

## Two Species of *Dipetalonema* from Pinnipeds Caught off Northern Japan

By

**Masaaki MACHIDA**

Department of Zoology, National Science Museum, Tokyo

Two species of *Dipetalonema* were obtained from the pinnipeds caught off northern Japan; one species, *D. odendhali*, from the subfascia of the northern fur seal, *Callorhinus ursinus*, and the other species, *D. spirocauda*, from the heart of the harbor seal, *Phoca vitulina*. Excepting a few records from zoological gardens, there has been no report on *Dipetalonema* from wild pinnipeds in Japan. The nematodes were preserved in 5% formalin and cleared in Gater's solution. The specimens are deposited in the collection of the National Science Museum, Tokyo.

Family Onchocercidae LEIPER, 1911

Subfamily Onchocercinae LEIPER, 1911

***Dipetalonema odendhali* PERRY, 1967**

(Figs. 1-6)

*Host.* Northern fur seal, *Callorhinus ursinus* (LINNAEUS).

*Habitat.* Subfascia (cervical and thoracic region).

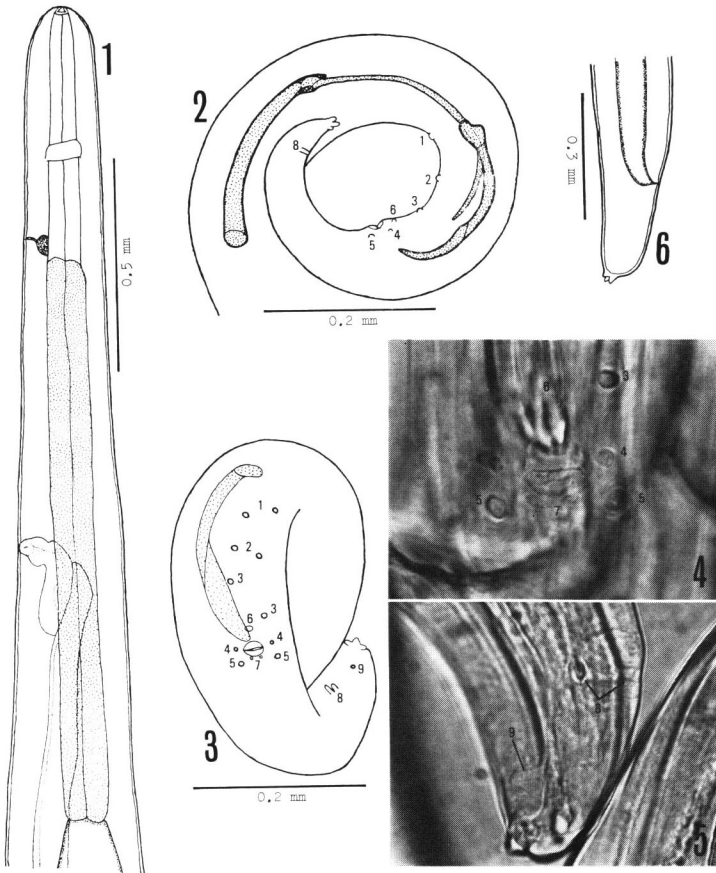
*Locality.* Off Sanriku District, Japan.

*Date.* V-1967.

*Specimen No.* NSMT-As-1426.

*Description.* Body filiform. Male smaller, spirally coiled posteriorly. Mouth tiny, circular, with four pairs of submedian cephalic papillae and a pair of lateral amphids. Buccal cavity shallow, conical, with sclerotized wall. Esophagus divided into two portions; the anterior short and muscular, the posterior long and glandular. Nerve ring near equator of muscular esophagus. Excretory pore near boundary between muscular and glandular esophagus.

*Male.* Body 60.4-68.0 mm long and 0.19-0.22 mm wide. Buccal cavity 0.010-0.013 mm long. Muscular and glandular esophagus 0.50-0.61 mm and 1.00-1.10 mm long, respectively. Nerve ring and excretory pore 0.31-0.36 mm and 0.51-0.57 mm from head end, respectively. Rod-like transverse bands on ventral surface anterior to spiral coil of posterior part of body. Extremely narrow caudal alae are seen in posterior part of tail. Cloaca a little projecting like lips. Five pairs of caudal sessile papillae on both sides of cloaca; of these four pairs are precloacal (Figs. 2-4: 1-4)



Figs. 1–6. *Dipetalonema odendhali* PERRY, 1967. — 1. Anterior part of female. — 2–5. Posterior part of male. — 6. Posterior part of female.

and one pair postcloacal (Figs. 2–4: 5). Third pair counting from head end asymmetrical (Figs. 2–4: 3). A single median sessile papilla (Figs. 2–4: 6) immediately anterior to cloaca. A pair of tiny papillae (Figs. 3 & 4: 7) just posterior to cloaca. Furthermore, a pair of pedunculate papillae (Figs. 2, 3 & 5: 8) at about middle of posterior half of tail, and a single submedian papilla (Figs. 3 & 5: 9) near tail end. Spicules unequal; right spicule stout, spatulate in posterior half, 0.22–0.26 mm long, and left spicule slender but becoming broader in anterior part, 0.55–0.63 mm long. Tail 0.22–0.34 mm long, trifold-pointed.

