

Parasitic Helminth Survey of *Apodemus argenteus* (Muridae: Rodentia) collected on Awashima Island, Niigata Pref., Japan

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Abstract. The parasitic helminth survey on *Apodemus argenteus* collected on Awashima Island, Niigata Pref., in Japan was carried out because there is no investigation on the occurrence and distribution of the island. Total number of the wood mice examined is 81 individuals collected from Dec. 1980 to Jun. 1998. Only 3 nematode species, viz., *Heligmosomoides kurilensis*, *Syphacia emileromani*, and *Heterakis spumosa*, were obtained, but a parasitic platyhelminth was not obtained in this survey. Furthermore, it is notable that neither *Heligmonoides speciosus* (Fam. Heligmonellidae) nor *Heligmosomoides desportesii* (Fam. Heligmosomidae) was obtained from Awashima I. although both nematode species are host specific to *A. argenteus*.

Key words: *Apodemus argenteus*, Awashima Island, parasitic nematodes, Japan.

Introduction

As a part of a zoogeographical research project of the parasitic helminth fauna of the Japanese endemic rodents obtained from the offshore islands of the Japan Sea (Asakawa, 1995; Asakawa and Yoshiyuki, 1992; Asakawa *et al.*, 1991, 1992a-c, 1994), an analysis was made on the Japanese wood mice, *Apodemus argenteus* (Temminck) (Murinae: Muridae: Rodentia), collected on Awashima Island, Niigata Pref., in Japan because there is no investigation on the occurrence and distribution of its helminth on the island.

Materials and Methods

Total number of the wood mice, *Apodemus argenteus*, examined is 81 individuals and its collection date and localities were shown below from 1) to 3). 1) Host animals collected on the date on Dec.

1980 are 46 individuals from 7 points of the marks "★" shown in Fig. 1. 2) Host animals collected on the date on Oct. 1988 and Nov., 1994 are 26 individuals from 2 points of the marks "●" shown in Fig. 1. 3) Host animals collected on the date on Sep. 1997 and Jun. 1998 are 9 individuals from 2 points of the marks "*" shown in Fig. 1

The mice obtained from 1980 to 1994 were collected by Drs Yasushi Takada, Takeo Miyao, Hajime Hanamura, Kazuhiro Koyasu, Eiichi Sakai, and Yasushi Uematsu, the Second Department of Anatomy, School of Dentistry, Aichi-Gakuin University, Chikusa-ku, Nagoya 464-8650, Japan (cf. Miyao *et al.*, 1982), and ones obtained from 1997 to 1998 were collected by K. Sakata, one of the present authors. The whole bodies of the mice have been kept in 10% formalin solution with a specimen label. The examination of the materials for the internal parasites was performed with the whole bodies including its muscles, lungs, and all viscera.

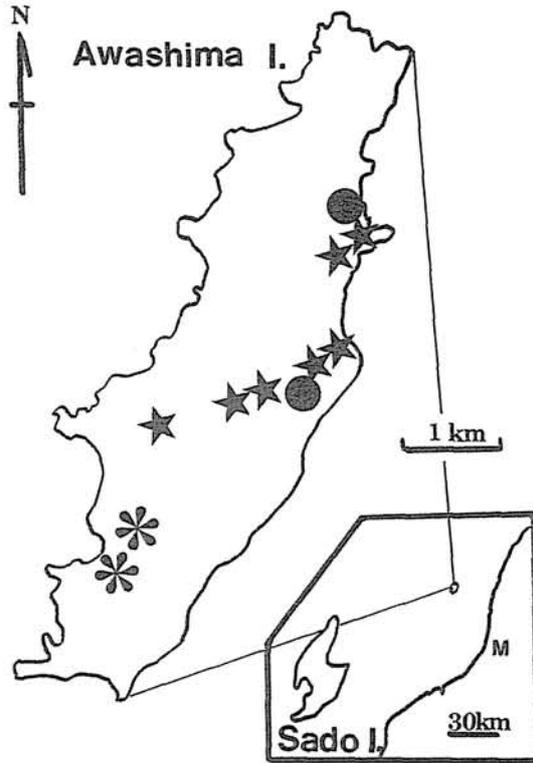


Fig. 1. Map showing collecting points of *Apodemus argenteus* on Awashima I., Japan. ★, ● and *: collecting points in 1980, in 1988 and 1994, and in 1997 and 1998, respectively. M: Comparative materials collected in Senami-Onsen, Murakami-shi, Niigata Pref., in Dec. 1980, by Drs Takada and his colleagues.

