

# Studies on the Avian Nematodes in Korea(I)

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韓國産 野鳥에 寄生하는 線蟲類에 관한 研究(第一報)

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= 국문초록 =

한국산 야조에 기생하는 윤충류에 관한 연구는 주들(1973)에 의해 흡충류 일부만이 기록되어 있을 뿐 그외에는 거의 분류학적인 연구가 되어 있지 않은 실정이다. 따라서 저자들은 1990년 1월부터 1990년 3월에 걸쳐 경기도, 강원도 및 경북등지에서 채집한 야조 5종으로부터 기생윤충류를 조사하였으며, 수집된 윤충류중 일단 선충류 3종을 분류, 기재하였다.

채집된 야조의 종류는 *Garrulus glandarius brandtii*, *Cyanopica cyanus koreensis*, *Otus scops stictonotus*, *Asio flammeus flammeus*, *Buteo buteo japonicus* 등이다.

동정된 선충류의 종류는 *Acuariidae*과의 *Dispharynx nasuta*(male & female), *Spiruridae*과의 *Excisa excisa*(male & female), *Fillariidae*과의 *Diplotrinaena manipoli*(male & female) 등 3종이며, 이들 3종은 모두 우리 나라에서는 처음 기록되는 종들이다.

## INTRODUCTION

Nematodes constitute large number of species in avian parasites and badly damage to poultry. So the taxonomic study on the avian parasites is fundamental and important work for further researches.

Yamaguti(1961) described 25 families of nematodes from 9 orders in the world avian species and Brus et al.(1978) classified nematodes which parasitized fish-eating birds in Palaeartic region.

Besides there are lots of studies on the avian nematodes in the world.

Up to date, however, there have been no published accounts of avian nematodes in Korea.\* There is only one paper about several species of avian trematodes by Chu et al.(1973)).

Therefore authors made a taxonomic study on the avian helminths in Korea and first described three species of nematodes in this paper.

These three species are the first record in Korea.

## Materials and Methods

The wild birds were collected in the period of January, 1990-March, 1990 and the species list is follows :

*Garrulus glandarius brandtii* Eversman, 1842

*Cyanopica cyanus koreensis* Yamashina, 1939

*Onus scops stictonotus*(Sharpe), 1875

*Asio flammeus flammeus*(Pontoppidan), 1763

*Buteo buteo japonicus*(Temminck & Schlegel), 1844

The nematodes collected from these birds were cleared in the glycerin-alcohol and stored in the complete glycerin.

## Results

Family Acuariidae Seurat, 1913

Type genus : *Acuaria* Bremser, 1811

Family distinguished from all other Spiruroidea by the presence of cordons that originate at the sides of the lips. The family contains 27 genera whose members are parasites of the digestive tract of birds.

Genus *Dispharynx* Railliet, Henry et Sisoff, 1912

Type species : *Dispharynx nasuta*(Rudolphi, 1819)

The genus includes more than 20 species in the world. Four species(*D. capitata*, *D. emberizae*, *D. laplantei*, *D. nasuta*) have been recorded in Japan. Among them, *D. nasuta* is cosmopolitan.

*Dispharynx nasuta*(Rudolphi, 1819)

Syn. *Spiroptera nasuta* Rudolphi, 1819

*Dispharynx spiralis*(Molin, 1858)

Body length 6.2-6.5 mm in male and 7.3-7.4 mm in female. Body width 0.25-0.30 mm in male, 0.48-0.50 mm in female. The posterior portion

of male rolled in spiral. Cuticle thick transversely striated.

Four wavy cuticular cordons on anterior end recurrent and not anastomosing. The descending cordons 4.4-4.7 mm in male and 0.53-0.58 mm in female. The ascending cordons 3.0-3.3 mm in male and 0.38-0.45 mm in female. Head with two small triangular lips and a pair of small papillae. The muscular part of esophagus 0.70-0.75 mm and glandular part 2.10-2.15 mm in male.

There are nine pairs of caudal papillae in male, four preanal, five postanal. The last papilla on postanal region is very small and the other papillae are similar length. The longer spicule is about 0.48-0.50 mm and the shorter spicule 0.18-0.20 mm in length.

The tail of female about 0.15 mm long and sharply protruded. The vulva about 1.65 mm from the posterior end.

Eggs 0.030-0.037×0.020-0.022 mm.

Host : *Onus scops stictonotus*, *Garrulus glandarius brandtii*, *Cyanopica cyanus koreensis*

Habitat : wall of proventriculus

Locality : Kanghwa, P'och'on Kyonggi-do ; Hongch'on Kang-won-do

## Discussion

*Dispharynx spiralis*(Molin, 1858) is regarded as a synonym of *D. nasuta* by many authors and we also followed these opinions.

Yamaguti(1935) reported *D. emberizae* as a new species, but the description of this species is scarcely distinguished with the description of *D. nasuta*. Only the egg size of *D. emberizae* is larger than that of *D. nasuta*. The egg sizes of our specimens are more similar with *D. nasuta* than *D. emberizae*(Table 1).

