiani* Moreira & Rúdio, 2011, *M. mimula* White, 1879, *M. novana* Drake & Plaumann, 1955, *M. quieta* Drake & Carvalho, 1954, and *M. sarpta* Drake & Harris, 1936.

Microvelia **sp. nov. 3** is most similar to *M. novana* (Fig. 21), known only from the type specimens from Santa Catarina state, southern Brazil. They can be separated by the shapes of the posterior margins of the pronotum (slightly concave in the middle in *M. sp. nov. 3* vs. rounded in *M. novana*), male abdominal mediotergite VII (slightly concave in the middle vs. straight), and male abdominal sternum VIII (straight vs. concave), and by the presence of spines on the hind femur of males in the new species, which are absent in *M. novana*.

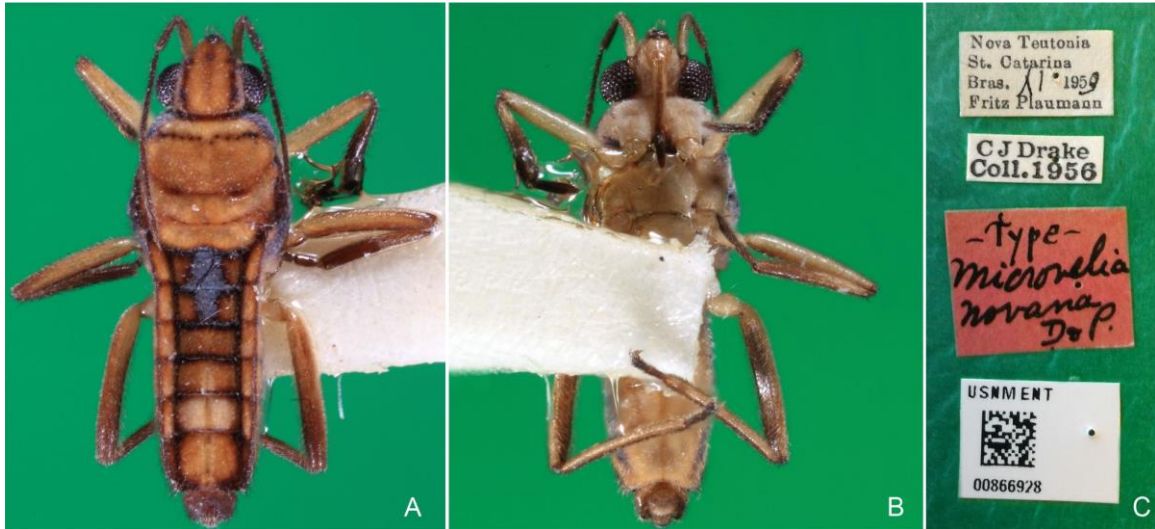


Figure 21. *Microvelia novana* apterous male holotype deposited in the Entomology Collection of the Smithsonian National Museum of Natural History (NMNH) A. Habitus, dorsal view; B. Habitus, ventral view; C. Labels.

Etymology.

[...]

Microvelia summersi Drake & Harris, 1928

Nomenclature

Microvelia summersi – see Drake and Harris (1928): 8.

Distribution

Brazil (Amazonas, Pará), Grenada, Guyana, Panama, Trinidad & Tobago (Moreira 2021e).

Notes

Previously recorded from Santarém (Moreira *et al.* 2011c), but absent from our samples.

***Microvelia venustatis* Drake & Harris, 1933**

Nomenclature

Microvelia venustatis – see Drake and Harris (1933): 53.

Materials

- a. country: Brazil; stateProvince: Pará; municipality: Santarém; verbatimLatitude: 02°27'32"S; verbatimLongitude: 54°44'48"W; verbatimEventDate: 14.IV.2020; habitat: puddle; sex: 1 macropterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen

Distribution

Argentina, Brazil (Amazonas, Espírito Santo, Maranhão, Mato Grosso, Minas Gerais, Pará, Rio de Janeiro, Santa Catarina, São Paulo), Colombia, Paraguay, Peru (Moreira 2021e).

Notes

Previously recorded from Santarém (Moreira *et al.* 2011c).

Photograph

Fig. 22



Figure 22. *Microvelia venustatis*, macropterous female, habitus A. Dorsal view; B. Ventral view. Scale bars: 1 mm.

***Rhagovelia amazonensis* Gould, 1931**

Nomenclature

Rhagovelia amazonensis – see Gould (1931): 15, pl. IV, fig. 2.

Distribution

Brazil (Amazonas, Mato Grosso, Pará, Rondônia), Guyana (Moreira 2021e).

Notes

Previously recorded from Santarém (Polhemus 1997), but absent from our samples.

***Rhagovelia brunae* Magalhães & Moreira, 2016**

Nomenclature

Rhagovelia amazonensis – see Cunha et al. (2015): 427 (misidentification).

Rhagovelia brunae Magalhães & Moreira in Magalhães et al. (2016): 587, figs 1–8 and 11.

Materials

- a. country: Brazil; stateProvince: Pará; municipality: Belterra; locality: Igarapé Jatuarana; verbatimLatitude: 03°15'44.7"S; verbatimLongitude: 54°56'37.5"W; verbatimEventDate: 11.II.2020; sex: 2 apterous ♂, 34 apterous ♀, 1 macropterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- b. country: Brazil; stateProvince: Pará; municipality: Belterra; locality: Igarapé Coronel Batista; verbatimLatitude: 02°37'50.6"S; verbatimLongitude: 54°58'12.4"W; verbatimEventDate: 08.XI.2019; sex: 7 apterous ♂, 20 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- c. country: Brazil; stateProvince: Pará; municipality: Mojuí dos Campos; locality: Igarapé Água Fria; verbatimLatitude: 02°47'19.7"S; verbatimLongitude: 54°38'40.9"W; verbatimEventDate: 24.IX.2020; sex: 10 apterous ♂, 9 apterous ♀, 1 macropterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen

- d. country: Brazil; stateProvince: Pará; municipality: Mojuí dos Campos; locality: Igarapé do Manel; verbatimLatitude: 02°25'06.3"S; verbatimLongitude: 54°44'26.3"W; verbatimEventDate: 24.II.2020; sex: 23 apterous ♂, 24 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- e. country: Brazil; stateProvince: Pará; municipality: Mojuí dos Campos; locality: Igarapé Terra Preta; verbatimLatitude: 02°43'09.1"S; verbatimLongitude: 54°40'20.7"W; verbatimEventDate: 10.II.2020; sex: 5 apterous ♂, 5 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- f. country: Brazil; stateProvince: Pará; municipality: Mojuí dos Campos; locality: Igarapé Santa Júlia; verbatimLatitude: 02°40'19.7"S; verbatimLongitude: 54°43'06.9"W; verbatimEventDate: 09.XII.2019; sex: 2 apterous ♂; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- g. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Diamantino; verbatimLatitude: 02°30'16.2"S; verbatimLongitude: 54°39'32.9"W; verbatimEventDate: 06.IX.2019; sex: 1 apterous ♂, 1 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- h. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Diamantino; verbatimLatitude: 02°30'16.2"S; verbatimLongitude: 54°39'32.9"W; verbatimEventDate: 16.IX.2019; sex: 5 apterous ♂; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- i. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé São Braz; verbatimLatitude: 02°29'07.0"S; verbatimLongitude: 54°49'41.9"W; verbatimEventDate: 26.VIII.2019; sex: 1 apterous ♂, 5 apterous ♀, 1 macropterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- j. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Cachoeira da Cavada; verbatimLatitude: 02°35'48.9"S; verbatimLongitude: 54°31'47.3"W; verbatimEventDate: 13.XI.2019; sex: 8 apterous ♂, 4 apterous ♀; recordedBy:

