

SHORT COMMUNICATION

First record of helminths parasitizing *Vanellus chilensis* (Aves, Charadriiformes) in Acre state, southwestern Brazilian Amazon

Leandro Siqueira de SOUZA^{1,2*}, Leilandio Siqueira De SOUZA², Edson GUILHERME³, Francisco Glauco de Araújo SANTOS^{4,2}

¹Instituto Oswaldo Cruz – IOC/Fiocruz, Laboratório de Biologia e Parasitologia de Mamíferos Silvestres Reservatórios, Rio de Janeiro, RJ, Brazil

²Universidade Federal do Acre, Laboratório de Patologia e Apoio a Vida Silvestre, Rio Branco, AC, Brazil

³Universidade Federal do Acre, Laboratório de Ornitologia, Rio Branco, AC, Brazil

⁴Universidade Federal do Acre, Centro de Ciências Biológicas e da Natureza, Rio Branco, AC, Brazil

*Corresponding author: leandrofiqueirasouza@gmail.com;  <https://orcid.org/0000-0003-4148-8092>

ABSTRACT

The southern lapwing, *Vanellus chilensis*, is a bird frequently seen in most of Brazil. Although it is widely distributed in other Brazilian biomes, including some parts of the Brazilian Amazon, it has only been recorded in the western Amazonian state of Acre since 2000. We report the presence of intestinal parasites in individuals of *V. chilensis* from the Cazumbá-Iracema Extractive Reserve in Acre through a coproparasitological analysis. Seven of the nine sampled individuals were parasitized. We observed larvae of *Strongyloides* sp. (28.5% of the samples), and eggs of *Ascaridia* sp. (28.5%), *Ancylostoma* sp. (14.2%), and *Choanotaenia* sp. (42.8%). These parasites are reported for the first time parasitizing *V. chilensis* in Brazil. The parasitized birds may act as reservoirs and were recorded in a peridomicile area, which may facilitate their contact with domestic birds.

KEYWORDS: endoparasites, wild birds, Nematoda, Cestoda, coproparasitology

Primeiro registro de helmintos parasitando *Vanellus chilensis* (Aves, Charadriiformes) no estado do Acre, sudoeste da Amazônia brasileira

RESUMO

O quero-quero, *Vanellus chilensis* é uma ave vista com frequência no Brasil. Apesar de ser uma espécie amplamente distribuída em todos os biomas brasileiros, incluindo algumas partes da Amazônia brasileira, somente a partir de 2000 começou a ser observado no Estado do Acre. Neste trabalho relatamos a presença de parasitas intestinais em indivíduos de *V. chilensis* capturados na Reserva Extrativista Cazumbá-Iracema, no Acre, por meio de análise coproparasitológica. Dos nove indivíduos com amostras coletadas, sete estavam parasitados. Foram encontradas larvas de *Strongyloides* sp. (28,5%), ovos de *Ascaridia* sp. (28,5%), ovos de *Ancylostoma* sp. (14,2%) e ovos de *Choanotaenia* sp. (42,8%). Estes parasitos são registrados pela primeira vez parasitando *V. chilensis* no Brasil. As aves parasitadas podem atuar como reservatórios e foram registradas em área de peridomicílio, o que pode facilitar o contato com aves domésticas.

PALAVRAS-CHAVE: endoparasitos, aves silvestres, Nematoda, Cestoda, coproparasitologia

The genus *Vanellus* Brisson, 1760 has 24 species, which are found on all continents (Wiersma and Kirwan 2020), but only two species occur in Brazil, the pied lapwing, *Vanellus cayanus* (Latham, 1790) and the southern lapwing, *Vanellus chilensis* (Molina, 1782) (Piacentini *et al.* 2015). *Vanellus chilensis* is found primarily in the vicinity of water bodies, including rivers, lakes, wetlands, and beaches, but also inhabits open fields, pastures, and even urban environments (Sick 2001; Wiersma and Kirwan 2020). These birds may live in groups of

more than 100 individuals, within which individuals defend territories and engage in anti-predator vigilance (Maruyama *et al.* 2009).

