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RESEARCH NOTE

Occurrence of gastrointestinal and pulmonary nematodes of fallow deer (*Dama dama* L.) in North-West Poland

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Abstract

The study was aimed at evaluating the extent of gastrointestinal and pulmonary helminth infections in the fallow deer in North-West Poland. Infection prevalence and intensity as well as the species composition of helminth fauna were determined. During about 2-year period, since March 2000 until February 2002, a total number of 52 animals and 98 faecal samples were examined. The fallow deer were shot during routine culls in 9 forest districts. We have found 12 gastrointestinal and 2 lung nematode species in fallow deer in NW Poland. The most common gastrointestinal species were *Oesophagostomum venulosum*, *Spiculopteragia boehmi*, *Haemonchus contortus* and *Nematodirus* spp. Other species were determined in a lower intensity. Two lung nematode species *Elaphostrongylus cervi* and *Varestrongylus sagittatus* were found, with their prevalence 59.6% and 46.1%, respectively.

Key words

Gastrointestinal and pulmonary nematodes, fallow deer, Poland

Gastrointestinal and lung nematodes are most common fallow deer parasites. So far, occurrence in fallow deer in NW Poland has not been studied. This contribution can thus be regarded as an additional source of data on fallow deer alimentary and lung nematodes in Poland. The aim of this study was determination of the prevalence and intensity of nematode infections as well as elucidation of the species composition of the parasitic fauna of alimentary tract and lungs of fallow deer in Poland.

Animals for this study were obtained from 9 forest districts in NW Poland. During about 2-year period, since March 2000 until February 2002, a total of 52 fallow deer were shot and biopsied. Parasitological examination was conducted following methods of Eckert (1983). The gastrointestinal helminths were permanently mounted in polyvinylpyrrolidone (PVP) on slides to facilitate taxonomic identification (Bueding *et al*. 1966). Special criteria were applied for identifying nematodes of the subfamily Ostertagiinae. Only male individuals were identified and the sex ratio (females:males) was determined (Barth and Matzke 1984). The lungs were cut into pieces and washed out with physiological solution (0.9% NaCl). For helminth eggs with the McMaster and Willis-Schlaaf method 98 faecal samples were collected from the recta and examined. The Baermann's technique was used to diagnose lungworm larvae from the faecal samples as also applied by Demiaszkiewicz (1986).

Results concerning the prevalence of gastrointestinal and lung nematodes are presented in the Table I. Additionally, the results of coproscopical examination of gastrointestinal nematodes are shown in Table II. The examined 52 fallow deer showed presence of 12 species of gastrointestinal and 2 lung helminths of the family Protostrongylidae. Only male specimens of gastrointestinal nematodes belonging to subfamily Ostertagiinae were determined. The sex ratio of males to females was 1:2.1.

Study on fallow deer parasitic fauna in NE Poland by Dróżdż (1966) recorded the presence of 14 gastrointestinal nematode species. The prevalence of individual species rang-

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Table I. The prevalence of gastrointestinal and pulmonary nematodes in fallow deer in North-West Poland

	Number of infected animals	Prevalence (%)	Range of intensity
Gastrointestinal nematodes			
Spiculopteragia boehmi	16	30.76	10–100
S. mathevossiani	2	3.84	20–30
S. asymmetrica	8	15.3	10–20
Ostertagia kolchida	2	3.84	20–30
O. leptospicularis	1	1.92	20
Haemonchus contortus	2	3.84	20–40
Chabertia ovina	4	7.69	10–40
Oesophagostomum venulosum	27	51.9	10–320
Nematodirus spp.	4	7.7	20–50
Trichocephalus ovis	5	9.67	20–80
Capillaria bovis	2	3.84	10
Trichostrongylus axei	1	1.92	20
Pulmonary nematodes			
*Elaphostrongylus cervi**	31	56.6	20–110
*Varestrongylus sagittatus**	24	46.15	10–90

*Results obtained according to Baermann's method.

Table II. The results of coproscopical examination of fallow deer in North-West Poland (gastrointestinal nematodes)

Number of faecal samples examined	Number of samples infected	Prevalence (%)	Number of positive samples (McMaster's method)	Intensity range (EPG)
98	71	72.4	50	5–205

EPG – eggs/g of faeces.

ing within 7–100%. Dróżdż *et al*. (1998) found that alimentary tract nematode infections concerned 12–100% of the fallow deer at the breeding station localized in Kosewo. These animals were infected with pulmonary nematodes too, in 5% with *Elaphostrongylus cervi*, 3% with *Varestrongylus sagittatus* and 8% with *Dictyocaulus noerneri* (Olsztyn region). Later, in the same region Demiaszkiewicz *et al*. (2000) observed *D. noerneri* in 40% of animals examined. Kozakiewicz *et al*. (1983) in coproscopical examination in Wielkopolska found gastrointestinal nematodes in 81.8–100% and lung nematode, *Dictyocaulus viviparus* in 40.1–49.7% of fallow deer examined. Research data published by Misiewicz and Demiaszkiewicz (1993) in the Olsztyn and Silesian forests showed: *E. cervi* in 62.2%, *V. sagittatus* in 12% and *D. noerneri* in 7.6% of fallow deer in Olsztyn forest region. In Silesian forest area, however, *E. cervi* was present in 38.5% and *D. noerneri* in 10% of fallow deer. Further examination carried on the same regions by Misiewicz (1994) showed occurrence of *E. cervi* in 43.9% of fallow deer in Olsztyn forest and in 69.1% in Silesian area. In the former Czechoslovakia Kotrlá and Kotrlý (1980) recorded 21 gastrointestinal nematode species in the fallow deer; the prevalence of infection amounted 0.5–60.9%. More recent studies on the prevalence of parasites in fallow deer were made in Slovenia (Vengušt 2003, Vengušt and Bidovec 2003). Vengušt and Bidovec (2003) recorded 16 species of gastrointestinal helminths in free living animals. Vengušt (2003) analysed the prevalence of gastrointestinal nematodes of fallow deer in two enclosures. He found the same species as in free living animals and the most frequent nematodes were *Spiculopteragia asymmetrica*, *O. venulosum* and two species of *Ostertagia*: *O. ostertagi* and *O. leptospicularis*. It is noteworthy that Vengušt (2003) and Vengušt and Bidovec (2003) did not find pulmonary nematodes in fallow deer of Slovenia. Barth and Matzke (1984) showed that in Germany fallow deer were infected with 16 gastrointestinal nematode species and the most frequent species was *O. radiatum* (in 94%). Also in Germany Ribbeck and Haupt (1989) examined the fallow deer both in wild and in restricted breeding centres. Nematode infection in the latter was more intensive and variable. According to those authors, the dominant species in case of gastrointestinal nematodes was *S. asymmetrica* and from lung worm only *Dictyocaulus* spp. was determined.

The present study showed that the fallow deer in NW Poland was infected with 12 gastrointestinal nematode species (Table I). The infection by particular species reached from

1.92 to 51.9% of animals. The most frequent species were *O. venulosum*, *S. boehmi* and *S. asymmetrica*. The prevalence of gastrointestinal nematodes evaluated by means of coproscopical methods was 72.4% (Table II). In the lungs of the fallow deer 2 species of pulmonary nematodes of the family Protostrongylidae: *E. cervi* and *V. sagittatus* were found. The prevalence of *E. cervi* was 56.6% and *V. sagittatus* was 46.1% (Table I).

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