NOTE

Diplostomulum of Pharyngostomum cordatum in the Muscle of a Raccoon Dog Nyctereutes procyonoides

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From the muscle of a raccoon dog captured in Gifu Prefecture, Japan, was a metacercaria (=diplostomulum), found encysted by the host tissues and possessing a conspicuous tribocytic organ and also calcareous granules. The diplostomulum was identified as that of Pharyngostomum cordatum. No adult worm was recovered when the diplostomula were fed to puppies. This is the first report of a diplostomulum in the muscle of a raccoon dog. —Key words: Diplostomulum, Raccoon dog.


Metacercariae of strigeoid trematodes are generally found in the muscles and visceral organs of fish, amphibia and reptiles. As far as we are aware of, the only metacercaria that has ever been reported from mammals in Japan is that of Tetracotyle sp. from Mustela sibirica itatsi (2). We present in this report a metacercaria (=diplostomulum) of a strigeoid trematode recovered from a raccoon dog Nyctereutes procyonoides and an attempt to obtain the adult worm.

The metacercariae were released from the cysts in the diaphragm muscle of a raccoon dog, which died in a traffic accident in October 1983, in Gifu Prefecture, Japan, with optical forceps under a disection microscope. The removed metacercaria was fixed in Bouin's fixative and stained with Semichon's carmine. Measurement of the mounted metacercaria was made with a camera lucida. A portion of the muscle containing the cyst was fixed in 10% formalin, dehydrated in an ethanol series, cleared in xylene and embedded in paraffin. Sections of 5 μm thickness were made and then stained with either hematoxylin-eosin or periodic acid-Schiff (PAS) stains. An attempt to obtain the adult worms was carried out by inoculating two female puppies of six weeks of age with 29 and 30 metacercariae each. The puppies were exsanguinated under pentobarbarbital anaesthesia 39 days after inoculation. Their alimentary tracts, diaphragm and lungs were examined for parasites.

Gross examination of the fresh diaphragm of the raccoon dog showed yellowish-white spots of about 2 mm in diameter in the muscle. Under the microscopic examination, the metacercariae could be seen moving inside the cysts. The mounted specimen of the metacercaria measured 627×445 μm. The oral sucker measured 40×62 μm, pharynx 40×51 μm, acetabulum 40×40 μm and tribocytic organ 151×129 μm. The metacercaria had a bifurcate caecum which extended down to the level just below the tribocytic organ. The tribocytic organ was very conspicuous and the acetabulum lay anteriorly to it. The excretory vasicle was well defined and H-shaped (Figs. 1 & 2). The whole body was
filled with spherical or ellipsoid calcareous granules (Fig. 3). There was no lateral sucker nor ear-like appendage near the oral sucker.

Histological sections revealed that the metacercaria was encysted by fibroblasts, lymphocytes, eosinophils, neutrophils and plasma cells. There was no true cyst of parasite origin (Fig. 4).

No trematode eggs were observed in the feces of the puppies inoculated with the metacercariae. At necropsy, no trematode could be recovered from the puppies.

From the above observation and the result of the feeding experiment, we concluded that the metacercaria was a diplostomulum of Diplostomidae. A diplostomulum has been defined as the metacercaria of Diplostomidae with no true cyst of parasite origin, showing reserved bladder of well defined tubules having a regular pattern and possessing spherical bodies in small diverticula arising from the main trunks (1). Thus, it is possible that this diplostomulum belongs to the genus Diplodotum, Tylophilid, Hysteromorpha, Alaria, Pharyngostomum or Fibricola. However, with the exception of the case in Alaria mustelae, whose diplostomulum has been found naturally in Peromyscus leucopus nubberia, Mustela vison and Procyon lotor, the diplostomula of these genera are generally found only in fish, amphibia and reptiles (6). Therefore, the presence of diplostomula in the muscle of a raccoon dog is a new finding.

Since we were not able to recover the adult worm from the puppies, it is not provable that the diplostomulum in the raccoon dog is of the genus Alaria because the dog serves as the definitive host for most species of this genus.
However, the metacercariae of *Pharyngostomum cordatum* have been reported from frogs and snakes in the western parts of Japan (3,4). Thus, considering the zoogeographical distribution and the almost identical morphological appearance of our metacercaria to that of *P. cordatum*, it is most probable that the metacercaria found in the raccoon dog is of *P. cordatum*.

It has been reported that the metacercariae of *P. cordatum* from either frogs or snakes, when fed to white rats, migrated into the diaphragm and became encapsulated without any change in structure (5). Kurimoto (3) was able to recover adult worms of *P. cordatum* from cats but not from dogs after infecting the animals with metacercariae from muscle of *Rana*. This implies that if our metacercaria is of *P. cordatum*, then it would not be surprising that we failed in our feeding experiment.

Therefore, the raccoon dog may serve as a paratenic host for *P. cordatum* in Japan.

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REFERENCES

要約

タヌキから検出された壷形吸虫 Pharyngostomum cordatum のメタセルカリア (diplostomulum)（短報）：ウイ・ホンキエン・神谷正男・工藤忠明1)・橋本 見2)・北沢 馨3)（北海道大学獣医学部家畜寄生虫病学教室, 1)岐阜大学農学部家畜外科学教室, 2)同附属家畜病院）——1983年10月、岐阜市で得たタヌキの横隔膜からメタセルカリア（=diplostomulum）が検出され、宿主由来の組織によって被囊され、顕著な tribocytic organ を持つ。形態学的特徴から、本吸虫は壷形吸虫 Pharyngostomum cordatum と同定された。仔犬に diplostomula を経口投与したが成虫は回収されなかった。タヌキからの本吸虫メタセルカリアの検出はこれが最初であり、本邦においてタヌキが壷形吸虫の寄生宿主となることが示唆された。