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Taxonomia e microbioma de ácaros que parasitam morcegos no Brasil: estudo da presença de patógenos e de comunidades comensais simbiontes nesses ectoparasitos

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1) Resumo do projeto proposto

Dentre os ácaros de importância médico-veterinária, as famílias Trombiculidae e Macronyssidae, que parasitam morcegos, são pouco estudadas, especialmente no que diz respeito à sua participação na cadeia epidemiológica de patógenos, alguns deles causadores de doenças graves. Os ácaros trombiculídeos possuem cerca de 70 espécies registradas para o Brasil. Dessas, apenas oito já foram encontradas parasitando morcegos, enquanto das 26 espécies de macronissídeos assinaladas para o país, 15 delas foram coletadas nesse mesmo grupo de hospedeiro. A importância dos ácaros dessas duas famílias, como potenciais vetores e/ou reservatórios no ciclo epidemiológico de patógenos já foi comentada por alguns autores do século passado. No entanto, o papel destes ácaros na epidemiologia de patógenos ainda não foi confirmado. Assim, no presente trabalho propôs-se o estudo detalhado da identificação desses ácaros depositados em Coleções Acarológicas. Concomitantemente, o material proveniente dos bancos de tecidos da Coleção Acarológica do Instituto Butantan, ISBP foram também examinados e submetidos à extração de DNA, bem como, foi realizada a investigação da presença de DNA de bactérias e protozoários nos ácaros investigados por meio de ensaios de PCR em tempo real e convencional, análises filogenéticas e "New Generation Sequencing" (NGS-*deep sequencing*). Uma vez que ambas as famílias podem picar humanos e apresentam indícios de serem possíveis vetores de patógenos, nossa proposta incluiu o estudo desses ácaros para todo o território nacional, com enfoque nos espécimes coletados parasitando morcegos. Abaixo, cada objetivo trará os seus respectivos resultados detalhadamente descritos.

Palavras-chaves: Trombiculidae, Macronyssidae, taxonomia, patógenos, morcegos.

2) Realizações no período que compreende esse relatório (de 01/05/2021 a 30/04/2024)

Ao final, foram possíveis seis publicações e sete manuscritos em preparação diretamente relacionadas ao presente projeto, tendo como protagonista o bolsista como primeiro autor ou como último autor, resultado de orientação de seus respectivos alunos de iniciação científica (Projetos FAPESP nº 2023/09381-9, 2023/09336-3, 2023/06878-0, 2023/06748-9 e 2022/08620-7). As publicações intituladas estão listadas ao final do relatorio: "*A new locality record for Radfordiella desmodi Radovsky, 1967 (Mesostigmata: Macronyssidae) parasitizing the vampire bat in Brazil*" **(Anexo 1)**, "*A new genus and two new species of chigger mites (Trombidiformes: Leeuwenhoekiidae) from Brazilian caves with notes about the genus Whartonia Ewing, 1944*" **(Anexo 2)**, "*The genus Perissopalla Brennan and White, 1960 (Trombidiformes: Trombiculidae) in Brazil: redescriptions, new localities and host-association records with the first molecular inference to this genus*" **(Anexo 3)**, *"Synonymy of Hooperella spinirostra (Vercammen-Grandjean, 1967) with Hooperella vesperuginis (Brennan and Jones, 1960): redescription based on the types, new locality, and host records from Brazil"* **(Anexo 4)**, *"Contribution to the knowledge of Parichoronyssus bakeri Morales-Malacara and Guerrero, 2007 (Mesostigmata: Macronyssidae): new locality and host-association records with additional molecular data."* **(Anexo 5)**, e *"Molecular detection of Bartonella spp. in bat-associated macronyssid mites (Acari: Macronyssidae) from Southern and Southeastern Brazil."* **(Anexo 6)**. Além disso, resultados parciais relacionados aos manuscritos citados acima foram apresentados em eventos nacionais e internacionais ocorridos durante a vigência do presente projeto, todos listados e melhor detalhados mais adiante.

De forma resumida, e de acordo com as normas, segue abaixo o detalhamento dos objetivos, seus principais resultados, bem como, os manuscritos gerados a partir destes estudos.

3) Realizações no período, referenciadas à lista de publicações e apresentações de trabalhos

A metodologia e os resultados estão descritos detalhadamente para cada objetivo do presente relatório, permitindo o acompanhamento das atividades realizadas e metas alcançadas no período de vigência do relatório (de 01/05/2021 a 30/04/2024).

3.1) Objetivo i: Identificar morfologicamente e molecularmente ácaros macronissídeos (Macronyssidae) e trombiculídeos (Trombiculidae *s. l.*) parasitas de morcegos no Brasil.

A coleção acarológica do Instituto Butantan (IBSP) é uma importante fonte de informação sobre ácaros de importância médico-veterinária na América Latina. Todo o material depositado na coleção IBSP está disponível para consulta pública, o que significa que pesquisadores e interessados podem acessar e estudar os mesmos espécimes examinados no presente estudo. Além disso, a coleção é constantemente atualizada com materiais recém recebidos, garantindo que ela continue a crescer e a refletir a diversidade e a distribuição dos ácaros na região. Isso é especialmente importante para pesquisas e ações relacionadas à saúde humana e animal, uma vez que os ácaros podem desempenhar papéis significativos como vetores de doenças.

A coleção IBSP utiliza duas formas de armazenamento para seus materiais: (1) montados em lâminas; e/ou (2) fixados em álcool (meio líquido) e mantidos em *freezers*. Os ácaros montados em lâminas foram examinados utilizando um microscópio de contraste de fase da marca Leica DM4000B. Durante o desenvolvimento desse projeto, os espécimes foram identificados quando não havia uma pré-identificação, ou foram re-identificados se já havia uma identificação prévia. Quanto aos ácaros armazenados em meio líquido, todos que estavam em boas condições foram submetidos à extração de DNA.

Desta forma, indo de acordo com o objetivo do presente projeto, nós examinamos o material referente os ácaros macronissídeos e trombiculídeos parasitas de morcegos. Considerando o material já montado em lâminas e o material em meio líquido (usado para montagem de novas lâminas ou para análises moleculares), foram examinados um total de 40 lotes de ácaros trombiculídeos e 260 lotes de ácaros macronissídeos.

Após todo o material estar montado em lâmina, fosse proveniente diretamente da coleção, ou posterior a extração de DNA, foram identificados morfologicamente utilizando-se as chaves de identificação de Radvosky (2010) para macronissídeos e de Brennan & Goff (1977) para trombiculídeos, bem como as descrições originais e o material tipo depositado em coleções. Portanto, foi possível identificar para a família Macronyssidae, adultos das espécies: *Chiasmanyssus cavernicola* Gomes-Almeida & Pepato, 2021; *Chiroptonyssus haematophagus* (Fonseca, 1935); *Chiroptonyssus robustipes* (Ewing, 1925), *Chiroptonyssus venezoelanus* (Vitzthum, 1932); *Macronyssoides kochi* (Fonseca, 1948); *Parichoronyssus bakeri* (Morales-Malacara & Guerrero, 2007); *Radfordiella desmodi* (Radovsky, 1967); *Steatonyssus* sp.1 e *Steatonyssus* sp.2; além de protoninfas dos gêneros *Macronyssus* e *Macronyssoides*.

Para a família Trombiculidae, as seguintes espécies foram identificadas (em estágio larval), *Hooperella vesperuginis* (Brennan & Jones, 1960); *Hooperella saccopteryx* (Brennan & Jones, 1960); *Perissopalla ipeani* Brennan, 1969l; *Perissopalla tanycera* Brennan, 1969 e *Whartonia pachywhartoni* Vercammen-Grandjean, 1966. Duas espécies novas foram descritas para essa família, *Caramuruacarus carnavalesca* Bassini-Silva & Jacinavicius, 2022 e *Whartonia parauapebensis* Bassini-Silva & Jacinavicius, 2022.

Com o objetivo de realizar a identificação molecular dos ácaros mencionados acima, sempre que viável, procedemos com a extração de DNA. Essa etapa foi conduzida utilizando-se o kit de extração *DNeasy Blood & Tissue* da *QIAGEN®*, seguindo as instruções fornecidas pelo fabricante. Cada amostra de DNA foi submetida a pelo menos quatro PCRs convencionais (cPCR) para a caracterização molecular desses ácaros, e posterior uso como controles endógenos nos testes de patógenos. Os genes utilizados foram 18S, 28S (nucleares), 16S e COI (mitocondriais). Os primers utilizados foram: 18S-1F (ATATTGGAGGGCAAGTCTGG) e 18S-1R (TGGCATCGTTTATGGTTAG); 28-f1 (GAAAGCAAAAGCGATTCCCT) e 28-R1 (CGACCTTTGACAACTACGAAC); 16S+1 (CTGCTCAATGATTTTTTAAATTGCTGTGG) e 16S–1(CCGGTCTGAACTCAGATCAAGT); e HC02198 (TAAACTTCAGGGTGACCAAAAAATC) e LCO1490 (GGTCAACAAATCATAAAGATATTGG).

A PCR foi programada seguindo os protocolos originais de desenho desses primers (Otto & Wilson, 2001; Zhou et al., 2020; Mangold et al., 1998; Folmer et al., 1994). Para cada reação foi utilizado controles: negativo (água Milli-Q autoclavada e livre de DNA) e positivo (*pool* de ácaros de poeira).

As amostras que foram amplificadas nos testes de cPCR foram purificadas utilizando o kit “ExoSAP-ITTM PCR Product Cleanup Reagent” (Thermo Scientific, San Jose, CA, USA), seguindo as instruções do fabricante, e o sequenciamento foi conduzido utilizando o método de terminação de cadeia com dideoxinucleotídeos (Sanger et al.1977) realizado pelo sequenciador ABI PRISM 3700 DNA Analyzer (Applied Biosystems®) no Centro de Recursos Biológicos e Biologia Genômica (CREBIO -FCAV - UNESP). Por fim, as sequências amplificadas foram submetidas a análise pela ferramenta BLAST. Ao todo, foram testados 500 ácaros, sendo 107 amostras de trombiculídeos e 393 amostras de macronissídeos.

Dentre os trombiculídeos, 82 amostras (76,6%) apresentaram resultado positivo para o gene 18S rRNA: 42 de 48 (87,5%) *P. ipeani*, 29 de 38 (76,31%) *H. vesperuginis*, e 11 de 21 (52,3%) *W. pachywhartoni*. Das 393 amostras de ácaros macronissídeos submetidas à análise molecular, 165 (41,98%) se apresentaram positivas para o gene 18S rRNA: 6 de 22 (27,3%) *C. cavernicola* foram positivas, 18 de 42 (42,85%) *Ch. haematophagus*, 17 de 80 (21,25%) *Ch. venezoelanus*, 36 de 40 (90%) *M. kochi*, 26 de 81 (32,1%) *Macronyssus* sp., 21 de 40 (52,5%) *P. bakeri*, 21 de 45 (46,66%) *R. desmodi*, 17 de 27 (62,96%) *Steatonyssus* sp. 1, e 3 de 16 (18,75%) *Steatonyssus* sp. 2. Para o gene 16S rRNA, 60 (36,36%) amostras de DNA foram positivas: 13 de 81 (16,04%) *Macronyssus* sp., 12 de 40 (30%) *P. bakeri*, 23 de 45 (51,11%) *R. desmodi*, 6 de 27 (22,22%) *Steatonyssus* sp. 1, e 6 de 16 (37,5%) *Steatonyssus* sp. 2.

Perissopalla tanycera não foi testada molecularmente pois não havia materiais em líquido. Além disso, as amostras de *C. robustipes* e *H. saccopteryx* não foram positivas para nenhum gene estudado. E ainda, nenhuma amostra foi positiva para os genes 28S rRNA e COI, e nenhum ácaro trombiculídeos foi positivo para o gene 16S rRNA.

Todas as sequências obtidas foram submetidas ao GenBank e seus números de acessos serão disponibilizados juntamente com as suas respectivas publicações.

Desse exame de material na coleção IBSP em conjunto com os dados inéditos das análises moleculares, foram gerados os trabalhos '*A new locality record for Radfordiella desmodi Radovsky, 1967 (Mesostigmata: Macronyssidae) parasitizing the vampire bat in*

Brazil (doi: 10.37486/2675-1305)' (Anexo 1), *'A new genus and two new species of chigger mites (Trombidiformes: Leeuwenhoekiidae) from Brazilian caves with notes about the genus Whartonia Ewing, 1944.'* (Anexo 2), *'New molecular data for the species Radfordiella desmodi Radowsky, 1967'* (**In prep**), '*The genus Perissopalla Brennan and White, 1960 (Trombidiformes: Trombiculidae) in Brazil: redescriptions, new localities and host-association records with the first molecular information to this genus*' (Anexo 3), *'Contribution to the knowledge of Parichoronyssus bakeri Morales-Malacara and Guerrero, 2007 (Mesostigmata: Macronyssidae): new locality and host-association records with additional molecular data.'* (Anexo 5), '*Redescription of the species Hooperella saccopteryx (Brennan and Jones, 1960) (Trombidiformes: Trombiculidae) and first record to Brazil'* (**In prep**), e *'The rediscovery of the types of Whartonia pachywhartoni Vercammen-Grandjean, 1966 (Trombidiformes: Leeuwenhoekiidae) with new records in Brazil'* (**In prep**). Todos estes artigos estão listados e detalhados no item 5.4 do presente projeto.

3.2) Objetivo ii: Detalhar e ilustrar a morfologia dos ácaros examinados e redescrever os tipos, quando necessário, das espécies de ácaros de ambas as famílias.

Sempre que possível, os tipos foram examinados para confirmar os espécimes não identificados. No caso dos trombiculídeos, foram realizadas quatro viagens técnicas à coleção do Smithsonian, onde, de acordo com Bassini-Silva et al. (2021), os tipos (holótipo e parátipos) de ácaros dessa família encontrados no Brasil parasitando morcegos estão depositados. Isso possibilitou a redescrição das três espécies do gênero *Perissopalla* registradas no país, bem como a identificação das espécies *P. ipeani* e *P. tancyera* em material recentemente coletado, revelando novas localidades e associações com hospedeiros.

Na procura pelos tipos das espécies *Whartonia pachywhartoni* e *Hooperella vesperuginis,* constatou-se que parátipos da espécie *Hooperella spinirostra* (Vercammen-Grandjean, 1967) se tratava de parátipos da espécie *W. pachywhartoni.* Desta forma, com o redescobrimento dos tipos de *Whartonia pachywhartoni* foi possível a redescrição dessa espécie e também o registro de novas localidades e hospedeiros. Além disso, quando comparamos *H. vesperuginis* e *H. spinirostra*, constatamos que se trava da mesma espécie, e assim nós as sinonimizamos, prevalecendo como válida a espécie *H. vesperuginis*.

Todos esses estudos taxonômicos geraram os seguintes trabalhos: '*The genus Perissopalla Brennan and White, 1960 (Trombidiformes: Trombiculidae) in Brazil: redescriptions, new localities and host-association records with the first molecular information to this genus*' (Anexo 3), 'Synonymy of *Hooperella spinirostra* (Vercammen-Grandjean, 1967) with *Hooperella vesperuginis* (Brennan and Jones, 1960): redescription based on the types, new locality and host records from Brazil'(Anexo 4), '*Redescription of the species Hooperella saccopteryx (Brennan and Jones, 1960) (Trombidiformes: Trombiculidae) and first record to Brazil'* (**In prep**), e *'The rediscovery of the types of Whartonia pachywhartoni Vercammen-Grandjean, 1966 (Trombidiformes: Leeuwenhoekiidae) with new records in Brazil'* (**In prep**). Todos estes artigos estão listados e detalhados no item 5.4 do presente projeto.

No caso das espécies dos macronissídeos, os tipos de *Chiroptonyssus haematophagus* (Fonseca, 1935), *Macronyssoides kochi* Fonseca, 1948 e *Steatonyssus joaquimi* (Fonseca, 1935) já foram examinados. Isso porque esses tipos estão depositados na coleção Acarológica do Instituto Butantan (IBSP), coleção essa, parceira do presente projeto. Redescrições destas espécies estão em andamento, uma vez que suas descrições foram bastante sucintas, e, futuramente, estarão disponíveis nas publicações em preparação conforme listados no item 5.4.

- **3.3) Objetivo iii: Verificar a distribuição geográfica dos ácaros estudados, com base em material de coleções.**

Após examinar o material da coleção IBSP, conduzir uma revisão de literatura, bem como, visita as coleções para exame dos tipos. Constatamos novos registros para grande parte de todas as espécies analisadas. Esses novos achados foram incorporados aos manuscritos posteriormente listados neste relatório.

Para a família Trombiculidae: pela primeira vez, registramos a presença de *Perissopalla ipeani* no estado do Rio de Janeiro, na Reserva Biológica de Tinguá, parasitando *morcegos das espécies Artibeus lituratus* e *Carollia perspicillata*, e *Perissopalla tanycera* em São Paulo, parasitando morcegos da espécie *Neonycteris pusilla*. O redescobrimento dos tipos de *W. pachywhartoni* e *H. vesperuginis* possibilitou a confirmação da identificação dos materiais estudados, marcando a primeira vez que essas espécies são registradas no estado do Rio de Janeiro, parasitando morcegos das espécies *A. lituratus* e *C. perspicillata*. Finalmente, *Hooperella saccopteryx* é documentada pela primeira vez no Brasil, parasitando *Saccopteryx billineata* nos estados de Rondônia, Pará e São Paulo. Embora esse trombiculídeo tenha uma ampla distribuição na América Latina, indo da Venezuela até o México, esse é o primeiro relato de sua presença no Brasil.

Quanto à distribuição dos ácaros examinados da família Macronyssidae, observamos pela primeira vez a presença de *Ch. venezuelanus* no Brasil (nos estados do Paraná e Minas Gerais), parasitando morcegos do gênero *Nyctinomops*, incluindo as espécies *Nyctinomops aurispinosus*, *Nyctinomops laticaudatus* e *Nyctinomops macrotis*.

Além disso, *Macronyssoides kochi* foi encontrado pela primeira vez parasitando *Artibeus fimbriatus* no estado do Rio de Janeiro.

Identificamos dois morfotipos diferentes de fêmeas de *Steatonyssus*, que representam possíveis novas espécies que serão descritas em breve. Ambos os espécimes foram coletados no estado do Paraná e associados a espécies de morcegos da família Vespertilionidae. Também é a primeira vez que o gênero *Macronyssus* é encontrado associado a morcegos do gênero *Molossus*, incluindo *Molossus fluminensis* e *Molossus molossus*, no território brasileiro. Embora possa indicar uma nova espécie de ácaro, serão necessárias futuras coletas para caracterizar morfologicamente os adultos e permitir a identificação até o nível de espécie.

3.4) Objetivo iv: Investigar a presença de DNA de *Anaplasma* spp., *Bartonella* spp., *Ehrlichia* spp., *Hepatozoon* spp., *Mycoplasma* spp., *Orientia* spp. e *Rickettsia* spp. nos ácaros macronissídeos e trombiculídeos coletados de morcegos, e que foram depositados nos bancos de tecidos e em coleções acarológicas, por meio de ensaios de PCR em tempo real e convencional, seguidos de análises filogenéticas.

Em todos os ácaros submetidos a análise molecular, os procedimentos foram os mesmos. O DNA dos ácaros foi extraído por meio do *DNeasy Blood & Tissue* da *QIAGEN*®, seguindo o protocolo conforme recomendações do fabricante. Os mesmos 500 ácaros seriam usados aqui, mas nós apenas utilizamos aqueles positivos para qualquer gene de caracterização descritos no **Objetivo i**, ou seja, foram utilizados 82 espécimes da família Trombiculidae e 165 espécimes da família Macronyssidae, totalizando 247 amostras. Dessas amostras positivas ao controle endógeno, nós tivemos amostras positivas para os protocolos de triagem de *Anaplasma* spp., *Bartonella* spp. e *Ehrlichia* spp. Infelizmente não conseguimos nenhum gene de caracterização para essas amostras positivas. A seguir estão descritos esses resultados.

Destas 247 amostras, 55 amostras (22,26%) de ácaros macronissídeos e trombiculídeos foram positivas para o gene de triagem de agentes Anaplasmataceae (*16S rRNA*), com tamanho de fragmento aproximadamente de 350 pb. Para a família Macronyssidae, 13 sequências apresentaram 98,7% de identidade com *Ehrlichia* sp., e duas demonstraram 98,2% de identidade com *Anaplasma* sp. As sequências de *Anaplasma* foram obtidas de uma fêmea de *Steatonyssus* sp. 1 coletada em Jataizinho, Paraná, parasitando *Eptesicus* sp., e de uma fêmea de *Chiroptonyssus venezoelanus* coletado no mesmo estado, parasitando *Nyctinomops laticaudatus*. Oito sequências obtidas de *Ehrlichia* sp. foram provenientes de seis ninfas de *Macronyssus* sp., de uma fêmea de *Chiroptonyssus haematophagus* e de uma fêmea de *Macronyssoides kochi* coletados no Estado do Rio de Janeiro. Três sequências foram obtidas de ácaros macronissídeos coletados no estado de Minas Gerais, procedentes de duas ninfas de *Macronyssus* sp. e uma fêmea de *Chiroptonyssus venezoelanus*. As duas sequências restantes de 16S rRNA de *Ehrlichia*, foram obtidas de ácaros macronissídeos coletados no Estado do Paraná e Rondônia, de uma fêmea de *Steatonyssus* sp. 1, e de uma fêmea de *Parichoronyssus* sp., respectivamente. Enquanto isso, para a família Trombiculidae, nós conseguimos obter duas sequências similares a *Ehrlichia* sp. Ambas as sequências foram obtidas de *Perissopalla ipeani*, coletados no Rio de Janeiro. Ambas as árvores filogenéticas estão apresentadas no final do presente relatório **(Figuras 1 e 2)**.

Em relação aos positivos para *Bartonella*, das 247 amostras, apenas 3 (1,2%) foram positivas para o gene *nuoG* na PCR convencional. Essas sequências foram detectadas nas amostras de DNA das espécies *Macronyssus* sp., *Macronyssoides kochi* e

Parichoronyssus bakeri provenientes do estado do Rio de Janeiro. Na figura 3 está representada a filogenia baseando-se neste gene.

Sendo assim, os resultados corroboram com os objetivos iniciais desse trabalho, que além de identificar morfologicamente os ácaros macronissídeos e trombiculídeos, associados à morcegos do Brasil, foi também possível detectar pela primeira vez sequências de *Bartonella* spp., *Anaplasma* sp. e *Ehrlichia* sp. nesses ácaros para os estados do Rio de Janeiro, Minas Gerais, Paraná e Rondônia.

Esses resultados foram compilados em duas publicações nas quais os alunos de iniciação científica orientados pelo bolsista encabeçaram a pesquisa, os trabalhos estão intitulados de *'Molecular detection of Anaplasmataceae agents in bat-associated macronyssid mites (Mesostigmata: Macronyssidae) in Southern and Southeastern Brazil'* e *'Molecular detection of Bartonella spp. in bat-associated macronyssid mites (Acari: Macronyssidae) from Southern and Southeastern Brazil'*, sendo que este último já foi publicado recentemente na revista internacional *Veterinary Research Communications* **(Anexo 6)**.

Todos os espécimes testados para *Hepatozoon* spp., *Mycoplasma* spp., *Orientia* spp. e *Rickettsia* spp. foram negativos.

3.5) Objetivo v: Investigar o microbioma de ácaros macronissídeos e trombiculídeos parasitas de morcegos no Brasil, por meio de técnicas de NGS (*New Generation Sequencing*)

Para o procedimento do estudo do microbioma, foram escolhidos aqueles ácaros mais bem preservados e mais frescos. Esses espécimes foram individualizados e limpos com hipoclorito de sódio a 1% por 2 min, álcool etílico a 70% por 2 min, seguido de enxágue com água destilada esterilizada três vezes, e então foram submetidos a extração de DNA conforme descrita nos objetivos acima, utilizou-se o kit de extração da QIAGEN® - *DNeasy Blood & Tissue Kit*, seguindo o protocolo do fabricante. Logo após os espécimes passaram por dois protocolos de triagem. Protocolo padrão, para ver se realmente foi extraído ácaro da amostra que se utiliza o gene 18S rRNA (Otto & Wilson, 2001), e em seguida, foi realizada uma triagem que dizemos ser "nosso controle de qualidade da amostra", no qual se utiliza o gene 16S rRNA com o objetivo de detecção de procariotos, apenas para saber se havia alguma bactéria circulante no material (Fradosh et al., 2014). Após esses dois procedimentos, nós encaminhamos o material para a empresa responsável para fazer o "New Generation Sequencing" (NGS-deep sequencing) visando as regiões V3-V4 do gene 16S rRNA bacteriano.

Ao todo, foram enviadas 12 amostras individuais de ácaros macronissídeos e 3 amostras de trombiculídeos. Em relação aos macronissídeos, foram sempre três fêmeas pertencentes as espécies: *Steatonyssus* sp.1, *Steatonyssus* sp.2, *C. venezuelanus*, e *P. bakeri*. Já para os trombiculídeos, foram três amostras individuais de larvas de *P. ipeani*. Todas as amostras foram viáveis para o sequenciamento de NGS, na tabela 1 estão mostradas a médias de sequências encontradas em cada uma das espécies estudadas. Dessas quinze amostras, foram obtidas 98804 *reads* em todas elas, compreendendo 45 bactérias diferentes pertencentes a oito filos bacterianos, com maior destaque para os gêneros de bactérias endossimbiontes como *Cardinium* spp., *Spiroplasma* spp. e *Wolbachia* spp. Essas bactérias foram detectadas em todos os ácaros estudados, bem como os gêneros que são de espécies patogênicas como *Anaplasma* spp. e *Bartonella* spp. Devido a limitação da técnica de microbioma, nós conseguimos recuperar apenas *small reads*, que impossibilitam chegar até uma identificação a nível de espécie.

Em relação as bactérias endossimbiontes, pouco se sabe sobre qual o real papel delas na regulação de outras bactérias ou no metabolismo dos ácaros estudados no presente estudo, apesar de sabermos que *Wolbachia* e *Spiroplasma* são responsáveis por regular diversas atividades em outros artrópodes, como abelhas e mosquitos. No entanto, podemos afirmar que *Cardinium* sp., *Spiroplasma* sp. e *Wolbachia* sp. são detectados nessas espécies de ácaros para ambas as famílias. Já as detecções de *Anaplasma* spp. e *Bartonella* spp. nos *Steatonyssus* sp.1, *C. venezuelanus* e *P. bakeri*, vão em conformidade com os testes de PCR realizados em outras amostras trabalhadas no presente projeto. Ainda existe a necessidade de análise do microbioma nas outras espécies , o que certamente ampliará nosso entendimento, ainda incipiente, da diversidade bacteriana presente nesses ácaros.

Os resultados aqui mostrados serão compilados em duas publicações que estão em preparação: *'Analysis on the prokaryotic microbiome in mites of the families Macronyssidae collected on bats from Brazil'* e *'Study of the bacterial microbiota of the species Perissopalla ipeani Brennan, 1969 (Trombidiformes: Trombiculidae).'*

5) Lista de publicações

5.1. Artigos diretamente relacionados ao presente projeto, publicados em revistas científicas indexadas

5.1.1. **Bassini-Silva R.,** Moura A. P., Dowling A. P. G., André M. R., Jacinavicius F. C., Barros-Battesti D. M. A new locality record for *Radfordiella desmodi* Radovsky, 1967 (Mesostigmata: Macronyssidae) parasitizing the vampire bat in Brazil. *Entomological Communications*. 3: ec03046, 2021 **(Anexo 1).**

5.1.2. **Bassini-Silva R.,** Zampaulo R. A., Welbourn C., Ochoa R., Brescovit A. D., Barros-Battesti D. M., Jacinavicius F. C. A new genus and two new species of chigger mites (Trombidiformes: Leeuwenhoekiidae) from Brazilian caves with notes about the genus *Whartonia* Ewing, 1944. *Journal of Natural History*. 56(29-32): 1297-1313, 2022. **(Anexo 2).**

5.1.3. **Bassini-Silva R.,** Jacinavicius F.C., Lourenço E.C., Welbourn C., Ochoa R., Famadas K.M., Barros-Battesti D.M. The genus *Perissopalla* Brennan and White, 1960 (Trombidiformes: Trombiculidae) in Brazil: redescriptions, new localities, and host-association records with the first molecular inference to this genus. Veterinary Parasitology: Regional Studies and Reports, 49, 101004, 2024 **(Anexo 3).**

5.1.4. **Bassini-Silva R.,** Jacinavicius F.C., Lourenço E.C., Welbourn C., Ochoa R., Famadas K.M., Barros-Battesti D.M. Synonymy of *Hooperella spinirostra* (Vercammen-Grandjean, 1967) with *Hooperella vesperuginis* (Brennan and Jones, 1960): redescription based on the types, new locality, and host records from Brazil. International Journal of Acarology **(Anexo 4).**

5.1.5. Mello-Oliveira V.S., Jacinavicius F.C., Guerro-de-Souza M., Dornelas L.F., Castro-Santiago A.C., Calchi A.C., Lourenço E.C., Dowling A.P.G., Famadas K.M., André M.R., Camargo L.M.A., Barros-Battesti D.M., **Bassini-Silva R.** Contribution to the knowledge of *Parichoronyssus bakeri* Morales-Malacara and Guerrero, 2007 (Mesostigmata: Macronyssidae): new locality and host-association records with additional molecular data. **Acarologia**, 64(1):56-62, 2023 **(Anexo 5).**

5.1.6. Chagas M.E.M, Mello-Oliveira V.S., Guerro-de-Souza M., Calchi A.C., Castro-Santiago A.C., Mello E.M., Suguiura I.M.S., Lourenço E.C., Famadas K.M., Dowling A.P.G., André M.R., Barros-Battesti D.M., Jacinavicius F.C., **Bassini-Silva R.** Molecular detection of *Bartonella spp.* in bat-associated macronyssid mites (Acari: Macronyssidae) from Southern and Southeastern Brazil. Veterinary Research Communications, 2024. https://doi.org/10.1007/s11259-024-10393-1 **(Anexo 6)**.

5.2. Trabalhos em preparação diretamente relacionados ao presente projeto

5.1.1. Mello-Oliveira V.S., Chagas M.E.M, Guerro-de-Souza M., Calchi A.C., Castro-Santiago A.C., Mello E.M., Suguiura I.M.S., Lourenço E.C., Famadas K.M., Dowling A.P.G., André M.R., Labruna M.B., Barros-Battesti D.M., Jacinavicius F.C., **Bassini-Silva R.** Molecular detection of Anaplasmataceae agents in bat associated macronyssid mites (Mesostigmata: Macronyssidae) in southern and southeastern Brazil**. In prep.**

5.1.2. **Bassini-Silva R.**, Mello-Oliveira V.S., Almeida B.R., Pesenato I.P., Calchi A.C., Castro-Santiago A.C., Lourenço E.C., Famadas K.M., Welbourn C., Ochoa R., André M.R., Barros-Battesti D.M., Jacinavicius F.C. Molecular detection of *Ehrlichia* spp. in bat-associated chigger mites (Trombidiformes: Leeuwenhoekiidae and Trombiculidae *s. s.*) from Brazil. **In prep.**

5.1.3. Almeida B.R., Jacinavicius F.C., Pesenato I.P., Dornelas L.F, Welbourn C., Ochoa R., Camargo L.M.A., Barros-Battesti D.M., **Bassini-Silva R.** Redescription of the species *Hooperella saccopteryx* (Brennan and Jones, 1960) (Trombidiformes: Trombiculidae) and first record to Brazil. **In prep.**

5.1.4. **Bassini-Silva R.**, Almeida B.R., Jacinavicius F.C., Lourenço E.C., Welbourn C., Ochoa R., Famadas K.M., Barros-Battesti D.M. The rediscovery of the types of *Whartonia pachywhartoni* Vercammen-Grandjean, 1966 (Trombidiformes:

Leeuwenhoekiidae) with new records in Brazil. **In prep.**

5.1.5. **Bassini-Silva R.**, Mello-Oliveira V.S., Almeida B.R., Pesenato I.P., Calchi A.C., Castro-Santiago A.C., Lourenço E.C., Famadas K.M., Welbourn C., Ochoa R., André M.R., Barros-Battesti D.M., Jacinavicius F.C. Analysis on the prokaryotic microbiome in mites of the Family Macronyssidae collected on bats from Brazil. **In prep.**

5.1.6. **Bassini-Silva R.**, Mello-Oliveira V.S., Almeida B.R., Pesenato I.P., Calchi A.C., Castro-Santiago A.C., Lourenço E.C., Famadas K.M., Welbourn C., Ochoa R., André M.R., Barros-Battesti D.M., Jacinavicius F.C. Study of the bacterial microbiota of the species *Perissopalla ipeani* Brennan, 1969 (Trombidiformes: Trombiculidae). **In prep.**

5.1.7. Guerro-de-Souza M.G., Chagas M.E.M, Mello-Oliveira V.S., Barros-Battesti D.M., Jacinavicius F.C., **Bassini-Silva R.** New molecular data for the species *Radfordiella desmodi* Radowsky, 1967. **In prep.**

5.2. Artigos relacionados indiretamente ao presente projeto, publicados em revistas científicas indexadas

5.2.1 **Bassini-Silva, R.,** M. Huang-Bastos, D. H. Morais, E. P. Alcantara, R. W. Ávila, C. Welbourn, R. Ochoa, D. M. Barros-Battesti, F. C. Jacinavicius A new species of *Hannemania* Oudemans, 1911 (Trombidiformes: Leeuwenhoekiidae) from Brazil. *Journal of Natural History*. 55(19-20): 1277-1287, 2021. **(Anexo 7)**.

5.2.2 **Bassini-Silva, R.,** Takatsu J. C., Barros-Battesti, D. M., Bermúdez S. E., Miranda R. J., C. Welbourn, R. Ochoa, D. M. Barros-Battesti, F. C. Jacinavicius. A checklist of chiggers (Trombidiformes: Trombiculidae and Leeuwenhoekiidae) of Panama. *Acarologia*. 61(4): 763-789, 2021. **(Anexo 8)**.

5.2.3 **Bassini-Silva R.,** Takatsu J. C., Peinado L. C., Faxina C., Moreira-Lima L., Fischer E., Hingst-Zaher E., Santos J. C., Moraes G. J., Dowling A. P. G., Barros-Battesti D. M., Jacinavicius F. C. Mites (Mesostigmata: Melicharidae) associated with hummingbirds (Aves: Trochilidae) in Brazil. *International Journal of Acarology*. 47 (8): 714-718, 2021. **(Anexo 9)**.

