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PARASITES OF THE JAPANESE SHREW MOLE,  
*UROTRICHUS TALPOIDES* TEMMINCK

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Seven specimens of the Japanese shrew mole, *Urotrichus talpoides* TEMMINCK, from central Japan were examined. A new nematode, *Thominx urotrichi* n. sp., was described from the mucosae of the mouth (tongue, palate and cheeks), the pharynx and an upper third of the esophagus. This nematode was characterized by long spicule and spicular sheath, and minute round depressions of the egg shell. Larvae of this nematode were observed in the skeletal muscle. Other parasites were also recognized: Larval nematode, probably *Porrocaecum* sp., from a lymph-node; *Capillaria* sp. from the urinary bladder; *Hymenolepis* sp. from the small intestine; and *Sarcocystis* sp. from the skeletal muscle.

INTRODUCTION

During a comparative anatomical study of the Japanese shrew mole, *Urotrichus talpoides* TEMMINCK, small nematodes were noted in some of the serial sagittal sections taken from the head of one animal. Judging from the morphological characteristics of the egg, the nematode was supposed to belong to Capillariidae. Therefore, a detailed investigation was carried out on formalin-fixed materials of 7 cases including the one above-mentioned, and the nematode was concluded to be a new species.

MATERIALS AND METHODS

The animals examined were collected in central Japan; 1 case nearby Lake Saiko at the foot of Mt. Fuji and 6 cases at Yumoto, Nikkô. All the organs were examined carefully using a microscope. The majority of specimens of *Thominx* was treated by lacto-phenol solution together with the oral or esophageal mucosae, although some of them could be taken out partially. One specimen of *Hymenolepis* sp. was obtained from the jejunum of case No. 1, which was stained by DELAFIELD's hematoxylin. In 2 cases, *Sarcocystis* sp. was recognized

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TABLE 1 *Materials examined*

CASE NO.	PLACE OF ORIGIN	DATE COLLECTED	<i>THOMINX UROTRICHI</i> N. SP.		<i>CAPILLARIA</i> SP.	<i>HYMENOLEPIS</i> SP.	<i>SARCOCYSTIS</i> SP.
			Esophagus	Mouth			
1	Yumoto	Oct. 22, '70	—	1♀	—	+	—
2	"	"	2♂, 1♀	2♂	—	—	—
3	"	"	—	—	+ *3	—	—
4*1	"	"	1♂, 1♀	2♀	—	—	+
5	"	"	—	—	—	—	+
6	"	"	—	1♀*2	—	—	—
7	Saiko	Nov. 1, '71	1♂	—	—	—	—

\*1 Revealed by histological examination of serial sections

\*2 Immature specimen

\*3 A fragmented anterior body

histologically in sections of the skeletal muscles stained by hematoxylin-eosin, and a detailed examination was conducted on the fixed material. The materials examined are shown in table 1.

## RESULTS AND DISCUSSION

### *Thominx urotrichi* n. sp.

Five host animals out of 7 (71.4%) were positive for this nematode (tab. 1). The complete nematode specimens examined were composed of 5 males and 2 females, but one of the latter was immature (tab. 2). The nematode was always embedded in the mucosal layer showing undulation. Eggs were found around the nematode body. In one case, both sexes lay parallel and copulated. The mucosa manifested no pathological lesions except outward pressure by the nematode or the formation of boring canals. The specimens are preserved in the Department of Parasitology, Faculty of Veterinary Medicine, Hokkaido University.

Host: *Urotrichus talpoides* TEMMINCK

Habitat: Oral (lingual, buccal and palatal), pharyngeal and esophageal (upper one third) mucosae

Locality: Yumoto, Nikkô, and Saiko, Japan

Description: Small slender nematode. Cuticle with fine transverse striations. Bacillary band unrecognizable.

