MOST FREQUENT NEMATODE PARASITES OF ARTIFICIALLY RAISED PHEASANTS (PHASIANUS COLCHICUS L.) AND MEASURES FOR THEIR CONTROL

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Helminthoses have an important role in the pathology of artificially raised game pheasants. During the period 1997-2002, we examined a total of 1893 pheasant poults aged from 4 to 14 weeks and 1432 adult birds at several pheasanteries in Serbia.

The following nematode species were found: Syngamus trachea, Ascaridia galli, A. columbae, Heterakis gallinarum, H. isolonche, Capillaria gallinae (sin. C. caudinflata), C. columbae (sin. C. obsignata) and C. phasianis.

The intensity of infection in total was not high, except for infection with ascaridata and gapeworms, and depended on age of the examined birds.

Consisting of anthelmintic drugs mixed with meal gave the most favourable results in therapy on the medicated food.

Key words: pheasants, Phasianus colchicus, nematodes, therapy

INTRODUCTION

Parasitoses caused by helminths produce health problems in free-living and artificially raised pheasants. Nematode infestation is the most frequently infection transmitted through intermediate host to the pheasant population. Earlier examination have shown that helminths normally occur in farm bred pheasants and occupy an important place in the pathology of these birds (Bejšovec, 1971; Okulewicz and Modrzejewska, 1980; Kazacos et al., 1986; Chroust, 1990; Schrike, 1991). In Serbia, the prevalence of parasites was earlier examined only by Nevenić (1960), Pavlović (1990a, 1990b, 1991) and Pavlović et al. (1992, 1995, 1996).

During artificial breeding we have the possibility to control helminth infections using various anthelmintic drugs mixed in the feed for pheasants. In this paper we give an outline of the nematode fauna of artificially raised pheasants and measures for its control.

MATERIAL AND METHODS

The investigation was carried out in 12 pheasanteries in Serbia in the period 1997-2002, using samples of faeces and dead pheasants. Samples of faeces...
were collected monthly from the bird flocks and examined using the sedimentation and flotation concentration technique as described by Euseby (1981). A total of 1893 pheasants up to 14 weeks old and 1432 adult pheasants were examined by parasitological necropsy.

The keys given by Soulsby (1977) were used to classify the helminths found. After diagnosis one of the following anthelmintics: mebendazole, fenbendazole, levamizole, cambendazole, pyrantel tartrate, thiabendazole, tetramizol chloride or piperazine was at once mixed in the feed.

The therapeutic efficacy of the anthelmintic drugs was examined at necropsy and by coprological examination.

RESULTS AND DISCUSSION

Infection with helminths we found in 41.83% (792/1893) of the pheasants up to 14 weeks old and in 33.03% (473/1432) of the adult pheasants. Polyparasitism involving by two species was detected in 341 (18.01%) pheasants up to 14 weeks old and in 343 (23.95%) adult birds.

The following nematode species were found: *Syngamus trachea* (Montagu, 1811), *Ascaridia galli* (Schrank, 1788), *Ascaridia columbae* (Gmelin, 1790), *Heterakis gallinarum* (Schrank, 1788), *Heterakis isolonche* (Schrank, 1798), *Capillaria gallinae* (sin. *C. caudinflata*) (Kowalewski, 1859), *Capillaria columbae* (sin. *C. obsignata*) (Rudolphi, 1818) and *Capillaria phasianis* (Kotlan, 1940).

In pheasants up to 14 weeks old the most prevalent was *Syngamus trachea* (37.19%), followed by *Heterakis isolonche* (27.97%), *Ascaridia galli* (12.98%), *H. gallinarum* (11.14%) and *Ascaridia columbae* (10.28%) (Figure 1). Other nematode species were found in less then 10% of the birds. In these young pheasants group, especially when the infection was of strong intensity, we usually found clinical signs of disease. With intestinal helminths the birds had diarrhea and were markedly emaciated and generally weak. For gapeworm infection the characteristic signs were dyspnoea and asphyxia. The birds shake and toss their heads about and may be caught, or they extend the neck, open the beak and perform gaping movements. With serious infection the mortality reached 15%. Pathological changes were similar to those described by Valenza (1975), Pavlović (1991), Pavlović et al. (1996), Florestean et al. (2001) and Florestean and Pavlović (2003).

