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Citation	Japanese Journal of Veterinary Research, 22(4), 116-120
Issue Date	1974-10
DOI	10.14943/jjvr.22.4.116
Doc URL	http://hdl.handle.net/2115/2057
Type	bulletin (article)
File Information	KJ00002371177.pdf



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**CITELLINA PETROVI SCHULZ, 1930 FROM
THE JAPANESE FLYING SQUIRREL,
PTEROMYS VOLANS ORII KURODA**

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(Received for publication, June 28, 1974)

A nematode species, *Citellina petrovi* SCHULZ, 1930, was found in the caecum and small intestine of a female *Pteromys volans orii* KURODA captured in Nakagawa-cho, Teshio district, northern Hokkaido, Japan, on January 2, 1972. This is the first distribution record of this helminth species in Japan.

INTRODUCTION

There are few reports which have examined the helminths of sciurine animals; YAMAGUTI's (1941, 1942) and QUENTIN's (1971) reports are among the few. The latter, especially, described an oxyurid nematode, *Sypharista kamegaii* QUENTIN, 1971, from the Japanese giant flying squirrel, *Petaurista leucogenys nikkonis* THOMAS. The authors dealt with one species of nematode in this paper, since the authors could not find any other helminth species.

MATERIALS AND METHODS

All the visceral organs and tissues were carefully examined microscopically. Seven male nematodes—5 from the caecum and 2 from the small intestine—were collected. The nematodes obtained were preserved in 5% formalin solution and treated with lacto-phenol solution for parasitological examination.

DESCRIPTION AND DISCUSSION

Citellina petrovi SCHULZ, 1930

Host: *Pteromys volans orii* KURODA

Habitat: Caecum and small intestine

Description: Body length 4.5~5.5 mm, maximum width 0.267~0.357 mm, cuticular striations obvious at intervals of 0.005~0.006 mm. Lateral flange

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distinct at each lateral side. Cephalic alae variable in shape and asymmetrical. Mouth with 3 lips, 2 papillae on each lip, but without buccal cavity. Nerve ring at 0.212~0.261 mm from anterior end. Esophagus with esophageal bulb. Length of esophagus 0.520~0.650 mm, width 0.059~0.072 mm. Size of esophageal bulb 0.108~0.134×0.114~0.134 mm. Lateral alae at caudal portion not distinguished from lobe-shaped bursa; their total length 0.663~0.728 mm. Lobe-shaped bursa with 2 lateral ribs 0.091~0.104 mm and a dorsal rib 0.098~0.114 mm in length. Each lateral rib with a swelling near the proximal end and abruptly tapered. Comparing with lateral ribs, dorsal rib tapers gradually. In addition to this arrangement of ribs, one elongated process arises beyond lateral ribs from each side. Size of this process, 0.039×0.023 mm, ending with conical tip. A pair of sucker-like cuticular formations, 0.059×0.023 mm in size, having 3 continuous elevations, are situated laterally close to cloaca. Feebly sclerotized cloaca, 0.006 mm in diameter, is situated at center of chestnut-shaped protrusion lying between these above-mentioned formations. An oval protrusion, 0.013 mm in diameter, is situated at distal side and makes contact with cloaca. A rough surfaced groove appears between gubernaculum and cloaca. Spicule feebly chitinized at its middle level, but both proximal and distal end clearly chitinized. Its distal end sharpened, and proximal end dilated and cup-shaped. Length of clearly visible spicule, 0.228 mm. On the other hand, spicule with clearly recognized ends, 0.088 mm in length at least. This difference in length of spicule results from the folded feature of the spicule's middle level due to the feebly chitinized spicule. Well chitinized gubernaculum 0.033~0.036 mm in length, with narrow groove through its middle, and having somewhat protruded distal end.