- S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- k. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Mararú; verbatimLatitude: 02°29'35.9"S; verbatimLongitude: 54°40'06.6"W; verbatimEventDate: 23.VIII.2019; sex: 6 apterous ♂, 10 apterous ♀, 2 macropterous ♂, 1 macropterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- l. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé do Rai; verbatimLatitude: 02°35'35.3"S; verbatimLongitude: 54°30'18.1"W; verbatimEventDate: 13.XI.2019; sex: 1 apterous ♂, 2 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- m. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Cajutuba II; verbatimLatitude: 02°27'39.2"S; verbatimLongitude: 54°46'53.4"W; verbatimEventDate: 10.X.2020; sex: 22 apterous ♂, 21 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- n. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Mutunuy; verbatimLatitude: 02°28'53.1"S; verbatimLongitude: 54°41'45.9"W; verbatimEventDate: 17.X.2015; sex: 1 apterous ♂, 4 apterous ♀; recordedBy: M. Galúcio; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- o. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Mutunuy; verbatimLatitude: 02°28'53.1"S; verbatimLongitude: 54°41'45.9"W; verbatimEventDate: 29.X.2015; sex: 1 apterous ♂; recordedBy: M. Galúcio; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen

Distribution

Brazil (Maranhão, Pará), Venezuela (Moreira 2021e).

Notes

First records from the study area.

Photograph

Fig. 23a, b

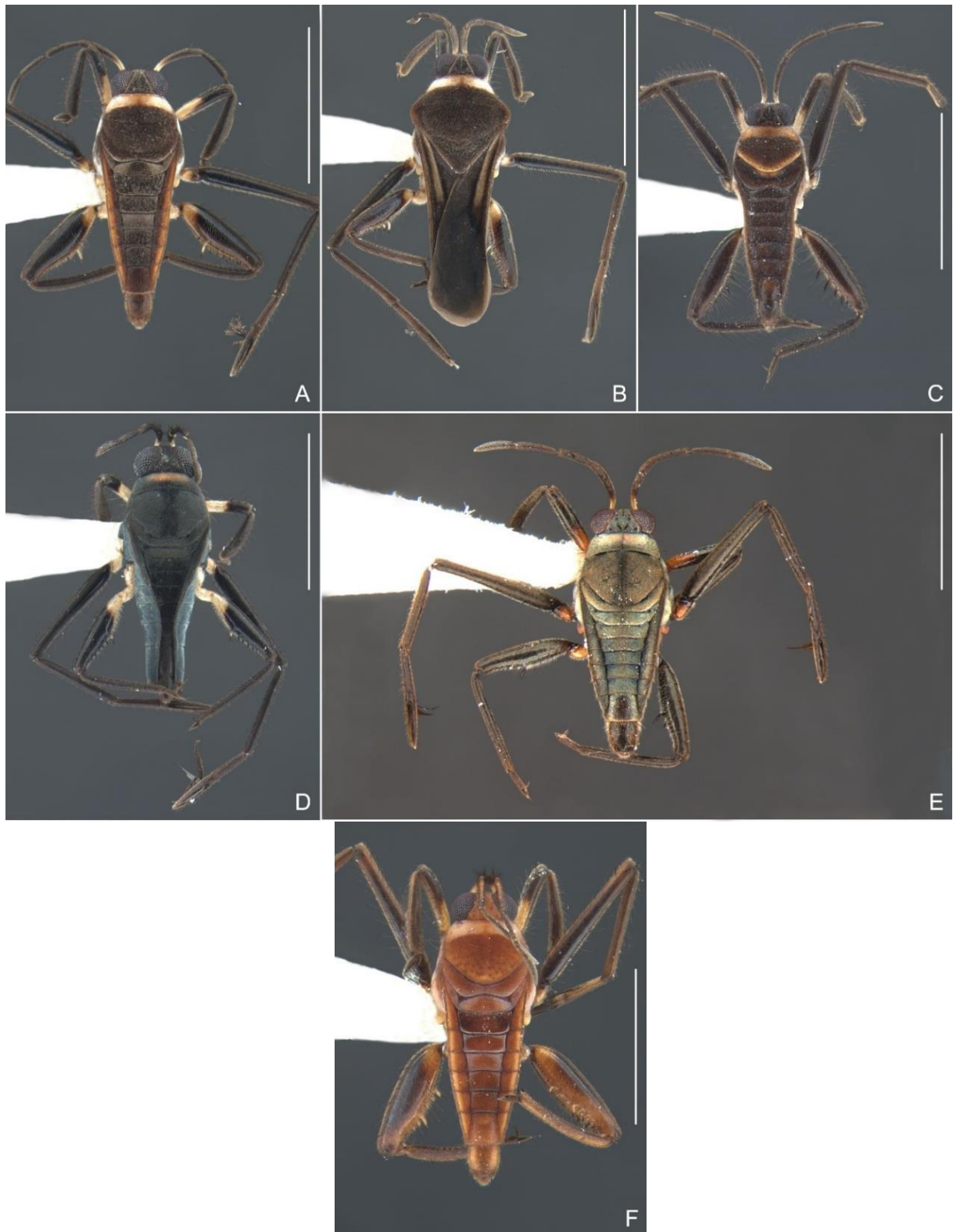


Figure 23. *Rhagovelia* spp., habitus, dorsal view. Scale bars: 1 mm. a: *R. brunae*, apterous male; b: *R. brunae*, macropterous male; c: *R. elegans*, apterous male; d: *R. evidis*, apterous female; e: *R. graziae*, apterous male; f: *R. jubata*, apterous male.

Rhagovelia elegans Uhler, 1894

Nomenclature

Rhagovelia elegans – see Uhler (1894): 216.

Rhagovelia insularis – see Champion (1898): 139, pl. IX, figs 3 and 3a (syn. by Polhemus 1997: 119).

Rhagovelia costalimai – see Drake (1948): 142 (syn. by Polhemus 1997: 119).

Rhagovelia trinidadalis – see Drake (1948): 143 (syn. by Polhemus 1997: 119).

Rhagovelia gorgona – see Manzano et al. (1995): 54, figs 1, 3 and 5 (syn. by Padilla-Gil and Moreira 2013: 410).