5.2.4 De Giosa M., **Bassini-Silva R.,** De Lillo E., McDonald E. M., Ochoa, R. Italian Acarine species intercepted in the United States. *International Journal of Acarology.* 47 (8): 689-694, 2021. **(Anexo 10)**.

5.2.5 **Bassini-Silva R.,** Huang-Bastos M., Welbourn C., Ochoa R., Barros-Battesti D. M., Jacinavicius F. C. Description of *Goffacarus* n. gen., to reallocate the species *Euschoengastia latchmani* Brennan and Yunker and *Euschoengastia obscura* Wrenn and Loomis (Trombidiformes: Trombiculidae). *Acta Parasitologica*. 66: 1448–1457, 2021. **(Anexo 11)**.

5.2.6 Santos-Rodrigues R., **Bassini-Silva R.,** Huang-Bastos M., Araujo K. M. Q., Carvalho F. C. G., Brêtas G., Jacinavicius F. C. A new case of trombiculiasis caused by *Eutrombicula daemoni* Bassini-Silva & Jacinavicius, 2018 (Trombidiformes: Trombiculidae) in a dog from Brazil. *Entomological Communications.* 3: ec03035, 2021. **(Anexo 12)**.

5.2.7 Takatsu J. C., **Bassini-Silva R.,** Moura A. P., Batista A. I. V., Dias G. F., Pereira J. S., Dowling A. P. G., Jacinavicius F. C. Unusual association between *Ornithonyssus bursa* (Berlese, 1888) (Mesostigmata: Macronyssidae) and *Parabuteo unicinctus* (Temminck, 1824) (Accipitriformes: Accipitridae) in Paraíba State, Brazil. *Entomological Communications.* 3: ec03038, 2021. **(Anexo 13)**.

5.2.8 Jacinavicius F. C., **Bassini-Silva R.,** Oda F. H., Kaiser H. New records of the mites *Geckobia bataviensis* Vitzthum, 1926 and *Pterygosoma dracoensis* Jack, 1962 (Trombidiformes: Pterygosomatidae) from Timor-Leste. *Entomological Communications*. 3: ec03041, 2021. **(Anexo 14)**.

5.2.9 Takatsu J. C., **Bassini-Silva R.,** Spicer G., Hingst-Zaher E., Jacinavicius F. C. New records of avian nasal mites (Mesostigmata: Rhinonyssidae) to Southeastern Brazil. *Entomological Communications*. 3: ec03040, 2021. **(Anexo 15)**.

5.2.10 Arbex R., **Bassini-Silva R.,** Huang-Bastos M., Ochoa R., Welbourn C., Barros-Battesti D. M., Jacinavicius F. C. New species records of *Quadraseta* Brennan, 1970 (Trombidiformes: Trombiculidae) in South America. *Entomological Communications*. 3: ec03042, 2021. **(Anexo 16)**.

5.2.11 Jacinavicius F. C., Arbex R. L., Barros-Battesti D. M., **Bassini-Silva R**. Evidence of co-parasitism between different species of chiggers (Trombidiformes: Trombiculidae) parasitizing cricetid rodents in Morro Grande Forest Reserve, São Paulo State, Brazil. *Entomological Communications*. 3: ec03043, 2021. **(Anexo 17)**.

5.2.12 Melo J. W. S., Jacinavicius F. C., Castilho R. C., Demite P. R., **Bassini-Silva R.,** Moraes G. J. SIBAC (Simpósio Brasileiro de Acarologia) em tempos de conectividade. *Entomological Communications*. 3: ec03050, 2021. **(Anexo 18)**.

5.2.13 Santana P. de la T., **Bassini-Silva R.,** Dowling A. P. G., Armas L. F. First record of *Pellonyssus gorgasi* Yunker & Radovsky, 1966 (Mesostigmata: Macronyssidae) in Cuba and a new host association. *International Journal of Acarology*. 48(2): 184-186, 2022. **(Anexo 19)**.

5.2.14 Huang-Bastos M., Arbex R., **Bassini-Silva R.,** Welbourn C., Ochoa R., Jacinavicius F. C., Barros-Battesti D. M. Synonymy of *Quadraseta brennani* Goff & Whitaker, 1984 with *Quadraseta antillarum* (Brennan, 1967) (Trombidiformes: Trombiculidae). *Systematic & Applied Acarology*. 27(4): 763-772, 2022. **(Anexo 20)**.

5.2.15 **Bassini-Silva R.,** M. Huang-Bastos, M. Turcatel, C. Welbourn, R. Ochoa, D. M. Barros-Battesti, F. C. Jacinavicius. A new genus proposal for the species *Euschoengastia chisosensis* Wrenn, Baccus and Loomis, 1976 (Trombidiformes: Trombiculidae). *Proceedings of the Entomological Society of Washington.* 123(4): 693-702, 2022. **(Anexo 21)**.

5.2.16 **Bassini-Silva R.,** Barros-Battesti D. M., Jacinavicius F. C. Reinstatement of *Eutrombicula butantanensis* (Fonseca, 1932) (Trombidiformes: Trombiculidae). *Systematic Parasitology*. 99(5): 557-562, 2022. **(Anexo 22)**.

5.2.17 López-Pérez A. M., Pesapane R., Bassini-Silva R., Clifford D. L., Foley P., Backus L., Vol A., Foley J. Host species and environment drivers of ectoparasite community of rodents in a Mojave Desert wetland. *PLOS one.* 17(6): e0269160, 2022. **(Anexo 23)**.

5.2.18 Huang-Bastos M., **Bassini-Silva R.,** Arbex R., Welbourn C., Ochoa R., Jacinavicius F. C., Barros-Battesti D. M. Contribution to the knowledge of *Quadraseta pazca* (Brennan and Jones, 1964) (Trombidiformes: Trombiculidae), including new host-association and locality records. *International Journal of Acarology.* 48(4-5): 401-406, 2022. **(Anexo 24)**.

5.2.19 **Bassini-Silva R.,** Scopel W., Lima E. F. B., Silva-Neto A. M., Flechtmann C. H. W., Welbourn C., Ochoa R., Brescovit A. D., Barros-Battesti D. M., Jacinavicius F. C. *Charletonia rocciai* Treat and Flechtmann, 1979 (Trombidiformes: Erythraeidae): larval redescription and new records for Brazil. *International Journal of Acarology*. 48(6): 433-441, 2022. **(Anexo 25)**.

5.2.20 **Bassini-Silva R.,** Castro-Santiago A. C., Calchi A. C., Perles L., Takatsu J. C., Alencar I., Ochoa R., Dowling A., Werther K., André M. R., Barros-Battesti D. M., Jacinavicius F. C. Sleeping with the enemy: case reports of *Ornithonyssus bursa* (Berlese, 1888) (Mesostigmata: Macronyssidae) causing human dermatitis in Brazil. *Parasitology research.* 121(9): 2641–2649, 2022. **(Anexo 26)**.

5.2.21 Ashani M. L. S., Gunathilaka P. A. D. H. N., Premarathne B. A. H. R., Chandrasena T. G. A. N., Jacinavicius F. C., **Bassini-Silva R.** Chigger mites

(Trombidiformes: Leeuwenhoekiidae, Trombiculidae and Walchiidae) of Sri Lanka. *Veterinary Parasitology: Regional Studies and Reports.* 34: 100771, 2022. **(Anexo 27)**.

5.2.22 Alcantara D. M. C., Ikeda P., Souza C. S., de Mello V. V. C., Torres J. M., Lourenço E. C., **Bassini-Silva R.,** Herrera H. M., Machado R. Z., Barros-Battesti D. M., Graciolli G., André M. R. Multilayer networks assisting to untangle direct and indirect pathogen transmission in bats. *Microbial Ecology,* 2022. **(Anexo 28)**.

5.2.23 Onrubia A. C. B., **Bassini-Silva R.,** Pereira J. S., Mello Érica M., Nitsche A., Jacinavicius F. C. An annotated checklist of fur mites (Trombidiformes: Myobiidae) housed at the Acarological Collection of the Butantan Institute. *Entomological Communications*. 4: ec04032, 2022. **(Anexo 29)**.

5.2.24 **Bassini-Silva R.,** Jacinavicius F.C., Castro-Santiago A.C., Dowling A.P.G., André M.R., Linardi P.M., Barros-Battesti D.M. Occurrence of the mite *Acanthonyssus proechimys* (Mesostigmata: Macronyssidae) on a spiny rat in Brazil. *Acta Amazonica*. 52: 328-330, 2022. **(Anexo 30)**.

5.2.25 Bassini-Silva R., Jacinavicius F.C., Muñoz-Leal S., Maturano R., Takatsu J.C., Tolesano-Pascoli G.V., Alquezar R.D., Lugarini C., Ferreira A., Moreira-Lima L., Welbourn C., Ochoa R., Hingst-Zaher E., André M.R., Labruna M.B., Barros-Battesti, D.M. Bacterial pathogens' screening in Brazilian chigger mites (Trombidiformes: Trombiculidae), with the first report of *'Candidatus* Rickettsia colombianensi'-like in avian-associated chiggers. *Archives of microbiology*. 205(1): 51, 2023 **(Anexo 31)**.

5.2.26 **Bassini-Silva R.,** Acuña F., Welbourn C., Ochoa R., Barros-Battesti D. M., Jacinavicius F. C. *Eutrombicula cochinocaensis* n. sp.: a chigger (Trombidiformes: trombiculidae) parasite of camelids (Cetartiodactyla: Camelidae) in Argentina. *International Journal of Acarology*. 49(1): 67-72, 2023. **(Anexo 32)**.

5.2.27 Perles L., **Bassini-Silva R.,** Jacinavicius F. C., Barreto W. T. G., Macedo G. C., Martins F. S., Herrera H. M., Machado R. Z., Barros-Battesti D. M., André M. R. Contribution to the knowledge of *Neotrichodectes* (*Nasuicola*) *pallidus* (Piaget, 1880) (Phthiraptera: Trichodectidae). *Veterinary Parasitology: Regional Studies and Reports.* 41: 100877, 2023. **(Anexo 33)**.

5.2.28 Braga, M. D. S. C. O., Costa, F. B., Calchi, A. C., de Mello, V. V. C., Mongruel, A. C. B., Dias, C. M., **Bassini-Silva, R.,** Silva, E. M. C., Pereira, J. G., Ribeiro, L. S. D. S., da Costa, A. P., de Andrade, F. H. E., Silva, A. L. A., Machado, R. Z., André, M. R. Molecular detection and characterization of vector-borne agents in common opossums (Didelphis marsupialis) from northeastern Brazil. *Acta tropica*, 244: 106955, 2023. **(Anexo 34)**.

5.2.29 Castro-Santiago, A.C.; Lima-Duarte, L.; Camargo, J.V.; De Almeida, B.R.; Simons, S.M.; Mathias, L.A.; **Bassini-Silva, R.;** Machado, R.Z.; André, M.R.; Barros-Battesti, D.M. Artificial Feeding of *Ornithodoros fonsecai* e *O. brasiliensis* (Acari: Argasidae) and Investigation of the Transstadial Perpetuation of *Anaplasma marginale*. *Microorganisms* 11: 1680, 2023. **(Anexo 35)**.

5.2.30 **Bassini-Silva R.,** Welbourn C., Ochoa R., Barros-Battesti D. M., Jacinavicius F. C. A new species of *Eutrombicula* Ewing, 1938 (Trombidiformes: Trombiculidae) from the Galápagos Islands, with a checklist of Ecuadorian chiggers. *Systematic Parasitology*, 100: 687-695, 2023. **(Anexo 36)**.

5.2.31 **Bassini-Silva R.,** Pesenato I. P., Melinski R. D., Santos C. O., Hingst-Zaher E., Barros-Battesti D. M., Jacinavicius F. C. New record of the chewing louse *Myrsidea dissimilis* (Kellogg, 1896) (Phthiraptera: Menoponidae) parasitizing a Purple Martin, *Progne subis* (Linnaeus, 1758) (Passeriformes: Hirundinidae) in Amazonas, Brazil. *Entomological Communications*, 5: ec05033, 2023. **(Anexo 37)**.

5.2.32 **Bassini-Silva R.,** Calchi A. C., Castro-Santiago A. C., Siconelli M.J., André M. R., Barros-Battesti D. M., Jacinavicius, F. C. Co-infestation caused by *Goniodes pavonis* (L., 1758) (Ischnocera: Goniodidae) and *Goniocotes rectangulatus* Nitzsch [In Giebel], 1866 on white Indian peafowl, *Pavo cristatus* L., 1758 (Galliformes: Phasianidaede) in Brazil. *Veterinary Parasitology: Regional Studies and Reports*, 2024. **(Anexo 38)**.

5.2.33 **Bassini-Silva R.,** Welbourn C., Ochoa R., Barros-Battesti D.M., Jacinavicius F.C. Redescription and lectotype designation of the species *Eutrombicula alfreddugesi* (Oudemans, 1910) (Trombidiformes: Trombiculidae), International Journal of Acarology, 50:1, 68-74, 2023. **(Anexo 39)**.

5.2.34 Trejo-Palacios S. J., Martínez-Salazar E. A., Rosas-Valdez R., **Bassini-Silva, R.** A new species of chigger mite and the record of a gastrointestinal nematode in *Sceloporus* *cautus* (Squamata: Phrynosomatidae) from the Chihuahuan desert province in Coahuila, Mexico. *The Journal of Parasitology,* 109(5): 514-524, 2023. **(Anexo 40)**.

5.2.35 Barros-Battesti D.M., André M.R., Hoppe E.G.L., Seron G., Bassini-Silva R., Calchi A.C., Andrade L.O., Perin P.P., Martins T.F., Castro-Santiago A.C., Leuchtenberger C., Almeida S., Foerster N., Furtado M., Jacinavicius F.C. Noteworthy records of the ticks *Ornithodoros rostratus* and *Amblyomma sculptum* parasitizing *Pteronura brasiliensis* in the central-western region of Brazil, with pathogen investigation notes. Revista Brasileira de Parasitologia Veterinária, 33(1), e014523, 2023. **(Anexo 41)**.

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5.2.37 **Bassini-Silva R.,** Castro-Santiago A.C., Calchi A.C., Mello E.M., Dornelas L.F., Viana A.O., Cunha I.N., Sabino-Santos G., Silva A.S., Telino-Júnior W.R., Silva L.A.M., Soares G., Dowling A.P.G., Oliveira J.B., André M.R., Camargo L.M.A., Hingst-Zaher E., Barros-Battesti D.M., Jacinavicius F.C. A catalogue of spinturnicid species (Mesostigmata: Spinturnicidae) from Brazil: distribution, host-specificity, and new locality records, International Journal of Acarology, 2024. **(Anexo 43)**.

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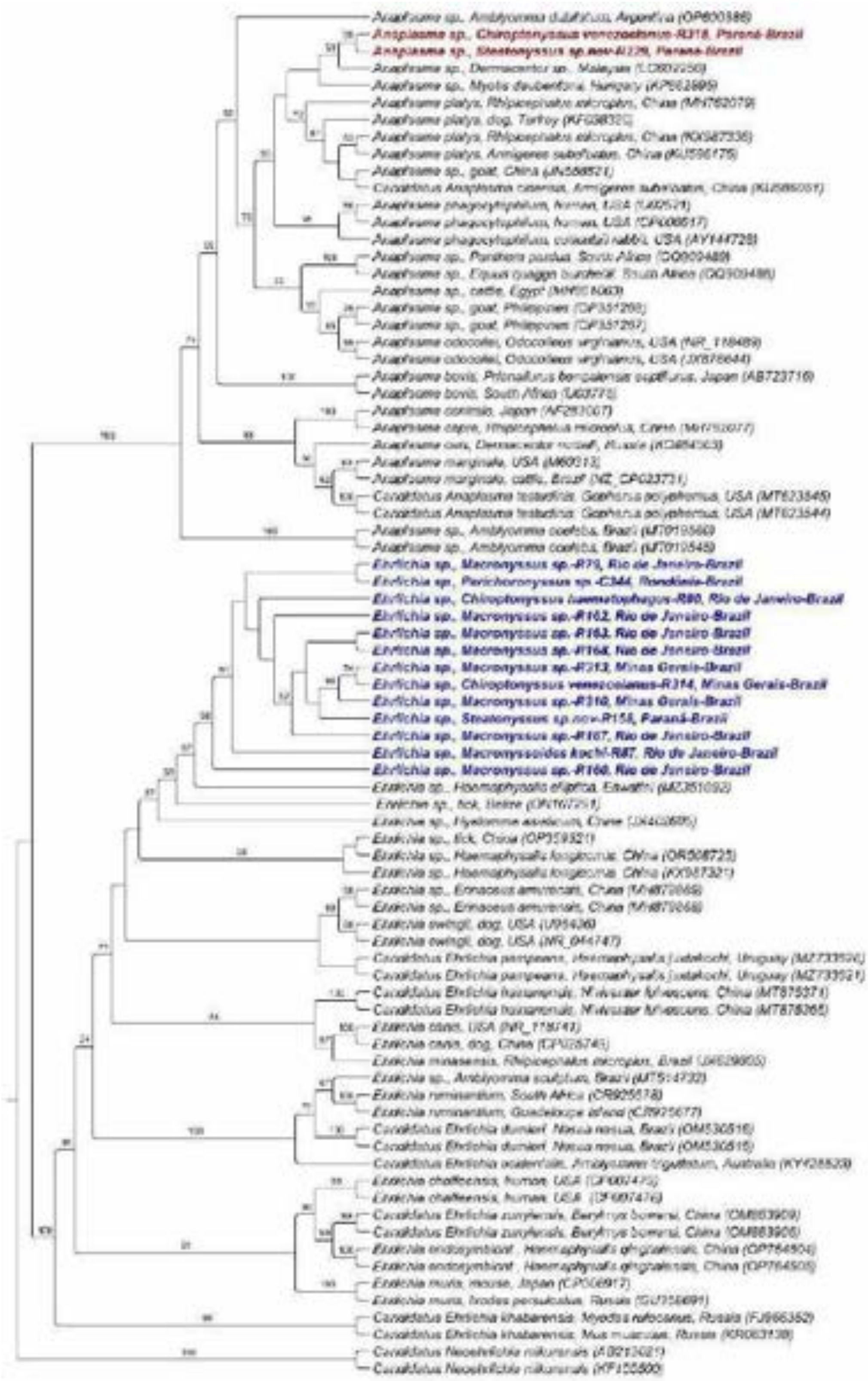

Figura 1. Árvore filogenética gerada a partir da metodologia descrita, utilizando as 15 sequencias do gene 16s rRNA de bactérias da família Anaplasmataceae obtidas nos ácaros macronissídeos.

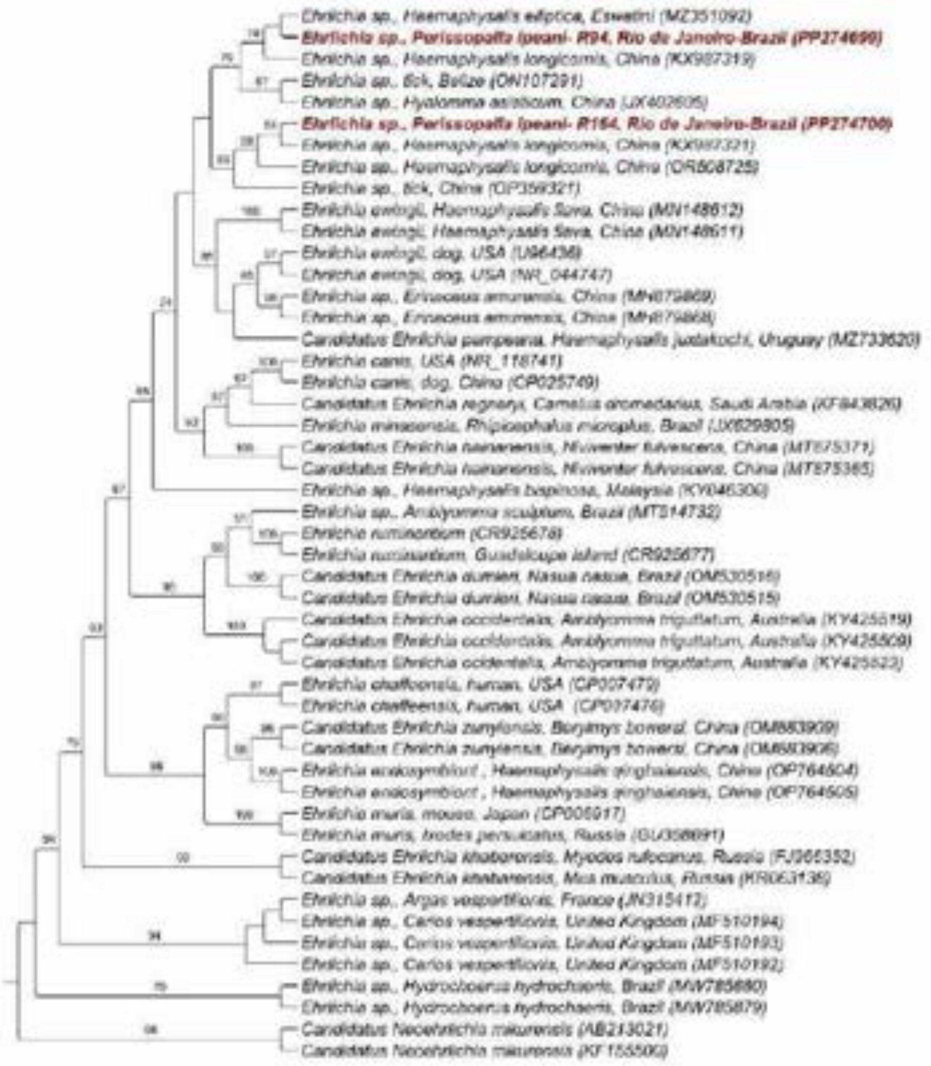

Figura 2. Árvore filogenética gerada a partir da metodologia descrita, utilizando as duas sequências do gene 16S rRNA de bactérias da família Anaplasmataceae obtidas nos ácaros trombiculídeos.

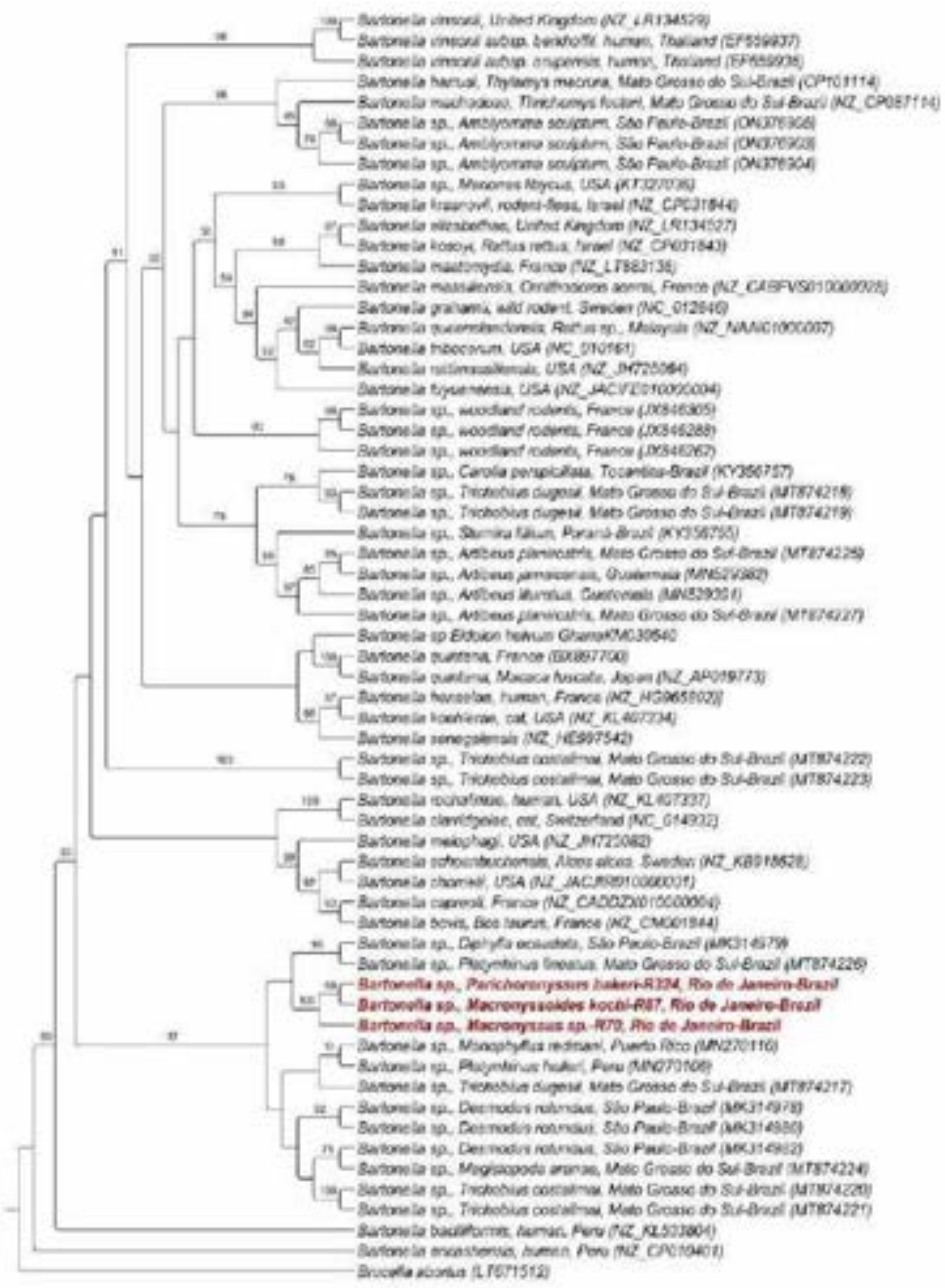

Figura 3. Árvore filogenética gerada a partir da metodologia descrita, utilizando as 3 sequencias do gene nouG de *Bartonella* sp. obtidas nos ácaros macronissídeos.

Tabela 1. Número total de microrganismos identificados nas amostras de DNA de ácaros macronissídeos e trombiculídeos parasitas de morcegos.

		Número de *reads*				
Filo	**Gênero**	*Steatonyssus sp.1*	*Steatonyssus sp.2*	*C. venezuelanus*	*P. bakeri*	*P. ipeani*
Pseudomonadota	*Acinetobacter* spp.	203	231	301	253	301
	Anaplasma spp.	55	0	44	0	0
	Aureimonas spp.	98	87	0	4	0
	Bartonella spp.	0	0	0	56	0
	Bosea spp.	332	620	0	0	3
	Brevundimonas spp.	2295	3667	3210	2231	1321
	Candidatus_Paracaedibacter spp.	1098	1911	2091	756	990
	Caulobacter spp.	540	866	665	432	1222
	Devosia spp.	631	114	0	53	66
	Enhydrobacter spp.	203	332	378	332	116
	Massilia spp.	493	112	458	678	444
	Paracoccus spp.	692	515	880	1023	994
	Phenylobacterium falsum	815	865	903	435	112
	Pseudomonas spp.	1887	1665	1873	1322	1092
	Pseudoxanthomonas spp.	1539	289	778	331	11
	Reyranella spp.	1077	388	227	211	323
	Roseomonas spp.	2467	270	3332	66	2312
	Stenotrophomonas spp.	856	121	222	10	32
	Wolbachia spp.	385	478	556	334	998
Bacteroidota	*Bacteroides* spp.	195	699	433	311	665
	Cardinium spp.	302	331	267	445	283
	Chitinophaga spp.	82	54	33	4	0
	Niabella yanshanensis	59	47	46	54	21
	Pedobacter spp.	281	144	229	312	554
	Sphingobacterium spp.	380	302	407	695	331
Actinomycetota	*Brevibacterium* spp.	96	186	231	443	213
	Chroococcidiopsis spp.	445	564	653	666	978

	Corynebacterium spp.	161	458	321	121	978
	Geodermatophilus spp.	187	144	105	32	55
	Lawsonella spp.	268	381	522	65	1
	Nocardioides spp.	194	202	333	432	98
	Olsenella spp.	675	590	257	432	443
Cyanobacteriota	*Candidatus_Obscuribacter* spp.	306	166	334	53	121
Deinococcota	*Deinococcus planocerae*	143	124	102	100	109
Bacillota	*Dolosigranulum* spp.	87	91	42	32	5
	Fenollaria spp.	78	99	2	0	0
	Lactobacillus spp.	204	457	179	44	12
	Paenibacillus purispatii	325	342	112	21	55
	Pseudoramibacter spp.	89	152	215	324	567
	Solibacillus spp.	133	167	125	543	120
	Solobacterium spp.	70	79	0	0	3
	Staphylococcus spp.	49	52	23	21	44
	Streptococcus spp.	318	331	12	14	99
Planctomycetota	*Pirellula* spp.	32	59	0	4	2
Mycoplasmatota	*Spiroplasma* spp.	1306	1430	1579	3890	332
	Número total	22131	20182	22480	17585	16426

ANEXO 1

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Scientific Note

A new locality record for *Radfordiella desmodi* Radovsky, 1967 (Mesostigmata: Macronyssidae) parasitizing the vampire bat in Brazil

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Abstract. Macronyssid mites are ectoparasites of reptiles, birds, and mammals (mainly bats). Out of 35 genera in this family, *Radfordiella* Fonseca, 1948 is a genus from the Neotropical region with six valid species, found parasitizing phyllostomid bats. Only *Radfordiella desmodi* Radovsky, 1967 and *Radfordiella oudemansi* Fonseca, 1948 have been registered in Brazil. The present study provides a new locality record for the species *R. desmodi*, microscopy images to aid in the identification, and a distribution map.

Keywords: mites, ectoparasites, Brazilian states, Chiroptera, *Desmodus rotundus*.

Mites of the family Macronyssidae Oudemans, 1936 are primarily ectoparasites of bats, although some genera parasitize reptiles, birds and other mammals (Radovsky 2010). Currently, there are approximately 35 genera and 241 valid species (Radovsky 2010; Orlova et al. 2017; Bassini-Silva et al. 2021; Gomes-Almeida & Pepato 2021). The recent detection of *Ehrlichia* spp. (Ikeda et al. 2021) and *Bartonella* spp. (Ikeda et al. 2020) in macronyssid mites parasitizing bats from Brazil highlights the need for investigating the diversity and geographical distribution of these mites in Brazilian territory.

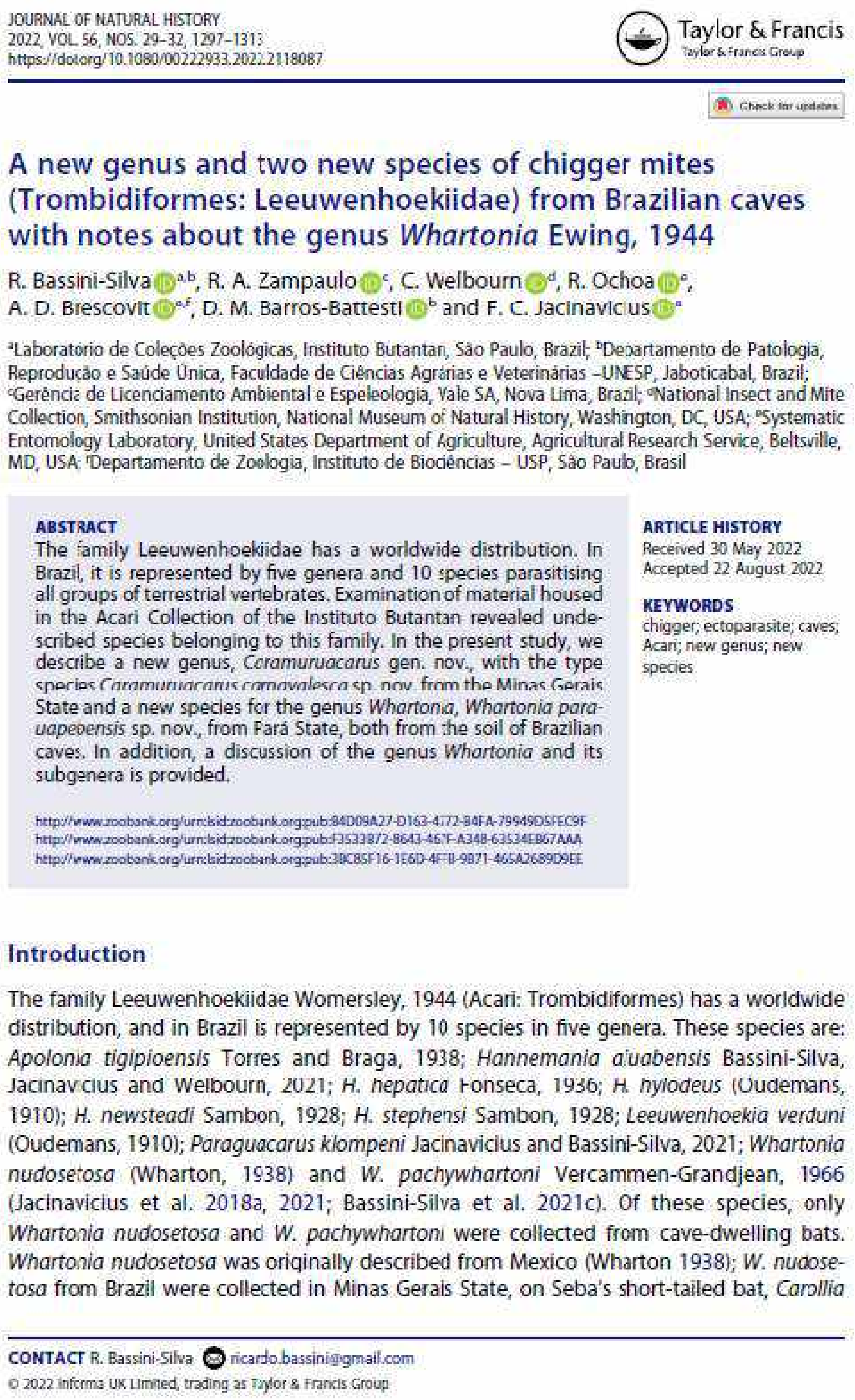
Radfordiella Fonseca, 1948 is a genus found in Neotropical areas and includes species that are ectoparasites of phyllostomid bats (Fonseca 1948; Radovsky 2010). There are currently six valid species, namely *Radfordiella anourae* Radovsky, Jones & Phillips, 1971; *Radfordiella carolliae* Radovsky, 1967; *Radfordiella desmodi* Radovsky, 1967; *Radfordiella monophylli* Radovsky, Jones & Phillips, 1971; *Radfordiella oricola* Radovsky, Jones & Phillips, 1971; and *Radfordiella oudemansi* Fonseca, 1948 (Fonseca 1948; Radovsky 1967; Radovsky et al. 1971). According to a recent checklist (Bassini-Silva et al. 2021), only *R. desmodi* and *R. oudemansi* have been recorded in Brazil.

