

## PRELIMINARY PARASITOLOGY RESEARCH IN WILD RABBIT IN VOJVODINA REGION (SERBIA)

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### Summary

The importance of wild animals is seen in the fact that their presence is an indirect indicator of pollution in an ecosystem. A reduced number of wild animals may indicate that the changes in the environment happened and that some infective diseases may be present. It seems that continual health surveillance of wild animals is necessary in order to have an insight into the situation. The subject of this paper is examining parasitology in the feces of shot rabbits in several hunting areas in southern part of Serbia (Vojvodina). The aim of this paper is to detect presence of parasitic flora in wild rabbits, determine the present species, see if there are differences between the categories we formed and examine if the presence of parasites is the reason of reduced number of rabbits on the field. The material for examination were the feces from the rabbits from several hunting area in Vojvodina. The rabbits were classified according to age and sex. A standard method of flotation was used, and for determining the number of endoparasite eggs MecMaster method was used. A total of 42 feces was examined and in all of them *Trichostrongylus retortaeformis* and *Graphidium strigosum* were discovered, as well as presence of different *Eimeria spp.* When examining the presence and number of parasites no difference was detected within the examined groups. The results point out that within this region there are the same species of parasites found in wild rabbits and that it is almost always the identical. This leads us to a conclusion that natural borders have not prevented spreading of parasites and that there is an immunology balance that may hide a real situation that causes reducing their number.

**Key words:** wild rabbit (*Lepus europeaus*), parasites, *Trichostrongylus retortaeformis*, *Graphidium strigosum*, *Eimeria spp.*, sex, age

Rabbit belongs to the most spread and most know group of game. On one hand, this animal is present in all the countries in Europe. On the other, it is one of the most important game for hunting. Wild rabbit (*Lepus europeaus*) belongs to genus *Lepus*, family *Leporidae*; family *Ochtonidae* (wild and domestic cony) belongs to the same order of *Lagomorpha* (Zečević M. et al., 1987.). In last two decades the number of rabbits considerably reduced and there are no reliable data that could give an explanation. Complexity of this problem demands an overall analyses of possible reasons. One of them certainly may be change of environment and unplanned hunting. However, possible reason may also be the presence of different viral, bacterial or parasitic diseases.

Harmful influence of parasites is not limited only to the organs where the parasites may be found, but the influence on the metabolism of the host in a direct or indirect way (Jovanović V., Orlić D., 2003.). The presence of parasites causes

humoral and cellular immunity. The result of this is that part of energy, needed for physiological process, is constantly used for immunology protection (Naglić T., Hajsig D., 1993.). Undesirable effects of the parasites may be manifested in weakening of general resistance. It's health status may influence on fertility and the course of gravity, as well as increased predisposition for other diseases to which the game is constantly exposed (Jovanović V. et al., 1997.). A special problem presents immunology balance between the host and the parasites. In such a correlation it is not possible to notice any clinical symptoms. Undesirable effect may be expressed through a longer period and have negative influence on game and its number.

Therefore, the objective of this paper is parasitology examination of feces samples taken from shot rabbits in several hunting area in southern region of Serbia (Vojvodina). The aim of the paper is to detect parasite in wild rabbits, determine the species, discover if there are differences between the categories and analyse if the presence of parasites is a possible reason or reduced population on the field.

#### Materials and methods

The material for this examination was feces of shot rabbits from several hunting area in Vojvodina collected during autumn hunting season. A total of 42 samples were categorized in different groups according to age (a group of young rabbits – up to 2 kg, and a group of older – more than 2 kg), and according to sex (a group of male and and a group of female). For detecting parasites we used a method with enriched preparation, i.e. the method of flotation (Šibalić S., Cvetković Lj., 1990). The liquid for flotation was 33% solution of zinc-sulfate and the necessary equipment for the mentioned method.

#### Results and discussions

The examining of feces from wild rabbits carried out for groups according to their age (up to 2 kg – a younger category; over 2 kg – an older category). In Table 1 the results on examining feces samples according to age may be found.

