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SOME NEMATODES OF THE JAPANESE SHREW MOLE, *UROTRICHUS TALPOIDES* TEMMINCK

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Six specimens of the Japanese shrew mole, *Urotrichus talpoides* TEMMINCK, from central Japan were examined, and four nematodes were described: *Spirura nipponensis* n. sp. from the stomach, *Capillaria himizu* n. sp. from the urinary bladder, *Rhabditis* sp. from the stomach, and larval Rhabditoidea from the lungs.

INTRODUCTION

In the preceding paper[4], we described 5 species of parasites of the Japanese shrew mole (Japanese name: Himizu): 3 nematodes (*Thomix urotrichi*, *Capillaria* sp. and larval *Porrocaecum* sp.), one cestode (*Hymenolepis* sp.) and one protozoa (*Sarcocystis* sp.). Among these parasites, *Capillaria* sp. was found in the urinary bladder, but the specimen was fragmented. Recently, we examined further parasitic materials from 5 cases. From these animals, complete specimens of *Capillaria* were obtained and were concluded to belong to a new species; also 2 more nematode species, including a larval form, were recognized; the last one was considered as a member of Rhabditoidea. Thereafter, the materials concerning the preceding paper were reexamined, and adult *Rhabditis* was collected from the gastric content of one case.

MATERIALS AND METHODS

The materials examined are shown in table 1. The animals were collected at Yumoto, Nikkô (2 cases) and the nearby Lake Saiko at the foot of Mt. Fuji (3 cases), although those from the former place were negative for helminths. The animals has been preserved in formalin solution.

In Case No. 4, rhabditid larvae were found within the pulmonary arteries. Other materials used in the preceding paper were reexamined, and an additional case (Case No. 1 in the preceding paper, collected at Yumoto on Oct. 22, '70)

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TABLE 1 *Materials examined*

CASE NO.	AUTOPSY NO.	PLACE OF ORIGIN	DATE COLLECTED	REMARKS
1	0031	Yumoto	Oct. 22, '70	Negative
2	0032	"	"	"
3	0139	Saiko	Nov. 3, '71	
4	0140	"	"	
5	0141	"	"	

was selected, from which adult *Rhabditis* was recognized.

Thomix urotrichi OHBAYASHI, MASEGI et KUBOTA, 1972, was detected in all cases from Saiko (descriptions are omitted).

All the parasites obtained were nematodes, and were treated by lacto-phenol solution. The specimens are preseved in the Department of Prasitology, Faculty of Veterinary Medicine, Hokkaido University.

RESULTS

1) *Spirura nipponensis* n. sp. (Nematoda : Spiruridae)

Each of 2 cases (Case Nos. 3 & 4) was positive for 1 male and 3 females. The nematodes were found in the stomach not attached to the mucosa.

Host : *Urotrichus talpoides* TEMMINCK

Habitat : Stomach

Locality : Saiko, Japan

Date collected : November 3, 1971

Description : Small nematode. Cuticle with fine transverse striations. Prominent ventral hump in anterior body. Mouth and buccal capsule elongated dorso-ventrally. Mouth is surrounded by a plate-like thickening with lateral lips. Each lateral lip possesses three lobes : two of which, the dorso- and the ventro-lateral, are similar in size, showing a minute ridge on the internal surface, but the intermediate one is large and protruded, with one conical tooth-like projection on both the ventral and the dorsal portions. There are 6 papillae surrounding the mouth, 2 lateral, 2 subventral and 2 subdorsal ; the lateral ones are conspicuous. The esophagus is very long divided into two parts.