Discussion: *Citellina petrovi* was described by SCHULZ (1930) for the first time when discovered in the flying squirrel, *Pteromys volans* LINNAEUS, in Northern Dvinsk, USSR. READ (1957) studied numerous materials of genus *Citellina* parasitized rodents of the family Sciuridae. He concluded that there were no morphological characters which could be used to separate *Oxyuris triradiata* HALL, 1916, *Citellina dispar* PRENDEL, 1928, *C. marmotae* MANTER, 1930, *C. petrovi* SCHULZ, 1930, *C. alpina* JETTMAR et ANSCHAU, 1951, and *C. alatau* SPASSKY RYJIKOV et SUDARIKOV, 1950, and that there was a cosmopolitan distribution of a single species, *Citellina triradiata* (HALL, 1916) in ground squirrels and marmots. According to his opinion, the differences in measurements were still within the range of variability, and the marked differences in the length of spicule were due to the feebly chitinous structure causing difficulty in establishing the correct length. The spicule of the present specimens was also poorly chitinized at its middle level. It was recognized that the interval

between the proximal and distal end of spicule was shortened, resembling an accordion.

Subsequently, ERHARDOVÁ-KOTRLÁ & DANIEL (1970) reported *Citellina hindukushensis* as a new species from *Marmota caudata* (JACQUEMONT) of Hindu Kush, Afghanistan. They had some doubts about READ's (1957) opinion, and studied statistically to find out whether a different spicule length could be considered as a diagnostic sign for differentiation of the individual species described. Consequently, they indicated that the spicule length was a suitable diagnostic feature.

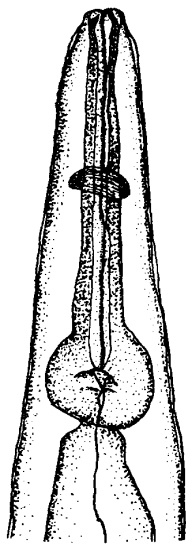
Up to this time, the genus *Citellina* species were described from hosts of the genera *Citellus*, *Marmota*, *Sciurus* and *Pteromys*. Only *C. petrovi* SCHULZ, 1930 was reported from *Pteromys volans* LINNAEUS. Some of the present specimens have cephalic alae, whereas the others show no cephalic alae; furthermore, their sizes are variable and asymmetrical. This cuticular expansion, like cephalic alae, should show artificial dilation. On the other hand, there were no signs of ovally post-cloacal protrusion and rough surfaced groove between cloaca and gubernaculum in the original description of SCHULZ (1930). The present specimens differ from the description of SCHULZ (1930) in the above-mentioned points; however, the authors consider that a new species cannot be established on the basis of these differences alone. Furthermore, the authors have no data which support the opinion of READ (1957). Although the above description is based only on male worms, the present species is classified as *Citellina petrovi* SCHULZ, 1930. This is the first recorded in Japan.

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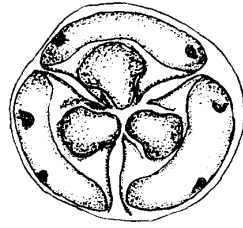
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EXPLANATION OF PLATE

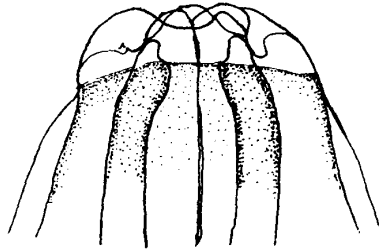
- Fig. 1 Anterior extremity, lateral view
- Fig. 2 Head, end-on view
- Fig. 3 Anterior extremity, lateral view
- Fig. 4 Posterior extremity, lateral view
- Fig. 5 Posterior extremity, ventral view
- Fig. 6 Pericloacal region, ventral view
- Fig. 7 Various size of cuticular expansion at anterior extremity
- Fig. 8 Lateral flange, lateral view