Male: Body 6.12~9.18 mm in length and 0.040~0.046 mm in width, slightly tapering to the anterior and posterior ends. Head end smooth, 0.010~0.014 mm in width at subterminal portion. Esophagus 1.22~2.04 mm long; its anterior portion 0.24~0.40 mm long; para-esophageal cells about 25 in number. Esophagus/body ratio 1:3.8~5.0. Retracted spicular sheath 0.596~0.792 mm in length and 0.012~0.016 mm in width, armed with numerous minute spines. Spicule filiform, very slightly chitinized, 0.808~1.237 mm in length and 0.003~0.004 mm in width; distal end bluntly pointed. Posterior end of body slightly bends ventrally. Cloacal aperture composed of one ventral and two lateral lobes; the latter hemispherical at end showing thickened cuticle, each lobe with one ventro-lateral nodular protrusion. Ventral lobe short and lip-like.

Female: One female 11.83 mm in length and 0.062 mm in width. Posterior end blunt; anus slightly subterminal. Esophagus 1.73 mm long; its anterior portion 0.28 mm long. Esophagus/body ratio 1:6.8. Vulva without appendages. Eggs elongated barrel-shape, 0.064~0.078×0.026~0.028 mm in size; egg shell composed of thick inner layer and very thin outer layer; on the surface, scattered minute round depressions; opercula not protruded.

In histologic sections of the skeletal muscles of the scapular area, three larval nematodes were observed. Body length was more than 0.480 mm and the width was 0.012~0.016 mm. The esophagus was more than 0.3 mm long. In one larva, the posterior body was inserted into a blood vessel. These larvae were considered to be those of the subjected species.

In a copulating male, the spicular sheath was folded within the vagina of a female, and the exerted portion of the sheath was 0.435 mm long by about 0.012 mm wide.

Discussion: *Thominx uotrichi* is characterized by its small body size,

TABLE 2 Measurement of *Thominx uotrichi* n. sp. (mm)

NO.	SEX	BODY		ESOPHAGUS	RETRACTED SPICULAR SHEATH	SPICULE	ESOPHAGUS/ BODY RATIO
		Length	Width				
1	♂	6.94	0.044	1.83	0.705	1.025	1:3.8
2*1	”	—	0.040	1.83	—	—	—
3	”	6.63	0.048	1.63	0.596	0.808	1:4.1
4	”	6.12	0.044	1.22	0.792	1.237	1:5.0
5	”	9.18	0.046	2.04	—	0.913	1:4.5
6	♀	11.83	0.062	1.73			1:6.8
7*2	”	5.09	0.070	1.75			1:2.9

\*1 Posterior end was lost

\*2 Immature specimen

long spicule and spicular sheath, and minute depressions of the egg shell. The habitat of this nematode is unique. Adults and eggs are recognizable, being embedded in the mucosae of the mouth (tongue, palate and cheeks), the pharynx and the upper third of the esophagus. *Thominx mogerae* MAMAEV et OKHOTINA, 1968, from the esophagus and intestine of *Mogera robusta* in Ussuri Region of the USSR is a small nematode similarly to the present species, but in the former, the spicule is short, 0.21 mm, and the egg shell is smooth. *T. marii* RUCHLIADEV, 1946, is also described from the esophagus of an insectivora of Talpidae, *Desmana moschata*. This nematode has a very large body and a short spicular sheath, although the spicule itself is quite long.

*Capillaria* sp.

A fragment of material from the esophageal portion was obtained from the urinary bladder of one animal. Judging from the morphology of the esophagus, this specimen is a capillarid nematode, but further investigation will be necessary in the future when complete specimens are collected.

Nematoda gen. sp. (larva)

In case No. 4, a larval ascarid nematode was observed in the serial sections of the axillary lymph-node, although the detailed structure was unknown. The larva was surrounded by granulation tissue. The diameter of the body was 0.036~0.044 mm, and that of the esophagus was 0.024 mm. From insectivorous animals, larval nematodes of the genus *Porrocaecum* are known<sup>1,2,4,5,8</sup>), and it is most probable that the present larva belongs to this genus.

*Hymenolepis* sp.

One specimen was obtained from the jejunum of case No. 1. The specimen was somewhat macerated.