Two males, body coiled, length 6.35 and 8.08 mm, maximal width 0.160 and 0.198 mm at posterior body : width near esophageal end 0.132 and 0.182 mm. Width of cephalic end 0.048 mm in both specimens. Ventral hump 0.809 and 0.858 mm from cephalic end. Buccal capsule with thick wall, 0.040 and 0.044 mm in length, dorso-ventral width 0.028 mm in both. Nerve ring at anterior part of esophagus, 0.180 and 0.208 mm from cephalic end. Excretory pore slightly behind nerve ring, 0.212 and 0.256 mm from cephalic end. Esophagus 3.44 and 3.76 mm long by 0.072 and 0.120 mm wide, of which anterior part 0.232 and 0.240 mm long by 0.032 and 0.032 mm wide. Anus 0.180 mm from blunt caudal end in both. Spicules and gubernaculum chitinized granularly, especially in the latter. Spicules slightly

bent ventrally, distal end slender and pointed, finely striated ala more conspicuous in left one. Right spicule 0.190 and 0.170 mm long, left spicule 0.170 and 0.160 mm. Gubernaculum cup-shaped and thickened dorsally, 0.040 and 0.040 mm long by 0.028 and 0.024 mm wide. Caudal alae prominent. Cuticle of precloacal area ornamented by longitudinal rows of pavement-like elevations. There are prominent pedunculated caudal papillae: 4 pairs of preanal; unpaired large one just in front of anus; 4 pairs of postanal, one pair of which just behind anus and others showing a short distance; 2 pairs of small subterminal.

Two females, length 9.41 and 12.35 mm; maximal width 0.215 and 0.255 mm, width at esophageal end 0.181 and 0.247 mm. In both, width of cephalic end 0.064 mm. Buccal capsule in second specimen 0.044 mm in length and 0.032 mm in dorso-ventral width. Ventral hump 0.990 mm from cephalic end in both. Nerve ring 0.208 and 0.224 mm, and excretory pore 0.264 and 0.256 mm from cephalic end, respectively. Esophagus 4.25 and 4.95 mm long by 0.080 and 0.132 mm wide, of which anterior part 0.264 and 0.284 mm long by 0.034 and 0.036 mm wide. Vulva without projection, 2.55 and 4.21 mm from caudal end. Anus 0.184 and 0.280 mm from caudal end. Tail conical with slight subterminal inflation. Uterine eggs of the second specimen embryonated, asymmetric in shape, one side straight and other side convex, 0.048~0.052×0.028~0.032 mm in size.

Discussion: Nematodes of the genus *Spirura* are known in some insectivorous animals, e. g., *S. talpae* (GMELIN, 1790), *S. rotschildi* SEURAT, 1915, and *S. rytipleurites seurati* CHABAUD, 1954. *S. nipponensis*, however, is easily differentiable from other *Spirura*-species including the above-mentioned by its small size (body, spicules etc.), oral structure, especially the conical projections of the intermediate lobe of lateral lip, and the ventral hump existing less than 1 mm from the cephalic end.

2) *Capillaria himizu* n. sp. (Nematoda: Capillariidae)

Two males and 1 female were obtained from the urinary bladder of Case No. 3.

Host: *Urotrichus talpoides* TEMMINCK

Habitat: Urinary bladder

Locality: Saiko, Japan

Date collected: November 3, 1971

Description: Small filiform nematode. Cuticle smooth. Cephalic end unarmed showing inflation. Bacillary bands well-recognized laterally throughout body.

Two males, 5.41 and 5.14 mm in length and 0.060 and 0.054 mm in maximal width. Body width at esophageal end 0.040 and 0.028 mm. Inflated cephalic end 0.012 mm in diameter, but 0.008 mm at constricted portion just behind it. Length of esophagus 2.83 and 2.82 mm, of which anterior part 0.120 mm in both specimens. Esophagus/body ratio 1 : 1.9 and 1 : 1.8. Spicule slender and slightly chitinized with fine transverse striations, distal end rounded and proximal portion gradually thickened, length 0.384 and 0.440 mm and width 0.006~0.008 mm. Retracted spicular sheath aspinose showing conspicuous transverse plications, 0.344 and 0.360 mm in length. Caudal end slightly bends ventrally, having no special structures. Anus subterminal.

One female, cephalic end lost, length 6.31 mm including almost whole body. Length of posterior body 3.18 mm. Maximal width and width at esophageal end 0.052 and 0.048 mm, respectively. Area of vulva unarmed, but slightly elevated. Caudal end rounded. Anus

subterminal. Eggs usually symmetric, but rarely asymmetric, outer layer of egg shell thicker than inner one, 0.058~0.064×0.020~0.022 mm in size. Opercula slightly protruded. Patterns of network, sometimes irregularly, in egg shell.

