

TWO NEW SPECIES OF NIPPOSTRONGYLINAE (NEMATODA: TRICHOSTRONGYLINA: HELIGMONELLIDAE) FROM THE GREY LEAF-EARED MOUSE *GRAOMYS GRISEOFLOVUS* (SIGMODONTINAE) IN ARGENTINA

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Summary:

Two new species of Nippostrongylinae, *Hassalstrongylus puntanus* n. sp., and *Stilestrongylus franciscanus* n. sp. are described from the intestine of the grey leaf-eared mouse *Graomys griseoflavus* (Waterhouse, 1837) (Sigmodontinae) from the Province of San Luis, Argentina. *Hassalstrongylus puntanus* n. sp. is distinguished from the most closely related species *H. dollfusi* (Díaz-Ungria, 1963), a parasite of *Mus musculus* from Venezuela by longer rays 2, shorter rays 4, proximal half of the dorsal ray non-enlarged and a non-retractile female tail. *Stilestrongylus franciscanus* n. sp. is distinguished from the most closely related species *S. flavescens* Sutton & Durette-Desset, 1991, a parasite of *Oryzomys flavescens* from Argentina, by rays 2 and 3 diverging separately from common trunk of rays 2 to 6, and by right ray 3 arising from this trunk more distally than ray 6. *Stilestrongylus azarai* Durette-Desset & Sutton, 1985, a parasite of *Akodon azarae* from Buenos Aires, Argentina, was also found parasitizing *G. griseoflavus*, representing new host and locality records. Some additional morphological data for this species are also provided.

KEY WORDS : *Hassalstrongylus puntanus* n. sp., *Stilestrongylus franciscanus* n. sp., *Stilestrongylus azarai* Durette-Desset & Sutton, 1985, Trichostrongylina, Nippostrongylinae, *Graomys griseoflavus*, Sigmodontinae, Argentina.

Résumé : DEUX NOUVELLES ESPÈCES DE NIPPOSTRONGYLINAE (NEMATODA: TRICHOSTRONGYLINA: HELIGMONELLIDAE) PARASITES DE *GRAOMYS GRISEOFLOVUS* (SIGMODONTINAE) EN ARGENTINE

Deux nouvelles espèces de Nippostrongylinae, *Hassalstrongylus puntanus* n. sp., et *Stilestrongylus franciscanus* n. sp., sont décrites chez *Graomys griseoflavus* (Waterhouse, 1837) (Sigmodontinae), dans la province de San Luis, Argentine. *Hassalstrongylus puntanus* n. sp. se différencie de l'espèce la plus proche *H. dollfusi* (Díaz-Ungria, 1963), parasite de *Mus musculus* du Venezuela, par les caractères suivants : des côtes 2 plus longues, des côtes 4 plus courtes, côte dorsale non élargie dans sa partie proximale et queue de la femelle non rétractile. *Stilestrongylus franciscanus* n. sp. se différencie de l'espèce la plus proche *S. flavescens* Sutton & Durette-Desset, 1991, parasite d'*Oryzomys flavescens* en Argentine, par des côtes 2 et 3 droites fortement séparées à leur base, et par la naissance de la côte 3 droite après celle de la côte 6 sur le tronc commun aux côtes 2 à 6. *Stilestrongylus azarai* Durette-Desset & Sutton, 1985, parasite d'*Akodon azarae* dans la province de Buenos Aires, Argentine, a été retrouvée chez *G. griseoflavus* qui représente un nouvel hôte pour cette espèce. Quelques compléments morphologiques sont ajoutés à la description de cette espèce.

MOTS CLÉS : *Hassalstrongylus puntanus* n. sp., *Stilestrongylus franciscanus* n. sp., *Stilestrongylus azarai* Durette-Desset & Sutton, 1985, Trichostrongylina, Nippostrongylinae, *Graomys griseoflavus*, Sigmodontinae, Argentine.

INTRODUCTION

This paper is part of a major study on the Nippostrongylinae parasites of Neotropical Sigmodontine rodents. In two previous articles, two new genera and four new species have been described from *Scapteromys aquaticus* Thomas and *Oxymycteris rufus* (Fischer) from the province of Buenos Aires (Argentina) (Digiani *et al.*, 2003, Digiani & Durette-Desset, 2003). The present paper concerns the trichostrongyles parasitic in the grey leaf-eared mouse

Graomys griseoflavus (Waterhouse, 1837) from the province of San Luis (Argentina). Trichostrongylid nematodes were hitherto unknown from this host. The only known report of parasitic helminths from *G. griseoflavus* are those of *Enterobius yagoi* Sutton, 1979 (Oxyurida, Oxyuroidea) and *Pterygodermatites (Pau-cipectines) massoi* (Sutton, 1979) (Spirurida, Rictularioidea) from the province of Mendoza (Sutton, 1979, 1984); and of *Mastophorus muris* (Gmelin, 1790) (Spiruroidea, Spirurida), from a single host in the province of La Pampa (Rojas, pers. comm.), both from Argentina. During this study, two new species of Nippostrongylinae belonging to the genera *Hassalstrongylus* Durette-Desset, 1971 and *Stilestrongylus* Freitas, Lent & Almeida, 1937 are described. Some additional morphological data concerning *Stilestrongylus azarai* Durette-Desset & Sutton, 1985, a parasite of *Akodon azarae* from the province of Buenos Aires, found in *G. griseoflavus*, are also provided.