As *V. chilensis* does not undertake any major post-reproductive migration, it is considered to be a sedentary species, although it may travel short distances to avoid flooding and other changes in the local environment (Guimarães *et al.* 2016). It is a typical bird from South America, but its distribution has already expanded to Central and North

CITE AS: Souza, L.S.; Souza, L.S.; Guilherme, E.; Santos, F.G.A. 2021. First record of helminths parasitizing *Vanellus chilensis* (Aves, Charadriiformes) in Acre state, southwestern Brazilian Amazon. *Acta Amazonica* 51: 255-259.

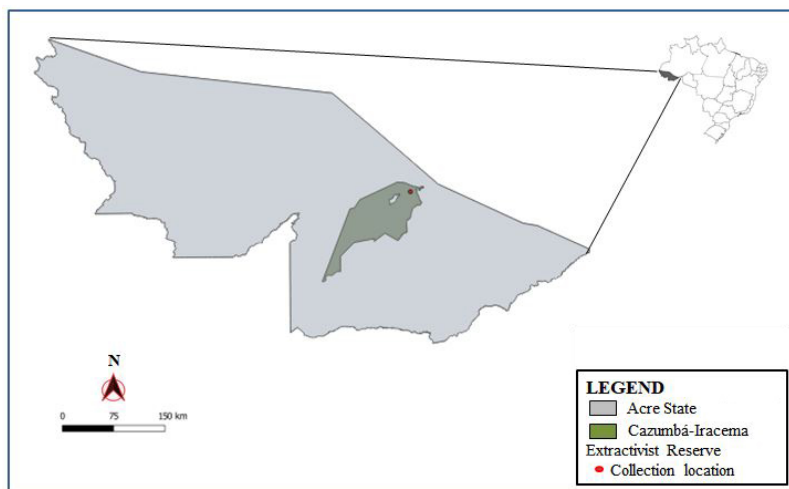


Figure 1. Location of the state of Acre in Brazil, and of the site at which *Vanellus chilensis* was captured (red dot) within the Cazumbá-Iracema Extractivist Reserve in the municipality of Sena Madureira. This figure is in color in the electronic version.

America (Wiersma and Kirwan 2020). It has also extended to the Amazon biome (Guilherme and Czaban 2015; Guimarães *et al.* 2016), where it has colonized areas that have been deforested for cattle ranching, with rivers and roads providing dispersal corridors that have allowed the species to reach the interior of the biome (Guilherme and Czaban 2015; Borges *et al.* 2017). *Vanellus chilensis* is considered to be an invasive species in the Brazilian state of Acre, where it can now be found on river margins during the dry season, as well as in cattle pastures and urban environments (Guilherme and Czaban 2015; Guilherme 2016).

The helminth fauna of *V. chilensis* is little known. The existing studies are restricted to some regions of Brazil and Argentina, with records of individuals parasitized by Platyhelminthes Gegenbaur, 1859, Acanthocephala Rudolphi, 1808 and Nematoda Rudolphi, 1808 (Travassos and Freitas 1940; Rêgo 1968; Pinto and Noronha 1972; Vicente *et al.* 1995; Avancini 2009; Silveira 2016). Here we report the first record of the presence of intestinal parasites in *V. chilensis* in the Amazon biome based on coproparasitological tests.

Birds were captured in the Extractivist Reserve Cazumbá-Iracema (*Resex do Cazumbá-Iracema*), a federal environmental protection area that covers a total of 750,794.70 ha in the municipality of Sena Madureira, Acre state, Brazil. Captures occurred in May and June 2018 in the community of Cuidado (9°08'47.2"S, 69°01'05.3"W), in the northwestern extreme of the reserve (Figure 1). The area has a considerable diversity of fauna and flora typical of the Western Amazon Corridor, one of seven major ecological corridors proposed for Brazil (ICMBio 2007).

Individuals of *V. chilensis* were first observed in a group of approximately 16 birds in an area of pasture near local residences (Figure 2). These individuals were captured using five mist nets. The nets were set at 5:00 am and closed at



Figure 2. Individuals of southern lapwing, *Vanellus chilensis* in a pasture in the study area in Sena Madureira, Acre, Brazil. Credit: Edson Guilherme. This figure is in color in the electronic version.

