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UNIVERSIDADE ESTADUAL PAULISTA
"JÚLIO DE MESQUITA FILHO"
FACULDADE DE MEDICINA VETERINÁRIA
CÂMPUS DE ARAÇATUBA

CAMILA MICHELE DE SOUZA HOSSOTANI

Prevalência de endoparasitos e caracterização molecular de *Cryptosporidium* spp. em amostras fecais de capivaras (*Hydrochoerus hydrochaeris*) em áreas urbanas

Araçatuba

2022

CAMILA MICHELE DE SOUZA HOSSOTANI

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Tese apresentada à Faculdade de Medicina Veterinária de Araçatuba da Universidade Estadual Paulista "Júlio de Mesquita Filho" – Unesp, como parte dos requisitos para a obtenção do título de Doutora em Ciência Animal (Medicina Veterinária Preventiva e Produção Animal).

Orientador: Prof. Dr. Marcelo Vasconcelos Meireles

Araçatuba

2022

H829p

Hossotani, Camila Michele de Souza

Prevalência de endoparasitos e caracterização molecular de Cryptosporidium spp. em amostras fecais de capivaras (Hydrochoerus hydrochaeris) em áreas urbanas / Camila Michele de Souza Hossotani. -- , 2022

106 p. : il., tabs., fotos, mapas

Tese (doutorado) - Universidade Estadual Paulista (Unesp), Faculdade de Medicina Veterinária, Araçatuba,

Orientador: Marcelo Vasconcelos Meireles

1. Criptosporisiose. 2. Parasitologia. 3. Roedores. I. Título.

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Título: Prevalência de endoparasitos e caracterização molecular de Cryptosporidium spp. em amostras fecais de capivaras (Hydrochoerus hydrochaeris) em áreas urbanas

AUTORA: CAMILA MICHELE DE SOUZA HOSSOTANI
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Araçatuba, 06 de dezembro de 2022.

AGRADECIMENTOS

Primeiramente agradeço aos meus pais, que proporcionaram toda a oportunidade de estudo para que eu pudesse chegar a este momento.

Ao meu marido, por todo o apoio ao longo desta longa jornada.

Aos meus irmãos e sobrinhas amadas.

Ao meu professor orientador, Marcelo Vasconcelos Meireles, pela orientação do trabalho, suporte e aprendizado.

À minha amiga, Profª Ma. Flavia Maria Almeida Moreira, por me ajudar nas coletas; sem ela eu não teria conseguido.

À Angelica Acialdi e Rafaela Acialdi, pelo apoio em minhas coletas e carinho.

A todos os meus queridos amigos de longa data, que sempre me incentivaram a fazer o doutorado.

A todos os novos amigos que adquiri ao longo de meu doutorado.

A todos professores e professoras que fizeram parte da construção de meu conhecimento acadêmico e possibilitaram a minha chegada a este momento.

À Coordenação de Aperfeiçoamento de Pessoal de Nível Superior - Brasil (CAPES) - Código de Financiamento 001.

“Que maravilha é ninguém precisar esperar um único momento para melhorar o mundo”

Anne Frank

HOSSOTANI, C.M.S. **Prevalência de endoparasitos e caracterização molecular de *Cryptosporidium* spp. em amostras fecais de capivaras (*Hydrochoerus hydrochaeris*) em áreas urbanas**. 2022. 106 f. Tese (Doutorado) Ciência Animal, Faculdade de Medicina Veterinária - Universidade Estadual Paulista, Araçatuba, 2022.

RESUMO

As capivaras (*Hydrochoerus hydrochaeris*) pertencem à família Caviidae e subfamília Hydrochoerinae. Seu habitat são ambientes próximos de leitos antigos de rios, lagoas e em margens de rios. As parasitoses de capivaras despertam interesse devido à sua crescente presença em áreas alagadas e antrópicas, como praças, parques e represas. Por isso, há uma crescente preocupação quanto à relação desses animais atuarem como reservatórios e representar fontes de infecção de parasitos para o homem. Algumas áreas antrópicas, como parques e praças que possuem lagos naturais ou artificiais, abrigam uma considerável densidade e biomassa de capivaras. Já foram encontradas em fezes de capivaras algumas espécies de protozoários, como *Giardia* sp., *Cryptosporidium* sp. e *Eimeria* sp., além de ovos de helmintos, como *Fasciola hepatica*, *Trichostrongyloidea* e *Capillaria spp*.. Tendo em vista o potencial das capivaras atuarem como reservatório para diversas parasitoses e a falta de estudos sobre a ocorrência e a caracterização molecular de espécies e genótipos de *Cryptosporidium* que infectam capivaras, o objetivo do presente estudo foi determinar a prevalência de endoparasitos e realizar a caracterização molecular de *Cryptosporidium* spp. em populações de capivaras presentes em áreas urbanas. Um total de 401 e 392 amostras fecais de capivaras (*Hydrochoerus hydrochaeris*) foi analisado por microscopia para a detecção de *Cryptosporidium* spp. e de outros endoparasitos, respectivamente. A detecção e análise moleculares de *Cryptosporidium* spp. foram realizadas pela reação em cadeia pela polimerase para amplificação de fragmento parcial dos genes da subunidade 18S do rRNA (18S rRNA), actina, proteína do choque térmico (HSP70) e glicoproteína (GP60). Os resultados dos exames microscópicos e moleculares revelaram prevalência de 0,25% (1/401) e 0,5% (2/401) para *Cryptosporidium* spp., respectivamente, e a presença de um novo genótipo de *Cryptosporidium*, denominado como *Cryptosporidium* genótipo capivara. As sequências genéticas amplificadas por PCR para amplificação de fragmentos