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MATERIALS AND METHODS

Rodents were captured from April to May 1990 in two different localities of the Province of San Luis, Central West Argentina. The bodies were fixed in 10 % formalin and preserved in 70° ethanol, and were provided by the Instituto Miguel Lillo (San Miguel de Tucumán, Argentina) in the frame of an agreement with the División Zoología Invertebrados of the Museo de La Plata (La Plata, Argentina), for helminthological study. The small intestines were opened and the nematodes recovered and stored in 70° ethanol. The synlophe was studied following the method of Durette-Desset (1985) and the nomenclature used for the study of the caudal bursa is that of Durette-Desset & Chabaud (1981). The nomenclature for parasites used above the family group is that of Durette-Desset & Chabaud (1993) and the nomenclature of the hosts follows Musser & Carleton (1993). Measurements are given in micrometres, except where stated otherwise. Type and voucher specimens are deposited in the Helminthological Collections of the Museo de La Plata (CHMLP) and of the Muséum National d'Histoire Naturelle, Paris (MNHN).

DESCRIPTIONS

HASSALSTRONGYLUS PUNTANUS N. SP. (Figs 1-11)

Type-material: male holotype, female allotype CHMLP 3459/1a. Paratypes: three males, five females CHMLP 3459/1b, three males, five females MNHN 672 KQ. Coparasites of *S. azarai* Durette-Desset & Sutton, 1985. Type-host: *Graomys griseoflavus* (Waterhouse, 1837) (Muridae, Sigmodontinae).

Site: small intestine.

Type-locality: San Francisco del Monte de Oro (32° 36' S, 66° 08' W), Province of San Luis, Argentina.

Voucher material: five males, four females CHMLP 3460/1, coparasites of *S. azarai*; three males, four females CHMLP 3461; six males, 14 females CHMLP 3462/1, coparasites of *S. azarai*; one female CHMLP 3476/1; three males, three females CHMLP 3477; one male, one female CHMLP 3478; six males, 15 females MNHN 673 KQ, three males, three females MNHN 674 KQ. Same host and locality.

Prevalence and intensity of infection: 87.5 % of the hosts (seven out of eight) were infected, harbouring 1-42 worms (mean = 13.3).

DESCRIPTION

Small nematodes, loosely coiled sinistrally along ventral side. Excretory pore situated within distal third of oesophagus length. Deirids at same level as excretory pore or slightly anterior or posterior to it (Fig. 1).

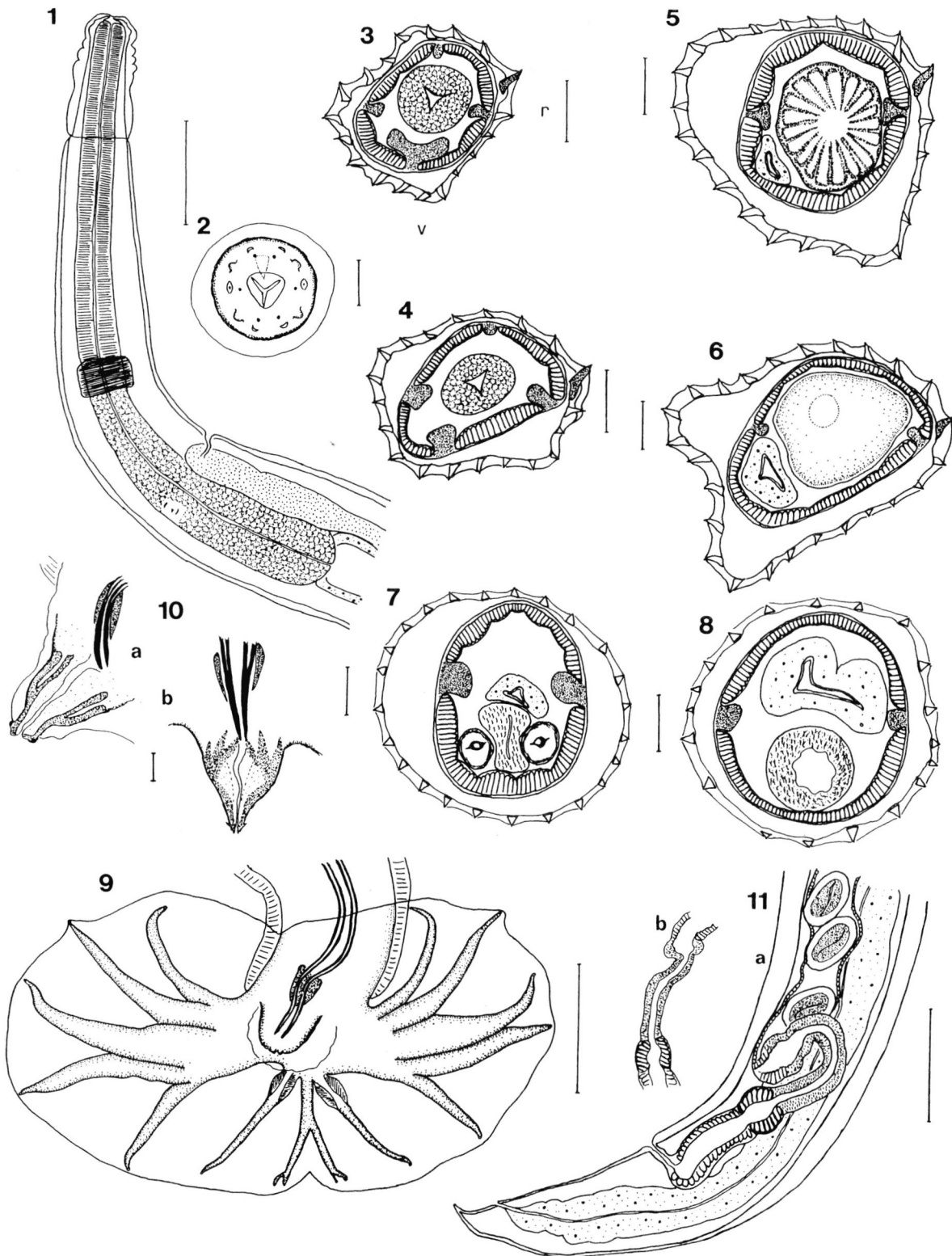
Head: cephalic vesicle present. In apical view, triangular buccal opening surrounded by very thin ring. Presence of two amphids, six interno-labial papillae, the medio-lateral closer to each other than to lateral, four externo-labial papillae (the two lateral probably fused with amphids), and four submedian cephalic papillae (Fig. 2).