Materials

- a. country: Brazil; stateProvince: Pará; municipality: Belterra; locality: Igarapé do Ailton; verbatimLatitude: 02°35'36.7"S; verbatimLongitude: 54°57'48.4"W; verbatimEventDate: 06.XI.2019; sex: 3 apterous ♂, 6 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- b. country: Brazil; stateProvince: Pará; municipality: Belterra; locality: Igarapé Coronel Batista; verbatimLatitude: 02°37'50.6"S; verbatimLongitude: 54°58'12.4"W; verbatimEventDate: 08.XI.2019; sex: 2 apterous ♂, 5 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- c. country: Brazil; stateProvince: Pará; municipality: Belterra; locality: Floresta Nacional do Tapajós; verbatimLatitude: 03°03'02.6"S; verbatimLongitude: 54°55'30.1"W; verbatimEventDate: 20.I.2020; habitat: igarapé; sex: 1 apterous ♂, 3 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- d. country: Brazil; stateProvince: Pará; municipality: Mojuí dos Campos; locality: Igarapé Água Fria; verbatimLatitude: 02°47'19.7"S; verbatimLongitude: 54°38'40.9"W; verbatimEventDate: 24.IX.2020; sex: 3 apterous ♂, 2 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- e. country: Brazil; stateProvince: Pará; municipality: Mojuí dos Campos; locality: Igarapé Antonio Leite; verbatimLatitude: 03°09'06.2"S; verbatimLongitude:

- 54°50'28.7"W; verbatimEventDate: 18.X.2019; sex: 2 apterous ♂; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- f. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé São Braz; verbatimLatitude: 02°29'07.0"S; verbatimLongitude: 54°49'41.9"W; verbatimEventDate: 26.VIII.2019; sex: 2 macropterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- g. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Cachoeira da Cavada; verbatimLatitude: 02°35'48.9"S; verbatimLongitude: 54°31'47.3"W; verbatimEventDate: 13.XI.2019; sex: 7 apterous ♂, 11 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- h. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé da Débora; verbatimLatitude: 02°44'27.7"S; verbatimLongitude: 54°26'01.2"W; verbatimEventDate: 21.X.2019; sex: 4 apterous ♂, 5 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- i. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé do Rai; verbatimLatitude: 02°35'35.3"S; verbatimLongitude: 54°30'18.1"W; verbatimEventDate: 13.XI.2019; sex: 3 apterous ♂, 8 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- j. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Cajutuba II; verbatimLatitude: 02°27'39.2"S; verbatimLongitude: 54°46'53.4"W; verbatimEventDate: 10.X.2020; sex: 7 apterous ♂, 6 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen

Distribution

Brazil (Amapá, Amazonas, Espírito Santo, Mato Grosso, Pará, Rio de Janeiro, Sergipe), Colombia, Costa Rica, Dominica, Ecuador, Grenada, Hispaniola Island, Martinique, Panama, St. Kitts & Nevis, St. Lucia, St. Vincent & Grenadines, Trinidad and Tobago, Venezuela (Moreira 2021e).

Notes

Previously recorded from Santarém (Bacon 1956; Polhemus 1997); first records from Belterra and Mojuí dos Campos.

Photograph

Fig. 23c

Rhagovelia evidis* Bacon, 1948*Nomenclature**

Rhagovelia evidis – see Bacon (1948): 73, fig. 6.

Materials

- a. country: Brazil; stateProvince: Pará; municipality: Belterra; locality: Igarapé Jatuarana; verbatimLatitude: 03°15'44.7"S; verbatimLongitude: 54°56'37.5"W; verbatimEventDate: 11.II.2020; sex: 1 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- b. country: Brazil; stateProvince: Pará; municipality: Mojuí dos Campos; locality: Igarapé Terra de Areia; verbatimLatitude: 02°47'58.7"S; verbatimLongitude: 54°38'15.6"W; verbatimEventDate: 24.I.2020; sex: 1 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- c. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Sonrizal; verbatimLatitude: 02°32'13.6"S; verbatimLongitude: 54°55'26.6"W; verbatimEventDate: 09.VIII.2019; sex: 1 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen

Distribution

Brazil (Amazonas, Pará), Peru (Moreira 2021e).

Notes

First records from the study area.

Photograph

Fig. 23d

Rhagovelia graziae* Galindo-Malagón, Morales & Moreira, 2021*Nomenclature**

Rhagovelia graziae – see Galindo-Malagón et al. (2021): 198, figs. 9E, 10E, 11E, 12E, 19N, 20N and 23C.

Materials

- a. country: Brazil; stateProvince: Pará; municipality: Belterra; locality: Igarapé Aramanaí; verbatimLatitude: 02°42'56.8"S; verbatimLongitude: 54°59'59.3"W; verbatimEventDate: 07.XI.2019; sex: 7 apterous ♂, 6 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen

Distribution

Brazil (Pará), Colombia (Galindo-Malagón et al. 2021).

Notes

First record from Brazil.

Photograph

Fig. 23e

Rhagovelia jubata* Bacon, 1948*Nomenclature**

Rhagovelia jubata – see Bacon (1948): 78, fig. 5.

Materials

- a. country: Brazil; stateProvince: Pará; municipality: Belterra; locality: BR-163, Km-115; verbatimLatitude: 03°17'34.8"S; verbatimLongitude: 54°52'45.6"W; verbatimEventDate: 23.XI.2019; habitat: igarapé; sex: 2 apterous ♂;

- recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- b. country: Brazil; stateProvince: Pará; municipality: Belterra; locality: BR-163, Km-115; verbatimLatitude: 03°17'34.8"S; verbatimLongitude: 54°52'45.6"W; verbatimEventDate: 25.IX.2020; sex: 1 apterous ♂, 1 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- c. country: Brazil; stateProvince: Pará; municipality: Belterra; locality: Igarapé do Ailton; verbatimLatitude: 02°35'36.7"S; verbatimLongitude: 54°57'48.4"W; verbatimEventDate: 06.XI.2019; sex: 7 apterous ♂, 2 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- d. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Sonrizal; verbatimLatitude: 02°32'13.6"S; verbatimLongitude: 54°55'26.6"W; verbatimEventDate: 09.XI.2019; sex: 4 apterous ♂, 5 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- e. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Cachoeira da Rocha Negra; verbatimLatitude: 02°29'48.5"S; verbatimLongitude: 54°45'13.3"W; verbatimEventDate: 25.IX.2020; sex: 86 apterous ♂, 66 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- f. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé da Débora; verbatimLatitude: 02°44'27.7"S; verbatimLongitude: 54°26'01.2"W; verbatimEventDate: 21.X.2019; sex: 2 apterous ♂, 1 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- g. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Mutunuy; verbatimLatitude: 02°28'53.1"S; verbatimLongitude: 54°41'45.9"W; verbatimEventDate: 17.X.2015; sex: 1 apterous ♂, 3 apterous ♀; recordedBy: M. Galúcio; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen

Distribution

Brazil (Amazonas, Pará, Rondônia), Ecuador, Peru (Moreira 2021e).

Notes

First records from the study area.

Photograph

Fig. 23f

Rhagovelia tenuipes* Champion, 1898*Nomenclature**

Rhagovelia tenuipes – see Champion (1898): 137, pl. VIII, fig. 29.

Rhagovelia gregalis – see Drake and Harris (1927): 136 (syn. by Bacon 1956: 743).

Rhagovelia regalis – see Drake and Harris (1927): 137 (syn. by Bacon 1956: 743).

