

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Faculty Publications from the Harold W. Manter
Laboratory of Parasitology

Parasitology, Harold W. Manter Laboratory of

7-1-2006

Research Note: First Record of *Ancylostoma malayanum* (Alessandrini, 1905) from Brown Bears (*Ursus arctos* L.)

Mitsuhiko Asakawa

Rakuno Gakuen University, askam@rakuno.ac.jp

Scott Lyell Gardner

University of Nebraska - Lincoln, slg@unl.edu

Tsutomu Mano

Hokkaido Institute of Environmental Science, mano@hokkaido-ies.go.jp

Follow this and additional works at: <http://digitalcommons.unl.edu/parasitologyfacpubs>



Part of the [Parasitology Commons](#)

Asakawa, Mitsuhiko; Gardner, Scott Lyell; and Mano, Tsutomu, "Research Note: First Record of *Ancylostoma malayanum* (Alessandrini, 1905) from Brown Bears (*Ursus arctos* L.)" (2006). *Faculty Publications from the Harold W. Manter Laboratory of Parasitology*. 7.

<http://digitalcommons.unl.edu/parasitologyfacpubs/7>

This Article is brought to you for free and open access by the Parasitology, Harold W. Manter Laboratory of at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Faculty Publications from the Harold W. Manter Laboratory of Parasitology by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

Research Note

First Record of *Ancylostoma malayanum* (Alessandrini, 1905) from Brown Bears (*Ursus arctos* L.)

MITSUHIKO ASAKAWA,¹ TSUTOMU MANO,² AND SCOTT LYELL GARDNER^{3,4}

¹ Department of Pathobiology, School of Veterinary Medicine, Rakuno Gakuen University, Ebetsu-shi, Hokkaido 069-8501, Japan,

² Hokkaido Institute of Environmental Science, Hokkaido 069-8501, Japan, and

³ Harold W. Manter Laboratory of Parasitology, W-529 Nebraska Hall, University of Nebraska State Museum, University of Nebraska – Lincoln, Lincoln, Nebraska 68588-0514, U.S.A. (e-mail: slg@unl.edu)

ABSTRACT: This is the first report of *Ancylostoma malayanum* (Alessandrini, 1905), subgenus *Ceylancylostoma* (Lichtenfels, 1980) from wild brown bears *Ursus arctos* L. The bears were collected by shooting in Wassamu-Cho province (44°05' N, 142°29' E), Hokkaido, Japan, November, 2003.

KEY WORDS: Nematodes, Ancylostomidae, *Ancylostoma malayanum*, *Ursus arctos*, Brown Bear, Hokkaido, Japan.

Nematodes of the family Ancylostomidae Nicoll, 1927 are common intestinal parasites of mammals including members of the family Ursidae. However nematodes of the genus *Ancylostoma* (Dubini, 1843) have not been previously reported from *Ursus arctos* L. which occurs throughout the Holarctic region, although the numerical density of some local populations of this species have declined substantially due to anthropogenically mediated habitat loss and local extirpation, especially during the last two centuries.

Herein, we report the first record of infection with *Ancylostoma* sp. from the brown bear. During an emergency operation by local governmental officials in November, 2003, two male brown bears were killed by shooting in Wassamu-cho Province (44°05' N, 142°29' E), on the north part of the island of Hokkaido, Japan. After collection, the entire gastro-intestinal tract was removed from both animals and frozen at –20° C prior to necropsy. The frozen intestines were subsequently examined by personnel at the Wild Animal Medical Center in Rakuno Gakuen University. Nematodes found in the anterior part of the small intestines (duodenum) from each bear were fixed and stored in 10% (v/v) formalin solution, cleared and mounted on a microscope slide in lactophenol, and examined with a compound microscope.

