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SHORT COMMUNICATION

The first report of *Cosmocerca parva* (Nematoda: Cosmocercidae) from *Colostethus fraterdanieli* (Anura: Dendrobatidae) in Colombia

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Palavras-chave: Anura, Dendrobatidae, *Colostethus fraterdanieli*, Nematoda, Cosmocercidae, *Cosmocerca parva*, Colômbia, helmintos.

Research on the nematode parasites of anurans in Colombia is scarce, with only three species of nematodes having been recorded from two Colombian anurans. Goldberg and Bursey (2003) reported *Cosmocerca podicipinus*, *Physocephalus* sp., and *Porrocaecum* sp. in the intestines, digestive tract musculature, and coelom, respectively, of the bufonid *Atelopus spurrelli* and the dendrobatid, *Oophaga histrionica* (*Dendrobates histrionicus* auctorum). *Cosmocerca parva* Travassos, 1925 (Ascaridida: Cosmocercoidea: Cosmocercidae), originally was described from the leptodactylid frog, *Hylodes nasus* (*Elosia nasus* auctorum) from Angra dos Reis, State of Rio de Janeiro, Brazil. Since this description, *C. parva* has been reported in 44 anuran species from eight countries in Central and South America (Table 1). Despite the diversity of anurans in Colombia (~750 species, Frost 2010), there are no reports of this nematode in an anuran in this country.

Colostethus fraterdanieli Silverstone, 1971 is endemic to Colombia. This species occurs at elevations between 1000 and 2500 m along the western flanks of the Cordillera Central, as well as on both the western and eastern sides of the Cordillera Occidental in the departments of Antioquia, Caldas, Risaralda, Quindío, Valle del Cauca, and Nariño (Grant and Castro-Herrera 1998). *Colostethus fraterdanieli* is diurnal and inhabits the leaf litter near streams (Grant and Castro-Herrera 1998, Ramírez *et al*. 2009). The males guard developing eggs and, at hatching, transport the tadpoles to small, still pools and shallow, slow-flowing streams (Grant and Castro-Herrera 1998). We discovered the nematode parasite, *Cosmocerca parva,* in *C. fraterdanieli;* this is the first record of this nematode species in Colombia and *C. fraterdanieli* is a novel host of *C. parva*.

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Table 1. Anuran species (names as in Frost 2010) reported as host of *Cosmocerca parva* in Central and South America.

Anuran host (= original name reported)	Country	Site of infection	Reference
BRACHYCEPHALIDAE:			
Hylodes nasus (= *Elosia nasus*)	Brazil	Intestines	Travassos 1925, Vicente *et al*. 1990
BUFONIDAE:			
Rhaebo glaberrimus (= *Bufo glaberrimus*)	Peru	Intestines	Bursey *et al*. 2001
Rhinella bergi (= *Chaunus bergi*)	Argentina	Small and large intestines	González and Hamann 2007a, González 2009
R. crucifer	Paraguay	No indicated	McAllister *et al*. 2010a
R. fernandezae (= *Chaunus fernandezae*)	Argentina	Large intestine	González and Hamann 2007b
R. granulosa (= *Bufo granulosus major*; *Chaunus granulosus major*)	Argentina	Small and large intestine	Mordeglia and Digiani 1998, González and Hamann 2006b
R. schneideri (= *Bufo paracnemis*)	Argentina, Paraguay	Large intestine	Baker and Vaucher 1984, González and Hamann 2008
R. margaritifer	Peru	Intestines	Bursey *et al*. 2001
R. marina (= *Bufo marinus)*	Peru	Intestines	Bursey *et al*. 2001
CRAUGASTORIDAE:			
Craugastor crassidigitus	Costa Rica	Large intestine	Goldberg and Bursey 2008
Craugastor gollmeri	Costa Rica	Large intestine	Goldberg and Bursey 2008
CYCLORAMPHIDAE:			
Odontophrynus americanus	Argentina	Large intestine	González and Hamann 2009
DENDROBATIDAE:			
Ameerega picta (= *Epipedobates pictus*)	Peru	Intestines	Bursey *et al*. 2001
A. trivittata	Peru, Guyana	Not indicated	McAllister *et al*. 2010b, c
HYLIDAE:			
Hypsiboas boans	Guyana	Intestines	McAllister *et al*. 2010c
H. fasciatus (= *Hyla fasciata*)	Peru	Intestines	Bursey *et al*. 2001

Table 1. *Continued.*

Anuran host (= original name reported)	Country	Site of infection	Reference
Phyllomedusa atelopoides	Peru	Intestines	Bursey *et al*. 2001
P. hypochondrialis	Guyana	Intestines	McAllister *et al*. 2010c
Scarthyla goinorum	Peru	Intestines	Bursey *et al*. 2001
Scinax acuminatus	Argentina	Large intestine	González and Hamann 2008
S. garbei	Peru	Intestines	Bursey *et al*. 2001
S. ictericus	Peru	Intestines	Bursey *et al*. 2001
S. nasicus	Argentina	Large intestine	Hamann *et al*. 2009
LEIUPERIDAE:			
Edalorhina perezi	Peru	Intestines	Bursey *et al*. 2001
Physalaemus soaresi	Brazil	Intestines	Vicente *et al*. 1990
LEPTODACTYLIDAE:			
Leptodactylus bufonius	Argentina	Small and large intestines	González and Hamann 2006a
L. chaquensis	Paraguay	Small and large intestines	Baker and Vaucher 1984, Hamann *et al*. 2006b
L. fuscus	Brazil	Intestines	Vicente *et al*. 1990
L. elenae	Argentina	Large intestine	Baker and Vaucher 1984
L. latinasus	Argentina	Large intestine	Hamann *et al*. 2006a
L. leptodactyloides	Peru	Intestines	Bursey *et al*. 2001
L. macrosternum	Trinidad	Large intestine	Goldberg *et al*. 2002
L. marmoratus (= *Adenomera marmorata*)	Brazil	Intestines	Vicente *et al*. 1990
L. mystaceus	Brazil	Intestines	Vicente *et al*. 1990, Bursey *et al*. 2001
L. nesiotus	Trinidad	Large intestine	Goldberg *et al*. 2002
L. ocellatus	Brazil	Intestines	Vicente *et al*. 1990
L. podicipinus	Brazil	Large intestine	Vicente *et al*. 1990, Trombeta 2008

