



**PROCEEDINGS
OF
III. INTERNATIONAL
AGRICULTURAL, BIOLOGICAL
& LIFE SCIENCE CONFERENCE
AGBIOL 2021**

SEPTEMBER 1-3, 2021

EDIRNE, TURKEY



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**1 – 3 SEPTEMBER, 2021,
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WELCOME NOTES

You are welcome to our III. AGBIOL Conference that is organized by Trakya University. The aim of our conference is to present scientific subjects of a broad interest to the scientific community, by providing an opportunity to present their work as oral or poster presentations that can be of great value for global science arena. Our goal was to bring three communities, namely science, research and private investment together in a friendly environment of Edirne, Turkey in order to share their interests and ideas and to benefit from the interaction with each other but we have to organize as online due to Covid_19 situation again. I hope next one we could host you in Edirne.

In September 2018, we organized the first AGBIOL Conference with more than 700 scientists and researchers from all over the world with over 800 scientific papers. Due to COVID-19 situation, AGBIOL 2021 has organized fully on-line event which was one of the biggest online conferences in recent years in the world with 499 papers and 1133 authors with 333 oral and 166 e-poster presentations from 55 countries. Therefore, this great interest gave ambition to organizers to make it a periodical event then we decided to organize 3rd one in this year.

The Organizing Committee of AGBIOL 2021 considers the health, safety, and security of its conference attendees and community as its top priority. Due to COVID-19 situation, which results in a very difficult travel restriction for most countries and the fact that there is no definite end in sight, with a careful consideration in all aspects, then AGBIOL 2021 has decided to move towards the organization of on-line again but with limited participation. There is a worldwide participation from 44 countries with 422 papers by contributing 1066 authors. Our AGBIOL 21 conference was organized with 288 oral, 134 e-poster presentations.

The participants with paid conference fee will be able to access all the virtual presentation talks in each session, as well as to visit the virtual poster hall via preliminary provided participant ID and codes. The selected ABSTRACTs will be published in the Conference ABSTRACT and Proceedings Book. Participants might send us their full papers, which based on their preferences will be published either in our Conference ABSTRACT and Proceedings Book or in selected International Indexed Scientific Journals.

Conference Topics:

Agriculture, Forestry, Life Sciences, Agricultural Engineering, Aquaculture and Biosystems, Animal Science, Biomedical science, Biochemistry and Molecular Biology, Biology, Bioengineering, Biomaterials, Biomechanics, Biophysics, Bioscience, Biotechnology, Botany, Chemistry, Chemical Engineering, Earth Sciences, Environmental Science, Food Science, Genetics and Human Genetics, Medical Science, Machinery, Pharmaceutical Sciences, Physics, Soil Science.

We would like to thank all of you for joining this conference and we would like to give also special thanks to our sponsors and collaborators for giving us a big support to organize this event.

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GASTROINTESTINAL HELMINTHS OF SHEEP BREED IN SPREAD BELGRADE AREA IN PERIOD 2018-2019

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Abstract

During 2018-2019. we were examined parasitic fauna of sheep in spread Belgrade area (Serbia). Coprological, and post-mortem examination revealed the following helminth species: *Teladorsagia (Ostertagia) circumcincta* in 75,23%, *Ostertagia trifurcata* 71,53%, *O.ostertagi* 21,99%, *Trichostrongylus axei* 62,23%, *T.colubriformis* 69,57%, *T.vitrinus* 62,85%, *Nematodirus spathiger* 77,43%, *N.filicolis* 33,31%, *Haemonchus contortus* 58,95%, *Marshallagia marshalli* 27,77%, *Skrjabinema ovis* 11,31%, *Bunostomum trigonocephalum* 13,28%, *Chabertia ovina* 63.85%, *Oesophagostomum venulosum* 27.91%, *Cooperia curticei* 60.52%, *C.oncophora* 28,39% and *C.punctata* 13,28%. The obtain results was compares with the results of research from 2009-2010 and the impact of changes in microlimatic and environmental conditions on the biodiversity of GI heminate sheep in this area.