5:30 pm, three times per week during the study period. Each individual captured in the nets was placed in a cloth bag containing absorbent paper for 20 min, before being released at the capture site. The feces deposited by the birds in the bags were collected in sterile containers containing a Merthiolate-Iodine-Formaldehyde (MIF) solution for preservation until the parasitological analysis. The capture and handling of individuals and the collection of feces was authorized by the Ethics Committee on the Use of Animals of Universidade Federal do Acre (CEUA/UFAC nr. 2107.009788/2016-01) and Instituto Chico Mendes de Conservação da Biodiversidade - ICMBio (SISBIO license nr. 54692-2).

The samples were sent for coproparasitological analysis to the Laboratory of Biology and Parasitology of Wild Mammal Reservoirs of Instituto Oswaldo Cruz (LABPMR/IOC), Rio de Janeiro, Brazil. The diagnosis was based on three

complementary techniques: (i) direct examination of the fresh feces, stained with Lugol's solution; (ii) spontaneous sedimentation; and (iii) centrifugal flotation with saturated sucrose solution under optical microscopy. All the parasite specimens observed during these analyses were photographed and measured using 10x and 40x magnification (Axio Scope A1). The parasites were identified based on the diagnostic characteristics described by Foret (2005) and Zajac and Conboy (2011). Testimony material was deposited in the Helminthological Collection of the Instituto Oswaldo Cruz (CHIOC 38988 -38991).

Eleven lapwings were captured in the mist nets, of which, nine (82%) provided fecal samples. The analysis of these samples revealed the presence of parasites in 77.8% (n = 7) of the cases. Four helminth taxa were identified, three nematodes and one cestode (Figure 3). Eggs of the cestode *Choanotaenia* sp. were the most common, present in three (42.8%) of the seven samples. Larvae of *Strongyloides* sp. were observed in two (28.5%), eggs of *Ascaridia* sp. in two (28.5%) and eggs of *Ancylostoma* sp. in one (14.2%) of the samples. Overall, 58 helminth eggs or larvae were found, of which almost half (48%, n = 28) were *Choanotaenia* sp. eggs, 24% (n = 14) were *Ascaridia* sp. eggs, 17% (n = 10) were *Ancylostoma* sp. eggs, and 10% (n = 6) were larvae of *Strongyloides* sp. (Figure 3).

Helminths have already been recorded parasitizing *V. chilensis* in a number of Brazilian states (Table 1), based on

necropsy and the analysis of internal organs. Overall, six species of Nematoda, four species of Digenea, four species of Cestoda, and four of Acanthocephala were recorded. Travassos and Freitas (1940) reported the infection of two southern lapwings by cestodes during a scientific survey of a railroad in Mato Grosso do Sul, Brazil, but did not identify the taxon.

We observed *V. chilensis* in peridomicile areas in very close proximity to human residences, which may facilitate their contact with domestic birds. *Ascaridia galli*, *Strongyloides* sp., and *Choanotaenia* sp. are all known to parasitize domestic birds (Olivares *et al.* 2006; Siqueira and Marques 2016; Marques *et al.* 2019; Neto *et al.* 2020) and, in the same region in Acre where the individuals of *V. chilensis* were captured, we have recorded parasites of three taxa (*Strongyloides* sp., *Ascaridia* sp., and Strongylida) in other bird species (Souza *et al.* 2020), which indicates possible transmission between local birds that share the same environment.

Wild animals are considered to be potential hosts and reservoirs of parasitic diseases, and wild birds, whether free-ranging or in captivity, may act as reservoirs of diseases that may be transmitted to humans (Souza *et al.* 2018). This emphasizes the importance of further research to catalogue the parasitological fauna of wild birds in the study region, together with molecular analyses to verify the possible presence of parasites with zoonotic potential that may infect the local human population.

