Flukes hepatic parasitism in sheep in the submountainous area and economic consequences

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SUMMARY. Investigations were conducted during 1999-2000 on Țurcană breed sheep from the submountainous area CN, bred under extensive system. Epidemiological, clinical, morphopathological and parasitological investigations resulted in identifying the species Fasciola hepatica, Fasciola gigantica and Dicrocoelium lanceatum which parasitized the liver simultaneously, causing great economic losses. Within the liver parasitocenosis, Fasciola hepatica had an extensiveness of 61.06 %, Fasciola gigantica 37.8 % and Dicrocoelium lanceatum 90.05 %.

The simultaneous evolution of liver trematodes was the result of the flock change of place from the submountainous grassland to the plain grassland in the same grazing season and geo-climatic conditions favourable to the development of specific intermediary hosts.

Key words: sheep, liver, trematodes, simultaneous multiple parasitism.

Introduction

Sheep simultaneous parasitizing by different trematode species result in great troubles of the general state of the body. The result of the trematode concerted aggression is the disturbance of the dynamic balance within the parasite-host system and implicitly of the ecological small area (1, 2, 3, 4, 8, 9).

The aim of this paper was to point out the trematode species of the liver parasitocenosis and the global multiple aggression reflected by economic losses, registered in sheep from the submountainous area (6).

Materials and Methods

Investigations were conducted during 1999-2001 in the submountainous area CN on an average Țurcană breed flock of 1454 sheep, bred under extensive private system.

Epidemiological data refered to the grassland size, relief zone, climate, water sources and intermediary hosts. The flock was investigated clinically, morphopathologically and parasitologically. The identified trematodes were classified taxonomically according to data from the literature of speciality.

Results and Discussion

The area on which sheep grazed combined different geo-climatic conditions: subcarpathian hills (200 ha) and plain (200 ha) crossed by the C. river. Sheep grazed in the submountainous area from May to September then they descended 15 km to South to the plain area, where they were found until the snow falling.

The flock change of place from one area to another facilitated the grassland pollution by invasional elements (trematode eggs) and metaceraria infection. The grassland offered favourable conditions to the development of land and water intermediary hosts.

In the submountainous area we identified gastropoda from the species Zebrina detrita (intermediary host for Dicrocoelium lanceatum) on brush leaves, 2-6 samples/brush of the 85 tested brushes. On grassland, we identified gastropoda of the Helicola genus and on reduced moisture areas, many and hills. In this area, on the grassland there are many rapid brooks with narrow riverbeds, ideal for the development of
the species *Limnea auricularia*, an intermediary host for *Fasciola gigantica* (4, 9).

On the plain area of the grassland where the river forms many water boggins as a result of overflows, the *Limnea truncatula* species - the intermediary host for *Fasciola hepatica* - was identified (76 samples/m²).

In that period, the climate factors showed great variations. In 1999, the annual mean temperature was 9°C, with a minimum one of -2°C in January and a maximum one of 32.6°C in August. In 2000 the mean temperature was 10°C, with a minimum one -6.8°C in January and a maximum one 38.2°C in August. The year 2000 was a very dry year, total rainfall was of 504 l/m² and in 1999, a medium moisture year, the total was of 634 l/m².

Sheep clinical examination pointed out the presence of diarrhoea, swelling abdomen, submandibular oedema, mucous membrane palor, sometimes jaundice state, debility, body areas without wool (Fig. 1, 2).

The morphopathological examination of the abdominal cavity pointed out the presence of ascitic liquid, swelling, dark-coloured, infiltrated liver, thickened Glisson capsule with scars, swelling biliary vesicle. The liver area was uneven with cirrhosis areas and sinusous whitish scars. Across sections, a lot of blood was expressed and in a few cases its firmness was increased. By liver centripetal compression, trematodes were taken from biliary ducts. Cholecyst sectioning allowed us to investigate the biliary content, which was reduced, viscous and mixed to many trematodes (5, 6, 7).

The identified species and their extensiveness in slaughtered sheep are presented in Table 1.

