

## NEMATODES OF FARM-RAISED PHEASANTS (*Phasianus colchicus* L.) AND SUPPRESSION MEASURES

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**Summary:** Helminthoses have an important role in the pathology of farm-bred pheasants. During the period 2009-2011 we examined a total of 693 pheasant chicks up to 14 weeks of age and 466 birds above 14 weeks of age by parasitological necropsy at 8 pheasantries in Serbia. A total of 216 samples of faeces from birds 4-14 weeks of age and 348 samples of faeces from birds above 14 weeks of age were examined using sedimentation and flotation concentration technique. The following nematode species were found: *Syngamus trachea*, *Ascaridia galli*, *Ascaridia columbae*, *Heterakis isolonche*, *Heterakis gallinarum*, *Capillaria gallinae*, *Capillaria columbae* and *Capillaria phasianina*. The optimal results in therapy were gained by applying anthelmintic drugs (mebendazole, fenbendazole, levamisole, tetramizolchloride, cambendazole, tiabendazole, pyranteltartarat and piperazine) mixed with food..

**Key words:** *Phasianus colchicus*, nematodes, therapy

### Introduction

Parasitoses caused by helminths produce health problems in wild-raised and farm-raised pheasants. Nematode infection is the most frequent infection transmitted throughout intermediate host to pheasants. Worldwide researches have shown that helminths normally occur in farm-raised pheasants and have an important place in the pathology of these birds [1, 2, 3, 4, 6, 7, 8, 21]. In Serbia, the prevalence of parasites was examined by Nevenić, and Pavlović et al. [12, 14, 15, 16, 18].

We had a possibility to control helminth infections in the farm environment by using various anthelmintic drugs mixed with food [8, 14]. In this paper we give an outline of nematode diseases of farm-reared pheasants and measures for the parasite suppression.

### Material and Methods

The investigation was carried out in 8 pheasantries in Serbia in the period 2009-2011 using samples of faeces and dead pheasants. A total of 348 samples of faeces from birds above 14 weeks of age and 216 samples of faeces from birds 4-14 weeks of age were examined using sedimentation and flotation concentration technique [20]. A total of 693 pheasants up to 14 weeks of age and 466 pheasants above 14 weeks of age were examined by parasitological necropsy.

The keys given by Soulsby [19] were used for the classification of nematodes

After a diagnosis, one of the following anthelmintic was mixed with food: mebendazole, fenbendazole, cambendazole, levamisole, pyranteltartarat, tetramizolchloride or piperazine. The therapeutic efficacy of the anthelmintic drugs was examined by coprological examination and necropsy.

### Results and Discussion

Infection with nematodes was found in 37.92% of the pheasants up to 14 weeks of age old and in 31.40% of pheasants above 14 weeks. Polyparasitism involving two species was detected in 28.01% pheasants up to 14 weeks of age and in 29.25% of birds above 14 weeks.

The following nematode species were found: *Syngamus trachea*, *Ascaridia galli*, *Ascaridia columbae*, *Heterakis isolonche*, *Heterakis gallinarum*, *Capillaria gallinae*, *Capillaria columbae* and *Capillaria phasianina*.

The most prevalent nematodes in pheasants up to 14 weeks of age were: *Syngamus trachea* (36.09%) and *Heterakis isolonche* (28.917%), then *Ascaridia galli* (14.68%), *Heterakis gallinarum* (12.04%), *Ascaridia columbae* (8.28%), *Capillaria gallinae* (3.97%), *Capillaria columbae* (3.37%) and *Capillaria phasianina* (3.29%) (Figure 1).