Synlophe: (studied in two male and two female paratypes). In both sexes cuticle bearing longitudinal, uninterrupted ridges appearing posterior to cephalic vesicle, up to about 100 µm posterior to oesophago intestinal junction, disappearing just anterior to caudal bursa in male and at caudal end in female. Number of ridges: 19 in male and 20 in female at level of oesophago-intestinal junction (Figs 3-4), 24 in male and 25 in female at mid-body (Figs 5-6), 24 in male and 19 in female at posterior end. At mid-body, ridges of similar size, except for those of ventral right quadrant, slightly smaller, and for dorsal ridge adjacent to right ridge, larger than the others. At posterior end, ridges of equal size in male and unequal in female (Figs 7-8). Axis of orientation of ridges directed from ventral right to dorsal left quadrant with inclination of about 48° to sagittal axis in male and 60° in female at oesophago-intestinal junction. At mid-body axis of orientation of ridges with different inclination on ventral and dorsal sides, of about 53° to sagittal axis in male and 59° in female in ventral right quadrant and 79° in both sexes in dorsal left quadrant. At posterior end, most ridges oriented perpendicularly to body surface.

Holotype male: 3.3 mm long and 150 wide at mid-body, cephalic vesicle 65 long and 35 wide, nerve ring, excretory pore and deirids situated at 170, 275 and 265 from apex, respectively. Oesophagus 340 long.

Sub-symmetrical caudal bursa, with pattern of type 1-3-1 (Fig. 9). Prebursal papillae not observed. Rays 3 and 6 arising at same level from common trunk of rays 3 to 6; rays 4 slightly longer than rays 5, both divergent at their distal third. Rays 8 strongly reinforced at base, arising from base of dorsal ray. Dorsal ray divided at mid-length into two branches, each branch divided into two subequal sub-branches: external (rays 9) slightly longer than internal (rays 10). Genital cone 45 long by 40 wide at base, with strongly sclerotised walls, bearing papilla 0 on ventral lip and two rounded papillae 7 on dorsal lip (Fig. 10). Thin alate subequal spicules, 450 long, ending in sharp tip (Fig. 10). Gubernaculum 17 long and 12 wide at base in ventral view (Fig. 10).

Measurements (range and average) of six male paratypes: 3.3-4.1 (3.52) mm long and 100-150 (142) wide at midbody. Cephalic vesicle 60-65 (63) long and 30-40 (35) wide. Nerve ring, excretory pore and deirids situated at 135-190 (166), 210-280 (249) and 210-280 (250) from apex, respectively. Oesophagus 330-350 (340) long. Spicules 390-450 (417) long.



Figs 1-11. – *Hassalstrongylus puntanus* n. sp. from *Graomys griseoflavus*.

1, male, anterior extremity, right lateral view. 2, female, head, apical view. 3-4, transverse sections of body (largest ridge shaded); 3-4, at oesophago-intestinal junction, 3, male, 4, female; 5-6, at mid-body, 5, male, 6, female; 7-8, at posterior end, 7, male, 200 μ m anterior to caudal bursa, 8, female, just anterior to vulva. 9, male, caudal bursa, ventral view. 10a, male, genital cone, left lateral view, 10b, male, genital cone, ventral view. 11a, gravid female, posterior extremity, left lateral view. 11b, non-gravid female, posterior extremity, schema of proximal part of infundibulum and distal part of uterus, transversally enlarged.

Abbreviations: r, right, v, ventral. Scale bars: 1, 50 μ m; 2, 10, 10 μ m; 3, 4, 7, 8, 20 μ m; 5, 6, 25 μ m; 9, 11a, 100 μ m.

Allotype female: 6.65 mm long and 200 wide at mid-body. Cephalic vesicle 70 long and 35 wide. Nerve ring, excretory pore and deirids situated at 190, 270 and 260 from apex, respectively. Oesophagus 395 long.