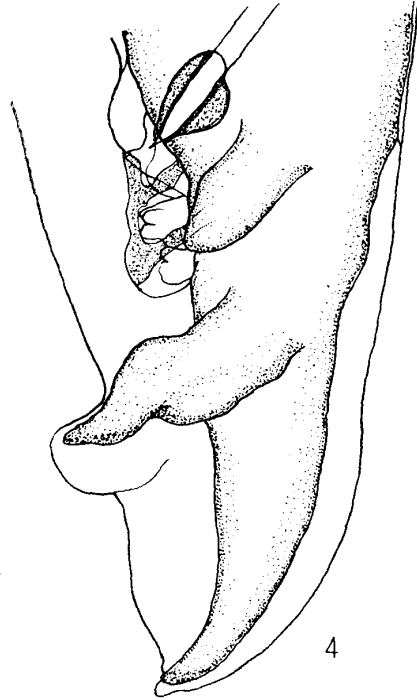
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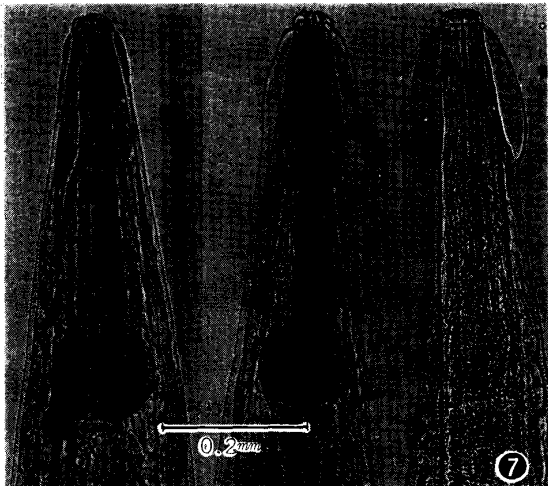
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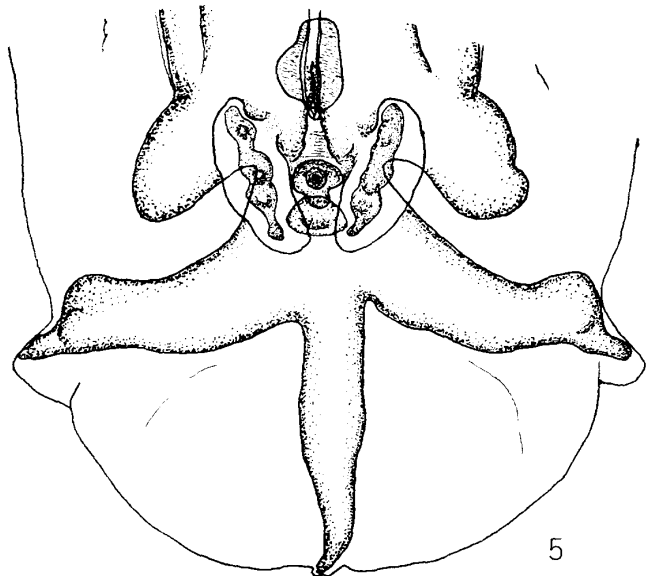
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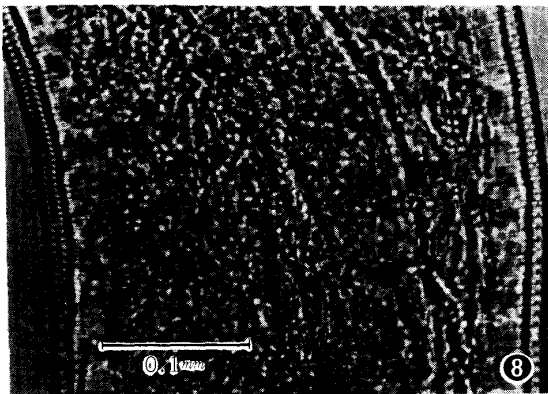
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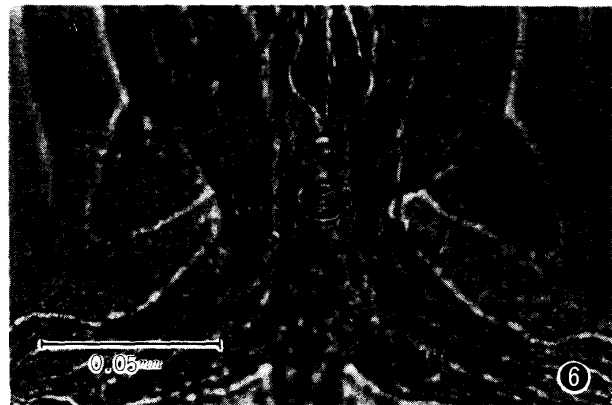
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5



8



6

0.05mm : 2, 3
0.1mm : 4, 5
0.4mm : 1