**Female.** Body 127.2–154.1 mm long and 0.20–0.42 mm wide. Buccal cavity 0.018–0.021 mm long. Muscular and glandular esophagus 0.43–0.68 mm and 0.82–1.35 mm long, respectively. Nerve ring and excretory pore 0.26–0.32 mm and 0.52–0.68 mm from head end, respectively. Vulva opening a little posterior to equator

of glandular esophagus, 1.03–1.30 mm from head end. Tail 0.25–0.28 mm long, trifid-pointed.

*Remarks.* Compared with PERRY's original description (1967), some differences are observed in the arrangement of male caudal papillae: 1) A single median papilla is situated just anterior to the cloaca. 2) A paired and a single papillae lie at about middle of the posterior half of the tail and near the tail end, respectively. These papillae were not mentioned in PERRY's description.

The present author (1969) erroneously reported this species under the name of *Skrjabinaria spirocauda*, but later corrected it to *D. odendhali* at the symposium on marine mammals which was held at the Ocean Research Institute, University of Tokyo, on November 29, 1973. According to SONIN (1975), *D. odendhali* has been found from pinnipeds belonging to the family Otariidae on the Pacific coast of North America and at Kamchatka of the USSR. In Japan, KAGEI and ODA (1975) reported a female of this species from the intermuscular fascia of the northern fur seal kept at Enoshima Marine Zoo.

*Dipetalonema spirocauda* (LEIDY, 1858)

(Figs. 7–13)

*Host.* Harbor seal, *Phoca vitulina* LINNAEUS.

*Habitat.* Ventriculus dexter (heart).

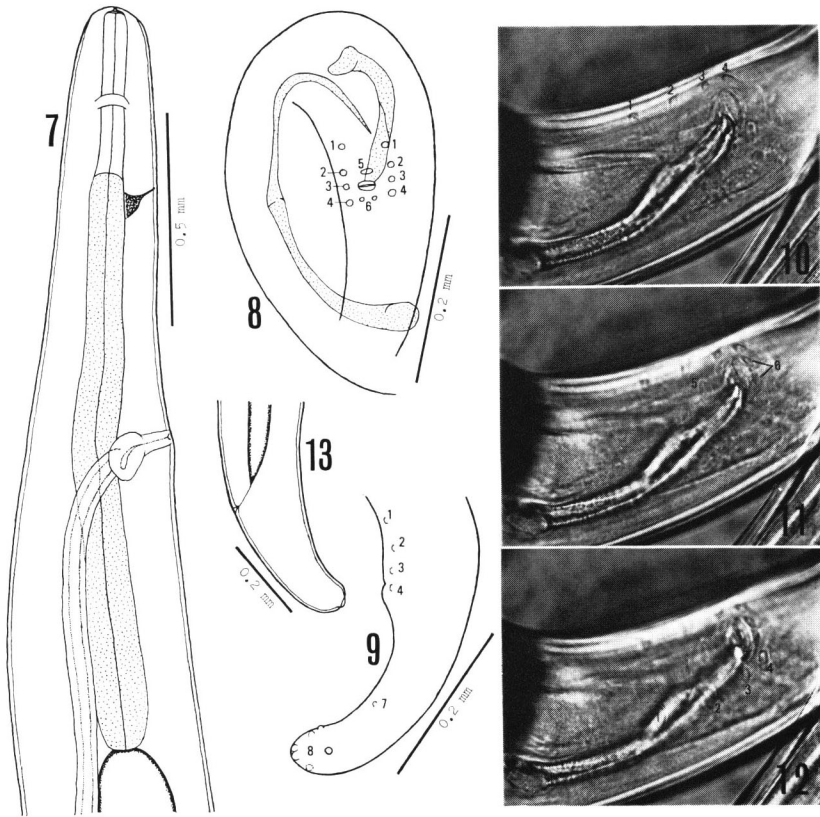
*Locality.* Odaitô, Hokkaido, Japan.

*Date.* 4–VII–1968.

*Specimen No.* NSMT–As–1427.

*Description.* Body filiform. Male smaller, spirally coiled posteriorly. Mouth tiny, circular, with four pairs of submedian cephalic papillae and a pair of lateral amphids. Buccal cavity shallow, pushpin-shaped, with sclerotized wall. Esophagus divided into two portions; the anterior short and muscular, the posterior long and glandular. Nerve ring near equator of muscular esophagus. Excretory pore near boundary between muscular and glandular esophagus.