Jang(1976) recorded *Acuaris spiralis* which parasitized in poultry, but this record had no taxonomic description and probably this would be a species of *D. nasuta*.

Table 1. Comparison of description among *Dispharynx* spp.

Character	Sex	<i>D. emberizuo</i> by Yamaguti (1935)	<i>D. nasuta</i> by Barus et al. (1978)	Author's
Body length	m	6~8 mm	4.1~8.0 mm	6.2~6.5 mm
	f	6.4~7.7 mm	3.47~9.21 mm	7.3~7.4 mm
Esophagus muscular		0.46~0.66 mm	0.41~0.88 mm	0.70~0.75 mm
		1.54~2.17 mm	1.46~2.07 mm	2.10~2.15 mm
Spicule longer		0.39~0.49 mm	0.395~0.482 mm	0.48~0.50 mm
		0.15~0.16 mm	0.120~0.189 mm	0.18~0.20 mm
Eggs length		0.039~0.042 mm	0.028~0.038 mm	0.030~0.037 mm
		0.022~0.025 mm	0.016~0.018 mm	0.020~0.022 mm
Vulva		3.0~4.4 : 1 divides body length	1.0~1.66 mm from posterior end	1.65 mm from posterior end

Family Spiruridae Oerley, 1885

Type genus : *Spirura* Blanchard, 1849

The family contains 36 genera which primarily are parasites of mammals. A few forms are parasites of birds and reptiles.

Genus *Excisa* Gendre, 1928

Type species : *Excisa excisa* (Molin, 1860)

The genus comprises three species and *E. excisa*. *E. excisiformis* were recorded in Japan.

*Excisa excisa* (Molin, 1860)

Syn. *Cymeia excisa* Molin, 1860

*Physaloptera striata* Linstow, 1883

Body length 9.6~11.0 mm in male and 17.2 mm in female. Body width 0.30 mm in male, 0.45 mm in female.

Two lips, ventral and dorsal. Bucal cavity cylindrical. 0.045~0.050 mm long in male, 0.055 mm in female. Esophagus divided into two parts, muscular part 0.44~0.45 mm long, glandular part 2.95~3.10 mm long in male.

Caudal alae supported on each side with four

large preanal papillae and one large postanal papillae.

The length of short spicule about 0.45 mm and long spicule about 1.50 mm. Vulva located slightly posterior to mid-body.

Eggs 0.041~0.046×0.019~0.022 mm.

Host : *Otus scops sictonotus*, *Asio flammeus flammeus*, *Buteo buteo japonicus*

Habitat : proventriculus

Locality : Kanghai, P'och'on Kyonggi-do

## Discussion

Yamaguti(1935) reported *Excisa excisiformis* as a new species. The differences between *E. excisa* and *E. excisiformis* are body size, number of papillae, length of spicules, breadth of eggs, etc.

The body and spicules length of our specimens are longer than *E. excisiformis*. The breadth range of eggs in our specimens is more adjust to *E. excisa* than *E. excisiformis*(Table 2).

Family Filariidae Claus, 1885

Type genus : *Filaria* Mueller, 1787

Table 2. Comparison of description among *Excisa* spp.

Character	Sex	<i>E. excisiformis</i> by Yamaguti (1935)	<i>E. excisa</i> by Barus et al. (1978)	Author's
Body length	m	8.0~8.4 mm	15.4~20.0 mm	9.6~11.0 mm
	f	11.6~11.95 mm	18.8~26.0 mm	17.2 mm
Body width	m	0.37~0.39 mm	0.40~0.60 mm	0.30 mm
	f	0.57~0.60 mm	0.55~0.72 mm	0.45 mm
Bucal cavity	m	0.022~0.028 mm	0.056~0.095 mm	0.045~0.050 mm
	f			0.055 mm
Spicule				
	longer	1.05~1.12 mm	1.80~2.50 mm	1.50 mm
shorter		0.39~0.42 mm	0.50~0.63 mm	0.45 mm
Eggs				
	length	0.040~0.046 mm	0.042~0.051 mm	0.041~0.046 mm
	length	0.040~0.046 mm	0.042~0.051 mm	0.041~0.046 mm
width	0.025~0.028 mm	0.018~0.024 mm	0.019~0.022 mm	

The species of this family are tissue parasites, and arthropods, generally insects of the order Diptera, may be their vectors.

The family contains 46 genera which are parasitic in all groups of vertebrates except fishes.

Genus *Diplotriaena* Railliet et Henry, 1909

Type species: *Diplotriaena ozouzi* Railliet et Henry, 1909

Four species (*D. bargusinica*, *D. manipoli*, *D. monticola*, *D. nipponensis*) are recorded in Japan.

*Diplotriaena manipoli* Chu, 1931

Body cylindrical, rounded at both ends. Body length 36.0~37.2 mm in male and 120~125 mm in female. Body width 0.5 mm in male, 0.85~1.0 mm in female. Body cuticle entirely smooth.