Radfordiella desmodi was recorded parasitizing the vampire bat, *Desmodus rotundus* (É. Geoffroy, 1810) (Chiroptera: Phyllostomidae), in the states of Mato Grosso do Sul, Minas Gerais and Rio de Janeiro (Azevedo et al. 2002; Silva et al. 2017; Lourenço et al. 2020). Two other records for this species include one in the state of Rio de Janeiro parasitizing Seba's short-tailed bat, *Carollia perspicillata* (L., 1758) (Chiroptera: Phyllostomidae) (Almeida et al. 2011), and another in the state of Minas Gerais, parasitizing the tropical big-eared brown bat *Histiotus velatus* (I. Geoffroy, 1824) (Chiroptera: Vespertilionidae) (Moras et al. 2013). In addition, *R. desmodi* has been found in Mexico, Colombia, Costa Rica, and Venezuela, parasitizing several phyllostomid bats, whereas it has been much more abundant and frequently found in *D. rotundus*, which apparently represents its preferred host (Saunders 1975; Rojas et al. 2008; Tarquino-Carbonell et al. 2015). *Radfordiella oudemansi*, the type species of the genus *Radfordiella*, was originally described from the state of São Paulo, southeastern Brazil, parasitizing *D. rotundus* (Fonseca 1948). In Brazil, there is only one other record for this species in the state of Mato Grosso do Sul, collected from the pale spear-nosed bat, *Phyllostomus discolor* Wagner, 1843 (Chiroptera: Phyllostomidae) (Silva et al. 2017). Outside Brazil, *R. oudemansi* has been recorded in Venezuela (Saunders 1975), Mexico (Colín-Martínez et al. 2018), Trinidad (Zhang & Uchikawa 1994), and in the US Virgin Islands (Reeves et al. 2006).

The vampire bat, *D. rotundus*, can be found from south-central Mexico to north-central Argentina, once this bat species has some preference for warmer regions, such as the Tropical and Subtropical Regions of the Americas (Simmons 2005). This species is one of the few species of bats that feed exclusively on vertebrate blood. Because of this, the bite of this animal can transmit pathogens (Brass 1994; Lord 1992). Thus, in Brazil, some institutions collect or monitor this bat species, such as Vector Control Management, situated in the Araraquara Municipality, state of São Paulo, which received a specimen of *D. rotundus* infested by mites. After handling and caring for the animal, its caregivers observed mites on the animal's skin, and immediately these mites were collected and sent to the to the Acarological Collection of Instituto Butantan (IBSP) for identification. The material previously stored in 70% alcohol was slide-mounted according to Barros-Battesti et al. (2021) and identified to the genus level using a previously published identification key (Radovsky 2010). In addition, all six original descriptions of *Radfordiella* species were consulted to obtain species identification.

From this material, 2 females and 9 protonymphs belonging to *R. desmodi* were identified (IBSP 11660). This species can be separated from the other species of the genus mainly because of the presence of two pairs of circular incrassation near the middle of the dorsal shield (in female and male, Fig. 1A) and a rectangular sternal shield (in female and male, Fig. 1B). Also, the females have Cx II with two subequal spurs (Fig. 1C), while the male has Ge IV with a very short, broad, ventral spur arising distally and opposed to the spur on Fe IV. Besides that, the shape of the pygidial shield with four setae (Fig. 1D) is one of the main characters to separate the protonymphs of *R. desmodi* from the others species. Herein we record *R. desmodi* for the first time in the state of São Paulo, expanding the range distribution of this species, previously found in the states of Mato Grosso do Sul, Minas Gerais, and Rio de Janeiro. The geographical distribution of *R. desmodi* in Brazil is shown in Fig. 2.

ANEXO 2



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A new genus and two new species of chigger mites (Trombidiformes: Leeuwenhoekiidae) from Brazilian caves with notes about the genus *Whartonia* Ewing, 1944

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ABSTRACT
The family Leeuwenhoekiidae has a worldwide distribution. In Brazil, it is represented by five genera and 10 species parasitising all groups of terrestrial vertebrates. Examination of material housed in the Acari Collection of the Instituto Butantan revealed undescribed species belonging to this family. In the present study, we describe a new genus, *Caramuruacarus* gen. nov., with the type species *Caramuruacarus carnavalesca* sp. nov. from the Minas Gerais State and a new species for the genus *Whartonia*, *Whartonia parauapebensis* sp. nov., from Pará State, both from the soil of Brazilian caves. In addition, a discussion of the genus *Whartonia* and its subgenera is provided.

http://www.zoobank.org/urn:lsid:zoobank.org:pub:84D09A27-D163-4772-84FA-79949D5FEC9F
http://www.zoobank.org/urn:lsid:zoobank.org:pub:F3533872-8643-467F-A348-63534EB67AAA
http://www.zoobank.org/urn:lsid:zoobank.org:pub:38C85F16-1E6D-4FFB-9871-465A2689D9EE

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KEYWORDS
chigger; ectoparasite; caves; Acari; new genus; new species

Introduction

The family Leeuwenhoekiidae Womersley, 1944 (Acari: Trombidiformes) has a worldwide distribution, and in Brazil is represented by 10 species in five genera. These species are: *Apolonia tigipioensis* Torres and Braga, 1938; *Hannemania aluabensis* Bassini-Silva, Jacinavicius and Welbourn, 2021; *H. hepatica* Fonseca, 1936; *H. hylodeus* (Oudemans, 1910); *H. newsteadi* Sambon, 1928; *H. stephensi* Sambon, 1928; *Leeuwenhoekia verduni* (Oudemans, 1910); *Paraguacarus klompeni* Jacinavicius and Bassini-Silva, 2021; *Whartonia nudosetosa* (Wharton, 1938) and *W. pachywhartoni* Vercammen-Grandjean, 1966 (Jacinavicius et al. 2018a, 2021; Bassini-Silva et al. 2021c). Of these species, only *Whartonia nudosetosa* and *W. pachywhartoni* were collected from cave-dwelling bats. *Whartonia nudosetosa* was originally described from Mexico (Wharton 1938); *W. nudosetosa* from Brazil were collected in Minas Gerais State, on Seba's short-tailed bat, *Carollia*

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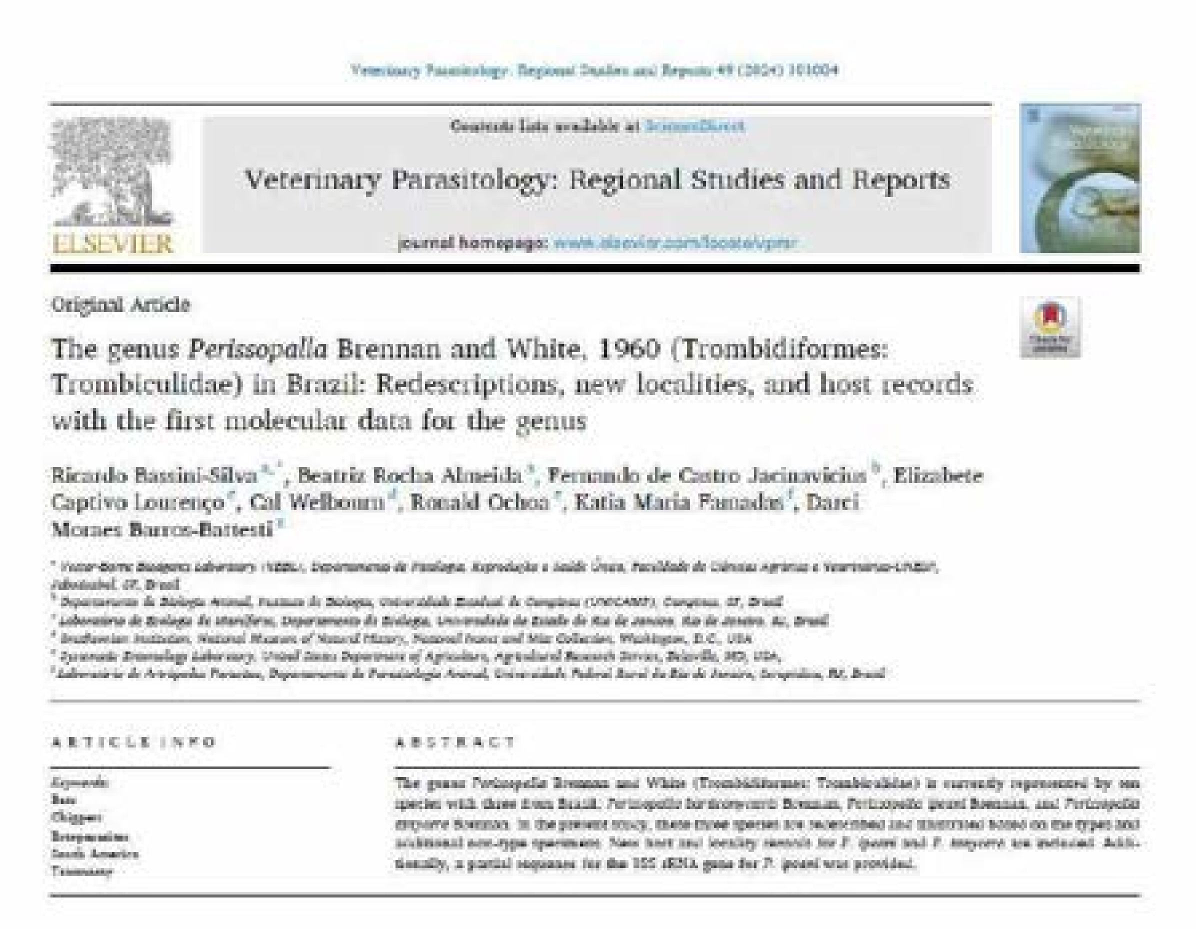
ANEXO 3



Veterinary Parasitology: Regional Studies and Reports 49 (2024) 101004

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Original Article

The genus *Perissopalla* Brennan and White, 1960 (Trombidiformes: Trombiculidae) in Brazil: Redescriptions, new localities, and host records with the first molecular data for the genus

Ricardo Bassini-Silva[a,*], Beatriz Rocha Almeida[a], Fernando de Castro Jacinavicius[b], Elizabete Captivo Lourenço[c], Cal Welbourn[d], Ronald Ochoa[e], Katia Maria Famadas[f], Darci Moraes Barros-Battesti[a]

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ABSTRACT

ANEXO 4

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Synonymy of *Hooperella spinirostra* (Vercammen-Grandjean, 1967) with *Hooperella vesperuginis* (Brennan and Jones, 1960): redescription based on the types, new locality and host records from Brazil

Ricardo Bassini-Silva[a,b], Fernando de Castro Jacinavicius[a], Elizabete Captivo Lourenço[c], Cal Welbourn[d], Ronald Ochoa[e], Katia Maria Famadas[f] and Darci Moraes Barros-Battesti[b]

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ABSTRACT
The New World genus *Hooperella* Vercammen-Grandjean has five valid species that are often collected parasitizing bats. Two of these species were examined in the present study, *Hooperella spinirostra* and *Hooperella vesperuginis*. Moreover, after examining both types, we propose *H. spinirostra* as a junior synonym of *H. vesperuginis*, since no difference was observed between them. In addition, we add new locality and host records for *H. vesperuginis*.

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KEYWORDS
Systematics; types; ectoparasites; bats; chiggers; Brazil; new records

ANEXO 5

Acarologia
Open Science in Acarology

Contribution to the knowledge of *Parichoronyssus bakeri* Morales-Malacara and Guerrero, 2007 (Mesostigmata: Macronyssidae): new locality and host-association records with additional molecular data

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Original research

ABSTRACT

The mite genus *Parichoronyssus* Radovsky (Mesostigmata: Macronyssidae) comprises twelve known species found parasitizing bats in the New World. This study aimed to identify morphologically and molecularly macronyssid mites collected from bats and kept as backlog in the tissue bank (-80C) at the Acarological Collection of the Butantan Institute (IBSP). After the examination, the material was listed and identified as *Parichoronyssus bakeri* Morales-Malacara and Guerrero. Here, we were able to provide diagnostic microscopic images for the females of this species, as well as molecular information (18S rRNA and 16S rRNA) that were deposited in Genbank for reference. New locality records were also provided for *P. bakeri* in Rio de Janeiro and Rondônia States, Brazil.

Keywords mites; bats; 16S rRNA; 18S rRNA; Brazil

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ANEXO 6

Veterinary Research Communications
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BRIEF REPORT

Molecular detection of *Bartonella* spp. in bat-associated macronyssid mites (Acari: Macronyssidae) from Southern and Southeastern Brazil

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Received: 6 March 2024 / Accepted: 21 April 2024

Abstract

Despite the worldwide occurrence and high genetic diversity of *Bartonella* spp. in bats, few studies investigate their occurrence in bat-associated mites. To date, 26 species of Macronyssidae mite species have been reported from Brazil, and 15 of which were found parasitizing bats. The present study aimed to investigate the presence of *Bartonella* DNA in bat-associated macronyssid mites from Brazil. For this purpose, 393 macronyssid specimens were selected by convenience from the tissue bank of the Acari Collection of the Instituto Butantan (IBSP). These mites were collected from 14 different bat species in three different Brazilian States (Minas Gerais, Paraná, and Rio de Janeiro). Out of 165 mites positive in the PCR for the endogenous 18S rRNA gene, only eight were positive in the qPCR for *Bartonella* spp. based on the *nuoG* gene, and we were able to obtain two sequences base in this same gene, and one sequence based on the 16S rRNA gene. The phylogenetic inference based on the *nuoG* gene grouped the obtained sequences with *Bartonella* genotypes previously detected in bats and associated bat flies, while the phylogeny based on the 16S rRNA grouped the obtained sequence in the same clade of *Bartonella* genotypes previously detected in *Dermanyssus gallinae*. These findings suggest that macronyssid mites might be associated with the maintenance of bartonellae among bats.

Keywords Macronyssidae · Taxonomy · Bartonellae · Bats

ANEXO 7

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2021, VOL. 55, NOS. 19–20, 1277–1287
https://doi.org/10.1080/00222933.2021.1944687

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A new species of *Hannemania* Oudemans, 1911 (Trombidiformes: Leeuwenhoekiidae) from Brazil

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ABSTRACT
Hannemania has 27 described species parasitizing amphibians in the Americas. To date, five species have been recorded from Brazil. Here, we describe a new species for the country, collected parasitising the South American white-lipped grass frog, Miranda's white-lipped frog, basin white-lipped, Bahia dwarf frog and granular toad all from Ceará state, Brazil.

http://www.zoobank.org/urn:lsid:zoobank.org:pub:CD88F94F-ED46-4BA9-8E8E-B4AA1D281581

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KEYWORDS
Chigger mites; ectoparasites; amphibia; frogs; South America; Ceará state

Introduction

The genus *Hannemania* Oudemans, 1911 (Leeuwenhoekiidae Womersley, 1944) with 27 nominate species from the Americas (Silva-de la Fuente et al. 2016) includes only species parasitizing species of amphibians. To date, five *Hannemania* species have been recorded from Brazil: *Hannemania achalai* Alzuet and Mauri, 1987; *H. hepatica* Fonseca, 1935; *H. hylodeus* (Oudemans, 1910); *H. newsteadi* Sambon, 1928; and *H. stephensis*, 1928 (Jacinavicius et al. 2018; Mendoza-Roldan et al. 2020).

The only known records for the species *H. hylodeus*, *H. newsteadi* and *H. stephensis* were their respective original descriptions. *Hannemania hylodeus* was described parasitizing a *Hylodes* sp. (Anura: Hylodidae) with no specific locality other than Brazil. *Hannemania newsteadi* was found parasitizing the red snouted treefrog, *Scinax ruber* (Laurenti) (Anura: Hylidae) in Mato Grosso do Sul state, and *H. stephensis* parasitizing the chirping robber frog, *Pristimantis conspicillatus* (Günther) (Anura: Craugastoridae) in Mato Grosso state

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ANEXO 8

Acarologia
Open Science in Acarology

A checklist of chiggers (Trombidiformes: Trombiculidae and Leeuwenhoekiidae) of Panama

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Original research

ABSTRACT

An updated checklist of chiggers from the family Trombiculidae and Leeuwenhoekiidae is presented, with 81 species in 38 genera parasitizing different terrestrial vertebrate hosts in Panama. The depository for all Panamanian records, including new localities and host-associations records for the species *Blankaartia sinnamaryi* (Floch and Fauran, 1956), *Eutrombicula tinami* (Oudemans, 1910), *Eutrombicula goeldii* (Oudemans, 1910), *Hooperella vesperuginis* (Brennan and Jones, 1960), and *Pseudoschoengastia bulbifera* Brennan, 1960 were provided.

Keywords: chigger mites; parasitism; vertebrates; Panama

Introduction

The first chigger described from Panama was *Odontacarus dentatus* (Ewing, 1925), originally described as *Trombicula dentata* Ewing, 1925 (Ewing 1925b). Eighteen years later, Fairchild (1943) published a list with eight species followed by Wharton and Fuller (1952) world list of chiggers, assigning five genera and ten species to Panama. In 1961, Brennan and Jones (1961b) described: *Arisocerus* Brennan and Jones, 1961; *Polylopadium* Brennan and Jones, 1961; and *Pseudolicus* Brennan and Jones, 1961 and including description of 17 new species. Soon after, Brennan and Yunker (1966) compiled a catalog for Panama, which recorded 78 species organized in 29 genera. In contrast, a key of chigger genera prepared by Brennan and Goff (1977a), identified 87 genera for the Nearctic and Neotropical regions, with only 25 assigned to Panama.

Compared to other countries in South and Central America, only Venezuela has the most significant diversity of chiggers, having 136 species in 38 genera (Brennan and Reed 1975). Among the countries that have a great diversity in this region with a compiled checklist were Brazil (83 species – Jacinavicius et al. 2018), Chile (25 species – de Silva-de la Fuente et al. 2020), and Peru (37 species – Brennan and Jones 1961) stand out, but still having a smaller number of species of chiggers when compared to Panama or Venezuela.

Here, we provide an updated checklist of Panamanian chiggers, the data on the distribution of these chiggers outside the country, and also, we provided the most recent taxonomic positions

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ANEXO 9

INTERNATIONAL JOURNAL OF ACAROLOGY
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Mites (Mesostigmata: Melicharidae) associated with hummingbirds (Aves: Trochilidae) in Brazil

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ABSTRACT
Mites of the family Melicharidae comprise 13 genera and 220 species often associated with edaphic environments and found in association with insects, birds and mammals. Two genera, *Proctolaelaps* and *Tropicoseius*, have been recorded in Brazil in association with birds and bromeliads. In this study, we add new locality and host-association records for *Proctolaelaps superagui* and *Tropicoseius braziliensis* in the country.

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Melicharid mites; phoresy; Trochilidae; Neotropical region; Brazil

Introduction

Worldwide mites of the family Melicharidae Hirschmann, 1962 are free-living but often having phoretic associations with insects, birds, and mammals (Santos et al. 2019). This family comprises 220 species of 13 genera (Moraes et al. 2016; Santos et al. 2019). Three of these genera have been found in association with hummingbirds: *Proctolaelaps* Berlese, *Rhinoseius* Baker & Yunker and *Tropicoseius* Baker & Yunker.

Proctolaelaps comprises 142 species worldwide (Abo-Shnaf and Moraes 2016; Literakova et al. 2016; Moraes et al. 2016; Rueda-Ramírez et al. 2016; Santos et al. 2019), with 11 species recorded in Brazil. Of these, three species - *P. belemensis* Fain, Hyland & Aitken, 1977, *P. cyanocompsae* Fain, Hyland & Aitken, 1977 and *P. hunteri* Fain, Hyland & Aitken, 1977 have been reported in association with hummingbirds. *Tropicoseius* comprises 38 species distributed in the Neotropical and Nearctic regions (Naskrecki and Colwell 1998; Moraes et al. 2016; Santos et al. 2019). Ten species have been recorded in Brazil, five of which are known associates of hummingbirds (Apodiformes: Trochilidae) - *T. bisacculatus* (Fain, Hyland & Aitken, 1977), *T. chlorestes* (Fain, Hyland & Aitken, 1977), *T. heliconiae* Baker & Yunker, (1964), *T. uniformis* (Fain, Hyland & Aitken, 1977) and *T. venezuelensis* Baker & Yunker. In this publication, we add new locality and host-association records for *Proctolaelaps superagui* Literakova, 2016 and *Tropicoseius braziliensis* Baker & Yunker, 1964 and provide scanning electron microscopy images to supplement previously published descriptive studies.

Observation

Melicharidae specimens stored in Ethanol (100%) at the Acari Collection of the Instituto Butantan (IBSP), collected during surveys conducted in different parts of the country (Table 1), were examined under scanning electron microscopy or phase and interference contrast light microscopy for species identification. All mites were collected from the nasal cavity of the hummingbirds, and a fine and malleable tweezers was used to assist in the collections, as these mites were not so deep in the cavity, it was easy to retrieve and store them in alcohol. The mites were identified to genus using keys from Moraes et al. (2016), and to species using the keys from Baker and Yunker (1964), Fain et al. (1977a, 1977b), OConnor et al. (1991), Fain (1992), Dusbabek et al. (2007), Literakova et al. (2016) and by comparing specimens to the original descriptions and redescriptions.

Two species, *Proctolaelaps superagui* Literakova and *Tropicoseius braziliensis* Baker & Yunker, were identified during examination of all collected material. Both species possess a hyaline lobe on the fixed cheliceral digit, which is common in the Melicharidae family, with some exceptions (Figure 1(a)). *Proctolaelaps superagui* can be identified by the following characteristics: dorsal shield with 44 pairs of setae, including *r2–r6* and *R1–R8* and females with 12 pairs of unequally long setae on unsclerotized cuticle of opisthogaster (Figures 1(b) and 2). *Tropicoseius braziliensis* has serrate setae on femur and trochanter of legs II–IV, dorsal shield divided and *Z5* much longer than other dorsal shield setae (Figures 1(c, d) and 3).

Proctolaelaps superagui females were collected from *Thalurania* sp. (Apodiformes: Trochilidae) and an unidentified hummingbird in the Paraty Municipality, Rio de Janeiro State and Ladainha Municipality, Minas Gerais State, respectively. Additional information in Table 1. These collections represent two new state records for Brazil and the first reported hummingbird host associations for *P. superagui*. This species was recently described by Literakova et al. (2016), and they found this species on Superagui Island, Guaraqueçaba municipality, Paraná state, on inflorescences of *Quesnelia arvensis* (Vell.) Mez. (Bromeliaceae).

Concerning *T. braziliensis*, only females were collected from *Thalurania furcata* and *Phaethornis pretrei* (Apodiformes: Trochilidae) and two unidentified hummingbirds in São Paulo Municipality, São Paulo State and Mato Grosso do Sul State. Also, additional information in Table 1. These collections

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ANEXO 10

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Italian Acarine species intercepted in the United States

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ABSTRACT
In the last century, biological invasions have increased greatly due to the intensification in international trade and world climate change, thus representing one of the most relevant issues for agricultural productivity and biodiversity. The Animal and Plant Health Inspection Service of the United States, from 2019 to 2021, intercepted different species from Italy belonging to the Orders Ixodida, Sarcoptiformes and Trombidiformes. The study reported four new records and several new host plant associations. In this framework, the inspection system not only plays a relevant role in the plant protection, human and animal health, but also contributes to the knowledge of the Acari fauna from exporting countries.

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New records; mites; interceptions; international commerce; plant protection; veterinary medical interest

Introduction

Economic globalization, liberalization of global trade policies and world climate change have been increasing the risk for introduction and dispersion of alien animals, plants and pathogens worldwide. Many Acari species are successful in expanding and dispersing because of their small size (many taxa are less than 500 µm long), cryptic colouration, exploitation of natural structures of a wide range of host plants (domatia, buds, galls, bark) and sheltered places on goods, plus tolerance to temperature and pesticides (Navia et al. 2010; Léger et al. 2012; Goka et al. 2012; Navajas and Ochoa 2013; Ochoa et al. 2018; Vásquez and Colmenárez 2020). The global economic importance of mites has been growing in the 21st century as many phytophagous species are being associated to viruses, rickettsiae, spirochaetes, phytoplasmas, mycoplasmas, protozoans and transportation of bacteria, fungi and nematodes on crops and ornamentals (Jongejan and Uilenberg 2004; Mullen and OConnor 2009; Nicholson et al. 2009; Bastianel et al. 2010; Navajas et al. 2010; Navia et al. 2013; Rodrigues and Childers 2013). Furthermore, species of medical and veterinary interest can have significant negative impacts on animals, livestock mainly, due to the parasitism of these species and their role as vectors of pathogens. The damage these mites can cause to wild animals cannot be disregarded for the direct consequences to the animals themselves and as a reservoir for continued impact on domestic animals (Mullen and OConnor 2009).

The Animal and Plant Health Inspection Service (APHIS) in the USA plays a fundamental role in protecting American agriculture from pests and diseases but also increasing knowledge of new threats from global commerce. This is vital as more countries enter the global economy where there is little or no scientific knowledge of native mite fauna and/or regulatory structure to track such movements (Ochoa et al. 2016).

Information related to frequency of occurrence, host material, locality, etc. are essential to construct management strategies and prevent possible infestation or disease in crops and livestock. The aim of this study is to improve the knowledge of Acari species that are being intercepted in the USA by port inspectors on materials imported from Italy between 2019 and 2021.

Material and methods

The list of species reported here regards mites found on infested plants and non-organic materials (art and construction objects) coming from Italy which have been intercepted by APHIS inspectors at ports of entry to the United States. New species records have been added to the Italian checklist by Bernini et al. (1995) and the subsequent update by Castagnoli and Nannelli (2003). Families, genera and species have been alphabetically sorted within each Order and the following format was used: Genus – valid name, author/s and date; Species – valid name of species, author/s, date and remarks when available. The dates of the intercepted material have been reported under the American format, month-day-year when they were recorded on the slides.

The slide-mounted specimens intercepted from Italy are deposited at the United States National Insect and Mite Collection Smithsonian Institution, located in the Systematic Entomology Laboratory (SEL), USDA, Beltsville, Maryland, USA (USNM). Only the specimens of *Brevipalpus russulus* Boisduval (1867), *Pentamerismus oregonensis* McGregor (1949) and *Tenuipalpus sarcophilus* Welbourn et al. (2017) are deposited at the Entomological and Zoological Unit, Department of Soil, Plant and Food Sciences (Di.S.S.P.A.), University of Bari Aldo Moro, Italy (UNIBA).

Results

Order Ixodida
Argasidae Koch 1844

Argasiden Koch 1844: 219 (original spelling).

The family Argasidae includes mites from two genera already listed in Italy (*Argas* Latreille 1796 and *Ornithodoros* Koch 1844). *Argas* is the most representative in the country, with four species recorded out of 210 species known within the family.

Genus *Argas* Latreille 1795

Argas Latreille 1795: 18.

There are four species already recorded in the country. In this study, we are reporting an adult of the pigeon tick, *Argas reflexus* (Fabricius 1794), collected on tiles from an Italian cargo in the USA.

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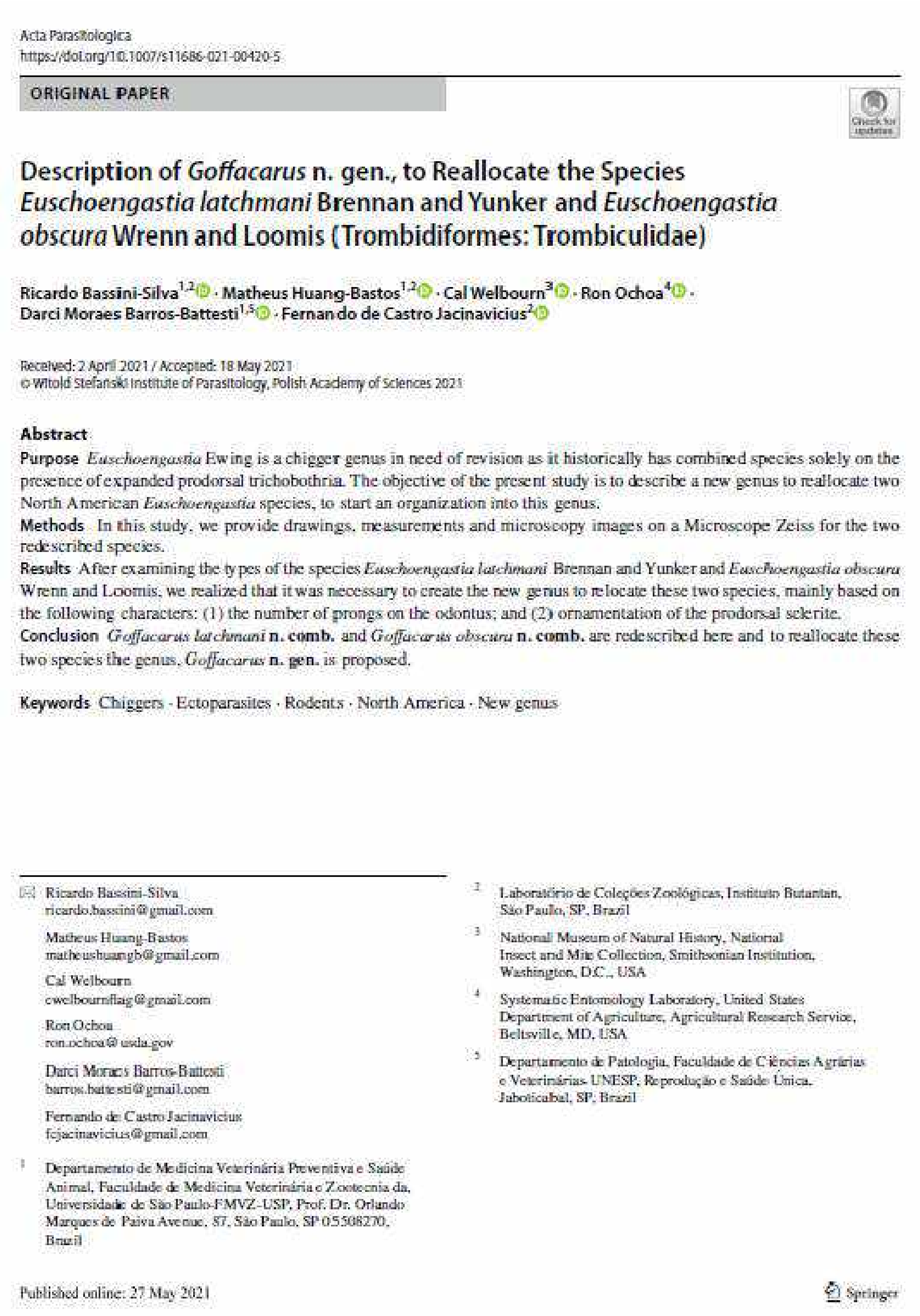
ANEXO 11



Acta Parasitologica
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ORIGINAL PAPER

Description of *Goffacarus* n. gen., to Reallocate the Species *Euschoengastia latchmani* Brennan and Yunker and *Euschoengastia obscura* Wrenn and Loomis (Trombidiformes: Trombiculidae)

Ricardo Bassini-Silva[1,2] · Matheus Huang-Bastos[1,2] · Cal Welbourn[3] · Ron Ochoa[4] · Darci Moraes Barros-Battesti[1,5] · Fernando de Castro Jacinavicius[2]

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Abstract

Purpose *Euschoengastia* Ewing is a chigger genus in need of revision as it historically has combined species solely on the presence of expanded prodorsal trichobothria. The objective of the present study is to describe a new genus to reallocate two North American *Euschoengastia* species, to start an organization into this genus.

Methods In this study, we provide drawings, measurements and microscopy images on a Microscope Zeiss for the two redescribed species.

Results After examining the types of the species *Euschoengastia latchmani* Brennan and Yunker and *Euschoengastia obscura* Wrenn and Loomis, we realized that it was necessary to create the new genus to relocate these two species, mainly based on the following characters: (1) the number of prongs on the odontus; and (2) ornamentation of the prodorsal sclerite.

Conclusion *Goffacarus latchmani* **n. comb.** and *Goffacarus obscura* **n. comb.** are redescribed here and to reallocate these two species the genus. *Goffacarus* **n. gen.** is proposed.

Keywords Chiggers · Ectoparasites · Rodents · North America · New genus

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ANEXO 12

ENTOMOLOGICAL
Communications

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Scientific Note

A new case of trombiculiasis caused by *Eutrombicula daemoni* Bassini-Silva & Jacinavicius, 2018 (Trombidiformes: Trombiculidae) in a dog from Brazil

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Abstract. Chiggers are ectoparasites and can cause severe dermatitis in their hosts, known as trombiculiasis. Besides that, these mites can be vectors of bacteria of the genus *Orientia*, in various regions of the world. The genera *Eutrombicula* Ewing, 1938 is currently represented by more than 80 species worldwide. Species of this genus are recorded parasitizing reptiles, birds, and mammals. One of this species, *Eutrombicula daemoni* Bassini-Silva & Jacinavicius, 2018 was recently described causing trombiculiasis in a dog. Our goal is to report a new case of a dog's trombiculiasis, including a new locality record for *E. daemoni* in Brazil. In May 2021, a female Shih-Tzu dog with three years old and with access to the forest of the Santa Tereza municipality, southeastern Brazil, sought veterinary medical attention for intense itching and erythema in the facial region. Mites were collected directly from the face of the dog. These materials were slide-mounted and deposited in the Acarological Collection of the Butantan Institute (IBSP). The material extracted from the dog was examined and identified as *E. daemoni*. Part of the fixation site tissue of the dog was collected, showing the feeding tube produced by the enzymatic reaction of saliva by the mite, known as a stylostome. In this report, we emphasize the occurrence of trombiculiasis in domestic animals that have access to forest regions, places that unfed chigger larvae live. Additionally, this record represents a new locality record for *E. daemoni* to the Espírito Santo State, Brazil.

Keywords: Chiggers, ectoparasites, Espírito Santo State, Carnivora, *Canis lupus familiaris*.