Description: The specimen was mature, 25.7 mm in length and 0.89 mm in maximum width near the posterior end. The number of proglottids was 227. There were numerous longitudinal muscles in proglottids. Scolex 0.232×0.176 mm in size; neck short, 0.096 mm in width; prominent suckers 0.080~0.088×0.072~0.076 mm. Rostellar sac 0.075×0.042 mm in size; rostellar hooks unrecognizable. Mature proglottids wider than long, 0.160~0.176×0.330~0.410 mm; gravid ones short, 0.144~0.160 mm in length. Three testes ellipsoid in shape, 0.056~0.064×0.032~0.048 mm, forming a triangle; two of them antiporal, almost tandem and close together; poral one at the level between other two. Ovary lobed, 0.064~0.080×0.056~0.080 mm. Vitelline gland closely behind ovary, triangle in shape; partly overlapping with the posterior antiporal testis; size

0.048~0.056×0.040~0.048 mm. Genital pores unilateral, at about anterior one third to two fifths of lateral margin of proglottid. Cirrus pouch not reaching median line, 0.096~0.104 mm in length and 0.016~0.024 mm in maximum width near the genital pore. Seminal receptacle 0.028~0.040 mm in diameter, lies near anterior border of proglottid. External seminal vesicle 0.020~0.024 mm in diameter. Eggs 0.032~0.040 mm in diameter, and oncospheres 0.020~0.028 mm in diameter.

Discussion: The specimen for staining was in an unsuitable condition, and detailed morphology was unavailable. Therefore, further specimens will be needed.

*Sarcocystis* sp.

This protozoa was obtained from the skeletal muscles of 2 cases. MIESHER's tube, about 5~6 mm long by 0.024~0.036 mm wide, was long and slender; its ends were blunt. RAINEY's corpuscles were very small, 0.0065~0.0086 mm long by around 0.0028 mm wide. The corpuscle was crescent- or banana-shaped, and showed an eccentric nucleus. Because of condition of materials, fine structures were hardly observable.

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EXPLANATION OF PLATES

PLATE I

Figs. 1~7 *Thominx urotrichi* n. sp.