Key words: sheep, gastrointestinal helminths, Belgrade

INTRODUCTION

Belgrade is the capital and largest city of Serbia. It is located at the confluence of the Sava and Danube rivers and the crossroads of the Pannonian Plain and the Balkan Peninsula. The city has an urban area of 360 km² while together with its metropolitan area it covers 3,223 km². The spread area of Belgrade has extremely favorable conditions for modern

agricultural production (climate, agricultural land, watercourses, developed processing industry). This economic branch is of strategic importance for supplying Belgrade with food products, along with the resources that abound in the wider environment (Vojvodina and Šumadija). The Belgrade region has a significant land potential of about 322,292 hectares of agricultural land, which makes up 70% of the total territory of the City of Belgrade.

During last decade small ruminant breeding is constantly growing and start to play an important role in providing animal protein for food, especially for those living in a village near Belgrade. Sheep are milked and they produce the bulk milk supply, together with a proportion of the meat that is consumed.

The first serious studies of parasitic fauna of sheep and goats in the area of Belgrade were done in the period 2009-2010 (Pavlović et al., 2009b,2012). In the meantime, there has been an increase in the number of herds, changes in microlimatic conditions and environmental conditions (Pavlović and Ivanović,2015b). Due to the sudden urbanization, which is inevitably accompanied by pollution of land and water, an increase in the number of non-owner dogs, the approach of wild animals to human settlements (foxes, etc.). This has affected the quality of the environment, the grazing areas where sheep are kept, as well as the global epidemiological and hygienic condition of the city. All this affects, together with parasitic infections, the production results (milk yield, growth, quantity and quality of wool) in sheep (Pavlović et al.2009a).

For these reasons, after ten years, we returned to examining the parasitic fauna of small ruminants in the area of Belgrade in order to see the current situation causing these changes.

MATERIAL AND METHODS

The study of endoparasites infection performed during 2018-2019. we were carried out in 152 flocks of sheep originated from from 6 Belgrade districts Mladenovac, Lazarevac, Obrenovac, Grocka, and Vozdovac (from the village Mladenovac, Vlaska, Mala Krsna, Velika Krsna, Medjuluzje, Senjak, Velika Ivanca, Orašac, Mala Vrbica, Rajkovac, Dubona, Šepšin, Resnik, Ritopek, Vrčin, Vinča, Leštane, Pinosava, Grocka, Velike Granice, Granice, Koracica, Jagnjilo, Markovac, Lazarevac, Arapovac, Junkovac, Leskovac, Sokolovo, Rabrovac, Vrbovno, Zvecka, Krtinska and Stepojevac). During our examination we were examined total of 631 fecal samples. Examination we performed using standard coprological technique (Euzaby,1981).

Geographical and climate data about examined area was next: Belgrade is situated in South-Eastern Europe, on the Balkan Peninsula. It lies at the point where the river Sava merges into the Danube, on the slope between two alluvial planes. The river waters surround it from three sides, and that is why since ancient times it has been the guardian of river passages. Belgrade's climate exhibits influences of oceanic, humid continental and humid subtropical zones, with four seasons and uniformly spread precipitation. Monthly averages range from 0.4 °C in January to 21 .8 °C in July, with an annual mean of 12.2 °C. There are, on average, 31 days a year when the temperature is above 30 °C, and 95 days when the temperature is above 25 °C. Belgrade receives about 680 millimeters of precipitation a year, with late spring being wettest (<http://www.hidmet.gov.rs/>).

Total of 73 sheep and lambs we were examined by post-mortem examination. Total differential worm counts were done on all the alimentary tract using the standard paristology necropsy technique described by Pavlović and Anđelić-Buzadžić (2010b). Determination of adult and eggs of parasites were done by keys given by Euzeby (1981) and Anderson (2000).

RESULTS AND DISCUSION

The faecal samples were obtained from a different source all together as they were collected from flocks in the field, and the results support the other findings. These counts were also of value in providing some information's on the peripartuirent egg rise. The number of guts and lungs examined in this survey thought small in number, but in combination with results of coprological examination, samples appeared to represent the population adequately.