Monodelphic. Vulva situated at 220 from caudal extremity. Vagina vera 25 long, vestibule 90, sphincter 35 long and 30 wide, infundibulum 85 long (Fig. 11a). In non-gravid females, proximal part of infundibulum and distal part of uterus transversally enlarged (Fig. 11b). In gravid females, infundibulum usually folded and enlargement not clearly observed. Uterus 600 long, taking up 9 % of body length, containing 11 embryonated eggs, 65 long and 40 wide. Tail conical, non-retractile, 45 long (Fig. 11a).

Measurements (range and average) of 10 female paratypes: 5.00-7.45 (6.13) mm long and 130-200 (171) wide at mid-body. Cephalic vesicle 60-75 (66) long and 35-50 (41) wide. Nerve ring, excretory pore and deirids situated at 150-180 (168), 240-280 (268) and 240-280 (268) from apex, respectively. Oesophagus 350-440 (393) long. Vulva situated at 180-230 (204) from caudal extremity. Vagina vera 20-30 (25) long, vestibule 80-100 (87), sphincter 30-40 (34) long and 30-40 (37) wide, infundibulum 80-140 (109). Uterus 650-930 (763) long, taking up 10-16 % (13 %) of body length. Number of eggs 25-48 (38), embryonated, 50-75 (62) long and 30-42 (37) wide. Tail 35-50 (44) long.

DISCUSSION

By the characters of the synlophe (number of ridges between 19-25, unequal in size) and of the caudal bursa (symmetrical, with genital cone non hypertrophied), the studied specimens may be included in the American genus *Hassalstrongylus* Durette-Desset, 1971a. (Heligmonellidae, Nippostrongylinae), including 16 species. Thirteen were described from the Sigmodontinae, one from the Sigmodontinae and the Arvicolinae, one from the Sigmodontinae and *Mus musculus*, and one from *Mus musculus*.

Only five species of *Hassalstrongylus* share with the specimens here described a sub-symmetrical caudal bursa with a pattern of type 1-3-1 for each lobe. These species are *H. argentinus* (Freitas, Lent & Almeida, 1937), a parasite of *Holochilus balnearum* from Argentina, *H. dollfusi* (Díaz-Ungria, 1963), a parasite of *Mus musculus* from Venezuela, *H. ecbalieri* Diaw, 1976, a parasite of *Oryzomys* sp. from French Guyana, *H. musculi* (Dikmans, 1935), a parasite of *Mus musculus* and *Oryzomys palustris* from USA, and *H. schadi* (Durette-Desset, 1971b), a parasite of *Nectomys alfaroi* from Colombia.

The specimens from *G. griseoflavus* differ from the above mentioned species by rays 2 being well-developed and of equivalent size to rays 3. In addition, they

differ from *H. argentinus*, *H. ecbalieri* and *H. musculi* by the number of ridges of the synlophe (24-25 vs. 19-22).

In *H. schadi* and *H. dollfusi* the caudal bursa is transversally elongated, and rays 6 are less developed than rays 5, as in the specimens from *G. griseoflavus*. However, *H. schadi* is distinguished by the triangular tip of the spicules and the indentation on the lip of the genital cone. *Hassalstrongylus dollfusi*, the most similar species, also possesses the character of rays 8 reinforced at base, but rays 4 are strongly directed anteriorly and much longer than rays 5, the proximal half of the dorsal ray is enlarged and the female tail is retractile. We consider thus the specimens found in *G. griseoflavus* to belong to a new species that we have named *Hassalstrongylus puntanus* n. sp. in reference to people born in San Luis Province, who are called "puntanos".

STILESTRONGYLUS FRANCISCANUS N. SP.

(Figs 12-24)

Type-material: male holotype, female allotype CHMLP 3465/1a. Paratypes: two males, one female CHMLP 3465/1b; one male MNHN 675 KQ.

Type-host: *Graomys griseoflavus* (Waterhouse, 1837) (Muridae, Sigmodontinae).

Site: small intestine.

Type-locality: San Francisco del Monte de Oro (32° 36' S, 66° 08' W), Province of San Luis, Argentina.