parciais dos genes 18S rRNA, HSP70, actina e GP-60 de *Cryptosporidium* genótipo capivara apresentaram similaridade genética com *Cryptosporidium wrairi* de 99%, 99,7%, 99,5% e 91,5%, respectivamente. Dentre as 392 amostras pesquisadas para a presença de endoparasitos, 84% (329/392) foram positivas e 14% (63/392) foram negativas para parasitoses gastrointestinais. Dentre as amostras positivas, foram encontradas as seguintes taxas de ocorrências: oocistos de *Eimeria* spp. (62%; 245/392), ovos de *Trichostrongylidae* (39%; 155/392), *Capillaria* sp. (1%; 6/392), *Anoplocephalidae* (2/392; 0,5%), *Strongyloides* spp. (0,5%; 2/392), *Paramphitosmatidae* (0,7%; 3/392) e ovos e adultos de *Protozoophaga obesa* (24%, 93/392). Foi observada uma baixa prevalência de *Cryptosporidium* spp., com identificação de um novo genótipo de *Cryptosporidium* em capivaras de áreas urbanas. Além disso, nossos resultados indicaram uma alta ocorrência de amostras positivas para diversos gêneros/famílias de parasitos, demonstrando o alto potencial desses animais abrigarem espécies variadas de parasitos e atuarem como reservatórios e possíveis dispersores de diversas parasitoses.

Palavras-chave: Criptosporisiose. Parasitologia. Roedores.

HOSSOTANI, C.M.S. **Prevalence of endoparasites and molecular characterization of *Cryptosporidium* spp. in fecal samples of capybaras (*Hydrochoerus hydrochaeris*) in urban areas.** 2022. 106 f. Tese (Doutorado) Ciência Animal, Faculdade de Medicina Veterinária - Universidade Estadual Paulista, Araçatuba, 2022.

ABSTRACT

Capybaras (*Hydrochoerus hydrochaeris*) belongs to the family Caviidae and subfamily Hydrochoerinae. Its habitat is environments close to old riverbeds, lakes and on riverbanks. Capybara parasites arouse interest due to their increasing presence in flooded and anthropic areas, such as squares, parks, and dams. Therefore, there is a growing concern about the relationship of these animals as reservoirs and represent sources of infection of parasites for humans. Some anthropic areas, such as parks and squares that have natural or artificial lakes, harbor a considerable density and biomass of capybaras. Some species of protozoa have already been found in capybara feces, such as *Giardia* sp., *Cryptosporidium* sp. and *Eimeria* spp., in addition to helminths, such as *Fasciola hepatica*, Trichostrongyloidea and *Capillaria* spp.. Considering the potential of capybaras to act as a reservoir for various parasites and the lack of studies on the occurrence and molecular characterization of species and genotypes of *Cryptosporidium* that infect capybaras, the aim of the present study was to determine the prevalence of endoparasites and carry out the molecular characterization of *Cryptosporidium* spp. in populations of capybaras present in urban areas. A total of 401 and 392 fecal samples from capybaras (*Hydrochoerus hydrochaeris*) were analyzed by microscopy for the detection of *Cryptosporidium* spp. and other endoparasites, respectively. Molecular detection and analysis of *Cryptosporidium* spp. were performed by polymerase chain reaction for amplification of a partial fragment of the 18S rRNA subunit (18S rRNA), actin, heat shock protein (HSP70) and glycoprotein (GP60) genes. The results of microscopic and molecular screening revealed prevalence of 0.25% (1/401) and 0.5% (2/401) for *Cryptosporidium* spp., respectively, and the presence of a new genotype of *Cryptosporidium*, named as *Cryptosporidium* genotype capybara. Genetic sequences amplified by PCR for amplification of partial fragments of the 18S rRNA, HSP70, actin and GP60 genes of *Cryptosporidium* genotype capybara showed genetic similarity with *C. wrairi* of 99%, 99.7%, 99.5% and 91. 5%, respectively. Among the 392 samples surveyed for the presence of

endoparasites, 84% (329/392) were positive and 14% (63/392) were negative for gastrointestinal parasites. Among the positive samples, the following occurrence rates were found oocysts of *Eimeria* sp. (62%; 245/392), eggs of Trichostrongylidae (39%; 155/392), *Capillaria* sp. (1%; 6/392), Anoplocephalidae (2/392; 0.5%), *Strongyloides* sp. (0.5%; 2/392), Paramphitosmatidae (0.7%; 3/392) and eggs and adults of *Protozoophaga obesa* (24%, 93/392). A low prevalence of *Cryptosporidium* spp. was observed, with identification of a new genotype of *Cryptosporidium* spp. in capybaras from urban areas. In addition, our results indicated a high occurrence of positive samples for several genera/families of parasites, demonstrating the high potential of these animals to harbor different species of parasites and to act as reservoirs and possible dispersers of several parasites.