Fig. 1 Posterior portion of male

Fig. 2 Posterior end of male, ventral view

Fig. 3 Posterior end of male, lateral view

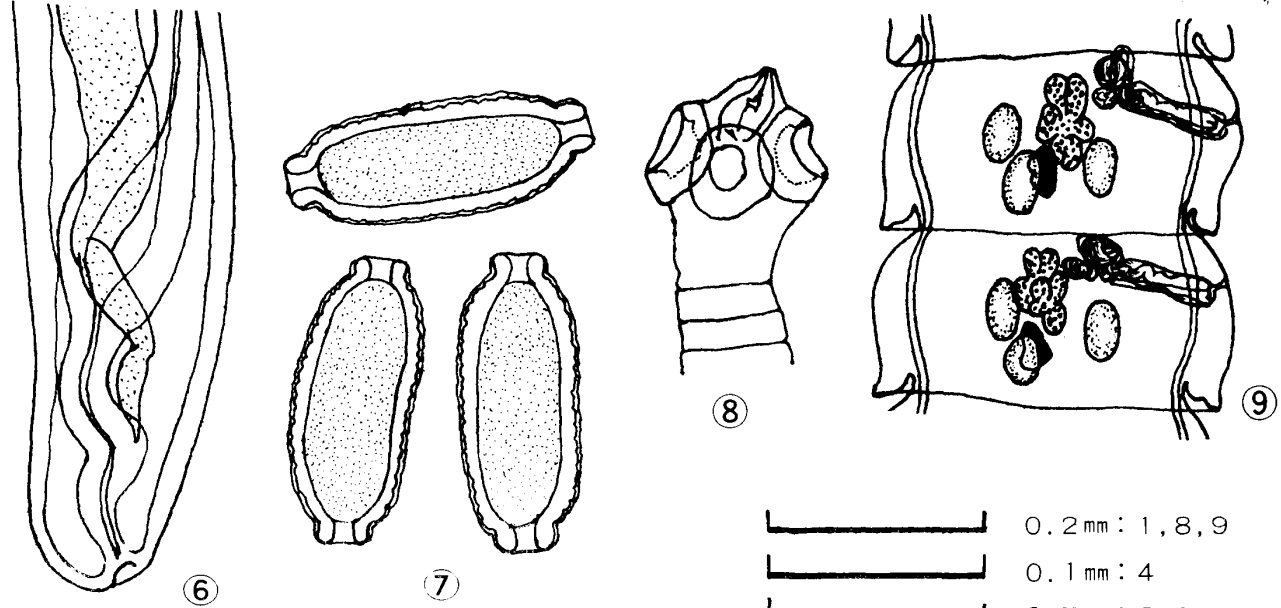
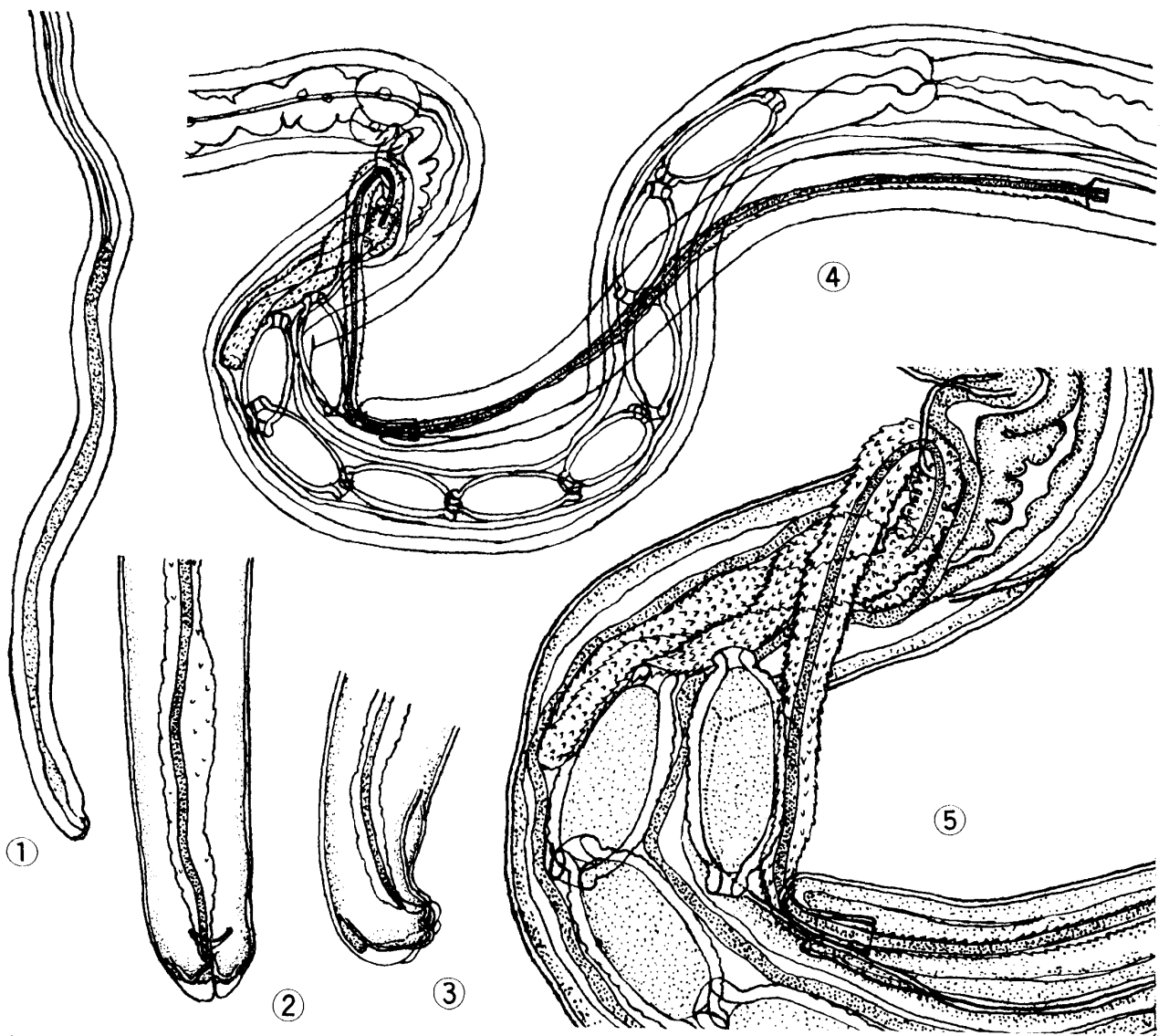
Figs. 4 & 5 Both sexes copulating

Fig. 6 Posterior end of female

Fig. 7 Eggs

Fig. 8 Scolex of *Hymenolepis* sp.

