

Helminths of *Gonatodes hasemani* and *Pseudogonatodes guinanensis* (Squamata, Gekkonidae) from Brazil, South America

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GONATODES *hasemani* Griffin, 1917 is known from southwestern Amazonia in Brazil, eastern Peru and northern Bolivia (Uetz et al., 2010). An isolated population exists in forest along the Rio Xingu south of Altimira as well collected by LJV in 1985 and deposited in the Museu de Zoologia, Universidade de Sao Paulo (MZUSP), Brazil. *Pseudogonatodes guinanensis* Parker, 1935 occurs in Amazonian Brazil, Colombia, Ecuador, French Guiana, Guyana, Peru, Suriname and Venezuela (Uetz et al., 2010). We know of no helminth records for these species. The purpose of this note is to establish the initial helminth lists for *G. hasemani* and *P. guinanensis* as part of an ongoing investigation of helminth distribution in Neotropical lizards.

METHODS AND MATERIALS

Forty individuals of *Gonatodes hasemani* (mean snout-vent length [SVL] = 35.1 ± 6.8 SD, range = 19-45 mm) and eleven individuals of *Pseudogonatodes guinanensis* (SVL = 24.1 mm ± 2.2 SD, range = 21-27 mm) collected by LJV were borrowed from the Department of Herpetology, Sam Noble Museum of Natural History (OMNH), University of Oklahoma, Norman Oklahoma, USA, and examined for helminths. Four individuals of *G. hasemani* (OMNH 36898-36901) were collected in Acre State, 5.0 km N Porto Walter, 8°15'S, 72°46'W, February-April, 1996; 11 (OMNH 37114-37124) were collected in Amazonas State, Rio Ituxi at Madeirera Scheffer (8°20'S, 65°42'W) February-March, 1997; and 25 (OMNH 37281-37305) were collected in Rondônia

State, Rio Formoso, Parque Estadual Guajará-Mirim, 90.0 ± km N Nova Mamoré (10°19'S, 64°33'W) January-March 1998. All individuals of *P. guinanensis* (OMNH 36920-36930) were collected in Acre State, 5.0 km N Porto Walter, February-April, 1996. Lizards had been field-fixed in 10% formalin, preserved in 70% ethanol and the stomachs removed for ecological studies (see Vitt et al. 2000 for *G. hasemani* and Vitt et al. 2005 for *P. guinanensis*). For this study, the small and large intestines, liver and body cavities were examined for helminths under a dissecting microscope. Nematodes were cleared in glycerol on a microscope slide. Cestodes and acanthocephalans were stained in hematoxylin and mounted in Canada Balsam. All helminths were studied as whole mounts under a compound microscope. Helminth community terminology is in accordance with Bush et al. (1997).

RESULTS

Number of helminths, prevalence (number of infected hosts divided by number of hosts examined X 100), mean intensity (mean number of helminths per infected host ± 1 SD) and range (lowest and highest intensities) are presented in Table 1. Found in *G. hasemani* were one species of Cestoda, a tetrathyridium of *Mesocestoides* sp. (small intestine) and one species of Nematoda, *Skrjabinelazia galliardi* Chabaud, 1973 (small and large intestines). One species of Acanthocephala, *Acanthocephalus saurius* Bursey & Goldberg, 2003 was found in the small intestine of *P. guinanensis*. Voucher helminths were deposited

Reptile Species	Helminth Species	Number	Prevalence (%)	Mean Intensity	Range
<i>Gonatodes hasemani</i>	<i>Mesocestoides</i> sp.	1	3	1.0	---
	<i>Skrjabinelazia galliardi</i>	4	8	1.7 ± 0.58	1-2
<i>Pseudogonatodes guinanensis</i>	<i>Acanthocephalus saurius</i>	9	36	1.8 ± 0.84	1-3

Table 1. Species and number of helminths, prevalence, mean intensity and range of infection in 40 *Gonatodes hasemani* and 11 *Pseudogonatodes guinanensis* from Brazil.

in the United States National Parasite Collection, USNPC, Beltsville, Maryland, USA as *G. hasemani*: *Mesocestoides* sp. (USNPC 103208), *Skrjabinelazia galliardi* (USNPC 103209) and *P. guinanensis*: *Acanthocephalus saurius* (USNPC 103207).

DISCUSSION

Tetrathyridia (second larval stage) of *Mesocestoides* sp. are cosmopolitan in amphibians and reptiles (Goldberg et al., 2004). Ants (Formicidae) have been suggested as first intermediate hosts while the strobilar stage occurs in mammals (Padgett & Boyce, 2005). *Skrjabinelazia galliardi* was described from *Gonatodes humeralis* from Belem, Brazil by Chabaud (1973). It was reported in *Tropidurus torquatus* from Belém, Brazil, *Gonatodes albogularis* from Panama and *Anolis limifrons* from Nicaragua (Vrcibradic et al., 2000; Bursey et al., 2007; Goldberg et al. 2010a). Two types of eggs are produced. One is thought to be autoinfective whereas the other is released to the environment and ingested by insects, which are thought to serve as paratenic (transport) hosts (Chabaud et al., 1988). The genus *Acanthocephalus* is cosmopolitan in distribution (Kennedy, 2006). *Acanthocephalus saurius* was described from *Anolis limifrons* from Costa Rica by Bursey & Goldberg (2003) and is also known from *Anolis capito*, *A. humilis* and *A. lionotus* from Nicaragua and *Anolis nitens* and *Prionodactylus oshaughnessyi* from Brazil (Bursey & Goldberg, 2004; Bursey et al., 2007; Goldberg et al. 2010a, 2010b). *Acanthocephalans* also require an arthropod intermediate host (Kennedy, 2006).

In each case, infection was a product of diet brought on by ingestion of an infected arthropod. Further work will be necessary to determine the

extent of helminth infections in these geckoes and whether diet or habitat is more consequential. *Gonatodes hasemani* represents a new host record for *Mesocestoides* sp. and *Skrjabinelazia galliardi*. *Pseudogonatodes guinanensis* represents a new host record for *Acanthocephalus saurius*.

ACKNOWLEDGEMENTS

Lizards were collected under collaborative projects in Brazil (through T.C.S. Avila-Pires). Permits were issued by Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq, Portaria MCT no. 170. De 28/09/94), the Instituto Renováveis (IBAMA, permit no. 073/94-DIFAS). All animals were treated in accordance with federal, state and university regulations (Animal Care Assurance 73-R-100, approved 8 November 1994). NSF grants DEB-92300779 and DEB-9505518 to L.J. Vitt and J.P. Caldwell supported collection of lizards. Cecilia Nava and Daisy Salguero (Whittier College) assisted with dissections.

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