Chigger's larvae (Trombidiformes: Trombiculidae *s. l.*) are ectoparasites of wild terrestrial vertebrates, and on rare occasions, the unfed larvae can parasitize domestic animals (Takahashi et al. 2004). The genus *Eutrombicula* Ewing, 1938 can cause severe skin reactions in the host, known as trombiculiasis. It is characterized as circular lesions of sizes ranging from 2 to 4 cm in diameter. Scratching the papules cause intense pruritus resulted in large inflamed areas of the skin (Faccini et al. 2017; Bassini-Silva et al. 2019). This genus is currently represented by more than 80 species worldwide and they are recorded parasitizing reptiles, birds, and mammals (Bassini-Silva et al. 2018; 2019). Nine species were recorded in Brazil, *Eutrombicula alfreddugesi* (Oudemans, 1910), *E. batatas* (Linnaeus, 1758), *E. daemoni* Bassini-Silva & Jacinavicius, 2018, *E. bruyanti* (Oudemans, 1910), *E. goeldii* (Oudemans, 1910), *E. ophidica* (Fonseca, 1932), *E. spipi* Brennan & Reed, 1974, *E. tinami* (Oudemans, 1910), and *E. tropica* (Ewing, 1925) (Bassini-Silva 2018; Jacinavicius et al. 2018).

One of these species, *E. daemoni* was originally described in the Minas Gerais State (Santa Bárbara do Monte Verde and Juiz de Fora municipalities, Fig. 1), parasitizing the social flycatcher, *Myiozetetes similis* (Spix, 1825) (Passeriformes: Tyrannidae). Later this same species was collected in a dog (Carnivora: Canidae) (Bassini-Silva et al. 2018; Sampaio et al. 2020). Considering that few cases report trombiculiasis caused by species of the genus *Eutrombicula* in South America, this kind of report is necessary, given the lack of information, especially in places where the fauna is practically unknown. Therefore, the present study describes a case report of a dog with trombiculiasis and a new locality (Santa Tereza municipality, Espírito Santo State, Fig. 1) for the species *E. daemoni*, in Brazil.

The fauna of chiggers was poorly represented in the Espírito Santo State, there are only two records. One of these records is the rare association with a chigger, *Odontacarus* sp., parasitizing an adult male of a whip spider, *Charinus brasilianus* Weygoldt, 1972 (Charinidae: Amblypygi) in Santa Teresa municipality (Gonçalves-Souza et al. 2014); the other record is the occurence of *Eutrombicula alfreddugesi s. l.* on *Tropidurus torquatus* (Wied, 1820) (Squamata: Tropiduridae) in the São Mateus, Guarapari and Presidente Kennedy municipalities (Rocha et al. 2020).

The Butantan Institute has a representative collection of mites and ticks (IBSP) characterized mainly by parasite species associated with humans and wild/domestic animals from the Neotropical Region. Recently, we received six larvae of chiggers, fixed in ethyl alcohol P.A 100%, collected on the face of a dog. On May, 31th 2021, the owner of a female Shih-Tzu dog with three years old and with access to the forest of the Santa Tereza municipality, mountainous region of the Espírito Santo State, southeastern Brazil (19° 56′ 07″ S, 40° 33′ 50″ W), sought veterinary medical attention for intense itching and erythema, both in the facial region of the animal (Fig. 2A). This material was slide-mounted with Hoyer's medium according to Barros-Battesti et al. (2021), deposited in the IBSP collection under the access number IBSP 16663. The specimens were imaged using a Leica DFC 500 digital camera coupled to an optical microscope Leica DM4000B, in the Zoological Collection Laboratory, Butantan Institute, São Paulo. All the images were prepared with Adobe Photoshop v. 13.0. The chiggers were identified as *Eutrombicula daemoni* via comparison with the

ANEXO 13

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Scientific Note

Unusual association between *Ornithonyssus bursa* (Berlese, 1888) (Mesostigmata: Macronyssidae) and *Parabuteo unicinctus* (Temminck, 1824) (Accipitriformes: Accipitridae) in Paraíba State, Brazil

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Abstract. *Ornithonyssus bursa* (Berlese, 1888), known as the tropical fowl mite, is a hematophagous mite of domestic and wild birds. This mite can bite humans accidentally, causing "gamasoidosis," "avian-mite dermatitis," or "bird-mite dermatitis" in tropical and subtropical regions of the world. In Brazil, *O. bursa* was previously recorded parasitizing birds of the orders Charadriiformes Huxley, 1867, Columbiformes Latham, 1790, Galliformes Temminck, 1820, Passeriformes Linnaeus, 1758, Strigiformes Wagler, 1830, and Tinamiformes Huxley, 1872. Here, we provide a new association of *O. bursa* with Harris's hawk, *Parabuteo unicinctus* (Temminck, 1824) (Accipitriformes: Accipitridae) and the first record of this mite species in the Paraíba State, Brazil.

Keywords: Macronyssid, ectoparasites, Brazilian Northeast, Birds of prey.

Macronyssidae comprise approximately 240 species, organized in 34 genera. The mites included in this family are ectoparasites of reptiles, birds, and mammals (Radovsky 2010). One of these species, *Ornithonyssus bursa* (Berlese, 1888), known as "tropical fowl mite", is a hematophagous mite of domestic and wild birds, and can bite humans accidentally, causing "gamasoidosis", "avian-mite dermatitis", or "bird-mite dermatitis" in tropical and subtropical regions of the world (Bassini-Silva et al. 2019, Lima-Barbero et al. 2019).

In Brazil, *O. bursa* is found parasitizing birds of the orders Charadriiformes Huxley, 1867, Columbiformes Latham, 1790, Galliformes Temminck, 1820, Passeriformes Linnaeus, 1758, Strigiformes Wagler, 1830, and Tinamiformes Huxley, 1872 (Vaz 1935; Reis 1939; Ribeiro et al. 1992; Mascarenhas et al. 2009; Goulart et al. 2011; Moraes et al. 2011; Coimbra et al. 2012; Oliveira et al. 2012; Wambier & Wambier 2012; Mentz et al. 2015; Silva et al. 2018; Bassini-Silva et al. 2019; Mesquita-Sousa et al. 2020). To plot the distribution map of *O. bursa* in Brazil, we used the occurrence locations provided in the previous records, including the new record of this study (Tab. 1, Fig. 1). To search for geographic coordinates not provided in the original records, we use the "GeoLoc" online tool, from the speciesLink project, for the georeferencing of zoological collections (CRIA 2021).

Here, we are providing a new association of *O. bursa* with Harris's hawk, *Parabuteo unicinctus* (Temminck, 1824) (Accipitriformes: Accipitridae) in Paraíba State, Brazil. The material was collected on September 18th, 2020, from a captive adult female Harris's Hawk (Fig. 2). The animal is legally kept and used by a professional falconer to control pigeons in the João Pessoa Municipality, Paraíba State. During a demonstration of falconry techniques held at the Arruda Câmara Zoo-Botanical Park, João Pessoa, Paraíba State, an ectoparasite was noticed walking on the animal's legs. Because of this, in this short communication we prefer to use the term "mite/bird of prey association". The ectoparasite was collected with a piece of tape and placed in a tube containing 70° alcohol. This material was slide-mounted with Hoyer's medium according to Barros-Battesti et al. (2021) and deposited in the Acarological Collection of Butantan Institute (IBSP) under the access number IBSP 16533. The specimen was imaged using a Leica DFC 500 digital camera coupled to an optical microscope Leica DM4000B, in the Zoological Collection Laboratory, Butantan Institute, São Paulo. All images were prepared with Adobe Photoshop v. 13.0. According to Bassini-Silva et al. (2019), we confirm the main set of morphological characters, and the details of the sternal and distal opisthosoma shields are shown in (Fig. 3).

The Harris's Hawk is widely distributed in the America's and can be found in the open lands of the southwestern region of the United States of America to the south of Argentina (Patagonia region) (Brown & Amadon 1968; Bednarz 1995; Couve & Vidal 2003). This hawk preys mainly on small birds and mammals, such as wild and synanthropic doves, passerines, quails, small herons, rodents, and marsupials (Whaley 1986; Jiménez & Jaksic 1993; Bednarz 1995).

In Brazil, the only record of *O. bursa* parasitizing birds of prey was made by Mascarenhas et al. (2009), who found a lot of this mite on the offspring of *Megascops choliba* (Vieillot, 1817) (Strigiformes: Strigidae), in Pelotas Municipality, Rio Grande do Sul State. This is the first report of *O. bursa* on *P. unicinctus*. The presence of this association can be important for the bird's health since the presence of this mite can cause lesions with intense pruritus, or even host mortality when population numbers are large (Coimbra et al. 2012; Mascarenhas et al. 2009).

Although this bird of prey species is considered as Least Concern (LC) on the Red List (IUCN 2021), and not threatened with extinction, its population has been declining in recent years. In addition, this kind of mite/bird of prey association may be related to this bird feeding

ANEXO 14

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Scientific Note

New records of the mites *Geckobia bataviensis* Vitzthum, 1926 and *Pterygosoma dracoensis* Jack, 1962 (Trombidiformes: Pterygosomatidae) from Timor-Leste

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Abstract. We report on the presence of scale mites (Trombidiformes: Pterygosomatidae) parasitizing three species of lizards in Timor-Leste. *Geckobia bataviensis* Vitzthum, 1926 was found associated with the Common House Gecko, *Hemidactylus frenatus* Duméril & Bibron, 1836, and the Indopacific Tree Gecko, *Hemiphyllodactylus typus* Bleeker, 1860, whereas *Pterygosoma dracoensis* Jack, 1962 was found on the patagia of a Timor Flying Dragon, *Draco timoriensis* Kuhl, 1820. The association of *G. bataviensis* with *H. frenatus* was well documented previously, but this is the first properly documented record of this mite for Timor-Leste. Our report of *G. bataviensis* on *H. typus* is the first association of this mite with this gecko. This is the second report of *P. dracoensis* on *D. timoriensis* and the first for Timor-Leste.

Keywords: Scale mites, ectoparasites, *Hemidactylus frenatus*, *Hemiphyllodactylus typus*, *Draco timoriensis*.

Mites of the family Pterygosomatidae Oudemans, 1910 (Acari: Trombidiformes) are permanent ectoparasites primarily associated with several groups of lizards (Fajfer 2015; 2018; 2020). These pterygosomatids or scale mites are organized into 13 genera that comprise over 180 species (Fajfer 2019). Among them, *Geckobia* Mégnin, 1878 is a diverse group (> 85 species) specialized to parasitize geckos (Gekkonidae Gray, 1825; Phyllodactylidae Gamble, Bauer, Greenbaum & Jackman, 2008; Carphodactylidae Kluge, 1967; Diplodactylidae Underwood, 1954; and Eublepharidae Boulenger, 1883) and tree iguanas (Liolaemidae Frost & Etheridge, 1989) (Fajfer 2012; 2015). In contrast, *Pterygosoma* Peters, 1849 includes at least 50 species associated with African and Asian agamid lizards (Fajfer 2020).

During the first comprehensive amphibian and reptile survey of Timor-Leste (Kaiser et al. 2011; 2013; O'Shea et al. 2012; 2015; Sanchez et al. 2012), ectoparasite samples from various reptiles were included in the ancillary collections. Among these were mites from the geckos *Hemidactylus frenatus* Duméril & Bibron, 1836 (Gekkonidae) and *Hemiphyllodactylus typus* Bleeker, 1860 (Gekkonidae), and from the flying dragon *Draco timoriensis* Kuhl, 1820 (Agamidae). We here report on new records for *Geckobia bataviensis* Vitzthum, 1926 parasitizing the two gecko species and *Pterygosoma dracoensis* Jack, 1962 parasitizing the flying dragon in Timor-Leste.

Lizard specimens included in this report were collected in Timor-Leste during two research surveys (January-February 2010, June-July 2012). They were euthanized using pericardial injections with 1% procaine, fixed in 10% formalin, and preserved in 70% ethanol. Mites were removed by gentle tugging with fine-point forceps during the post-mortem, pre-fixation examination and preserved in 95% ethanol.

Scale mites were removed from preservative and slide-mounted in Hoyer's medium, following the procedure described by Barros-Battesti et al. (2021). Mite specimens were deposited in the Acarological Collection of the Instituto Butantan, São Paulo, Brazil (IBSP) under accession numbers IBSP 16506-16511. They were identified to genus using the key to pterygosomatid genera of Bertrand (2013), and to species using keys for *Geckobia* (Bertrand 2013) and *Pterygosoma* (Fajfer 2020). Microscope images were taken using a Leica DM4000B compound microscope with phase contrast. Extended focal range images were compiled using the Leica Application Suite v. 2.5.0, and images were further improved using Adobe Photoshop v. 13.0.

Geckobia bataviensis Vitzthum, 1926

Specimens. We recovered a total of 52 female specimens of *G. bataviensis* (Fig. 1A-C) from the following five geckos: *H. frenatus* (USNM 579085), collected at 3.2 km south of Tua Koin Lodge, Ataúro Island, Dili Municipality, Timor-Leste (8°16'13"S; 125°36'8"E, elevation 105 m) on 30 January 2010, two females (IBSP 16506); *H. frenatus* (USNM 579735) collected at Barry's Place, Ataúro Island, Dili Municipality, Timor-Leste (8°13'8"S; 125°36'41"E, sea level) on 28 January 2010, five females (IBSP 16509); *H. frenatus* (USNM 580492) collected near Baguia, Baucau Municipality, Timor-Leste (8°37'12"S; 126°39'29"E, elevation 439 m) on 30 June 2012, 25 females (IBSP 16508); *H. frenatus* (USNM 579079) collected on a tree in the dry bed of the Marae River, west of Maubara, Liquiça Municipality, Timor-Leste (8°37'22"S; 125°10'14"E, elevation 30 m) on 6 February 2010, 14 females (IBSP 16511); *H. typus* (USNM 580505) collected at Ossohuna, Baucau Municipality, Timor-Leste (8°40'41"S; 126°37'01"E, elevation 938 m) on 1 July 2012, six females (IBSP 16507).

Records. *Geckobia bataviensis* is a widely distributed scale mite that has been recorded parasitizing several species of the lizard genera *Hemidactylus* Goldfuss, 1820, *Gehyra* Gray, 1834, and *Gekko* Laurenti, 1768. It is the most common scale mite associated with *H. frenatus* (Fig. 2A), a human commensal gecko that has been introduced to many tropical and subtropical areas all over the world from its presumed Indo-Malayan origin (Vitzthum 1926; Domrow 1983; Haitlinger 1988;

ANEXO 15

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Scientific Note

New records of avian nasal mites (Mesostigmata: Rhinonyssidae) to Southeastern Brazil

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Abstract. The avian nasal mites are a group of Mesostigmata, belonging to the family Rhinonyssidae, Trouessart, 1895, obligate endoparasites of the respiratory system of birds. In Brazil, seven of the eight genera of this family have been recorded. After examining the Acarological Collection of the Instituto Butantan, the species *Rallinyssus gallinulae* Fain, 1960 and *Rhinoecius bisetosus* Strandtmann, 1952 were identified from *Gallinula galeata* (Lichtenstein, 1818) (Gruiformes: Rallidae) and an unidentified owl, respectively. In this study, we are recording for the first time *R. gallinulae* from Brazil (Rio de Janeiro State), while *R. bisetosus* is recorded for the second time to this country (São Paulo State), however from a different specific locality.

Keywords: Avian nasal mites, endoparasites, Rio de Janeiro State, São Paulo State, Rallidae, Strigidae.

The family Rhinonyssidae Trouessart, 1895, popular known as avian nasal mites, is a group of Mesostigmata mites, obligate endoparasites of the respiratory system of birds. Currently, this family comprises about 600 species into eight genera - *Larinyssus* Strandtmann, 1948; *Ptilonyssus* Berlese & Trouessart, 1889; *Rallinyssus* Strandtmann, 1948; *Rhinoecius* Cooreman, 1946; *Rhinonyssus* Trouessart, 1894; *Ruandanyssus* Fain, 1957; *Sternostoma* Berlese & Trouessart, 1889; *Tinaminyssus* Strandtmann & Wharton, 1958 (Pence 1975). Of these genera, seven have already been recorded in Brazil, except for *Ruandanyssus*, unique to the Asia and Oceania region (Pence 1975; Mascarenhas et al. 2018).

The genus *Rallinyssus* encompasses twelve species, *Ra. amaurornis* Wilson, 1965; *Ra. caudistigmus* Strandtmann, 1948; *Ra. congolensis* Fain, 1956; *Ra. cychramus* Wilson, 1965; *Ra. gallinulae* Fain, 1960; *Ra. limnocoracis* Fain, 1956; *Ra. porzanae* Wilson, 1967; *Ra. rallinae* Wilson, 1966; *Ra. sorae* Pence & Young, 1979; *Ra. strandtmanni* Gretillat, 1961; *Ra. trappi* Amaral, 1962; and *Ra. verheyeni* Fain, 1963, which are exclusive parasites of rails (Gruiformes: Rallidae). There are only two species recorded to South America. One of these species - *R. trappi* - was described from Brazil, collected on the Blackish Rail, *Pardirallus nigricans* (Vieillot, 1819) (cited as *Ortygonax nigricans*) (Gruiformes: Rallidae) in Itaporanga Municipality, São Paulo State (Amaral 1962a). While, *Ra. caudistigmus* was collected in Neuquen province, Argentina, parasitizing the Red-gartered Coot, *Fulica armillata* Vieillot, 1817 (Gruiformes: Rallidae) (Kun & Vega 2018).

The genus *Rhinoecius* also has twelve species, all of which are exclusive parasites of owls: *Rh. aegolii* Butenko, 1971; *Rh. africanus* Zumpt & Patterson, 1951; *Rh. alifanovi* Butenko, 1976; *Rh. bisetosus* Strandtmann, 1952; *Rh. brikinboricus* Butenko, 1976; *Rh. cavannus* Wilson, 1968; *Rh. cooremani* Strandtmann, 1952; *Rh. grandis* Strandtmann, 1952; *Rh. nycteae* Butenko, 1976; *Rh. oti* Cooreman, 1946; *Rh. subbisetosus* Bregetova, 1965; and *Rh. tytonis* Fain, 1956. So far, two species have been recorded in Brazil: *Rh. bisetosus* and *Rh. grandis*, both originally described from Texas, USA (Strandtmann 1952), and later recorded in Brazil by Amaral (1962b). *Rhinoecius bisetosus* has been reported parasitizing the Burrowing Owl, *Athene cunicularia grallaria* (Temminck, 1822) (cited as *Speotyto cunicularia grallaria*) (Strigiformes: Strigidae) in Itaporanga Municipality, São Paulo State and *R. grandis* has been reported parasitizing the Band-bellied owl, *Pulsatrix melanota* (Tschudi, 1844) (Strigiformes: Strigidae) in Boracéia Municipality, São Paulo State (Amaral 1962b). The present study provides new locality and host-association records for two species of avian nasal mites, as well as microscopy images that help in the identification of these species.

The examined material was slide-mounted and deposited in the Acarological Collection of the Instituto Butantan (IBSP) as "non-identified specimen" and belongs to a collection dated from the 1930s. We tried to retrieve, as much information as possible, from the collection records, and from the original labels for each slide. The identification of genus and species was carried out according to the dichotomous keys made by Domrow (1969) and Pence (1975), and compared with the original descriptions of the species belonging to each genus.

The specimens were identified as *Rallinyssus gallinulae* (IBSP 254) and *Rhinoecius bisetosus* (IBSP 272, IBSP 273, and IBSP 274). A general view of the second species is shown in Fig. 1A. *Rallinyssus gallinulae* can be morphologically separated from the other Rallinyssus species due to the different shape of the opisthosomal and sternal shields (Figs. 1C and D). This species was originally described from the common moorhen, *Gallinula chloropus* (L., 1758) (Gruiformes: Rallidae) from Zoo d'Anvers, Belgium (Fain 1960). Our new record from the IBSP collection was collected in 1933, from the Common Gallinule, *Gallinula galeata* (Lichtenstein, 1818) (Gruiformes: Rallidae) in the Rio de Janeiro Municipality, Rio de Janeiro State. Although until 2014 the common moorhen and the common gallinule were considered the same species (del Hoyo et al. 2014), the first is restricted to the Old World, while *G. galeata* is restricted to the New World.

The other species, identified as *Rh. bisetosus* was firstly described from Texas, USA, parasitizing the Burrowing Owl, *Athene cunicularia* (Temminck, 1822) (Strigiformes: Strigidae) (Strandtmann 1952), and

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Scientific Note

New species records of *Quadraseta* Brennan, 1970 (Trombidiformes: Trombiculidae) in South America

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Abstract. The genus *Quadraseta* Brennan, 1970 (Trombiculidae) is distributed in South American, with a few records from Central America. The larvae (chiggers) are primarily mammal parasites, with one species from birds. Examination of unidentified material at US National Insect and Mite Collection revealed five species to this genus: *Q. brasiliensis* Goff & Gettinger, 1989, *Q. falconensis* Goff & Brennan, 1977, *Q. flochi* (Brennan & Jones, 1960), *Q. mackenziei* (Yunker & Brennan 1964), and *Q. mirandae* Goff & Brennan, 1977. This study resulted in new South American localities and host records for these species.

Keywords: chiggers, ectoparasites, Brazil, Suriname, Venezuela.

Chiggers are the larval stage of the trombiculid mites (Trombidiformes: Trombiculidae *s. l.*) (Miyajima & Okumura 1917; Bassini-Silva et al. 2021). Chiggers are parasites of terrestrial vertebrates including humans and can cause dermatitis to the host (Shatrov 2000). There are currently 188 valid genera in this family (Nielsen et al. 2021). One of these genera, *Quadraseta* Brennan, 1970 is occurs in South American, with a few records from Central America (Jacinavicius et al. 2018b; 2021; Silva-de la Fuente et al. 2021). Larval *Quadraseta* are parasites of small mammals with a single species parasitizing birds (Jacinavicius et al. 2018b; 2021).

Examination of unidentified material deposited at the US National Insect and Mite Collection, Smithsonian Institution, National Museum of Natural History, Washington, DC, USA (USNM), currently located at the Systematic Entomology Laboratory (BARC-USDA-ARS), Beltsville, MD, USA, revealed five species of *Quadraseta*: *Q. brasiliensis* Goff & Gettinger, 1989, *Q. falconensis* Goff & Brennan, 1977, *Q. flochi* (Brennan & Jones, 1960), *Q. mackenziei* (Yunker & Brennan, 1964), and *Q. mirandae* Goff & Brennan, 1977. Identification was made by comparing specimens with their respective types and published descriptions. No types were available for *Quadraseta brasiliensis* so we compared our specimens with previously identified material deposited at the USNM and the original description by Goff & Gettinger (1989). The material data examined represents the new records for each species.

Trombiculidae Ewing, 1929

Quadraseta Brennan, 1970

Quadraseta brasiliensis Goff & Gettinger, 1989

This species was described from Brasília, Federal District, Brazil, parasitizing the rodent, *Hylaeamys megacephalus* (Fischer, 1814) (Rodentia: Cricetidae), and two marsupial species, the chacoan mouse opossum, *Marmosa agilis* (Tate, 1931) and the Northern three-striped opossum, *Monodelphis americana* (Müller, 1776) (Didelphimorphia: Didelphidae) (Goff & Gettinger 1989). Jacinavicius et al. (2018a) recorded *Q. brasiliensis* parasitizing the russet rice rat, *Euryoryzomys russatus* (Wagner, 1848) (Rodentia: Cricetidae), from Adrianopólis Municipality, Paraná State, Cotia, Peruíbe, and Sete Barras Municipalities, São Paulo State and in the Serra da Cantareira, São Paulo State. Additional host records from, Sete Barras Municipality, included *Delomys* sp., *Oligoryzomys* sp., and *Oxymycterus* sp., as well as the black-footed pygmy rice rat, *Oligoryzomys nigripes* (Olfers, 1818) (Rodentia: Cricetidae), and Ihering's short-tailed opossum, *Monodelphis iheringi* Thomas, 1888 (Didelphimorphia: Didelphidae). In Cotia Municipality, *Q. brasiliensis* has been recorded parasitizing the montane akodont, *Akodon montensis* Thomas, 1913 (Rodentia: Cricetidae), the Blackish Grass Mouse, *Thaptomys nigrita* (Lichtenstein, 1830), and an unidentified marsupial of the genus *Monodelphis* Burnett, 1829. And in the Serra da Cantareira, *Q. brasiliensis* was recorded parasitizing the agouti, *Cuniculus paca* (L., 1766) (Rodentia: Cuniculidae). Beyond to the localities mentioned above, Jacinavicius et al. (2018a) recorded *Q, brasiliensis* from Itapevi Municipality, São Paulo State, on the marsupial *Monodelphis* sp., and the Brazilian common opossum, *Didelphis aurita* (Wied-Neuwied, 1826) (Didelphimorphia: Didelphidae). In the SÃo Paulo Zoo, SÃo Paulo Municipality, this species was found on the rodent *Akodon* sp. (Jacinavicius et al. 2018a).

In this study, we report *Q. brasiliensis* from the Santo Boma region, Wanica District in Suriname parasitizing the Cayenne spiny rat, *Proechimys guyannensis* (É. Geoffroy, 1803) (Rodentia: Echimyidae) as new locality and host.

Material examined. 1 larva (RML 58520); Suriname, Santo Boma region, Wanica District, Suriname; 8 August 1971; ex. *P. guyannensis*; F. Lukoschus & Kok colls.

Quadraseta falconensis Goff & Brennan, 1977

This species was described from Falcón state, Venezuela, parasitizing the Eastern cottontail, *Sylvilagus floridanus* (J.A. Allen, 1890) (Lagomorpha: Leporidae) (Goff & Brennan 1977). Recently, Jacinavicius et al. (2019) recorded this species from Brazil, in Petrolina Municipality, Pernambuco State, parasitizing the white-eared opossum, *Didelphis albiventris* Lund, 1840 (Didelphimorphia: Didelphidae).

ANEXO 17

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Scientific Note

Evidence of co-parasitism between different species of chiggers (Trombidiformes: Trombiculidae) parasitizing cricetid rodents in Morro Grande Forest Reserve, São Paulo State, Brazil

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Abstract. Chigger mites are ectoparasites of terrestrial vertebrates and can even accidentally bite humans, causing lesions on their skins. The co-parasitism is gradually being reported for this family, and recent studies have highlighted this relationship worldwide. In Brazil, only some records of chigger species co-parasitizing rodents and lizards in the Pernambuco and Piauí States were done. The present study reports six co-parasitism situations in cricetid rodents collected in the Morro Grande Forest Reserve, Cotia Municipality, São Paulo State, Brazil.

Keywords: Trombiculids, ectoparasites, Neotropical region, Rodentia.

Chigger mites (Trombidiformes: Trombiculidae s. l.) are ectoparasites of terrestrial vertebrates, such as amphibians, reptiles, birds, and mammals, as well as, these mites accidentally can bite humans, causing lesions in the skin host (Miyajima & Okumura 1917; Shatrov 2000).

Many studies have been done on the taxonomy and systematics of chigger mites, but little is known about their ecology. The co-parasitism relationship exists for mites and is gradually being reported for this family as well. Although there are few records in literature (Goff 1979), recent studies have highlighted the co-parasitism within different species of chiggers around the world (Bernard et al. 2015; Moniuszko et al. 2018; Jacinavicius et al. 2019; 2021).

In Brazil, some co-parasitism cases were already reported for two states (Jacinavicius et al. 2019; 2021). In Pernambuco State, *Pseudoschoengastia petrolinensis* Jacinavicius, Bassini-Silva & Barros-Battesti, 2019, *Eutrombicula batatas* (L., 1758) and *Quadraseta falconensis* Goff & Brennan, 1977 parasitizing the same white-eared opossum, *Didelphis albiventris* Lund, 1840 (Didelphimorphia: Didelphidae) and also, *P. petrolinensis* and *Q. falconensis* were collected again together in a second host of the same species, *D. albiventris*, in the same state (Jacinavicius et al. 2019). While in the state of Piauí, six cases of co-parasitism were reported, (1) *Eutrombicula alfreddugesi* (Oudemans, 1910), *Microtrombicula brachytrichia* Brennan, 1971 and *Neoschoengastia ochoai* Jacinavicius & Bassini-Silva, 2021 were collected parasitizing the same Peters' lava lizard, *Tropidurus hispidus* (Spix, 1825) (Squamata: Tropiduridae); (2) *Susa bouchani* Jacinavicius & Bassini-Silva, 2021 and *Quadraseta welbourni* Jacinavicius & Bassini-Silva, 2021 parasitizing the same São Lourenço Punare, *Thrichomys laurentius* Thomas, 1904 (Rodentia: Cricetidae); and three different situations of chiggers parasitizing an unidentified rodent of the genus *Rhipidomys* Tschudi, 1845 (Rodentia: Cricetidae), which occurred among *Paraguacarus klompeni* Jacinavicius & Bassini-Silva, 2021 and *M. brachytrichia*; *P. klompeni* and *Microtrombicula rhipidomysi* Goff, Whitaker & Dietz, 1983; and *P. klompeni* and *P. petrolinensis* (Jacinavicius et al. 2021).

The taxonomy chigger mites survey of Morro Grande Forest Reserve, Cotia Municipality, São Paulo State, Brazil, was previously reported by Jacinavicius et al. (2015, 2018a, 2018b). However, the present study aims to show the co-parasitism observed between different chigger mite species collected from small mammals in the Morro Grande Forest Reserve. The Morro Grande Forest Reserve represents one of the most significant remnants of forests on the Planalto Paulistano (Metzger et al. 2006), extending from the Serra do Mar to the city of Campinas. The collections of the small mammals took place in two localities of this reserve, one close to the Pedro Beicht Dam (23°42'56"S; 46°57'29"W) and Graça Dam (23°39'11"S; 46°57'58"W) between March 2013 and December 2015, during five days per month. All mites were collected and stored in 100% alcohol for further studies. Each host represented a collection event; thus, all collected mites were stored together to do the screening later.

The mites collected were sent to the Acarological Collection of Instituto Butantan (IBSP) to be slide-mounted and identified, following the preparations described by Barros-Battesti et al. (2021). For the chigger identification, we use the genera key made by Brennan & Goff (1977) and the original descriptions of all species described in the identified genera.

At the end of the collection campaign, 72 hosts parasitized by mites were collected. They were 16 marsupials (Didelphimorphia: Didelphidae) - 10 *Didelphis aurita* (Wied-Neuwied, 1826); 1 *Metachirus nudicaudatus* (É. Geoffroy, 1803); and 5 *Monodelphis americana* (Müller, 1776); and 56 cricetid rodents (Rodentia: Cricetidae) - 32 *Akodon montensis* Thomas, 1913, 1 *Delomys dorsalis* (Hensel, 1873), 4 *Delomys sublineatus* (Thomas, 1903), 7 *Euryoryzomys russatus* (Wagner, 1848), 5 *Holochilus brasiliensis* (Desmarest, 1819), 1 *Necromys lasiurus* (Lund, 1840), 1 *Nectomys squamipes* (Brants, 1827), 1 *Sooretamys angouya* (Fischer, 1814), and 4 *Thaptomys nigrita* (Lichtenstein, 1830). Of which 35 hosts (5 marsupials and 30 cricetid rodent species) had been collected with chigger mites.

The co-parasitism was observed on six hosts examined. Four of them with two different chigger species, and the associations were: *Quadraseta mirandae* Goff & Brennan, 1977 (IBSP 10606C) and *Quadraseta pazca* (Brennan & Jones, 1964) (IBSP 10606D) parasitizing the same montane akodont, *Akodon montensis* Thomas, 1913 (Rodentia: Cricetidae) (Fig. 1A); *Quadraseta trapezoides* (Brennan

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Viewpoint

SIBAC (Simpósio Brasileiro de Acarologia) em tempos de conectividade

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SIBAC (Brazilian Symposium of Acarology) in times of connectivity

Abstract. Although not readily recognizable by humanity (mainly due to their small size), mites are found in many environments, directly or indirectly affecting humans. The study of mites in Brazil has become a topic of great relevance. Acarologists periodically meet at SIBAC (Brazilian Symposium of Acarology) events to exchange experiences and professional debates. So far, seven symposia have been held. The last one has just been held in a virtual format, involving the participation of 292 subscribers, coming from 24 federative units in Brazil and 17 other countries.

Keywords. Mites, ticks, scientific event, online, Brazil.

O termo "acarologia" se refere ao estudo dos ácaros, organismos que muito frequentemente passam despercebidos pelo seu reduzido tamanho. A grande maioria apresenta aproximadamente 0,5 mm de comprimento. Dependendo da espécie a que pertencem, podem ser encontrados em pequenos ou grandes grupos. Seus parentes próximos mais bem conhecidos são as aranhas, usualmente muito maiores. Como estas, alguns estágios da maioria dos ácaros também apresentam quatro pares de pernas, não possuindo uma cabeça diferenciada. Também como as aranhas, muitos são predadores, alimentando-se de outros invertebrados de pequeno porte, embora existam aqueles que ataquem plantas, reduzindo sua produtividade, aqueles que são parasitos de diversos animais, inclusive do próprio ser humano, e outros com hábitos fungívoros ou detritívoros.

O primeiro grupo de ácaros a chamar a atenção das pessoas foi o dos carrapatos, com hábito hematófago, que além de causar irritação na pele dos animais atacados e retirar parte de seu sangue, podem também transmitir patógenos que causam sérias enfermidades, muitas vezes levando o animal atacado à morte. Outros ácaros que chamaram a atenção das pessoas há muito tempo são os que atacam a pele dos animais, sem consumirem seu sangue, como é o caso dos ácaros que causam sarnas, por despertarem um processo que conduz à irritação local, coceira e muitas vezes o efeito secundário de microrganismos e inflamação local. Há ainda aqueles que não se alimentam dos animais, mas que a estes causam danos devido à possibilidade que têm de causar alergias, inclusive respiratória.

Bem mais tarde, foram notados pelo ser humano os ácaros que danificam as plantas cultivadas e os alimentos armazenados, todos adquirindo importância crescente à medida que aumenta a demanda de alimentos para a crescente população humana. Estes ácaros podem frustrar a expectativa dos produtores se não forem adequadamente controlados, o que usualmente é feito com o uso de produtos químicos e, em certas situações, com o uso de outros organismos que atacam os ácaros-praga (controle biológico).

Esta sequência dos temas de interesse ao longo do tempo foi observada no mundo todo, inclusive no Brasil. Devido ao aumento destes problemas, estudos têm sido conduzidos por especialistas há centenas de anos, visando à descoberta de formas de controlá-los eficientemente. Breves históricos sobre o desenvolvimento da acarologia no Brasil foram apresentados por Flechtmann et al. (2006), Pallini et al. (2007) e Moraes & Flechtmann (2008).