Keywords: Cryptosporidiosis. Parasitology. Rodentia

APÊNDICE – REFERÊNCIAS DA INTRODUÇÃO GERAL

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ANEXO A – Autorização do Instituto de Meio ambiente de Mato Grosso do Sul (IMASUL)

GOVERNO DO ESTADO DE MATO GROSSO DO SUL
SECRETARIA DE ESTADO DE MEIO AMBIENTE, DESENVOLVIMENTO ECONÔMICO, PRODUÇÃO E AGRICULTURA FAMILIAR – SEMAGRO
INSTITUTO DE MEIO AMBIENTE DE MATO GROSSO DO SUL - IMASUL

AUTORIZAÇÃO AMBIENTAL PARA PESQUISA CIENTÍFICA EM UC

AA Nº: 006/2019	VALIDADE: 12/2022	PROCESSO Nº: 71/405296/2019

DADOS DO TITULAR DA PESQUISA E DO PROJETO

Titular da Pesquisa: CAMILA MICHELE DE SOUZA HOSSOTANI
CPF: 379.411.178-86 Nível acadêmico: Doutoranda
Formação Acadêmica: Ciências Biológicas
Instituição de pesquisa: Faculdade de Medicina Veterinária de Araçatuba – FMVA/UNESP

EQUIPE DE APOIO

Orientador:
Marcelo Vasconcelos Meireles/UNESP/FMVA

Colaboradores:
Flávia Maria Almeida Moreira

TÍTULO DO PROJETO

Prevalência, variação sazonal da eliminação de oocistos e caracterização molecular de *Cryptosporidium* spp. em amostras fecais de capivaras (*Hydrochoerus hydrochoeruis)* em áreas urbanas.

RESUMO DA PESQUISA

Objetivos Geral (de acordo com o projeto apresentado):

Determinar a prevalência, realizar a caracterização molecular e quantificar a eliminação sazonal de oocistos de *Cryptosporidium* spp. no ambiente, em populações de capivaras presentes em áreas urbanas.

UNIDADE DE CONSERVAÇÃO: Parque das Nações Indígenas

Atividades/metodologia a ser utilizada dentro da Unidade:
Acompanhamento dos grupos de capivara; coleta de fezes frescas das capivaras; monitoramento noturno; monitoramento diurno. Os vários grupos de capivaras presentes nos diversos locais do parque

os animais. As fezes serão coletadas com espátula de madeira e armazenadas em potes contendo dicromato de potássio.

CRONOGRAMA DE ATIVIDADES A SEREM REALIZADAS NA UNIDADE:

Cronograma de trabalho	Início (mês/ano)	Término (mês/Ano)
Período previsto para execução do projeto	08/2019	12/2022
Trabalho de Campo na UC	12/2019	06/2022
Análise de Dados	08/2019	06/2022
Entrega do Relatório Final	-	12/2022
Entrega dos Produtos Finais (tese, Imagens, mapas)	-	12/2022

Campo Grande, _____ de dezembro de 2019.

ANDRÉ BORGES BARROS DE ARAÚJO
Diretor Presidente do IMASUL

OBSERVAR AS SEGUINTES CONDICIONANTES:

1. Esta autorização aprova ambientalmente a execução das atividades relativas ao monitoramento de capivaras no Parque das Nações Indígenas com coleta de fezes, sem contato físico com os animais ou coleta de qualquer outro material biológico não descrito no projeto;
2. Informação dos trabalhos de pesquisa (datas e locais) à Companhia Independente de Polícia Militar Ambiental da região;
3. O gestor da Unidade de Conservação deverá estar ciente da referida pesquisa e se possível fazer o acompanhamento
4. Qualquer alteração no projeto, equipe, período e/ou metodologia deverão ser previamente autorizadas por este Instituto;
5. Os componentes da equipe deverão utilizar algum método de fácil identificação da atividade para fins de pesquisa;
6. Durante a execução das atividades a equipe deverá portar a Autorização para Pesquisa para efeito de fiscalização;
7. É de inteira responsabilidade do requerente o envio de **Relatório de Conclusão do Projeto**, conforme termo de referência de relatório final disponível no site do IMASUL, em formato digital e impresso, ao e-mail: guc@imasul.ms.gov.br e

protocolar o documento à Gerencia de Unidades de Conservação - GUC/IMASUL, prazo de 60 (sessenta) dias após a conclusão dos trabalhos;