In period 2018-2019 we found next helminth species: *Teladorsagia (Ostertagia) circumcincta* in 75,23%, *Ostertagia trifurcata* 71,53%, *O.ostertagi* 21.99%, *Trichostrongylus axei* 62,23%, *T.colubriformis* 69,57%, *T.vitrinus* 62,85%, *Nematodirus spathiger* 77,43%, *N.filicollis* 33,31%, *Haemonchus contortus* 58,95%, *Marshallagia marshalli* 27,77%, *Skrijabinema ovis* 11,31%, *Bunostomum trigonocephalum* 13,28%, *Chabertia ovina* 63.85%, *Oesophagostomum venulosum* 27.91%, *Cooperia curticei* 60.52%, *C.oncophora* 28,39% and *C.punctata* 13,28%.

Most prevalence species of nematode are *Trichostrongylus* and *Nematodirus* species. The distribution of species within the established genera also varied. Within the genus *Ostertagia* most abundant were dominated by *Ostertagia circumcincta* and *O.trifurcata*. Prevalence of infection with *Ostertagia ostertagi* and *Ostertagia occidentalis* was higher during the colder periods of the year. Among the species of the genus *Trichostrongylus* was the most prevalent *Trichostrongylus colubriformis*. Extensity of infection with *Trichostrongylus axei* and *T.vitrinus* varied, without any regularity. Extensity of infection with *Nematodirus filicollis* and *N.spathiiger* demonstrated a tendency to increase and leveled off at the highest level of the whole study period.

If we make a comparison with the results we had during the research done in the period 2009-2010, it can be seen that the prevalence of certain types of parasites has decreased, but the number of parasite species has increased. There are many reasons for that, and the main one is that in the past period there has been a significant increase in the number of herds in the villages around the city. these were mainly animals that were procured from other parts of Serbia where these types of parasites are present (table 1, figure 1).

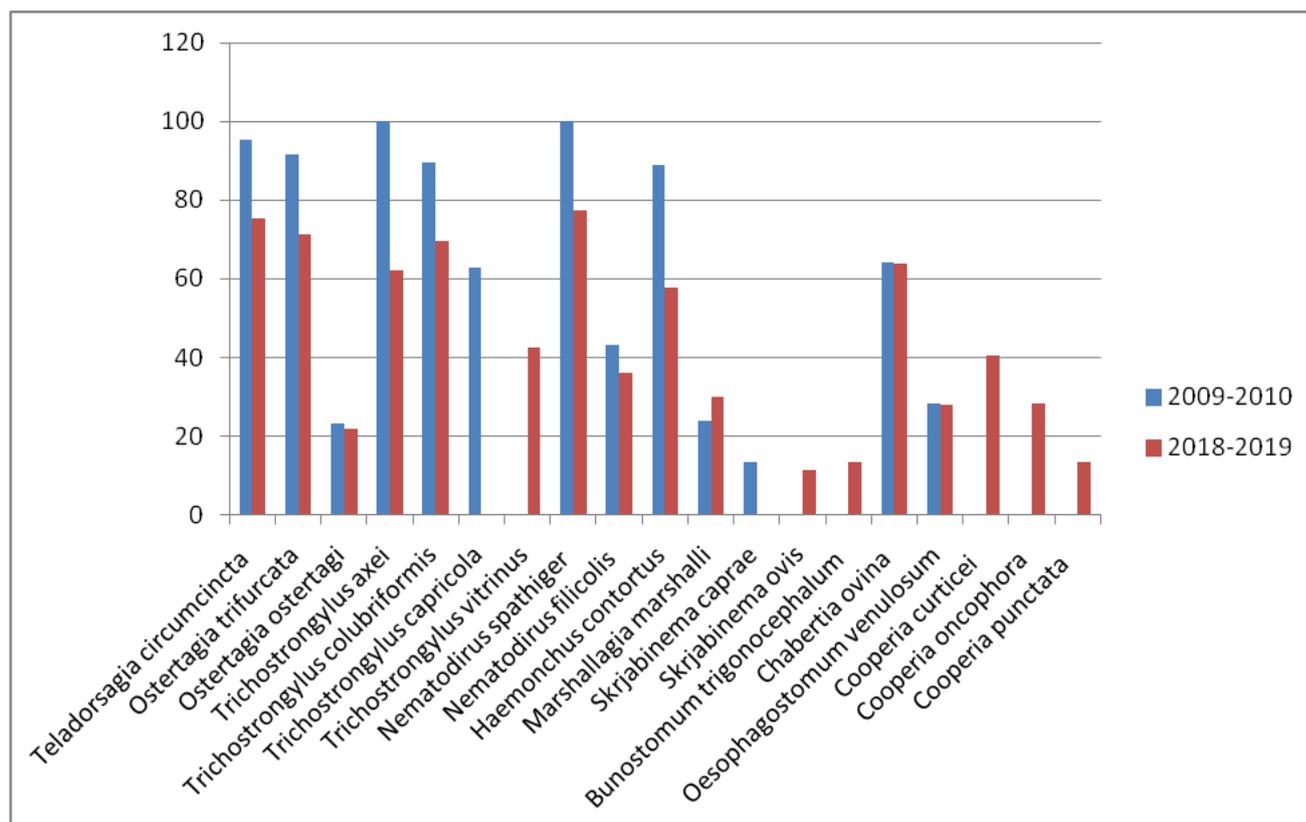
Table 1. Comparative prevalence of GI helminths og sheep in perid 2009-210 and 2018-2019