Em nosso país, no estudo dos parasitos de animais destacaram-se inicialmente pesquisadores diplomados em medicina, como Henrique de B. R. Aragão (Instituto Oswaldo Cruz, Rio de Janeiro) e Flávio O. R. da Fonseca (Instituto Butantan, São Paulo), no início do século XX. Ambos foram muito influenciados por seus colegas europeus, que também se dedicavam ao estudo dos ácaros parasitos. A estes se seguiram muitos outros, recentemente aposentados, ou que ainda continuam ativos, além daqueles que iniciaram suas atividades mais recentemente.

Já em relação aos ácaros de importância agrícola, com o incremento das terras brasileiras que passaram a ser ocupadas por cultivos agrícolas, os estudos sobre estes foram iniciados no país por profissionais que não eram especificamente acarologistas, mas mesmo assim conseguiram gerar subsídios relevantes para o conhecimento dos ácaros e para seu controle. No entanto, o primeiro acarologista brasileiro com total dedicação ao estudo dos ácaros plantícolas foi Carlos H. W. Flechtmann (ESALQ/USP, Piracicaba), que começou sua atuação profissional na segunda metade do século passado, e que até hoje continua extremamente ativo em seu trabalho, apesar de sua aposentadoria há vários anos.

Histórico dos eventos científicos no Brasil

Por constituírem os ácaros um grupo menos diverso do que os insetos, praticamente em todo o mundo o número de profissionais que se dedicam ao estudo dos ácaros é muito menor que o número daqueles que se dedicam ao estudo dos insetos. Em ambas as áreas, e em outras áreas de especialização, trocas de experiências são extremamente relevantes para o crescimento do conhecimento científico e tecnológico. Visando à troca de informações técnico-científicas, especialistas se reúnem periodicamente em congressos,

ANEXO 19

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First record of *Pellonyssus gorgasi* Yunker & Radovsky, 1966 (Mesostigmata: Macronyssidae) in Cuba and a new host association

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ABSTRACT

The mite *Pellonyssus gorgasi* Yunker & Radovsky is recorded for the first time in Cuba, based on several specimens collected on a young Cuban Emerald, *Riccordia ricordii ricordii* (Gervais) (Apodiformes: Trochilidae) and in its nest from San Antonio de los Baños, Artemisa Province. In this study, *R. r. ricordii* represents a new host-association for *P. gorgasi*, whereas the genus *Pellonyssus* is also recorded for the first time in Cuba.

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KEYWORDS
Riccordia ricordii ricordii; mite; ectoparasite; Cuban Emerald; hummingbird; West Indies

Introduction

The family Macronyssidae Oudemans, 1936 currently has 35 genera, associated with birds, reptiles, and mammals, including humans (Radovsky 2010; Orlova et al. 2017; Bassini-Silva et al. 2019; Gomes-Almeida and Pepato 2021). The genus *Pellonyssus* Clark & Yunker, 1956 includes 14 species that specialize on bird hosts, including hummingbirds (Apodiformes: Trochilidae) (Radovsky 2010; Bassini-Silva et al. 2019).

The Cuban Emerald, *Riccordia ricordii ricordii* (Gervais, 1835) (Apodiformes: Trochilidae), is endemic to Cuba and is very common throughout the country and easily observed in cities and towns (Alayón García 1980; García 1987; Garrido and Kirkconnell 2010). The reproductive cycle of the Cuban Emerald covers the whole year, although it has a peak in the spring (Gundlach 1893; Garrido and Kirkconnell 2010). The Cuban Emerald usually builds its nests between 0.8 and 2.5 m above ground level (Gundlach 1876; García Sarmiento and Rojas Tito 1997), usually at the end of a thin branch.

Observation

On 8 May 2021, a female *R. r. ricordii* was observed in San Antonio de los Baños, Artemisa province, Cuba beginning to build its nest on top of a small branch of the *Leptocereus maxonii* Britton & Rose (Cactaceae) 3.30 m above the ground (Figure 1). On the 12th of the same month, the hummingbird female laid the first egg; the second was set on the 15th, both in the afternoon. However, six days later there was only one, which hatched during the night of June 30–31, after 16 days of incubation. On June 7, the chick died from a large ulcer lesion, infected by about twenty small larvae of an indeterminate dipteran. When the hummingbird was removed from the nest for its preservation in 75% ethanol, several mites were detected on its body, as well as 30–40 mites on the nest. A sample was taken from both, which was transferred to the Central Plant Quarantine Laboratory (LCCV), in Havana, for processing and subsequent identification. All the mites were deposited in the LCCV collection.

All collected mites were female and the specimens were slide-mounted in Hoyer's medium, according to Walter and Krantz (2009). An Axioscop 40 ZEISS microscope, with phase contrast, was used for the identification, and the photos were taken with a 16.1-megapixel Sony Cybershot camera. The identification was made according to Radovsky (1998, 2010), and once the genus *Pellonyssus* was confirmed, the original descriptions of all known *Pellonyssus* species described were consulted to confirm species level identification.

After the examination of the material, we identified the species as *Pellonyssus gorgasi* Yunker & Radovsky, 1966 (Figure 2(a–e)), for which females can be separated from the other species by the following characters: podonotal shield with 10 pairs of setae; opisthosomal shield without the *Z4* setae and with five pairs of posterolateral setae and one more additional setae on the anterolateral margin; sternal shield with *st1* setae more than half the length of *st2* (or sub-equal in length); only the first pair of sternal pores is present; metasternal setae (*st4*) absent; palptrochanter without spur; cheliceral segment II (including fixed digit) with 250–285 µm long; peritrema ending in the posterior half of the Cx II; Cx II with anterior spur; ventral setae on Fe III proximal to the fissure; Ta I and II without any whip-shaped setae.

Pellonyssus gorgasi has some atypical characteristics together with *Pellonyssus similis* that present two pairs of postero-marginal setae on the opisthosomal shield (instead of three). Although it differs from the latter by the absence of a ventral spur on the palptrochanter and a total of 10 pairs of setae on the podonotal shield, being the only species with the *j1* setae on the anterior margin of the podonotal shield, instead of being outside this shield (Radovsky 1998).

Material examined

Twelve ♀ (LCCV 2382–2386); San Antonio de los Baños, Artemisa Province, Cuba; 8 VI 2021; ex. in nest and on the chicks of *Riccordia r. ricordii*; L. F. de Armas coll.

In general, the morphological characteristics of the examined specimens coincide with that indicated by Radovsky (1998) and Bassini-Silva et al. (2019) (Figure 2), although the length of the idiosoma was longer (642–925 µm vs. 580 µm). It is necessary to highlight the difference, at first glance, of the specimens

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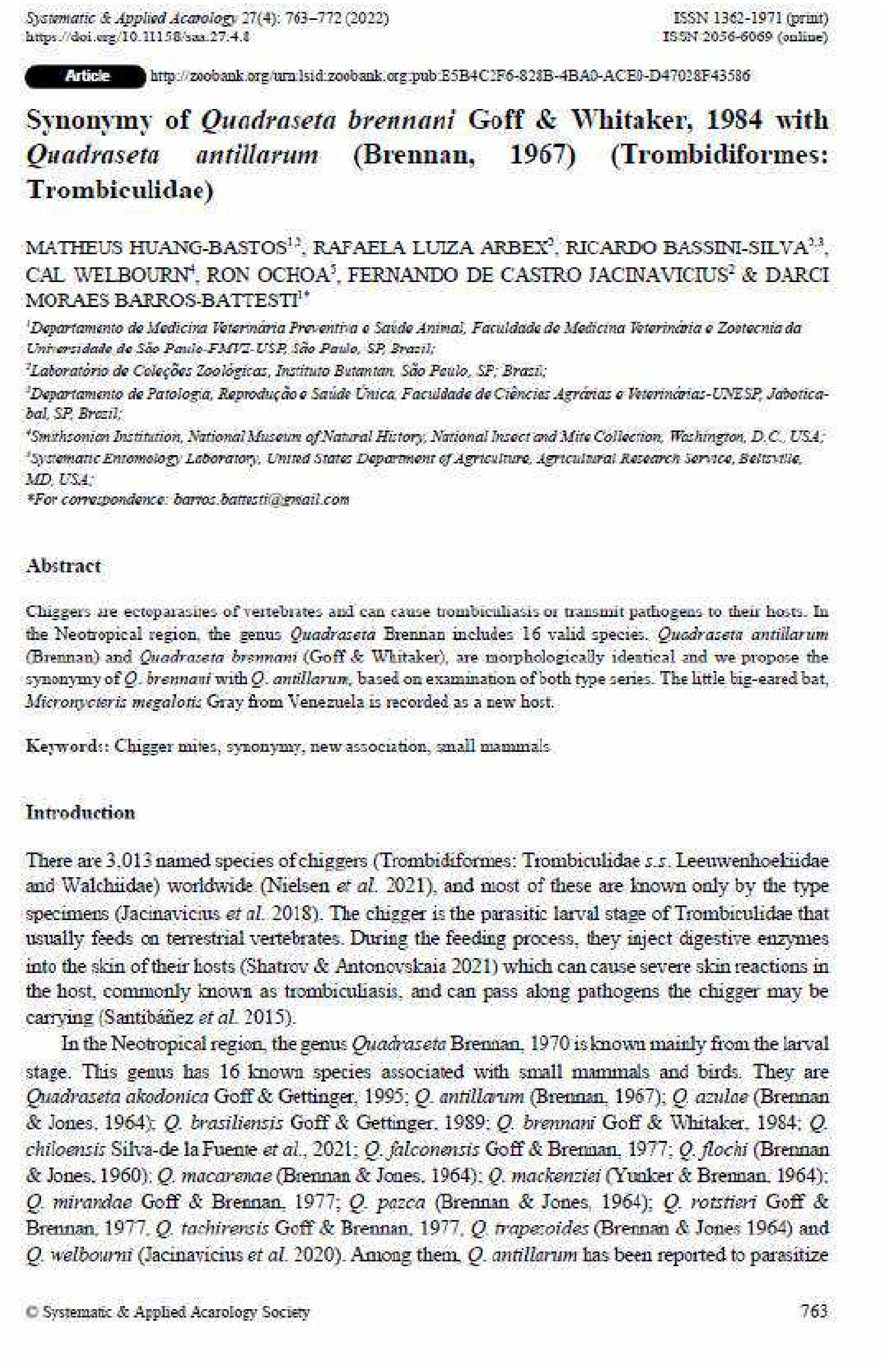
ANEXO 20



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Synonymy of *Quadraseta brennani* Goff & Whitaker, 1984 with *Quadraseta antillarum* (Brennan, 1967) (Trombidiformes: Trombiculidae)

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Abstract

Chiggers are ectoparasites of vertebrates and can cause trombiculiasis or transmit pathogens to their hosts. In the Neotropical region, the genus *Quadraseta* Brennan includes 16 valid species. *Quadraseta antillarum* (Brennan) and *Quadraseta brennani* (Goff & Whitaker), are morphologically identical and we propose the synonymy of *Q. brennani* with *Q. antillarum*, based on examination of both type series. The little big-eared bat, *Micronycteris megalotis* Gray from Venezuela is recorded as a new host.

Keywords: Chigger mites, synonymy, new association, small mammals

Introduction

There are 3,013 named species of chiggers (Trombidiformes: Trombiculidae *s.s.* Leeuwenhoekiidae and Walchiidae) worldwide (Nielsen *et al.* 2021), and most of these are known only by the type specimens (Jacinavicius *et al.* 2018). The chigger is the parasitic larval stage of Trombiculidae that usually feeds on terrestrial vertebrates. During the feeding process, they inject digestive enzymes into the skin of their hosts (Shatrov & Antonovskaia 2021) which can cause severe skin reactions in the host, commonly known as trombiculiasis, and can pass along pathogens the chigger may be carrying (Santibáñez *et al.* 2015).

In the Neotropical region, the genus *Quadraseta* Brennan, 1970 is known mainly from the larval stage. This genus has 16 known species associated with small mammals and birds. They are *Quadraseta akodonica* Goff & Gettinger, 1995; *Q. antillarum* (Brennan, 1967); *Q. azulae* (Brennan & Jones, 1964); *Q. brasiliensis* Goff & Gettinger, 1989; *Q. brennani* Goff & Whitaker, 1984; *Q. chiloensis* Silva-de la Fuente *et al.*, 2021; *Q. falconensis* Goff & Brennan, 1977; *Q. flochi* (Brennan & Jones, 1960); *Q. macarenae* (Brennan & Jones, 1964); *Q. mackenziei* (Yunker & Brennan, 1964); *Q. mirandae* Goff & Brennan, 1977; *Q. pazca* (Brennan & Jones, 1964); *Q. rotstieri* Goff & Brennan, 1977, *Q. tachirensis* Goff & Brennan, 1977, *Q. trapezoides* (Brennan & Jones 1964) and *Q. welbourni* (Jacinavicius *et al.* 2020). Among them, *Q. antillarum* has been reported to parasitize

ANEXO 21

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A NEW GENUS FOR *EUSCHOENGASTIA CHISOSENSIS* WRENN, BACCUS, AND LOOMIS, 1976 (TROMBIDIFORMES: TROMBICULIDAE)

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Abstract.—The trombiculid genus *Euschoengastia* Ewing, 1938 is currently comprised of species from all biotic regions giving the genus a worldwide distribution. In North America, there are 60 described species. One species, *Euschoengastia chisosensis* Wrenn, Baccus, and Loomis, was collected parasitizing cricetid rodents in Texas, USA. In the present study, a new genus is proposed for this species, ***Jumanoacarus*** **Bassini-Silva, Jacinavicius, and Welbourn**.

Key Words: chiggers, ectoparasites, USA, North America, taxonomy.

DOI: 10.4289/0013-8797.123.4.693

Euschoengastia Ewing, 1938 (Trombidiformes: Trombiculidae) was first described from the Americas and currently comprises 85 species (Neilson et al. 2021) that parasitize primarily rodents. Over the years as many as eight to nine subgenera were recognized: *E.* (*Euschoengastia*) Ewing, 1938; *E.* (*Anahuacia*) Hoffmann, 1963; *E.* (*Brunehaldia*) Vercammen-Grandjean, 1960; *E.* (*Fascutella*) Vercammen-Grandjean, 1960; *E.* (*Farrellia*) Vercammen-Grandjean, 1960; *E.* (*Farrellioides*) Vercammen-Grandjean, 1960; *E.* (*Heaslipioides*) Vercammen-Grandjean, Nadchatram, and Traub, 1966; *E.* (*Tauffliebiella*) Vercammen-Grandjean, 1960; and *E.* (*Trigenualaea*) Vercammen-Grandjean and Langston, 1976 (Vercammen-Grandjean 1960, Vercammen-Grandjean

ANEXO 22

Syst Parasitol
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Reinstatement of *Eutrombicula butantanensis* (Fonseca, 1932) (Trombidiformes: Trombiculidae)

Ricardo Bassini-Silva · Darci Moraes Barros-Battesti · Fernando de Castro Jacinavicius

Received: 5 March 2022 / Accepted: 9 May 2022

Abstract *Eutrombicula* Ewing is currently represented with more than 80 species worldwide parasitizing amphibians, reptiles, birds, and mammals. In the present study, we examined the type series and additional material of two Neotropical chigger's species: *Eutrombicula butantanensis* (Fonseca) and *E. ophidica* (Fonseca). *Eutrombicula butantanensis* (Fonseca) was previously synonymized with *E. alfreddugesi* (Oudemans). However, we are proposing the reinstatement of *E. butantanensis* as a valid species. Besides that, we are proposing that *E. ophidica* is a junior synonym of *E. butantanensis*. Beyond the morphological similarities, *E. butantanensis* and *E. ophidica* were initially described to the state of São Paulo, Brazil, and were accidentally collected parasitizing the skin of a human. Besides that, we are increasing the knowledge about *E. butantanensis* on Brazil's national territory, recording new locality and host associations.

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Introduction

The genus *Eutrombicula* Ewing 1938 (Trombidiformes: Trombiculidae) is currently represented with more than 80 species worldwide parasitizing amphibians, reptiles, birds, and mammals (Bassini-Silva et al. 2019). Until the present study, nine valid species were recorded from Brazil: *E. alfreddugesi* (Oudemans 1910), *E. batatas* (Linnaeus 1758), *E. bruyanti* (Oudemans 1910), *E. daemoni* Bassini-Silva and Jacinavicius 2018, *E. goeldii* (Oudemans 1910), *E. ophidica* (Fonseca 1932), *E. spipi* Brennan and Reed 1974, *E. tinami* (Oudemans 1910), and *E. tropica* (Ewing 1925) (Bassini-Silva et al., 2018; 2019; Jacinavicius et al., 2018a, b; 2019; 2020; Mendoza-Roldan et al., 2020; Sampaio et al., 2020).

The species *Eutrombicula butantanensis* (Fonseca 1932) and *E. ophidica*, originally placed in the *Trombicula* Berlese 1905 (Fonseca, 1932a, b) were moved to *Eutrombicula* by Ewing (1938). In the revision made by Jenkins (1949), *E. butantanensis* was synonymized with *E. alfreddugesi*.

Both species were originally described from São Paulo State and collected parasitizing the skin of a man working in a snake captivity (Fonseca, 1932a, b). In addition, Fonseca (1932b) also recorded *E. ophidica* parasitizing the Wagler's snake, *Xenodon merremii* (Wagler) (Squamata: Colubridae), and in this same

ANEXO 23

PLOS ONE

RESEARCH ARTICLE

Host species and environment drivers of ectoparasite community of rodents in a Mojave Desert wetlands

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Abstract

Drivers of patterns of ectoparasitism in rodents in patchy Mojave Desert wetlands were investigated. A total of 1,571 ectoparasites in Mesostigmata, Trombidiformes, Siphonaptera and Ixodida were collected from 341 rodents (*Microtus californicus scirpensis*, *Mus musculus*, *Reithrodontomys megalotis*, *Peromyscus eremicus*, and *Neotoma lepida*) at eleven marshes. Trombiculids accounted for 82.5% of mites, followed by the mesostigmatid *Ornithonyssus bacoti* (17.5%), with chiggers predominating on voles and harvest mice. There were at least three genera of chiggers (*Eutrombicula alfreddugesi*, *Euschoengastia* sp. novel, and *Blankaartia* sp. novel). Fleas included *Orchopeas leucopus* (90.3% of all fleas) and *O. sexdentatus* (9.7%), and ticks were the novel endemic *Ixodes mojavensis* (82.1% of ticks) and *Dermacentor similis* (17.9%). On all hosts and at all marshes, coverage-based rarefaction sampling was over 96%, indicating coverage sufficient for analysis. Dissimilarities in ectoparasite community structure were driven mainly by chiggers, *I. mojavensis* and *O. leucopus*. Northern marshes were dominated by chiggers; central marshes by *I. mojavensis*; and southern marshes by *O. leucopus*. Primary determinants of ectoparasite community structure were host species, patch size, and parasite interspecific interactions. Host species richness and environmental factors such as patch distance and water and plant availability were not significantly associated with patterns of ectoparasitism. There were nine (60%) significant negative pairwise associations between ectoparasite taxa and no significant positive relationships. *Ixodes mojavensis* had the highest number of negative associations (with five other species), followed by chiggers and *O. bacoti* with two negative associations each. The study area is among the most arid in North America and supports numerous rare and endemic species in increasingly isolated wetland habitat patches; knowledge of ectoparasite ecology in this region identifies potential ectoparasite vectors, and

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ANEXO 24

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Taylor & Francis
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Contribution to the knowledge of *Quadraseta pazca* (Brennan and Jones, 1964) (Trombidiformes: Trombiculidae), including new host-association and locality records

Matheus Huang-Bastos[a,b], Ricardo Bassini-Silva[b,c], Rafaela Luiza Arbex[b], Cal Welbourn[d], Ron Ochoa[e], Fernando de Castro Jacinavicius[b] and Darci Moraes Barros-Battesti[a,c]

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ABSTRACT
The Neotropical genus *Quadraseta* Brennan has 15 valid species associated with small mammals and birds. *Quadraseta pazca* (Brennan and Jones, 1964) is the type species chosen by Brennan (1970) to describe the genus *Quadraseta*. This species was originally described parasitizing murids in Argentina and later recorded parasitizing cricetids in two different Brazilian states, Minas Gerais and São Paulo. In this study, we provide a redescription of *Q. pazca* based on the type series. The following characters separate this species from the others within the genus: palptibia lateral setae branched; adoral setae branched; one pair of clavate trichobothria (*si*); leg I genu with three solenidia (σ); and the base of microseta (ε) of leg I tarsus is proximal to the base of solenidion (ω). In addition, we also provide new locality and host-association records for this species in Brazil.

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Chigger mite; ectoparasite; new records; South America; Acarology

Introduction

Quadraseta Brennan, 1970 (Trombidiformes: Trombiculidae) is a Neotropical genus associated with small mammals and birds (Brennan and Jones 1960, 1964a; Yunker and Brennan 1964, 1964b; Brennan 1967; Goff and Brennan 1977; Goff and Whitaker 1984; Goff and Gettinger 1989, 1995; Jacinavicius et al. 2021; la Fuente Mc et al. 2021; Nielsen et al. 2021; Huang-Bastos et al. 2022). The genus was created for the type species, *Euschoengastia pazca* (Brennan and Jones, 1964), and six more species previously included in *Euschoengastia* Ewing, 1938.

The species *Q. pazca* was described parasitizing *Rattus* sp., *Mus* sp. (Rodentia: Muridae), an unidentified Caviidae (Rodentia), and an unidentified Didelphidae (Didelphimorphia) from Azul City, Buenos Aires Province, Argentina (Brennan and Jones 1964a).

Later, Whitaker and Dietz (1987) reported this species from the Serra da Canastra National Park, Minas Gerais State, Brazil, parasitizing the delicate vesper mouse, *Calomys tener* (Winge, 1887) (Rodentia: Cricetidae). Jacinavicius et al. (2018) reported *Q. pazca* from Morro Grande, Cotia Municipality in Sao Paulo State, Brazil, parasitizing the montane akodont, *Akodon montensis* Thomas, 1913 (Rodentia: Cricetidae) and the russet rice rat, *Euryoryzomys russatus* (Wagner, 1848) (Rodentia: Cricetidae).

Here, we redescribe the larval stage, providing new diagnostic characters, report new host-associations, and locality records to *Q. pazca*.

Materials and methods

In this study, we examined the type series of *Q. pazca* deposited in the US National Entomology Collection (USNMENT), Smithsonian Institution, National Museum of Natural History (USNM), Washington, DC, USA, currently located at the Systematic Entomology Laboratory (BARC-USDA-ARS), Beltsville, MD, USA. New records were obtained from additional material housed at the USNM and at the Acarological Collection of the Instituto Butantan, São Paulo, Brazil (IBSP).

Drawings and measurements were made using an optical microscope Leica DM4000B, with a camera lucida and phase contrast. DIC was used for Figure 4. Extended focal range images were compiled with the Leica Application Suite version 2.5.0 software. The images were prepared with Adobe Photoshop v.13.0 and Inkscape v.1.0.1. The measurements, with maximum and minimum, are provided for the type series (Tables 1 and 2).

We used the nomenclature proposed by Grandjean (1939) with adaptations by Kethley (1990) for the setae on the prodorsal Grandjean (1935, 1947) for the specialized setae on the legs and palps. Additional nomenclature is based on the glossary proposed by Goff et al. (1982). Collectors identified as "Smithsonian Army coll." were hired from the Department of the Army for the Smithsonian Institution expeditions.

Systematics

Genus *Quadraseta* Brennan, 1970

Type-species: *Euschoengastia pazca* Brennan and Jones, 1964

Quadraseta pazca (Brennan and Jones, 1964)

Euschoengastia pazca: Brennan and Jones 1964a: 700; Bassini-Silva et al. 2021: 85.
Boshellia (*Pseudoschoengastia*) *pazca*: Vercammen-Grandjean 1965: 121.

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ANEXO 25

INTERNATIONAL JOURNAL OF ACAROLOGY
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Charletonia rocciai Treat and Flechtmann, 1979 (Trombidiformes: Erythraeidae): larval redescription and new records for Brazil

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ABSTRACT
The family Erythraeidae has 60 genera worldwide, of which *Charletonia* Oudemans has 86 described species, only two of which are recorded in Brazil. Here, we redescribe one of these species based on the holotype, *Charletonia rocciai* Treat and Flechtmann, and newly collected material. The material represents new records from four different localities in São Paulo State and one in Santa Catarina State. In addition, we provide SEM images of the morphological structures to improve the diagnosis and redescription, an updated distribution map, including biological data, and new host-associations of *C. rocciai* with the following orders of insects, Coleoptera and Thysanoptera; and with an order of Arachnida – Araneae.

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KEYWORDS
Parasitengona; ectoparasite; Coleoptera; Thysanoptera; Araneae; new records; Brazil

Introduction

The family Erythraeidae Robineau-Desvoidy, 1828 has 60 genera described worldwide. *Charletonia* Oudemans, 1910 contains 86 valid species distributed worldwide based on larvae and post-larval stages (Mąkol and Wohltmann 2012, 2013; Hakimitabar and Saboori 2022).

Two *Charletonia* species have been recorded from Brazil: *Charletonia domawiti* Haitlinger, 2004 and *Charletonia rocciai* Treat and Flechtmann, 1979 (Treat and Flechtmann 1979; Haitlinger 2004). *Charletonia domawiti* is only known from the larval stage, while all stages have been described for *C. rocciai*, (Treat and Flechtmann 1979; Rosa and Flechtmann 1980; Haitlinger 2004; Costa et al. 2019).

Charletonia domawiti was described from plants near Foz do Iguaçu, Paraná State, Brazil by Haitlinger (2004). Three additional records were reported by Mayoral and Barranco (2011a, b) from the San Ramón District, Alajuela Province, Costa Rica parasitizing the broad-tipped conehead *Neoconocephalus triops* (L., 1758) (Orthoptera: Tettigoniidae) and from Kaw Mountain, Cayenne, French Guiana, parasitizing an unidentified grasshopper (Romaleidae), the vagrant grasshopper, *Schistocerca nitens* (Thunberg, 1815) (Orthoptera: Acrididae), and *Abracris flavolineata* (De Geer, 1773) (Orthoptera: Acrididae).

Charletonia rocciai is restricted to Brazil and has been reported from multiple localities in the south and southeast regions of the country. Treat and Flechtmann (1979) described this species from Jaú Municipality, São Paulo State, parasitizing the Amazon fly, *Lydella minense* (Townsend, 1927) (syn. *Metagonistylum minense*) (Diptera: Tachinidae). Rosa and Flechtmann (1980) reported it from Piracicaba Municipality, São Paulo state, parasitizing *Allotruxalis gracilis* (Giglio-Tos, 1897) (syn. *Allotruxalis strigata*) (Orthoptera: Acrididae), *Eutryxalis filata* (Walker, 1870) (Orthoptera: Acrididae), *Orphulella punctata* (De Geer, 1773) (syn. *Orphulella intricata*) (Orthoptera: Acrididae), and *Rhonderosia bergii* (Stål, 1878) (syn. *Dichroplus bergii*) (Orthoptera: Acrididae). The same authors recorded this species from Piracicaba and Pontal do Paranapanema Municipalities, São Paulo state, parasitizing a froghopper, *Zulia* sp. (Hemiptera: Cercopidae), and from Rio Claro Municipality, São Paulo State, parasitizing a dragonfly (Odonata: Anisoptera). Recently, Costa et al. (2019) recorded this species from the campus of the Federal University of Lavras, Lavras Municipality, Minas Gerais state, parasitizing an unidentified booklouse (Insecta: Psocoptera), in Atuba Park, Paraná State, parasitizing *Auchmerina limbatipennis* Enderlein, 1918 (Hemiptera: Psyllidae), and from Serra do Rola Moça State Park, near Belo Horizonte Municipality, Minas Gerais State, parasitizing an unidentified insect. Furthermore, these authors recorded the postlarval stage in Morro do Pilar Municipality, Minas Gerais State and in Serra do Japi, Jundiaí Municipality, São Paulo State, without information about the larvae or their host.

In this study, we redescribe the larval stage of *Charletonia rocciai* based on the holotype, recently collected material, and material identified from the IBSP collection from four new localities in São Paulo State and one from the Santa Catarina State. In addition, SEM images are provided along with distribution maps.

Materials and methods

Recently collected material was stored in 99% ethanol and deposited at the Acarological Collection of the Instituto Butantan, São Paulo, Brazil (IBSP). Part of this material was slide-mounted in Hoyers medium, and the other part was stored in alcohol and examined under scanning electron microscopy (SEM). Both preparations were according to Walter and Krantz (2009). Slide-mounted specimens were examined using phase contrast (PH) and differential interference contrast (DIC). All measurements and illustrations were made using a Leica DFC 500 digital camera through a Leica DM4000B PH microscope with a camera lucida.

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ANEXO 26

Parasitology Research
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RESEARCH

Sleeping with the enemy: case reports of *Ornithonyssus bursa* (Berlese, 1888) (Mesostigmata: Macronyssidae) causing human dermatitis in Brazil

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Abstract
Ornithonyssus bursa, known as the "tropical fowl mite," is a hematophagous mite of domestic and wild birds, which occasionally bites humans. Accidental bites on humans occur mainly when abandoned bird nests are close to homes or when people are handling parasitized birds. In the present study, we describe five case reports of bites on humans and new records of localities for this species. Based on the material examined, we provide morphological and molecular characterizations for this species herein.

Keywords Tropical fowl mite · Human parasitism · Avian-mite dermatitis · Molecular analysis

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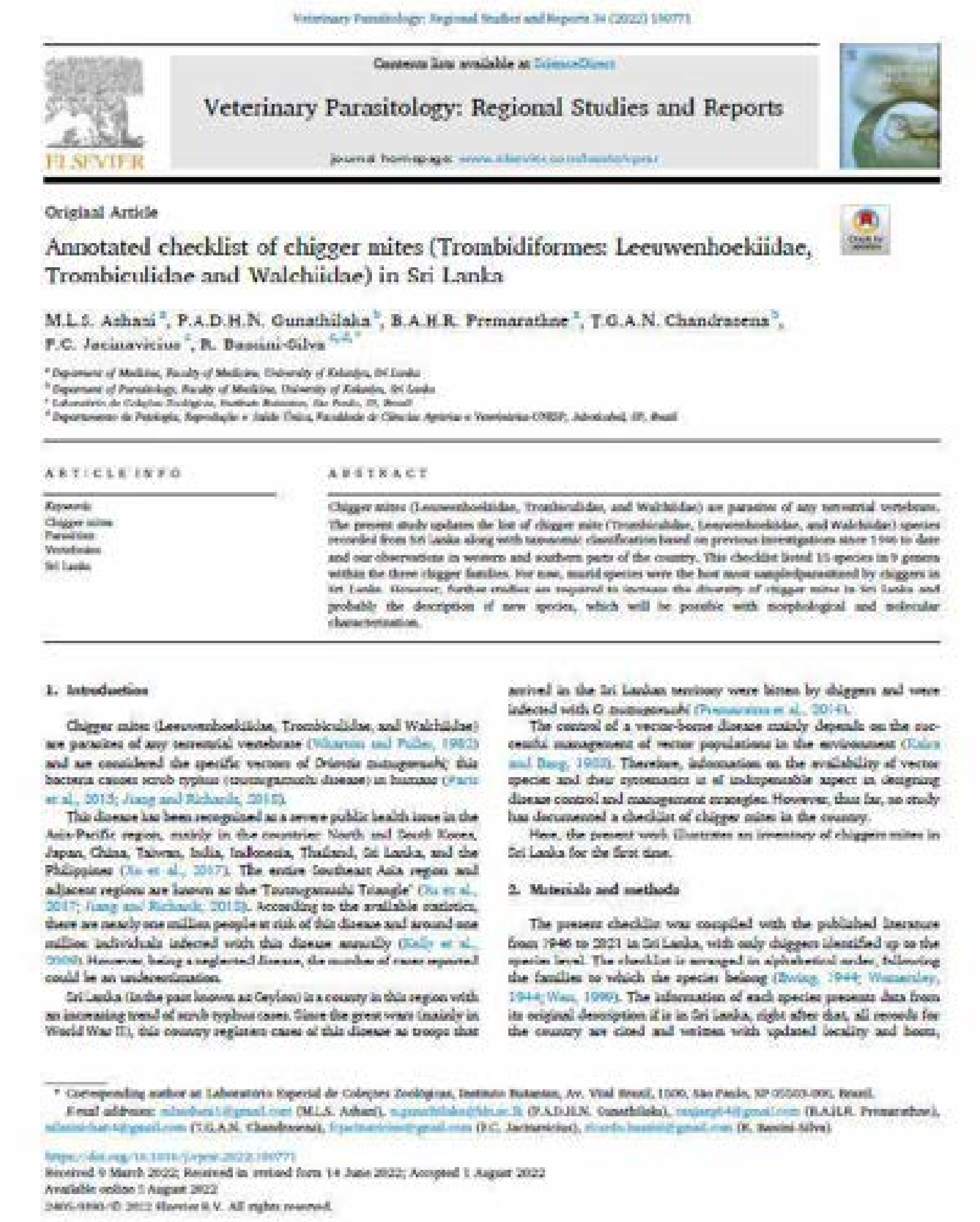
Springer

ANEXO 27



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Original Article

Annotated checklist of chigger mites (Trombidiformes: Leeuwenhoekiidae, Trombiculidae and Walchiidae) in Sri Lanka

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ABSTRACT

Chigger mites (Leeuwenhoekiidae, Trombiculidae, and Walchiidae) are parasites of any terrestrial vertebrate. The present study updates the list of chigger mite (Trombiculidae, Leeuwenhoekiidae, and Walchiidae) species recorded from Sri Lanka along with taxonomic classification based on previous investigations since 1946 to date and our observations in western and southern parts of the country. This checklist listed 15 species in 9 genera within the three chigger families. For now, murid species were the host most sampled/parasitized by chiggers in Sri Lanka. However, further studies are required to increase the diversity of chigger mites in Sri Lanka and probably the description of new species, which will be possible with morphological and molecular characterization.

1. Introduction

Chigger mites (Leeuwenhoekiidae, Trombiculidae, and Walchiidae) are parasites of any terrestrial vertebrate (Wharton and Fuller, 1952) and are considered the specific vectors of *Orientia tsutsugamushi*; this bacteria causes scrub typhus (tsutsugamushi disease) in humans (Paris et al., 2015; Jiang and Richards, 2018).