Rhagovelia confusa – see Gould (1931): 23, pl. V, fig. 5 (syn. by Bacon 1956: 743).

Rhagovelia obscura – see Gould (1931): 38, pl. IV, fig. 6 (syn. by Bacon 1956: 743).

Rhagovelia vega – see Padilla-Gil (2011): 210, figs. 13–16 (syn. by Galindo-Malagón et al. 2021: 210).

Rhagovelia mocoa – see Padilla-Gil (2015): 88, figs. 14 and 41 (syn. by Galindo-Malagón et al. 2021: 210).

Rhagovelia umbria – see Padilla-Gil (2015): 90, figs. 15 and 42 (syn. by Galindo-Malagón et al. 2021: 210)

Distribution

Belize, Brazil (Amazonas, Espírito Santo, Maranhão, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Pará, Rio de Janeiro, Roraima, São Paulo), Cayman Islands, Colombia, Costa Rica, Ecuador, Guatemala, Honduras, Mexico, Nicaragua, Peru, Trinidad & Tobago, Venezuela (Moreira 2021e).

Notes

Previously recorded from Santarém (Bacon 1956), but absent from our samples.

***Rhagovelia trailii* (White, 1879)**

Nomenclature

Neovelgia trailii – see White (1879^a): 487.

Rhagovelia trailii – see Kirkaldy and Torre-Bueno (1909): 206; Polhemus and Polhemus (1985): 168; Polhemus (1997): 174; Pereira and Melo (2007): 645; Moreira et al. (2011c): 26; Padilla-Gil and Moreira (2013): 415, 420, 423; Moreira and Barbosa (2014): 599; Cordeiro and Moreira (2015): 21; Floriano and Moreira (2015): 440; Magalhães et al. (2016): 591; Aristizábal-García (2017): 303, 897, [appendix] 210; Magalhães et al. (2019): 395 (incorrect subsequent spelling).

Rhagovelia trailii – see Gould (1931): 45; Bacon (1956): 878.

Rhagovelia perfidiosa – see Bacon (1948): 81, fig. 10 (syn. by Polhemus and Polhemus 1985: 168).

Materials

- a. country: Brazil; stateProvince: Pará; municipality: Belterra; locality: Igarapé Jatuarana; verbatimLatitude: 03°15'44.7"S; verbatimLongitude: 54°56'37.5"W; verbatimEventDate: 11.II.2020; sex: 16 apterous ♂, 1 macropterous ♂; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- b. country: Brazil; stateProvince: Pará; municipality: Mojuí dos Campos; locality: Igarapé Terra de Areia; verbatimLatitude: 02°47'58.7"S; verbatimLongitude: 54°38'15.6"W; verbatimEventDate: 24.I.2020; sex: 13 apterous ♂, 10 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- c. country: Brazil; stateProvince: Pará; municipality: Mojuí dos Campos; locality: Igarapé Santa Júlia; verbatimLatitude: 02°40'19.7"S; verbatimLongitude: 54°43'06.9"W; verbatimEventDate: 09.XII.2019; sex: 5 apterous ♂; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- d. country: Brazil; stateProvince: Pará; municipality: Mojuí dos Campos; locality: Igarapé Antonio Leite; verbatimLatitude: 03°09'06.2"S; verbatimLongitude: 54°50'28.7"W; verbatimEventDate: 18.X.2019; sex: 1 apterous ♂, 2 apterous ♀;

- recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- e. country: Brazil; stateProvince: Pará; municipality: Mojuí dos Campos; locality: Igarapé Mojuí dos Caboclos; verbatimLatitude: 02°42'03.0"S; verbatimLongitude: 54°41'01.0"W; verbatimEventDate: 21.I.2020; sex: 3 apterous ♂, 2 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- f. country: Brazil; stateProvince: Pará; municipality: Mojuí dos Campos; locality: Igarapé Terra Preta; verbatimLatitude: 02°43'09.1"S; verbatimLongitude: 54°40'20.7"W; verbatimEventDate: 24.II.2020; sex: 2 apterous ♂, 2 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- g. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Guaraná; verbatimLatitude: 02°46'25.9"S; verbatimLongitude: 54°23'20.6"W; verbatimEventDate: 06.III.2020; sex: 21 apterous ♂, 20 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- h. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Ponte do Juá; verbatimLatitude: 02°26'40.6"S; verbatimLongitude: 54°47'21.1"W; verbatimEventDate: 06.XII.2019; sex: 3 apterous ♂, 2 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- i. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Diamantino; verbatimLatitude: 02°30'16.2"S; verbatimLongitude: 54°39'32.9"W; verbatimEventDate: 06.IX.2019; sex: 1 macropterous ♂; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- j. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Diamantino; verbatimLatitude: 02°30'16.2"S; verbatimLongitude: 54°39'32.9"W; verbatimEventDate: 16.IX.2019; sex: 3 macropterous ♂; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- k. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé São Braz; verbatimLatitude: 02°29'07.0"S; verbatimLongitude: 54°49'41.9"W;

verbatimEventDate: 26.VIII.2019; sex: 2 apterous ♂, 6 apterous ♀, 1 macropterous ♂; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen

- l. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Jatobá; verbatimLatitude: 02°34'17.9"S; verbatimLongitude: 54°51'36.8"W; verbatimEventDate: 10.X.2020; sex: 3 apterous ♂, 2 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- m. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Mutunuy; verbatimLatitude: 02°28'53.1"S; verbatimLongitude: 54°41'45.9"W; verbatimEventDate: 29.X.2015; sex: 1 apterous ♂; recordedBy: M. Galúcio; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen

Distribution

Brazil (Amazonas, Pará, Roraima), French Guiana, Peru, Suriname, Venezuela (Moreira 2021e).

Notes

Previously recorded from Santarém (Bacon 1948; as *R. perfidiosa*); first records from Belterra and Mojuí dos Campos.

Photograph

Fig. 24



Figure 24. *Rhagovelia trailii*, habitus, dorsal view A. Apterous male; B. Macropterous male. Scale bars: 1 mm.

***Callivelia conata* (Hungerford, 1929)**

Nomenclature

Velia conata – see Hungerford (1929^a): 199.

Paravelia conata – see Polhemus (1976): 509.

Callivelia conata – see Polhemus (2021): 349.

Materials

- a. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Cachoeira da Rocha Negra; verbatimLatitude: 02°29'48.5"S; verbatimLongitude: 54°45'13.3"W; verbatimEventDate: 25.IX.2020; sex: 1 macropterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen

Distribution

Brazil (Amazonas, Espírito Santo, Goiás, Mato Grosso, Pará, Rondônia), French Guiana, Guyana, Peru, Suriname, Trinidad & Tobago, Venezuela (Moreira 2021e).

BNotes

First record from the study area.

Photograph

Fig. 25a



Figure 25. Veliinae spp., habitus, dorsal view. Scale bars: 1 mm. a: *Callivelia conata*, macropterous female; b: *Oiovelia cunucunumana*, macropterous male; c: *Paravelia bullialata*, macropterous male; d: *Paravelia dilatata*, macropterous male.

Oiovelia chena Rodrigues & Melo, 2014

Nomenclature

Oiovelia chena – see Rodrigues & Melo in Rodrigues et al. (2014a): 84, figs 47–49, 59–61, 74 and 78.

