

New Records of Parasitic Nematodes from Five Species of the Order Anseriformes in Hokkaido, Japan

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(2000.10.19 received, 2001.3.19 accepted)

北海道に飛来した5種のカモ類に認められた寄生線虫

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ABSTRACT. Seven species of the order Anseriformes (*Mergus merganser*, *Melanitta nigra*, *Anas platyrhynchos*, *A. crecca*, *Aix galericulata*, *Cygnus bewickii*, and *C. cygnus*), collected in Hokkaido, Japan, were examined helminthologically in order to obtain parasitic nematodes. A total of five nematode species was obtained. These were: *Pseudocapillaria mergi* (from *A. crecca* and *C. cygnus*), *Contraecaecum* sp. (from *M. merganser*), *Amidostomum anseris* (from *A. platyrhynchos*, *C. bewickii* and *C. cygnus*), *Tetrameres fisispina* (from *A. platyrhynchos*), and *Physaloptera* sp. (from *A. crecca*). The records of both *P. mergi* and *A. anseris* were the first from Japan, while the records of *T. fisispina* and *Physaloptera* sp. involved new hosts. Among these five nematodes, *A. anseris* seems to be one of the most common occurring among the Anatidae of Hokkaido.

Key Words: Anseriformes, *Pseudocapillaria mergi*, *Amidostomum anseris*, *Tetrameres fisispina*, first record, Japan

Jpn. J. Zoo Wildl. Med. 6(1) : 27-33, 2001

INTRODUCTION

Although the trematodes and cestodes hosted by species in the order Anseriformes (Aves) (including domestic ducks) in Japan have been widely reported, the parasitic nematode fauna of the Anseriformes in this region is not well-known. Previously, seven nematode genera have been reported: *Capillaria*, *Eustrongylides*, *Contraecaecum*, *Ascaridia*, *Heterakis*, *Echinuria*, and *Sarconema* [1-4] from Japan,

although all of them have been did from the islands of Kyushu and Honshu. There have been no previous reports of such parasitic nematodes from Hokkaido, despite this northern part of the Japanese Archipelago being on the EastAsian flyway used by many species of migratory waterfowl. In order to address this gap in our knowledge, the present authors examined several waterfowl species in Hokkaido helminthologically to obtain parasitic nematodes.

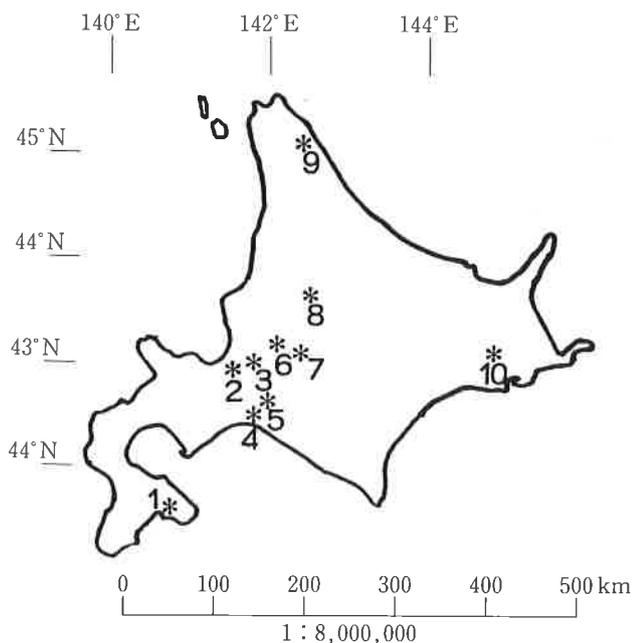


Fig. 1. Map showing localities where bird specimens were collected.

1: Hakodate, 2: Sapporo, 3: Ebetsu, 4: Tomakomai, 5: Chitose, 6: Bibai, 7: Mikasa, 8: Asahikawa, 9: Hamatonbetsu, 10: Shibeche.