8. O IMASUL/SEMAGRO/MS reserva-se o direito de a qualquer momento e de acordo com as normas legais, exigir melhorias e/ou alterações na execução das atividades;
9. A presente Autorização não dispensa e nem substitui outras Licenças, Autorizações, Alvarás ou Certidões de qualquer natureza exigidas pela legislação Federal, Estadual ou Municipal;
10. Mediante decisão motivada a Autorização será suspensa e/ou cancelada, sem prejuízo da adoção das outras medidas punitivas administrativas e judiciais, quando ocorrer:

    I - Violação ou inadequação de quaisquer das condicionantes acima descritas ou normas legais;

    II- Omissão ou falsa descrição das informações relevantes que subsidiarem a expedição da Autorização;

    III- Superveniência de graves riscos ambientais e à saúde;
11. Admitindo-se a renovação, deverá esta, encontrar-se em conformidade com o disposto nos Artigos 32 e 35 da Resolução SEMADE nº 09/2015.
12. Caso envolva espécie ameaçada de extinção, o requerente deverá tomar ciência da Instrução Normativa ICMBio n° 03/2014, e solicitar o registro voluntário para coleta junto ao Sisbio.

protocolar o documento à Gerencia de Unidades de Conservação - GUC/IMASUL, prazo de 60 (sessenta) dias após a conclusão dos trabalhos;

8. O IMASUL/SEMAGRO/MS reserva-se o direito de a qualquer momento e de acordo com as normas legais, exigir melhorias e/ou alterações na execução das atividades;
9. A presente Autorização não dispensa e nem substitui outras Licenças, Autorizações, Alvarás ou Certidões de qualquer natureza exigidas pela legislação Federal, Estadual ou Municipal;
10. Mediante decisão motivada a Autorização será suspensa e/ou cancelada, sem prejuízo da adoção das outras medidas punitivas administrativas e judiciais, quando ocorrer:

    I - Violação ou inadequação de quaisquer das condicionantes acima descritas ou normas legais;

    II- Omissão ou falsa descrição das informações relevantes que subsidiarem a expedição da Autorização;

    III- Superveniência de graves riscos ambientais e à saúde;
11. Admitindo-se a renovação, deverá esta, encontrar-se em conformidade com o disposto nos Artigos 32 e 35 da Resolução SEMADE nº 09/2015.
12. Caso envolva espécie ameaçada de extinção, o requerente deverá tomar ciência da Instrução Normativa ICMBio n° 03/2014, e solicitar o registro voluntário para coleta junto ao Sisbio.

ANEXO B - Sistema de Autorização e Informação em Biodiversidade (SISBio)

Ministério do Meio Ambiente - MMA
Instituto Chico Mendes de Conservação da Biodiversidade - ICMBio
Sistema de Autorização e Informação em Biodiversidade - SISBIO

Autorização para atividades com finalidade científica

Número: 70987-1	Data da Emissão: 26/11/2019 17:48:14	Data da Revalidação*: 26/11/2020
De acordo com o art. 28 da IN 03/2014, esta autorização tem prazo de validade equivalente ao previsto no cronograma de atividades do projeto, mas deverá ser revalidada anualmente mediante a apresentação do relatório de atividades a ser enviado por meio do Sisbio no prazo de até 30 dias a contar da data do aniversário de sua emissão.		

Dados do titular

Nome: Camila Michele de Souza Hossotani	CPF: 379.411.178-86
Título do Projeto: coleta de fezes de capivaras em áreas urbanas dos municípios de Três Lagoas-MS; São José do Rio Preto-SP; Campo Grande -MS	
Nome da Instituição: UNIVERSIDADE ESTADUAL PAULISTA - UNESP	CNPJ: 48.031.918/0039-05

Cronograma de atividades

#	Descrição da atividade	Início (mês/ano)	Fim (mês/ano)
1	coleta de fezes	01/2020	12/2021

Equipe

#	Nome	Função	CPF	Nacionalidade
1	Flávia Maria de Almeida Moreira	auxiliar na coleta de fezes	036.586.291-69	Brasileira
2	HELDER SILVA E LUNA	auxiliar na coleta de fezes	117.269.188-66	Brasileira