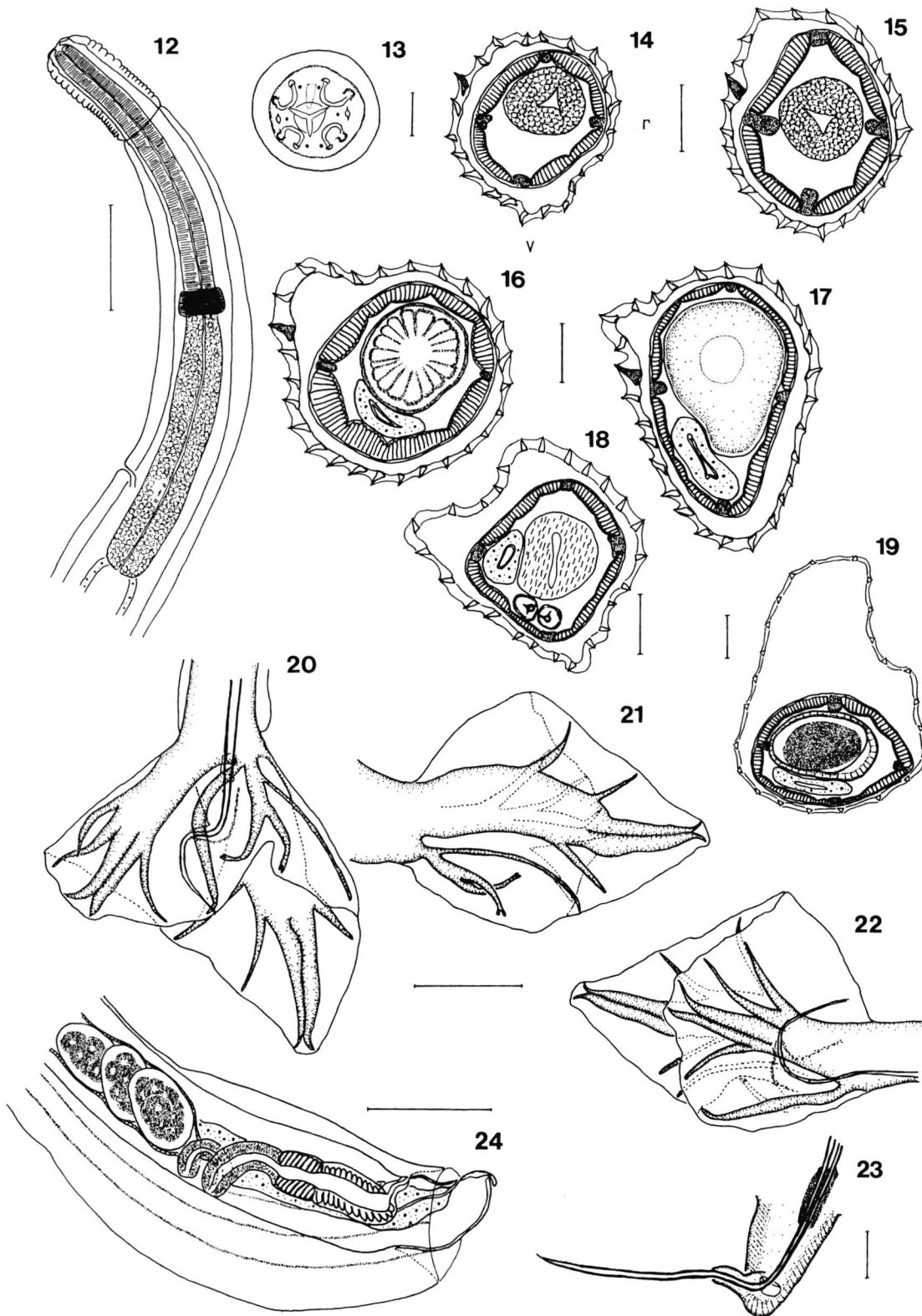
Prevalence and intensity of infection: 12.5 % of the hosts (one out of eight) was infected with six specimens.

DESCRIPTION

Small nematodes, tightly (females) or loosely (males) coiled sinistrally along ventral side. Excretory pore situated within distal third of oesophagus length. Deirids at same level as excretory pore (Fig. 12) or slightly posterior to it.

Head: cephalic vesicle present. In apical view, triangular buccal opening surrounded by very thin ring. Presence of two amphids, six interno-labial papillae, the medio-lateral closer to each other than to lateral, four externo-labial papillae (the two lateral probably fused with amphids), and four submedian cephalic papillae. Externo-labial and cephalic papillae connected two to two by cuticular structures in arc of circle, resembling cuticular cordons (Fig. 13).

Synlophe: (studied in two male and one female paratypes). In both sexes cuticle bearing longitudinal, uninterrupted ridges appearing posterior to cephalic vesicle up to about 100 µm posterior to oesophago-intestinal junction, disappearing just anterior to caudal bursa in male and at caudal end in female. Number of ridges: 22 in male and 24 in female at level of oesophago-intestinal junction (Figs 14-15), 27 in male and 28 in



Figs 12-24. – *Stilestrongylus franciscanus* n. sp. from *Graomys griseoflavus*.

12, male, anterior extremity, left lateral view. 13, female, head, apical view. 14-17, transverse sections of body (largest ridge shaded); 14-15, at oesophago-intestinal junction, 14, male, 15, female; 16-17, at mid-body, 16, male, 17, female; 18-19, at posterior end, 18, male, 180 µm anterior to caudal bursa, 19, female, distal part of uterus, at 320 µm from posterior end. 20-22, male, caudal bursa, 20, latero-dorsal view, 21, right lobe, latero-dorsal view (left lobe in dotted lines), 22, left lobe, latero-dorsal view (right lobe and genital cone in dotted lines). 23, genital cone, ventro-lateral view. 24, female, posterior extremity, right lateral view.

Abbreviations: r, right, v, ventral. Scale bars: 12, 50 µm; 13, 10 µm; 14-19, 23, 20 µm; 20-22, 24, 100 µm.

female at mid-body (Figs 16-17), 25 in male and 24 in female at posterior end (Fig. 18-19). Ridges of similar size, except those of ventral right quadrant which are slightly smaller, and for dorsal ridge adjacent to left ridge, which is larger than the rest. Axis of orientation of ridges directed from ventral right to dorsal left quadrant with inclination of about 52° to sagittal axis in male and 58° in female at oesophago-intestinal junction and about 70° to sagittal axis in male and 76° in female at mid-body (Figs 14-17). At posterior end, axis of orientation of about 42° in male and ridges oriented perpendicularly to body surface in female.

Holotype male: 3.65 mm long and 120 wide at mid-body, cephalic vesicle 60 long and 30 wide. Nerve ring, excretory pore and deirids situated at 170, 265 and 265 from apex, respectively. Oesophagus 300 long.