Adult pheasants, were infected with the same parasite species but the intensity of infection (except with *Syngamus trachea* and *Ascaridia galli*) was not sufficient to induce clinical signs of disease. *Syngamus trachea* was the most abundant species (34.45%), followed by *Ascaridia galli* (23.06%) and *Ascaridia columbae* (18.19%). *Heterakis isolonche* (7.41%) and *H. gallinarum* (4.57%) were less prevalent than in younger birds (Figure 2).

The evident pathological role of those helminthoses in both pheasant populations necessitated decision on the optimal way to treat the infected flocks. After the parasitological examination we mixed suitable antiparasitic drugs in the feed (as a premix) (Cosoaraba and Ciolofan, 1985).

Simple infections with *Ascaridia galli* or *A. columbae* were treated most efficiently with piperazine at 250 mg/kg at once, and 14 days later again. In cases of
Pavlović I et al. Most frequent nematode parasites of artificially raised pheasants (*Phasianus colchicus* L.) and measures for their control.

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

**Figure 2.** Prevalence of nematode species in adult pheasants (%)

Nematode species
mixed infection we used a wide spectrum anthelmintic like mebendazole or fenbendazole. Ascaridosis alone was recorded in 7.71% of the younger and 8.23% of the adult birds. The therapeutic effect of piperazine was completely successful. When ascaridosis was present with other nematode helminth species we treated with tetramisole and levamisole at 20-30 mg/kg of dry food. Mebendanzole was used for 3 successive days in a dosage of 8 mg/kg of feed. Cambendazole was added at 60 mg/kg and pyranteltartarat at 100 mg/kg of feed. All the anthelmintic drugs gave 100% elimination of parasites.

Gapeworm infection was the most common infection in both populations of pheasants. In both cases the best therapeutic effects were with mebendazole given for 3 days at 30 mg/kg of feed (100% efficacy). Fenbendazole administered for 3 days in a dose of 20 mg/kg or at 100 mg/kg in a single dose gave full therapeutic efficacy. Favourable 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. Levamizole in a dosage of 20 mg gave successful results.

Heterakidosis in both population was treated with several anthelmintic drugs. Mebendazole mixed in the feed was successfules used in a therapeutic dosage of 30 mg/kg. Fenbendazole was given for one day at 100 mg/kg of feed or at 20 mg/kg for 3 days and had an efficacy of 97%. Thiafilmazide (0.3-1.5 mg/kg) and levamizole (20 mg/kg) was very efficient against hetarakis in more than 90% of cases.

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 the parasite, while fenbendazole in a dosage of 20 mg/kg for one day had a 100% therapeutic effect. Similar results were obtained with levamizole in a dosage of 30 mg/kg.

Comparing the results obtained with those of other similar examinations (Bickford and Gaffar, 1966; Franck, 1977; Pence et al., 1980; Perilo, 1980; Githokopoulus, 1984a,b), we concluded that the helminth species found, which excluded Ornythostrongylus quadriradiatus, have a worldwide distribution with a similar rate of infection. These nematode species have a wide range of distribution in the bird population and have been found in pigeons, fowls and other free living and breeding bird species (Bejšovec, 1971; Okulewicz and Modrezejawska, 1980). The same parasites species occurred in pigeons in Serbia (Kulišić, 1988, 1989a, 1989b; Kulišić et al., 1996) and in domestic fowls (Pavlović et al., 1997a). Many intermediate hosts (arthropods) and free living breeding birds infected with these helmint species allow transmission to the pheasant populations artificially bred (Bejšovec, 1976; Pavlović et al., 1990c).

Therapy with medicated feed is the only efficient method to control the presence of theses nematode parasites species in farm bred pheasants (Kirsch, 1985; Kulišić et al., 1993; Lamka et al., 1997). This was confirmed here by examination of the infected flocks after treatment.

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