Table 1. *Continued.*

Anuran host (= original name reported)	Country	Site of infection	Reference
MICROHYLIDAE:			
Elachistocleis ovalis	Peru	Intestines	Bursey *et al*. 2001
Hamptophryne boliviana	Peru	Intestines	Bursey *et al*. 2001
STRABOMANTIDAE:			
Oreobates quixensis	Ecuador, Peru	Large intestine	Dyer and Altig 1977, McAllister *et al*. 2010b
Pristimantis fenestratus (= *Eleutherodactylus fenestratus*)	Peru	Intestines	Bursey *et al*. 2001
P. peruvianus (= *E. peruvianus*)	Peru	Intestines	Bursey *et al*. 2001
P. toftae (= *E. toftae*)	Peru	Intestines	Bursey *et al*. 2001
P. turpinorum (= *E. turpinorum)*	Tobago	Large intestine	Goldberg *et al*. 2002

We collected 37 *Colostethus fraterdanieli* (24 males, 13 females; SVL = 22.6 mm ± 3.0 SD) from Vereda La Paloma, Municipio Santa Rosa de Cabal, Departamento Risaralda (4°49' N, 75°33' W), in the western versant of the Cordillera Central (Colombia, South America). The frogs were collected by hand and euthanized with topical xylocaine (5%); they were fixed in 10% buffered formalin and preserved in 70% ethanol. The body cavity of each frog was accessed by a longitudinal incision from throat to the cloaca and the digestive tract was removed. The entire digestive tract (esophagus, stomach, and small and large intestines) was slit open and examined under a dissecting microscope. The isolated nematode parasites were washed with saline solution (Iannacone 2003a, b) and mounted on glass slides; the parasites were cleared with Amann´s lactophenol (González and Hamann 2004). We used the keys of Anderson *et al*. (1974) and Yamaguti (1961) to identify the species of nematode. Prevalence (number of infected frogs ÷ number of frogs examined × 100, expressed as percentage), mean intensity (mean number of nematodes ÷ infected host) and mean abundance (total number of nematodes ÷ number of examined hosts) were calculated according to Bush *et al*. (1997). We deposited some of the frogs examined in the herpetological collection of the Museo de Herpetología, Universidad de Antioquia (MHUA, Medellín, Colombia; voucher numbers MHUA 6587–6589 and MHUA 6618–6622); the nematodes were deposited in the helminthological collection of the Colección Colombiana de Helmintos (CCH, Medellín, Colombia; voucher numbers CCH 140).

Of the 37 frogs examined, each of three males (MHUA 6587–6589) harbored one adult *Cosmocerca parva*. The parasitic prevalence, mean intensity and mean abundance in *C. fraterdanieli* was 8.1%, 1.0 (± 0.0) and 0.09 (± 0.0), respectively. All *C. parva* found in the intestines of *C. fraterdanieli* are male, based on the presence of spicules on the nematode. The males have four or five pairs of plectanes arranged in rows; contralateral plectanes are independent of one another. Each plectane has four or five pairs of ventral papillae that are rosette in form. *Cosmocerca parva* has a pharynx and a long, muscular esophagus, with a light prebulbar area and a posterior sub-spherical bulb bearing a tri-radiate, stagnant valvular apparatus.

Cosmocerca parva is common in the intestines of anurans (Travassos 1931, Baker 1987, González and Hamann 2007b, 2009, McAllister *et al*. 2010a; Table 1). Like other cosmocercid species, this nematode is monoxenic and infects its hosts through larval integumentary penetration (Anderson 2000). Because of these characteristics, *C. parva* is a typical parasite of anuran species inhabiting terrestrial environments (McAlpine 1997, Bursey *et al*. 2001, Goldberg *et al*. 2002, Bolek and Coggins 2003, Luque *et al*. 2005, González and Hamann 2006b). Most anurans that are hosts of *C. parva* are denizens of the forest floor where they feed and reproduce, although some species, such as *C. fraterdanieli*, all *Leptodactylus*, the bufonid *Rhinella*, and many species of hylid frogs, use the lotic and lentic waters for egg and tadpole development.

The presence of *Cosmocerca parva* in only males of *Colostethus fraterdanieli* in this study may indicate that in this taxon, males are more prone to the infection by this parasite than the females. Because the larvae of *Cosmocerca* survive in thin films of water (Anderson 2000), male *C. fraterdanieli* may be infected in wet leaf litter as they attend their eggs or as they transport larvae on their backs to deposit them in creeks. However, this hypothesis must be investigated.

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