Caudal bursa bell-shaped, with pattern of type 1-4 (rays 2 arising first from common trunk of rays 2 to 6), asymmetrical with hypertrophied right lobe (Figs 20-22). Prebursal papillae not observed. Right lobe: arising of rays 2 and 3 from common trunk very distant; ray 3 arising more distally than ray 6; rays 4 and 5 divergent at extremity (Fig. 21). Left lobe: rays 2 and 3 divergent in V; rays 3 and 6 divergent at same level from common trunk; rays 4 and 5 divergent at extremity (Fig. 22). Right ray 8 thin, arising from proximal third of dorsal ray, left ray 8 robust, arising at base from dorsal ray, both rays 8 longer than dorsal ray. Dorsal ray divided at mid-length into two branches, each branch divided into two subequal sub-branches: external (rays 9) slightly longer than internal (rays 10). Genital cone well-developed, 100 long by 60 wide at base (Fig. 23). Papillae 0 and 7 not observed. Thin alate subequal spicules, 580 long, ending in sharp tip (Fig. 23). Gubernaculum long and slender, 30 long and 10 wide at base in ventral view (Fig. 23).

Measurements (range and average) of three male paratypes: 3.4-3.7 (3.56) mm long and 110-140 (123) wide at mid-body. Cephalic vesicle 50-65 (58) long and 22-40 (31) wide. Nerve ring, excretory pore and deirids situated at 150-170 (160), 260-270 (267) and 260-280 (270) from apex, respectively. Oesophagus 300-330 (310) long. Spicules 550-580 (570) long.

Allotype female: 4.85 mm long and 110 wide at mid-body. Cephalic vesicle 60 long and 35 wide. Nerve ring, excretory pore and deirids situated at 170, 260 and 260 from apex, respectively. Oesophagus 300 long.

Monodelphic. Posterior end retracted up to level of vulva. Vulva situated at 70 from caudal extremity. Vagina vera 25 long, vestibule 65, sphincter 40 long and 35 wide, infundibulum 180 long. Uterus 800 long, taking up 16 % of body length, containing 30 eggs, at morula stage, 60-70 long and 40-45 wide. Tail conical, 30 long, bearing a mucron (Fig. 24).

Measurements of the female paratype: 4.5 mm long and 100 wide at mid-body. Cephalic vesicle 60 long and

35 wide. Nerve ring, excretory pore and deirids situated at 150, 225 and 235 from apex, respectively. Oesophagus 290 long. Vulva situated at 70 from caudal extremity. Vagina vera 25 long, vestibule 70, sphincter 40 long and 40 wide, infundibulum 175 long. Uterus 820 long, taking up 18 % of body length, containing 28 eggs 45-50 long and 30-35 wide. Tail 40 long.

DISCUSSION

By the characters of the synlophe (number of ridges from 23 to 30, small, of equivalent size) and of the caudal bursa (asymmetrical, with hypertrophied genital cone), the studied specimens may be included in the genus *Stilestrongylus* Freitas, Lent & Almeida, 1937 (Heligmonellidae, Nippostrongylineae), including 19 Neotropical species, 18 parasitic in the Sigmodontinae and one in the Echimyidae.

Among these species, four along with the specimens here described share the following characters: caudal bursa of type 1-4 in both lobes; strongly asymmetrical caudal bursa with hypertrophied right lobe; right rays 4 and 5 of equivalent length and divergent at extremity. Three of these species come from Argentina: *S. aureus* Durette-Desset & Sutton, 1985, a parasite of *Reithrodon auritus*; *S. azarai* Durette-Desset & Sutton, 1985, a parasite of *Akodon azarae*; *S. oryzomysi* Sutton & Durette-Desset, 1991, a parasite of *Oryzomys flavescens*; and the fourth, *S. flavescens* Sutton & Durette-Desset, 1991, a parasite of *Oryzomys flavescens*, from Uruguay. *Stilestrongylus aureus*, *S. azarai* and *S. oryzomysi* differ from the specimens from *Graomys griseoflavus* mainly by having a caudal bursa with a long dorsal ray, and rays 6 forming a lateral trident with rays 4 and 5. *Stilestrongylus flavescens* is the most similar species, but it differs from our specimens mainly by the pattern of the right lobe: rays 2 and 3 are divergent in "V" and ray 3 arises from the common trunk of rays 3 to 6 more proximally than ray 6 (*vs.* more distally in our specimens). The specimens from *G. griseoflavus* are thus considered to belong to a new species, which we have named *Stilestrongylus franciscanus* n. sp., after the type locality.

Two other species, *S. scapteromys* Suriano & Navone, 1996, parasitic in *Scapteromys aquaticus* from Argentina, and *S. peromysci* Falcón Ordaz & Sanabria, 1999, parasitic in *Peromyscus difficilis* from Mexico, possess a strongly asymmetrical caudal bursa with a hypertrophied right lobe, but the descriptions are insufficient to be able to determine the pattern of the caudal bursa. However, they can be distinguished from *S. franciscanus* n. sp. by the number of cuticular ridges of the synlophe (16-18 in *S. scapteromys* and 30 in *S. peromysci*).

