Journal of Helminthology (2009) **83,** 267–269 doi:10.1017/S0022149X08201926

Helminths of the teiid lizard *Kentropyx calcarata* (Squamata) from an Amazonian site in western Brazil

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Abstract

Despite being conspicuous members of neotropical lizard communities, aspects of the life history of many teiid lizard species are poorly known, especially endoparasites infecting the genus *Kentropyx*. We studied seven specimens of *K. calcarata* collected at an Amazonian site in Mato Grosso state, Central Brazil in 2007. Four species of helminth were recovered: *Oswaldocruzia* sp., *Piratuba digiticauda*, *Physaloptera retusa* and *Physalopteroides venancioi*. *Piratuba digiticauda*, a body-cavity, parasite had the highest prevalence (42.9%), whereas the stomach parasites *P. venancioi* and *P. retusa* presented the highest intensity of infection and abundance, respectively. Moreover, this is the first report of *Oswaldocruzia* sp., *P. digiticauda* and *P. venancioi* in *K. calcarata* and new locality records for all nematodes were assigned.

Introduction

South American lizards of the family Teiidae are conspicuous members of the major biomes, occurring in a wide variety of habitats (Pianka & Vitt, 2003). Although several aspects of many teiids have been studied in the past few years, such as reproduction, activity, diet and parasitism (Vitt, 1991; Vitt & Colli, 1994), there is a lack of knowledge of some genera (e.g. *Tupinambis*, *Dracaena* and *Kentropyx*). To our knowledge, the only records of helminths infecting *Kentropyx* species are those from *K. altamazonica* and *K. pelviceps* in Amazonian Peru (Bursey *et al.*, 2005) and *K. calcarata* from the Pará state, in the Brazilian Amazon (see Vicente *et al.*, 1993; Goldberg *et al.*, 2007).

Kentropyx calcarata is a teiid lizard commonly found in open habitats and forest edges throughout central and eastern Amazonia, in Guyana, French Guiana, Suriname and six states of Amazonian Brazil (Ávila-Pires, 1995). Studies of helminths of a widespread host along their geographical distribution are important to highlight the importance of habitat types and biogeographical patterns of the parasites (Aho, 1990; Rocha *et al.*, 2003). Thus, the purpose of this article is to present data on the helminths of *K. calcarata* from the southern Amazon, Mato Grosso state, Brazil and, using available data, compare the helminth fauna of this population with those of other populations and congenerics.

Materials and methods

Lizards ($n = 7$) were collected by hand or pitfall traps in August 2007 in a tropical rain forest (Amazon) of Juara municipality (57°38′W, 10°25′S, datum: SAD69), Mato Grosso State, Brazil. The hosts were euthanized with a lethal injection of sodium thiopental, fixed in 10% formalin and stored in 70% alcohol. Lizards were deposited in the Coleção Zoológica de Vertebrados da Universidade Federal de Mato Grosso (UFMT 6876, 5982, 6562, 5986, 6761, 5985, 6003).

Subsequently lizards were necropsied and lungs, body cavity and digestive tract were surveyed under a stereomicroscope for endoparasites. Helminths were cleared in phenol, identified and deposited in the Coleção Helmintológica do Instituto de Biociências da Universidade Estadual Paulista Júlio de Mesquita Filho, Instituto de Biociências de Botucatu, São Paulo State, Brazil, under the acronym CHIBB (2647–2653 and 3044).

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Table 1. Epidemiological data for seven *Kentropyx calcarata* and their nematode parasites from the rain forest of Juara municipality, Mato Grosso State, Brazil. For each nematode the total number (*N*), prevalence, intensity of infection (mean ± one standard deviation), mean abundance and the sites of infection are given.

Parasite species	*N*	Prevalence (%)	Intensity of infection	Mean abundance	Sites of infection
Oswaldocruzia sp.	2	28.6	1	0.3	LI, SI
Piratuba digiticauda	5	42.9	1.3 ± 0.6	0.6	BC
Physaloptera retusa	6	28.6	3 ± 2.8	0.9	ST
Physalopteroides venancioi	4	14.3	4	0.6	ST

LI, large intestine; SI, small intestine; BC, body cavity; ST, stomach.