Observações e ressalvas

1	A autorização não eximirá o pesquisador da necessidade de obter outras anuências, como: I) do proprietário, arrendatário, posseiro ou morador quando as atividades forem realizadas em área de domínio privado ou dentro dos limites de unidade de conservação federal cujo processo de regularização fundiária encontra-se em curso; II) da comunidade indígena envolvida, ouvido o órgão indigenista oficial, quando as atividades de pesquisa forem executadas em terra indígena; III) do Conselho de Defesa Nacional, quando as atividades de pesquisa forem executadas em área indispensável à segurança nacional; IV) da autoridade marítima, quando as atividades de pesquisa forem executadas em águas jurisdicionais brasileiras; V) do Departamento Nacional da Produção Mineral, quando a pesquisa visar a exploração de depósitos fossilíferos ou a extração de espécimes fósseis; VI) do órgão gestor da unidade de conservação estadual, distrital ou municipal, dentre outras.
2	Em caso de pesquisa em UNIDADE DE CONSERVAÇÃO, o pesquisador titular desta autorização deverá contactar a administração da unidade a fim de CONFIRMAR AS DATAS das expedições, as condições para realização das coletas e de uso da infraestrutura da unidade.
3	O titular de autorização ou de licença permanente, assim como os membros de sua equipe, quando da violação da legislação vigente, ou quando da inadequação, omissão ou falsa descrição de informações relevantes que subsidiaram a expedição do ato, poderá, mediante decisão motivada, ter a autorização ou licença suspensa ou revogada pelo ICMBio, nos termos da legislação brasileira em vigor.
4	Este documento somente poderá ser utilizado para os fins previstos na Instrução Normativa ICMBio nº 03/2014 ou na Instrução Normativa ICMBio nº 10/2010, no que especifica esta Autorização, não podendo ser utilizado para fins comerciais, industriais ou esportivos. O material biológico coletado deverá ser utilizado para atividades científicas ou didáticas no âmbito do ensino superior.
5	As atividades de campo exercidas por pessoa natural ou jurídica estrangeira, em todo o território nacional, que impliquem o deslocamento de recursos humanos e materiais, tendo por objeto coletar dados, materiais, espécimes biológicos e minerais, peças integrantes da cultura nativa e cultura popular, presente e passada, obtidos por meio de recursos e técnicas que se destinem ao estudo, à difusão ou à pesquisa, estão sujeitas a autorização do Ministério de Ciência e Tecnologia.
6	O titular de licença ou autorização e os membros da sua equipe deverão optar por métodos de coleta e instrumentos de captura direcionados, sempre que possível, ao grupo taxonômico de interesse, evitando a morte ou dano significativo a outros grupos; e empregar esforço de coleta ou captura que não comprometa a viabilidade de populações do grupo taxonômico de interesse em condição in situ.
7	Esta autorização NÃO exime o pesquisador titular e os membros de sua equipe da necessidade de obter as anuências previstas em outros instrumentos legais, bem como do consentimento do responsável pela área, pública ou privada, onde será realizada a atividade, inclusive do órgão gestor de terra indígena (FUNAI), da unidade de conservação estadual, distrital ou municipal, ou do proprietário, arrendatário, posseiro ou morador de área dentro dos limites de unidade de conservação federal cujo processo de regularização fundiária encontra-se em curso.

Este documento foi expedido com base na Instrução Normativa nº 03/2014. Através do código de autenticação abaixo, qualquer cidadão poderá verificar a autenticidade ou regularidade deste documento, por meio da página do Sisbio/ICMBio na Internet (www.icmbio.gov.br/sisbio).

Código de autenticação: 0709870120191126

Ministério do Meio Ambiente - MMA
Instituto Chico Mendes de Conservação da Biodiversidade - ICMBio
Sistema de Autorização e Informação em Biodiversidade - SISBIO

Autorização para atividades com finalidade científica

Número: 70987-1	Data da Emissão: 26/11/2019 17:48:14	Data da Revalidação*: 26/11/2020

De acordo com o art. 28 da IN 03/2014, esta autorização tem prazo de validade equivalente ao previsto no cronograma de atividades do projeto, mas deverá ser revalidada anualmente mediante a apresentação do relatório de atividades a ser enviado por meio do Sisbio no prazo de até 30 dias a contar da data do aniversário de sua emissão.

Dados do titular

Nome: Camila Michele de Souza Hossotani	CPF: 379.411.178-86
Título do Projeto: coleta de fezes de capivaras em áreas urbanas dos municípios de Três Lagoas-MS; São José do Rio Preto-SP; Campo Grande -MS	
Nome da Instituição: UNIVERSIDADE ESTADUAL PAULISTA - UNESP	CNPJ: 48.031.918/0039-05

Observações e ressalvas

8	Este documento não dispensa o cumprimento da legislação que dispõe sobre acesso a componente do patrimônio genético existente no território nacional, na plataforma continental e na zona econômica exclusiva, ou ao conhecimento tradicional associado ao patrimônio genético, para fins de pesquisa científica, bioprospecção e desenvolvimento tecnológico. Veja maiores informações em www.mma.gov.br/cgen.