Discussion: *Capillaria himizu* is a very small nematode, and is characterized by the short spicule, the simple caudal end of male and the network patterns of the egg shell. From the urinary bladder of insectivorous animals 3 species of the genus *Capillaria* are known: *C. capillaris* (LINSTOW, 1882) from *Sorex aranaeus, Crocidura russula* and *Talpa europaea*; *C. incrassata* (DIESING, 1851) from *Sorex aranaeus*; and *C. sunci* CHEN, 1937, from *Suncus coerulus*. These species are larger than *C. himizu* and the spicule is more than 0.8 mm in length. Moreover, eggs of *C. capillaris* are shorter but wider than those of *C. himizu*. The caudal end of *C. incrassata* is not simple but truncate. *C. sunci* has a cephalic annular constriction, but male caudal end has small bursa-like lobes.

3) *Rhabditis* sp. (Nematoda : Rhabditidae)

Five female specimens were obtained from the stomach of a host collected at Yumoto, Nikkô on October 22, 1970.

Host: *Urotrichus talpoides* TEMMINCK

Habitat: Stomach

Locality: Yumoto, Nikkô, Japan

Date collected: October 22, 1970

Description: Small thick nematode, body slightly bends ventrally. Cuticle very thin and smooth. Length of body 0.95~1.19 mm and maximal width 0.056~0.096 mm at about middle of body. Width of cephalic end 0.016~0.018 mm. Mouth opening trigonal, surrounded by 6 labia of same size; 2 lateral, 2 dorso-lateral and 2 ventro-lateral. Each labium with 3 papillae, one of which internal and two external. Buccal capsule cylindrical, 0.016~0.020 mm in length and about 0.005 mm in width. Esophagus rhabditisform, length 0.140~0.152 mm and width of anterior part and esophageal bulb 0.016~0.020 mm and 0.028~0.036 mm, respectively. Nerve ring and excretory pore 0.108~0.124 mm and 0.136~0.152 mm from cephalic end, respectively. Vulva at about middle of body showing transverse slit with lip-like elevations, 0.472~0.592 mm from cephalic end. Uteri divergent oppositely. Two specimens show 8 and 16 non-embryonated immature eggs with thin shell, 0.052~0.064×0.028~0.036 mm in size. Anterior and posterior ovaries thick, reflex at portions apart from esophageal end and anus, respectively, then run straight and their distal ends overlap at level of vulva. Anus 0.116~0.140 mm from caudal end. Tail tapers showing filiform end.

Discussion: This nematode was found in the stomach of one case out of 12 animals. There remains a suspicion that this species is an aberrant parasite originating from others, e. g., that of food insects.

4) Rhabditoidea gen. sp. (larva)

More than 10 specimens, freely or together with tissues, were collected from the lungs of Case No. 5. A few of these nematodes were found in the parenchymatous tissue, but others were observed in the pulmonary arteries.

Host: *Urotrichus talpoides* TEMMINCK

Habitat: Lungs

Locality: Saiko, Japan

Date collected: November 3, 1971

Description: Two specimens, small nematodes, fragile and thick, length 0.94 and 0.82 mm. Cuticle very thin and smooth. Maximal body width and head width 0.064 and 0.052 mm, and 0.010 and 0.012 mm, respectively. Cephalic end rounded, no special structures recognizable. Buccal capsule slender and cylindrical, length 0.026 and 0.028 mm. Esophagus rhabditisform, 0.124 and 0.120 mm in length. Width of its anterior part and that of bulb 0.012 and 0.012 mm, and 0.020 and 0.028 mm, respectively. In one specimen, nerve ring and excretory pore 0.124 and 0.160 mm from cephalic end, respectively. Intestine thick and straight, filling body. Anus 0.068 mm from caudal end in both specimens. Tail shows filiform termination.

Discussion: The exact taxonomic position is unknown, because no adults of this nematode were obtained from the same host. Judging from the morphological characteristics, this larval form is considered as a member of Rhabditoidea. The nematode is thought to be in the process of migrating. No relationship between this and the adult *Rhabditis* sp. from the stomach above-mentioned has sofar been detected.

