

# The systematic position of some nippostrongyline nematodes (Trichostrongylina: Heligmosomoidea) parasitic in Argentinean sigmodontine rodents

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**Abstract** The systematic position of two nippostrongyline nematodes described from Argentinean sigmodontine rodents is clarified. The first species, *Hassalstrongylus multiovatus* Suriano & Navone, 1992, parasitic in *Akodon simulator* Thomas from the province of Tucumán, was studied on the basis of type and voucher material. *H. multiovatus* is proposed as a junior synonym of *Trichofreitasia lenti* Sutton & Durette-Desset, 1991, a parasite described from *Oligoryzomys flavescens* (Waterhouse) in the province of Buenos Aires. The holotype and three of seven paratypes deposited as *H. multiovatus* were identified as *T. lenti*. One male paratype was identified as *Guerrerostrongylus uruguayensis* Sutton & Durette-Desset, 1991, a parasite described from *O. flavescens* in Uruguay.

Three female paratypes were identified as *Guerrerostrongylus* sp. The second species, *Stilestrongylus scapteromys* Suriano & Navone, 1996, parasitic in *Scapteromys aquaticus* Thomas from the province of Buenos Aires, was studied on voucher material. *Stilestrongylus scapteromys* and *Malvinema frederici* Digiani, Sutton & Durette-Desset, 2003, the type-species of *Malvinema* Digiani, Sutton & Durette-Desset, 2003, were described from the same host and geographical region. As they are considered to refer to one and the same taxon, the new combination *Malvinema scapteromys* n. comb. is proposed for this species.

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## Introduction

In order to elucidate the systematics and phylogeny of the the Nippostrongylinae Durette-Desset, 1971 (Heligmosomoidea: Heligmonellidae), a cosmopolitan group of nematodes parasitic in muroid rodents, it is first necessary to clarify the systematic position of some species in which the synlophe, the main character used for species identification, is unknown or incompletely described. Previous papers in this series have dealt with some heligmosomoids parasitic in South African and North American rodents and in lagomorphs (Durette-Desset & Digiani 2005a, b). This

paper concerns some Argentinean nippostrongylines parasitic in sigmodontine rodents, for which the descriptions of the synlophe are inaccurate.

## Materials and methods

### Material available for study

*Hassalstrongylus multiovatus* Suriano & Navone, 1992. Type-material from the Colección Nacional de Parasitología (Museo Argentino de Ciencias Naturales ‘Bernardino Rivadavia’), Buenos Aires, Argentina (MACN-Pa): No. 364 (holotype male, allotype female) and No. 364 A-B (3 male and 3 female paratypes). Voucher material provided by one of the authors (G.N.), 7 males and 18 females deposited in the Helminthological Collection of the Museo de La Plata, Argentina, CHMLP No. 5540–5542.

All type and voucher specimens were measured and the caudal bursa spread out in three males. Transverse sections of the body were made at the mid-body of three paratypes (1 male and 2 females) and on voucher material from the same sample (same host, locality and date of collection) (1 male and 2 females). The poor state of preservation of the specimens constrained our study, some characters being hardly visible (structures of the anterior part of the body) or not visible at all (ovejector in females of *Guerrerostrongylus* sp.).

*Stilestrongylus scapteromys* Suriano & Navone, 1996. Type-material, MACN-Pa No. 370 (holotype male, allotype female). Voucher material provided by one of the authors (G.N.) (3 males and 14 females), deposited as MACN-Pa No. 430.

The holotype and allotype were both in a very bad condition and could not be properly studied or measured. In the absence of paratypes, voucher specimens from the same host and locality were studied. All specimens were measured and the caudal bursa studied in two males. Transverse sections of the body were made on one male and one female.

The synlophe was studied following the method of Durette-Desset (1985). The parasite classification used above the family group level is that of Durette-Desset and Chabaud (1993). The

nomenclature of the hosts at the species level follows Wilson and Reeder (1993), except for *Scapteromys aquaticus*, which follows D’Elía and Pardiñas (2004).

