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OCCURENCE OF PARAMPHISTOMIDAE (TREMATODA: DIGENEA) IN SMALL RUMINANTS IN SPREAD BELGRADE AREA

Ivan PAVLOVIC, Snezana IVANOVIC, Bozidar SAVIC, Dragica VOJINOVIC

Scientific Veterinary Institute of Serbia, Belgrade, V.Toze 14, 11000 Belgrade, Serbia,
Phone: +381.11.285.10.96, Fax: +381.11.285.10.96, Email: dr_ivanp@yahoo.com

Corresponding author email: dr_ivanp@yahoo.com

Abstract

Today, breeding of small flocks of sheep and goats has increased on Belgrade area. Alongwith the increasing number of flocks the interest in examination of their health status increased as well. A study about occurrence of Paramphistomidae trematodes in small ruminants at spread Belgrade area was conducted. During the period from March 2009 to January 2010a total of 91 flocks of goats (n = 22) and sheep (n = 69), from 6 Belgrade districts, were examined. Paramphistomidae parasites were foundin 7 out of 67goats (prevalence of 10.44%) and 12 out of 89 sheep (prevalence of 13.48%) examined by necropsy.. After histological examination, the paramphistome trematodes were identified as Paramphistomum cervi. P.cervi has been previously found in sheep and cattle in Serbia, but this is the first report of *P.cervi*in in goats.

Key words*: Paramphistomidae, small ruminants, Paramphistomum cervi, Belgrade area*

INTRODUCTION

Urban and peri-urban livestock keeping has been hailed as a source of livelihood by some households in cities around the world (Mireri et al 2007, Pavlović et al.2012). With the limited grazing spaces, urban farmers have opted for animals which require less space such as small ruminants and pigs.

Further, the breeding of small ruminants (goats and sheep) increased during last decade on Belgrade area, too. They are usually kept under extensive conditions and graze or brows on any land that is not being cultivated (Pavlović et al. 2009).

In pasture breed condition helminth infections are common especially during late spring and autumn months (Pavlović et al. 2012, Žugić 2012) Research of goats and sheep parasites were performed sporadically in the last 20 yearsin Serbia and little is known about this topic. Most of the research related to gastrointestinal and lung helminth infections (Pavlović et al. 2010b, 2011a).

For this reason, the aim of our study was to investigate the occurrence of platyhelminths infection with special care to the platyhelminths of genus *Paramphistomum* (Digenea: Paramphistomidae) at spread Belgrade area.

MATERIALS AND METHODS

The study about helminths of small ruminant at spread Belgrade area was conducted from March 2009 to January 2010. During the study, we examined a total of 91 flocks of goats and sheep from 6 Belgrade districts.

A total of 67 goats and 89 sheep we were analyzed by post-mortem examination.

The paramphistomes parasites recovered from animals were fixed in 10% buffered formalin and prepare to histological examination

Selected parasites were embedded in paraffin, sectioned medio-sagittal to 5-6 micrometers, and stained with hematoxylin-eosin.

Identification of these flukes was originally based on morphological criteria established by Näsmark (1937). These criteria were later revised by Eduardo (1982a). Identification is based o the morphology of the acetabulum, pharynx, terminal genitalium, tegumental papillae, and internal organs of flukes.

RESULTS

At post-mortem examination of 67 goats and 89 sheep,*Paramphistomum* specimens were found at 10.44% (7/67) goats and 13.48% (12/89) sheep. Number of mature parasites found in sheep was 223 to 850 and 74 to 282 in goats.
The largest number of adult parasites was found in the rumen and, to a lesser extent in the omasum and reticulum.
Young parasites were found in all animals attached in a brownish-pink cluster in the mucosa of the duodenum, just distal to the pylorus, with the wall and folds so thickened that the intestinal lumen was almost completely occluded. Erosions and minor hemorrhages were visible in the mucosa, and the intestinal content was discoloured red. The serosa was reddened, blood vessels enlarged and prominent. Within the pale areas there were irregular patches upto 1mm in diameter
At the primary site of infestation, the rumen, destruction of the papillae was detected, as well as hyperplasia of the epithelium and inflammatory reaction with the lymphocytes, similar to that described by Singh et al (1984), Pavlović et al. (2007) and Seck et al. (2007).
Determination of species we performedbased the morphological characteristic as observed of acetabulum and the genital atrium at histological cuts of parasites.
The acetabulum was examined for determination of genera and the genital atrium and acetabulum for determination of Paramphistomidae species. The dorsal part of the acetabulum was characteristic. The dorsal circular muscle was divided into two parts, the dorsal exterior circular muscle series 1 and the dorsal exterior circular muscle series 2. These circular muscle layers are used for the determination of the genus *Paramphistomum*. The ventral exterior circular muscle series, the ventral interior circular muscle series, the radial muscle fibers, the external longitudinal and median circular muscle series of the acetabulum specifically identified the parasites as *P.cervi* (Vujić 1965, Vishnyakov 1980).
According to Eduardo (1982a) the body surface of *P. cervi* is lacking tegumental papillae, the genital opening of *P. cervi* is of gracile type.According to the literature, the genital atrium of *P. cervi* is located at the level of the posterior part of the esophagus (Willmoth, 1950), which is more posterior than in flukes studied by us. The genital atrium of *P. cervi* is located atthe level of the posterior part of the esophagus and the absence of tegumental papillae observed in *P. cervi* is just a normal morphological variation seen in one species. These entire morpfological characteristic we occurred during our determination of occurred paramphistomides to concluded that was *Paramphismoumu cervi.*

DISCUSSIONS

Although infections with trematodes are less frequent, related to gastrointestinal helminths, they can also cause serious health problems, including fasciolosis and distomatosis (Pavlovic et al., 2007). Paramphistomiasis is a seldom-reported platyhelminth infection in ruminants (Horak 1971, Silvestre et al.2000). The development of *Paramphistomum* sp. includes an intermediate host – a snail of the genus *Bulinus* (Soulsby 1977). After the ingestion of the metacercaria by the final host, the development is completed after the passage through the rumen, abomasum, and small intestine (Vujić, 1965).
The prepatent period is 8 week in cattle and 10 week in sheep (Rangel-Ruiz et al., 2003) and under normal conditions, the complete infection cycle takes 3-4 month.
The disease is characterized by sporadic epizootics with acute parasitic gastroenteritis, followed by high morbidity and mortality of predominantly young animals (Seck et al., 2007).
Infections of paramphistomes are worldwide spread, especially at Africa countries and East Asia (Sissay et al., 2007, Seck et al., 2007). In Southern and Eastern Europe, the species *Paramphistomum microbothrium, P. cervi* and *P. ichikawai* (Horak, 1971, Kotrlá and Kotrlý 1982, Vishnyakov, 1980, Silvestre et al, .2000) have been recorded in domestic and wild ruminants. In Serbia, *P.cervi* has been found in sheep and cattle, *P.microbothrium* has been found in sheep and cattle as well as in deer and red deer (Vujić and Petrović, 1971, Pavlović et al., 2007, 2012a).

CONCLUSIONS

During a study performed in 2009-2010, we examined a total of 91 flocks of goats and sheep from 6 Belgrade districts at 10.44% (7/67) goats and 13.48% (12/89) sheep we occurred infection with parampistomidae fluke. After histological determination, we concluded that occurred paramphistomes belonging to the species *Paramphistomum cervi.* This is the first report of *P.cervi*in goats in Serbia.

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