A total of 30 birds of seven waterfowl species were collected from various localities (Table 1 and Fig. 1) in Hokkaido, Japan, from 1995 to 1998; all

birds were brought to the laboratory for necropsy.

The gastric tracts (stomachs, small and large intestines, and other viscera) of all thirty birds were examined parasitologically. The parasitic nematodes recovered were stored in either 70 % ethanol or 10 % formalin solution and examined microscopically in a lacto-phenol solution. Some trichostrongylids were sectioned with a razor for observation of the synlophe. These nematodes were measured and illustrated with the aid of a camera lucida. The specimens have been deposited in the Faculty of Veterinary Medicine, Rakuno Gakuen University, Hokkaido, Japan, and in the Meguro Parasitological Museum, Tokyo, Japan.

Five nematode species were obtained from nine of the above 30 birds examined during this investigation (Table 1): *Pseudocapillaria mergi* (Madsen 1945) (Capillaridae; from the small intestines of *A. crecca* and *C. cygnus*) (Figs. 2); *Contraecaecum* sp. cf. Yamaguti 1941 (Anisakidae; from the stomach of *M. merganser*) (Figs. 3); *Amidostomum anseris* (Zeder 1800) (Amidostomatidae; from the stomachs of *A. platyrhynchos*, *C. bewickii* and *C. cygnus*) (Figs. 4 and 5-1 to 5-3); *Tetrameres fissispina* (Diesing 1861) (Tetrameridae; from the stomach of *A. platyrhynchos*) (Figs. 5-4 and 5-5, and 6-1 to 6-3);

Table 1. Occurrence of parasitic nematodes from waterfowl in Hokkaido, Japan.

Localities*	1	2	3	4	5	6	7	8	9	10
Hosts**	Cc	MnAp	MmApAcAg	ApCc	Cc	CbCc	Cb	Ag	Cb	ApAc
No. of birds exam.	1	11	1111	13	1	34	1	1	1	26
<i>Pseudocapillaria mergi</i>	0	00	0000	00	0	10	0	0	0	01
<i>Contraecaecum</i> sp.	0	00	1000	00	0	10	0	0	0	00
<i>Amidostomum anseris</i>	0	01	0100	01	0	10	1	0	0	00
<i>Tetrameres fissispina</i>	0	01	0100	00	0	00	0	0	0	00
<i>Physaloptera</i> sp.	0	00	0000	00	0	00	0	0	0	01
Nematode free	1	10	0011	12	1	04	0	1	1	24

*Abbreviations of localities. 1: Hakodate, 2: Sapporo, 3: Ebetsu, 4: Tomakomai, 5: Chitose, 6: Bibai, 7: Mikasa, 8: Asahikawa, 9: Hamatonbetsu, 10: Shibeche.

**Abbreviations of bird species examined. Mm=*Mergus merganser*, Mn=*Melanitta nigra*, Ap=*Anas platyrhynchos*, Ac=*A. crecca*, Ag=*Aix galericulata*, Cb=*Cygnus bewickii*, and Cc=*C. cygnus*.

