

OCCURRENCE AND SEASONALITY OF DOMESTIC SHEEP GASTRO-INTESTINAL PARASITES*

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The aim of this study was to determine the occurrence and seasonality of gastro-intestinal parasites in domestic sheep (*Ovis aries*). From March 2009 to February 2010, a survey of the parasitological state in flock of the Romanov sheep (15 rams, 15 ewes and 15 lambs) in village in the northern Czech Republic had been studied. Of all the parasites in this study, the genus *Trichostrongylus* was the most common representative (58% for ewes and 69% for rams). The ram group had the highest values of the genus *Trichostrongylus* in May and October. For ewes, the highest prevalence was in April. The lambs had the highest prevalence of the genus *Eimeria* (91%).

parasites; prevalence; *Trichostrongylus* spp.; *Eimeria* spp.; Czech Republic

INTRODUCTION

With a rising world population and economic development, the global demand for meat, milk and other animal products is increasing dramatically. Controlling parasitic diseases in livestock, in particular helminth infections, could rapidly improve productivity and resource utilization (Piedrafitá et al., 2010). Sheep can be parasitized by a diverse range of parasites, with well over 150 species of internal and external parasites reported worldwide (Taylor, 2010). The most important endoparasitic disease seen in sheep, is parasitic gastroenteritis (PGE), which is caused by a range of gastrointestinal (GI) nematodes, as it is of a significant cost for sheep farming (West et al., 2009). Therefore, the aim of this study was to observe the situation in a flock of sheep to determine main genera of parasites of sheep in the Czech Republic. Results can be applied subsequently for finding strategy: how to fight with parasites of sheep.

MATERIALS AND METHODS

In this research occurrence of parasites in flock of the Romanov sheep that is bred in some upland village on the north area of the Czech Republic was investigated. From this flock 45 subjects were chosen. Sheep were divided to 3 groups: 15 rams, 15 ewes,

15 lambs. Faeces from sheep were collected every month, from March 2009 to February 2010.

The samples of faeces were examined by the McMaster egg counting technique according to Permin and Hansen, 1998 with using flotation medium (saturated NaCl + 500 g of glucose per 1 liter of NaCl). Results were processed in program Microsoft Excel, where we counted prevalence, average, minimum, maximum for every group of parasites in sheep (Figs. 1–3).

RESULTS AND DISCUSSION

We found genera: *Trichostrongylus*, *Strongyloides*, *Trichuris* (Nematoda), *Eimeria* (Coccidia).

Of all the parasites in this study, the genus *Trichostrongylus* (Fig. 4) was the most common representative. Similar results can be find in the studies in Canada, where were found predominant nematode genera – *Trichostrongylus*, *Teladorsagia*, *Haemonchus* (Mederosa et al., 2010) and in Australia, where for the majority of sheep *Trichostrongylus* spp. and *Teladorsagia circumcincta* were represented (Roebber et al., 2011). In Italy for sheep, a total of 23 species of helminths were identified belonging to the family of Trichostrongylidae, with the genera *Trichostrongylus*, *Haemonchus*, *Ostertagia* (*Teladorsagia*), *Cooperia* and *Nematodirus* (Torina et al., 2004). In our

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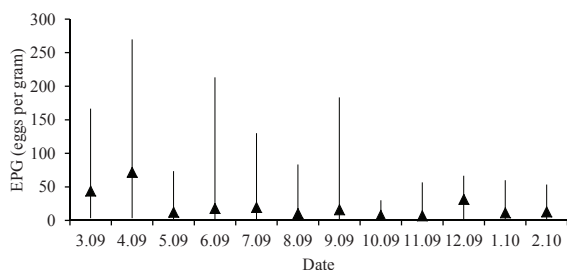


