

## Short notes

## Occurrence of tapeworms of the family Anoplocephalidae in herds of dairy cattle in Lesser Poland and in Lower Silesia, Poland

Jolanta Piekarska, Marian Kuczaj<sup>1</sup>, Magdalena Wereszczyńska,  
Michał Gorczykowski, Krzysztof Janeczko<sup>2</sup>, Katarzyna Płoneczka–Janeczko<sup>3</sup>

Division of Parasitology, Faculty of Veterinary Medicine, Wrocław University of Environmental and Life Sciences, 31 Norwida Street, 50-375 Wrocław, Poland

<sup>1</sup>Institute of Animal Breeding, Faculty of Biology and Animal Breeding, Wrocław University of Environmental and Life Sciences, 38 C Chełmońskiego Street, Wrocław, Poland

<sup>2</sup> Department of Reproduction and Clinic for Farm Animals, Faculty of Veterinary Medicine, Wrocław University of Environmental and Life Sciences, 49 Grunwaldzki Square, 50-366 Wrocław, Poland

<sup>3</sup>Department of Epizootiology with Clinic of Birds and Exotic Animals, Wrocław University of Environmental and Life Sciences, 45 Grunwaldzki Square, 50-366 Wrocław, Poland .

Corresponding autor: Jolanta Piekarska; E-mail: jolanta.piekarska@up.wroc.pl

**ABSTRACT.** This study was performed to determine the tapeworm infection of grazing cattle in 11 dairy herds in Lower Silesia and Lesser Poland (Galicia). Rectal faecal samples were examined microscopically for tapeworm eggs by Willis-Shlaaf's flotation, Telemann's sedimentation (for fatty stools) and decantation method. Out of 182 cattle, 10 (5.5%) were found to be infected with tapeworms. The prevalence in 5 of 11 examined herds varied from 15.5 to 30.5% and was highest for animal being in the first lactation. Tapeworm eggs were detected in animals being in the first and second lactation (about three- to four-years-old cows). All the qualitative methods were effective in the diagnosis of tapeworm infection in cattle.

**Key words:** Anoplocephalidae tapeworm eggs, dairy cattle, faecal samples

### Introduction

Cestodes and the gastrointestinal nematodes are an important threat to the productivity and welfare of dairy cattle. Infected animals show reduction of food intake, and milk losses could reach 0.6 kg per day [1]. *Moniezia benedeni* and *Moniezia expansa* are large tapeworms of the Anoplocephalidae family, occurring in ruminants in Europe, Asia, Africa, America and Australia [2]. The adult parasitize in the small intestine of ruminants, and the cysticercoids larvae develops inside Oribatoidea mites appearing in a large numbers (several thousand per 1m<sup>2</sup> surface) in pastures. *Moniezia* infection of sheep in several countries is a serious

breeding problem [3,4]. Tapeworms occurring in cattle cause intestinal diseases that greatly impair the value of production and breeding [5,6]. Infections with *Moniezia* spp. is a current problem, especially in the grazed cattle, because of the prevalence of intermediate hosts in wet pasture ecosystems. In adult dairy cattle infections are most often subclinical course therefore antiparasitic prophylaxis or treatment is overlooked in herd health program.

The aim of this study was to assess the degree of contamination of selected dairy herds from different regions of Poland with tapeworms of the Anoplocephalidae family.

## Materials and Methods

Coproscopical examinations were conducted in October and November 2011 in a 11 (3 from Lower Silesia and 8 from Lesser Poland) dairy cattle herds. The material consisted of 182 rectal faecal samples. The percentage of examined faecal samples of each herd varied from 32 to 73 depending on its size. The grazing period started between April and May, and ended in November 2011. Faeces samples were examined macroscopically for proglottids and microscopically for tapeworm eggs by Willis-Shlaaf's flotation, Telemann's sedimentation (for fatty stools) and decantation method. Chi-square tests was used for statistical analysis.

$P < 0.01$  values were considered significant. The confidence limits (confidence level: 95%,  $P < 0.05$ ) of infection frequencies (%) were calculated according to the modified Wald method [7].

## Results and Discussion

In the macroscopic examination there were no tapeworm proglottids detected. Faeces examination with 3 different qualitative methods showed presence of the tapeworm eggs in 5 out of 11 examined herds. The percentage of infected cows was: 17.5% (2<sup>nd</sup> herd), 15.5% (3<sup>rd</sup> herd), 16.4% (6<sup>th</sup> herd), 30.5% (7<sup>th</sup> herd) and 19.7% (11<sup>th</sup> herd) (Table 1). The analysis of results from the infected herds indicated that the prevalence could correlate with the age of cows. Therefore, animals from the infected herds were divided into two groups depending of the age: group I included animals in the first lactation (19 cows), and group II after first lactation (66 cows). There were 6 infected animals in the group I and 4 in the group II. Chi-square tests showed that the frequency of infection in animals in