### *Trichofreitasia lenti* Sutton & Durette-Desset, 1991

Syn. *Hassalstrongylus multiovatus* Suriano & Navone, 1992<sup>1</sup>

*Host*: *Akodon simulator* Thomas (Rodentia, Sigmodontinae).

*Locality*: Burreuyacú, Province of Tucumán, Argentina.

*Site*: Small intestine.

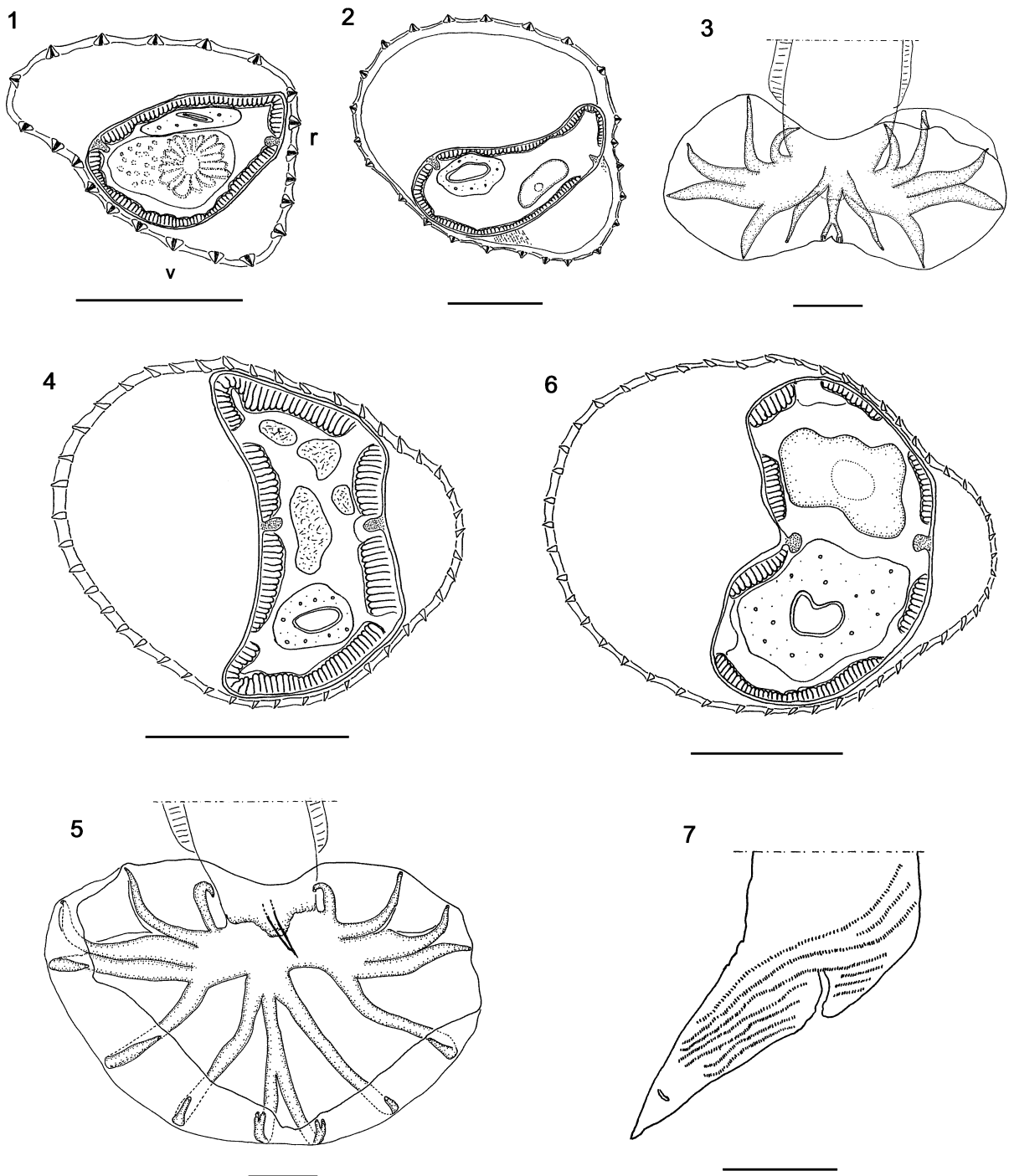
*Material studied*: One male (MACN-Pa No. 364); 2 males, 1 female (MACN-Pa No. 364 A- B). Voucher specimens: 6 males and 12 females from the same sample (same host, locality and date of collection) provided by one of the authors (G.N.): CHMLP No. 5540.