*Male.* Body 90.6–92.2 mm long and 0.34–0.44 mm wide. Buccal cavity 0.013–0.018 mm long. Muscular and glandular esophagus 0.40–0.44 mm and 1.14–1.32 mm long, respectively. Nerve ring 0.26–0.31 mm from head end. Rod-like transverse bands on ventral surface anterior to spiral coil of posterior part of body. Caudal alae inconspicuous. Cloaca a little projecting like lips. Caudal papillae sessile. Four pairs of papillae on both sides of cloaca; of these three pairs are precloacal (Figs. 8–12: 1–3), more or less asymmetrical, and one pair postcloacal (Figs. 8–12: 4). A single, wide, median papilla (Figs. 8 & 11: 5) immediately anterior to cloaca. A pair of small papillae (Figs. 8 & 11: 6) just posterior to cloaca. Furthermore, a pair of papillae (Fig. 9: 7) on ventral surface at about middle of tail. Spicules unequal; right spicule stout, spatulate in posterior half, 0.25–0.28 mm long, and left spicule slender in posterior half but broader in anterior half, 0.50–0.62 mm long. Tail 0.25–0.28



Figs. 7-13. *Dipetalonema spirocauda* (LEIDY, 1858). — 7. Anterior part of female. — 8-12. Posterior part of male. — 13. Posterior part of female.

mm long, with a total of six papillae (Fig. 9: 8) on ventro-lateral surface at and around tail end.

**Female.** Body 163.0-170.0 mm long and 0.64-0.76 mm wide. Buccal cavity 0.013-0.015 mm long. Muscular and glandular esophagus 0.38-0.39 mm and 1.36 mm long, respectively. Nerve ring and excretory pore 0.23-0.26 mm and 0.40 mm from head end, respectively. Vulva opening near equator of glandular esophagus, 1.04 mm from head end. Tail curved dorsally, 0.28-0.32 mm long, with a dump process at end.

**Remarks.** ANDERSON (1959) discussed the taxonomy of *D. spirocauda*; later HELLE and BLIX (1973) examined this species by light and scanning electron microscopy, and found some individual variations in the arrangement of male caudal papillae. In normal pattern, five papillae are placed more or less on a longitudinal row lateral to the cloaca, and symmetrically on each side, three precloacal and two postcloacal. ANDERSON's description (1959) is based on a variant type. The present specimens seem to be included in the normal pattern of caudal papillae, but the posteriormost

pair is situated further back and more indistinct as compared with that described by ANDERSON (1959) and HELLE and BLIX (1973). In addition, two small papillae are observed just posterior to the cloaca in the present specimens, instead of three papillae in ANDERSON's specimens.

*Dipetalonema spirocauda* has been obtained from pinnipeds belonging to the family Phocidae from the coastal Pacific and Atlantic (SONIN, 1975). In Japan, NAKAMURA and MIKAMI (1967) collected 17 individuals of this species from the harbor seal at Obihiro Zoo, but did not describe the morphology of the worms.

### References

- ANDERSON, R. C., 1959. The taxonomy of *Dipetalonema spirocauda* (LEIDY, 1858) n. comb. (= *Skrjabinaria spirocauda*) and *Dirofilaria roemeri* (LINSTOW, 1905) n. comb. (= *Dipetalonema roemeri*). *Can. J. Zool.*, **37**: 481–493.
- HELLE, O., & A. S. BLIX, 1973. Some morphological characteristics of *Dipetalonema spirocauda* LEIDY, 1858, isolated from the hooded seal, *Cystophora cristata* ERXLEBEN, 1777. *J. Parasit.*, **59**: 217–218.
- KAGEI, N., & T. ODA, 1975. *Dipetalonema odendhali* PERRY, 1967 found from fur seal, *Callorhinus ursinus* (LINNAEUS, 1758). *Bull. Inst. Publ. Hlth.*, **24**: 203–205.
- MACHIDA, M., 1969. Parasites of the northern fur seal and their relationship to the breeding islands. *Proc. Jap. Soc. syst. Zool.*, (5): 16–17. (In Japanese, with English summary.)
- NAKAMURA, S., & N. MIKAMI, 1967. Filariasis (*Dipetalonema spirocauda*) in a harbor seal. *J. Jap. Ass. zool. Gar. Aquar.*, **9**: 51–52. (In Japanese, with English summary.)
- PERRY, M. L., 1967. A new species of *Dipetalonema* from the California sea lion and a report of microfilariae from a Steller sea lion (Nematoda: Filarioidea). *J. Parasit.*, **53**: 1076–1081.
- SONIN, M. D., 1975. Osnovy Nematodologii. T. 24. Filariaty zhivotnykh i cheloveka i vzyvyaemyimi zabolevaniia. 1–396 pp. Moscow, Nauka. (In Russian.)