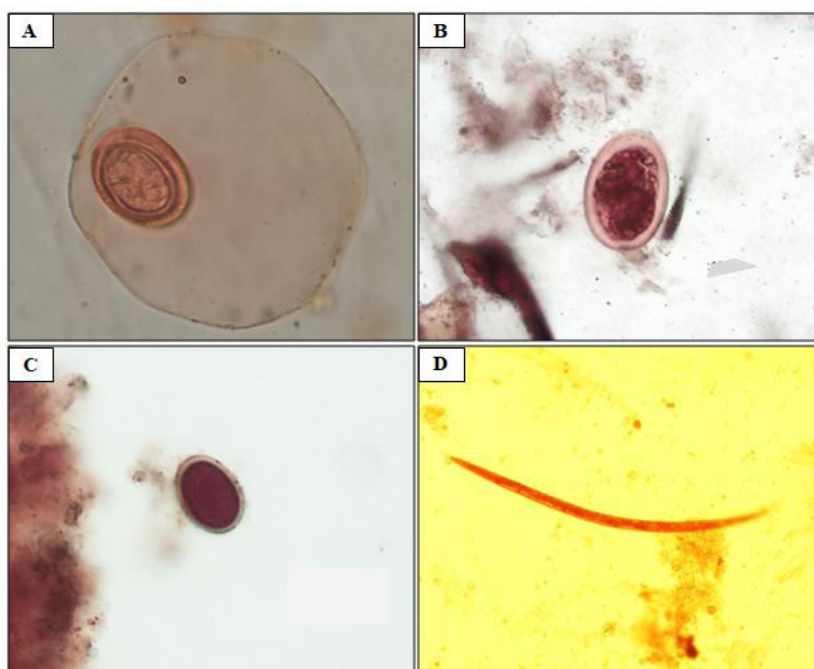


Figure 3. Endoparasites found in the feces of southern lapwings, *Vanellus chilensis* captured in the Cazumbá-Iracema Extractive Reserve in Sena Madureira, Acre, Brazil. A – egg of *Choanotaenia* sp. (amplified 40x); B – egg of *Ancylostoma* sp. (20x); C – egg of *Ascaridia* sp. (20x); D – larva of *Strongyloides* sp. (20x). This figure is in color in the electronic version.

Table 1. Helminths observed parasitizing *Vanellus chilensis* in Brazil.

| Parasite | Stage | Organ infected | Brazilian state | Reference |
|-------------------------------------|---------------|--|-----------------------------------|-------------------------------------|
| Nematodes | | | | |
| <i>Ancylostoma</i> sp. | Eggs | Feces | Acre | Present study |
| <i>Ancyracanthopsis coronata</i> | Adult | Gizzard | Not reported | Vicente <i>et al.</i> 1995 |
| <i>Ascaridia</i> sp. | Eggs | Feces | Acre | Present study |
| <i>Brevithominx asperodorsus</i> | Adult | Gizzard | Rio Grande do Sul | Avancini 2009 |
| Capillariidae | Adult | Gizzard, esophagus, trachea | Paraná | Silveira 2016 |
| <i>Dispharynx nasuta</i> * | Adult | Gizzard, proventricle | Rio Grande do Sul | Avancini 2009 |
| <i>Heterakis psophiae</i> * | Adult | Cecum, proventricle, duodenum, large intestine | Rio Grande do Sul | Avancini 2009 |
| <i>Oxyspirura matogrosensis</i> | Adult | Eyes | Not reported | Vicente <i>et al.</i> 1995 |
| <i>Strongyloides</i> sp. | Larvae | Feces | Acre | Present study |
| Digenetics | | | | |
| <i>Echinostoma aphyractum</i> | Adult | Small intestine, large intestine | Rio Grande do Sul | Avancini 2009 |
| <i>Leucochloridium parcum</i> | Adult | Cloaca | Paraná | Silveira 2016 |
| <i>Neivaia cymbium</i> | Adult | Bill, trachea | Rio Grande do Sul | Avancini 2009 |
| <i>Stomylotrema vicarium</i> | Adult | Large intestine, cecum | Rio Grande do Sul | Avancini 2009 |
| Cestodes | | | | |
| <i>Choanotaenia</i> sp. | Eggs | Feces | Acre | Present study |
| <i>Gyrocoelia crassa</i> | Adult /strobe | Small intestine | Pará, Mato Grosso Minas Gerais | Rêgo 1968 Pinto and Noronha 1972 |
| <i>Gyrocoelia perversa</i> | Adult | Small intestine | Rio Grande do Sul | Avancini 2009 |
| <i>Infula macrophallus</i> | Adult | Jejunum, anterior ileum | Paraná | Silveira 2016 |
| <i>Parachoanotaenia macracantha</i> | Adult | Small intestine | Pará, Mato Grosso | Rêgo 1968 |
| Cestoda | Not reported | Not reported | Mato Grosso do Sul | Travassos and Freitas 1940 |
| Acanthocephala | | | | |
| <i>Centrorhynchus</i> sp. | Adult | Jejunum, posterior ileum | Paraná | Silveira 2009 |
| <i>Gigantorhynchida</i> | Adult | Jejunum, posterior ileum | Paraná | Silveira 2009 |
| <i>Mediorhynchus</i> sp. | Adult | Jejunum, posterior ileum | Paraná | Silveira 2009 |
| <i>Plagiorhynchus</i> sp. | Adult | Jejunum, posterior ileum | Paraná | Silveira 2009 |

*Also recorded in Paraná.

