寄生虫学　原　著

Parasitic Helminths from Himalayan Field Mice, *Apodemus gurkha* and Sikkim Vole, *Microtus sikimensis*, in the Himalayas, Nepal

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(1997.7.4 received, 1997.7.24 accepted)

ネパール・ヒマラヤ地方で採集されたヒマラヤアカネズミ *Apodemus gurkha* およびシッキムハタネズミ *Microtus sikimensis* の内部寄生虫相の検討

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ABSTRACT. Although there are many reports on parasitic helminths obtained from the rodents belonging to the Muridae, there has been no report on *Apodemus gurkha* and *Microtus sikimensis*. Accordingly, 14 individuals of *A. gurkha* and 9 individuals of *M. sikimensis* collected from Myagdi district of the Himalayas, Nepal, in November of 1994 and March of 1996 were examined parasitologically. *Heligmosomoides neopolygyrus*, *Heligmonoides* sp., *Syphacia agraria*, *Heterakis spumosa*, *Rictularia cristata* and *Catenotaenia* sp. were obtained from *A. gurkha*, and *Carolinensis minutus*, *Syphacia montana*, *Aonchotheca murissylvatici*, *Trichuris* sp., Anoplocephalidae gen. sp. and a metacestode of Taeniidae gen. sp. were obtained from *Microtus sikimensis*. These species, excluding *Heligmonoides* sp. which seems to be host specific to *A. gurkha* and belongs to a new species, are the common species from the genera *Apodemus* or *Microtus* in the Eurasian Continent.

Key words : *Apodemus gurkha*, *Microtus sikimensis*, Nepal, parasitic nematodes

Jpn. J. Zoo Wildl. Med. *2(2): 81-85, 1997*

INTRODUCTION

As part of a zoogeographical research project, we have studied the parasitic nematode fauna of Microtinae and Murinae (Mammalia: Rodentia: Muridae) in the Holarctic region and the zoogeographical character of Japanese parasitic nematodes [1]. In the present paper, we report the results of a parasitic helminth survey of Himalayan field mice, *Apodemus gurkha*, and Sikkim voles, *Microtus sikimensis*, collected in the Himalayas in Nepal. Although there are many reports dealing with the parasitic helminths obtained from the genera *Apodemus* and *Microtus* [2,3], there has been no report on *A. gurkha* or *M. sikimensis*.

MATERIALS AND METHODS

In November of 1994 and March of 1996, 14 individuals of *Apodemus gurkha* and 9 individuals of *Microtus sikimensis* were collected at Ghorepani (28°25'N, 83°40'E; altitude ca.2,800 m), Myagdi district, Dhaulagiri state, Nepal, and all individuals of the murids were examined parasitologically. The parasitic nematodes were fixed and preserved in 10 % formalin solution and cestodes were preserved in 70 % ethanol, and all of the specimens were examined microscopically in lacto-phenol solution. Some heligmosomid and heligmonellid nematodes were sectioned with a razor for observation of the synlophe [4]. Measuring and drawing of these nematodes were done with the aid of a camera lucida, OLYMPUS Model BH 2-DA. These specimens has been deposited in the Faculty of Veterinary Medicine, Rakuno Gakuen University, Hokkaido, Japan.

RESULTS AND DISCUSSION

Apodemus gurkha

Five nematode species, namely *Heligmosomoides neopolygyrus* Asakawa *et* Ohbayasi, 1986 (Heligmosomidae: Strongylida, Fig.1), *Heligmonoides* sp. (Heligmonellidae: Strongylida, Figs.2~4), *Syphacia agraria* Sharpilo, 1973 (Oxyuridae: Oxyurida, Fig.5), *Heterakis spumosa* Schneider, 1866 (Heterakidae: Ascaridida) and *Rictularia cristata* Froelich, 1802 (Rictulariidae: Spirurida, Fig.6), and a cestode species, *Catenotaenia* sp. (Catenotaeniidae: Cyclophyllidea, Fig.10) were obtained from *Apodemus gurkha*. The sites and occurrence of these helminths are shown in Table 1. Among the nematode species, thought to be the anonymous taxon belonging to the genus *Heligmonoides* is host-specific to *A. gurkha* and should belong to a new species because of the number of ridges of the synlophe (13~14 in males, Fig.2) and the morphological characteristics of the bursa [5,6] (Figs.3 and 4). A taxonomical report including precise description of the present *Heligmonoides* will be given elsewhere. Furthermore, several individuals of immature nematodes, *Syphacia* sp., were obtained from 1 individual of *A. gurkha*, but this nematode seems to be *S. agraria*.