It is interesting to note that in females of the species mentioned in the discussion, with the exception of

S. scapteromys, the tail is retracted up to the level of the vulva. In a cladistic analysis of the genus *Stilestrongylus* (Pérez-Ponce de León *et al.*, 2000), the retracted tail was one of the synapomorphies supporting a monophyletic group composed of *S. azarai*, *S. aureus*, *S. flavescens*, *S. oryzomysi*, *S. freitasi* Durette-Desset, 1968, a parasite of *Zygodontomys lasiurus* and *Oryzomys subflavus* from Brazil, *S. inexpectatus* Durette-Desset & Tchérpakoff, 1969, a parasite of *Trichomys apereoides* from Brazil, and *S. moreli* Diaw, 1976, a parasite of *Phyllotis boliviensis* from Bolivia. This character was also attributed to *S. bidalguensis* Falcón-Ordaz & Sanabria, 1999 (Fig. 2d), a parasite of *Peromyscus* sp. from Mexico, even when, after the original illustration, the female tail is not retracted in this species whereas, on the contrary, it is retracted in *S. peromysci*, a parasite of *Peromyscus difficilis* from Mexico (Falcón-Ordaz & Sanabria, 1999, Fig. 1c).

Another interesting character in *S. franciscanus* n. sp. is the dorsal ridge adjacent to the left ridge being larger than the others, a character shared with *S. flavescens* and *S. oryzomysi*.

STILESTRONGYLUS AZARAI

DURETTE-DESSET & SUTTON, 1985 (Figs 25-36)

Material studied: three females CHMLP 3459/2, coparasites of *H. puntanus* n. sp.; two males, one female CHMLP 3460/2, coparasite of *H. puntanus* n. sp.; one female CHMLP 3462, coparasites of *H. puntanus* n. sp. from San Francisco del Monte de Oro (32° 36' S, 66° 08' W), Province of San Luis, Argentina; four males, four females CHMLP 3468; 15 males, 24 females CHMLP 3472/1; 10 males, 10 females MNHN 676 KQ; two males, five females MNHN 677 KQ from San Luis Capital (33° 19' S, 66° 21' W), Province of San Luis, Argentina. Host: *Graomys griseoflavus* (Waterhouse, 1837) (Muridae, Sigmodontinae).

Site: small intestine.

Prevalence and intensity of infection: 37.5 % of the hosts (three out of eight) from San Francisco del Monte de Oro were infected, with intensities of infection of one-three worms. 33.3 % of the hosts (two out of six) from San Luis Capital were infected, with intensities of infection of 15-59 worms.

ADDITIONAL MORPHOLOGICAL DATA

Head: cephalic vesicle present (Fig. 25). In apical view, triangular buccal opening surrounded by very thin ring. Presence of two amphids, six interno-labial papillae, the submedian closer to each other than to lateral, four externo-labial papillae (the two lateral probably fused with amphids), and four submedian cephalic papillae. Externo-labial and cephalic papillae connected two to two by weak cuticular structures in arc of circle, resembling cuticular cordons (Fig. 26).

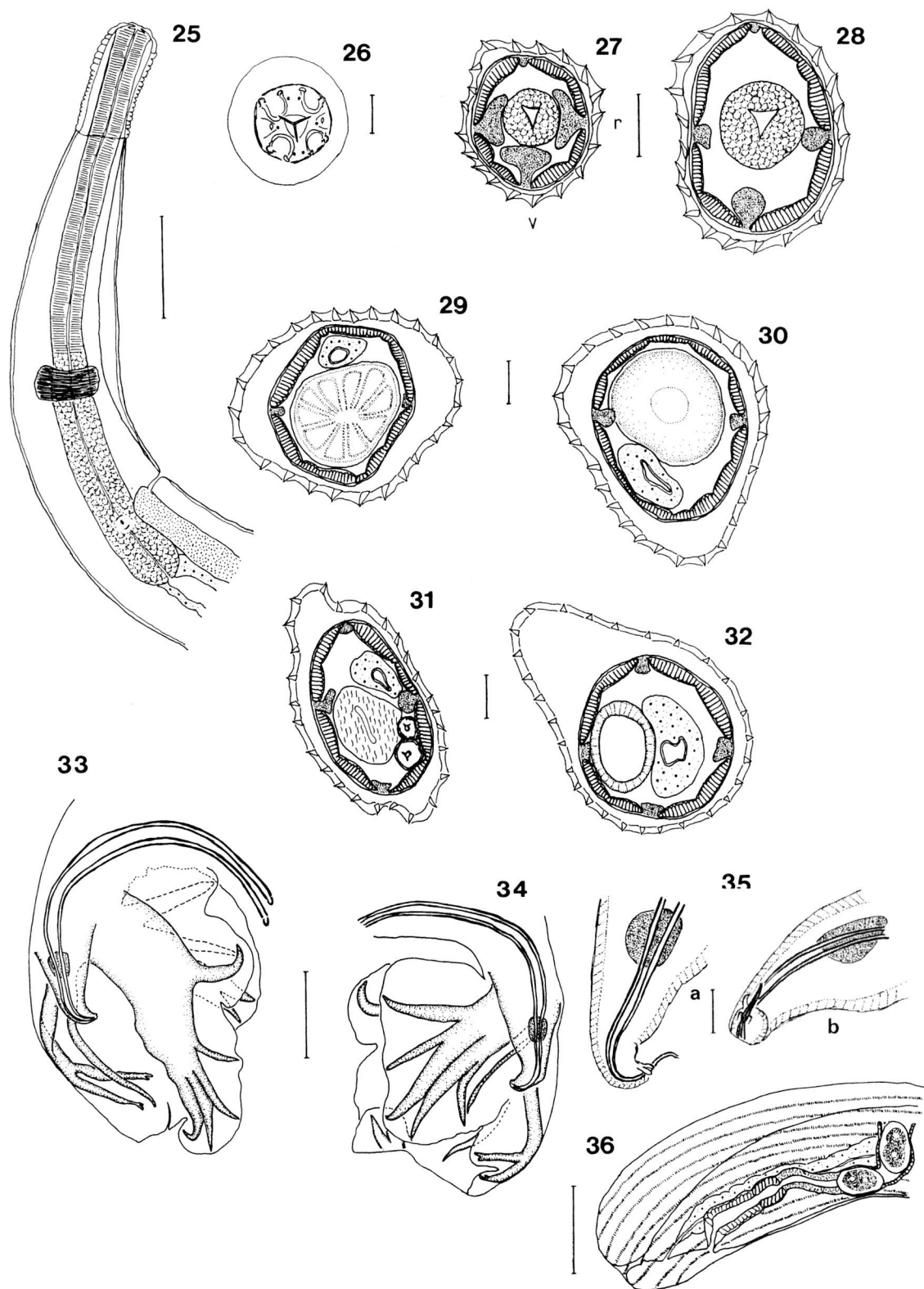
Synlophe: (studied in two males and two females). Number of ridges: 18 in male and 21 in female at level of oesophago-intestinal junction (Figs 27-28), 26 in male and 28 in female at mid-body (Figs 29-30) and at posterior end (Figs 31-32). Ridges of similar size, except for those of ventral right quadrant, slightly smaller. Axis of orientation of ridges directed from ventral right to dorsal left quadrant, with inclination of about 53° to sagittal axis in both sexes at oesophago-intestinal junction and 65° in male at mid-body. In female, at mid-body, axis of orientation of ridges with different inclination on ventral and dorsal sides, of about 45° on right ventral quadrant, and subfrontal on left dorsal quadrant. At posterior end, axis of orientation of about 83° in male and ridges oriented perpendicularly to body surface in female (Figs 31-32).

