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Vampirolepis urawaensis sp. n. (Cestoda: Hymenolepididae), with Records of Known Cestodes, from Japanese Bats

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Abstract

Hymenolepidid cestodes, six (including a new) species were recorded from the bats collected at various places in Japan in 1988. *Vampirolepis urawaensis* sp. n. was described from the Japanese pipistrelle, *Pipistrellus abramus,* of Urawa-shi, Saitama Prefecture. The shape of rostellar hooks and the larger size of strobilae distinguish this cestode from all of three known species of *Vampirolepis* armed with 21—26 rostellar hooks in the range of 0.021—0.025 mm, from bats. The cestode was observed in 36% of 11 bats.

Key words: hymenolepidid cestodes, *Vampirolepis,* house dwelling bat

Introduction

In succession to the investigation in 1988, various bats collected in 15 administrative areas from Hokkaido to Kagoshima were examined for cestodes to obtaine supplementary data on the helminth fauna of bats in Japan. This paper reports a new hymenolepidid cestode with records of the known hymenolepidid cestodes from bats in Japan.

Materials and Methods

The bats were captured alive and autopsied immediately at the collecting sites (Fig. 1). Their digestive tracts were cut open to extract endoparasites as soon as possible and fixed in Carnoy's fluid and brought to my laboratory. After being soaked in 45% acetic acid for about 1 hr for expanding, endoparasites were stored in 70% alcohol. The scoleces, eggs and a part of mature segments were mounted unstained and observed under an interference contrast light microscope. The strobilae were stained with alcohol-hydrochloride-carmine, dehydrated in alcohol, cleared in xylene, and mounted in Canada balsam. Measurements are given in millimeters.

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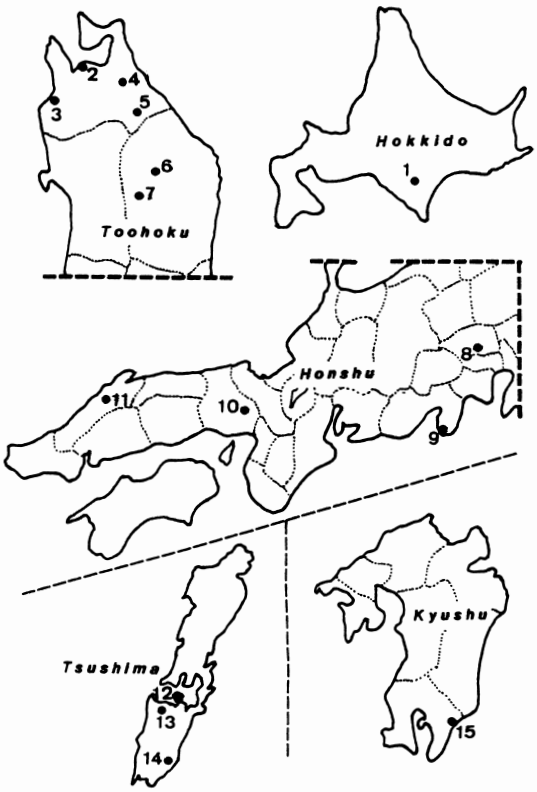


Fig. 1 Map showing the collection sites of bats. For the locality number, see Table 1.

Table 1 Localities and dates of bats examined and their cestode parasites in 1988