Remarks (Figs. 1–3)

*Hassalstrongylus multiovatus* was described by Suriano and Navone (1992) based on 36 males and 45 females parasitic in *Akodon simulator* from Burreuyacú, Tucumán, Argentina. The general description, the body measurements and especially the figures provided suggested that this material was very close to *Trichofreitasia lenti* Sutton & Durette-Desset, 1991, a parasite of *Oligoryzomys flavescens* (Waterhouse) (= *Oryzomys flavescens*) from the Province of Buenos Aires, Argentina.

The specimens studied herein, because of their relatively large size, and especially because of the characters of the synlophe, in particular the type of cuticular ridges (symmetrical, orientated perpendicularly to the body surface) undoubtedly belong in *Trichofreitasia* Sutton & Durette-Desset, 1991. Moreover, the number of ridges in the synlophe in males and females (21 and 24, respectively), the body measurements and the pattern of the caudal bursa correspond to the only species in the genus, *T. lenti* (Figs. 1–3).

<sup>1</sup> Among the paratypes designated for this species are also specimens of *Guerrerostrongylus uruguayensis* Sutton & Durette-Desset, 1991 and *Guerrerostrongylus* sp.



**Figs. 1–7** 1–3. *Trichofreitasia lenti* Sutton & Durette-Desset, 1991: 1–2. Body sections at mid-body, 1, male, 2, female (MACN-Pa No. 364 A-B); 3. Male, caudal bursa, dorsal view. 4–5. *Guerrerostrongylus uruguayensis* Sutton & Durette-Desset, 1991: 4, male (MACN-Pa No. 364 A-B), body section at mid-body; 5, male, caudal bursa,

ventral view. 6–7. *Guerrerostrongylus* sp.: 6, female (MACN-Pa No. 364 A-B), body section at mid-body, 7, female, posterior extremity, left lateral view. *Abbreviations:* r, right, v, ventral. All body sections orientated as Fig. 1. All drawings, unless otherwise indicated, are from voucher specimens. *Scale-bars:* 100  $\mu$ m

Although the deposited material belongs to at least two different taxa (see footnote), the holotype and the published description of *H. multiovatus* undoubtedly correspond to *T. lenti*, and, consequently, we propose that *H. multiovatus* be considered a junior synonym of *T. lenti*.

***Guerrerostrongylus uruguayensis* Sutton & Durette-Desset, 1991**

*Host:* *Akodon simulator* Thomas (Rodentia, Sigmodontinae).

*Locality:* Burreuyacú, Province of Tucumán, Argentina.

*Site:* Small intestine.

*Material studied:* One male (MACN-Pa No. 364 A–B). Voucher specimen: 1 male from the same sample (same host, locality and date of collection) provided by one of the authors (G.N.): CHMLP No. 5541.

Remarks (Figs. 4–5)

These specimens, both males, possess a synlophe with more than 40 cuticular ridges of equivalent size, those on the left side being orientated perpendicularly to the body surface, and the caudal bursa shows hypertrophy of the dorsal lobe and rays 6. These characters, together with the relatively large size of the worms, allow us to place the specimens studied in *Guerrerostrongylus* Sutton & Durette-Desset, 1991. From the number of ridges of the synlophe (44 and 48) (Fig. 4), the body measurements, and especially the pattern of the caudal bursa (Fig. 5), they are identifiable as *G. uruguayensis* Sutton & Durette-Desset, 1991, originally described from *Oligoryzomys flavescens* (= *Oryzomys flavescens*) in the Departamento Artigas, Uruguay.

***Guerrerostrongylus* sp.**

*Host:* *Akodon simulator* Thomas (Rodentia, Sigmodontinae).