Distribution

Brazil (Amazonas, Pará) (Moreira 2021e).

Notes

Previously recorded from Santarém (Rodrigues *et al.* 2014a), but absent from our samples.

***Oiovelia cunucunumana* Drake & Maldonado-Capriles, 1952**

Nomenclature

Oiovelia cunucunumana – see Drake and Maldonado-Capriles (1952): 52, fig. 1.

Paravelia correntina – see Iglesias and Crespo (1999): 259, figs 1–11 (syn. by Torres *et al.* 2007: 143)

Materials

- a. bcountry: Brazil; stateProvince: Pará; municipality: Mojuí dos Campos; locality: Igarapé Antonio Leite; verbatimLatitude: 03°09'06.2"S; verbatimLongitude: 54°50'28.7"W; verbatimEventDate: 18.X.2019; sex: 23 macropterous ♂, 12 macropterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecime

Distribution

Argentina, Brazil (Amapá, Amazonas, Bahia, Minas Gerais, Pará, São Paulo, Santa Catarina), Colombia, Peru, Paraguay, Venezuela (Moreira 2021e).

Notes

First record from the study area.

Photograph

Fig. 25b

***Paravelia bullialata* Polhemus & Polhemus, 1984**

Nomenclature

Paravelia bullialata – see Polhemus and Polhemus (1984): 342, figs 4 and 5a.

Materials

- a. country: Brazil; stateProvince: Pará; municipality: Belterra; locality: Floresta Nacional do Tapajós; verbatimLatitude: 03°03'02.6"S; verbatimLongitude: 54°55'30.1"W; verbatimEventDate: 20.I.2020; habitat: igarapé; sex: 2 macropterous ♂, 1 macropterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- b. country: Brazil; stateProvince: Pará; municipality: Belterra; locality: BR-163, Km-115; verbatimLatitude: 03°17'34.8"S; verbatimLongitude: 54°52'45.6"W; verbatimEventDate: 23.XI.2019; habitat: igarapé; sex: 1 macropterous ♂; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen

Distribution

Bolivia, Brazil (Amazonas, Pará, Rondônia), French Guiana, Guyana, Suriname, Venezuela (Moreira 2021e).

Notes

First records from the study area.

Photograph

Fig. 25c

Paravelia dilatata Polhemus & Polhemus, 1984

Nomenclature

Paravelia dilatata – see Polhemus and Polhemus (1984): 498, figs 1 and 3.

Materials

- a. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Mutunuy; verbatimLatitude: 02°28'53.1"S; verbatimLongitude: 54°41'45.9"W; verbatimEventDate: 17.X.2015; sex: 1 macropterous ♂; recordedBy: M. Galúcio; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen

Distribution

Brazil (Amazonas, Pará), Guyana, Suriname (Moreira 2021e).

Notes

First record from Pará state.

Photograph

Fig. 25d

Stridulivelia alia* (Drake, 1957)*Nomenclature**

Velia alia – see Drake (1957^a): 115.

Stridulivelia alia – see Polhemus (1976): 509.

Materials

- a. country: Brazil; stateProvince: Pará; municipality: Belterra; locality: BR-163, Km-115; verbatimLatitude: 03°17'34.8"S; verbatimLongitude: 54°52'45.6"W; verbatimEventDate: 22.XI.2019; habitat: igarapé; sex: 4 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- b. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé da Débora; verbatimLatitude: 02°44'27.7"S; verbatimLongitude: 54°26'01.2"W; verbatimEventDate: 21.X.2019; sex: 1 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen

Distribution

Brazil (Amazonas, Pará), Guyana, Suriname, Venezuela (Moreira 2021e).

Notes

First records from the study area.

Photograph

Fig. 26a

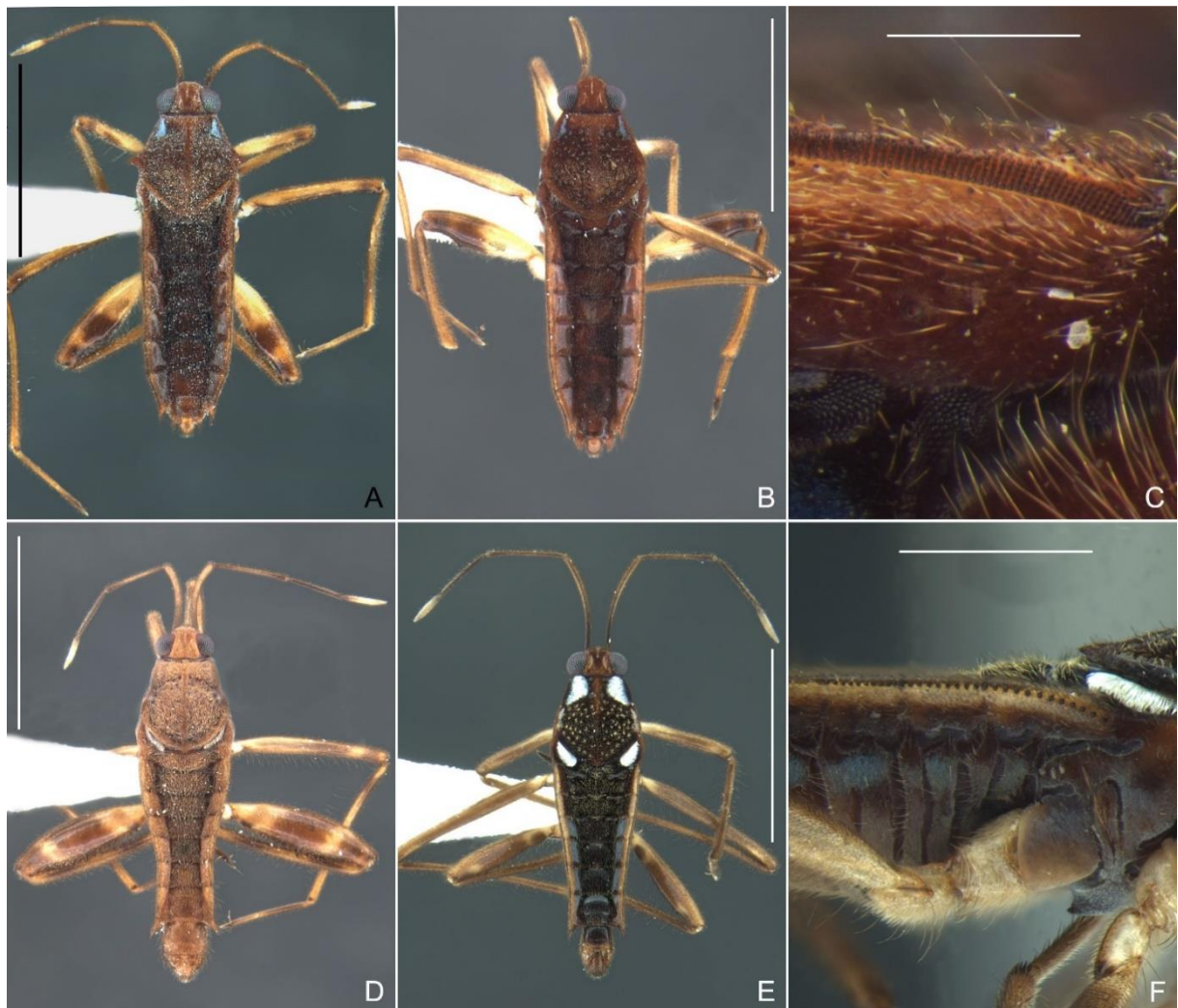


Figure 26. *Stridulivelia* spp. Scale bars: (A, B, D and E) 1 mm, (C) 0.2 mm, (F) 0.5 mm. a: *S. alia*, apterous female, habitus, dorsal view; b: *S. quadrispinosa*, apterous female, habitus, dorsal view; c: *S. quadrispinosa*, apterous female, detail of stridulatory apparatus, lateral view; d: *S. stridulata*, apterous male, habitus, dorsal view; e: *S. strigosa*, micropterous male, habitus, dorsal view; f: *S. strigosa*, micropterous male, detail of stridulatory apparatus, lateral view.