References

1) Dougherty, E. C. (1955): *J. Helminth.*, **29**, 105
2) Koubulej, T. & Versenyi, L. (1953): *Acta vet. hung.*, **3**, 189 (in Russian with German summary)
3) López-Neyra, C. R. (1947): "Los Capillarinae" *Mems R. Acad. Cienc. exact. fís. nat. Madr.*, **12**, 1 (in Spanish)
4) Ohbayashi, M., Masegi, T. & Kubota K. (1972): *Jap. J. vet. Res.*, **20**, 50
5) Skrjabin, K. I., Shikhobalova, N. P. & Orlov, I. V. (1957): (translated title) "Trichocephalidae and Capillariidae of animals and man" Osnovy nematodologii, **6**, Ed. Skrjabin, K. I., Moscow: Akad. Nauk SSSR (in Russian)
6) Skrjabin, K. I., Shikhobalova, N. P., Sobolev, A. A., Paramonov, A. A. & Sudarikov, V. E. (1954): (translated title) Key to parasitic nematodes, **4**, Ed. Skrjabin, K. I., Moscow: Akad. Nauk SSSR (in Russian)
7) Skrjabin, K. I. & Sobolev, A. A. (1963): (translated title) "Spirurata of animals and man" Osnovy nematodologii, **11**, Ed. Skrjabin, K. I., Moscow: Akad. Nauk SSSR (in Russian)
8) Sołtys, A. (1954): *Acta parasit. pol.*, **1**, 353 (in Polish with Russian and English summaries)
9) Yamaguti, S. (1961): "The nematodes of vertebrates" Systema helminthum, **3**, New York & Lodon: Interscience Publ.

Explanation of plates

PLATE I *Spirura nipponensis* n. sp.

Fig. 1 Anterior body of female, lateral view

Fig. 2 Anterior end of male, ventral view

Fig. 3 Cephalic end of female, lateral view

Fig. 4 Cephalic end of female, ventral view

Fig. 5 Cephalic end of female, showing oral area

Fig. 6 Posterior end of female, lateral view

Fig. 7 Posterior end of female, ventral view

Fig. 8 Eggs

Fig. 9 Posterior end of male

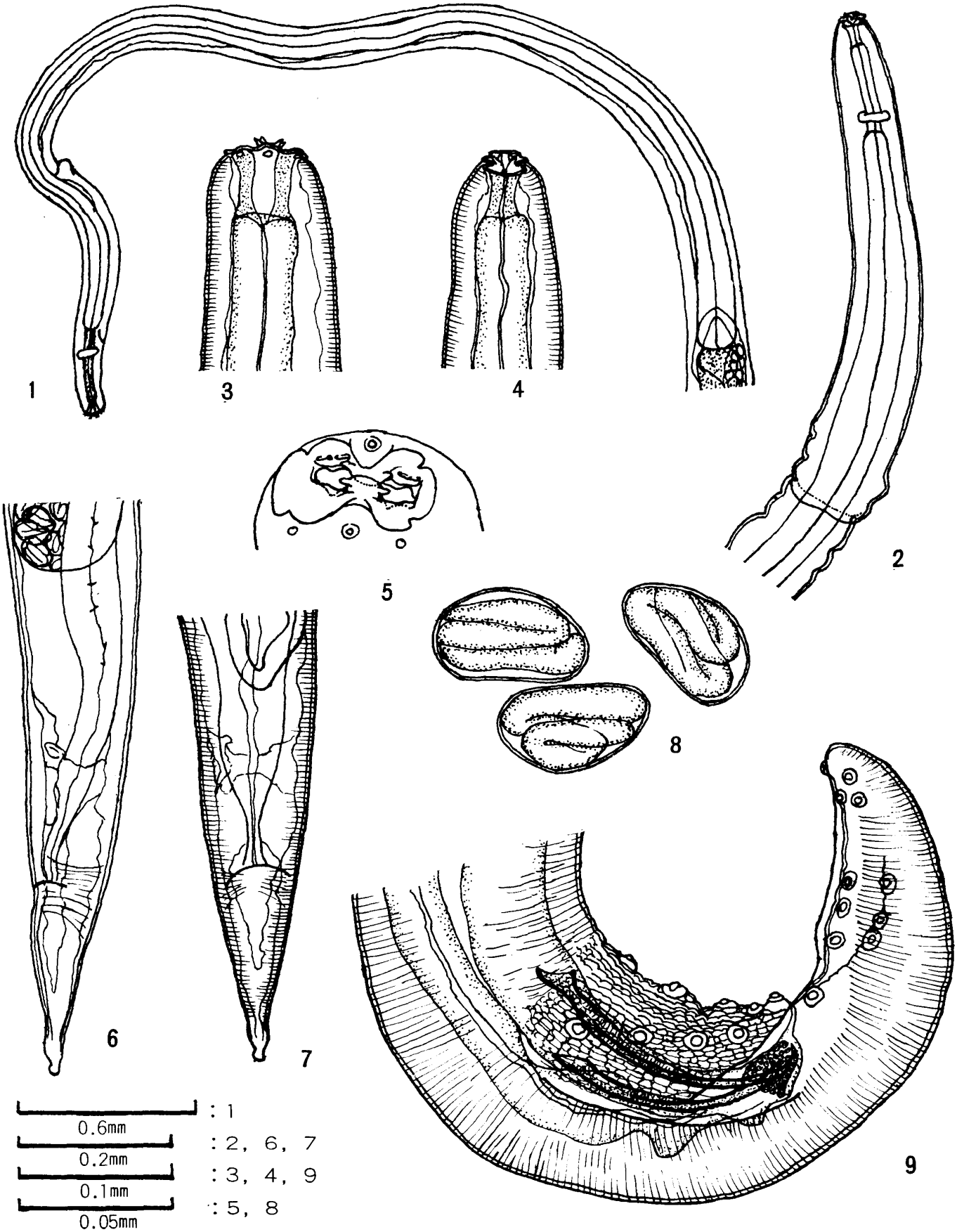
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PLATE II