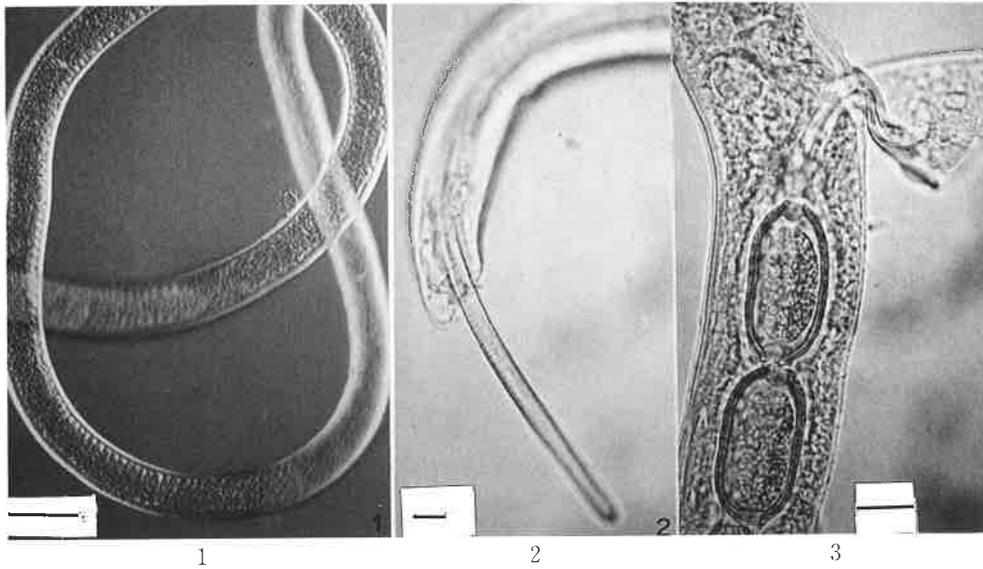


Fig. 2. *Pseudocapillaria mergi* (Madsen 1945)

- 1 : Stichocytes (Bar=0.05 mm),
- 2 : Posterior extremity of male (Bar=0.01 mm), right-lateral view,
- 3 : Vulva of female, right-lateral view (Bar=0.01 mm)

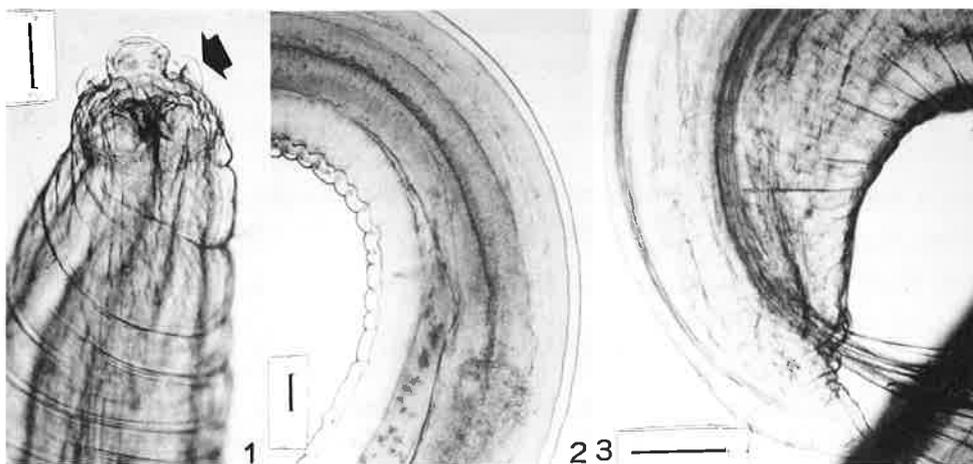


Fig. 3. *Contracaecum* sp. cf. Yamaguti 1941

- 1 : Anterior extremity with interlabia (arrow) (Bar=0.1 mm),
- 2 : Base of oesophagus with oblong posterior ventriculus and intestinal caecum (Bar=0.1 mm)
- 3 : Posterior extremity of male, right-lateral view (Bar=0.1 mm).

