ISSN Versión Impresa 2218-6425 ISSN Versión Electrónica 1995-1403

*Neotropical Helminthology, 2026, vol. 20 (2), 295-299*

Neotropical Helminthology

ORIGINAL ARTICLE / ARTÍCULO ORIGINAL

# HELMINTH ANALYSIS OF TWO SPECIES OF THE GENUS *STENOCERCUS, S. CADUCUS* (COPE, 1862) AND *S. SINESACCUS* (TORRES-CARVAJAL, 2005) (SAURIA: REPTILIA)

# ANÁLISIS DE HELMINTOS EN DOS ESPECIES DEL GÉNERO *STENOCERCUS, S. CADUCUS* (COPE, 1862) Y *S. SINESACCUS* (TORRES-CARVAJAL, 2005) (SAURIA: REPTILIA)

# ANÁLISE DE HELMINTOS EM DUAS ESPÉCIES DO GÊNERO *STENOCERCUS, S. CADUCUS* (COPE, 1862) E *S. SINESACCUS* (TORRES-CARVAJAL, 2005) (SAURIA: REPTILIA)

**Kaylane Lucas da Costa[1]*, Gabriel Pinho Carvalho[1], Milena Maria de Andrade Lima[1], Robson Waldemar Avila[1] & Reinaldo J. Silva[2]**

[1] Regional Ophiology Center, Federal University of Ceará, Block 905, Science Center, Pici Campus, Fortaleza, CE, Zip Code 60455-760, Brazil.
[2] Department of Biodiversity and Biostatistics, Institute of Biosciences, São Paulo State University (UNESP), Botucatu, 18618-689, SP, Brazil
* Corresponding author: kaylaelcsa@gmail.com

Kaylane Lucas da Costa: https://orcid.org/0009-0007-0288-5956
Gabriel Pinho Carvalho: https://orcid.org/0009-0006-3776-6722
Milena Maria de Andrade Lima: https://orcid.org/0009-0004-8469-3445
Robson Waldemar Avila: https://orcid.org/0000-0003-3641-8321
Reinaldo J. Silva: https://orcid.org/0000-0002-3426-6873

## ABSTRACT

The lizard genus *Stenocercus* is one of the most widely distributed taxa in South America, both geographically and ecologically; nevertheless, parasite-host interactions within the group remain poorly documented. Before this study, parasitological studies have been conducted in only two species, *Stenocercus roseiventris* (D'Orbigny in Duméril & Bibron, 1837) and *Stenocercus caducus* (Cope, 1863). Thus, the aim of this study is to present new data on helminths infecting *S. caducus* and *S. sinesaccus*. A total of 16 specimens were analyzed. For *S. caducus*, only the nematode *Strongyluris oscari* (Travassos, 1923) was found with a prevalence of 7.69%. For *S. sinesaccus*, three helminth taxa were identified: *Subulura lacertilia* Vicente, Van Sluys, Fontes & Kiefer, 2000, *Oochoristica* sp., and *Oswaldocruzia* sp., with an overall infection prevalence

Este artículo es publicado por la revista Neotropical Helminthology de la Facultad de Ciencias Naturales y Matemática, Universidad Nacional Federico Villarreal, Lima, Perú auspiciado por la Asociación Peruana de Helmintología e Invertebrados Afines (APHIA). Este es un artículo de acceso abierto, distribuido bajo los términos de la licencia Creative Commons Atribución 4.0 Internacional (CC BY 4.0) [https:// creativecommons.org/licenses/by/4.0/deed.es] que permite el uso, distribución y reproducción en cualquier medio, siempre que la obra original sea debidamente citada de su fuente original.

DOI: https://doi.org/10.62429/rnh20262022230

of 100%. This research presents the first record of parasites for *S. sinesaccus* and expands the existing parasitological data for *S. caducus*.

**Keywords:** Helminths – *Stenocercus* – parasites – Tropiduridae – Cerrado – Pantanal

## RESUMEN

El género de lagartos *Stenocercus* es uno de los taxones con mayor distribución geográfica y ecológica en Sudamérica; sin embargo, las interacciones parásito-huésped dentro de este grupo aún están poco documentadas. Antes de este estudio, solo se habían realizado estudios parasitológicos en dos especies, *Stenocercus roseiventris* (D'Orbigny in Duméril & Bibron, 1837) y *Stenocercus caducus* (Cope, 1863). Por lo tanto, el objetivo de este estudio es presentar nuevos datos sobre los helmintos que infectan a *S. caducus* y *S. sinesaccus*. Se analizaron un total de 16 especímenes. En *S. caducus*, solo se encontró el nematodo *Strongyluris oscari* (Travassos, 1923) con una prevalencia del 7,69%. En *S. sinesaccus*, se identificaron tres taxones de helmintos: *Subulura lacertilia* Vicente, Van Sluys, Fontes & Kiefer, 2000, *Oochoristica* sp. y *Oswaldocruzia* sp., con una prevalencia de infección general del 100%. Esta investigación presenta el primer registro de parásitos para *S. sinesaccus* y amplía los datos parasitológicos existentes para *S. caducus*.