Table 1

**Parasites found in wild rabbits, categorized according to age**

|   | Examined groups           | Number of examined samples | Parasites   | No. of parasites per gr feces |
|---|---------------------------|----------------------------|---|-------------------------------|
| 1 | Younger category (< 2 kg) | 19                         | Trichostrongylus retortaeformis<br>Graphidium strigosum<br>Eimeria spp. | ≤ 100                         |
| 2 | Older category (> 2 kg)   | 23                         | Trichostrongylus retortaeformis<br>Graphidium strigosum<br>Eimeria spp. | ≤ 100                         |

The presence of eggs and oocysts in feces was determined by the method of flotation and the presence of parasites was confirmed. In most cases in one gram of feces parasites or elements of parasites could not be detected. Therefore, in the Table the number of parasite is expressed with  $\leq$ .

In Table 2 are given the data obtained from the feces categorized according to sex.

Table 2.

**Presence of parasites in the examined samples, grouped according to sex**

|   | Examined group | Number of examined samples | Parasites   | No. of parasites per gr feces |
|---|----------------|----------------------------|---|-------------------------------|
| 1 | Female         | 26                         | <i>Trichostrongylus retortaeformis</i> ,<br><i>Graphidium strigosum</i> ,<br><i>Eimeria</i> spp | $\leq 100$                    |
| 2 | Male           | 16                         | <i>Trichostrongylus retortaeformis</i> ,<br><i>Graphidium strigosum</i> ,<br><i>Eimeria</i> spp | $\leq 100$                    |

Data from Table 1 and 2 show that, regardless to age and sex, no difference in parasite fauna can be found. The examination was carried out on similar samples (Cattadori I. et al., 2008., Boag B. et al. 2001). When analyzing *Trichostrongylus retortaeformis* in different groups categorized according to age it may be concluded that the number of parasites was larger in the younger category and it raised in a shorter period. However, after immunology reaction their number decreased so in older group their number was insignificant. When examining *Graphidium strigosum*, their number increased after a certain period. This is a weak immunogenic parasite whose presence could not be controlled by immunology reaction in an organism. It is interesting to notice that some authors (Cattadori I. et al., 2008., Boag B. et al. 2001) noted that the number of bacterial co-infection influenced the number of parasites in rabbits, and this was only regarding *Trichostrongylus retortaeformis*. This species of parasite (well immunogenic) was present in the older animals because in co-infection immunology reaction was weaker. When examining the samples from male and female animals, no difference could be noticed.

When comparing our findings with the data in other literature (Boag B. et al. 2001), it can be noticed that in our examination the number of detected species was considerably lower. The examination (presented in Lello J., 2005.) shows that *Eimeria stiedae* has negative correlation to body mass of rabbits. Rabbits with parasites had smaller body mass. No correlation was detected regarding fertility of animals. The authors suggest that this examinations should be continued, because reduced body mass is found in rabbits infected with *Eimeria stiedae* and this influences fertility and regular development of embryo.

The causative agent of coccidiosis has immediate harmful influence on the health of rabbits, but may have harmful influence on all rabbit population because long presence of these parasites may cause strains with changed pathogen features. Some authors (Pakandl M., Alena J. 2006.) have proved that in experimental conditions rabbits with *Eimeria piriformis* in digestive tract, pathogenicity of the parasite increased after multiple passages. This has been proved by a reduced period of prepatent of *Eimeria* in the organism until cases of clinical diarrhoea symptoms. Changed pathogenicity will depend on immunology reaction of an animal, but most of all on local, mucous and system response (Renau S.et al., 2003.).

Some authors have analyzed the importance of Lagomorpha (Sulai M., Cabaret J., 1998.) and their findings detected the presence of some ruminant parasites in rabbits. In our examinations we do not have such findings, which suggest that the wild rabbit plays a role of a vector for other animals.

### Conclusions

This examination points out that different parasites may be found in wild rabbits and the level of infection is not high. Certainly, it is important to determine that other species of parasites may be found in hunting areas in Vojvodina. Clinical symptoms should not be expected because the number of parasites is small. However, harmful influence of the parasites is expressed in continual exhaustion of organism, or low resistance, fertility or body mass. Further research should give answers to some of these questions.

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