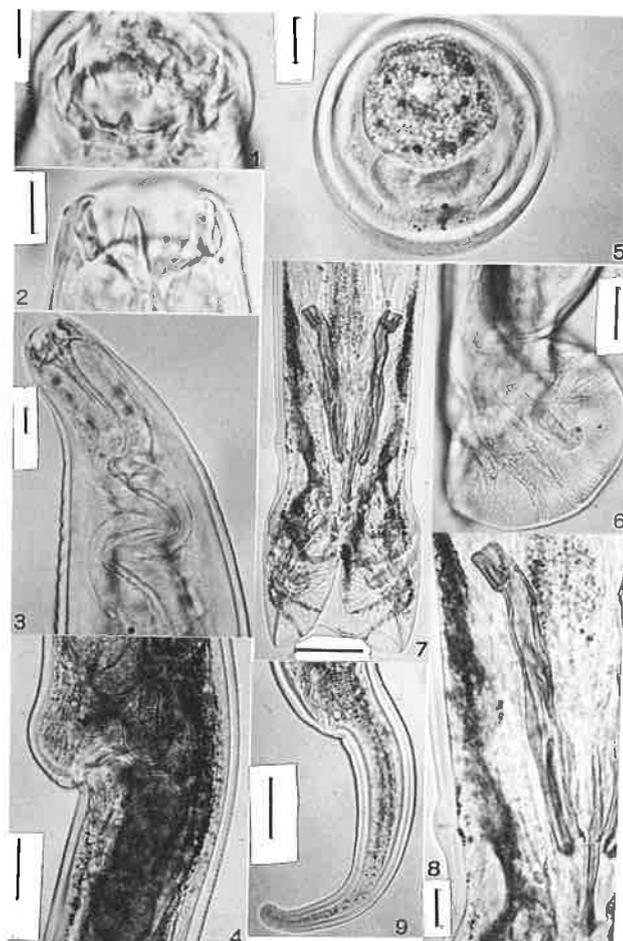


Fig. 4. *Amidostomum anseris* (Zeder 1800)

- 1: Apical view of buccal portion (Bar=0.01 mm)
- 2: Lateral view of buccal portion (Bar=0.01 mm)
- 3: Anterior extremity, lateral view (Bar=0.01 mm)
- 4: Vulva of female, left-lateral view (Bar=0.1 mm)
- 5: Cross-section of mid-body without cuticular ridge (Bar=0.02 mm)
- 6: Posterior extremity of male, right-lateral view (Bar=0.05 mm)
- 7: Posterior extremity of male, ventral view (Bar=0.05 mm)
- 8: Spicule and gubernaculum (Bar=0.01 mm)
- 9: Posterior extremity of female, left-lateral view (Bar=0.05 mm).

and *Physaloptera* sp. (Family Physalopteridae; from the stomach of *A. crecca*) (Figs. 5-6 to 5-8 and 6-4 to 6-6).

Although three capillarid species have previously been reported from Anatidae from Honshu (*Capillar-*

ia anatis, *C. nyrocinarum*, and *Eucoleus contortus* [1,2]), the present record of the genus *Pseudocapillaria* is obtained from the Anatidae in Japan. One of the remarkable morphological characters of the genus *Pseudocapillaria* is its non-spiny spicular