**Palabras clave:** Helmintos – *Stenocercus* – parásitos – Tropiduridae – Cerrado – Pantanal

## RESUMO

O gênero de lagarto *Stenocercus* é um dos táxons mais amplamente distribuídos na América do Sul, tanto geograficamente quanto ecologicamente; apesar disso, as interações parasita-hospedeiro do grupo ainda são pouco documentadas. Até o presente estudo, somente duas espécies haviam tido sua parasitologia previamente estudada: *Stenocercus roseiventris* (D'Orbigny in Duméril & Bibron, 1837) e *Stenocercus caducus* (Cope, 1863), com registros limitados à Serra de Bodoquena, no Mato Grosso do Sul. Assim, o objetivo deste trabalho é apresentar novos dados sobre helmintos hospedeiros de *S. caducus e S. sinesaccus*. Dessa forma, foram analisados 16 espécimes no total. Para *S. caducus*, apenas um helminto foi encontrado, o *Strongyluris oscari* (Travassos, 1923), apresentando uma prevalência de 7,69%. Para *S. sinesaccus*, três táxons de helmintos foram encontrados: *Subulura lacertilia* Vicente, Van Sluys, Fontes & Kiefer, 2000, *Oochoristica* sp. e *Oswaldocruzia* sp., com uma prevalência geral de infecção de 100%. A investigação apresenta o primeiro registro de parasitas para *S. sinesaccus* e expande os dados parasitológicos conhecidos para *S. caducus.*

**Palavras-chave:** Helmintos – *Stenocercus* – parasitas – Tropiduridae – Cerrado – Pantanal

## INTRODUCTION

Tropidurid lizard genus *Stenocercus* is one of the most widely distributed taxa in South America, both geographically and ecologically (Torres-Carvajal, 2007). Actually, 81 species are recognized and distributed in forested environments from northern Colombia through Bolivia and Brazil to central Argentina, mainly distributed in the Andean region (Ávila-Pires, 1995; Torres-Carvajal, 2007). However, despite their wide distribution and diversity, their habits remain poorly understood (Ávila & Silva, 2010; Silva *et al.*, 2010; Ávila *et al.*, 2012).

*Stenocercus caducus* (Cope, 1863) encompasses a large part of the genus's distribution, occurring in Argentina, Bolivia, and Brazil (Nogueira & Rodrigues, 2006). Studies with *S. caducus* focus primarily on its reproductive biology, sexual dimorphism, diet, and habitat use (Silva *et al.*, 2010; Smith & Smith, 2019), with a single study on parasitism (Ávila & Silva, 2010).

On the other hand, *Stenocercus sinesaccus* (Torres-Carvajal, 2005) is recorded in the Brazilian states of Mato Grosso, Rondônia, and Goiás (Torres-Carvajal, 2005; Morais *et al.*, 2010), being a species with a significant gap in knowledge, limited essentially to taxonomic diagnosis and distribution notes.

Parasitism is one of the most widespread modes of life on the planet, and studies in parasitology are key to better

understanding the natural history, ecology, life cycle, and evolution of parasites and hosts (Loreau *et al.*, 2005; Albuquerque *et al.*, 2012; Vieira *et al.,* 2019). Despite the diversity of species within the genus *Stenocercus*, there is a gap in parasitological research on the group. To date, only two have been the subject of parasitological studies: *Stenocercus roseiventris* (D'Orbigny in Duméril & Bibron, 1837) and *Stenocercus caducus* (with records limited to the Serra de Bodoquena in Mato Grosso do Sul (Ávila & Silva, 2010). Thus, this study presents new data on parasitism in *S. caducus* and *S. sinesaccus*, expanding knowledge regarding the genus.

## MATERIAL AND METHODS

Specimens of *S. caducus* were collected at two localities in Mato Grosso do Sul state: Dois Irmãos do Buriti municipality (19°13'15.78" S, 57°34'23.11" W) and Morro Santa Cruz (19°13'15.78" S, 57°34'23.11" W) and Serra do Amolar (17°49' S, 57°29' W), Corumbá municipality. Specimens of *S. sinesaccus* were collected at Manso Dam (APM Manso; 14°44'42"S 55°19'23" W), Chapada dos Guimarães municipality, Mato Grosso State. These localities are within the Pantanal (Corumbá municipality) and Cerrado Biomes, where lizards were captured by hand during active searches and by pitfall traps with drift fences (Fitzgerald, 2012). Lizard specimens were euthanized with a lethal injection of Thiopental, fixed with 10% formalin, and housed at Coleção Zoológica de Referência do Campus de Corumbá, Seção de Herpetologia da Universidade Federal do Mato Grosso do Sul (CEUCH) e Coleção Herpetológica da Universidade Federal de Mato Grosso, acervo de vertebrados do Instituto de Biociências (UFMT-R).

