

## Report on the occurrence of *Angiostrongylus costaricensis* in southern Brazil, in a new intermediate host from the genus *Sarasinula* (Veronicellidae, Gastropoda)

Registro de *Angiostrongylus costaricensis* no sul do Brasil, em novo hospedeiro intermediário do gênero *Sarasinula* (Veronicellidae, Gastropoda)

Antonio Carlo Laitano<sup>1</sup>, Júlia Pasquali Genro<sup>1</sup>, Ricardo Fontoura<sup>1</sup>, Susana Siqueira Lima Branco<sup>1</sup>, Rafael Lucyk Maurer<sup>1</sup>, Carlos Graeff-Teixeira<sup>1</sup>, José Maria Milanez<sup>3</sup>, Luís Antônio Chiaradia<sup>3</sup> and José Willibaldo Thomé<sup>2</sup>

**Abstract** *Veronicellid slugs are the main intermediate hosts for Angiostrongylus costaricensis. In a rural locality in Nova Itaberaba (SC, southern Brazil) Sarasinula linguaeformis was identified as a crop pest. The parasitological examination revealed A. costaricensis infection in 43 out of 50 slugs. The prevalence of 86% and the individual parasitic burdens are the highest so far reported in Brazil and S. linguaeformis is the first species from the genus Sarasinula to be identified as intermediate host for A. costaricensis in southern Brazil.*

**Key-words:** *Angiostrongylus. Veronicellidae. Sarasinula. Zoonosis.*

**Resumo** *Lesmas veronicelídeas são os principais hospedeiros intermediários de Angiostrongylus costaricensis. Em uma localidade rural de Nova Itaberaba (SC, no sul do Brasil) Sarasinula linguaeformis apresenta-se como peste agrícola. O exame parasitológico das lesmas demonstrou infecção pelo A. costaricensis em 43 de 50 animais. A prevalência de 86% e as cargas parasitárias são as mais altas registradas até o momento no Brasil e S. linguaeformis é a primeira espécie do gênero Sarasinula a ser identificado como hospedeiro intermediário do A. costaricensis no sul do país.*

**Palavras-chaves:** *Angiostrongylus. Veronicellidae. Sarasinula. Zoonosis.*

*Angiostrongylus costaricensis* Morera and Céspedes, 1971 is a parasitic nematode from wild rodents, with a widespread geographic distribution, from southern United States<sup>6</sup> to northern Argentina<sup>2</sup> and southern Brazil<sup>5</sup>. Terrestrial molluscs are the main intermediate hosts, especially from the Veronicellidae family, such as *Phyllocaulis variegatus* (Semper, 1885) in southern Brazil<sup>5</sup> and *Sarasinula plebeia* (Fisher, 1868) (syn.: *Vaginulus plebeius*) in Central America<sup>4</sup>.

Besides its importance as a biological vector for this nematode, veronicellid slugs may also be a crop pest<sup>1</sup>. Recently this problem was detected in the southwestern municipality of Nova Itaberaba, State of Santa Catarina (29°00'00" S; 53°10'00" W). The slugs were identified as *Sarasinula sp.*, probably *S. linguaeformis*. A sample of 50

slugs was sent for parasitological examination. Eviscerated bodies of the slugs were individually minced and incubated for 1 hr, at 37°C, in 0.03% (w/v) Pepsin (Sigma, P7125) and 0.7% (v/v) aqueous solution. These preparations were left in Baermann funnels, and the sediment was examined after 6h.

Prevalence of *A. costaricensis* infection in this population was 86%: 43 out of 50 slugs were found to be infected. A sample of 64 larvae was inoculated into Swiss mice (8 animals), by gastric entubation, leading to the recovery of adult *A. costaricensis* worms, from its intra-arterial location in the mesentery.

Among the individual parasitic burdens now reported, 7720 L3 is the highest number found in naturally infected animals in southern Brazil. Also the frequency distribution

1. Laboratórios de Biologia Parasitária e Parasitologia Molecular; 2. Laboratório de Malacologia, Faculdade de Biociências e Instituto de Pesquisas Biomédicas da Pontifícia Universidade Católica do Rio Grande do Sul (PUCRS), Porto Alegre RS, Brasil; 3. Centro de Pesquisas para Pequenas Propriedades, EPAGRI-SC, Chapecó, SC.

Apoio financeiro: CNPq, CAPES, FAPERGS, PUCRS.

Address to: Dr. Carlos Graeff-Teixeira. Av Ipiranga 6690. IPB 2º andar, sala 20, 90690-900 Porto Alegre, RS, Brasil

e-mail: graetei@puccrs.br

Recebido para publicação em 18/8/2000.

(Table 1) of parasitic burdens shows that from most of the infected slugs (51%) less than 10 L3 were recovered by the artificial digestion method. These data confirm previous findings with naturally infected molluscs from several other transmission foci<sup>5</sup>, shown for comparison

in Table 2 against *P. variegatus* — so far considered the most important intermediate host. The number of slugs with parasitic burdens higher than 50 L3 was much higher (21%) than that previously reported by the same authors (7%).

*Table 1 - Individual parasitic burden - Angiostrongylus costaricensis' third stage larvae – in naturally infected slugs (Sarasinula sp.) expressed as the absolute number of larvae isolated from individual molluscs. Nova Itaberaba, Santa Catarina (southern Brazil), March 1999.*

Range of L3 countings	Individual slug parasitic burden	Number of slugs (%)
0-9	1,1,1,1,1,2,2,2,2,2,3,3,4,4,4,4,5,5,6,8,8,9	22 (51.2)
10-19	10,10,11,16,17,18	6 (14.0)
20-29	20	1 (2.3)
30-39	32,33,34,38	4 (9.3)
40-49	42	1 (2.3)
50-59	53,54,54,58	4 (9.3)
60-69	62	1 (2.3)
>100	107,150,179,7720	4 (9.3)
Total infected slugs		43 (100)

*Table 2 - Parasitic burden in Phyllocaulis variegatus found infected in 11 transmission foci of abdominal angiostrongyliasis in Rio Grande do Sul (southern Brazil), expressed as the absolute number of larvae isolated from individual molluscs. January 1994 to April 1995. Modified from Rambo et al, Memórias do Instituto Oswaldo Cruz 92:9-14, 1997.*

Range of L3 countings	Individual slug parasitic burden	Number of slugs (%)
0-9	1,1,1,1,1,1,1,1,1,1,1,1,1,2,2,3,3,4,4,6,8,9	21 (75%)
10-19	11,14,19	3 (11%)
20-29	20	1 (3.5%)
30-39	38	1 (3.5%)
40-49		0
50-59		0
60-69	69	1 (3.5%)
70-79	75	1 (3.5%)
>100		0
Total infected slugs		28 (100)

There is no documented human case of abdominal angiostrongyliasis in the municipality, but the entire southwestern region of Santa Catarina is endemic for this zoonotic parasitosis and probably it is underdiagnosed, since usually only the most severe disease is diagnosed.

These findings stress the importance of veronicellid slugs, specially the genus *Sarasinula*, as hosts for *A.*

*costaricensis* and indicates that the species found naturally infected in Nova Itaberaba may be such an important host as *P. variegatus*. They also add evidence for the diversity of host species and the relative lack of specificity of this metastrongylid regarding its intermediate hosts.

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