Stridulivelia quadrispinosa (Hungerford, 1929)

Nomenclature

Velia quadrispinosa – see Hungerford (1929b): 52, pl. I, figs 2, 6, 11, pl. II, fig. 3.

Stridulivelia quadrispinosa – see Polhemus (1976): 509.

Materials

- a. country: Brazil; stateProvince: Pará; municipality: Mojuí dos Campos; locality: Igarapé Água Fria; verbatimLatitude: 02°47'19.7"S; verbatimLongitude: 54°38'40.9"W; verbatimEventDate: 24.IX.2020; sex: 1 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen

Distribution

Bolivia, Brazil (Espírito Santo, Mato Grosso, Minas Gerais, Pará, Rio de Janeiro), Guyana, Peru, Venezuela (Moreira 2021e).

Notes

Previously recorded from Santarém (Hungerford 1929b); first record from Mojuí dos Campos.

Photograph

Fig. 26b, c

Stridulivelia stridulata* (Hungerford, 1929b)*Nomenclature**

Velia stridulata – see Hungerford (1929b): 53, pl. I, figs 3, 8, pl. II, fig. 6.

Stridulivelia stridulata – see Polhemus (1976): 509.

Materials

- a. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Sonrizal; verbatimLatitude: 02°32'13.6"S; verbatimLongitude: 54°55'26.6"W; verbatimEventDate: 09.VIII.2019; sex: 2 apterous ♂, 2 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen

Distribution

Brazil (Amapá, Amazonas, Mato Grosso, Pará), Colombia, Suriname (Moreira 2021e).

Notes

First record from the study area.

Photograph

Fig. 26d

Stridulivelia strigosa* (Hungerford, 1929)*Nomenclature**

Velia strigosa – see Hungerford (1929b): 50, pl. I, figs 1, 7, pl. II, fig. 4.

Stridulivelia strigosa – see Polhemus (1976): 509.

Materials

- a. country: Brazil; stateProvince: Pará; municipality: Belterra; locality: Floresta Nacional do Tapajós; verbatimLatitude: 03°03'02.6"S; verbatimLongitude: 54°55'30.1"W; verbatimEventDate: 20.I.2020; habitat: igarapé; sex: 1 micropterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- b. country: Brazil; stateProvince: Pará; municipality: Mojuí dos Campos; locality: Igarapé Terra de Areia; verbatimLatitude: 02°47'58.7"S; verbatimLongitude: 54°38'15.6"W; verbatimEventDate: 24.I.2020; sex: 1 micropterous ♂; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- c. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Sonrizal; verbatimLatitude: 02°32'13.6"S; verbatimLongitude: 54°55'26.6"W; verbatimEventDate: 09.VIII.2019; sex: 1 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen

Distribution

Brazil (Amapá, Amazonas, Mato Grosso, Pará), French Guiana, Guyana, Peru, Suriname, Venezuela (Moreira 2021e).

Notes

First records from the study area.

Photograph

Fig. 26e, f

Stridulivelia tersa (Drake & Harris, 1941)

Nomenclature

Velia tersa – see Drake and Harris (1941b): 338.

Velia nama – see Drake (1957a): 114 (syn. by Polhemus and Spangler 1995: 147).

Stridulivelia tersa – see Polhemus (1976): 509

Materials

- a. country: Brazil; stateProvince: Pará; municipality: Belterra; locality: Igarapé Jatuarana; verbatimLatitude: 03°15'44.7"S; verbatimLongitude: 54°56'37.5"W; verbatimEventDate: 11.II.2020; sex: 1 micropterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- b. country: Brazil; stateProvince: Pará; municipality: Mojuí dos Campos; locality: Igarapé Água Fria; verbatimLatitude: 02°47'19.7"S; verbatimLongitude: 54°38'40.9"W; verbatimEventDate: 24.IX.2020; sex: 1 macropterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- c. country: Brazil; stateProvince: Pará; municipality: Mojuí dos Campos; locality: Igarapé do Manel; verbatimLatitude: 02°25'06.3"S; verbatimLongitude: 54°44'26.3"W; verbatimEventDate: 24.II.2020; sex: 1 macropterous ♂, 2 macropterous ♀, 2 micropterous ♂, 1 micropterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- d. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Diamantino; verbatimLatitude: 02°30'16.2"S; verbatimLongitude: 54°39'32.9"W; verbatimEventDate: 06.IX.2019; sex: 2 macropterous ♂, 3

- macropterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- e. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Cachoeira da Cavada; verbatimLatitude: 02°35'48.9"S; verbatimLongitude: 02°35'48.9"S; verbatimEventDate: 13.XI.2019; sex: 2 macropterous ♂; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- f. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Cachoeira da Cavada; verbatimLatitude: 02°35'48.9"S; verbatimLongitude: 02°35'48.9"S; verbatimEventDate: 21.X.2019; sex: 1 macropterous ♂; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- g. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Vila Nova; verbatimLatitude: 02°30'50.4"S; verbatimLongitude: 54°49'29.7"W; verbatimEventDate: 10.X.2015; sex: 2 apterous ♂; recordedBy: M. Galúcio; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- h. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Urumari; verbatimLatitude: 02°28'25.3"S; verbatimLongitude: 54°41'52.3"W; verbatimEventDate: 19.X.2015; sex: 1 apterous ♂; recordedBy: M. Galúcio; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen

Distribution

Bolivia, Brazil (Amazonas, Espírito Santo, Maranhão, Mato Grosso, Minas Gerais, Pará), Colombia, Guyana, Peru, Suriname, Trinidad & Tobago, Venezuela (Moreira 2021e).

Notes

First records from the study area.

Photograph

Fig. 27a, b



Figure 27. *Stridulivelia* spp., habitus, dorsal view. Scale bars: 1 mm. a: *S. tersa*, micropterous male; b: *S. tersa*, macropterous male; c: *S. transversa*, apterous male.

Stridulivelia transversa (Hungerford, 1929)

Nomenclature

Velia transversa – see Hungerford (1929b): 54, pl. I, fig. 10, pl. II, fig. 7.

Stridulivelia tersa – see Polhemus (1976): 509.