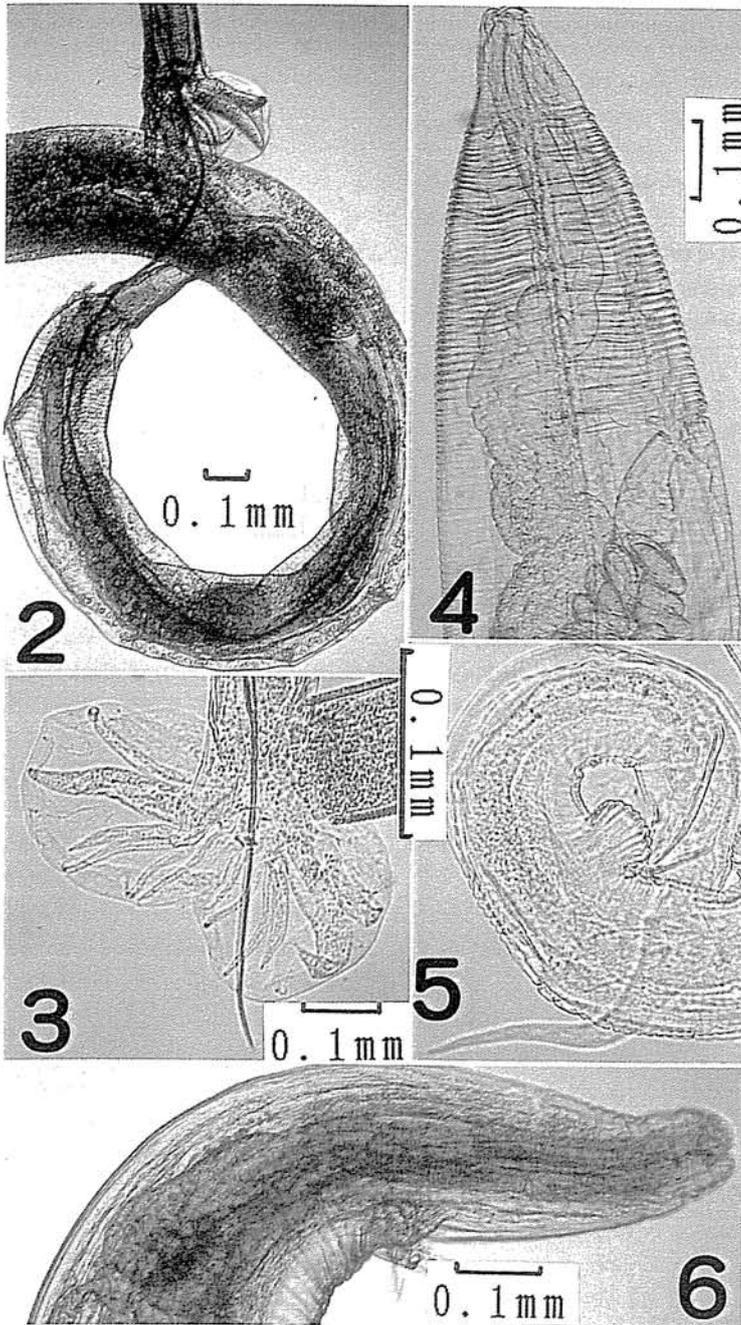
Furthermore, the eyes were investigated for the 3rd larva of the rhabditid nematodes.

After naked eye examination, the helminths were collected under a dissecting microscope. Nematodes were fixed and preserved in 10% formalin solution or 70% ethanol, and examined microscopically with lacto-phenol solution. Measuring and drawing of the nematodes were done with the aid of a camera lucida, OLYMPUS Model BH2-DA.