Figs. 10~15 *Capillaria himizu* n. sp.

Fig. 10 Anterior end of male

Fig. 11 Portion at junction of esophagus with intestine, male

Fig. 12 Posterior end of male

Fig. 13 Vulvar region

Fig. 14 Posterior end of female, lateral view

Fig. 15 Eggs, one of which showing patterns of egg shell

Figs. 16 & 17 Rhabditoidea gen. sp. (larva)

Fig. 16 General view

Fig. 17 Anterior end

Figs. 18~22 *Rhabditis* sp.

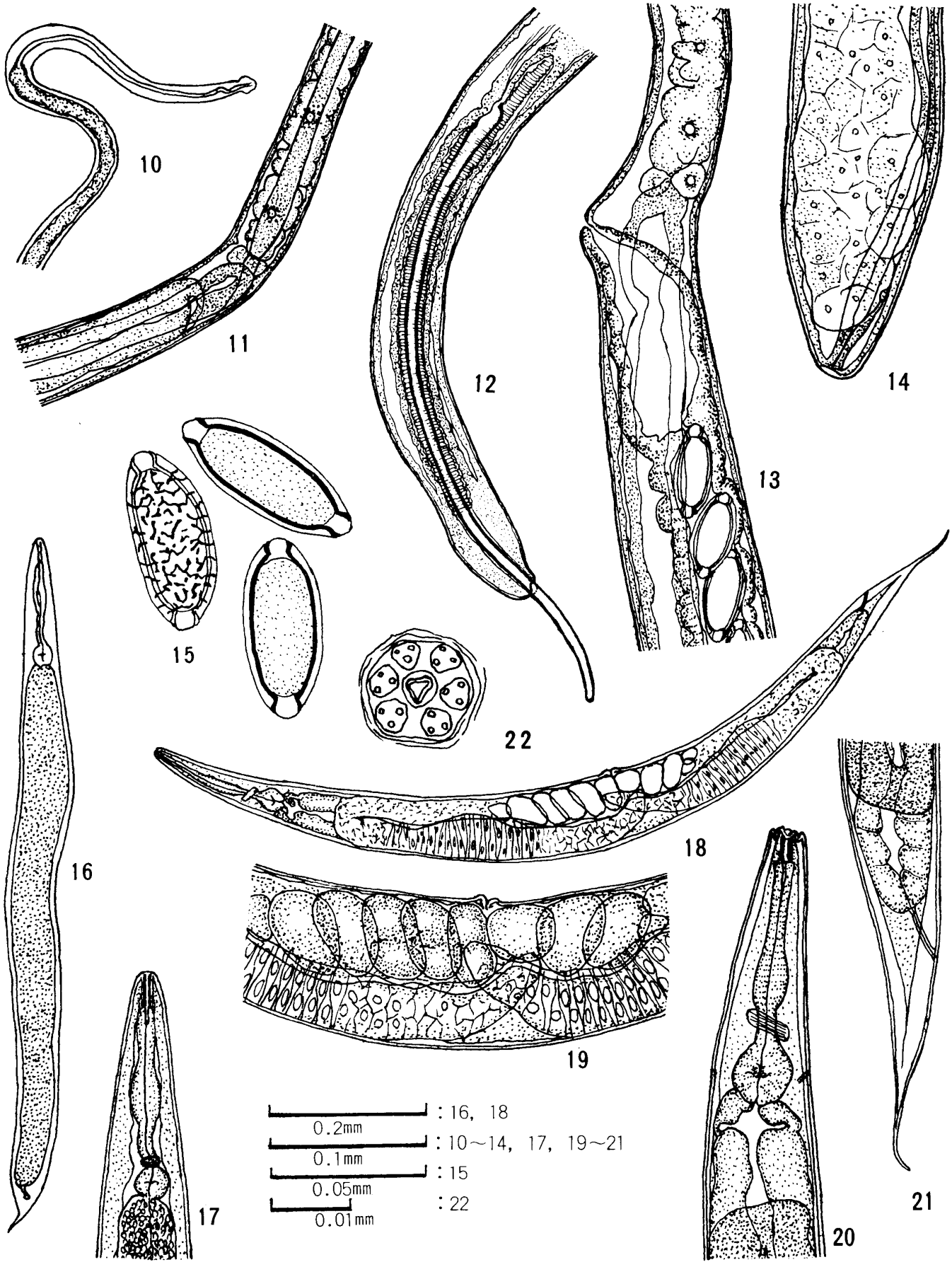
Fig. 18 General view

Fig. 19 Vulvar region

Fig. 20 Anterior end