There are 14 species in the genus *Apodemus* throughout the Eurasian Continent, North Africa, and many islands including Japan and Formosa [7,8]. Although, there are reports on the parasitic nematodes obtained from *Apodemus sylvaticus*, *A. flavicollis*, *A. agrarius*, *A. microps*, *A. peninsulae*, *A. mystacinus*, *A. speciosus*, and *A. argenteus* [2], this is the first report on parasitic helminths from *A. gurkha*. However, the nematodes, excluding *Heligmonoides* sp. from *A. gurkha*, are common to those of other species belonging to the genus *Apodemus* [2].

Figs.1~6. Parasitic nematodes from *Apodemus gurkha* in Himalayas.
Fig.1. Posterior extremity of male of *Heligmosomoides neopolygyrus*.
Figs.2~4. Male of *Heligmonoides* sp..
Fig. 2. Cross-section of mid-body. D, dorsal; V, ventral; L, left; R, right.
Figs. 3 and 4. Posterior extremity, ventral view.
Fig. 5. Male of *Syphacia agraria*, right lateral view.
Fig. 6. Male of *Rictularia cristata*, left lateral view.
Figs. 7 and 8. Parasitic nematodes from *Microtus sikimensis* in Himalayas.
Fig. 7. Posterior extremity of male of *Aonchotheca murissylvatici*, ventral view.
Fig. 8. Male of *Syphacia montana*, lateral lateral view.
Figs. 9 and 10. Cestodes in Himalayas.
Fig. 9. Anoplocephalidae gen.sp. from *Microtus sikimensis*.
Fig. 10. Catenotaenia sp. from *Apodemus gurkha*.

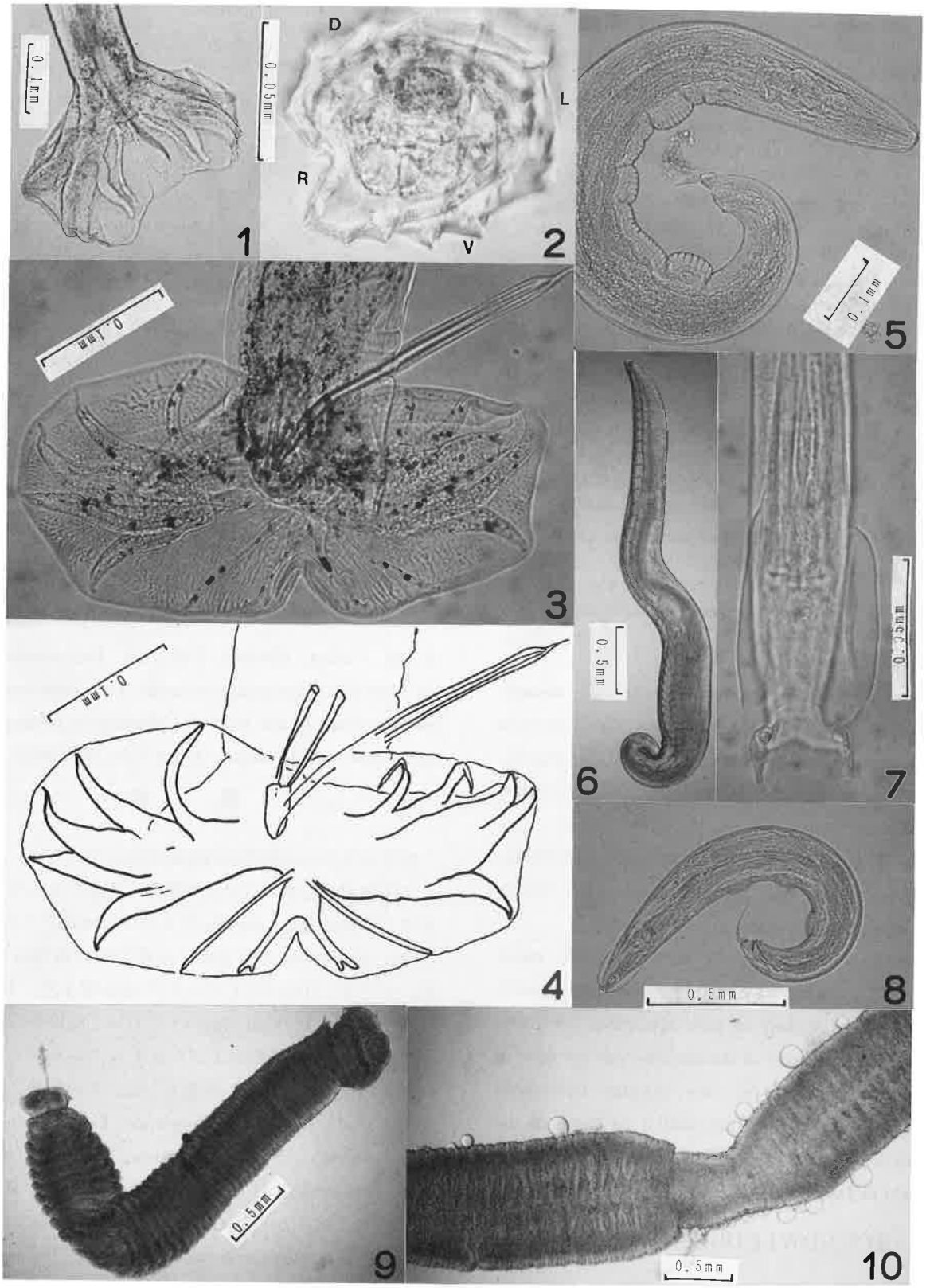
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Table 1 Site and occurrence of parasitic helminths from *Apodemus gurkha* and *Microtus sikimensis* in Himalayas