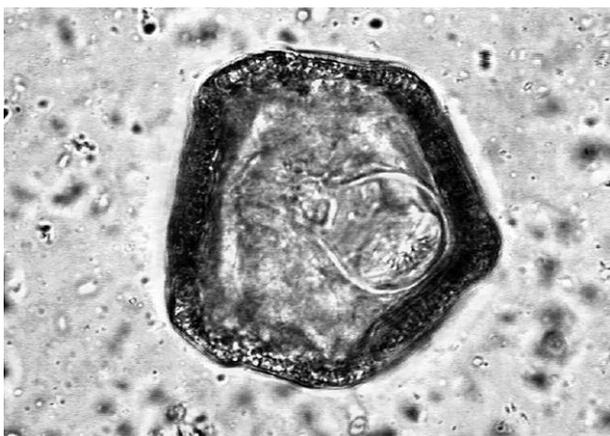


Fig. 1. *Moniezia* sp. egg. Magnification 400×

the group I was significantly higher than in the group II ( $\chi^2=6.96$ ,  $P < 0.01$ ). Anti-parasitic drugs like oxfendazol, albendazol or fenbendazol were used in 3 of 5 infected dairy herds. Tapeworm infections were found in both treated or not treated flocks, suggesting insufficiency of the applied preventive measures and confirming the presence of the parasite in the environment. The tapeworm eggs can survive on pastures from 49 up to 91 days in the temperature of 5.8–14.6°C and humidity of 65.3–76.7% [8]. Experimental incubation of eggs in the temperature of 4°C for 1–5 weeks reduces their viability, as well as decreases infection rates and infection intensity in mites from Oribatoidea family [9]. It was shown that the infected intermediate host can survive in the environment up to 7 months [10]. Irregular quadrangular shape of Anoplocephalidae family eggs with well defined pyriform apparatus makes diagnosis difficult (Fig. 1). Earlier studies carried out in Poland in 1999 and 2000 detected the tapeworm eggs in 3.4% of examined dairy cattle [6]. The present study demonstrated the presence of tapeworm eggs within 10 of 182 examined samples of faeces, which constitutes 5.5% of investigated animals. The infected animals came from 5 dairy herds, 2 of which were from Lower Silesia and 3 from Lesser Poland. The study has shown that grazing housing system and associated contamination of pastures most significantly enhance further spread of the invasion and maintenance of tapeworms in herds. The tapeworm infection should be regarded as a risk factor for grazing cattle in the surveyed regions of Poland and should be taken into consideration in preventive against parasites.

## References

- [1] Gross S.J., Ryan W.G., Ploeger H.W. 1999. Anthelmintic treatment of adult dairy cows and its effect on milk production. *Veterinary Record* 144: 581-587.
- [2] Zhang H., Zhao W.J., Kang L.C., Wang X.H., Bo X.W. 2010. Characterization of a *Moniezia expansa* ubiquitin-conjugating enzyme E2 cDNA. *Molecular Biology Reports* 37: 1585-1590.
- [3] Becker B., Mehlhorn H., Andrews P., Thomas H. 1981. Ultrastructural investigations on the effect of praziquantel on the tegument of five species of cestodes. *Zeitschrift für Parasitenkunde-Parasitology Research* 64: 257-269.
- [4] Połec W. 1990. Immunological studies on lambs experimentally infected with *Moniezia expansa*. *Acta Parasitologica Polonica* 35: 333-339.

Table 1. Cattle herds in Lower Silesia<sup>1</sup> and Lesser Poland Region examined for Anoplocephalidae tapeworm eggs (2011)

	Herd size	No. of tested faeces samples/ No. of positive samples	Mean age of cows in the herd		Infection Frequencies (CI <sup>**</sup> )	Mean no. of eggs in examined samples			Anti-parasitic prophylaxis recently used
			Mean No. of lactation in herd	Mean No. of lactation of infected animals		flotation	sedimentation	decantation	
I <sup>1</sup>	90	30/0	3.1	-		-	-	-	Spring 2008
II <sup>1</sup>	54	30/4	2.6	1.2	17.5% (4.7-30.3)	4	18	2	-
III	28	15/1	5.6	1.0	15.5 % (0-31.8)	23	5	2	Spring 2011
IV	40	21/0	2.9	-		-	-	-	Autumn 2010
V	76	22/0	3.8	-		-	-	-	Spring 2010
VI	30	20/2	4.1	2.0	16.4% (1.6-31.3)	2	1	1	Spring 2010
VII	14	9/2	2.8	1.5	30.5% (5.3-55.7)	5	8	3	Autumn 2010
VIII	13	9/0	5.1	-		-	-	-	Spring 2011
IX	11	8/0	3.9	-		-	-	-	Spring 2010
X	10	7/0	4.3	-		-	-	-	Spring 2011
XI <sup>1</sup>	30	11/1	3.0	1.0	19.7% (0-39.9)	4	3	3	-

<sup>\*\*</sup>CI = 95% confidence limits according to the modified (adjusted) Wald method

- [5] Kozakiewicz B. 1976. Extent of monieziasis in large-herd farms. *Wiadomości Parazytologiczne* 22: 161-164.
- [6] Romaniuk K., Wojtaszewska K., Stark D. 2001. Internal parasites in Lowland-black and white and Red-Polish cattle. *Medycyna Weterynaryjna* 57: 288-289.
- [7] Sauro J. 2005 Confidence Interval Calculator for a completion rate. Measuring usability. <http://www.measuringusability.com/wald.htm#marg>, Accessed: 30.12.2010.
- [8] Jelenova I. 1991. The effect of temperature and relative humidity on survival of eggs of the cestode, *Moniezia expansa* (Rudolphi, 1810). *Veterinarni Medicina*

*na* 36: 291-296.

- [9] Xiao L., Herd R.P. 1992. Infectivity of *Moniezia benedeni* and *Moniezia expansa* to Oribatid mites from Ohio and Georgia. *Veterinary Parasitology* 45: 101-110.
- [10] Połec W., Moskwa B. 1994. Development of early larval forms of *Moniezia expansa* under laboratory conditions. *Wiadomości Parazytologiczne* 40: 153-157.

Received 19 February 2012

Accepted 6 April 2012