Fig. 21 Posterior end

Fig. 22 Cephalic end, showing oral area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0.01mm : 22

PLATE III

Fig. 23 Eggs of *Capillaria himizu* n. sp., showing patterns of egg shell

Fig. 24 *Capillaria himizu* n. sp., posterior end of male

Fig. 25 *Spirura nipponensis* n. sp., posterior end of male

Fig. 26 Rhabditoidea gen. sp. (larva) in the pulmonary artery Hematoxylin-eosin stain

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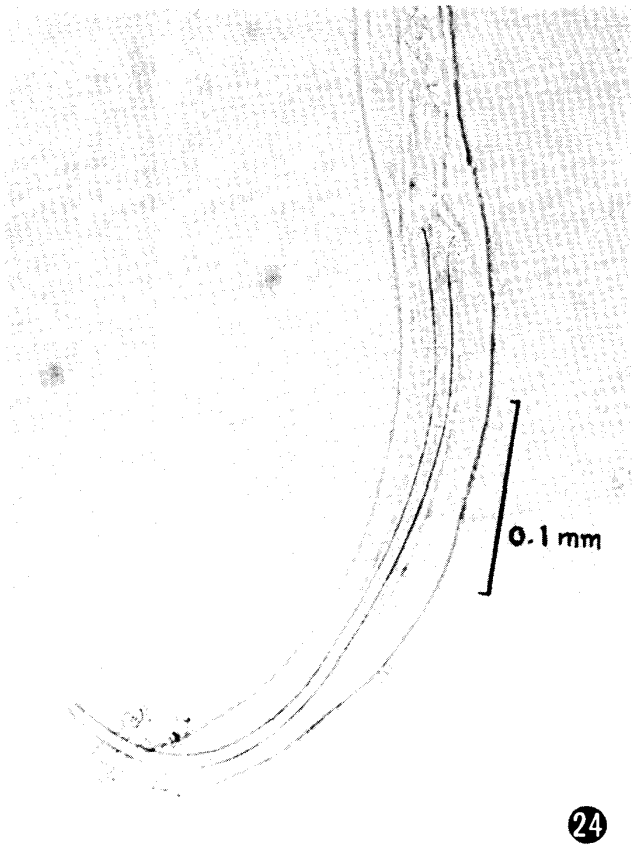