These helminth specimens are deposited in the Department of Parasitology, School of Veterinary Medicine, Rakuno Gakuen University, Hokkaido, Japan.

Results and Discussion

Following nematode species, viz., *Heligmosomoides kurilensis* (Nadtochi, 1966) [Fam. Heligmosomidae; Site: small intestine], *Syphacia emileromani* Chabaud *et al.*, 1963 [Fam. Oxyuridae; small and large intestine], and *Heterakis spumosa* Schneider, 1866 [Fam. Heterakidae; large intestine], were obtained from 68 individuals of the wood mice examined although a parasitic plathyhelminth was not obtained in this survey. The occurrence of each nematode species is shown in Tab. 1. The positive identification of *Heligmosomoides* sp. obtained from 8 individuals of the mice examined (Tab. 1) was not



Figs 2-6. Parasitic nematodes of *Apodemus argenteus* on Awashima I., Japan. 2-3. *Heligmosomoides kurilensis*. (2. Posterior extremities of male and female, and its copulation, lateral view. 3. Copulatory bursa of male, ventral view.). 4-5. *Syphacia emileromani*. (4. Anterior extremity of female, right lateral view. 5. Posterior extremity of male, left lateral view.). 6. *Heterakis spumosa*, anterior extremity of female, right lateral view.

Table 1. Occurrence of parasitic nematodes of *Apodemus argenteus* on Awashima I.

	1980 ¹⁾	1988 & 1994 ²⁾	1997 & 1998 ³⁾	Total
	46 ⁴⁾	26	9	81
<i>Heligmosomoides kurilensis</i>	16	15	2	33
<i>H. sp.</i>	5	2	1	8
<i>Syphacia emileromani</i>	37	10	8	55
<i>Heterakis spumosa</i>	1	0	0	1
helminth free	7	5	1	13

1-3): Collecting points of each year are shown in Fig. 1.

4): Total number of wood mice examined.

possible because of the absence of male nematodes from the host.

Four resident mammalian species including *A. argenteus* occur on Awashima I. although the area of this island is very small in size (9.5 km²), but the parasitic helminth fauna of the mammals had not been investigated until the present study. Hence, this is the first report of *H. kurilensis*, *S. emileromani*, and *Het. spumosa* of Awashima I., although parasitic helminths of the *A. argenteus* occurring on Sado I. and Tsushima I. of Japan Sea (Asakawa *et al.*, 1991, 1992c).

The nematode species, *Heligmonoides speciosus* (Konno, 1958) [Fam. Heligmonellidae] and *S. emileromani* are endemic to *Apodemus* spp. in Japan (Asakawa, 1995; Hasegawa and Asakawa, 1991).

For example, the occurrences of *Heligmon. speciosus* and *S. emileromani* are 5 and 5 in Mar. 1991 (N=5) (total number of the wood mice, *Apodemus argenteus*, examined), and 11 and 6 from Nov. 1995 to Oct. 1996 (N=17) on Sado I., respectively (Asakawa *et al.*, 1992c; Sakata and Asakawa, unpubl.). Furthermore, the occurrences of *Heligmon. speciosus* and *S. emileromani* are 9 and 7 in Dec. 1980 (N=11) in Murakami-shi, Niigata Pref. (the mark "M" shown in Fig. 1; Sakata and Asakawa, unpubl.).

In this survey, it is confirmed that *S. emileromani* is also common to *A. argenteus* on Awashima I. On the other hand, *Heligmon. speciosus* has not been

obtained from Awashima I.

Heligmosomoides desportesi (Chabaud *et al.*, 1963) [Fam. Heligmosomidae] is host specific to *A. argenteus*.

For example, the occurrence of *H. desportesi* is 70 from central part of Honshu of Japan (N=189) (Asakawa *et al.*, 1993). Nevertheless, *H. desportesi* was not found from Awashima I. in this survey, but another species belonging to the genus *Heligmosomoides*, *H. kurilensis*, was obtained (Table 1).

Mentioned above, it is remarkable that neither *Heligmon. speciosus* nor *H. desportesi* was obtained on Awashima I. More precise investigation of the geographical distribution of these nematodes on offshore islands of the Japan Sea should be carried out in future.

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