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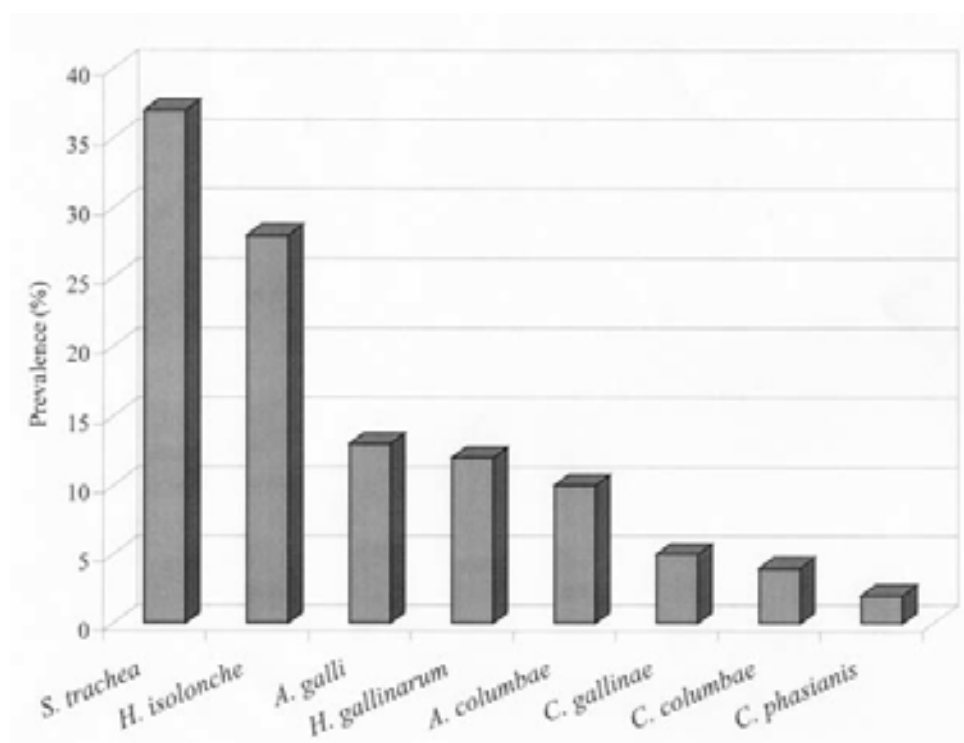


Figure 1. Prevalence (%) of nematode species in pheasants up to 14 weeks of age

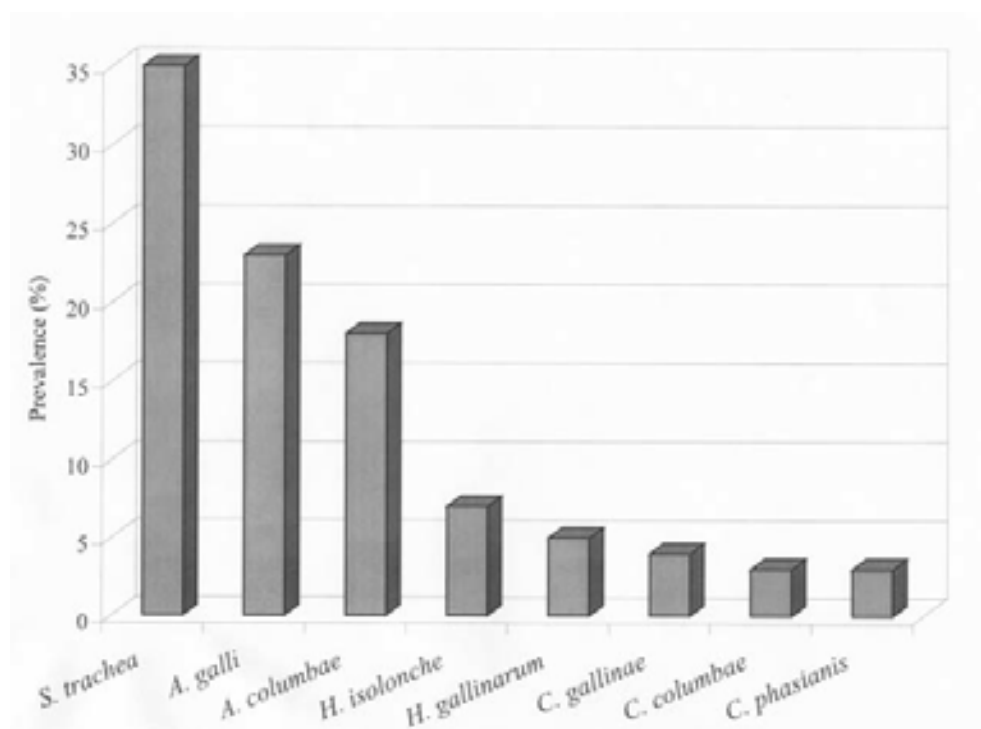


Figure 2. Prevalence (%) of nematode species in pheasants above 14 weeks of age.