<table>
<thead>
<tr>
<th>Year</th>
<th>Slaughtered sheep</th>
<th>Infected sheep</th>
<th>Parasite species</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Fasciola hepatica</td>
<td>Fasciola gigantica</td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>1999</td>
<td>24</td>
<td>21</td>
<td>87,5</td>
</tr>
<tr>
<td>2000</td>
<td>36</td>
<td>29</td>
<td>80,5</td>
</tr>
<tr>
<td>2001</td>
<td>14</td>
<td>10</td>
<td>71,4</td>
</tr>
<tr>
<td>Total</td>
<td>74</td>
<td>60</td>
<td>81,08</td>
</tr>
</tbody>
</table>
The study of data from Table 1 shows the presence of species *Fasciola hepatica, Fasciola gigantica* and *Dicrocoelium lanceatum* in the liver of slaughtered sheep (6, 8).

*Fasciola hepatica* was identified in 81.08% of the cases with variations of 87.5% in 1999 and 71.5% in 2001. 43 fascicles were extracted from liver and cholecyst and 26 fascicles from cholecyst alone, in that case the parasites occupying the whole vesicle. Trematode sizes were 2-3 cm/1.5-2 cm (3, 4).

*Fasciola gigantica* was identified in 37.8% of the cases with variation of 38.8% in 2000 and 35.07% in 2001 and was always found in association with *Fasciola hepatica*. The number of samples taken from liver and biliary vesicle varied between 5 and 19 parasites. The body sizes were 3-5 cm/1 cm (Fig. 3, 4). The body was covered by a thin transparent cuticle without cuticular thorne (4, 5, 6, 9).

*Dicrocoelium lanceatum* was found in 90.05% of the cases with variations of 95.8% in 1999 and 79.5% in 2001, occupying in high number the small biliary ducts and biliary ducts and biliary vesicle. The sizes were 5-10 x 2-3 mm. The body was thin, leaf-like, covered with a transparent cuticule (1, 3, 4).

Because of sheep simultaneous parasitizing by different trematode species, the results testified the great aggression on liver, with bad consequences on the whole body.

The correlation between geo-climatic factors and trematode evolution in the submountainous area C-N was confirmed by trematode extensiveness of 87.5% in 1999 when rainfall was abundant and 71.4% in 2001, the year 2000 being known as a dry year.

Epidemiological, clinical, morphopathological and parasitological investigations on sheep of the area C-N showed that 90% of the registered economic losses were caused by liver trematodoses, by non-economic slaughters, high decreases in specific productions and diminution in number of sheep.

**Conclusions**

1. In a number of sheep from the submountainous area C-N, on identified the species *Fasciola hepatica, Fasciola gigantica, Dicrocoelium lanceatum*, which parasitized simultaneously the liver during 1999-2001.

2. The presence of the species *Fasciola gigantica* in liver parasitoccosis was due to geo-climatic factors, favorable to the development of specific intermediary hosts.

3. The species showed a different extensiveness: 81.08% *Fasciola hepatica*, 37.8% *Fasciola gigantica* and 90.05% *Dicrocoelium lanceatum*.
4. The simultaneous evolution of liver trematodoses in sheep caused great (90 %) economic losses

REZUMAT

Parazitismul hepatic cu trematode la oi în zona submontană și consecințele economice

Cercetările au fost întreprinse în perioada 1999-2001 asupra unui efectiv de ovine de rasă Țurcană, din zona submontană C-N, crescut în sistem extensiv.

Investigațiile epidemiologice, clinice, morfopatologice și parazitologice au condus la identificarea speciilor Fasciola hepatica, Fasciola gigantica, și Dicrocoelium lanceatul, care au parazitat simultan ficatul lor determinând grave pierderi economice.

Extensivitatea trematodelor la ovinele sacrifice a fost diferită: 81,08%, Fasciola hepatica; 37,8%, Fasciola gigantica și 90,05% Dicrocoelium lanceatum.

Evoluția concomitentă a trematodocelor hepatiche a fost posibilă datorită deplasării turmelor din zona submontană către zona de șes, în cadrul același sezon de pășunet și a condițiilor geo-climatice favorabile dezvoltării gazdelor intermediare specifice.

Cuvinte cheie: ovine, ficat, trematode, parazitism multiplu simultan.

References