Host species Cave and locality	Date	Number of bats examined	infectied	%	Cestode species
Rhinolophidae					
(1) *Rhinolophus cornutus cornutus*					
3)* Man-made cave Fukaura-cho, Aomori Pref.	Oct. 3	1	0	0	
9) Quarry Matsuzaki-cho, Shizuoka Pref.	Mar. 10	20	6	30	*Vampirolepis isensis*
13) Kashi abandoned mine	Mar. 15	19	0	0	
	Oct. 22	14	0	0	
Mitsushima-cho, Nagasaki Pref.					
14) Nariai abandoned mine Izuhara-cho, Nagasaki Pref.	Mar. 14	15	0	0	
(2) *Rhinolophus ferrumequinum nippon*					
12) A ruined battery Mitsushima-cho, Nagasaki Pref.	Oct. 22	4	3	75	*Hymenolepis rashomonensis*
13) Kashi abandoned	Oct. 22	4	1	25	*H. rashonensis*
15) Katano-do Shibushi-cho, Kagoshima Pref.	May 29	5	2	40	*H. rashomonensis*
Vespertilionidae					
(3) *Miniopterus schreibersii fuliginosus*					
11) Iwami abandoned mine Mizukami-cho, Shimane Pref.	Feb. 7	9	1	11	*V. hidaensis*
13) Kashi abandoned mine	Mar. 14	17		6	*V. hidaensis*
(4) *Myotis macrodactylus*					
3) Man-made cave	Aug. 1	1	0	0	
11) Iwami abandoned mine	Feb. 7	6	0	0	
(5) *Myotis frater*					
1) Broad-leaf forest Petagari-dake, Hidaka range, Hokkaido	Aug. 30	1	0	0	
2) Forest Tashirodani, Aomori-shi, Aomori Pref.	Sept. 13	2	0	0	
3) Forest Fukaura-cho, Aomori Pref.	Aug. 1	1	0	0	
5) Beech forest Tatsuko-cho, Aomori Pref.	Aug. 22	2	1	50	*V. kaguyae*
(6) *Myotis pruinosus*					
5) Beech forest	Aug. 21	6	0	0	
7) Beech forest Sawauchi-mura, Iwate Pref.	Aug. 10	1	0	0	
(7) *Myotis hosonoi*					
2) Beech-forest Sukayu, Aomori-shi, Aomori Pref.	Aug. 27	1	0	0	
4) Beech forest Shingo-mura, Aomori Pref.	Aug. 13	1	0	0	

5) Beech forest	Aug. 22	2	1	50	*V. brevihamata*
7) Beech forest	Aug. 11	1	0	0	
(8) *Myotis esoensis*					
1) Broad-leaf forest	Aug. 30	2	0	0	
(9) *Murina ussuriensis*					
3) Forest	Aug. 1	2	0	0	
4) Beech forest	Aug. 12	1	0	0	
(10) *Plecotus auritus*					
1) Broad-leaf forest	Aug. 30	1	0	0	
4) Beech forest	Aug. 12	1	0	0	
(11) *Nyctalus furvus*					
4) Beech forest	Aug. 12	1	0	0	
6) Forest	Aug. 7	1	0	0	
Isogozawa, Morioka-shi, Iwate Pref.					
(12) *Pipistrellus abramus*					
8) House	Oct. 23	11	4	36	*V. urawaensis* sp. n.
Shikatebukuro, Urawa-shi, Saitama Pref.					
Molossidae					
(13) *Tadarida insignis*					
10) School room	Feb. 20	1	0	0	
Kaibara-cho, Hyogo Pref.					

*Locality numbers correspond to those in Fig. 1.