Materials

- a. country: Brazil; stateProvince: Pará; municipality: Belterra; locality: BR-163, Km-115; verbatimLatitude: 03°17'34.8"S; verbatimLongitude: 54°52'45.6"W; verbatimEventDate: 23.X.2019; habitat: igarapé; sex: 2 apterous ♂, 4 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- b. country: Brazil; stateProvince: Pará; municipality: Belterra; locality: Igarapé do Ailton; verbatimLatitude: 02°35'36.7"S; verbatimLongitude: 54°57'48.4"W; verbatimEventDate: 06.XI.2019; sex: 1 micropterous ♂; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- c. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Cachoeira da Cavada; verbatimLatitude: 02°35'48.9"S; verbatimLongitude: 54°31'47.3"W; verbatimEventDate: 13.XI.2019; sex: 1 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen

- d. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Mararú; verbatimLatitude: 02°29'35"S; verbatimLongitude: 54°40'06"W; verbatimEventDate: 23.VIII.2019; sex: 1 apterous ♂; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- e. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé da Débora; verbatimLatitude: 02°44'27.7"S; verbatimLongitude: 54°26'01.2"W; verbatimEventDate: 21.X.2019; sex: 1 apterous ♂, 2 apterous ♀; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen
- f. country: Brazil; stateProvince: Pará; municipality: Santarém; locality: Igarapé Cajutuba II; verbatimLatitude: 02°27'39.2"S; verbatimLongitude: 54°46'53.4"W; verbatimEventDate: 10.X.2020; sex: 1 apterous ♂; recordedBy: S.E. Santos; type: PhysicalObject; institutionCode: LETIA; basisOfRecord: PreservedSpecimen

Distribution

Brazil (Amapá, Amazonas, Pará), French Guiana, Suriname, Venezuela (Moreira 2021e).

Notes

First records from the study area.

Photograph

Fig. 27c

Discussion

Our survey of the semi-aquatic bugs from the MRS revealed the occurrence of 14 genera and 44 species belonging to the families Gerridae, Hydrometridae, Mesoveliidae and Veliidae in the study region (Table 2). This represents a 100% increase in relation to the specific diversity previously recorded from the area in literature (Champion 1898, Hungerford 1929b, Drake and Harris 1930, Kuitert 1942, Bacon 1948, Hungerford 1954, Neering 1954, Bacon 1956, Nieser 1970, Polhemus 1997, Moreira et al. 2008, Moreira et al. 2011a, Rodrigues et al. 2014a). Amongst the recorded species, *Microvelia* **sp. nov. 1**, *M. sp. nov. 2* and *M. sp. nov. 3* are

described as new and, together with *M. aschnakiranae*, newly recorded from Brazil, increase the number of species of the genus known to occur in the country from 29 to 33 (Moreira 2021e). This contributes to fill a gap of knowledge about the genus in South America, where many species of Microveliinae remain undescribed (Polhemus and Polhemus 2007). Additionally, the recently-described *Rhagovelia graziae* is recorded from Brazil for the first time, increasing the distribution range of the species by more than 2000 km eastwards, from the Colombian Llanos to the Brazilian Amazon (Galindo-Malagón et al. 2021). Finally, *M. longipes* and *Paravelia dilatata* are recorded for the first time from Pará State. The former is quite common in temporary water bodies in South America and the new records fill a gap in its distribution between Roraima and Amazonas States and north-eastern Brazil (Polhemus 1990, Moreira and Campos 2012, Rodrigues et al. 2012, Cordeiro and Moreira 2015, Rodrigues et al. 2021). The latter is a much rarer species, known from less than 10 localities in Guyana, Suriname and Brazil (Amazonas State) (Polhemus 2014, Polhemus and Polhemus 1984, Pereira and Melo 2007, Rodrigues et al. 2014b, Rodrigues and Moreira 2016). Our record extends the known distribution of the species by about 600 km to the east of the previous records in its southern edge, in Manaus, Amazonas State, Brazil (Polhemus and Polhemus 1984, Polhemus 2014, Rodrigues et al. 2014b, Rodrigues and Moreira 2016).

Table 2: Distribution of semi-aquatic bug species in the three Municipalities of the MRS, Pará, Brazil and references for the records. A single asterisk (*) indicates a new record from Pará State. Two asterisks (**) indicate a new record from Brazil.

Taxa	Belterra	Mojuí dos Campos	Santarém	References
GERRIDAE				
Charmatometrinae				
<i>Brachymetra lata</i>	x	x	x	This work
<i>Brachymetra shawi</i>			x	This work
Cylindrostethinae				
<i>Cylindrostethus drakei</i>			x	Nieser 1970
<i>Cylindrostethus palmaris</i>	x	x	x	Kuitert 1942, this work
Gerrinae				
<i>Limnogonus aduncus aduncus</i>			x	Nieser 1970, this work
<i>Limnogonus recurvus</i>	x	x	x	Kuitert 1942, this work
<i>Neogerris genticus</i>	x		x	Drake and Harris 1930, this work
<i>Neogerris lotus</i>			x	Drake and Harris 1930
<i>Neogerris lubricus</i>	x	x	x	Kuitert 1942, Nieser 1970, this work
<i>Neogerris visendus</i>	x		x	Nieser 1970, this work
<i>Tachygerris adamsoni</i>			x	This work
Rhagadotarsinae				
<i>Rheumatobates crassifemur esakii</i>			x	Hungerford 1954

<i>Rheumatobates klagei</i>			x	Hungerford 1954, Nieser 1970
HYDROMETRIDAE				
Hydrometrinae	x		x	Champion 1898, this work
<i>Hydrometra argentina</i>				
MESOVELIIDAE				
Mesoveliinae				
<i>Mesovelia mulsanti</i>	x	x		Neering 1954, this work
<i>Mesovelia zeteki</i>			x	Moreira et al. 2008
VELIIDAE				
Microveliinae				
<i>Microvelia aschnakiranae</i>			x**	This work
<i>Microvelia sp. nov. 1</i>	x			This work
<i>Microvelia sp. nov. 2</i>	x			This work
<i>Microvelia longipes</i>			x*	This work
<i>Microvelia mimula</i>		x	x	Moreira et al. 2011a, this work
<i>Microvelia pulchella</i>		x	x	This work
<i>Microvelia sp. nov. 3</i>		x		This work
<i>Microvelia summersi</i>			x	Moreira et al. 2011a
<i>Microvelia venustatis</i>			x	Moreira et al. 2011a, this work
Rhagoveliinae				
<i>Rhagovelia amazonensis</i>			x	Polhemus 1997
<i>Rhagovelia brunae</i>	x	x	x	This work
<i>Rhagovelia elegans</i>	x	x	x	Bacon 1956, Polhemus 1997, this work
<i>Rhagovelia evidis</i>	x	x	x	This work
<i>Rhagovelia graziae</i>	x**			This work
<i>Rhagovelia jubata</i>	x		x	This work
<i>Rhagovelia tenuipes</i>			x	Bacon 1956
<i>Rhagovelia trilli</i>	x	x	x	Bacon 1948, this work
Veliinae				
<i>Callivelia conata</i>			x	This work
<i>Oiovelia chenae</i>			x	Rodrigues e al. 2014a
<i>Oiovelia cunucunumana</i>		x		This work
<i>Paravelia bullialata</i>	x			This work
<i>Paravelia dilatata</i>			x*	This work
<i>Stridulivelia alia</i>	x		x	This work
<i>Stridulivelia quadrispinosa</i>		x	x	Hungerford 1929b, this work
<i>Stridulivelia stridulata</i>			x	This work
<i>Stridulivelia strigosa</i>	x	x	x	This work
<i>Stridulivelia tersa</i>	x	x	x	This work
<i>Stridulivelia transversa</i>	x		x	This work