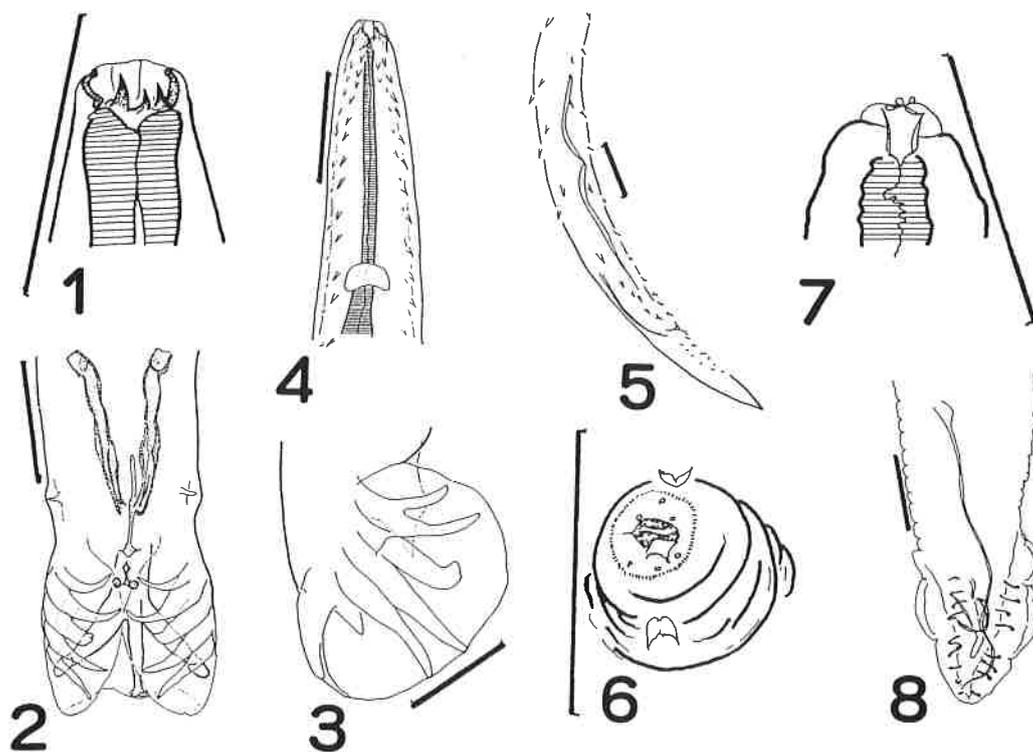


Fig. 5. *Amidostomum anseris* (Zeder 1800) (5-1 to 3), *Tetrameres fissispina* (Diesing 1861) (5-4 and 5), *Physaloptera* sp. 5-6 to 5-8).
5-1, 4, 6 and 7 Anterior extremity of male 5-2, 3, 5 and 8 Posterior extremity of male (Bar=0.1 mm).

sheath (Fig. 2-2), which is in contrast to the spiny spicular sheath found in the genera *Capillaria* and *Eucoleus* [5]. Although Moravec [5] insisted that the vulvar appendage is absent in the genus *Pseudocapillaria*, it is in fact present (see Skrjabin et al. [6]), and was observed in the present specimens (Fig. 2-3).

Yamaguti [7] reported *Contraecaecum* sp. (possibly referable to *C. turkestanicum*) as having been obtained from *Mergus merganser merganser* collected in Gifu Prefecture. The present nematode is likely to be the Yamaguti's anonym species because of the accordance of both the host species and the general measurements (male: Body 15-34×0.45-1.0 mm,

headshort, 0.125-0.21 mm diameter; lips 60-110 μ long, each with a plump medial and two small anteromedial lobes; interlabia arched inwards, 42-100 μ long, containing slender pulp. Nerve ring and cervical papillae 0.38-0.63 mm and 0.42-0.65 mm respectively from head end. Esophagus 2-4×0.15-0.25 mm, ventriculus 0.15-0.2×0.13-0.2 mm, ventricular appendix 0.5-1.1 mm long; intestinal caecum 1.5-2.9 mm long. Tail conical, 0.13-0.25 mm long. Spicules equal, alate, 3.4-5.8 mm long. Preanal papillae in 28-34 pairs, first pair 3.0-7.1 mm from cloacal aperture).

Species in the genus *Amidostomum* are the most common parasites found in aquatic birds of the

