

***Baylisascaris transfuga* from the Wild Japanese Black Bear  
(*Selenarctos thibetanus japonicus*)**

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**Key words:** *Baylisascaris transfuga*, nematode, japanese black bear

*Baylisascaris transfuga* was reported from animals in the family Ursidae in the Holarctic Region (Sprent, 1968; Rogers and Rogers, 1976). In Japan, this parasite has reportedly only been found in captive bears in zoological gardens (Okoshi *et al.*, 1962).

In this paper we report the discovery of this parasite in the wild black bear of Honshu, the main island of Japan. We present a description of them, supplemented by our examinations of this parasite in both wild and captive Yezo brown bears of Hokkaido, the northern island of Japan.

**Materials and Methods**

Two parasites from the small intestine of one Japanese black bear shot in Taihei, Akita, in October, 1979. The specimens were fixed in 70% alcohol and cleared in lactophenol for microscopic examination. To elucidate the cuticular bars of the cervical alae reflecting the important generic character, some sections from the esophagus region were taken from one of them. The

specimens are deposited in the collection of this medical school.

Utilizing a floating method, dung examination for parasitic eggs was made on 12 wild Japanese black bears from Akita.

*Supplementary material*

1) Two males and five females of *B. transfuga* from a polar bear (*Thalarctos maritimus*) preserved in 70% alcohol. As a result of anthelmintic worming treatments conducted from 1973 to 1979 on 2 polar bears kept in Tennoji Zoological Gardens, one thousand fifty specimens of this parasite were recorded.

2) A single female specimen from a Yezo brown bear (*Ursus arctos yesoensis*) kept in the same gardens. (The eggs of this species were once recorded in the dung of a Japanese black bear from the same gardens).

3) Six specimens (3 males and 3 females) from a wild Yezo brown bear, deposited in Hokkaido University.

4) Twenty-one specimens (11 males and 10 females) from captive Yezo brown bears kept freely in one compound at Noboribetsu Bear Park in Hokkaido.