Results

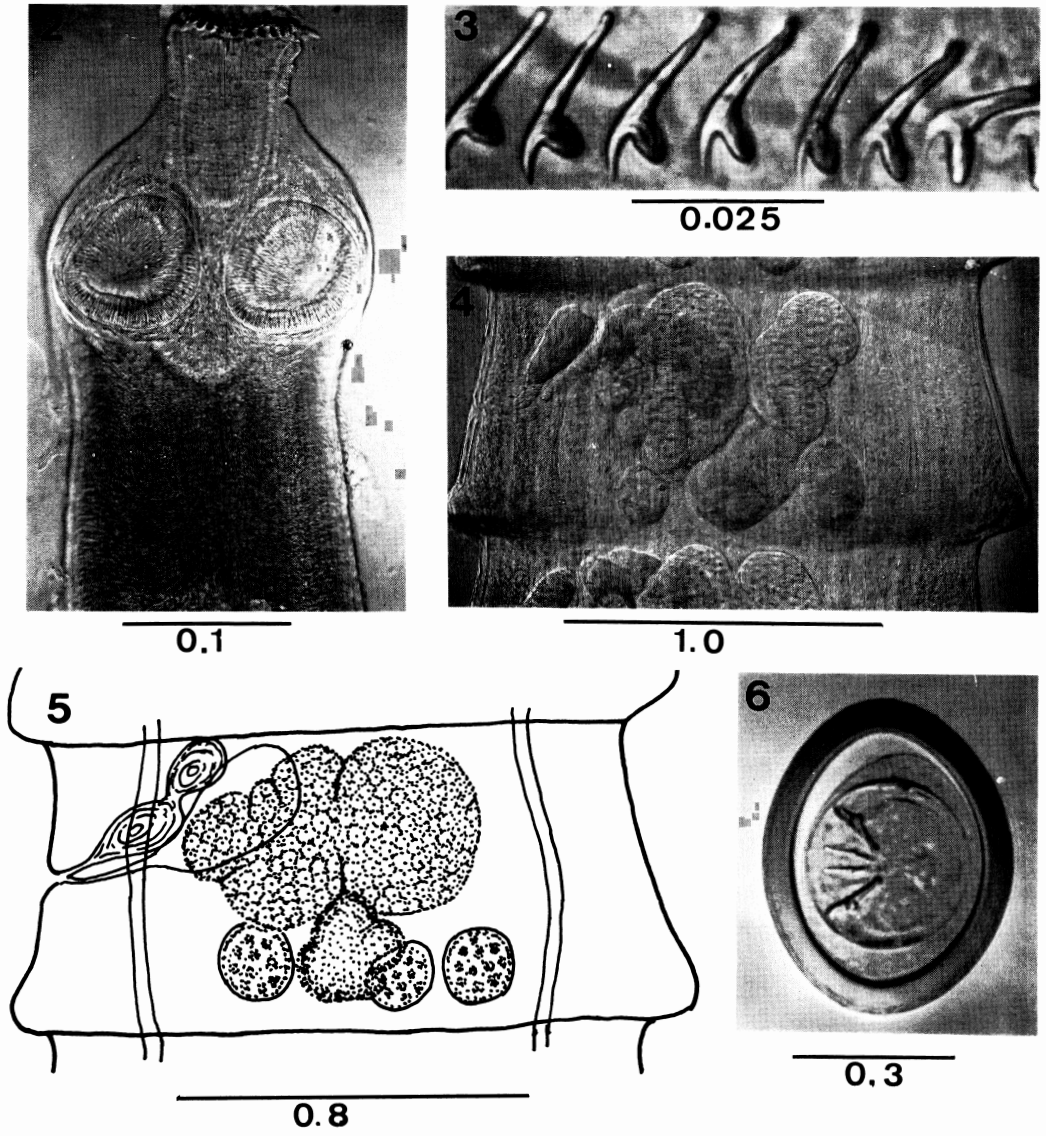
Bats examined and cestodes obtained are shown in Table 1.

Vampirolepis Spassky, 1954
Vampirolepis urawaensis sp. n.
(Figs. 2—6)

On October 23, 1988, 11 specimens of Japanese pipistrelle, *Pipistrellus abramus,* were captured by Mukooyama around a house at Shika'tebukuro, Urawa-shi, Saitama Prefecture. On dissection, four of them were found infected with 1—2 mature specimens of this cestode.

Description: Medium-sized hymenolepidid; mature worm 65—72 in length and 1.5—1.9 in maximum width. Metamerism distinct, craspedote, segment margins slightly serrate. Scolex 0.231—0.280 long by 0.238—0.280 wide, not sharply demarcated from neck region. Rostellum mushroom-shaped, 0.140—0.161 long by 0.091—0.140 wide, armed with a single circle of 24—25 spanner-shaped hooks measuring 0.025. Hook handle slender and slightly curved against guard; guard bulky, protrusive and round at its end, shorter than blade; blade remarkably curved and sharp at its end. Rostellar sac elongate, 0.224—0.280 long by 0.091—0.105 wide, extending beyond posterior base of suckers. Suckers discoid, 0.091—0.098 by 0.098—0.105.

Genital pores unilateral, located a little anterior to or at the middle of segment. Testes three in number, spherical or subspherical, 0.084—0.091 by 0.063—0.070, arranged in a transverse row, one poral and two aporal. Cirrus sac pyriform, 0.161—0.175 long by 0.042—0.049 wide, extending beyond osmoreguratory canals. Internal seminal vesicle 0.098—0.112 long by 0.042—0.049 wide, occupying almost whole of cirrus sac. External seminal vesicle 0.105—0.140 long by 0.049—0.056 wide, directly dorsal to seminal receptacle, situated in anterior half of segment. Vagina initially posterior to cirrus sac, passing behind cirrus sac, gradually expanding into voluminous seminal receptacle measuring



Figs. 2—6 *Vampirolepis urawaensis* sp. n.
2: Scolex. 3: Rostellar hooks. 4: Mature segment, ventral view. 5: Outline tracing of Fig. 4. 6: Egg. Scale in mm.

0.126—0.154 long by 0.056—0.063 wide. Ovary prominent, frequently irregularly lobate, 0.252—0.280 across, lying posterior to ovary. Eggs spherical or oval, 0.056—0.063 by 0.046—0.049, surrounded by four envelopes; outermost chorion thick, 0.007 in thickness. Onchospheres spherical 0.032 in diameter; embryonic hooks 0.014 long.

Host: *Pipistrellus abramus,* the Japanese pipistrelle.

Location: Small intestine.

Locality and date: Shika'tebukuro, Urawa-shi, Saitama Prefecture; October 23, 1988.

Type specimen: Holotype: NSU Lab. Coll. No. 8913: Paratypes No. 8914.

Remarks: Out of known species of *Vampiro-*

Table 2 A comparison of related species of *Vampirolepis* armed with 21—26 rostellar hooks in range of 0.012—0.025 mm, from bats

Cestode species	Size of strobila		Rostellar hooks		Host
	Length	Width	Number	Length	
(a) *V. pipistrelli* (Lepez-Neyra, 1941)	33-66	1.25-1.50	22-24	0.012-0.023	*Pipistrellus pipistrellus*
(b) *V. stenocephala* (Sawada, 1988)	21-26	0.62-0.72	21-26	0.025	*Nyctalus lasiopterus aviator*
(c) *V. kawasakiensis* (Sawada, 1986)	28-35	0.4-0.5	25	0.025	〃 〃 〃
(d) *V. urawaensis* sp. n.	65-82	1.5-1.9	24-25	0.025	*Pipistrellus abramus*

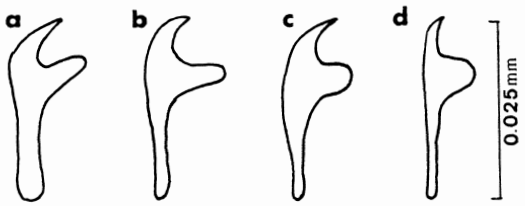


Fig. 7 Comparison of rostellar hook shape among four related species.
a: *V. pipistrelli*. b: *V. stenocephala*. c: *V. kawasakiensis*. d: *V. urawaensis* sp. n.

lepis from bats, three are armed with 21—26 rostellar hooks in the range of 0.021—0.025 (López-Neyra, 1941 and Schmidt, 1986). *Vampirolepis urawaensis* sp. n. differs from all of them in the shape of rostellar hooks and the longer strobilae (Table 2 and Fig. 7).

Vampirolepis isensis Sawada, 1966

Host: *Rhinolophus cornutus cornutus*. For locality, see Table 1 and Fig. 1.

Vampirolepis hidaensis Sawada, 1967

Host: *Miniopterus schreibersii fuliginosus*. For locality, see Table 1 and Fig. 1.

Vampirolepis kaguyae Sawada, 1987

Host: *Myotis frater*. For locality, see Table 1 and Fig. 1.

Vampirolepis brevihamata Sawada, 1988

Host: *Myotis hosonoi*. For locality, see Table 1 and Fig. 1.

Hymenolepis Weinland, 1858
Hymenolepis rashomonensis Sawada, 1972

Host: *Rhinolophus ferrumequinum nippon*. For locality, see Table 1 and Fig. 1.

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