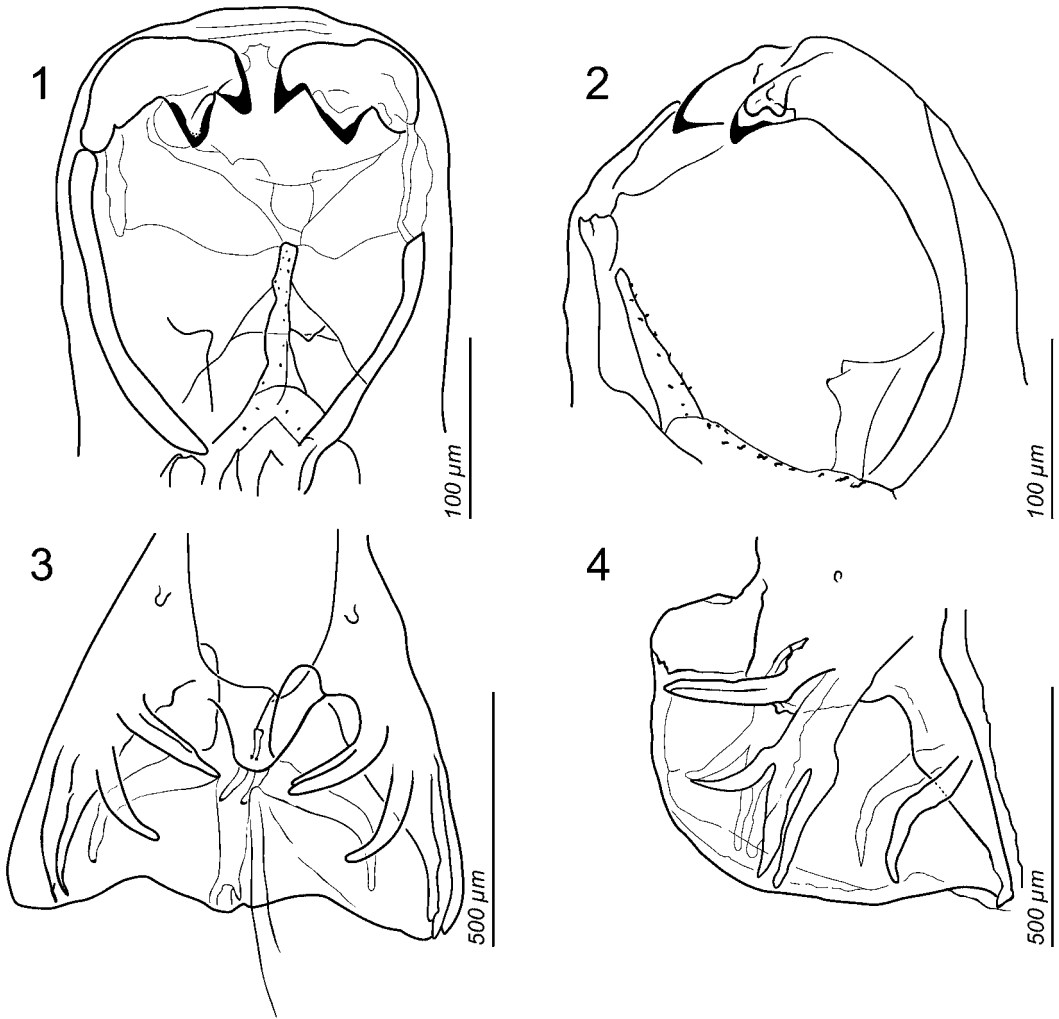
Morphological measurements and drawings of these nematodes were made with the aid of a camera lucida and calibrated ocular micrometer. Salient characters are shown in Figures 1–10, measurements are given in Table 1.

Brief Description. Anterior extremity of body bent dorsad. Oral opening armed with two well-developed pairs of ventrolateral teeth (Figs. 1, 5). Externolateral ray of bursa divergent from mediolateral and posterolateral rays which are parallel. Externodorsal ray originating from middle of dorsal ray. Using description by Lane (1916) and Biocca (1960), the present ancylostomid nematode was identified as *Ancylostoma malayanum* (Alessandrini, 1905) belonging to the subgenus *Ceylancylostoma* (Lichtenfels, 1980). Specimens have been deposited with the Wild Animal Medical Center, Rakuno Gakuen University, Hokkaido, Japan (RGU-AS3531-1 and RGU-AS3660-1) and Harold W. Manter Laboratory of Parasitology, U.S.A. (HWML48326 and HWML48327).

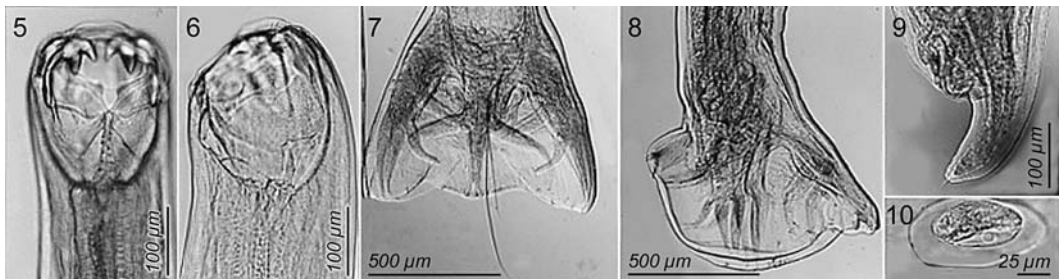
Ancylostoma malayanum has been recorded from *Ursus thibetanus* Cuvier, 1823 in India on the Eurasian Continent and from *Melursus ursinus* (Shaw, 1791) (see Skrjabin et al., 1952; Setasuban and Vajrasthira, 1975). In Japan, these nematodes had previously been recovered from a captive polar bear (*Ursus maritimus* (Phipps, 1774)) in a zoological garden on Honshu (Sugiyama et al., 2000). According to Yoshida (1977), *A. malayanum* has been shown, via experimental infection, to thrive in dogs and there is one human case of infection with this species. To our knowledge, this is the first record of *Ancylostoma malayanum* from *Ursus arctos*.