**Results**

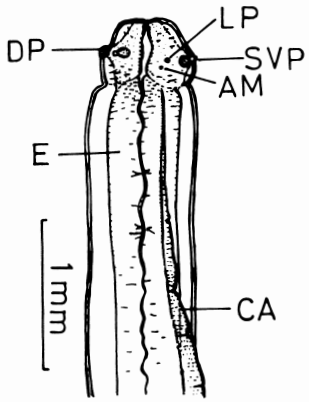
*Baylisascaris transfuga*

The material (2 male specimens availa-

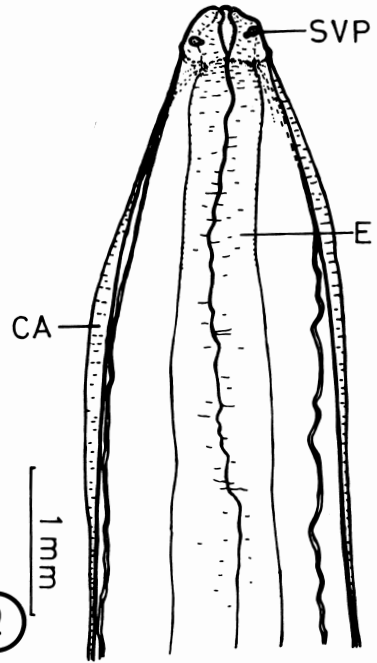
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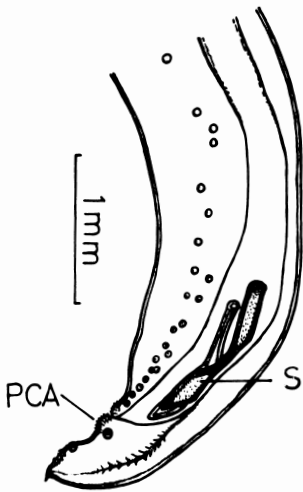
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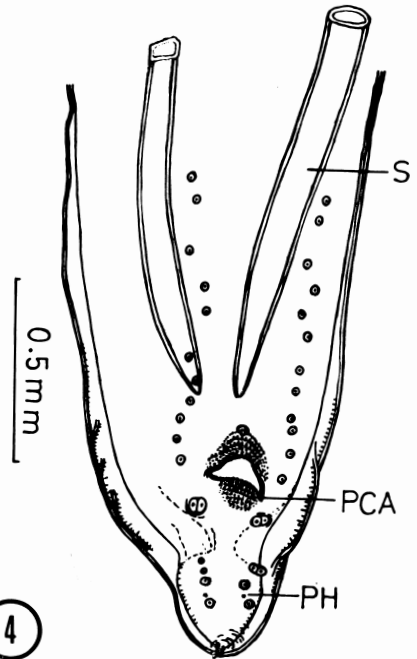
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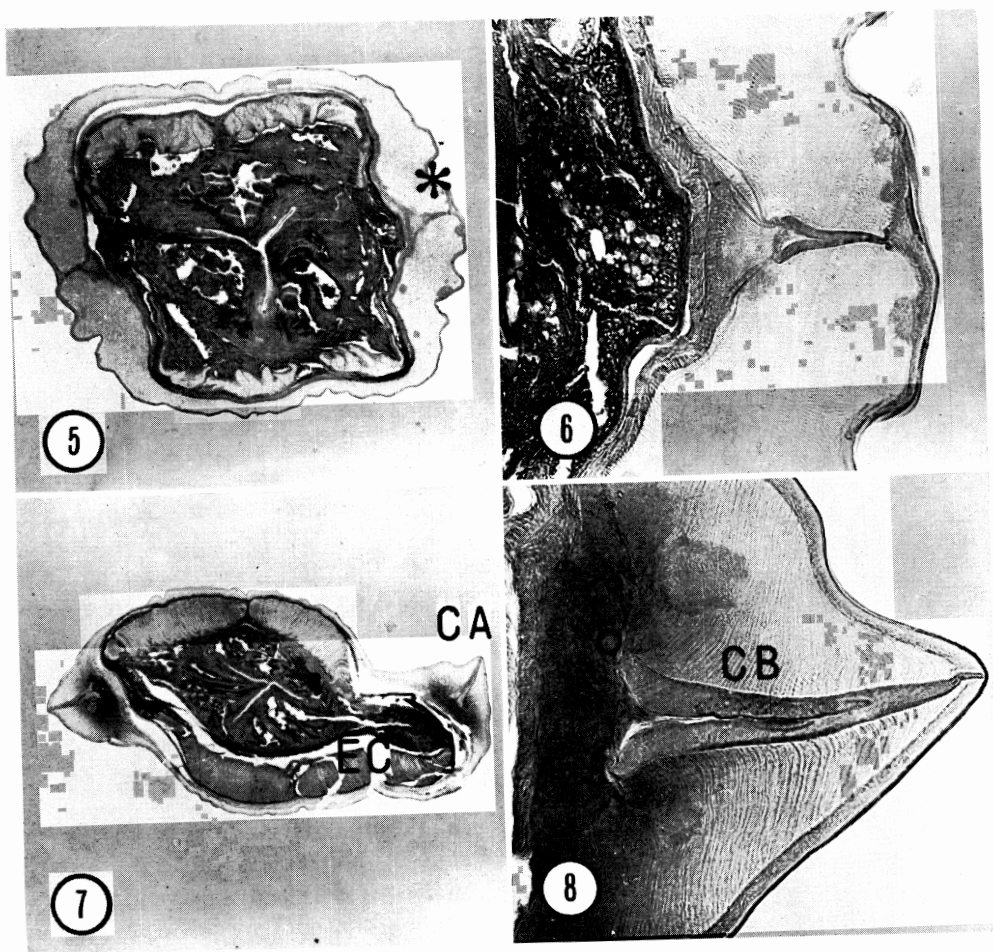
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#### Explanation of Figures

Figs. 1-4 *Camera lucida* drawings of *Baylisascaris transfuga* from Japanese black bear.

Fig. 1 Lateral view of head of male.

Fig. 2 Ventral view of anterior part showing cervical alae.

Fig. 3 Lateral view of posterior part.

Fig. 4 Ventral view of posterior part showing papillae and pericloacal area.

Figs. 5-8 Cross-sections of anterior part.

Fig. 5 At the level just behind head, cuticular bar\*.  $\times 70$ .

Fig. 6 Cuticular bar enlarged.  $\times 280$ .

Fig. 7 At the level of excretory commissure.  $\times 40$ .

Fig. 8 Enlarged cuticular bar of Fig. 7.  $\times 260$ .

AM: Amphidial pore	CA: Cervical ala
CB: Cuticular bar	DP: Dorsal papilla
E: Esophagus	EC: Excretory commissure
LP: Lateral papilla	PCA: Pericloacal area
PH: Phasmidial pore	S: Spicule
SVP: Subventral papilla	

Table 1. Measurements of *Baylisascaris transfuga* from the Japanese black bear

	Male (2 specimens)
Body length	120-125 mm
Body width (max.)	2.5-3.0
Esophagus length	5.0-6.8
Esophagus width	0.5
Cervical ala length	5.0-8.0
Cervical ala height	0.13
Spicule length	1.0-1.1
Precloacal papillae	34-45*
Tail	0.6
Phasmidial pore	0.19†

\* Numbers of papillae on each side.