YEARS			
2009-2010		2018-2019	
parasites species	%	parasites species	%
<i>Teladorsagia (Ostertagia) circumcincta</i>	95.23	<i>Teladorsagia (Ostertagia) circumcincta</i>	75.23
<i>Ostertagia trifurcata</i>	91.53	<i>Ostertagia trifurcata</i>	71.33
<i>Ostertagia ostertagi</i>	23.33	<i>Ostertagia ostertagi</i>	21.99
<i>Trichostrongylus axei</i>	100.00	<i>Trichostrongylus axei</i>	62.23
<i>Trichostrongylus colubriformis</i>	89.57	<i>Trichostrongylus colubriformis</i>	69.57
<i>Trichostrongylus capricola</i>	62.85	<i>Trichostrongylus vitrinus</i>	42.45
<i>Nematodirus spathiger</i>	100.00	<i>Nematodirus spathiger</i>	77.43
<i>Nematodirus filicolis</i>	43.31	<i>Nematodirus filicolis</i>	35.91
<i>Haemonchus contortus</i>	88.95	<i>Haemonchus contortus</i>	57.65
<i>Marshallagia marshalli</i>	23.77	<i>Marshallagia marshalli</i>	29.89
<i>Skrjabinema caprae</i>	13.28	<i>Skrjabinema ovis</i>	11.31
<i>Chabertia ovina</i>	64.14	<i>Bunostomum trigonocephalum</i>	13.28
<i>Oesophagostomum venulosum</i>	28.39	<i>Chabertia ovina</i>	63.85
		<i>Oesophagostomum venulosum</i>	27.91
		<i>Cooperia curticei</i>	40.52
		<i>Cooperia oncophora</i>	28.39
		<i>Cooperia punctata</i>	13.28

During our research done in the period 2018-2019, a difference in the biodiversity of GI helminths is noticed in comparison with the research done in the period 2009-2010 (Pavlović et al.2012). This research has for the first time identified parasites of the genus *Cooperia* that were not previously present in the Belgrade area. They are usually found in sheep flocks in southern and south-east Serbia (Pavlović et al.2013a,b). Simultaneously with the increase in the number of GI helminth species, the prevalence of previously established species decreased. This is most noticeable in the three bridge prevalence genera of the GI nematode *Ostertagia*, *Trichostrongylus* and *Nematodirus* species.

Found parasites species were present at small ruminants in other parts of Serbia. This was confirmed by during examination performed in the hilly areas of Serbia (Šar Planina, Stara Planina) (Vujić et al.,1911,2015a), south, south-east and south-west part of Serbia, (Pavlović et al.2013a,b, 2018a), at Timok District (Jovanović et al.1991), Belgrade area (Pavlović et al.2009,2012) Vojvodina (Pavlović et al.2017b) and Kosovo (Pavlović et al.1995,Milanović et al.2018). Same parasitic species were occurred at other Balkan countries like Macedonia or Bulgaria (Georgievski,1989, Zurliski and Rusev,1990).