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Comentários à coordenação do PPGBEES:

Prezados enfatizo que a dissertação está muito bem escrita e muito bem apresentada, com um artigo já finalizado. Com certeza uma dissertação importante para a região com novas ocorrências de espécies e descrição de novas espécies, o que reforça a necessidade em estudos faunísticos na região, para aumentar o conhecimento sobre os Gerromorpha. Deixei pouquíssimos comentários na dissertação.

Parabéns a discente e aos orientadores.

Agradeço a oportunidade e me coloco a disposição para qualquer esclarecimento.

Avaliação final do projeto de dissertação de mestrado**I - Aprovada (X)**

Aprovada: indica que o revisor aprova a dissertação sem ou com correções. Na existência de correções, estas devem ser indicadas nos comentários à coordenação e/ou no próprio documento da dissertação.

IV - Reprovada ()

Reprovada: indica que a dissertação não é adequada.

Nome do membro da banca:

Data: 21/06/2021



Comentários à coordenação do PPGBEES:

Agradeço e fico lisonjeada com o convite, muito obrigada.

A candidata realizou diversas coletas na região metropolitana de Santarém, identificou todos em espécies, fotografou e descreveu três novas espécies de *Microvelia*. Eu o avanço do conhecimento dos percevejos semiaquáticos do Norte do Brasil. O trabalho está bem escrito, padronizado e muito bem ilustrado. Parabéns aos envolvidos.

Tenho algumas sugestões que poderão melhorar o trabalho:

- 1 – Fazer um breve histórico dos pesquisadores que já realizaram coleta na região e das espécies que estão previamente recordadas. Essa informação precisa estar posicionada na introdução;
 - 2– Fazer uma mapa com as espécies previamente registradas para a RMS e outro com os seus dados;
 - 3– Fazer fotos de todas as espécies coletadas ou previamente registradas para a região.
 - 4- Substituir as fotos das terminalia por ilustrações;
 - 5- Separar a diagnose das notas comparativas.
- Demais informações segue no corpo do texto.

Avaliação final do projeto de dissertação de mestrado

I - Aprovada (X)

Aprovada: indica que o revisor aprova a dissertação sem ou com correções. Na existência de correções, estas devem ser indicadas nos comentários à coordenação e/ou no próprio documento da dissertação.

IV - Reprovada ()

Reprovada: indica que a dissertação não é adequada.

Nome do membro da banca: Dra. Carla Fernanda Burguez Floriano

Data: 21/06/2021



Assinatura:

Comentários à coordenação do PPGBEES:

O trabalho desenvolvido pela discente Suzane E. dos Santos representa uma importante contribuição no incremento do conhecimento sobre a diversidade de Heteroptera, e não só para a região do estudo, mas, também, para todo o Brasil. Além disso, o trabalho tem uma relevância fundamental por se tratar de amostragem em uma área que vem sofrendo bastante pressões antrópicas nos últimos anos e que foi pouco estudada para muitos grupos de insetos. A dissertação em si apresenta-se bem estruturada, com um bom arcabouço teórico e com objetivos claros, gerando um capítulo submetido à um ótimo periódico. Acredito que por se tratar de um conteúdo relevante e com bastante informações inéditas (novos registros e três novas espécies) o trabalho será publicado facilmente. Sendo assim, sou de parecer favorável à aprovação da discente.

Anexo encaminho a dissertação com algumas poucas sugestões/ correções no corpo do texto. No mais, coloco-me à disposição para sanar qualquer dúvida.

Por fim, gostaria de parabenizar a discente e aos seus orientadores pelo trabalho e agradecer a indicação do meu nome para a avaliação

Avaliação final do projeto de dissertação de mestrado**I - Aprovada (X)**

Aprovada: indica que o revisor aprova a dissertação sem ou com correções. Na existência de correções, estas devem ser indicadas nos comentários à coordenação e/ou no próprio documento da dissertação.

IV - Reprovada ()

Reprovada: indica que a dissertação não é adequada.

Nome do membro da banca: Jeane Marcelle Cavalcante do Nascimento

Data: 19/08/2021

Assinatura: 

Comentários à coordenação do PPGBEES:

A dissertação em referência possui 110 páginas e encontra-se organizada em introdução geral e capítulo único (esse último com introdução, material e métodos, tratamentos de táxon, discussão geral e referências), através do qual a mestranda apresenta, com clareza e rigor acadêmico, um levantamento dos percevejos semiaquáticos da região metropolitana de Santarém, estado do Pará, Brasil, no qual três novas espécies do gênero *Microveflia* são descritas, duas espécies são registradas pela primeira vez no Brasil, duas para o estado do Pará, e 15 para a região metropolitana de Santarém.

No geral, o esforço despendido na dissertação da mestranda Suzane Evaristo dos Santos é de grande relevância para o conhecimento regional sobre a fauna de Heteroptera e, provavelmente, com qualidade suficiente para se configurar como dissertação de potencial para publicação. A introdução é clara, no qual a revisão da literatura ajuda a preparar o terreno para o resto do artigo. Os métodos são completos e bem documentados. Os resultados (tratamentos de táxon) foram apresentados de forma clara e bem documentado, porém, sugiro a inserção de mapas de distribuição das espécies. A discussão é superficial e não mescla a pesquisa com o corpo da literatura sobre Heteroptera, no entanto, acredito que a elaboração de um item de "Discussão" não era obrigatório nas normas do periódico escolhido para publicação. Em todo o conteúdo a argumentação da mestranda revela experiência na taxonomia do grupo estudado. No entanto, com intuito de contribuir um pouco mais com dissertação, eu pontuo de forma global e/ou pontual algumas sugestões aos autores no arquivo anexo, que disponibilizo (ver dissertação).

Os poucos ajustes que pontuei no arquivo, não são capazes de impedir a finalização positiva dessa etapa, e desta forma, sou de parecer favorável à aprovação da dissertação de mestrado de Suzane Evaristo dos Santos, "Gerromorpha (Insecta: Hemiptera: Heteroptera) da região metropolitana de Santarém, Pará, Brasil".

Avaliação final do projeto de dissertação de mestrado**I - Aprovada (x)**

Aprovada: indica que o revisor aprova a dissertação sem ou com correções. Na existência de correções, estas devem ser indicadas nos comentários à coordenação e/ou no próprio documento da dissertação.

IV - Reprovada ()

Reprovada: indica que a dissertação não é adequada.

Nome do membro da banca: José Max Barbosa de Oliveira Junior

Data: 21/06/2021

Assinatura:

