

Helminth Fauna of Shrews on Sado Island, Niigata Prefecture, Japan

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Abstract

Four (including two new) species of hymenolepidid cestodes are recorded from the shrew, *Sorex sadonis* collected at Donden-yama and Shirase on Sado Island, Niigata Prefecture from November 21 to 23, 1989. *Ditestolepis minuta* sp. nov. is related to but differs from *D. longicirrosa* in the size of the strobila, the scolex, the sucker, the cirrus sac and the onchosphere. *D. cyclocephala* sp. nov. is related to but differs from *D. diaphona* and *D. longicirrosa* in the shape of the scolex. *Neoskrjabinolepis singularis* (Cholodkovsky, 1913) Spassky, 1954 and *Coronacanthus parviamata* Sawada and Koyasu, 1990 are reported from *Sorex sadonis*.

Key words: *Sorex sadonis*, Hymenolepidid cestodes, Sado Island

INTRODUCTION

Hitherto helminths of Insectivora on Sado Island are unknown for the most part. The present study was carried out to clarify the systematic position of cestodes obtained from shrews on Sado Island.

Materials and Methods

Six specimens of Sado shrew, *Sorex sadonis* Yoshiyuki and Imaizumi were captured by trap at Donden-yama and Shirase from November 21 to 23, 1989. The shrews were autopsied immediately after capture at collecting sites, and their guts were fixed in Carny's fluid. At the laboratory, after being soaked in 45% acetic acid for about three hr for expanding, the guts were cut open in 70% ethanol, and agitated manually to disengage existing cestodes. Cestodes gathered up were stored in 70% ethanol. The scoleces, eggs and a part of mature segments were unstained and observed under a interference contrast light microscope. The mature segments were stained

with ethanol-hydrochloride-carmin, dehydrated in graded series of ethanol, cleared in xylene, and mounted in Canada balsam. Measurements are given in millimeters.

Neoskrjabinolepis Spassky, 1947

Neoskrjabinolepis singularis

(Cholodkovsky, 1913) Spassky, 1954

(Figs. 1–5)

Hymenolepis singularis Cholodkovsky, 1913, pp. 221–232, Figs. 32–35.

A large number of specimens of this cestode were obtained from six shrews (Table 1).

Description: Small-sized hymenolepidid; strobila length 4.1–6.9; maximum width 0.15–0.28. Mature segments not serrate. Scolex weak, 0.210–0.287 long and 0.280–0.357 wide, demarcated from neck region. Rostellum 0.119–0.189 long and 0.077–0.119, armed with a crown of 10 hooks measuring 0.035 long. Hook handle reduced; blade long, slender and pointed; guard slightly prominent, round at its end, and shorter than blade. Rostellar sac elongate, 0.252 long and 0.147–0.154 wide. Suckers subspherical, 0.119–0.133 long and 0.105–0.126 wide. Neck region slender, 0.60–0.63 and 0.09–0.12 wide.

Genital pore unilateral, situated in middle of segment margin. Testes three in number, elliptical, 0.046–0.049 long and 0.018 wide, arranged

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Table 1. Shrews examined and their cestode parasites on Sado Island in 1989

Locality	Date	Shrew species	No. of shrew		Cestode species
			examined	infected	
Donden-yama, Ryotsu City	Nov. 21	<i>Sorex sadonis</i>	2	2	<i>Neoskrjabinolepis singularis</i> <i>Ditestolepis minuta</i> sp. nov. <i>D. cyclocephala</i> sp. nov.
Shirase, Ryotsu City	Nov. 22	<i>Sorex sadonis</i>	2	2	<i>N. singularis</i> <i>Coronacanthus parviamata</i>
Donden-yama, Ryotsu City	Nov. 23	<i>Sorex sadonis</i>	2	2	<i>N. singularis</i> <i>D. minuta</i> sp. nov.

in a transverse row, one poral and two antiporal. Cirrus sac elongate, 0.070 long and 0.014 wide, extending beyond longitudinal excretory canal. Cirrus armed with fine spines. Internal seminal vesicle 0.042 long and 0.007 wide. External seminal vesicle 0.046 long and 0.010 wide. Ovary transversely elongate, bilobate, 0.070–0.088 in transverse diameter. Seminal receptacle developed, 0.035–0.049 long and 0.010 wide. Vitelline gland compact, 0.018 long and 0.011 wide, located at posterior field of segment. Egg oval, 0.049–0.063 in major axis and 0.039–0.042 in minor axis. Onchosphere, 0.028–0.032 by 0.018–0.021; embryonic hook 0.011 long.

Host: *Sorex sadonis* Yoshiyuki and Imaizumi, 1986.

Remarks: This is a new host and distributional record of this species in Japan. There are considerable differences and variabilities as regards the rostellar hooks in *N. singularis*. See the description given by Sawada and Koyasu (1990) for further particulars.

Ditestolepis Soltys, 1952
Ditestolepis minuta sp. nov.
(Figs. 6–10)

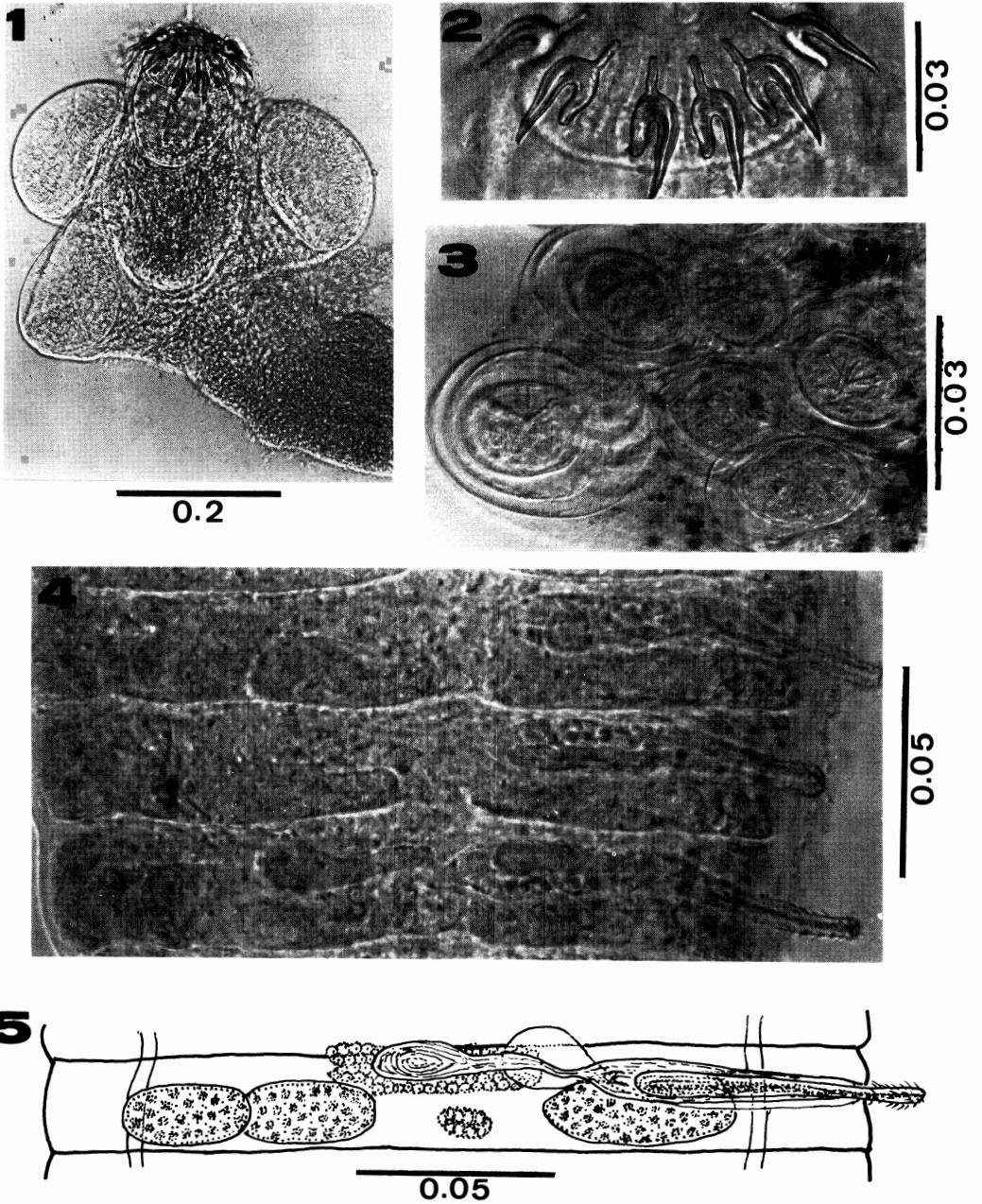
A large number of specimens of this cestode were obtained from four shrews (Table 1). Two shrews captured at Donden-yama on November 21 were triply infected with two new and a known species: *Ditestolepis minuta* sp. nov., *D.*

cyclocephala sp. nov. and *Neoskrjabinolepis singularis*.

Description: Small-sized hymenolepidid; strobila length 1.6–1.8 and maximum width 0.11–0.14. Metamerism indistinct, segment margin not serrate. Strobila characterized by a distinctly marked subdivision into three series, each of which possessing segments uniformly advance in development. Scolex 0.210–0.217 long and 0.154–0.245 wide, sharply demarcated from short neck region. Rostellum rudimentary. Sucker confluent, 0.119–0.126 long and 0.084–0.112 wide.

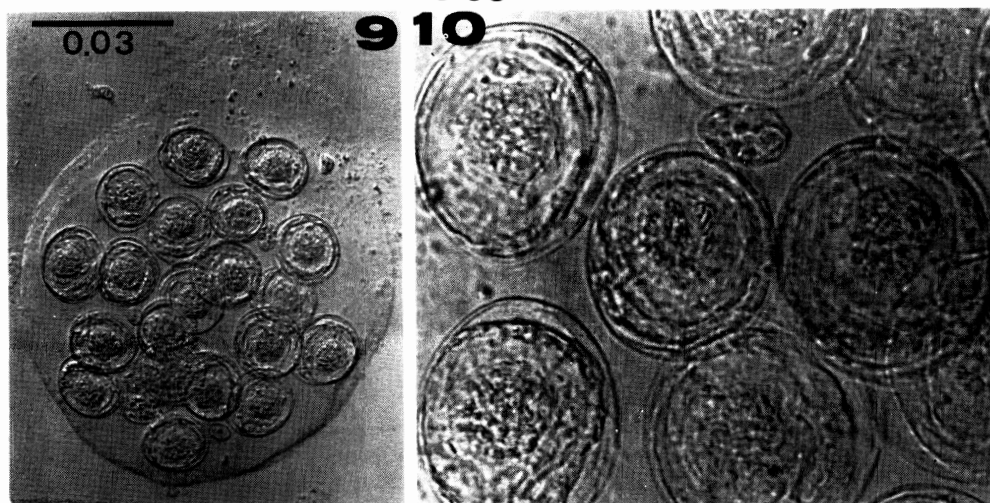
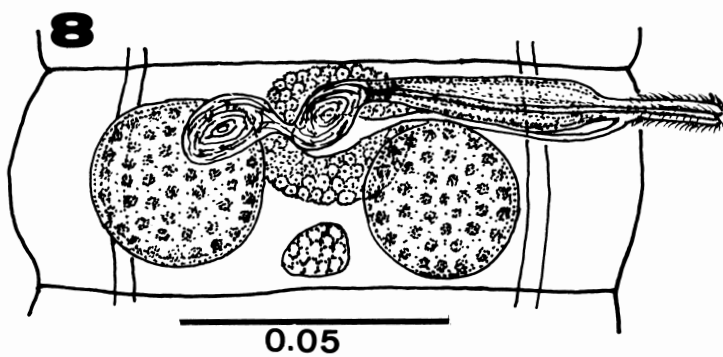
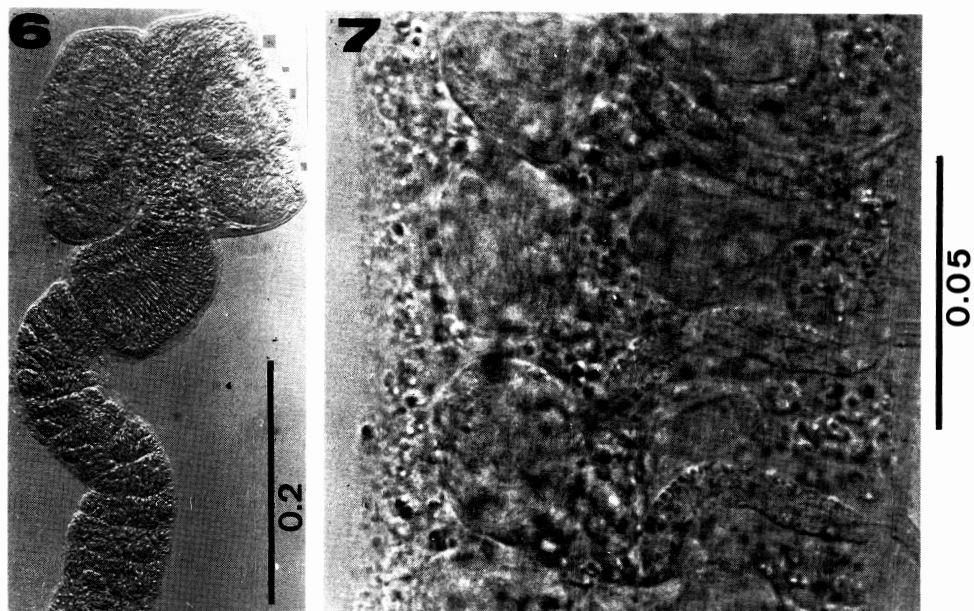
Genital pore unilateral, located at anterior $\frac{1}{3}$ of segment margin. Testes two in number, spherical, 0.025–0.028 long and 0.032–0.039 wide, one on each side of ovary. Ovary spherical or subspherical, 0.025–0.039 by 0.025–0.042. Vitelline gland compact, 0.014–0.018 by 0.014. Cirrus sac elongate, surpassing center field of segment, 0.056–0.088 long and 0.021 wide. Cirrus armed with delicate spines. Internal seminal vesicle, located at inner part of cirrus sac, 0.042–0.053 long and 0.008–0.011 wide. External seminal vesicle 0.025–0.035 long and 0.014 wide. Vagina opening in genital atrium, extending to aporal side, then enlarging and forming seminal receptacle measuring 0.025 long and 0.018 wide. Egg spherical, 0.039 in diameter, surrounded by four thin envelopes, with smooth surface. Onchosphere spherical, 0.014–0.018 by 0.018; embryonic hook 0.011 long.

Type host: *Sorex sadonis* Yoshiyuki and



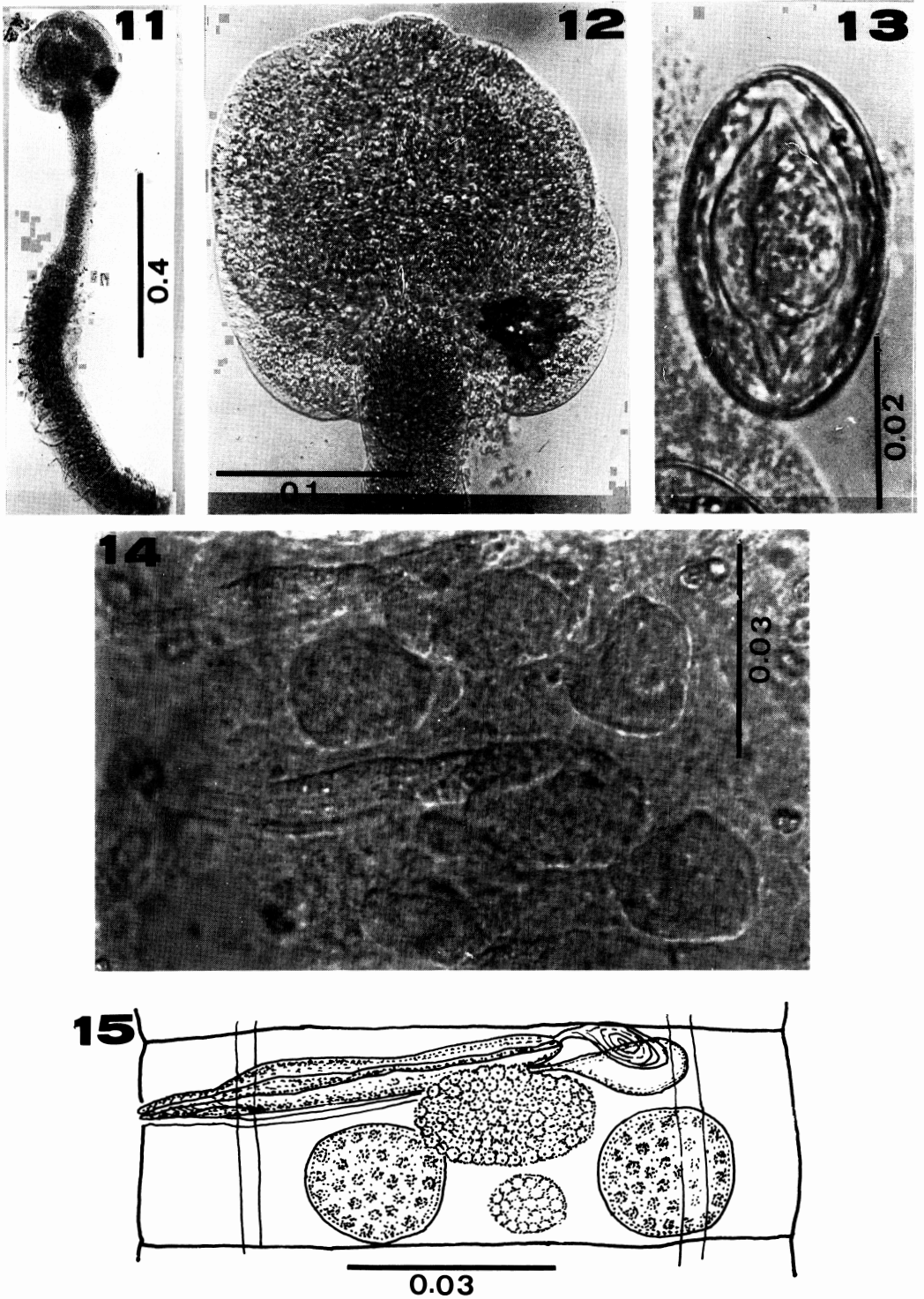
Figs. 1–5. *Neoskrjabinolepis singularis* (Cholodkovsky, 1913)

1: Scolex. 2: Rostellar hooks. 3: Eggs. 4: Mature segments, dorsal view. 5: Mature segment drawn from projected photographic negative. Scales in mm.



Figs. 6–10. *Ditestolepis minuta* sp. nov.

6: Scolex. 7: Mature segments, dorsal view. 8: Mature segment drawn from projected photographic negative.
9: Egg pouch. 10: Eggs. Scales in mm.