Locais onde as atividades de campo serão executadas

#	Descrição do local	Município-UF	Bioma	Caverna?	Tipo
1	parque das nações indígenas	Campo Grande-MS	Cerrado	Não	Fora de UC Federal
2	lago do amor - dentro do campus da universidade federal de mato grosso do Sul	Campo Grande-MS	Cerrado	Não	Fora de UC Federal
3	represa municipal de são jose do rio preto	São José do Rio Preto-SP	Mata Atlântica	Não	Fora de UC Federal
4	lagoa maior de tres lagoas	Três Lagoas-MS	Cerrado	Não	Fora de UC Federal

Atividades

#	Atividade	Grupo de Atividade
1	Coleta/transporte de amostras biológicas in situ	Fora de UC Federal

Atividades X Táxons

#	Atividade	Táxon	Qtde.
1	Coleta/transporte de amostras biológicas in situ	Hydrochoerus hydrochaeris	-

Materiais e Métodos

#	Tipo de Método (Grupo taxonômico)	Materiais
1	Amostras biológicas (Outros mamíferos)	Fezes

Este documento foi expedido com base na Instrução Normativa nº 03/2014. Através do código de autenticação abaixo, qualquer cidadão poderá verificar a autenticidade ou regularidade deste documento, por meio da página do Sisbio/ICMBio na Internet (www.icmbio.gov.br/sisbio).

Ministério do Meio Ambiente - MMA
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Autorização para atividades com finalidade científica

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Nome da Instituição: UNIVERSIDADE ESTADUAL PAULISTA - UNESP	CNPJ: 48.031.918/0039-05

Destino do material biológico coletado

#	Nome local destino	Tipo destino
1	UNIVERSIDADE ESTADUAL PAULISTA - UNESP	Laboratório

Ministério do Meio Ambiente - MMA
Instituto Chico Mendes de Conservação da Biodiversidade - ICMBio
Sistema de Autorização e Informação em Biodiversidade - SISBIO

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Registro de coleta imprevista de material biológico

De acordo com a Instrução Normativa nº03/2014, a coleta imprevista de material biológico ou de substrato não contemplado na autorização ou na licença permanente deverá ser anotada na mesma, em campo específico, por ocasião da coleta, devendo esta coleta imprevista ser comunicada por meio do relatório de atividades. O transporte do material biológico ou do substrato deverá ser acompanhado da autorização ou da licença permanente com a devida anotação. O material biológico coletado de forma imprevista, deverá ser destinado à instituição científica e, depositado, preferencialmente, em coleção biológica científica registrada no Cadastro Nacional de Coleções Biológicas (CCBIO).

Táxon*	Qtde.	Tipo de Amostra	Qtde.	Data

* Identificar o espécime do nível taxonômico possível.

Este documento foi expedido com base na Instrução Normativa nº 03/2014. Através do código de autenticação abaixo, qualquer cidadão poderá verificar a autenticidade ou regularidade deste documento, por meio da página do Sisbio/ICMBio na Internet (www.icmbio.gov.br/sisbio).

Código de autenticação: 0709870120191126

ANEXO C – Certificado Ética no Uso de Animais FMVA (UNESP) – Araçatuba – SP

UNIVERSIDADE ESTADUAL PAULISTA
"JÚLIO DE MESQUITA FILHO"

CAMPUS ARAÇATUBA
FACULDADE DE ODONTOLOGIA
FACULDADE DE MEDICINA VETERINÁRIA

CEUA - Comissão de Ética no Uso de Animais
CEUA - Ethics Committee on the Use of Animals

CERTIFICADO

Certificamos que o Projeto de Pesquisa intitulado **"Prevalência, variação sazonal da eliminação de oocistos e caracterização molecular de Cryptosporidium spp. em amostras fecais de capivaras (Hydrochoerus hydrochaeris) em áreas urbanas"**, Processo FOA nº 00917-2019, sob responsabilidade de Marcelo Vasconcelos Meireles apresenta um protocolo experimental de acordo com os Princípios Éticos da Experimentação Animal e sua execução foi aprovada pela CEUA em 20 de Fevereiro de 2020.

VALIDADE DESTE CERTIFICADO: 28 de Março de 2022.
DATA DA SUBMISSÃO DO RELATÓRIO FINAL: até 28 de Abril de 2022.

CERTIFICATE

We certify that the study entitled **"Prevalence, seasonal oocyst shedding and molecular characterization of Cryptosporidium spp. from urban areas capybara (Hydrochoerus hydrochaeris) feces"**, Protocol FOA nº 00917-2019, under the supervision of Marcelo Vasconcelos Meireles presents an experimental protocol in accordance with the Ethical Principles of Animal Experimentation and its implementation was approved by CEUA on February 20, 2020.

VALIDITY OF THIS CERTIFICATE: March 28, 2022.
DATE OF SUBMISSION OF THE FINAL REPORT: April 28, 2022.