Fig. 1. Minimum, maximum and average of *Trichostrongylus* spp. in ewes

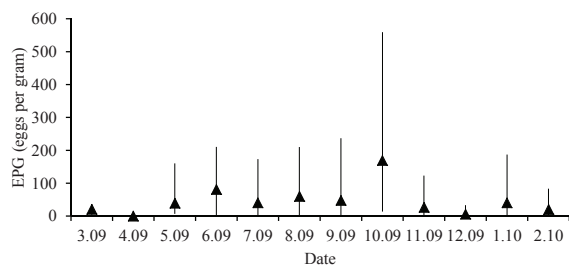


Fig. 2. Minimum, maximum and average of *Trichostrongylus* spp. in rams

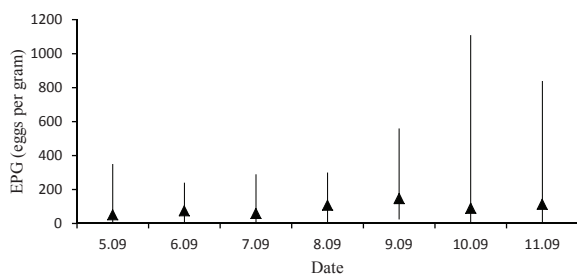


Fig. 3. Minimum, maximum and average of *Eimeria* spp. in lambs

study the highest average prevalence of the genus *Trichostrongylus* was found in ewes (58%) and in rams (69%). In India ova of strongyles were predominant in adult sheep, too (K h a j u r i a et al., 2009). Prevalence of *Trichostrongylus* spp. in Kenya was similar to our study, 55% (N g ' a n g ' a et al., 2004). However, in Poland prevalence of the *Trichostrongylus* spp. was lower, 17.65% (P i l a r z y k et al., 2008).

Lower values occurred in the genus *Strongyloides* (Fig. 5) (average prevalence was 25% of rams) and the lowest prevalence was evident with respect to *Trichuris* spp. (Fig. 6), where its average prevalence was 12% in lambs. Similar situation for prevalence was in the Slovak Republic, in the Tulus (Sudan) and in Egypt. In the Slovak Republic *Strongyloides papillosus* (28.4%) and *Trichuris* spp. (9.7%) were identified (C e r n a n s k a et al., 2005). In the Tulus sheep had prevalence of *Strongyloides papillosus* 26.2% and prevalence of *Trichuris* spp. was lower, only 0.1% (A l m a l a i k et al., 2008). In Egypt prevalence of *Trichuris ovis* was a little bit lower than in our study, 5.8%. Other result was in Turkey, prevalence of *Trichuris ovis* was 72% (U n u r , Y u k a r i , 2005). According to sex and age, in the Ethiopian study were no significant differences in the mean intensity of each nematode species (including *Strongyloides papillosus* and *Trichuris ovis*) between males and females, and young and adult sheep (S i s s a y et al., 2007).

Prevalence of the genus *Eimeria* (Fig. 7) was 60.75% for all sheep groups in our study. In Poland in comparative study the mean prevalence of infestation with *Eimeria* spp. protozoa in sheep from ecological farms was 67.74% and in sheep from conventional farms was 35.29% (P i l a r z y k et al., 2008). In China the overall prevalence of coccidial infection was 92.9% (287/309) for sheep (W a n g a et al., 2010). The high-

est average prevalence of the genus *Eimeria* (91%) was in lambs in our observation. Results are similar in studies in Turkey (O z d a l et al., 2009), in Slovakia (V a s i l k o v a et al., 2004) and in Iran. In Iran intensity of the infection by *Eimeria* spp. was significantly higher in young sheep compared with older animals (Y a k h c h a l i et al., 2008). But in the Austrian ewes (prevalence was 20–60%) excreted significantly fewer *Eimeria* spp. oocysts than yearlings (prevalence was 38–73%) (P l a t z e r et al., 2004).

Seasonality

The ram group had the highest values of the genus *Trichostrongylus* in May and October, these values decreased in the following month. For ewes, the highest prevalence was in April, later the values fell to below 60% until January 2010. Lambs had the highest prevalence in August and September. In Canada were results similar, because EPGs of family Trichostrongylida were higher in seasons May–June for ewes and July–August for lambs (M e d e r o s a et al., 2010). In Sweden, eggs of *Trichostrongylus* spp. were much more prevalent in ewe faecal samples taken in spring than in autumn (L i n d q v i s t et al., 2001), like in our research.

The genus *Strongyloides* values reached a maximum in the autumn months for groups of ram and lamb groups, the ewes occurred sporadically with a peak in March 2009. In the Ethiopia, there were significant differences between the wet and dry seasons, more *Strongyloides papillosus* in wet season (S i s s a y et al., 2007). But in Nigeria strongyloides species were encountered throughout the year in sheep irrespective of the season (N w o s u et al., 2006).

Genus *Trichuris* occurred irregularly with maximum values appearing in late summer and autumn in all groups. In Egypt similar result was found (K h a l a f a l l a et al., 2010). Other result was in Turkey, where the infection level of the *Trichuris* spp. was not uniform throughout the season, but increased slightly in May, July, September and January and remained at minimum levels in the other months of the year (U m u r , Y u k a r i , 2005).