The present survey was supported in part by a Grant-in-Aid (No. 14560271) and High Technological Research Center (Rakuno Gakuen Univ.), Ministry of the Education, Science and Culture of Japan.

⁴ Corresponding author.



Figures 1–4. Male of *Ancylostoma malayanum* (Alessandrini, 1905) from *Ursus arctos* L. **1.** Anterior, stoma (dorsal view). **2.** Anterior, stoma (lateral view). **3.** Posterior extremity of bursa (ventral view). **4.** Posterior extremity of bursa (left lateral view).



Figures 5–10. *Ancylostoma malayanum* (Alessandrini, 1905) from *Ursus arctos* L. **5.** Anterior, stoma (dorsal view). **6.** Anterior, stoma (lateral view). **7.** Posterior extremity of bursa, male (ventral view). **8.** Posterior extremity of bursa, male (left lateral view). **9.** Posterior end of female (left lateral view). **10.** Egg.

Table 1. Measurements of *Ancylostoma malayanum* obtained from brown bears (*Ursa arctos*), Hokkaido, Japan.

Character	Mature male (N = 10)	L5 male (N = 1)	Female (N = 10)
Stoma length (μm)	210–240 (226 \pm 89)*	160	230–290 (27 \pm 21.7)
Stoma width (μm)	50–190 (173 \pm 11)	130	180–240 (21 \pm 25.5)
Body length (mm)	13.0–14.3 (13.74 \pm 0.46)	10.5	19.4–21.6 (20.75 \pm 0.67)
Body width (mm)	0.46–0.57 (0.51 \pm 0.04)	0.36	0.58–0.71 (0.63 \pm 0.04)
Esophagus length (mm)	1.3–1.5 (1.35 \pm 0.041)	0.99	1.5–1.7 (1.62 \pm 0.08)
Nerve ring location from head end (mm)	0.72–0.96 (0.80 \pm 0.09)	0.49	0.64–1.13 (0.91 \pm 0.19)
Excretory pore location from head end (mm)	0.94–1.49 (1.21 \pm 0.85)		1.09–1.17 (1.13 \pm 0.05)
Spicule length (mm)	2.9–3.4 (3.09 \pm 0.19)		
Gubernaculum length (μm)	75–117 (91.7 \pm 16.98)		
Gubernaculum width (μm)	26–34 (29.3 \pm 3.39)		
Vulva location from tail end (mm)			7.3–7.7 (7.54 \pm 0.17)
Tail length (mm)			0.13–0.23 (0.17 \pm 0.03)
Egg length (μm)			64–72 (67.2 \pm 3.0)
Egg width (μm)			35–47 (40.0 \pm 4.8)

* Range (Mean \pm SD).**LITERATURE CITED**

- Biocca, E.** 1960. Studio degli esemplari tipo di *Ancylostoma* (*Ceylancylostoma*) *malayanum* (Alessandrini, 1905) e ridescrizione della specie. *Parasitologia* 2:55–63.
- Hasegawa, H., and Asakawa, M.** 2003. Parasitic helminth fauna of terrestrial vertebrates in Japan. In: (Otsuru, M., Kamegai, S. and Hayashi, S. eds.) *Progress of Medical Parasitology in Japan*, Vol. 7, Meguro Parasitological Museum, Tokyo: 129–145.
- Lane, C.** 1916. The genus *Ancylostoma* in India and Ceylon. *Indian Journal of Medical Research* 4:74–92.
- Lichtenfels, J. R.** 1980. Keys to genera of the superfamilies Ancylostomatoidea and Diaphanocephaloidea. In: *CIH Keys to the Nematode Parasites of Vertebrates* (Anderson, R. C., Chabaud, A. G. & Willmott, S. eds.), No. 8, Commonwealth Agricultural Bureau, England. 26 pp.
- Setasuban, P., and Vajrasthira, S.** 1975. *Ancylostoma malayanum*, Alessandrini, 1905 in Thailand. *Southeast Asian Journal of Tropical Medicine and Public Health* 6:505–509.
- Skrjabin, K. I., Shikhobalova, N. P., Schulz, R. S., Popova, T. I., Boev, S. N., and Dellyamure, S. L.** 1952. *Key to Parasitic Nematodes. III. Strongylata*. Moscow: Akad. Nauk, SSR. pp. 883. (Translated English version available as OTS60-51062 from N. T. I. S., U.S. Dept. Commerce, Springfield, VA 22151, USA.)
- Yoshida, Y.** 1977. Ancylostomid nematodes. In *Illustrated Human Parasitology*, Nanzando Company, Limited, Tokyo: 98–99. (In Japanese.)