Profa. Associada Maria Cristina Rosifini Alves Rezende
Coordenador da CEUA
CEUA Coordinator

CEUA - Comissão de Ética no Uso de Animais
Faculdade de Odontologia de Araçatuba
Faculdade de Medicina Veterinária de Araçatuba
Rua José Bonifácio, 1193 – Vila Mendonça - CEP: 16015-050 – ARAÇATUBA – SP
Fone (18) 3636-3234 Email CEUA: ceua.foa@unesp.br

ANEXO D – Normas de Publicação da Revista

VETERINARY PARASITOLOGY
An international scientific journal and the Official Organ of the American Association of Veterinary Parasitologists (AAVP), the European Veterinary Parasitology College (EVPC) and the World Association for the Advancement of Veterinary Parasitology (WAAVP)

AUTHOR INFORMATION PACK

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ISSN: 0304-4017

DESCRIPTION

Veterinary Parasitology is concerned with those aspects of **helminthology**, **protozoology** and **entomology** which are of interest to **animal health** investigators, veterinary practitioners and others with a special interest in **parasitology**. Papers of the highest quality dealing with all aspects of disease prevention, pathology, treatment, epidemiology, and control of parasites in all domesticated animals, fall within the scope of the journal. Papers of geographically limited (local) interest which are not of interest to an international audience will not be accepted. Authors who submit papers based on local data will need to indicate why their paper is relevant to a broader readership. Or they can submit to the journal?s companion title, Veterinary Parasitology: Regional Studies and Reports, which welcomes manuscripts with a regional focus.

Parasitological studies on **laboratory animals** fall within the scope of *Veterinary Parasitology* only if they provide a reasonably close model of a disease of **domestic animals**. Additionally the journal will consider papers relating to **wildlife** species where they may act as disease reservoirs to domestic animals, or as a zoonotic reservoir. Case studies considered to be unique or of specific interest to the journal, will also be considered on occasions at the Editors' discretion. Papers dealing exclusively with the taxonomy of parasites do not fall within the scope of the journal.

Studies on rickettsial disease organisms (Ehrlichia, Anaplasma, Eperythrozoon) will be considered for publication in Veterinary Parasitology, but only if the paper deals with vector transmission of these organisms to domesticated animals, or if zoonotic. Studies on Rickettsia per se will not be accepted.

Studies dealing with **parasite control** by means of natural products, both *in vivo* and *in vitro*, fall within the scope of the journal, but only if well documented and with therapeutically relevant minimum inhibitory concentrations of the active compound(s) being clearly demonstrated.

Circumstances relating to animal experimentation must meet the International Guiding Principles for Biomedical Research Involving Animals as issued by the Council for International Organizations of Medical Sciences. (Obtainable from: Executive Secretary C.I.O.M.S., c/o W.H.O., Via Appia, CH-1211 Geneva 27, Switzerland.)

Manuscripts reporting meta-analyses and systematic reviews **that follow PRISMA or MOOSE reporting guidelines will receive consideration only** if they go beyond reporting parasite prevalence and provide a description and analysis of factors and mechanisms associated with the reported data.

AUDIENCE

Research Workers and Practitioners in veterinary medicine, Animal Health Investigators and others with a special interest in parasitology, veterinary pharmaceutical industry.

IMPACT FACTOR

2020: 2.738 © Clarivate Analytics Journal Citation Reports 2021

ABSTRACTING AND INDEXING

BIOSIS Citation Index
Elsevier BIOBASE
Helminthological Abstracts
PubMed/Medline
Index Catalog of Medical and Veterinary Zoology
Index Veterinarius
Protozoological Abstracts
Veterinary Bulletin
Scopus
Current Contents - Agriculture, Biology & Environmental Sciences
Referativnyi Zhurnal VINTI-RAN (Russian Academy of Sciences)