*Locality:* Burreuyacú, Province of Tucumán, Argentina.

*Site:* Small intestine.

*Material studied:* One female (MACN-Pa No. 364); 2 females (MACN-Pa No. 364 A–B). Voucher specimens: 6 females from the same sample (same host, locality and date of collection) provided by one of the authors (G.N.): CHMLP No. 5542.

Remarks (Figs. 6–7)

These specimens, all females, also possess a synlophe with more than 40 cuticular ridges of equivalent size, with those on the left side being orientated perpendicularly to the body surface. These characters, together with their relatively large size, allow us to place them in *Guerrerostrongylus*. They possess a synlophe with 49–56 cuticular ridges (Fig. 6) and a distal twisting on the tail of 90° to the right (Fig. 7). This latter character is absent from the known species of the genus, *G. uruguayensis* and *G. zeta* (Travassos, 1937) (Sutton & Durette-Desset, 1991). However, this character alone is not sufficient to identify or to exclude the specimens from the mentioned species. Moreover, the opacity of the specimens did not allow a full description, and thus we prefer to identify this subset of specimens as *Guerrerostrongylus* sp.

***Malvinema scapteromys* (Suriano & Navone, 1996) n. comb.**

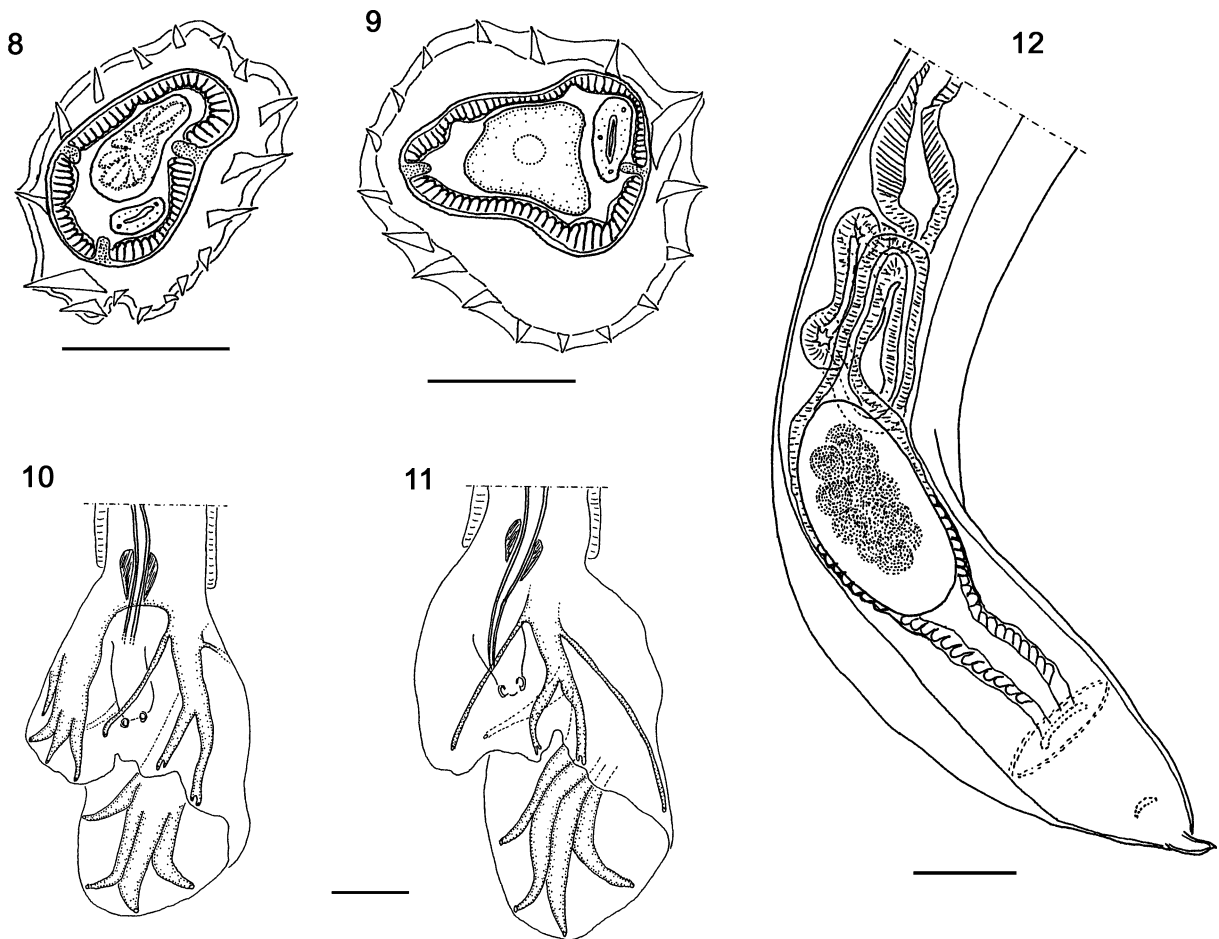
Syns *Stilestrongylus scapteromys* Suriano & Navone, 1996; *Malvinema frederici* Digiani, Sutton & Durette-Desset, 2003