ACKNOWLEDGMENTS

We would like to thank Mrs. Maria Marilene Rufino, the administrator of the Cazumbá-Iracema Extractive Reserve, for her support during fieldwork, with special thanks to the residents of the Cazumbá Reserve for their help with the bird captures, in particular, Mr. José Acácio and Mrs. Francisca da Rocha.

REFERENCES

- Avancini, LF 2009. *Helminths e artrópodes de Vanellus chilensis (Molina, 1782), quero-quero, da região sul do Rio Grande do Sul*. Masters thesis, Universidade Federal de Pelotas, Brazil, 59p. (<http://guaiaca.ufpel.edu.br:8080/handle/123456789/2351>)
- Borges, S.H.; Whittaker, A.; Almeida, R.A.; Cornélius, C.; Santos, M.A.; Moreira, M. 2017. Bird records in the northwestern and central portions of the Amazon Basin highlight the needs for inventories and long-term monitoring in the region. *Revista Brasileira de Ornitologia*, 25: 206-220.
- Bush, A.O.; Lafferty, K.D.; Lotz, J.M.; Shostak, A.W. 1997. Parasitology meets Ecology on its own terms: Margolis *et al.* revisited. *Journal of Parasitology*, 83: 575-583.
- Digiani, M.C. 1999. *Estúdios helmintológicos en aves limnicolas del litoral rioplatense*. Doctoral thesis, Universidad Nacional de La Plata, Argentina, 148p. (<http://sedici.unlp.edu.ar/handle/10915/4524>)
- Foreyt, W.J. 2005. *Parasitologia Veterinária: Manual de Referência*. 5th ed. Roca, São Paulo, 240p.
- González-Acuña, D.; Olmedo, P.; Cicchino, A. 2008. Parasitos de *Vanellus chilensis chilensis* (Aves, Charadriidae) en Chillán, Centrosur de Chile. *Boletín Chileno de Ornitología*, 14: 36-48.
- Guilherme, E. 2016. *Aves do Acre*. 1st ed. Edufac, Rio Branco, 897p.
- Guilherme, E.; Czaban, R. 2015. First record of the yellowish pipit in Acre with notes on other grassland birds in southwestern Amazônia. *Neotropical Biology and Conservation*, 10: 169-176.
- Guimarães, D.P.; De Lima, A.C.G.; Pedroza, D. 2016. New record and geographic expansion of *Vanellus chilensis* in the state of Amazonas, Brazil. *Atualidades Ornitológicas*, 190: 24.
- Martorelli, S.R.; Ivanov, V.A. 1996. Host-Induced and geographical variation in *Levinseniela cruzi* Travassos, 1920 (Digenea: Microphallidae). *The Helminthological Society of Washington*, 63: 130-135.
- Maruyama, P.K.; Cunha, A.F.; Tizo-Pedroso, E.; Del-Claro, K. 2009. Relation of group size and daily activity patterns to southern