Figure 2. Comparative prevalence of GI helminths of sheep in period 2009-210 and 2018-2019

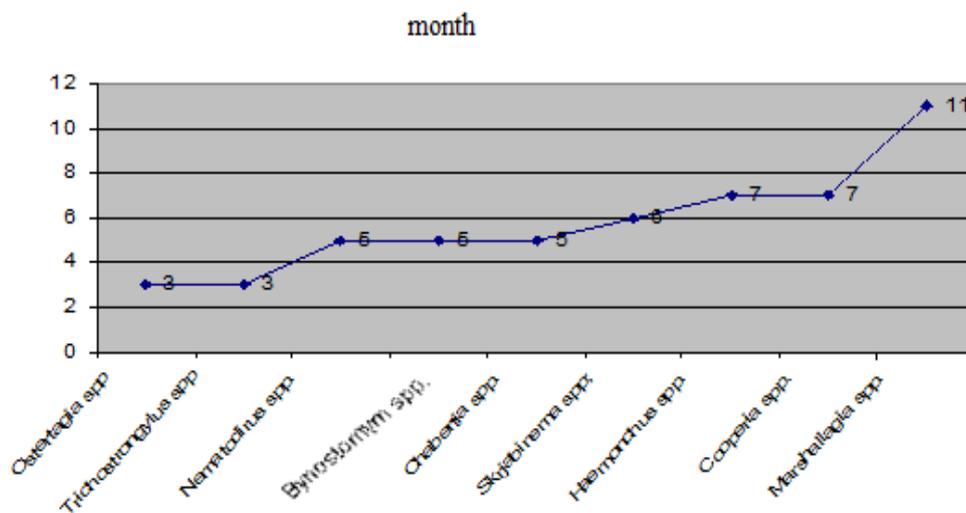


Although most of the gastro-intestinal species appear to follow this general pattern of seasonal distribution, some variations in intensity and duration of these characteristics with different worm species occurred (Pavlović and Ivanović,2018). Thus with *Trichostrongylus* and *Nematodirus* species infection at mature sheep the spring peak was more pronounced than the autumn infection.

The season dynamics of the established parasites species was as follows (figure2):

- In March have occurred *Ostertagia spp.* and *Trichostrongylus spp.*
- In May, the observed infection with *Nematodirus spp.*, *Bunostomum spp.* and *Chabertia spp.* (*ovina*)
- In June was the first record of *Skrjabinema spp.*;
- In July were established eggs of *Haemonchus spp.* (*contortus*) and *Cooperia spp.*
- In November showed the presence of *Marshallagia spp.*

Figure 2. The season dynamics of GI parasitesx in period 2018-2019



Climate variations are a significant factor of seasonal distribution of certain species of sheep helminates (Ardeleanu et al.2007). There are discrepancies in the seasonal distribution between certain regions in Serbia. Thus, certain species within the genera *Ostertagia*, *Trichostrongylus* and *Nematodirus* occur earlier in the plains (north Serbia Vojvodina) and the area of Belgrade than in hilly and mountainous areas (Pavlović et al.2015b, 2017b, Pavlović and Ivanović,2018).

Generally speaking the occurred parasites represent a global problem. Way of breeding usually at shepeng had prerequisite to a lot of infections including parasitoses. Pasture breeding make possible contact within sheep and eggs, larvar stages and intermediate host of parasites. Those induce that there are no one sheep without parasites. The countries of Magreb, Middle East and Northern Africa are also in permanent probleme with parasitic infections and losses ensued by them. Negative influence of parasitic infection reflected throught lost of weight and decrement quantum of lactation (Bahgat et al.1988, Dogana, et al.1989, Ashraf and Nepote,1989, Fakae,1990, Smith,1990, Quesadaet al.1990).

CONCLUSION

However, since the parasitic infections are in majority sub clinical this problem is not played due attention by a sheep breeder from the village in the Belgrade area. The prophylactic treatment is not conducted in the majority of flocks or it is only partially performed what can be seen by the records from the slaughter line and from production results. In aim of introducing parasites fauna of sheep and prepare measure to its control we must to continue our examination. This was the only way to obtain better product results, characteristics and quality of sheep and lambs meat.

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