This disease has been recognized as a severe public health issue in the Asia-Pacific region, mainly in the countries: North and South Korea, Japan, China, Taiwan, India, Indonesia, Thailand, Sri Lanka, and the Philippines (Xu et al., 2017). The entire Southeast Asia region and adjacent regions are known as the 'Tsutsugamushi Triangle' (Xu et al., 2017; Jiang and Richards, 2018). According to the available statistics, there are nearly one million people at risk of this disease and around one million individuals infected with this disease annually (Kelly et al., 2009). However, being a neglected disease, the number of cases reported could be an underestimation.

Sri Lanka (in the past known as Ceylon) is a country in this region with an increasing trend of scrub typhus cases. Since the great wars (mainly in World War II), this country registers cases of this disease as troops that arrived in the Sri Lankan territory were bitten by chiggers and were infected with *O. tsutsugamushi* (Premaratna et al., 2014).

The control of a vector-borne disease mainly depends on the successful management of vector populations in the environment (Kalra and Bang, 1988). Therefore, information on the availability of vector species and their systematics is of indispensable aspect in designing disease control and management strategies. However, thus far, no study has documented a checklist of chigger mites in the country.

Here, the present work illustrates an inventory of chiggers mites in Sri Lanka for the first time.

2. Materials and methods

The present checklist was compiled with the published literature from 1946 to 2021 in Sri Lanka, with only chiggers identified up to the species level. The checklist is arranged in alphabetical order, following the families to which the species belong (Ewing, 1944; Womersley, 1944; Wen, 1999). The information of each species presents data from its original description if is in Sri Lanka, right after that, all records for the country are cited and written with updated locality and hosts,

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ANEXO 28

Microbial Ecology
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HOST MICROBE INTERACTIONS

Multilayer Networks Assisting to Untangle Direct and Indirect Pathogen Transmission in Bats

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Abstract

The importance of species that connect the different types of interactions is becoming increasingly recognized, and this role may be related to specific attributes of these species. Multilayer networks have two or more layers, which represent different types of interactions, for example, between different parasites and hosts that are nonetheless connected. The understanding of the ecological relationship between bats, ectoparasites, and vector-borne bacteria could shed some light on the complex transmission cycles of these pathogens. In this study, we investigated a multilayer network in Brazil formed by interactions between bat-bacteria, bat-ectoparasite, and ectoparasite-bacteria, and asked how these interactions overlap considering different groups and transmission modes. The multilayer network was composed of 31 nodes (12 bat species, 14 ectoparasite species, and five bacteria genera) and 334 links, distributed over three layers. The multilayer network has low modularity and shows a core-periphery organization, that is, composed of a few generalist species with many interactions and many specialist species participating in few interactions in the multilayer network. The three layers were needed to accurately describe the multilayer structure, while aggregation leads to loss of information. Our findings also demonstrated that the multilayer network is influenced by a specific set of species that can easily be connected to the behavior, life cycle, and type of existing interactions of these species. Four bat species (*Artibeus lituratus*, *A. planirostris*, *Phyllostomus discolor*, and *Platyrrhinus lineatus*), one ectoparasite species (*Steatonyssus*) and three bacteria genera (*Ehrlichia*, hemotropic *Mycoplasma* and *Neorickettsia*) are the most important species for the multilayer network structure. Finally, our study brings an ecological perspective under a multilayer network approach on the interactions between bats, ectoparasites, and pathogens. By using a multilayer approach (different types of interactions), it was possible to better understand these different ecological interactions and how they affect each other, advancing our knowledge on the role of bats and ectoparasites as potential pathogen vectors and reservoirs, as well as the modes of transmission of these pathogens.

Keywords *Bartonella* · Chiroptera · *Ehrlichia* · Hemoplasmas · *Neorickettsia* · Host-parasite association

Introduction

The study of networks provides a robust and powerful framework to understand a variety of systems, such as veterinary epidemiology and the spread of pathogens [1, 2]. By studying the underlying network of a complex system, we can summarize the complex array of interactions, identify interaction patterns (network structure) and, also, provide insights about the processes driven by network structure, such as those involved in the transmission of pathogens [2, 3]. However, natural systems typically exhibit several types of biotic interactions, such as bats interacting with ectoparasites and pathogens interacting with both bats and ectoparasites [1, 4, 5]. Hence, taking advantage of multiple interactions together seems crucial to predict system diversity and stability, with considerable value for the study of wildlife diseases, role of hosts, impact of interactions between pathogens and/or parasites, and modes of transmission [2, 6–8]. Recent advances in multilayer networks have provided an exciting opportunity to analyze complex systems containing multiple biotic interactions. Multilayer networks have two or more layers, representing different types of interactions

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ANEXO 29

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Open Access Full Text Article

Scientific Note

An annotated checklist of fur mites (Trombidiformes: Myobiidae) housed at the Acarological Collection of the Butantan Institute

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Abstract. The fur mites (Trombidiformes: Myobiidae) are true parasites of mammals, especially bats, rodents, and marsupials. In the present study, we examined the fur mites housed at the Acarological Collection of the Butantan Institute (IBSP), Brazil, and providing an annotated checklist of the mites examined, including type species data, new host associations and new locality records.

Keywords: ectoparasites, mammals, mites., IBSP.

ANEXO 30

ACTA
AMAZONICA

http://dx.doi.org/10.1590/1809-4392202200512

SHORT COMMUNICATION

Occurrence of the mite *Acanthonyssus proechimys* (Mesostigmata: Macronyssidae) on a spiny rat in Brazil

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ABSTRACT

Macronyssid mites are ectoparasites of terrestrial vertebrates. We slide-mounted and re-examined mite material collected in a 1987-1989 expedition to Maracá Ecological Station, Roraima State, Brazil. The specimens were identified as *Acanthonyssus proechimys* Yunker and Saunders (Mesostigmata: Macronyssidae), which were collected parasitizing a South American spiny rat, *Proechimys* sp. This represents the first record of *Acanthonyssus* in Brazil.

KEYWORDS: mites, ectoparasites, *Proechimys*, new record

Ocorrência do ácaro *Acanthonyssus proechimys* (Mesostigmata: Macronyssidae) em um echimídeo no Brasil

RESUMO

Os ácaros macronissídeos são ectoparasitas de vertebrados terrestres. Nós montamos e reexaminamos material de ácaros coletado em uma expedição entre 1987-1989 à Estação Ecológica de Maracá, Estado de Roraima, Brasil. Os espécimes foram identificados como *Acanthonyssus proechimys* Yunker e Saunders (Mesostigmata: Macronyssidae), que haviam sido coletados parasitando um echimídeo sul-americano, *Proechimys* sp. Este é o primeiro registro de *Acanthonyssus* no Brasil.

PALAVRAS-CHAVE: ácaros, ectoparasitas, *Proechimys*, novo registro

The family Macronyssidae Oudemans, 1936 has 35 known genera worldwide (Radovsky 2010; Orlova et al. 2017; Bassini-Silva *et al.* 2021; Gomes-Almeida and Pepato 2021). The genus *Acanthonyssus* Yunker and Radovsky, 1966 has two valid species: *Acanthonyssus dentipes* (Strandtmann and Eads, 1947) and *Acanthonyssus proechimys* Yunker and Saunders, 1973. *Acanthonyssus dentipes* was described parasitizing hispid cotton rats, *Sigmodon hispidus* Say & Ord, 1825 (Rodentia: Cricetidae) in Texas state, USA (Strandtmann and Eads 1947), while *A. proechimys* was described parasitizing the Tomes's spiny rat, *Proechimys semispinosus* Tomes, 1860, the cayenne spiny rat, *Proechimys guyannensis* (É. Geoffroy, 1803), and an undetermined *Proechimys* sp. (Rodentia: Echimyidae) in Zulia State, Venezuela (Yunker and and Saunders 1973). Despite the possible specificity to *Proechimys*, associations of *A. proechimys* with *Heteromys anomalus* (Thompson, 1815) (Rodentia: Heteromyidae), *S. hispidus*, *Zygodontomys brevicauda* Allen & Chapman, 1893 (Rodentia: Cricetidae), a squirrel, some marsupials, and a bat have been recorded (Yunker and Saunders 1973). So far, *A. proechimys* has not been recorded outside Venezuela.

The material examined in the present study originated from an expedition to Maracá Ecological Station (3°24'04"N, 61°39'19"W), a fluvial island in Roraima state, northern Brazil, organized and sponsored by the Royal Geographical Society (UK) and Instituto Nacional de Pesquisas da Amazônia (INPA), Manaus, Amazonas State, Brazil, between 1987 and 1989. Ectoparasites including mites were collected from small mammals during this expedition and stored in 70% ethanol at the Ectoparasite Sector of the Department of Parasitology of Universidade Federal de Minas Gerais (UFMG) (Linardi *et al.* 1991).

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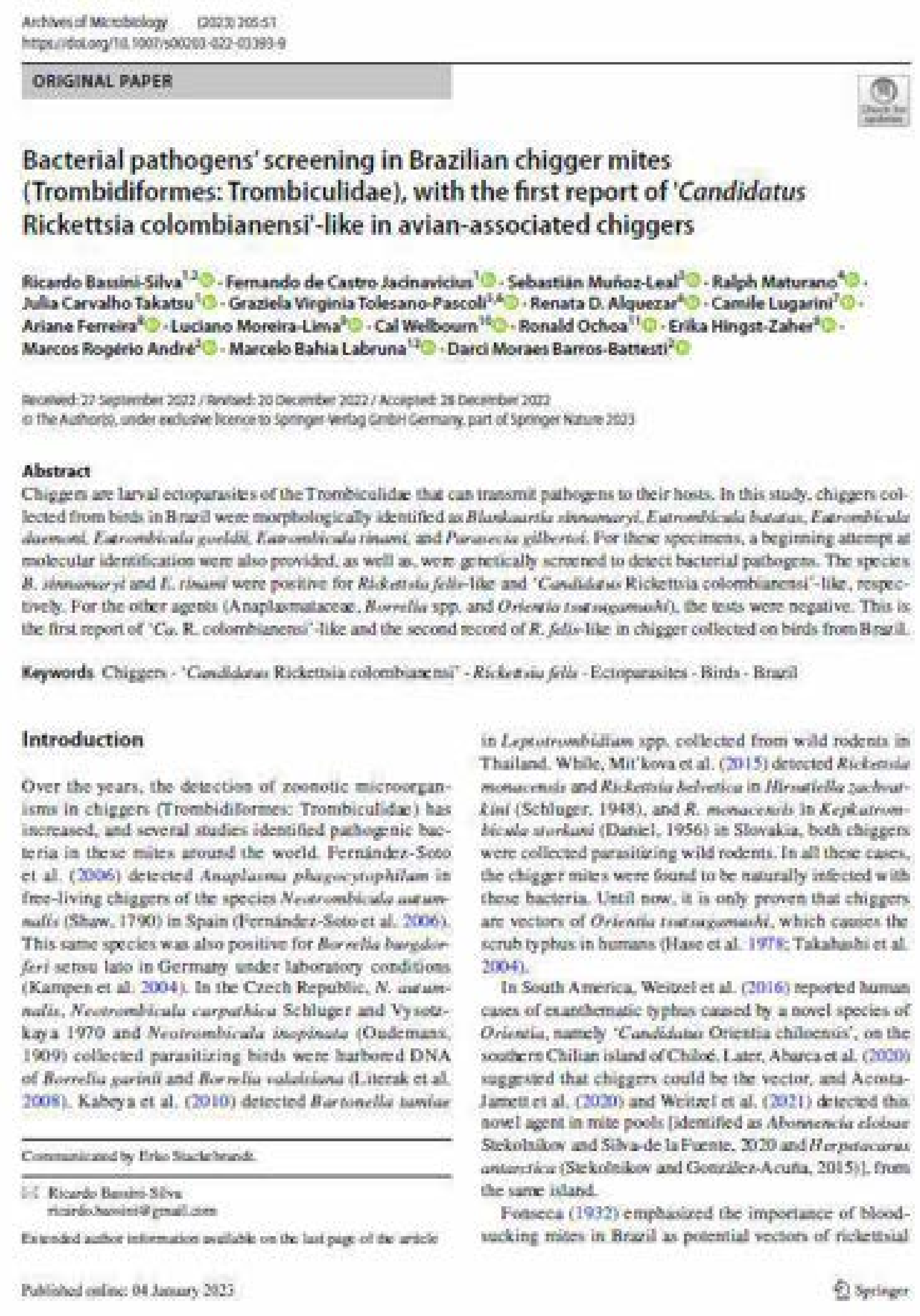
ANEXO 31



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ORIGINAL PAPER

Bacterial pathogens' screening in Brazilian chigger mites (Trombidiformes: Trombiculidae), with the first report of '*Candidatus* Rickettsia colombianensi'-like in avian-associated chiggers

Ricardo Bassini-Silva[1,2] · Fernando de Castro Jacinavicius[1] · Sebastián Muñoz-Leal[3] · Ralph Maturano[4] · Julia Carvalho Takatsu[1] · Graziela Virginia Tolesano-Pascoli[5,6] · Renata D. Alquezar[6] · Camile Lugarini[7] · Ariane Ferreira[8] · Luciano Moreira-Lima[9] · Cal Welbourn[10] · Ronald Ochoa[11] · Erika Hingst-Zaher[8] · Marcos Rogério André[2] · Marcelo Bahia Labruna[1,2] · Darci Moraes Barros-Battesti[2]

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Abstract

Chiggers are larval ectoparasites of the Trombiculidae that can transmit pathogens to their hosts. In this study, chiggers collected from birds in Brazil were morphologically identified as *Blankaartia sinnamaryi*, *Eutrombicula batatas*, *Eutrombicula daemoni*, *Eutrombicula goeldii*, *Eutrombicula tinami*, and *Parasecia gilbertoi*. For these specimens, a beginning attempt at molecular identification were also provided, as well as, were genetically screened to detect bacterial pathogens. The species *B. sinnamaryi* and *E. tinami* were positive for *Rickettsia felis*-like and '*Candidatus* Rickettsia colombianensi'-like, respectively. For the other agents (Anaplasmataceae, *Borrelia* spp. and *Orientia tsutsugamushi*), the tests were negative. This is the first report of '*Ca.* R. colombianensi'-like and the second record of *R. felis*-like in chigger collected on birds from Brazil.

Keywords Chiggers · '*Candidatus* Rickettsia colombianensi' · *Rickettsia felis* · Ectoparasites · Birds · Brazil

Introduction

Over the years, the detection of zoonotic microorganisms in chiggers (Trombidiformes: Trombiculidae) has increased, and several studies identified pathogenic bacteria in these mites around the world. Fernández-Soto et al. (2006) detected *Anaplasma phagocytophilum* in free-living chiggers of the species *Neotrombicula autumnalis* (Shaw, 1790) in Spain (Fernández-Soto et al. 2006). This same species was also positive for *Borrelia burgdorferi* sensu lato in Germany under laboratory conditions (Kampen et al. 2004). In the Czech Republic, *N. autumnalis*, *Neotrombicula carpathica* Schluger and Vysotzkaya 1970 and *Neotrombicula inopinata* (Oudemans, 1909) collected parasitizing birds were harbored DNA of *Borrelia garinii* and *Borrelia valaisiana* (Literak et al. 2008). Kabeya et al. (2010) detected *Bartonella tamiae* in *Leptotrombidium* spp. collected from wild rodents in Thailand. While, Mit'ková et al. (2015) detected *Rickettsia monacensis* and *Rickettsia helvetica* in *Hirsutiella zachvatkini* (Schluger, 1948), and *R. monacensis* in *Kepkatrombicula storkani* (Daniel, 1956) in Slovakia, both chiggers were collected parasitizing wild rodents. In all these cases, the chigger mites were found to be naturally infected with these bacteria. Until now, it is only proven that chiggers are vectors of *Orientia tsutsugamushi*, which causes the scrub typhus in humans (Hase et al. 1978; Takahashi et al. 2004).

In South America, Weitzel et al. (2016) reported human cases of exanthematic typhus caused by a novel species of *Orientia*, namely '*Candidatus* Orientia chiloensis', on the southern Chilean island of Chiloé. Later, Abarca et al. (2020) suggested that chiggers could be the vector, and Acosta-Jamett et al. (2020) and Weitzel et al. (2021) detected this novel agent in mite pools [identified as *Abonnencia eloisae* Stekolnikov and Silva-de la Fuente, 2020 and *Herpetacarus antarctica* (Stekolnikov and González-Acuña, 2015)], from the same island.

Fonseca (1932) emphasized the importance of blood-sucking mites in Brazil as potential vectors of rickettsial

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ANEXO 32

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Eutrombicula cochinocaensis n. sp.: a chigger (Trombidiformes: trombiculidae) parasite of camelids (Cetartiodactyla: camelidae) in Argentina

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ABSTRACT
The known chigger fauna of Argentina comprises 17 species organized in the families Trombiculidae (10) and Leeuwenhoekiidae (7). The present study describes a new species of *Eutrombicula* with drawings, phase contrast microscopy images, and SEM images. This chigger was collected parasitizing a vicuna in Abra Pampa City, Jujuy Province. It is the first time a chigger from Argentina has been collected from the family Camelidae.

http://www.zoobank.org/urn:lsid:zoobank.org:act:48F5F4EE-27CD-4FB5-959D-6ED3137D84C5

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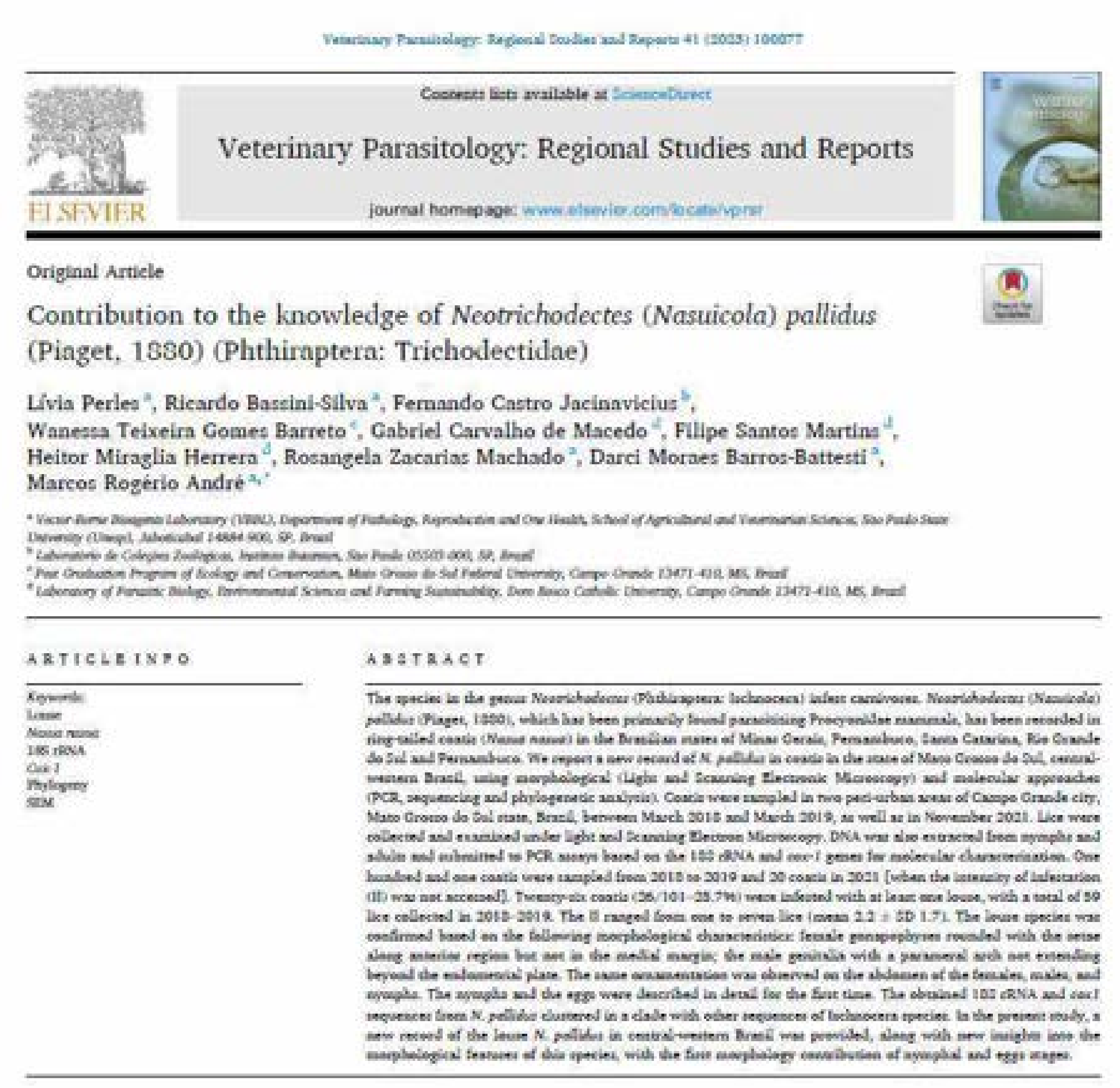
KEYWORDS
Acari; ectoparasite; new species; South America; vicuna

ANEXO 33



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Original Article

Contribution to the knowledge of *Neotrichodectes* (*Nasuicola*) *pallidus* (Piaget, 1880) (Phthiraptera: Trichodectidae)

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Louse
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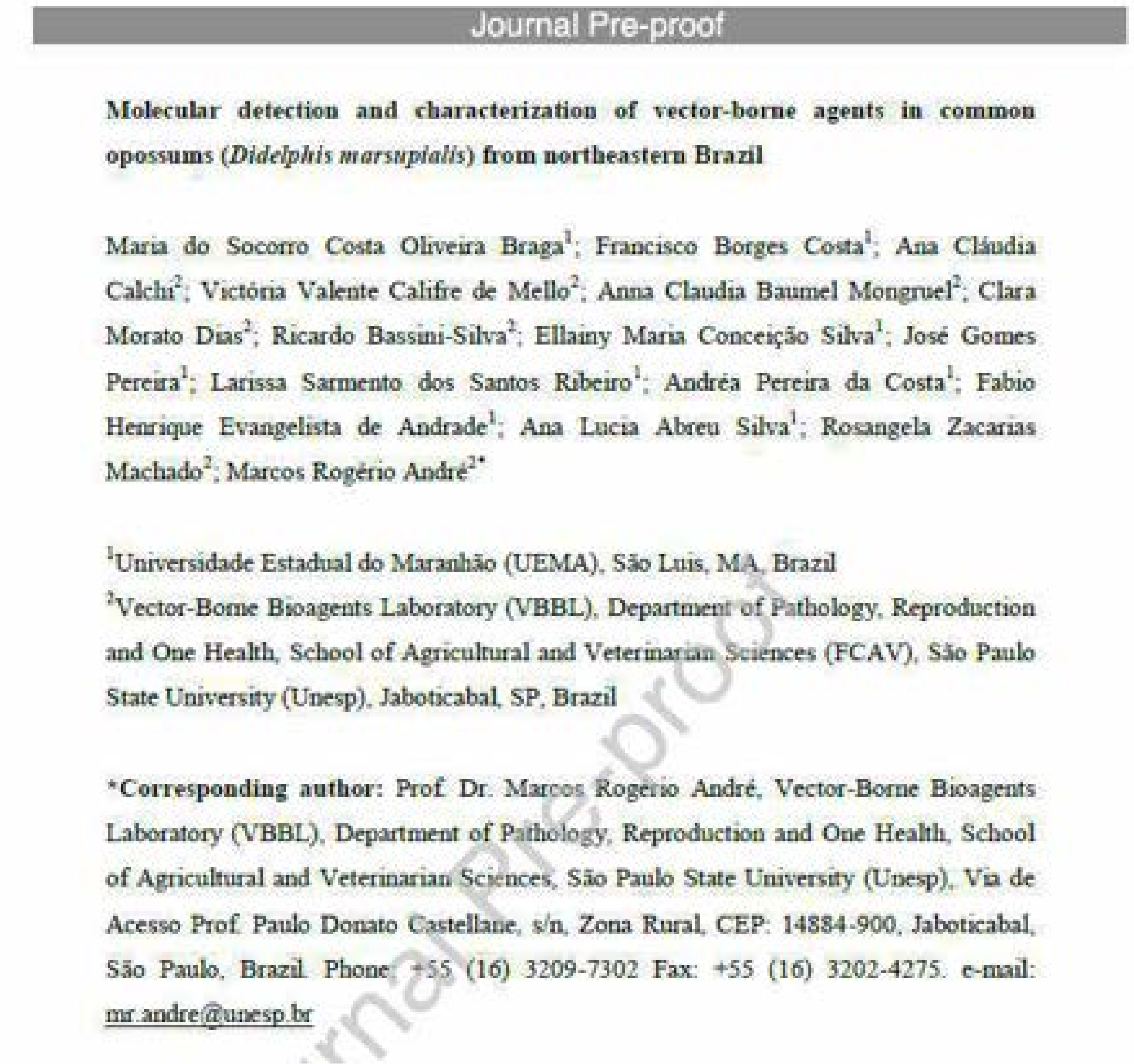
Phylogeny
SEM

ABSTRACT

The species in the genus *Neotrichodectes* (Phthiraptera: Ischnocera) infest carnivores. *Neotrichodectes* (*Nasuicola*) *pallidus* (Piaget, 1880), which has been primarily found parasitizing Procyonidae mammals, has been recorded in ring-tailed coatis (*Nasua nasua*) in the Brazilian states of Minas Gerais, Pernambuco, Santa Catarina, Rio Grande do Sul and Pernambuco. We report a new record of *N. pallidus* in coatis in the state of Mato Grosso do Sul, central-western Brazil, using morphological (Light and Scanning Electronic Microscopy) and molecular approaches (PCR, sequencing and phylogenetic analysis). Coatis were sampled in two peri-urban areas of Campo Grande city, Mato Grosso do Sul state, Brazil, between March 2018 and March 2019, as well as in November 2021. Lice were collected and examined under light and Scanning Electron Microscopy. DNA was also extracted from nymphs and adults and submitted to PCR assays based on the 18S rRNA and *cox-1* genes for molecular characterization. One hundred and one coatis were sampled from 2018 to 2019 and 20 coatis in 2021 [when the intensity of infestation (II) was not accessed]. Twenty-six coatis (26/101–25.7%) were infested with at least one louse, with a total of 59 lice collected in 2018–2019. The II ranged from one to seven lice (mean 2.2 ± SD 1.7). The louse species was confirmed based on the following morphological characteristics: female gonapophyses rounded with the setae along anterior region but not in the medial margin; the male genitalia with a parameral arch not extending beyond the endomeral plate. The same ornamentation was observed on the abdomen of the females, males, and nymphs. The nymphs and the eggs were described in detail for the first time. The obtained 18S rRNA and *cox1* sequences from *N. pallidus* clustered in a clade with other sequences of Ischnocera species. In the present study, a new record of the louse *N. pallidus* in central-western Brazil was provided, along with new insights into the morphological features of this species, with the first morphology contribution of nymphal and eggs stages.

ANEXO 34



Journal Pre-proof

Molecular detection and characterization of vector-borne agents in common opossums (*Didelphis marsupialis*) from northeastern Brazil

Maria do Socorro Costa Oliveira Braga[1]; Francisco Borges Costa[1]; Ana Cláudia Calchi[2]; Victória Valente Califre de Mello[2]; Anna Claudia Baumel Mongruel[2]; Clara Morato Dias[2]; Ricardo Bassini-Silva[2]; Ellainy Maria Conceição Silva[1]; José Gomes Pereira[1]; Larissa Sarmento dos Santos Ribeiro[1]; Andréa Pereira da Costa[1]; Fabio Henrique Evangelista de Andrade[1]; Ana Lucia Abreu Silva[1]; Rosangela Zacarias Machado[2]; Marcos Rogério André[2]*

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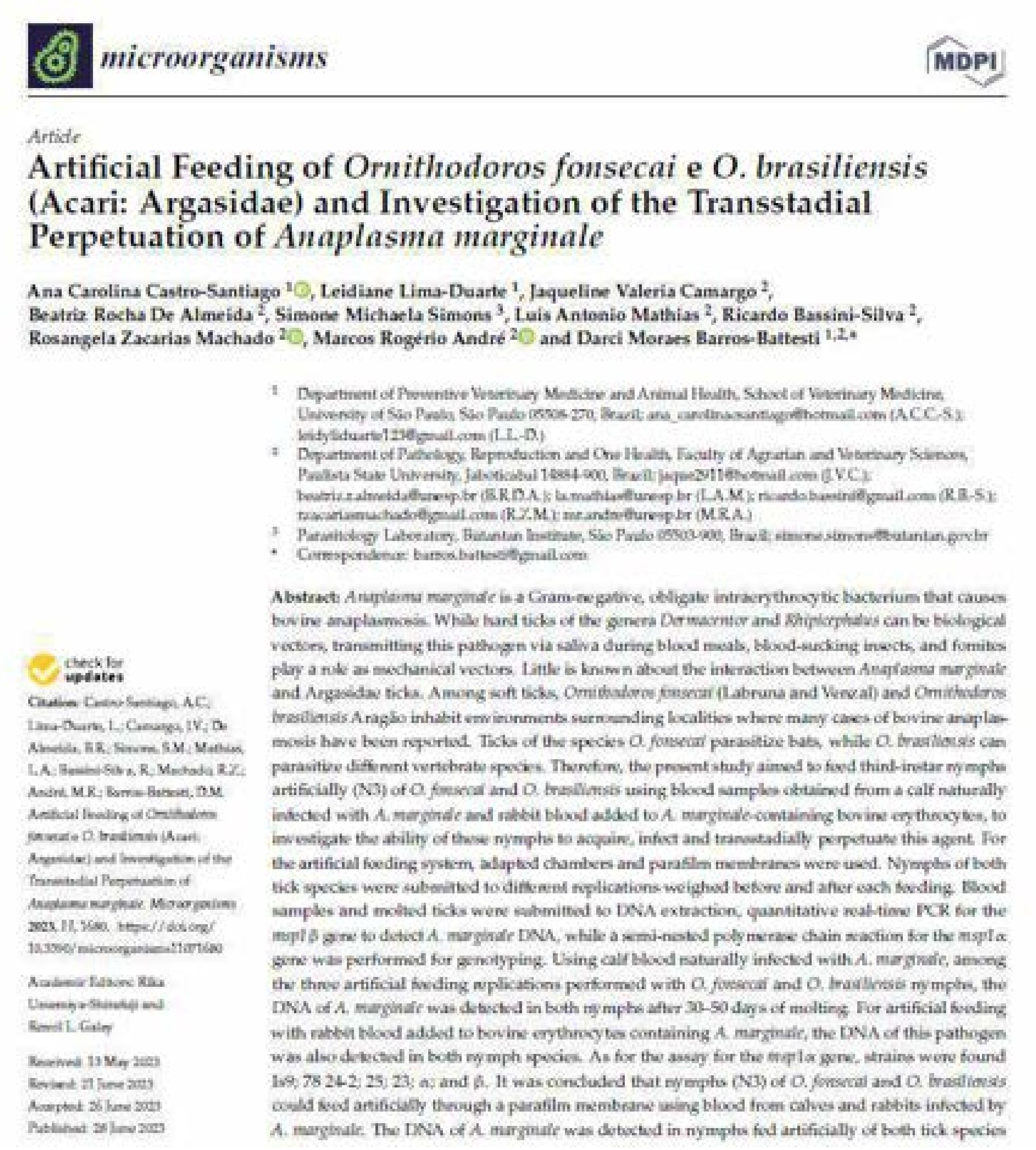
ANEXO 35



microorganisms

Article

Artificial Feeding of *Ornithodoros fonsecai* e *O. brasiliensis* (Acari: Argasidae) and Investigation of the Transstadial Perpetuation of *Anaplasma marginale*

Ana Carolina Castro-Santiago [1], Leidiane Lima-Duarte [1], Jaqueline Valeria Camargo [2], Beatriz Rocha De Almeida [2], Simone Michaela Simons [3], Luis Antonio Mathias [2], Ricardo Bassini-Silva [2], Rosangela Zacarias Machado [2], Marcos Rogério André [2] and Darci Moraes Barros-Battesti [1,2,*]

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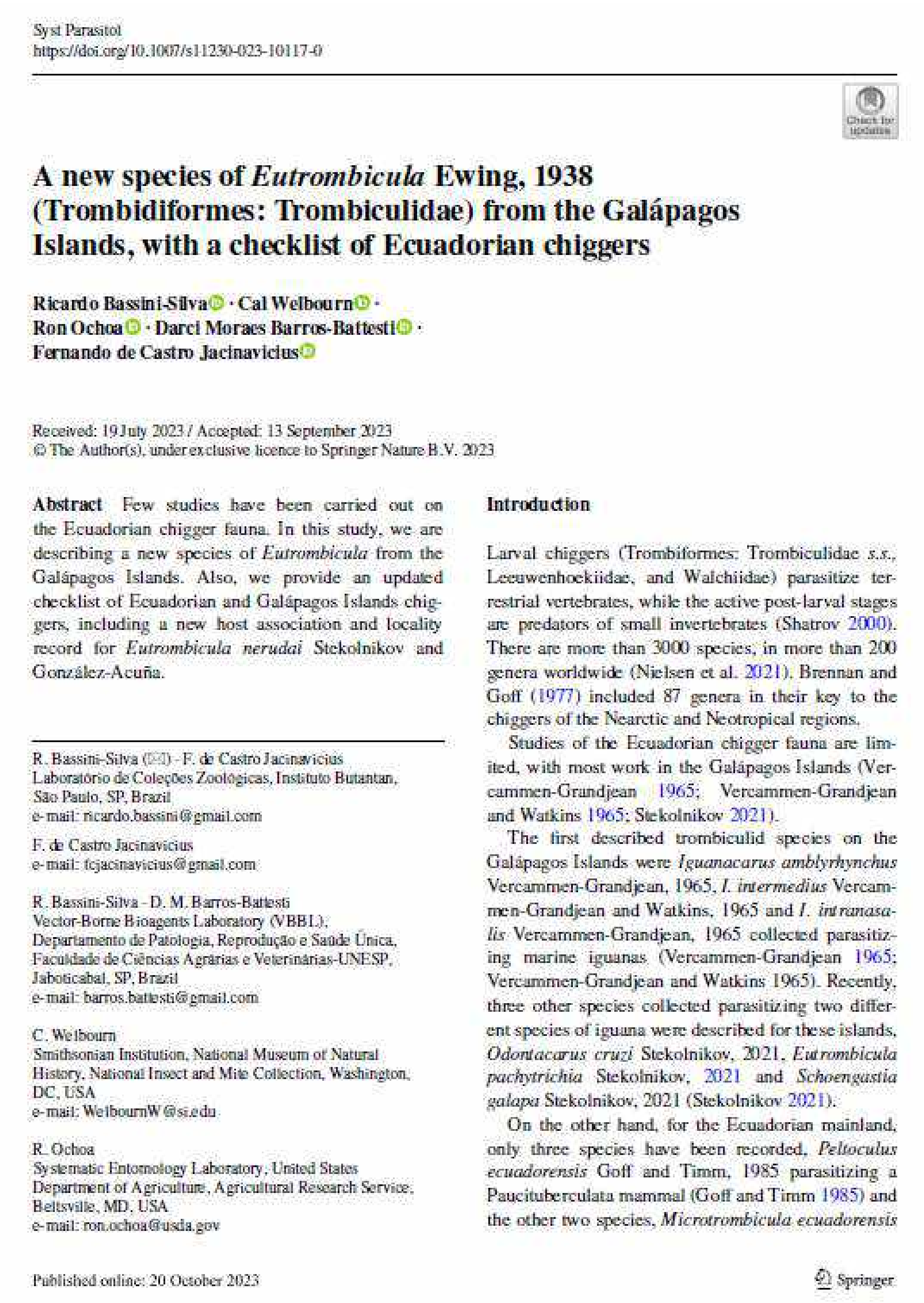
Abstract: *Anaplasma marginale* is a Gram-negative, obligate intraerythrocytic bacterium that causes bovine anaplasmosis. While hard ticks of the genera *Dermacentor* and *Rhipicephalus* can be biological vectors, transmitting this pathogen via saliva during blood meals, blood-sucking insects, and fomites play a role as mechanical vectors. Little is known about the interaction between *Anaplasma marginale* and Argasidae ticks. Among soft ticks, *Ornithodoros fonsecai* (Labruna and Venzal) and *Ornithodoros brasiliensis* Aragão inhabit environments surrounding localities where many cases of bovine anaplasmosis have been reported. Ticks of the species *O. fonsecai* parasitize bats, while *O. brasiliensis* can parasitize different vertebrate species. Therefore, the present study aimed to feed third-instar nymphs artificially (N3) of *O. fonsecai* and *O. brasiliensis* using blood samples obtained from a calf naturally infected with *A. marginale* and rabbit blood added to *A. marginale*-containing bovine erythrocytes, to investigate the ability of these nymphs to acquire, infect and transstadially perpetuate this agent. For the artificial feeding system, adapted chambers and parafilm membranes were used. Nymphs of both tick species were submitted to different replications weighed before and after each feeding. Blood samples and molted ticks were submitted to DNA extraction, quantitative real-time PCR for the *msp1β* gene to detect *A. marginale* DNA, while a semi-nested polymerase chain reaction for the *msp1α* gene was performed for genotyping. Using calf blood naturally infected with *A. marginale*, among the three artificial feeding replications performed with *O. fonsecai* and *O. brasiliensis* nymphs, the DNA of *A. marginale* was detected in both nymphs after 30–50 days of molting. For artificial feeding with rabbit blood added to bovine erythrocytes containing *A. marginale*, the DNA of this pathogen was also detected in both nymph species. As for the assay for the *msp1α* gene, strains were found 1s9; 78 24-2; 25; 23; α; and β. It was concluded that nymphs (N3) of *O. fonsecai* and *O. brasiliensis* could feed artificially through a parafilm membrane using blood from calves and rabbits infected by *A. marginale*. The DNA of *A. marginale* was detected in nymphs fed artificially of both tick species

ANEXO 36



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A new species of *Eutrombicula* Ewing, 1938 (Trombidiformes: Trombiculidae) from the Galápagos Islands, with a checklist of Ecuadorian chiggers

Ricardo Bassini-Silva · Cal Welbourn · Ron Ochoa · Darci Moraes Barros-Battesti · Fernando de Castro Jacinavicius

Received: 19 July 2023 / Accepted: 13 September 2023

Abstract Few studies have been carried out on the Ecuadorian chigger fauna. In this study, we are describing a new species of *Eutrombicula* from the Galápagos Islands. Also, we provide an updated checklist of Ecuadorian and Galápagos Islands chiggers, including a new host association and locality record for *Eutrombicula nerudai* Stekolnikov and González-Acuña.

