SHORT COMMUNICATION

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

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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

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...
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). 

Vanelus 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 (T ravassos 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 Cuíldado
(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
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

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.

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.
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 lapings 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 peridomestic 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                       |             |                                                     |                 |                                   |
| Anclylostomus sp.               | Eggs        | Feces                                               | Acre            | Present study                     |
| Anclylostomus coronata          | Adult       | Gizzard                                             | Not reported    | Vicente et al. 1995                |
| Ascaridia sp.                   | Eggs        | Feces                                               | Acre            | Present study                     |
| Belethomina asperodonsus        | Adult       | Gizzard, esophagus, trachea                         | Rio Grande do Sul | Avancini 2009                     |
| Capillariae                     | Adult       | Gizzard, esophagus, trachea                         | Parana          | Silveira 2016                     |
| Dispharynx nasuta*              | Adult       | Gizzard, proventricle                               | Rio Grande do Sul | Avancini 2009                     |
| Heterakis psophiace*            | Adult       | Cecum, proventricle, duodenum, large intestine      | Rio Grande do Sul | Avancini 2009                     |
| Oxyospirura matagrosensis       | Adult       | Eyes                                                | Not reported    | Vicente et al. 1995                |
| Strongyloides sp.               | Larvae      | Feces                                               | Acre            | Present study                     |
| Digenetics                      |             |                                                     |                 |                                   |
| Echinostoma ophylactum          | Adult       | Small intestine, large intestine                    | Rio Grande do Sul | Avancini 2009                     |
| Leucoclinorhynchus percarum     | Adult       | Cloaca                                              | Parana          | Silveira 2016                     |
| Neivaia cymbium                 | Adult       | Bill, trachea                                       | Rio Grande do Sul | Avancini 2009                     |
| Stomylotrema vicianum           | Adult       | Large intestine, cecum                              | Rio Grande do Sul | Avancini 2009                     |
| Cestodes                        |             |                                                     |                 |                                   |
| Chaonotaenia sp.                | Eggs        | Feces                                               | Acre            | Present study                     |
| Gyrocoelia crassa               | Adult /strobe| Small intestine                                     | Pará, Mato Grosso Minas Gerais | Rêgo 1968                       |
| Gyrocoelia perversa             | Adult       | Small intestine                                     | Rio Grande do Sul | Avancini 2009                     |
| Influla macrophilus             | Adult       | Jejunum, anterior ileum                             | Parana          | Silveira 2016                     |
| Parachoanotaenia macracantha    | Adult       | Small intestine                                     | Pará, Mato Grosso | Rêgo 1968                       |
| Cestoda                         | Not reported| Not reported                                        | Mato Grosso do Sul | Travassos and Freitas 1940       |
| Acanthocephala                  |             |                                                     |                 |                                   |
| Centrorhynchus sp.              | Adult       | Jejunum, posterior ileum                            | Parana          | Silveira 2009                     |
| Gigantorhynchida                | Adult       | Jejunum, posterior ileum                            | Parana          | Silveira 2009                     |
| Mediorhynchus sp.               | Adult       | Jejunum, posterior ileum                            | Parana          | Silveira 2009                     |
| Plagiorhynchus sp.              | Adult       | Jejunum, posterior ileum                            | Parana          | Silveira 2009                     |

*Also recorded in Parana.

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