- lapwing (*Vanellus chilensis*) behavior. *Journal of Ethology*, 28: 339-344.
- Marques, S.M.T.; Menetrier, L.C.; Natal, A.C.C.; Fernandes, L.S.; Meyer, J.; Alievi, M.M. 2019. Prevalence of intestinal parasites in domestic and wild birds of the south of Brazil. *Agrarian Academic Journal*, 2: 17-24.
- Neto, B.D.O.S.; Bombonato, N.G.; Veras, S.A.; de Miranda, R.L.; de Castro, J.R. 2020. Parasitas gastrointestinais em uma criação semi-intensiva de galinhas caipiras, no município de Carmo do Paranaíba, MG. *Publicações em Medicina Veterinária e Zootecnia*, 14: a623. doi.org/10.31533/pubvet.v14n8a623.1-10
- Olivares, L.L.; Kyvsgaard, N.; Rimbaud, E.; Pineda, N. 2006. Prevalencia y carga parasitaria de helmintos gastrointestinales en gallinas de traspatio (*Gallus gallus domesticus*), en el municipio de El Sauce, departamento de León, Nicaragua. *Revista Electrónica de Veterinaria*, 7: 1-4. <https://www.redalyc.org/pdf/636/63612653015.pdf>
- Piacentini, V.Q.; Aleixo, A.; Agne, C.E.; Mauricio, G.N.; Pacheco, J.F.; Bravo G.A.; *et al.* 2015. Annotated checklist of the birds of Brazil by the Brazilian Ornithological Records Committee. *Revista Brasileira de Ornitologia*, 23: 91-298.
- Pinto, R.M.; Noronha, D. 1972. Contribuição ao conhecimento da fauna helmintológica do município de Alfenas, Estado de Minas Gerais. *Memorias do Instituto Oswaldo Cruz*, 70: 391-497.
- Rêgo, A.A. 1968. Sobre três cestódeos de aves Charadriiformes. *Memorias do Instituto Oswaldo Cruz*, 66: 107-115.
- Ribon, R.; Lamas, I.R.; Gomes, H.B. 2004. Avifauna da zona da mata de Minas Gerais: Município de Goiana e Rio Novo, com alguns registros para Coronel Pacheco e Juiz de Fora. *Revista Árvore*, 28: 291-305.
- Sick, H. 2001. *Ornitologia Brasileira*. 3rd ed. Nova Fronteira, Rio de Janeiro, 862p.
- Silveira, T.D. 2016. *Análise da fauna helmintológica do quero-quero Vanellus chilensis (molina, 1782) procedente da área do Aeroporto de Bacacheri, Curitiba, Paraná, Brasil*. Masters thesis, Universidade Federal do Rio Grande do Sul, 119p. (<https://lume.ufrgs.br/handle/10183/196610?locale-attribute=es>)
- Siqueira, G.B.; Marques, S.M.T. 2016. Parasitos intestinais em galinhas caipiras da região metropolitana de Porto Alegre, RS. *Publicações em Medicina Veterinária e Zootecnia*, 10: 690-695.
- Souza, T.N.; Silva, R.V.S.; Evangelista, B.B.C.; Freire, S.M. 2018. Prevalence of parasitic zoonoses and its relationship to wild birds in northeast of Brazil. *Jornal Interdisciplinar de Biociências*, 3: 39-42.
- Souza, L.S.; Guilherme, E.; Gul, S.; Andrade, A.M.F.; Santos, F.G.A. 2020. First report of Davaneidae and Strongylida parasitizing *Ramphocelus carbo* (Aves: Passeriformes: Thraupidae) in the southwest of the Brazilian Amazon region. *Revista Brasileira de Parasitologia Veterinaria*, 10:e016719. doi: 10.1590/S1984-29612019105. PMID: 32049145.
- Travassos, L.; De Freitas, J.F.T. 1940. Relatório da excursão científica realizada na zona da Estrada de Ferro noroeste do Brasil em julho de 1939. *Memorias do Instituto Oswaldo Cruz*, 35: 525-556.
- Vicente, J.J.; Rodrigues, H.O.; Gomes, D.C.; Pinto, R.M. 1995. Nematoides do Brasil. Parte IV: Nematoides de Aves. *Revista Brasileira de Zoologia*, 12: 1-273.
- Wiersma, P.; Kirwan, G.M. 2020. Southern Lapwing (*Vanellus chilensis*). In: Del Hoyo, J.; Elliott, A.; Sargatal, J.; Christie, D.A.; Juana, E. (Ed.). *Handbook of the Birds of the World Alive*. Lynx Edicions, Barcelona. (<https://www.hbw.com/node/53814>). Accessed on 02 Mar 2020.
- Zajac, A.M.; Conboy, G.A. 2011. *Veterinary Clinical Parasitology*. 8th ed. Wiley, New Jersey, 368p.

RECEIVED: 22/03/2021

ACCEPTED: 09/04/2021

ASSOCIATE EDITOR: Sérgio H. Borges