Introduction

Larval chiggers (Trombiformes: Trombiculidae *s.s.*, Leeuwenhoekiidae, and Walchiidae) parasitize terrestrial vertebrates, while the active post-larval stages are predators of small invertebrates (Shatrov 2000). There are more than 3000 species, in more than 200 genera worldwide (Nielsen et al. 2021). Brennan and Goff (1977) included 87 genera in their key to the chiggers of the Nearctic and Neotropical regions.

Studies of the Ecuadorian chigger fauna are limited, with most work in the Galápagos Islands (Vercammen-Grandjean 1965; Vercammen-Grandjean and Watkins 1965; Stekolnikov 2021).

The first described trombiculid species on the Galápagos Islands were *Iguanacarus amblyrhynchus* Vercammen-Grandjean, 1965, *I. intermedius* Vercammen-Grandjean and Watkins, 1965 and *I. intranasalis* Vercammen-Grandjean, 1965 collected parasitizing marine iguanas (Vercammen-Grandjean 1965; Vercammen-Grandjean and Watkins 1965). Recently, three other species collected parasitizing two different species of iguana were described for these islands, *Odontacarus cruzi* Stekolnikov, 2021, *Eutrombicula pachytrichia* Stekolnikov, 2021 and *Schoengastia galapa* Stekolnikov, 2021 (Stekolnikov 2021).

On the other hand, for the Ecuadorian mainland, only three species have been recorded, *Peltoculus ecuadorensis* Goff and Timm, 1985 parasitizing a Paucituberculata mammal (Goff and Timm 1985) and the other two species, *Microtrombicula ecuadorensis*

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ANEXO 37

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Scientific Note

New record of the chewing louse *Myrsidea dissimilis* (Kellogg, 1896) (Phthiraptera: Menoponidae) parasitizing a Purple Martin, *Progne subis* (Linnaeus, 1758) (Passeriformes: Hirundinidae) in Amazonas, Brazil

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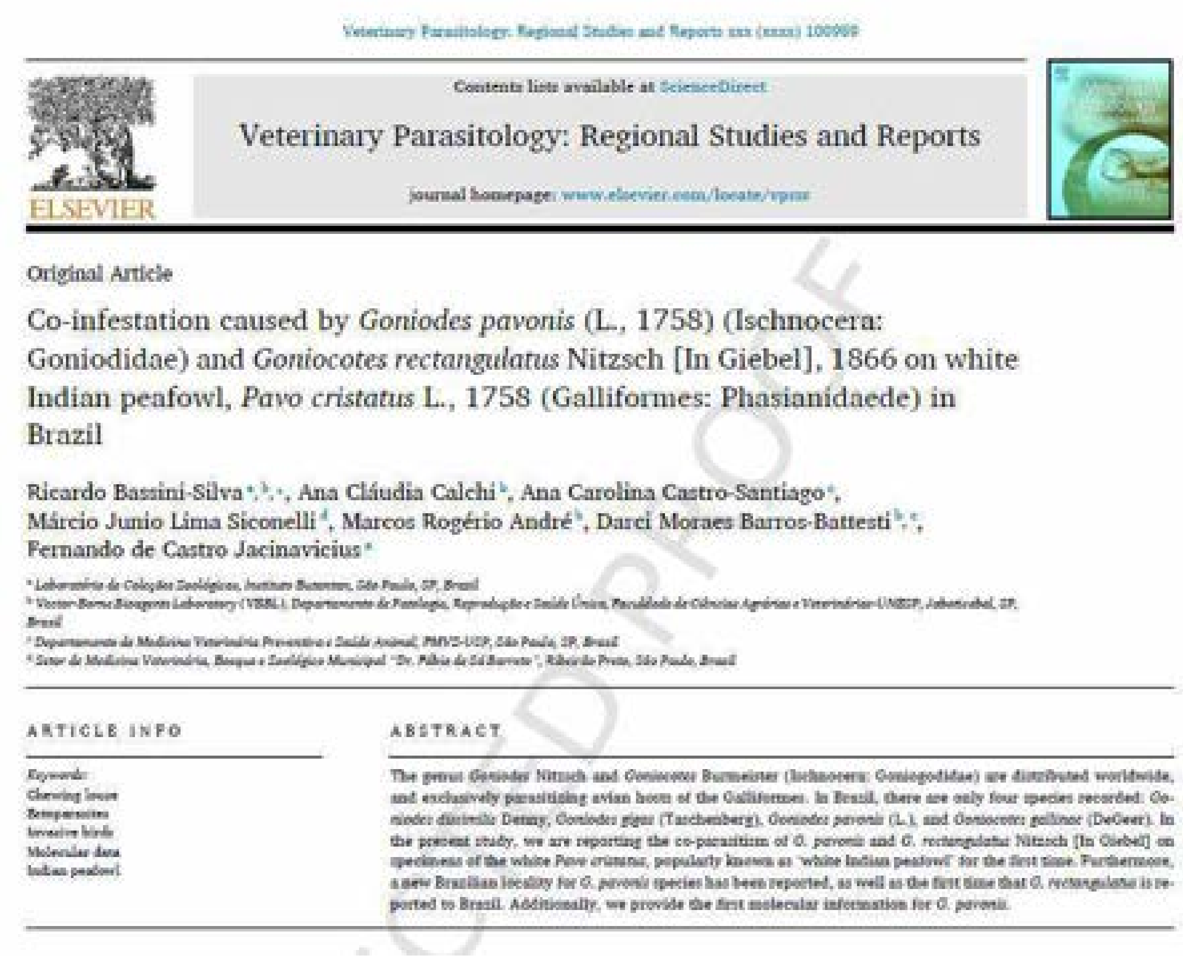
Abstract. The chewing lice are obligatory ectoparasites of birds and mammals distributed worldwide. From an expedition to Comaru Island, Brazilian Amazon, a chewing louse parasitizing a Purple Martin [*Progne subis* (Linnaeus, 1758)], a Neotropical migrant, was collected. The specimen was slide-mounted and identified as a male of *Myrsidea dissimilis* (Kellogg, 1896) (Phthiraptera: Menoponidae). It represents the first record of this species in the Amazonas State and in Central Amazon.

Keywords: lice, ectoparasites, swallows, migratory birds, Central Amazon.

ANEXO 38



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Original Article

Co-infestation caused by *Goniodes pavonis* (L., 1758) (Ischnocera: Goniodidae) and *Goniocotes rectangulatus* Nitzsch [In Giebel], 1866 on white Indian peafowl, *Pavo cristatus* L., 1758 (Galliformes: Phasianidaede) in Brazil

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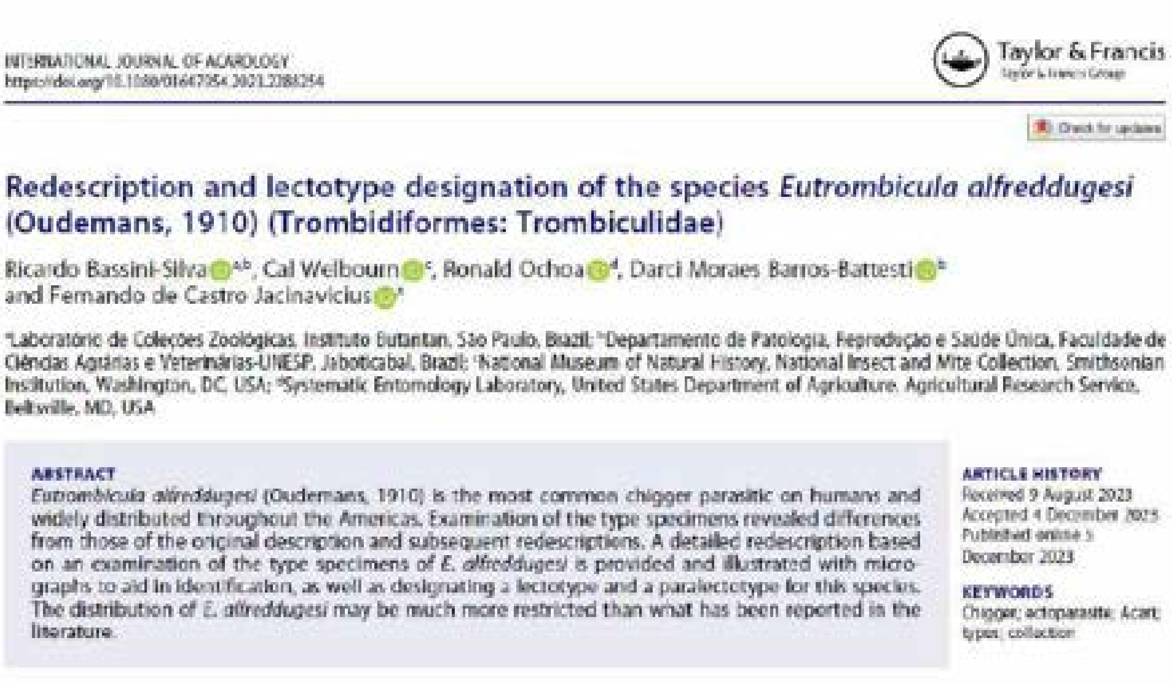
ABSTRACT

The genus *Goniodes* Nitzsch and *Goniocotes* Burmeister (Ischnocera: Goniogodidae) are distributed worldwide, and exclusively parasitizing avian hosts of the Galliformes. In Brazil, there are only four species recorded: *Goniodes dissimilis* Denny, *Goniodes gigas* (Taschenberg), *Goniodes pavonis* (L.), and *Goniocotes gallinae* (DeGeer). In the present study, we are reporting the co-parasitism of *G. pavonis* and *G. rectangulatus* Nitzsch [In Giebel] on specimens of the white *Pavo cristatus*, popularly known as 'white Indian peafowl' for the first time. Furthermore, a new Brazilian locality for *G. pavonis* species has been reported, as well as the first time that *G. rectangulatus* is reported to Brazil. Additionally, we provide the first molecular information for *G. pavonis*.

ANEXO 39



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Redescription and lectotype designation of the species *Eutrombicula alfreddugesi* (Oudemans, 1910) (Trombidiformes: Trombiculidae)

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ABSTRACT

Eutrombicula alfreddugesi (Oudemans, 1910) is the most common chigger parasitic on humans and widely distributed throughout the Americas. Examination of the type specimens revealed differences from those of the original description and subsequent redescriptions. A detailed redescription based on an examination of the type specimens of *E. alfreddugesi* is provided and illustrated with micrographs to aid in identification, as well as designating a lectotype and a paralectotype for this species. The distribution of *E. alfreddugesi* may be much more restricted than what has been reported in the literature.

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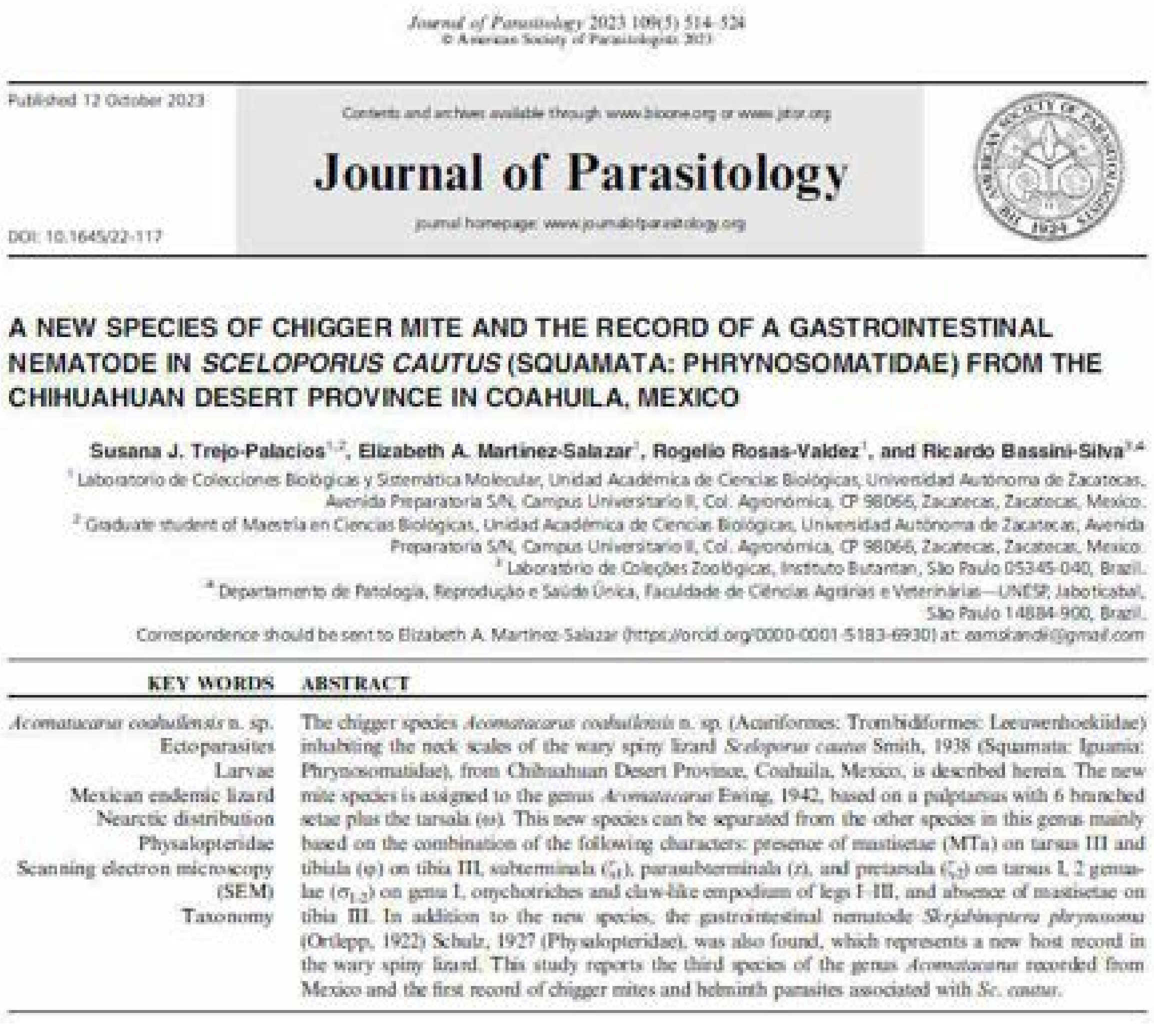
KEYWORDS
Chigger; ectoparasite; Acari; types; collection

ANEXO 40



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A NEW SPECIES OF CHIGGER MITE AND THE RECORD OF A GASTROINTESTINAL NEMATODE IN *SCELOPORUS CAUTUS* (SQUAMATA: PHRYNOSOMATIDAE) FROM THE CHIHUAHUAN DESERT PROVINCE IN COAHUILA, MEXICO

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KEY WORDS

Acomatacarus coahuilensis n. sp.
Ectoparasites
Larvae
Mexican endemic lizard
Nearctic distribution
Physalopteridae
Scanning electron microscopy (SEM)
Taxonomy

ABSTRACT

The chigger species *Acomatacarus coahuilensis* n. sp. (Acariformes: Trombidiformes: Leeuwenhoekiidae) inhabiting the neck scales of the wary spiny lizard *Sceloporus cautus* Smith, 1938 (Squamata: Iguania: Phrynosomatidae), from Chihuahuan Desert Province, Coahuila, Mexico, is described herein. The new mite species is assigned to the genus *Acomatacarus* Ewing, 1942, based on a palptarsus with 6 branched setae plus the tarsala (ω). This new species can be separated from the other species in this genus mainly based on the combination of the following characters: presence of mastisetae (MTa) on tarsus III and tibiala (φ) on tibia III, subterminala (ζ_1), parasubterminala (z), and pretarsala (ζ_2) on tarsus I, 2 genualae (σ_{1-2}) on genu I, onychotriches and claw-like empodium of legs I–III, and absence of mastisetae on tibia III. In addition to the new species, the gastrointestinal nematode *Skrjabinoptera phrynosoma* (Ortlepp, 1922) Schulz, 1927 (Physalopteridae), was also found, which represents a new host record in the wary spiny lizard. This study reports the third species of the genus *Acomatacarus* recorded from Mexico and the first record of chigger mites and helminth parasites associated with *Sc. cautus*.

ANEXO 41

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Short Communication

Noteworthy records of the ticks *Ornithodoros rostratus and Amblyomma sculptum* parasitizing *Pteronura brasiliensis* in the central-western region of Brazil, with pathogen investigation notes

Interessantes registros dos carrapatos *Ornithodoros rostratus* e *Amblyomma sculptum* parasitando *Pteronura brasiliensis* na região centro-oeste do Brasil, com informações sobre a investigação de patógenos

Darci Moraes Barros-Battesti[1,2*]; Marcos Rogério André[1]; Estevam Guilherme Lux Hoppe[1];
Gustavo Seron[1]; Ricardo Bassini-Silva[1,3]; Ana Claúdia Calchi[1]; Lívia Oliveira Andrade[1];
Patrícia Parreira Perin[1]; Thiago Fernandes Martins[2,4]; Ana Carolina Castro-Santiago[2];
Caroline Leuchtenberger[5,6,7]; Samara Almeida[5,7,8]; Nathalie Foerster[6,7]; Mariana Furtado[5];
Fernando de Castro Jacinavicius[3]

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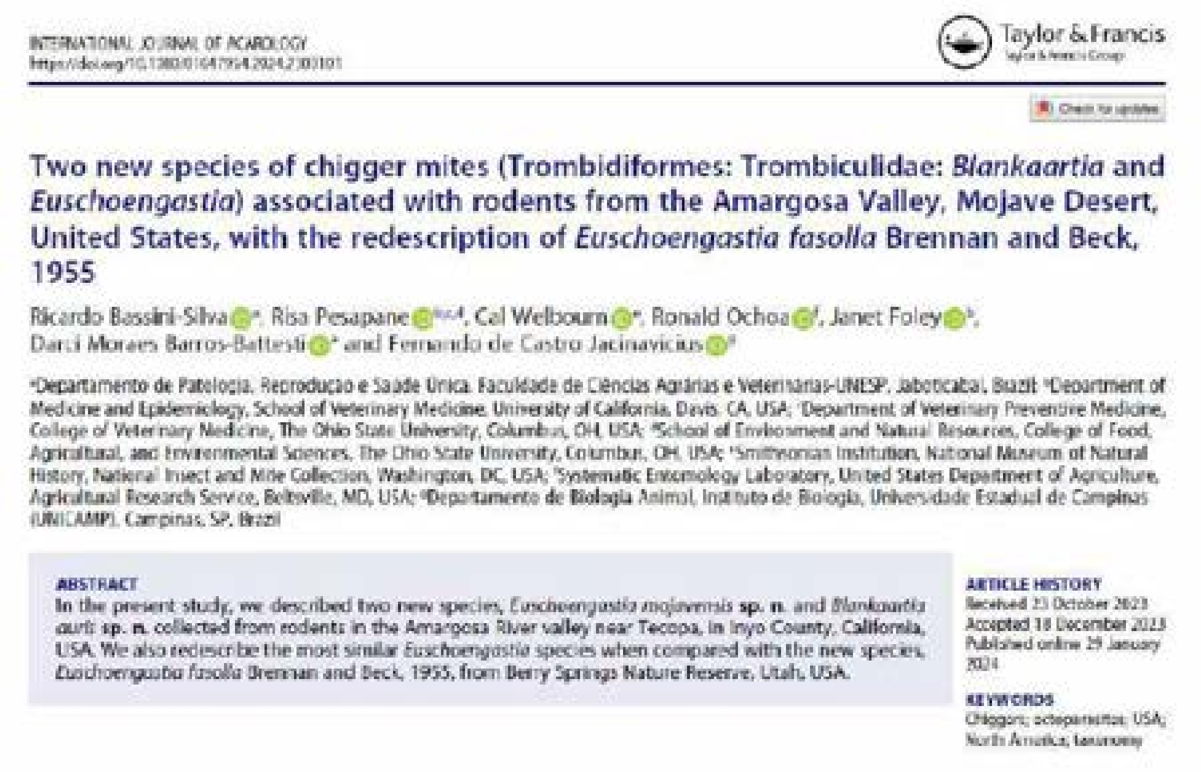
ANEXO 42



INTERNATIONAL JOURNAL OF ACAROLOGY
https://doi.org/10.1080/01647954.2024.2303101

Two new species of chigger mites (Trombidiformes: Trombiculidae: *Blankaartia* and *Euschoengastia*) associated with rodents from the Amargosa Valley, Mojave Desert, United States, with the redescription of *Euschoengastia fasolla* Brennan and Beck, 1955

Ricardo Bassini-Silva[a], Risa Pesapane[b,c,d], Cal Welbourn[e], Ronald Ochoa[f], Janet Foley[b],
Darci Moraes Barros-Battesti[a] and Fernando de Castro Jacinavicius[g]

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ABSTRACT
In the present study, we described two new species, *Euschoengastia mojavensis* **sp. n.** and *Blankaartia auri* **sp. n.** collected from rodents in the Amargosa River valley near Tecopa, in Inyo County, California, USA. We also redescribe the most similar *Euschoengastia* species when compared with the new species, *Euschoengastia fasolla* Brennan and Beck, 1955, from Berry Springs Nature Reserve, Utah, USA.

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Published online 29 January 2024

KEYWORDS
Chiggers; ectoparasites; USA; North America; taxonomy

ANEXO 43

INTERNATIONAL JOURNAL OF ACAROLOGY
https://doi.org/10.1080/01647954.2024.2314091

Taylor & Francis
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A catalogue of spinturnicid species (Mesostigmata: Spinturnicidae) from Brazil: distribution, host-specificity, and new locality records

Ricardo Bassini-Silva[a], Ana Carolina Castro-Santiago[b], Ana Cláudia Calchi[a], Érica M. de Mello[c], Leormando Fortunato Dornelas Jr[d,e], Amanda de Oliveira Viana[f], Irineu Norberto Cunha[g], Gilberto Sabino-Santos[h,i], Allyson dos Santos da Silva[j], Wallace Rodrigues Telino-Júnior[k], Luiz Augustinho Menezes da Silva[l], Gabriella Soares[m], Ashley P. G. Dowling[n], Jaqueline Bianque de Oliveira[o], Marcos Rogério André[a], Luis Marcelo Aranha Camargo[d,p,q,r], Erika Hingst-Zaher[g], Darci Moraes Barros-Battesti[a] and Fernando de Castro Jacinavicius[a]

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ABSTRACT
Spinturnicid mites are ectoparasites exclusively of bats. Herein, we provide a comprehensive catalogue of spinturnicid species recorded in Brazil focusing on their distribution nationwide. This catalogue listed 16 spinturnicid species into four different genera, and a key for the genera recorded in Brazil. Also, it provides new locality records for four species: *Cameronieta almaensis* Almeida, Gettinger and Gardner, *Periglischrus acutisternus* Machado-Allison, *Periglischrus caligus* Kolenati, and *Periglischrus iheringi* Oudemans. Additionally, this study includes a detailed discussion on the host-specificity and molecular data of these mites.

ARTICLE HISTORY
Received 23 October 2023
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KEYWORDS
Mites; ectoparasite; bats; Chiroptera; new records

ANEXO 44

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Eutrichophilus cordiceps Mjöberg, 1910 (Ischnocera: Trichodectidae) in Spiny Tree Porcupines (*Coendou villosus*): New locality records and the first molecular evidence of association with *Bartonella* sp.

Ricardo Bassini-Silva[a,*], Maria Eduarda Moraes das Chagas[a], Victor de Souza Mello-Oliveira[a], Ana Cláudia Calchi[a], Ana Carolina Castro-Santiago[b], Lívia de Oliveira Andrade[a], Gabriela Coelho Benedet[c], Fernanda Mara Aragão Macedo Pereira[d], Lauro Leite Soares-Neto[d], Alícia Giolo Hippólito[d], Estevam Guilherme Lux Hoppe[a], Karin Werther[a], Marcos Rogério André[a], Rosiléia Marinho de Quadros[c,e], Darci Moraes Barros-Battesti[a], Sebastián Muñoz-Leal[f], Fernando de Castro Jacinavicius[g]

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ARTICLE INFO

Keywords:
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Ectoparasites
Erethizontidae
Molecular analysis
New World porcupines
Pathogens

ABSTRACT

The chewing louse genus *Eutrichophilus* Mjöberg has 19 species only associated with porcupines (Rodentia: Erethizontidae). Of these species, *E. cercolabes*, *E. cordiceps*, *E. emersoni*, *E. minor*, *E. moojeni*, and *E. paraguayensis* have been recorded in Brazil. In the present study, we report *E. cordiceps* for the first time in the São Paulo State (Bauru Municipality) and for the second time in the Santa Catarina State (Lages Municipality), providing scanning electron images and light microscopy for the eggs, as well as the first molecular data (16S rRNA) for the genus. Additionally, *Bartonella* sp. was detected for the first time in this chewing lice species.

ANEXO 45

CERTIFICADO

VII SIBAC

ACAROLOGIA EM TEMPOS DE CONECTIVIDADE

6 A 9 DE DEZEMBRO DE 2021

Certificamos que o trabalho **MELICHARID MITES (MESOSTIGMATA: MELICHARIDAE) ASSOCIATED WITH HUMMINGBIRDS (AVES: TROCHILIDAE) IN BRAZIL** foi apresentado por **Júlia Carvalho Takatsu, Ricardo Bassini Silva, Laura C. Peinado, Dra. Claudenice Faxina, Luciano Lima, Erich Fischer, Erika Hingst-Zaher, Jandir Cruz Santos, Gilberto J. Moraes, Ashley P. G. Dowling, Darci Moraes Barros Battesti e Fernando de Castro Jacinavicius**, na forma **Pôster**, na área temática **Acarologia básica e ecologia**, durante o **VII Simpósio Brasileiro de Acarologia (SIBAC)**, realizado em 06/12/2021 a 09/12/2021, de forma virtual.

9 de dezembro de 2021.

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ANEXO 46

Verifique o código de autenticidade [illegible] em https://www.even3.com.br/documentos

CERTIFICADO

VII SIBAC

ACAROLOGIA EM TEMPOS DE CONECTIVIDADE

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Certificamos que o trabalho **A NEW RECORD OF Eutrombicula daemoni BASSINI-SILVA & JACINAVICIUS, 2018 (TROMBIDIFORMES: TROMBICULIDAE) IN ESPÍRITO SANTO STATE, BRAZIL** foi apresentado por **Rodrigo Dos Santos Rodrigues, Ricardo Bassini Silva, Matheus Huang Bastos, KARINE QUADROS, Flávia Clare Goulart De Carvalho, Guilherme Brêtas e Fernando de Castro Jacinavicius**, na forma **Pôster**, na área temática **Acarologia médico-veterinária**, durante o **VII Simpósio Brasileiro de Acarologia (SIBAC)**, realizado em 06/12/2021 a 09/12/2021, de forma virtual.

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José Wagner da S. Melo
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ANEXO 47

IX COPANEO

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LA UNIVERSIDAD AUTÓNOMA DEL CARMEN,
EL IX CONGRESO INTERNACIONAL DE PARASITOLOGÍA NEOTROPICAL
Y LA APHIA OTORGAN LA SIGUIENTE

Constancia

A: Matheus Huang-Bastos, Fernando de Castro Jacinavicius, Ricardo Bassini-Silva, Elaine Amaral, Danieli Silva Valentim, Karina Affeldt Guterres, Darci Moraes Barros-Battesti y Luciana Laitano Dias-de-Castro

Por participar como EXPOSITOR del tema:

LAGOSCHILASCARIS MINOR PARASITIZING A DOMESTIC DOG (*Canis lupus familiriaris*) IN THE SOUTH OF BRAZIL

Presentado en el IX Congreso Internacional de Parasitología Neotropical, **"Ciencia e investigación en parasitología: Creando redes para la salud"**. Realizado del 4 al 6 de octubre del 2021, formato virtual en la Universidad Autónoma del Carmen, Ciudad del Carmen, Campeche, México.

Dra. Ma. Amparo Rodríguez Santiago
Presidenta del COPANEO 2021

Dr. José Alberto Iannacone Oliver
Vicepresidente del COPANEO 2021

ANEXO 48

IX COPANEO

MEXICO-2021

LA UNIVERSIDAD AUTÓNOMA DEL CARMEN,
EL IX CONGRESO INTERNACIONAL DE PARASITOLOGÍA NEOTROPICAL
Y LA APHIA OTORGAN LA SIGUIENTE

Constancia

A: Rodrigo Santos-Rodrigues, Ricardo Bassini-Silva, Matheus Huang-Bastos, Karine Matos de Quadros Araujo, Flavia Clare Goulart de Carvalho, Guilherme Brêtas y Fernando de Castro Jacinavicius

Por participar como EXPOSITOR del tema:

A NEW CASE OF TROMBICULIASIS CAUSED BY *Eutrombicula daemoni* BASSINI-SILVA AND JACINAVICIUS, 2018 (TOMBIDIFORMES: TROMBICULIDAE) IN A DOG FROM BRAZIL

Presentado en el IX Congreso Internacional de Parasitología Neotropical, **"Ciencia e Investigación en parasitología: Creando redes para la salud"**. Realizado del 4 al 6 de octubre del 2021, formato virtual en la Universidad Autónoma del Carmen, Ciudad del Carmen, Campeche, México.

Dra. Ma. Amparo Rodríguez Santiago
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APHIA

Dr. José Alberto Iannacone Oliver
Vicepresidente del COPANEO 2021

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ANEXO 49

IX COPANEO
MEXICO-2021

LA UNIVERSIDAD AUTÓNOMA DEL CARMEN.
EL IX CONGRESO INTERNACIONAL DE PARASITOLOGÍA NEOTROPICAL
Y LA APHIA OTORGAN LA SIGUIENTE

Constancia

A: Rafaela Luiza Arbex, Matheus Huang-Bastos, Ricardo Bassini-Silva, Darci Moraes Barros-Battesti y Fernando de Castro Jacinavicius

Por participar como EXPOSITOR del tema:

SYNONYMY OF THE SPECIES *Quadraseta antillarum* (BRENNAN, 1967) WITH *Quadraseta brennani* GOFF & WHITAKER, 1984 (TROMBIDIFORMES: TROMBICULIDAE)

Presentado en el IX Congreso Internacional de Parasitología Neotropical, "**Ciencia e Investigación en parasitología: Creando redes para la salud**". Realizado del 4 al 6 de octubre del 2021, formato virtual en la Universidad Autónoma del Carmen, Ciudad del Carmen, Campeche, México.