With the aid of a digital caliper (1mm precision), the snout-vent length (SVL) of each lizard specimen was taken, and then each individual was necropsied with a careful examination for helminths in the body cavity, lungs, and digestive tract under a stereoscopic microscope. Helminths found were processed following the guidelines of Aguiar *et al*. (2026): nematodes were cleared in phenol, and cestodes were dehydrated in an increasing series of alcohol, stained with the hydrochloric carmine technique, cleared in eugenol, mounted on temporary slides, and analyzed under a light microscope. After identification, helminth vouchers were deposited at Coleção Helmintológica do Instituto de Biociências da Unesp de Botucatu (CHIBB 2414, 2415, 3090, 3278, 3279, 3280, 3281, 3355, 3356 e 3357).

**Ethical aspects**: Lizard sampling permits were issued by Instituto Chico Mendes de Conservação da Biodiversidade (ICMBio), and this study was approved by the Animal Ethics Committee of the Universidade Federal do Ceará (CEUA-UFC), process #CEUA 6314010321.

## RESULTS

Thirteen *S. caducus* (69.28 ± 8.95 mm SVL; three females and ten males) were examined, and the helminth *Strongyluris oscari* Travassos, 1923 (n=4) was found. The overall prevalence was 7.69%. The helminths were found in a male, primarily in the large intestine (n=3), with one being found in the small intestine.

Three *S. sinesaccus* (68.48 ± 7.38 mm SVL; one female and two males) were examined, and three helminth taxa were found: the helminth *Subulura lacertilia* Vicente, Van Sluys, Fontes & Kiefer, 2000 (n=41), an unidentified species of Oochoristica (n=7), and an unidentified species of *Oswaldocruzia* (n=1). The overall prevalence was 100%, while the individual prevalence was 66.7% for *Subulura lacertilia*, 33.3% for *Oochoristica sp.*, and 33.3% for *Oswaldocruzia sp. Subulura lacertilia* was found in the large intestine of a male (n=13) and a female (n=28). *Oochoristica sp.* was found in the small intestine of a male, while one *Oswaldocruzia sp.* was found in the small intestine of the other male, representing a co-infection with *S. lacertilia.*

## DISCUSSION

The Pantanal covers 1.9% of the Brazilian territory in the Mato Grosso and Mato Grosso do Sul states (IBGE, 2019, 2025), with a total area of 150,961 Km² and harboring 31 lizard species (Strüssmann *et al.,* 2007), of which 41.9% have been studied for parasites. On the other hand, the Cerrado is the second largest Biome in Brazil, covering parts of 11 states plus the Federal District, with 76 lizard species registered and only 21 (27.6%) studied for parasites. This low number is concerning, as both ecosystems are suffering from biodiversity loss due to agricultural activities (MMA, 2016).

To the best of our knowledge, only two species of *Stenocercus* have been studied for parasites: *Stenocercus roseiventris* and *Stenocercus caducus*. The last one involved a study restricted solely to the Serra de Bodoquena region where two helminths were found (*Strongyluris oscari* and

*Skrjabinellazia intermedia*; Ávila & Silva, 2010). The three analyzed specimens of *S. sinesaccus* exhibited a high parasite load, with three different types of helminths found; however, the data were insufficient to determine a relationship between richness/abundance and snout-vent length (SVL). It is noteworthy that parasitological studies have been conducted on only approximately 3.7% of the genus *Stenocercus*, underscoring the fact that there is much more to be discovered.

Despite the small sample size of lizards analyzed, the results obtained in the present study contribute to expanding knowledge regarding the endoparasitic fauna of *S. caducus* and *S. sinesaccus*. However, given the wide distribution of *S. caducus* and the lack of studies on *S. sinesaccus* and most species of the genus, there is a clear need for further research with larger sample sizes to better understand and characterize helminth diversity and the relationships between these parasites and their hosts.

**Author contributions: CRediT (Contributor Roles Taxonomy)**

**KLC** = Kaylane Lucas da Costa
**GPC** = Gabriel Pinho Carvalho
**MMAL** = Milena Maria de Andrade Lima
**RWA** = Robson Waldemar Ávila
**RJS** = Reinaldo José da Silva

**Conceptualization**: LC, GPC, MMAL
**Data curation**: RWA, RJS
**Formal Analysis:** GPC, RWA
**Funding acquisition**: RWA
I**nvestigation**: KLC, RWA
**Methodology**: MMAL
**Project administration:** KLC
**Resources**: RWA
**Software**: KLC, GPC, MMAL, WRA, RJS
**Supervision**: KLC, RWA
**Validation**: RWA
**Visualization**: KLC, GPC, MMAL, WRA, RJS
**Writing – original draft**: KLC, GPC, MMAL, WRA, RJS
**Writing – review & editing**: KLC, GPC, MMAL, WRA, RJS

## ACKNOWLEDGEMENTS

This work was supported by the Conselho Nacional de Desenvolvimento Científico e Tecnológico - CNPq under Grants to RWA [process 307722/2021-0 and 303570/2026-1] and scholarships from the CNPq/PIBIC program at UFC for KLC and MMAL.

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Received September 25, 2026.

Accepted October 8, 2026.

Published online October 12, 2026.