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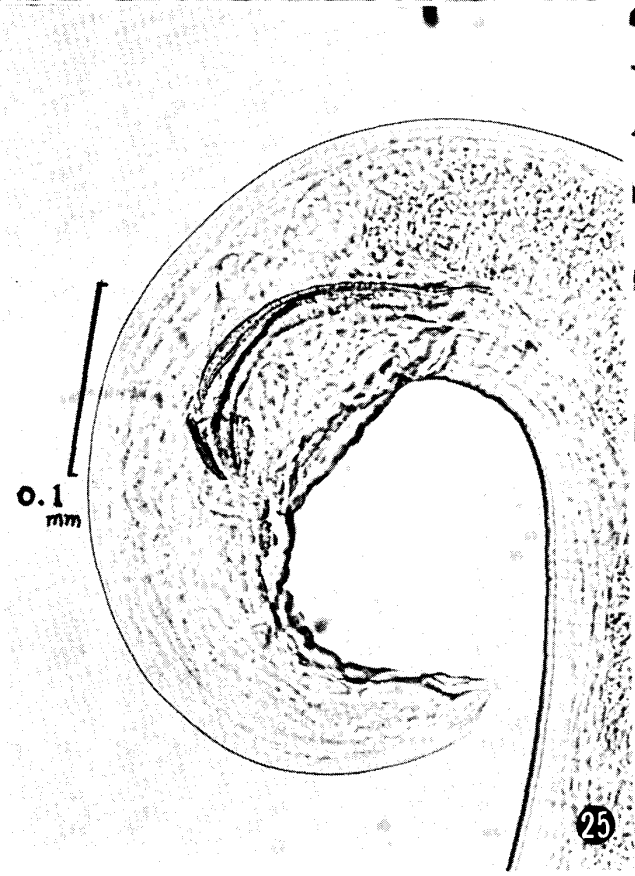

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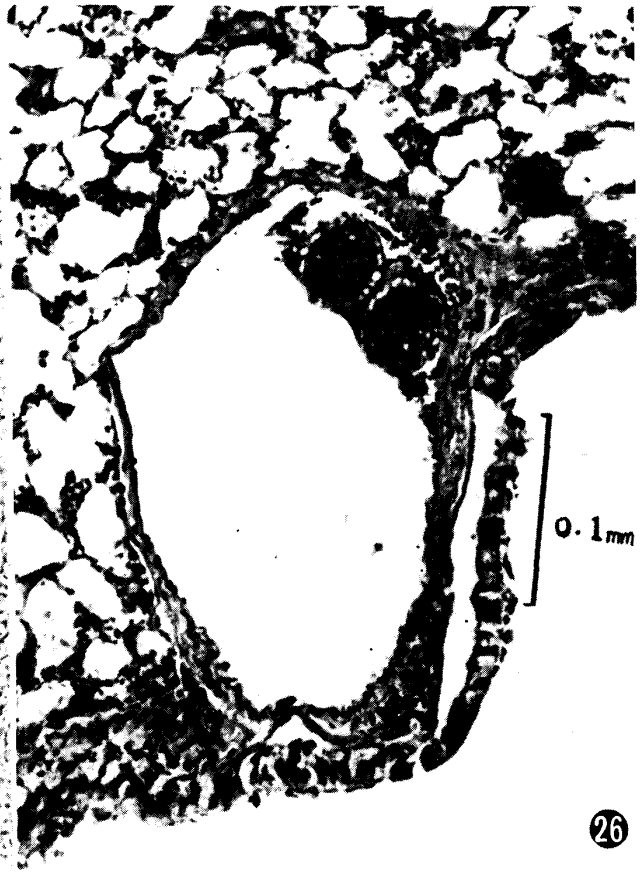

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