

Research Note

On the Helminths from Raccoon Dogs in Japan

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A helminthological survey was made by the necropsy-examination of three wild Japanese raccoon dogs, *Nyctereutes procyonoides* Gray, which died by traffic accident in Machida-city of Tokyo, Japan. The first raccoon dog (male, 4.2 kg in body weight, autopsied on November 30, 1982) had 2 filarid worms (juvenile females) in the heart, the second one (female, 3.5 kg in body weight, autopsied on December 6, 1982) had 17 hookworms (7 males and 10 females) in the small intestine and 63 ascarid worms (29 males and 34 females) in the duodenum, and the third one (female, 3.6 kg in body weight, autopsied on March 16, 1983) was found to harbour 12 hookworm (4 males and 8 females) in the small intestine and capillarid eggs in the rectal content. By the following morphological characteristics and measurements of the nematodes, they were identified as *Dirofilaria immitis* (Leidy, 1856) (Dirofilarinae, Nematoda), *Arthrostoma miyazakiense* (Nagayoshi, 1955) (Arthrocephalinae, Nematoda), *Toxocara tanuki* Yamaguti, 1941 (Toxocarinae, Nematoda) and eggs of *Capillaria* sp. (Capillarinae, Nematoda) respectively.

Toxocara tanuki whitish, slender and of

median size (12.7-48.8×0.27-1.27 mm in male; 9.9-49.8×0.27-1.12 mm in female), usually curled up at tail end of male, distinctly attenuated toward head in both sexes. Cuticle with fine transverse striations throughout the length. Head rounded at the end and narrower than neck. Three well-defined lips with dentigerous ridges; interlabia absent. Esophagus divided into the anterior muscular portion (3.48-3.69×0.26-0.44 mm in male; 2.85-3.95 mm long in female) and the posterior ventricular portion (0.41-0.50×0.27-0.32 mm in male; 0.38-0.42 mm long in female). Ventricular appendix and intestinal caecum absent. Tail of female pointed conically, 0.74-0.8 mm long; tail of male conical, 0.24-0.27 mm long, with two constrictions, bearing five postanal papillae (with one double papilla) on each side. Spicules equal in length and shape, 3.38-3.55 mm long, gubernaculum absent. Vulva 12.85-14.24 mm (27.6-38.1% of body length) from anterior extremity in female 36.7-49.8 mm in body length. Uterine eggs subglobular, 80 (71-89)×67 (60-73) μm, with pitted surface.

This ascarid species was first found from the small intestine of *N. procyonoides* captured near Kyoto and described by Yamaguti (1941) as a new species due to the distinct differences in the number of postanal papillae, the length of spicules and the size of eggs and the position of

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vulva, from the closely species *Toxocara canis*. The present worms differ from *T. canis* and agree with *T. tanuki* described by Yamaguti (1941) except for the size of eggs. Although this species was reported from 16 raccoon dogs in Okayama prefecture by Nagahana *et al.* (1976), the present paper is the first record of this species in Tokyo.

Arthrostoma miyazakiense whitish, rather small and slender (4.52–5.15×0.17–0.23 mm in male; 6.48–7.09×0.23–0.27 mm in female) with fine transverse cuticular striations, 7–8 μm apart. Mouth opening anterodorsally, buccal capsule (61–78×53–61 μm in male; 72–93×57–63 μm in female) composed of 10 articulated plates and lacking in teeth or cutting plates. Muscular portion of esophagus 266–324×98–116 μm in male and 577–622×131–138 μm in female. Spicules slender and tubular, 1.11 to 1.29 mm long, within transversely striated sheaths, ending in a sharp point. Gubernaculum club-shaped, 116 μm long. Vulva situated 2.40–2.58 mm (36.4–39.6% of body length) from posterior end of body, protected by an upper small flap of cuticle. A single, spherical prevulval papilla situated at right angle. Tail 192–226 μm long, having a sharp spine, 21–28 μm long, at caudal end. Eggs not embryonated, 73 (68–81)×43 (42–46) μm when laid, 66–73×40–41 μm in uterus, and similar to those of other hookworms in shape.

Two species of the hookworms were collected from the raccoon dogs in Miyazaki prefecture and named *Ancylostoma kushimaense* and *Necator miyazakiense* by Nagayoshi (1955) firstly as new species, and later Yoshida and Arizono (1976) found the latter species from raccoon dogs in Kyoto prefecture and Hokkaido, re-described in detail and transferred it from the genus *Necator* Stiles, 1903 to the genus *Arthrostoma* Cameron, 1927. The same species was reported later by Noda and Kugi (1980) from *N. procyonoides* and

Vulpes vulpes japonicus collected from Oita prefecture and Kitakyushu-city. Except for these reports, we can not find any other papers about *A. miyazakiense* from raccoon dogs. Therefore, this is a new zoogeographical record of this species from raccoon dogs.

One female specimens of *Diriofilaria immitis* (the other specimen without posterior half of body) 67.45 mm in length and 0.30 mm in width; nerve ring 0.23 mm from anterior end of body; esophagus 1.02 mm in length; vulva situated 1.36 mm (2.02% of body length) from anterior end; tail length 0.15 mm. This immature female not having the microfilaria in the uteri.

D. immitis occurs frequently in dogs of Japan. However, there are only a few reports that raccoon dogs harbored *D. immitis* in Japan (Itagaki and Kume, 1938; Noda, 1951; Asai, 1960; Kato, 1961 and Hayasaki and Oishi, 1982). Hayasaki and Oishi (1982) observed that the females of this species collected from raccoon dogs had the microfilariae in their uteri, and Asai (1960) found the microfilariae in blood at the necropsy of the raccoon dogs. As there are some reports of human cases of *D. immitis* infections in Japan (Yoshimura, 1983), it will be suggested that the filarid worms of raccoon dogs are important as infection source for the human.

The eggs of *Capillaria* sp. brown and cylindrical barrel-shaped, 63–73×28–31 μm . The shell thick, 8–9 μm , the external layer covered with a network of small fissures. Transparent protruding opercula present at each pole, the width of opercula 8–9 μm . The egg not segmented when passed in feces.

A report on capillarid nematodes found from the Japanese raccoon dog is only one paper of Yamaguti (1935) in which the worms were named as *Capillaria* sp. However, these nematodes were found from the urinary bladder of this host. So, although the present ova observed in the feces seem

to differ from those of Yamaguti (1935), the size of eggs were almost equal to each other. And further, when raccoon dogs eat prey animals that parasitized with *Capillaria* spp., the eggs of *Capillaria* will be passed into the stool of the predators temporarily, because most of prey animals harbour *Capillaria* parasites.

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短 報

本邦産タヌキの寄生蠕虫類について

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東京都町田市で捕獲された3頭のタヌキの寄生蠕虫類について調査を行い、犬糸状虫 (*Dirofilaria immitis*) の幼若虫、ミヤザキタヌキ鉤虫 (新称) (*Arthrostoma miyazakiense*)、タヌキ回虫 (*Toxocara tanuki*) の各成虫及び *Capillaria* sp. の虫卵を見出した。ミ

ヤザキタヌキ鉤虫、タヌキ回虫、*Capillaria* sp. の東京産タヌキからの報告は始めてであり、また犬糸状虫は人畜共通寄生虫の問題ともからみ、保虫宿主であるタヌキが人への感染源として重要であることを報告した。