Fig. 9 Mature proglottids of *Hymenolepis* sp.



— 0.2 mm : 1, 8, 9  
— 0.1 mm : 4  
— 0.05 mm : 2, 3, 5~7

PLATE II *Thominx uotrichi* n. sp.

- Fig. 10 Adults and eggs in the palatal and lingual mucosae H.-E.  
Fig. 11 Sections of a female in the lingual mucosa H.-E.  
Fig. 12 An egg in the lingual mucosa H.-E.  
Fig. 13 Both sexes copulating Lacto-phenol  
Fig. 14 Posterior portion of male Lacto-phenol

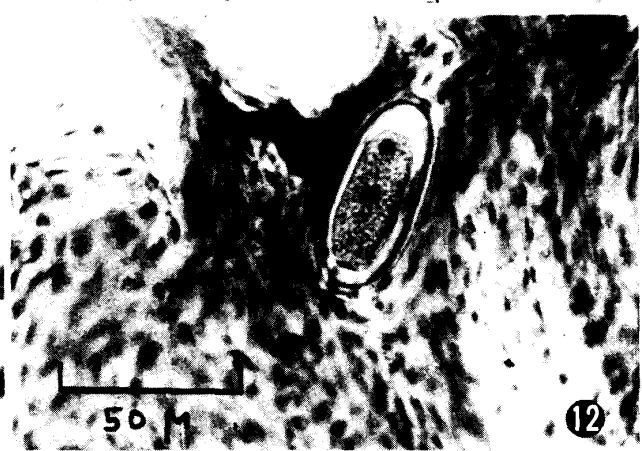
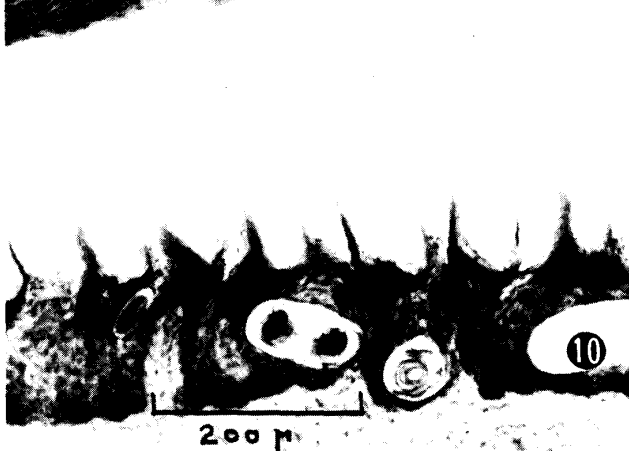
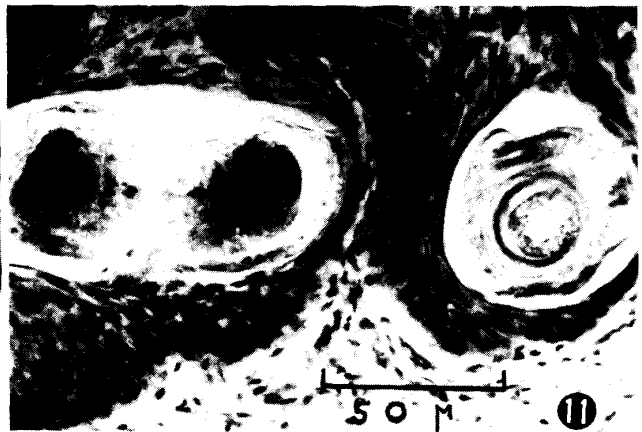


PLATE III

- Fig. 15 Larvae of *Thominx urotrichi* n. sp. in skeletal muscle H.-E.
- Fig. 16 Eggs of *T. urotrichi* n. sp. showing minute depressions in the egg shell Lacto-phenol
- Fig. 17 A nematode larva, probably *Porrocaecum* sp., in the axillary lymph-node H.-E.
- Fig. 18 *Sarcocystis* sp. in the skeletal muscle showing MIESHER's tubes H.-E.
- Fig. 19 *Sarcocystis* sp. showing RAINEY's corpuscles Lacto-phenol