We usually found clinical signs of disease in the group of young pheasants, especially when the infection had strong intensity. The birds with intestinal nematodes had diarrhea and were markedly emaciated and generally weak. The characteristic signs of gapeworm infection were dyspnoea and asphyxia. The birds shook and tossed their heads about and might have been caught, or they were

extending the neck, opened the beak and performed gaping movements. In cases of severe infection the mortality reached 19%.

Pheasants above 14 weeks of age were infected with the same nematode species (Figure 2). The most abundance species (34.85%) was *Syngamus trachea*, followed by *Ascaridia galli* (22.56%) and *Ascaridia columbae* (16.34%), *Heterakis isolonche* (6.04%), *Heterakis gallinarum* (4.09%), *Capillaria gallinae* (3.97%), *Capillaria columbae* (3.37%), and *Capillaria phasianina* (3.29%)

Pathological changes were similar to those described by Schmäsckke [4], Hospes [7], Florestean [8], Floristean et al. [9], Menzes et al. [11], and Pavlović et al. [17]

The obvious pathological effect of those nematode diseases in both pheasant populations requires decision on the optimal way of treatment of the infected flocks.

After the parasitological examination we mixed suitable anthelmintic drugs with food (as a premix) [3, 8, 12, 17].

Simple infections with *Ascaridia galli* or *Ascaridia columbae* were treated most efficiently with piperazine with dosage of 250 mg/kg given at once, and again after 14 days. The therapeutic effect of piperazine was completely successful (Table 1).

Table 1. Efficacy of used anthelmintic drugs

Nematode species	anthelmintic drugs					
	mebendazole	fenbendazole	levamisole	tiabendazole	tetramizole	piperazine
<i>Syngamus trachea</i>	+++	+++	+++		+++	
<i>Ascaridia galli</i>	+++	+++	+++	+++	+++	+++
<i>Ascaridia columbae</i>	+++	+++	+++	+++	+++	+++
<i>Heterakis isolonche</i>	+++	+++	+++	+++		
<i>Heterakis gallinarum</i>	+++	+++	+++	+++	+++	
<i>Capillaria gallinae</i>	+++	+++	+++		+++	
<i>Capillaria columbae</i>	+++	+++	+++		+++	
<i>Capillaria phasianina</i>	+++	+++	+++		+++	

Legend:

+++ 100% efficacy, ++ up to 90% efficacy, + up to 80% efficacy, - les of 75% efficacy

When ascaridiosis was present with other nematode species, we treated it using tetramizole and levamisole with 20-30 mg/kg of dry food. Mebendanzole was used for 3 successive days in a dosage of 8 mg/kg of food. Cambendazole was added in dosage of 60 mg/kg and pyranteltartarat in dosage of 100 mg/kg of feed. All the anthelmintic drugs resulted in 100% elimination of parasites [8, 12, 17]

Gapeworm infection was the most common infection in both populations of pheasants. In both cases the best therapeutic effects were achieved with mebendazole given for 3 days in dosage of 30 mg/kg of feed (100% efficacy). Fenbendazole given for 3 days in a dosage of 20 mg/kg or at 100 mg/kg in a single dose gave full therapeutic efficacy. Better results were obtained with tetramizole given for one day in a dosage of 1.5 mg/kg or at 0.15% concentration for 6 days. Levamisole in a dosage of 20 mg gave successful results [8, 17].

Capillariosis was treated with mebendazole in the feed in a dosage of 30 mg/kg for 3 days. Tetramizolechloride at 40 mg/kg gave a 95% of reduction of infection, while fenbendazole in a dosage of 20 mg/kg for one day had a 100% therapeutic effect. Similar results were obtained with levamisole in a dosage of 30 mg/kg [8, 17].

Heterakidosis in both populations was treated with several anthelmintic drugs. Mebendazole mixed with food was successfully used in a therapeutic dosage of 30 mg/kg. Fenbendazole was given for one day at 100 mg/kg of food or at 20 mg/kg for 3 days and had an efficacy of 97%. Thiabendazole (0.3-1.5 mg/kg) and levamisole (20 mg/kg) was very efficient against hetarakis in more than 90% of cases [17]. Comparing the results obtained with the results of other examinations we concluded that the results are similar [1, 2, 5, 6, 7, 13, 21].

Therapy with medicated food is the only efficient method to control the presence of these nematode parasite species in farm-reared pheasants [8, 12]. This was confirmed here by examination of the infected flocks after treatment.

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