In our research the number of *Eimeria* spp. was reaching a maximum prevalence for the lamb group in April, May, September and November 2009 (100%)

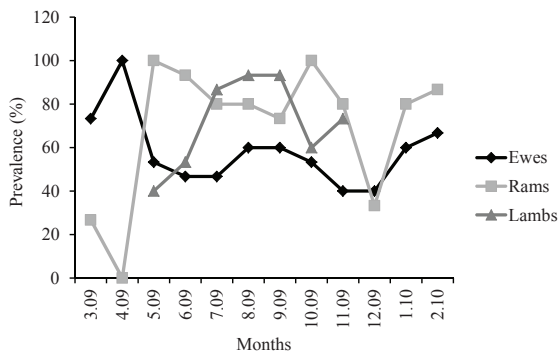


Fig.4. Prevalence and seasonal dynamics of *Trichostrongylus* spp.

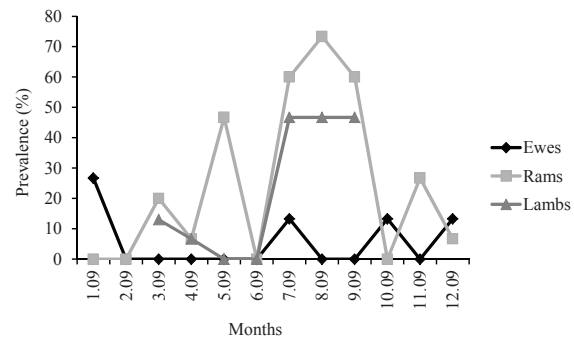


Fig.5. Prevalence and seasonal dynamics of *Strongyloides* spp.

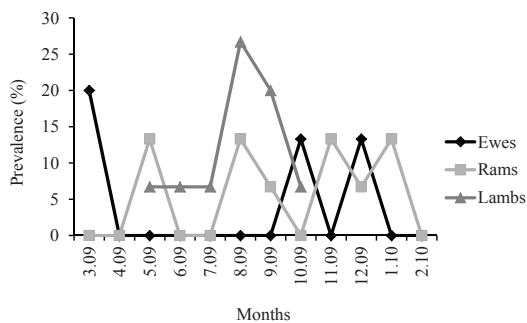


Fig.6. Prevalence and seasonal dynamics of *Trichuris* spp.

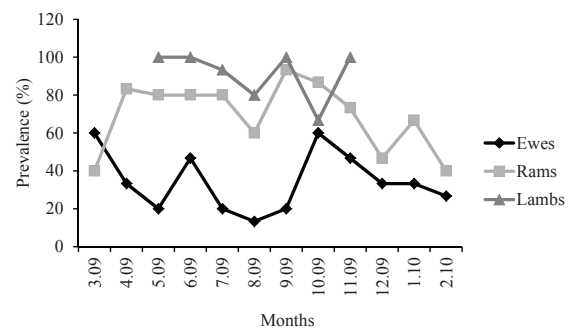


Fig.7. Prevalence and seasonal dynamics of *Eimeria* spp.

and was decreased in August and in the winter months. Ram group had high prevalence of this genus from June to October (80–93.3%). Ewes have had peaks of *Eimeria* spp. in March, June and October. In the South Africa the highest mean values for sheep were recorded during March (Bakunzi et al., 2010). But in Brazil (Rio de Janeiro) was high prevalence of coccidiosis in the months of November, December and January (Cosendey et al., 2008). Although these studies were conducted in other climatic conditions, the results are similar to those of our work.

CONCLUSIONS

It is clear that the genus *Eimeria* is important parasite for lambs. On the other side for adult ewes and rams are serious parasites Nematoda, specifically order Strongylida, genus *Trichostrongylus*. Treatment of lambs should be concentrated on coccidia and treatment of adult sheep on Nematoda. The biggest development of these parasites was in the spring and in the autumn. This fact confirmed many other works. To treat the sheep in the early spring is important.

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Výskyt a sezónnost gastrointestinálních parazitů u ovce domácí

Scientia Agric. Bohem. 43, 2012, 104–108

Cílem naší práce bylo prozkoumat výskyt a sezónnost parazitů ovce domácí (*Ovis aries*) na vybrané farmě v České republice. Od března 2009 do února 2010 byla zkoumána parazitologická situace ve stádu Romanovských ovcí (15 beranů, 15 bahnic, 15 jehňat) na soukromé farmě v blízkosti města Liberec. Ze všech druhů zkoumaných parazitů byl nejvíce zastoupen rod *Trichostrongylus* (58 % u ovcí a 69 % u beranů). Skupina beranů měla největší hodnoty tohoto rodu v květnu a v říjnu. U bahnic byla největší prevalence v dubnu. Ve skupině jehňat převládala infekce rodem *Eimeria* (91 %).

parazit; prevalence; *Trichostrongylus* spp.; *Eimeria* spp.; Česká republika

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