† Distance from posterior end.

ble) from a wild Japanese black bear: Three lips are situated on the head; one dorsal lip with two dorsal papillae, and two subventral lips, each with one subventral papilla, one lateral papilla and one amphidial pore (Fig. 1). Lips are equipped with relatively large denticles at the margin. Cervical alae present as expansions of cuticle behind lips laterally (Fig. 2, Table 1). Esophagus widens gradually in the posterior half. Tail attenuating with a small mucronate termination. Caudal alae present on the lateral sides near cloaca level. Precloacal papillae arranged in pairs subventrally with many more paired anteriorly, numbering from 34 to 45 in each row. A precloacal central papilla situated at the top of the prominent pericloacal area with numerous small spines. Postcloacal papillae, well paired; the first arranged as one double papilla, next two small closely arranged single papillae at right, opposite one double papilla, followed by two single papillae on each side (Fig. 4). The phasmidial pore opens subventrally between the last two single papillae on each side. Spicules are stout and equal, with a slight expansion recognizable by lateral view at their posterior ends (Fig. 3).

Through microscopic examination of sections we find that just below the lips the

cuticular bars develop laterally on each side in the thicker cuticle (Figs. 5 and 6), and that they become conspicuous at the level of excretory commissure, attaching directly to the outer cuticle of the cervical alae (Figs. 7 and 8).

#### *Dung examination*

The eggs of this species were found in the contents of the rectum in only one of twelve wild black bears examined in Akita.

#### *Supplementary material*

The specimens were microscopically examined on the cervical alae of both female and male worms. In addition, the pericloacal rough area and the arrangement of caudal papillae were examined in detail. It was found that they resembled each other.

### Discussion

Sprent (1968) created the genus *Baylisascaris* with the presence of the pericloacal rough area in the male and the cervical alae in both sexes, as the result of his study of ascaridoid specimens from various mammals. Some species with such specific characteristics which had been included in *Toxascaris* or *Ascaris* (Baylis and Daubney, 1922; Sprehn and Haakh, 1956; Hartwich, 1962) were subsequently classified as belonging to this genus. Since a new species was found in the Tasmanian devil from north-east Tasmania by Sprent (1970), ten species in all have been recorded as belonging to this genus.

In Japan, *Toxascaris* (= *Baylisascaris*) *transfuga* was reported only in captive bears (the polar bear, the sloth bear and Yezo brown bear) in Ueno Zoological Gardens, Tokyo (Okoshi *et al.*, 1962). As the result of our present research, we know that this parasite is found in the wild black bears on Honshu. In Hokkaido, ascaridoid specimens with salient cervical alae were once

noted in a captive Yezo brown bear, identified provisionally as *Ascaris lumbricoides* by Inukai and Yamashita (1934). Later, for Okoshi *et al.* (1962), the description of the cervical alae led them to conclude the specimens from Hokkaido were most likely *Toxascaris transfuga*. Through the present examination it was confirmed that *B. transfuga* infected both wild and captive Yezo brown bears in Hokkaido.

The prevalence rate of this parasite in the wild Japanese black bears seems to be rather low. While it is very high among captive polar bears. Conversely it is low in other kinds of bears kept in zoological gardens throughout Japan (Miyashita and Uni, 1980). Considering the facts that *B. transfuga* infects the polar bears more commonly and more numerously than other species of bears even in the similar environment of a zoological garden, further observations may be necessary to find out the relationship between the presence of this parasite and different kinds of bears.

### Summary

*B. transfuga* was found to inhabit the wild Japanese black bear of Akita. The morphological features of the parasite were described. By this examination, Honshu, the main island of Japan, was added to the natural habitat of this parasite. Supplementarily, the presence of this parasite was confirmed in both wild and captive Yezo brown bears in Hokkaido.

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野生ニホンツキノワグマ (*S. thibetanus japonicus*) からの  
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秋田県におけるニホンツキノワグマの生息調査において捕獲されたクマの内2頭より *B. transfuga* の成虫(雄2隻)および虫卵が見い出された。本種は日本では動物園のクマ科動物から報告されているのみであ

る。したがって今回の知見によって、日本の野生ツキノワグマの寄生虫相に新たに本種が加えられるものと考えられる。