Prevalence was calculated as (infected lizards/examined lizards) × 100, mean intensity of infection as arithmetic mean number of worms from infected lizards, and mean abundance as total number of a particular parasite divided by total number of hosts (both infected and uninfected hosts) (Bush *et al.*, 1997). Means are ± 1 standard deviation.

Results

From the seven specimens of *K. calcarata* examined, 57.1% were found to harbour nematodes (table 1). Seventeen helminths of four nematode species were recovered and were identified as *Oswaldocruzia* sp., *Piratuba digiticauda*, *Physaloptera retusa* and *Physalopteroides venancioi*. Nematode cysts were also found in the lungs of one specimen. Of these, the body cavity parasite *P. digiticauda* presented the higher prevalence (42.9%), followed by the intestinal and stomach parasites, *Oswaldocruzia* sp. and *P. retusa* respectively, which had the same prevalence (28.6%). The species with the highest intensity of infection was the stomach parasite *P. venancioi*, and the highest abundance was shown by *P. retusa*. Three lizards (42.9%) had no parasites, one presented just one parasite species, two harboured two parasite species and one was infected by three parasite species (table 1).

Discussion

Despite the small sample size, the helminth richness found in *K. calcarata* in the Mato Grosso state was higher than those reported for other congeneric populations (table 2).

Reports on endoparasites of *Kentropyx* species are scarce and restricted to the Pará State and Departamento Madre de Dios, Cuzco Amazonico in Peru (Baker, 1982, 1987; Vicente *et al.*, 1993; Bursey *et al.*, 2005; Goldberg *et al.*, 2007). Thus, Mato Grosso state represents a new locality record for all the nematodes found and *K. calcarata* represents a new host record for *Oswaldocruzia* sp., *P. digiticauda* and *P. venancioi*.

The stomach parasites *P. retusa* and *P. venancioi* have been recorded in South America in a wide variety of reptilian and amphibian hosts (see Bursey *et al.*, 2007). On the other hand, the body-cavity parasite *P. digiticauda* has been recorded only in sit-and-wait forager lizard hosts (Bursey & Goldberg, 2004); this is the first record of *P. digiticauda* in an active foraging lizard. In the present study we did not find *Kentropyxia sauria*, which is recorded only in *K. calcarata* in the Pará state. Another Molineidae nematode was found infecting *K. calcarata* in the Mato Grosso state: *Oswaldocruzia* sp. Differences in helminth communities in different populations of *K. calcarata* along their geographical range may be the result of changes in habitat characteristics and

Table 2. Comparison of helminths in different species and populations of *Kentropyx*.

Host species	*N*	Helminth composition	Locality	Source
K. altamazonica	11	*Physaloptera retusa* *Physalopteroides venancioi*	Cuzco, Peru	Bursey *et al.*, 2005
K. calcarata	7	*Oswaldocruzia* sp. *Piratuba digiticauda* *Physaloptera retusa* *Physalopteroides venancioi*	Juara, Mato Grosso, Brazil	This study
K. calcarata		*Piratuba shawi* *Kentropyxia sauria*	Belém, Pará, Brazil	Baker, 1982, 1987
K. calcarata	17	*Kentropyxia sauria* *Physaloptera retusa*	Novo Progresso, Pará, Brazil	Goldberg *et al.*, 2007
K. pelviceps	15	*Ophiotaenia flava* *Dujardinascaris* sp. *Parapharyngodon sceleratus* *Physaloptera retusa* *Physalopteroides venancioi*	Cuzco, Peru	Bursey *et al.*, 2005

biological features of hosts, as noted by Rocha *et al.* (2003) in the scincid *Mabuya* species.

The small sample size may be responsible for the low helminth richness found in the genus *Kentropyx*, because large sample size enhances the possibility of recording rare and accidental helminth species (Rocha *et al.*, 2003). Also, all reports on *Kentropyx* endoparasites come from Amazonian sites and more helminth species would be recorded in other species inhabiting different habitats, such as the Cerrado and Pantanal in central Brazil.

Acknowledgements

We would like to thank the Instituto de Biociências da Universidade Federal de Mato Grosso, especially Ricardo A.K. Ribeiro and Marcos A. Carvalho, for providing lizards for this parasitological study. This study had financial support from FAPESP (process 06/59692-5). R.W.A. thanks CAPES for a grant.

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(Accepted 22 November 2008)
First Published Online 5 February 2009