Measurements (range and average) of 10 males: 3.0-4.0 (3.33) mm long and 120-150 (132) wide at mid-body. Cephalic vesicle 55-65 (61) long and 30-40 (33) wide. Nerve ring, excretory pore and deirids at 140-175 (155), 220-260 (239) and 220-260 (239) from apex, respectively. Oesophagus 290-310 (300) long. Spicules 440-480 (456) long.

Measurements (range and average) of 10 females: 4.5-5.7 (5.1) mm long and 100-140 (121) wide at mid-body. Cephalic vesicle 50-75 (63) long and 35-50 (38) wide. Nerve ring, excretory pore and deirids at 120-170 (148), 190-240 (220) and 190-240 (220) from apex, respectively. Oesophagus 325-360 (344) long. Vulva at 70-100 (82) from caudal extremity. Vagina vera 20-30 (24) long, vestibule 55-75 (62), sphincter 30-40 (38) long and 40-40 (40) wide, infundibulum 90-110 (104). Uterus 800-980 (874) long, taking up 15-19 % (17 %) of body length. Number of eggs 24-43 (31), embryonated, 55-70 long and 35-45 wide. Tail 20-25 (22) long.

DISCUSSION

The specimens studied are identified, both by the characters of the synlophe and those of the caudal bursa, as *Stilestrongylus azarai* Durette-Desset & Sutton, 1985, a parasite of *Akodon azarae* from the province of Buenos Aires, Argentina. Slight differences may be found in the position of the nerve ring (within proximal third of oesophagus in specimens from *A. azarae* vs. middle third in our specimens) and the excretory pore (within middle third of oesophagus in specimens from *A. azarae* vs. distal third in our specimens). On the other hand, in females, the uterus contains six eggs and takes up 9 % of body length in specimens from *A. azarae*, whereas in our specimens the uterus contains 24-43 eggs, taking up 15-21 % of body length. However, these are the only differences and seem of insufficient importance to create a new species, and we attribute the specimens from *Graomys griseoflavus* to *S. azarai*. With the present report, the host and geographical range for *S. azarai* is enlarged.



Figs 25-36. – *Stilestrongylus azarai* Durette-Desset & Sutton, 1985 from *Graomys griseoflavus*.

25, male, anterior extremity, right lateral view. 26, female, head, apical view. 27-32, transverse sections of body; 27-28, at oesophago-intestinal junction, 27, male, 28, female; 29-30, at mid-body, 29, male, 30, female; 31-32, at posterior end, 31, male, 350 μ m anterior to caudal bursa, 32, female, at 250 μ m from posterior end. 33-34, male, caudal bursa, 33, right lobe, dorsal view (left rays in dotted lines), 34, left lobe, dorsal view (right rays in dotted lines). 35a, male, genital cone, lateral view, 35b, male, genital cone, ventral view. 36, female, posterior extremity, left lateral view.

Abbreviations: r, right, v, ventral. Scale bars: 25, 50 μ m; 26, 10 μ m; 27-32, 35, 20 μ m; 33-34, 36, 100 μ m.

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