Head round, with one lateral amphid on either side. The head has three-forked chitinous structure which called trident on each side of anterior region. The length of trident 0.087~0.093 mm in male, 0.093 mm in female.

Nerve ring lies 0.2 mm from the head end. Muscular esophagus extended to posterior margin of nerve ring.

The spiral spicule 0.85~0.87 mm long and straight spicule 0.95~0.97 mm long. The vulva located 0.57~0.60 mm from the head end.

Eggs 0.058~0.060×0.040 mm.

Host: *Garrulus glandarius brandtii*

Habitat: body cavity

Locality: Namyangju Kyonggi-do:

Ch'unch'on Kang-won-do

## Discussion

The comparisons between Yamaguti(1935) and

Table 3. Comparison of *D. manipoli* description between Yamaguti(1935) and Author's

Character	Sex	Yamaguti(1935)	Author's
Body width	m	34~38mm	36.0~37.2mm
	f	88~126mm	120~125mm
Body width	m	0.5~0.6mm	0.5mm
	f	0.8~1.0mm	0.85~1.0mm
Length of trident		0.084~0.105mm	0.087~0.093mm
Spicule			
	spiral	0.75~0.88mm	0.85~0.87mm
straight		1.12~1.28mm	0.95~0.97mm
Vulva		0.45~0.56mm from anterior end	0.57~0.60mm from anterior end
Eggs			
	length	0.051~0.058mm	0.058~0.060mm
width		0.036~0.040mm	0.038~0.040mm

author's are follows (Table 3).

*Garrulus branchis* and *Garrulus glandarius japonicus* were recorded as the host species of *D. manipoli* (Chu, 1931 and Yamaguti, 1935) and *Garrulus glandarius brandtii* is recorded as a new host species of *D. manipoli* by present work. From this we can suppose that the species belong to the genus of *Garrulus* are representing host species of *D. manipoli*.

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### =ABSTRACTS=

#### Studies on the Avian Nematodes in Korea(I)

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From five species of wild birds which were collected in the period of January, 1990 - March, 1990, three species of nematodes were identified.

The three species were *Dispharynx nasuta* (Rudolphi, 1819) in Acuariidae, *Excisa excisa* (Molin, 1860) in Spiruridae and *Diplotrriaena manipoli* Chu, 1931 in Fillaridae.

They are the first recording species in Korea and the morphological characters of each species (male & female) are described.

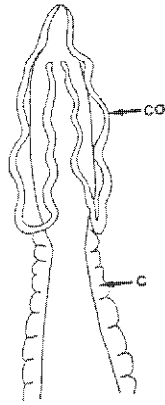


Fig. 1

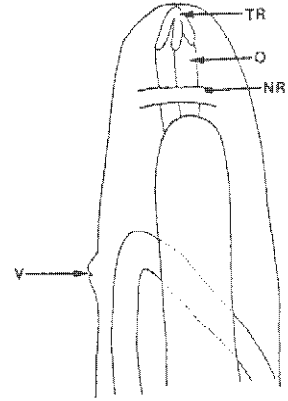


Fig. 5

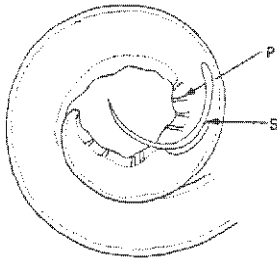


Fig. 2

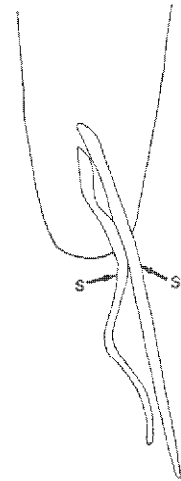


Fig. 6

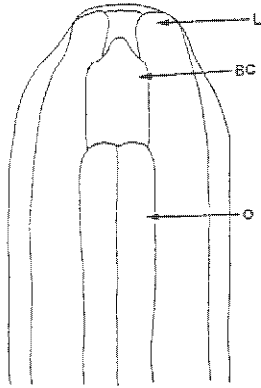


Fig. 3

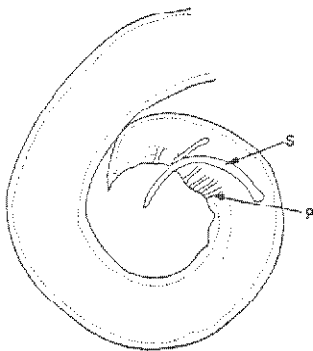


Fig. 4

Fig. 1-2. *Dispharynx nasuta*.

1-Anterior part of female (CO : cordon, C : cuticle)

2-Posterior part of male (P : papilla, S : spicule)

Fig. 3-4. : *Excisa excisa*.

3-Anterior part of male

(L : lip, BC : bucal cavity, O : oesophagus)

4-Posterior part of male (S : spicule, P : papilla)

Fig. 5-6. : *Diplotrianea manipoli*.

5-Anterior part of female

(TR : trident, O : oesophagus, NR : nerve ring, V : vulva)

6-Posterior part of male (S : spicule)