Parasitic Helminths	Site	Occurrence	
		Ag(14)	Ms(9)
Nematoda			
Heligmosomoides neopolygyrus	s.i.	10	0
Heligmonoides sp.	s.i.	14	0
Carolinensis minutus	s.i.	0	9
Syphacia agraria	l.i.	1	0
S. montana	l.i.	0	7
S. sp. (immature)	l.i.	1	0
Heterakis spumosa	l.i.	2	0
Rictularia cristata	s.i.	1	0
Aonchotheca murissylvatici	sto.	0	6
Trichuris sp.	l.i.	0	1
Cestoda			
Catenotaenia sp.	s.i.	7	0
Anoplocephalidae gen. sp.	s.i.	0	1
Taeniidae gen. sp. (metacestodes)	liv.	0	1

Abbreviations of site and host names.
s.i. : small intestine, l.i. : large intestine, sto. : stomach, liv. : liver, Ap : *Apodemus gurkha*, Ms : *Microtus sikimensis*.
Parenthese indicating no. of rodents examined.

Microtus sikimensis

Four nematode species, namely *Carolinensis minutus* (Dujardin, 1845) (Heligmonellidae: Strongylida), *Syphacia montana* Yamaguti, 1943 (Oxyuridae: Oxyurida, Fig.8), *Aonchotheca murissylvatici* (Diesing, 1851) (Capillariidae: Enoplida, Fig. 7) and *Trichuris* sp. (Trichuridae : Enoplida), and Anoplocephalidae gen. sp. (Cyclophyllidea, Fig. 9), and a metacestode of Taeniidae gen. sp. (Cyclophyllidea) were obtained from *M. sikimensis*.

The present *Trichuris* sp. is similar to *T. muris* (Schrank, 1788), although we could not identify it specifically because of the absence of male specimens. Furthermore, precise classification of the cestodes was not done in the present paper, however, the present nematodes obtained from *M. sikimensis* are similar to those of the other species belonging to the genus *Microtus* in the Eurasian Continent and in Japan [3].

ACKNOWLEDGEMENTS

We hereby wish to acknowledge our indebtedness to Mr. A. M. Vaidya, Pension SAKURA, Kathmandu, Nepal, for kind help in collecting materials. This work was supported by a grant-in-aid from the Ministry of Education, Science, Sports and Culture, Japan (No. 09839037).

要　　約

野生のネズミ科動物の内部寄生虫については，比較的多くの報告があるが，ヒマラヤ地方に生息するヒマラヤアカネズミ *Apodemus gurkha* およびシッキムハタネズミ *Microtus sikimensis* を宿主とする寄生虫の報告は皆無である。そこで，1994年11月および1996年3月，ネパール・ヒマラヤ地方 Myagdi district において採集されたヒマラヤアカネズミ14個体およびシッキムマツネズミ9個体について内部寄生蠕虫類の検査をした。その結果，ヒマラヤアカネズミからは *Heligmosomoides neopolygyrus*, *Heligmonoides* sp., *Syphacia agraria*, *Heterakis spumosa*, *Rictularia cristata* および *Catenotaenia* sp. が，また，シッキムハタネズミからは *Carolinensis minutus*, *Syphacia montana*, *Aonchotheca murissylvatici*, *Trichuris* sp., Anoplocephalidae gen. sp. および Taeniidae gen. sp.

(嚢尾虫)が検出された。今回検出された寄生虫のうち，*Heligmonoides* sp.についてはヒマラヤアカネズミに宿主特異的な新種である可能性が高いが，他の種はユーラシア大陸の他地域に産するアカネズミ属あるいはハタネズミ属の寄生虫と共通であることが判明した。

キーワード：*Apodemus gurkha*, *Microtus sikimensis*, ネパール，寄生線虫類

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