*Type-host:* *Scapteromys aquaticus* Thomas (Rodentia, Sigmodontinae).

*Type-locality:* Punta Lara, Province of Buenos Aires, Argentina.

*Site of infection:* Small intestine.

*Material deposited:* Holotype male, allotype female, MACN-Pa No. 370. Paratypes: 3 males, 14 females, MACN-Pa No. 430. Voucher material, CHMLP 4691/1 and in the Muséum National d'Histoire Naturelle, Paris, France, MNHN 1 MM and MNHN 43 MM.



**Figs. 8–12** *Malvinema scapteromys* n. comb.: 8–9. Body sections at mid-body, 8, male, 9, female; 10–11. Male caudal bursa, 10, left laterodorsal view, 11, right laterodorsal view; 12. Female, posterior extremity showing the

tail twisting 90° to the left, right lateral view; vulva and anus in dorsal view. Body sections are orientated as in Fig. 1. All drawings are from voucher specimens. Scale-bars: 25  $\mu$ m

#### Remarks (Figs. 8–12)

*Malvinema scapteromys* n. comb. was originally described by Suriano and Navone (1996) as a species of *Stilestrongylus* Freitas, Lent & Almeida, 1937, parasitic in the swamp rat *Scapteromys aquaticus* from Punta Lara, Argentina. However, the original description was incomplete, especially with respect to the synlophe. Suriano and Navone (1996) prepared histological cross-sections to study the synlophe, and the cuticular ridges are described as being of equivalent size. Cuticular structures in histological sections are highly deformed and the

shape, size and orientation of the ridges may be misinterpreted. Moreover, the lateral fields were not illustrated and the synlophe was not properly orientated. Lastly, the different parts of the female ovejector were not illustrated and the illustrations of the caudal bursa are unclear.

The voucher specimens studied herein possess a synlophe with larger ridges in the ventral left and dorsal right quadrants and a quadruple decreasing, latero-median gradient in the size of the ridges (Figs. 8–9). The caudal bursa is asymmetrical, with a hypertrophied right lobe, a bursal ray pattern of the type 1–4 and a prominent genital cone (Figs. 10–11). Judging from these

characters, the specimens belong to *Malvinema* Digiani, Sutton & Durette-Desset, 2003. Of the four species in the genus, they correspond to *M. frederici* Digiani, Sutton & Durette-Desset, 2003, which was described from the same host in the Isla Talavera region, also in the province of Buenos Aires (Digiani, Sutton, & Durette-Desset 2003). The synlophes of the males and females (based on number, size and orientation of the ridges) are identical in both species, and the body measurements are very similar. The caudal bursa, even though it could not be completely spread out in the voucher specimens, corresponds to that of *M. frederici*, as does the female posterior extremity (Fig. 12).

As the names *Stilestrongylus scapteromys* and *Malvinema frederici*, the type-species of *Malvinema*, refer to one and the same taxon, the new combination *Malvinema scapteromys* n. comb. is proposed for this species.

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