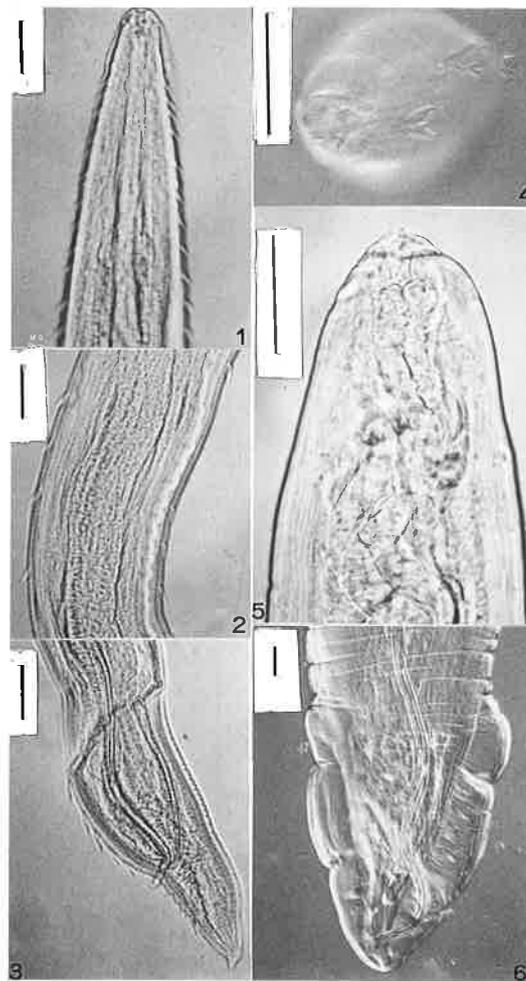


Fig. 6. *Tetrameres fissispina* (Diesing 1861) (6-1 to 3), and *Physaloptera* sp. (6-4 to 6).

6-1, 4 and 5 Anterior extremity of male, lateral view (Bar=0.05 mm).

6-2 Mid-body (Bar=0.05 mm)

6-3 and 6 Posterior extremity of male (Bars=0.05 mm and 0.01 mm, respectively)

Palearctic Region. Three species of thisgenous commonly parasitize the order Anseriformes, *A. anseris*, *A. orientale*, and *A. aculum* [8]. Specimens obtained during the present study were identified as *A. anseris* because on the basis that the buccal capsule had three teeth (Fig. 5-1: cf. the buccal capsules of the other species with just one tooth). Although this is actually the first record of the genus

Amidostomum from Japan, it is evident that *A. anseris* is one of the most common nematode parasites among the Anatidae visiting Hokkaido because it was found from three waterfowl species at five localities.

The records of *Tetrameres fissispina* and *Physaloptera* sp. were both firsts from Anatidae in Japan, although they have previously been obtained

from the other avian groups in Japan [4].

要 約

カモ目の寄生線虫相を明らかにする目的で、北海道内の野生から採集されたカワアイサ *Mergus merganser*, クマガモ *Melanitta nigra*, マガモ *Anas platyrhynchos*, コガモ *A. crecca*, オシドリ *Aix galericulata*, コハクチョウ *Cygnus bewickii* およびオオハクチョウ *C. cygnus* の消化管を検索した。その結果, *Pseudocapillaria mergi* (宿主: コガモ, オオハクチョウ), *Contracaecum* sp. (宿主: カワアイサ), *Amidostomum anseris* (宿主: マガモ, コハクチョウ, オオハクチョウ), *Tetrameres fissispina* (宿主: マガモ) および *Physaloptera* sp. (宿主: コガモ) の5種の線虫が検出された。*P. mergi* と *A. anseris* は日本初記録, *T. fissispina* と *Physaloptera* sp. はそれぞれの宿主種で初めての記載であった。また, 道内で広範に分布すること, および宿主域が広いことから, *A. anseris* はカモ目に普通の寄生虫であることが示唆された。

キーワード: カモ目, *Pseudocapillaria mergi*, *Amidostomum anseris*, *Tetrameres fissispina*, 国内初記録

ACKNOWLEDGEMENTS

We wish to thank Prof. S. Nogami, Nihon University, for sharing his data on the parasites of waterfowl with us, and Dr. M. Sasagawa DVM and the Utonai Nature Centre, for their donations

of some of the materials studied. We are also grateful to Dr. H. Taniyama, Dr. T. Nakade, and many students of Rakuno Gakuen University, for support during the necropsy of the materials. Finally thanks to Dr. M. Brazil, Rakuno Gakuen University, for correcting our report.

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