EDITORIAL BOARD

Parasitology and Parasitic diseases, Acarology, Entomology and helminthology, Epidemiology, Pathology, Control
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Veterinary Epidemiology, Biostatistics and Diagnostic Test Validation
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Coccidia, Sarcocystidae
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Ikuo Igarashi, Obihiro University of Agriculture and Veterinary Medicine, Obihiro, Japan
Survey of protozoan disease, Diagnostics of protozoan diseases, Development of chemotherapy
Anja Joachim, University of Veterinary Medicine, Department of Pathobiology, Institute of Parasitology, Vienna, Austria
Areas of expertise - Porcine parasites, Coccidia, Diagnostic parasitology, Zoonoses, Vector-borne pathogens of domestic animals
Pikka Jokelainen, State Serum Institute, Department of Bacteria, Parasites and Fungi, Infectious Disease Preparedness, Laboratory of Parasitology, Copenhagen, Denmark
Zoonotic parasites, Toxoplasma gondii, One health
Ray Kaplan, University of Georgia, Athens, Georgia, United States of America
Anthelmintic Resistance, Parasite Diagnosis, Epidemiology And Control Of Gastrointestinal Helminths
Andrew Kotze, CSIRO Queensland Bioscience Precinct, St Lucia, Australia
Anthelmintic resistance, Helminth control, Drug discovery
Laura Kramer, University of Parma, Parma, Italy
Parasitology Epidemiology Pathogenesis Immunology Control Dog Cat Horse Pig Ruminants
Marcelo Labruna, University of Sao Paulo, São Paulo, Brazil
Adrian Luis Lifschitz, Pharmacology Laboratory, Tandil Veterinary Research Center (CIVETAN) (UNCPBA-CICPBA-CONICET), Faculty of Veterinary Sciences, UNCPBA, Tandil, Argentina
pharmacology of antiparasitic drugs, pharmacokinetics
Alan A. Marchiondo, Zoetis Genetics, Santa Fe, NM, Michigan, United States of America
Parasiticide Efficacy, Ecto- And Endoparasites, Companion And Food-Production Animals
Marcelo Molento, Federal University of Parana, Curitiba, Brazil
Epidemiology of parasite infections, Forecast analysis, Drug resistance, ,
Jorge Morales-Montor, National Autonomous University of Mexico Department of Immunology, Ciudad de México, Mexico
Helminthes, Neuroimmunoendocrinology, Host-Parasite interactions
Vinny Naidoo, University of Pretoria, Pretoria, South Africa
Pharmacokinetics, Preclinical Safety Testing, Phytomedicines, Regulatory Pharmacology, ,
Pia Olafson, USDA-ARS Knipling-Bushland US Livestock Insects Research Laboratory, Kerrville, Texas, United States of America
livestock ectoparasites, Arthropod disease vectors, Host-vector interactions, Pesticide resistance
Domenico Otranto, University of Bari, Bari, Italy
Canine and feline vector-borne zoonotic diseases
Roberto Papini, University of Pisa, Pisa, Italy
Veterinary parasitology, Veterinary parasitic diseases, Zoonotic parasites, Zoonotic parasitic diseases
Kurt Pfister, Ludwig Maximilians University Munich, Munich, Germany
Ticks and Tick-borne diseases (all animal species), Ruminant helminths including epidemiology, prevention and control, Targeted anthelmintic treatment of horses
Dierk Rebeski, Lohmann Animal Health GmbH & Co KG, Cuxhaven, Germany
Gereon Schares, Friedrich-Loeffler-Institute Federal Research Institute for Animal Health, Greifswald, Germany

Toxoplasmosis, Toxoplasma gondii, Neosporosis, Neospora spp., Besnoitiosis, Besnoitia spp., Hammondia spp., Cryptosporidiosis, Cryptosporidium spp., Echinococcosis
Theo Schetters, University of Pretoria, Department of Veterinary Tropical Diseases, Pretoria, South Africa
Tick Borne Diseases, Vaccine development, Pathology, Immunology
Johann Schröder, Meat and Livestock Australia, North Sydney, Australia
Experimental Design, Epidemiology, Chemical Parasiticides, Integrated Parasite Management, Anti-Parasitic Vaccines, Parasite Diagnostics, Ticks, Flies, Lice, Nematodes, Cestodes, Trematodes
Jan Šlapeta, University of Sydney Faculty of Science Sydney School of Veterinary Science Laboratory of Veterinary Parasitology, Camperdown, New South Wales, Australia
Biology, Apicomplexa, Parasites, Fleas and ticks, Vector borne diseases, Veterinary diagnostics, Veterinary parasitology education
Ian Sutherland, Hopkirk Research Institute, Palmerston North, New Zealand
Parasitology, immunology, anthelmintic resistance, welfare
Mike Taylor, Vparst Limited, York, United Kingdom
Sheep, cattle, worm control, fluke, coccidiosis, anthelmintic resistance, FECRT methods
Andrew Thompson, Murdoch University, Murdoch, Australia
Expertise - Zoonoses, cestodes, enteric protozoa, trypanosomes, wildlife
Donato Traversa, University of Teramo Veterinary Hospital, Teramo, Italy
Companion animals, Helminths, Vector-borne diseases
Gert Venter, University of the Free State, Bloemfontein, South Africa
Culicoides Biting Midges, Vector Competence And Capacity
Georg Von Samson-Himmelstjerna, Free University of Berlin, Berlin, Germany
Helminthoses in horses, dogs, cats and ruminants, Ticks and tick transmitted diseases, Drug resistance, Mechanism of drug action
Lihua Xiao, South China Agricultural University College of Veterinary Medicine, Guangzhou, China
Protozoa, Cryptosporidium, Giardia, Molecular epidemiology, Zoonosis
Dante Zarlenga, USDA-ARS Beltsville Agricultural Research Center, Beltsville, Maryland, United States of America
Food-borne and Animal Parasitology, molecular biology, phylogeny
Xing-Quan Zhu, Shanxi Agricultural University, College of Veterinary Medicine, Taigu, China
Parasite epidemiology, Diagnostics and control strategies, Parasite genetics, Genomics and functional omics, Molecular vaccines
Annetta Zintl, University College Dublin, Dublin, Ireland
Molecular epidemiology, Immunology, Vaccine development, Parasitic protozoa and helminths, ,

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Wilson, M.B., Nakane, P.K., 1978. Recent developments in the periodate method of conjugating horseradish peroxidase (HRPO) to antibodies. In: Knapp, W., Holubar, K., Wick, G. (Eds.), Immunofluorescence and Related Staining Techniques. North Holland, Amsterdam, pp. 215–224.

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