Dra. Ma. Amparo Rodríguez Santiago
Presidenta del COPANEO 2021

APHIA

Dr. José Alberto Iannacone Oliver
Vicepresidente del COPANEO 2021

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ANEXO 50

IX
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MEXICO-2021

LA UNIVERSIDAD AUTÓNOMA DEL CARMEN,
EL IX CONGRESO INTERNACIONAL DE PARASITOLOGÍA NEOTROPICAL
Y LA APHIA OTORGAN LA SIGUIENTE

Constancia

A: Julia Carvalho Takatsu, Ricardo Bassini-Silva, Ron Ochoa y Fernando de Castro Jacinavicius

Por participar como EXPOSITOR del tema:

SLEEPING WITH THE ENEMY: CASE REPORTS OF *Ornithonyssus bursa* (BERLESE 1888) (MESOSTIGMATA: MACRONYSSIDAE) CAUSING DERMATITIS IN HUMANS

Presentado en el IX Congreso Internacional de Parasitología Neotropical, "**Ciencia e Investigación en parasitología: Creando redes para la salud**". Realizado del 4 al 6 de octubre del 2021, formato virtual en la Universidad Autónoma del Carmen, Ciudad del Carmen, Campeche, México.

Dra. Ma. Amparo Rodríguez Santiago
Presidenta del COPANEO 2021

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Dr. José Alberto Iannacone Oliver
Vicepresidente del COPANEO 2021

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ANEXO 51

CERTIFICADO

VII SIBAC

ACAROLOGIA EM TEMPOS DE CONECTIVIDADE

6 A 9 DE DEZEMBRO DE 2021

Certificamos que o trabalho **NEW RECORDS OF MACRONYSSID MITES (MESOSTIGMATA: MACRONYSSIDAE) ON BATS (CHIROPTERA) FROM SOUTH AMERICA** foi apresentado por **Ana Paula De Moura, Ricardo Bassini Silva, Gilberto Sabino-Santos Jr, Felipe Maia, Renata Muylaert, Thallyta Maria Vieira, Luiz Tadeu Moraes Figueiredo, Ashley P. G. Dowling, Érica Munhoz de Mello, Igor M. S. Suguiura e Fernando de Castro Jacinavicius**, na forma **Apresentação oral**, na área temática **Acarologia médico-veterinária**, durante o **VII Simpósio Brasileiro de Acarologia (SIBAC)**, realizado em 06/12/2021 a 09/12/2021, de forma virtual.

9 de dezembro de 2021.

Instituições Organizadoras

Patrocinadores

ANEXO 52

First molecular sequence for the genus *Pseudoschoengastia* (Trombidiformes: Trombiculidae) from Brazil

JACINAVICIUS, Fernando C.[1], TAKATSU, Julia C.[1], HUANG-BASTOS, Matheus[1], ROSÁRIO, Maria C. F.[1], ANDRADE, Gabrielle R.[1], BARROS-BATTESTI, Darci M.[2] & BASSINI-SILVA, Ricardo[1,2]

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Chiggers are the larval stage of the family Trombiculidae s.l. (Acari: Trombidiformes) that parasitize terrestrial vertebrates. These mites inject digestive enzymes into the host's skin during feeding, triggering inflammatory reactions known as trombiculiasis. There are approximately 3,700 described species, organized into 300 genera worldwide. In Brazil, there are 74 valid chigger species. One of these species, *Pseudoschoengastia petrolinensis* Jacinavicius, Bassini-Silva & Barros-Battesti is known from the type data from Petrolina municipality, Pernambuco State, Brazil, parasitizing *Didelphis albiventris* Lund (Didelphimorphia: Didelphidae), and from the conservation unit Parque Nacional da Serra das Confusões (PNSC), Piauí State, on *Thrichomys laurentius* Thomas, and *Rhipidomys* sp. (Rodentia: Cricetidae). *Pseudoschoengastia petrolinensis* can be separated from the other 29 Neotropical and Nearctic *Pseudoschoengastia* by the following set of characters: Palptibia with the dorsal, lateral, and ventral setae branched, adoral setae branched, idiosoma with ca. 90 setae; genu of the legs I each with three σ, tarsus of the legs I and II with an ε proximal to ω. The DNA of Twelve specimens housed at the Acarological Collection of the Butantan Institute (IBSP) was extracted individually, and the 18S rRNA genes of 2 specimens were amplified. In the NCBI 10,278 18S rRNA gene sequences from chigger's mites are deposited: 9,918 (96,5 %) only for *Leptotrombidium deliense*, the primary vector of scrub typhus (tsutsugamushi disease) mostly distributed in tropical regions of Southeast Asia. From Brazil, we have 28 18S rRNA gene sequences from 13 chigger species: *Blankaartia sinnamaryi* (2), *Eutrombicula daemoni* (2), *Eutrombicula goeldii* (1), *Eutrombicula tinami* (2), *Fonsecia ewingi* (4), *Hannemania hepatica* (3), *Hannemania yungicola* (3), *Herpetacarus hertigi* (1) *Kymocta* sp. (1), *Quadraseta brasiliensis* (6), *Quadraseta pazca* (1), *Quadraseta trapezoides* (1), and *Trombewingia bakeri* (1). Here we provide the first sequence for a chigger from the genus *Pseudoschoengastia*, increasing the number of 18S rRNA gene sequences from chiggers known from Brazil. Funding: FAPESP, CNPq, and CAPES.

ANEXO 53

Publicación Especial de la Sociedad Entomológica Argentina, Nº 4, Año 2022, ISSN En línea 2953-4178

A novel *Eutrombicula* species (Trombidiformes: Trombiculidae) parasitizing a camelid (Cetartiodactyla: Camelidae) in Argentina

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[3] Estación Experimental Agropecuaria Abra Pampa, Instituto Nacional de Tecnología Agropecuaria. Jujuy, Argentina.

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Chigger larvae (Trombiformes: Trombiculidae s.s., Leeuwenhoekiidae, and Walchiidae) parasitize terrestrial tetrapods, while the post-larval stage is a predator of small invertebrates. In Argentina, the first chigger recorded was the post-larval stage of *Eutrombicula coarctata* (Berlese), collected on rocks in Buenos Aires. The chigger mites fauna of Argentina comprises 17 species organized in the families Trombiculidae and Leeuwenhoekiidae. The present study describes a new chigger species, providing drawings, phase-contrast microscopy images, and SEM images. This chigger mite was collected parasitizing a vicuna (*Vicugna vicugna*) in Abra Pampa City, Jujuy Province, and identified as a novel species of *Eutrombicula*. This novel *Eutrombicula* species can be separated from the other by the following set of characters: dorsal and lateral setae nude, and ventral setae branched on the palptibia; adoral (*cs*) setae nude; odontus bifurcate, outer prong longer than inner prong; C row with 12 setae; 52 opisthosomal setae including 20 ventral setae; base of famulus (ε) on Ta I and II distal and proximal to solenidion (ω), respectively; one mastisota on Ti III and Ta III each. Also, we are providing molecular data for this new species. This is the first time that a chigger has been collected parasitizing camelids in Argentina.

ANEXO 54

LA UNIVERSIDAD RICARDO PALMA, X COPANEO 2022
Y LA APHIA OTORGAN EL SIGUIENTE

Reconocimiento

A: Julia Carvalho Tolcatsu, Matheus Huang-Bastos, Ricardo Bassini-Silva, Maria Cristina Ferreira do Rosário, Gabrielle Ribeiro de Andrade, Darci Moraes Barros-Battesti y Fernando de Castro Jacinavicius

Por su participación con la ponencia:

NEW 18S RDNA SEQUENCES OF Quadraseta pazca (BRENNAN AND JONES, 1964) (TROMBIDIFORMES: TROMBICULIDAE) FROM BRAZIL.

En el X Congreso Internacional de Parasitología Neotropical, III Simposio de Ictioparasitología Neotropical "Hacia una perspectiva integral para la comprensión de problemas de salud global". Realizado del 5 al 7 de octubre del 2022, formato híbrido en la Universidad Ricardo Palma, Lima, Perú.

Dr. José Alberto Iannacone Oliver
PRESIDENTE DEL COPANEO 2022

APHIA

Dra. Ma. Amparo Rodríguez Santiago
VICEPRESIDENTA DEL COPANEO 2022

UNACAR

ANEXO 55

XXI Congresso Brasileiro de Parasitologia Veterinária

ANTIGOS PROBLEMAS NOVOS PARADIGMAS

Certificamos que DARCI MORAES BARROS BATTESTI e colaboradores apresentaram o trabalho "CULTURAS PRIMÁRIAS DE CÉLULAS EMBRIONÁRIAS DE Amblyomma sculptum COLETADAS NA REPRESA GUARAPIRANGA, SÃO PAULO" no XXI Congresso Brasileiro De Parasitologia Veterinária, realizado no período de 18 à 21 de outubro de 2022, de forma presencial em Ilhéus/BA.

Ilhéus - BA, 21 de outubro de 2022

https://cbpv.mini.app.br/validar

Código de validação:
98C8F83E597F

ANEXO 56

XXI Congresso Brasileiro de Parasitologia Veterinária

ANTIGOS PROBLEMAS NOVOS PARADIGMAS

Certificamos que DARCI MORAES BARROS BATTESTI e colaboradores apresentaram o trabalho "EVALUATON OF TRANSOVARIAN TRANSMISSION AND TRANSSTADIAL PERPETUATION OF Bartonella machadoae IN Amblyomma sculptum (ACARI: IXODIDAE), THROUGH in vitro INFECTION AND NATURAL FEEDING ON EXPERIMENTALLY-INFECTED RODENTS" no XXI Congresso Brasileiro De Parasitologia Veterinária, realizado no período de 18 à 21 de outubro de 2022, de forma presencial em Ilhéus/BA.

Ilhéus - BA, 21 de outubro de 2022

Código de validação:

ANEXO 57

XXI Congresso Brasileiro de **Parasitologia** Veterinária

ANTIGOS PROBLEMAS NOVOS PARADIGMAS

Certificamos que ANA CAROLINA CASTRO SANTIAGO e colaboradores apresentaram o trabalho "ESTUDO PRÉVIO DA ANÁLISE PROTEÔMICA DE LINHAGENS CELULARES DE Amblyomma sculptum (ASE-14) E Rhipicephalus microplus (RBME-6)" no XXI Congresso Brasileiro De Parasitologia Veterinária, realizado no período de 18 à 21 de outubro de 2022, de forma presencial em Ilhéus/BA.

Ilhéus - BA, 21 de outubro de 2022

Código de validação:
FCCC8FF3859D

ANEXO 58

XXI Congresso Brasileiro de Parasitologia Veterinária

ANTIGOS PROBLEMAS NOVOS PARADIGMAS

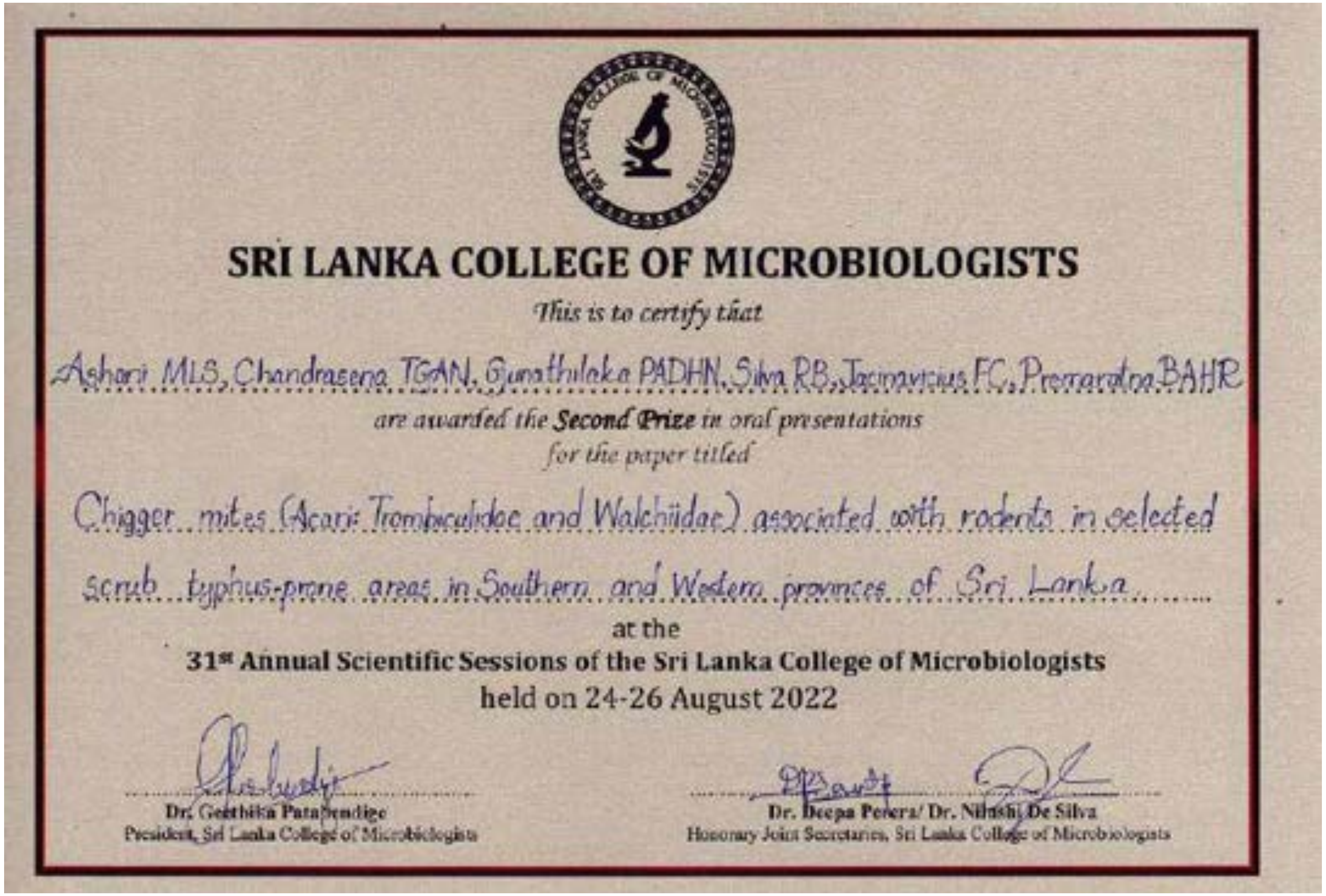
Certificamos que FERNANDO DE CASTRO JACINAVICIUS e colaboradores apresentaram o trabalho "THREE CHIGGER SPECIES (TROMBIDIFORMES: TROMBICULIDAE) CO-PARASITIZING A DOMESTIC CAT IN RIO GRANDE DO SUL, BRAZIL" no XXI Congresso Brasileiro De Parasitologia Veterinária, realizado no período de 18 à 21 de outubro de 2022, de forma presencial em Ilhéus/BA.

Ilhéus - BA, 21 de outubro de 2022

https://cbpv.mini.app.br/validar

Código de validação:
215E5EA5BA0D

ANEXO 59



SRI LANKA COLLEGE OF MICROBIOLOGISTS

This is to certify that

Ashari MLS, Chandrasena TGAN, Gunathilaka PADHN, Silva RB, Jacinavicius FC, Premaratna BAHR

are awarded the ***Second Prize*** *in oral presentations*

for the paper titled

Chigger mites (Acari: Trombiculidae and Walchiidae) associated with rodents in selected scrub typhus-prone areas in Southern and Western provinces of Sri Lanka

at the

31st Annual Scientific Sessions of the Sri Lanka College of Microbiologists

held on 24-26 August 2022

Dr. Geethika Patabendige
President, Sri Lanka College of Microbiologists

Dr. Deepa Perera/ Dr. Nilushi De Silva
Honorary Joint Secretaries, Sri Lanka College of Microbiologists

ANEXO 60

XXXIV congresso brasileiro de ZOOLOGIA

Curitiba, 22-25 agosto 2022

CERTIFICADO

Certificamos que o trabalho intitulado **A new genus and two new species of chigger mites (Trombidiformes: Leeuwenhoekiidae) from Brazilian caves** , de autoria de FERNANDO DE CASTRO JACINAVICIUS, ROBSON DE ALMEIDA ZAMPAULO, CAL WELBOURN, RONALD OCHOA, ANTONIO DOMINGOS BRESCOVIT, GABRIELLE RIBEIRO DE ANDRADE, MARIA CRISTINA FERREIRA DO ROSÁRIO, DARCI MORAES BARROS-BATTESTI e RICARDO BASSINI-SILVA, foi apresentado na modalidade "**Poster**", no XXXIV Congresso Brasileiro de Zoologia realizado entre 22 e 25 de Agosto de 2022 em Curitiba, Paraná.

Curitiba, Paraná, Brasil, 22 a 25 de agosto de 2022

Luciane Marinoni, Dra.
Presidente do XXXIV CBZ
Presidente da Sociedade Brasileira de Zoologia

Maurício Moura, Dr.
Coordenador Científico do XXXIV CBZ

ANEXO 61

XXXIV congresso brasileiro de ZOOLOGIA

Curitiba, 22-25 agosto 2022

CERTIFICADO

Certificamos que o trabalho intitulado **Contribution with the knowledge of three Brazilian *Perissopalla* spp. (Trombidiformes: Trombiculidae)** , de autoria de RICARDO BASSINI-SILVA, FERNANDO DE CASTRO JACINAVICIUS e DARCI MORAES BARROS-BATTESTI, foi apresentado na modalidade "**Poster**", no XXXIV Congresso Brasileiro de Zoologia realizado entre 22 a 25 de Agosto de 2022 em Curitiba, Paraná.

Curitiba, Paraná, Brasil, 22 a 25 de agosto de 2022

Luciane Marinoni, Dra.
Presidente do XXXIV CBZ
Presidente da Sociedade Brasileira de Zoologia

Mauricio Moura, Dr.
Coordenador Científico do XXXIV CBZ

Realização
Apoio Institucional
Apoio
Parceiros

ANEXO 62

XXI Congresso Brasileiro de Parasitologia Veterinária

ANTIGOS PROBLEMAS NOVOS PARADIGMAS

Certificamos que RICARDO BASSINI SILVA e colaboradores apresentaram o trabalho "First achievement of the 16S rRNA gene partial sequence for the genus Parichoronyssus Radovsky, 1966 (Mesostigmata: Macronyssidae)" no XXI Congresso Brasileiro De Parasitologia Veterinária, realizado no período de 18 à 21 de outubro de 2022, de forma presencial em Ilhéus/BA.

Ilhéus - BA, 21 de outubro de 2022

[illegible]

Código de validação:
[illegible]

GEORGE REGO ALBUQUERQUE

ANEXO 63

XXI Congresso Brasileiro de Parasitologia Veterinária

Certificamos que RICARDO BASSINI SILVA e colaboradores apresentaram o trabalho "Expansion of the geographic distribution of Steatonyssus joaquimi (Fonseca, 1935): new locality and host-association records with additional molecular data" no XXI Congresso Brasileiro De Parasitologia Veterinária, realizado no período de 18 à 21 de outubro de 2022, de forma presencial em Ilhéus/BA.

Ilhéus - BA, 21 de outubro de 2022

Código de validação:

GEORGE REGO ALBUQUERQUE

ANEXO 64

Certificate of attendance

This is to certify that Ricardo Bassini - Silva

has attended the

IX Symposium

EURAAC2022

Acarology 1.0 to 2.0:

Progress in Changing Times

July 12-15, 2022 - BARI (ITALY)

Prof. Salvatore Ragusa
President
IX EurAAc 2022

ANEXO 65

X CONGRESSO
DA SOCIEDADE PAULISTA DE PARASITOLOGIA

24 a 26
Novembro 2023

Centro de Convenções
Unesp/FCAV
Câmpus de Jaboticabal/SP

Certificamos a **Apresentação Oral** na área de **Epidemiologia e Vetores** intitulada **"MOLECULAR DETECTION OF Bartonella spp. IN BAT-ASSOCIATED MACRONYSSID MITES (ACARI: MACRONYSSIDAE) FROM SOUTHERN BRAZIL."** de autoria de **Maria Eduarda Moraes das Chagas; Victor de Souza Mello-Oliveira; Ana Cláudia Calchi; Ana Carolina Castro-Santiago; Marcos Rogério André; Darci Moraes Barros-Battesti; Fernando de Castro Jacinavicius; Ricardo Bassini-Silva** no **X CONGRESSO DA SOCIEDADE PAULISTA DE PARASITOLOGIA**, organizado pela **Sociedade Paulista de Parasitologia** e pela **Fundação de Apoio a Pesquisa, Ensino e Extensão - Funep**, realizado na **Unesp/FCAV – Câmpus de Jaboticabal, SP**, no dia **26 de novembro de 2023.**

Jaboticabal, 26 de novembro de 2023

Prof. Dr. Estevam Guilherme Lux Hoppe
Coordenador

Profa. Dra. Maria Cristina Thomaz
Diretora-Presidente da Funep

Certificado registrado sob o nº 91555

ORGANIZAÇÃO
Sociedade Paulista
de Parasitologia

PATROCINADORES

APOIO

FINANCIAMENTO

REALIZAÇÃO

ANEXO 66

X CONGRESSO

DA SOCIEDADE PAULISTA DE PARASITOLOGIA

24 a 26
Novembro 2023

Centro de Convenções
Unesp/FCAV
Câmpus de Jaboticabal/SP

Certificamos a **Apresentação de Pôster** na área de **Epidemiologia e Vetores** intitulada **"MOLECULAR DETECTION OF ANAPLASMATACEAE AGENTS IN BAT-ASSOCIATED MACRONYSSID MITES (MESOSTIGMATA: MACRONYSSIDAE) IN SOUTHERN AND SOUTHEASTERN BRAZIL."** de autoria de **Victor de Souza Mello-Oliveira; Maria Eduarda Moraes das Chagas; Ana Cláudia Calchi; Ana Carolina Castro-Santiago; Marcos Rogério André; Darci Moraes Barros-Battesti; Fernando de Castro Jacinavicius; Ricardo Bassini-Silva** no **X CONGRESSO DA SOCIEDADE PAULISTA DE PARASITOLOGIA**, organizado pela **Sociedade Paulista de Parasitologia** e pela **Fundação de Apoio a Pesquisa, Ensino e Extensão - Funep**, realizado na **Unesp/FCAV – Câmpus de Jaboticabal, SP**, no dia **25 de novembro de 2023.**

Jaboticabal, 25 de novembro de 2023

Prof. Dr. Estevam Guilherme Lux Hoppe
Coordenador

Profa. Dra. Maria Cristina Thomaz
Diretora-Presidente da Funep

ORGANIZAÇÃO
Sociedade Paulista
de Parasitologia

PATROCINADORES

APOIO

FINANCIAMENTO

REALIZAÇÃO

Certificado registrado sob o nº 91496

ANEXO 67

X CONGRESSO

DA SOCIEDADE PAULISTA DE PARASITOLOGIA

24 a 26
Novembro 2023

Centro de Convenções
Unesp/FCAV
Câmpus de Jaboticabal/SP

Certificamos a **Apresentação de Pôster** na área de **Epidemiologia e Vetores** intitulada **"NEW MOLECULAR DATA FOR THREE BAT-ASSOCIATED CHIGGERS (TROMBIDIFORMES: TROMBICULIDAE s.l.)."** de autoria de **Beatriz Rocha de Almeida; Mariane Guerro-de-Souza ; Maria Eduarda Moraes das Chagas; Victor de Souza Mello-Oliveira; Darci Moraes Barros-Battesti; Fernando de Castro Jacinavicius; Ricardo Bassini-Silva** no **X CONGRESSO DA SOCIEDADE PAULISTA DE PARASITOLOGIA**, organizado pela **Sociedade Paulista de Parasitologia** e pela **Fundação de Apoio a Pesquisa, Ensino e Extensão - Funep**, realizado na **Unesp/FCAV – Câmpus de Jaboticabal, SP**, no dia **25 de novembro de 2023.**

Jaboticabal, 25 de novembro de 2023

Prof. Dr. Estevam Guilherme Lux Hoppe
Coordenador

Profa. Dra. Maria Cristina Thomaz
Diretora Presidente da Funep

ORGANIZAÇÃO
Sociedade Paulista
de Parasitologia

PATROCINADORES

APOIO

FINANCIAMENTO

REALIZAÇÃO

Canal Ético

FAPESP

Funep

Certificado registrado sob o nº 91473

ANEXO 68

X CONGRESSO
DA SOCIEDADE PAULISTA DE PARASITOLOGIA

24 a 26
Novembro 2023

Centro de Convenções
Unesp/FCAV
Câmpus de Jaboticabal/SP

Certificamos a **Apresentação de Pôster** na área de **Epidemiologia e Vetores** intitulada **"NEW MOLECULAR DATA FOR THE SPECIES Radfordiella desmodi RADOVSKY, 1967 (MESOSTIGMATA: MACRONYSSIDAE)."** de autoria de **Mariane Guerro-de-Souza; Maria Eduarda Moraes das Chagas; Victor de Souza Mello-Oliveira; Darci Moraes Barros-Battesti; Fernando de Castro Jacinavicius; Ricardo Bassini-Silva** no **X CONGRESSO DA SOCIEDADE PAULISTA DE PARASITOLOGIA**, organizado pela **Sociedade Paulista de Parasitologia** e pela **Fundação de Apoio a Pesquisa, Ensino e Extensão - Funep**, realizado na **Unesp/FCAV – Câmpus de Jaboticabal, SP**, no dia **25 de novembro de 2023.**

Jaboticabal, 25 de novembro de 2023

Prof. Dr. Estevam Guilherme Lux Hoppe
Coordenador

Profa. Dra. Maria Cristina Thomaz
Diretora-Presidente da Funep

ORGANIZAÇÃO
Sociedade Paulista
de Parasitologia

PATROCINADORES

APOIO

FINANCIAMENTO

REALIZAÇÃO

Canal Ético

Certificado registrado sob o nº 91486

ANEXO 69

CERTIFICADO

VII SIBAC

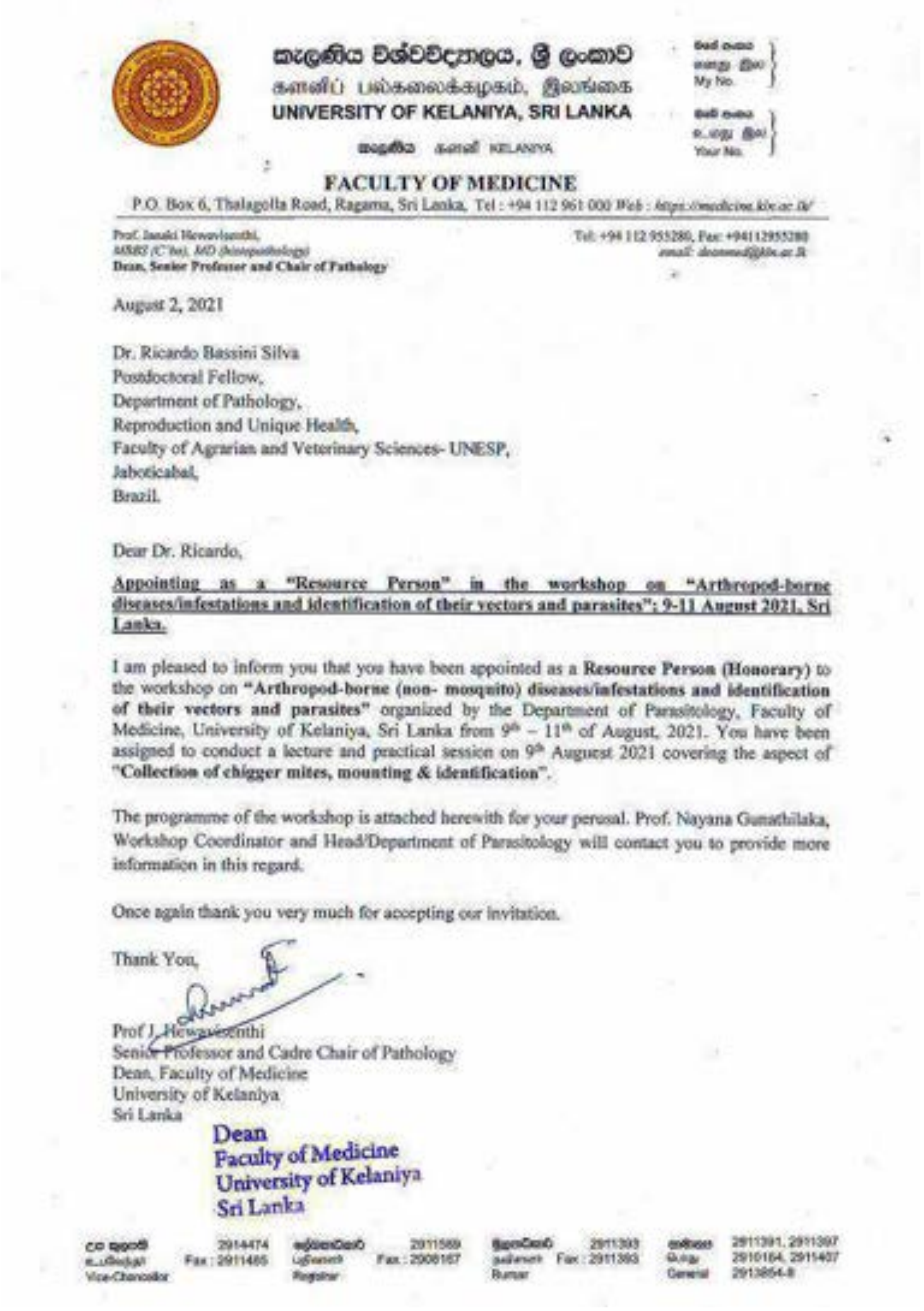
ACAROLOGIA EM TEMPOS DE CONECTIVIDADE

6 A 9 DE DEZEMBRO DE 2021

Certificamos que **Ricardo Bassini Silva** participou, na qualidade de **Palestrante da Mesa-redonda - Ácaros forenses e de importância em saúde pública**, do VII Simpósio Brasileiro de Acarologia (SIBAC), realizado de 06/12/2021 a 09/12/2021, de forma virtual.

9 de dezembro de 2021.

ANEXO 70



කැලණිය විශ්වවිද්‍යාලය, ශ්‍රී ලංකාව
களனிப் பல்கலைக்கழகம், இலங்கை
UNIVERSITY OF KELANIYA, SRI LANKA
කැලණිය களனி KELANIYA

My No.
Your No.

FACULTY OF MEDICINE
P.O. Box 6, Thalagolla Road, Ragama, Sri Lanka. Tel : +94 112 961 000 Web : https://medicine.kln.ac.lk/

Prof. Janaki Hewavisenthi,
MBBS (C'bo), MD (Histopathology)
Dean, Senior Professor and Chair of Pathology

Tel: +94 112 955280, Fax: +94112955280
email: deanmed@kln.ac.lk

August 2, 2021

Dr. Ricardo Bassini Silva
Postdoctoral Fellow,
Department of Pathology,
Reproduction and Unique Health,
Faculty of Agrarian and Veterinary Sciences- UNESP,
Jaboticabal,
Brazil.

Dear Dr. Ricardo,

Appointing as a "Resource Person" in the workshop on "Arthropod-borne diseases/infestations and identification of their vectors and parasites": 9-11 August 2021, Sri Lanka.

I am pleased to inform you that you have been appointed as a **Resource Person (Honorary)** to the workshop on **"Arthropod-borne (non- mosquito) diseases/infestations and identification of their vectors and parasites"** organized by the Department of Parasitology, Faculty of Medicine, University of Kelaniya, Sri Lanka from 9th – 11th of August, 2021. You have been assigned to conduct a lecture and practical session on 9th Auguest 2021 covering the aspect of **"Collection of chigger mites, mounting & identification"**.

The programme of the workshop is attached herewith for your perusal. Prof. Nayana Gunathilaka, Workshop Coordinator and Head/Department of Parasitology will contact you to provide more information in this regard.

Once again thank you very much for accepting our invitation.

Thank You,

Prof J. Hewavisenthi
Senior Professor and Cadre Chair of Pathology
Dean, Faculty of Medicine
University of Kelaniya
Sri Lanka

Dean
Faculty of Medicine
University of Kelaniya
Sri Lanka

ANEXO 71

Publicación Especial de la Sociedad Entomológica Argentina, Nº 4, Año 2022, ISSN En línea 2953-4178

57.3

Bites in humans by species of the family Macronyssidae (Acari: Parasitiformes: Mesostigmata)

BASSINI SILVA, Ricardo[1,2]

[1] Laboratório de Coleções Zoológicas, Instituto Butantan. São Paulo, SP, Brasil.

[2] Departamento de Patologia, Reprodução e Saúde Única, Faculdade de Ciências Agrárias e Veterinárias-UNESP. Jaboticabal, SP, Brasil.

E-mail: ricardo.bassini@gmail.com

Acari Leach is one of the most diverse groups in the Kingdom Animalia and has about 54,000 described species. However, one million species are estimated to be discovered. The mites are organized into two superorders: Acariformes and Parasitiformes, divided in six Orders: Holothrida, Opilioacarida, Acariformes, Sarcoptiformes, Ixodida and Mesostigmata. Four of these six orders have specimens related to medical and veterinary importance. In the order *Mesostigmata*, the family *Macronyssidae* stands out, and are organized into 34 genera with approximately 232 validated species. These mites are parasites of reptiles, birds and mammals (mainly rodents, marsupials and bats). The vast majority of species are associated with a single host and have some parasitic specificity. However, other species are considered generalists, such as *Ornithonyssus sylviarum* (Canestrini and Fanzago) and *Ornithonyssus bursa* (Berlese), both recorded in different species of captive birds and also in free-ranging birds; *Ornithonyssus bacoti* (Hirst), which has already been recorded in several rodent species, including synanthropic ones; and *Ophionyssus natricis* (Gervais), which is a common species of snakes and lizards, mainly in animals kept in captivity. Furthermore, these four species have already been reported biting humans. It is worth mentioning that macronyssid cause dermatitis when they bite their hosts. However, there are still no records or evidence about the transmission of pathogens by these mites. Thus, the importance of taxonomic and systematic studies, as well as the investigation of pathogens in these mites, is emphasized due to the possible capacity of being vectors in the epidemiological chain of any diseases.