Figs. 11–15. *Ditestolepis cyclocephala* sp. nov.

11: Entire worm. 12: Scolex. 13: Egg. 14: Mature segment, ventral view. 15: Mature segment drawn from projected photographic negative. Scales in mm.

Imaizumi, 1986.

Habitat: Small intestine.

Locality and date: Donden-yama and Shirase, Ryotsu City, Niigata Prefecture; November 21 and 22, 1989.

Type specimen: Holotype; Nara Sangyo University Lab. Coll. No. 9101, Paratypes: No. 9102.

Remarks: *Ditestolepis minuta* sp. nov. resembles *D. longicirrosa* Sawada and Harada, 1990 from *Sorex shinto shinto* in the shape of the scolex and the strobila. However, this new species is distinguished from it by the smaller strobila (1.6–1.8 by 0.11–0.14 vs. 2.1–2.6 by 0.3–0.4), the smaller scolex (0.210–0.217 by 0.154–0.245 vs. 0.245 by 0.329–0.350), the smaller sucker (0.119–0.126 by 0.084–0.112 vs. 0.217–0.231 by 0.140–0.147), the smaller cirrus sac (0.056–0.088 by 0.021 vs. 0.147–0.154 by 0.028) and the smaller onchosphere (0.014–0.018 by 0.018 vs. 0.025–0.032 by 0.028).

Ditestolepis cyclocephala sp. nov.

(Figs. 11–15)

A number of specimens of this cestode were obtained from four shrews at Donden-yama (Table 1).

Description: Small-sized hymenolepidid; strobila length including scolex 1.4–1.6 and maximum width 0.1–0.2. Scolex round, 0.161–0.207 long and 0.221–0.266 wide, sharply demarcated from long neck region. Rostellum rudimentary. Sucker confluent, 0.070 in diameter. Neck region slender, 0.3–0.4 long and 0.06–0.07 wide.

Genital pore unilateral, located a little anterior to middle of segment margin. Testes two in number, spherical, 0.032–0.035 by 0.035–0.039, one on each side of ovary. Ovary subspherical, 0.035–0.038 long and 0.028–0.032 wide. Vitelline gland weakly developed, 0.018–0.025 long and 0.014–0.018 wide, directly posterior to ovary. Cirrus sac elongate, surpassing center of segment, 0.074–0.084 long and 0.011 wide. Cirrus covered with delicate spines. Internal seminal vesicle 0.063–0.067 long and 0.011 wide. External seminal vesicle 0.025–0.028 long

and 0.014–0.018 wide. Seminal receptacle 0.032 long and 0.014–0.018 wide, extending to antiporal longitudinal excretory canal. Egg elliptical, 0.039–0.046 long and 0.025–0.028 wide, surrounded by four thin envelopes; embryophore 0.032–0.039 long and 0.018–0.021 wide. Onchosphere 0.018 by 0.014; embryonic hook 0.011 long.

Type host: *Sorex sadonis* Yoshiyuki and Imaizumi, 1986.

Habitat: Small intestine.

Locality and date: Donden-yama, Ryotsu City, Niigata Prefecture; November 21 and 23, 1989.

Type specimen: Holotype; Nara Sangyo University Lab. Coll. No. 9103.

Remarks: *Ditestolepis cyclocephala* sp. nov. differs from other known species of *Ditestolepis*; *D. diaphona* Cholodkovsky, 1906; *D. longicirrosa* Sawada and Harada, 1990 and *D. minuta* sp. nov., mainly in the shape of the scolex and the shape of the egg (elliptical vs. oval or spherical).

Coronacanthus Spassky, 1954

Coronacanthus parvihamatus

Sawada and Koyasu, 1990

Coronacanthus parvihamata Sawada and Koyasu, 1990, pp.187–201, Figs. 15–20.

Host: *Sorex sadonis*. for locality, see Table 1.

Remarks: This is the new host and distributional record in Japan.

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