

VETERINARSKI ARHIV 72 (6), 319-325, 2002

Appearance of American liver fluke (*Fascioloides magna*, Bassi, 1875) in Croatia - a case report

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MARINCULIĆ, A., N. DŽAKULA, Z. JANICKI, Z. HARDY, S. LUČINGER, T. ŽIVIČNJAK: Appearance of American liver fluke (*Fascioloides magna*, Bassi, 1875) in Croatia. Vet. arhiv 72, 319-325, 2002.

ABSTRACT

Cases of American liver fluke (*Fascioloides magna*) were detected in Croatia for the first time in January 2000. Initial suspicions with regard to the presence of *Fascioloides magna* in the red deer (*Cervus elaphus* L.) population were raised in Baranja, eastern Croatia, during the winter of 1999. Red deer liver samples from that area were examined and 22 adult parasites were recovered. The parasites, as well as mature eggs, were determined to be *Fascioloides magna*. The parasite was probably introduced into the Baranja region by natural deer migration from neighbouring Hungary.

Key words: *Fascioloides magna*, red deer, Croatia

Introduction

The presence of American liver fluke was first reported in Europe by Bassi (MALEK, 1980) in an outbreak in deer near Turin, Italy. It is well

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known that the American deer species are natural hosts of this trematode and it was concluded that it must have been introduced into Europe from North America by deer game. To date, the presence of the fluke has been reported in Italy, Germany, Austria, Slovenia, the former Czechoslovakia and Hungary (MALEK, 1980; PFEIFFER, 1982). As a consequence of the natural migration of game it is anticipated that the parasite will spread to other countries. It must be stressed that the outbreak of *Fascioloides magna* infection in non-specific hosts such as domestic ruminants, pigs, horse or rodents is usually fatal. Sheep usually die already in the acute stage (FOREYT and TODD, 1976). The aim of this study was to describe the first report of the parasite in Croatia, with special emphasis on the threat of the spread of the fluke and resultant losses to the economy in deer husbandry.

Case report

During the autumn/winter of 1999 hunters and forestry workers at J.P. Croatian Forestry Department, Osijek, operating in the region of Baranja,



Fig. 1. Several American liver flukes collected from the liver of a red deer from Baranja and preserved in formalin. Note the variations in size and shape.

Table 1. Dimensions of *Fascioloides magna* collected from the liver of a red deer from Baranja (mm)

No.	Length	Width
1.	45	25
2.	50	28
3.	42	19
4.	52	20
5.	50	25
6.	45	27
7.	36	22
8.	37	20
9.	49	19
10.	50	20
11.	42	17
12.	57	30
13.	46	20
14.	40	19
15.	55	27
16.	54	25
17.	46	20
18.	61	30
19.	47	23
20.	53	22
21.	59	25
22.	64	32
M	49.0909	23.4090

M = average size

eastern Croatia, noticed that the condition of red deer (*Cervus elaphus L.*) population was moderately poor. In eastern Baranja (45°30' to 45°52' N; 18°45' to 18°58' E) in the region managed by Bilje Forestry Department the workers also found lesions and outgrowths in livers that were filled with a brownish substance resembling blood clots. According to their reports, in January 2000 suspect deer from the Čiprašat site (45°46' N; 18°52' E) were scrupulously examined and the liver was sent to the Department of Parasitology and Parasitic Diseases, Faculty of Veterinary Medicine in Zagreb. The liver weighed approximately 4.5 kg, was compact to the

touch with foci of the size of a plum protruding from the surface. After cutting, the foci proved to be clearly distinct connective tissue cysts of 3 mm wall thickness. The lumen of the cysts were filled with a blackish-brown substance. Most cysts measured from 2 to 3 cm in diameter, usually forming coalescing lacunae. Large flukes were isolated from most of the cysts. A total of 22 flukes were collected from the same liver. All flukes were measured and their dimensions are shown in Table 1. Mature eggs were found in most of the flukes as well as in the tissue debris.

The eggs resemble those of *Fasciola hepatica*. According to the gross lesions found in liver, the size and specific morphology of adults, and the structure of eggs, it was concluded that the isolated flukes belonged to the species *Fascioloides magna*.

Discussion

According to our findings and observations on deer game it can be concluded that the infection with the trematode *Fascioloides magna* is present in Croatia, which can be considered the result of the parasite being widely spread throughout Central European countries.

It is thought that the parasite must have been introduced into the Baranja region by deer from neighbouring Hungary. The fluke most likely migrated into Hungary from the North, by deer moving across the border with Slovakia. KASSAI and BEKESI (1993) reported the occurrence of *F. magna* in Hajdu-Bihar County, while the detailed study by MAJOROS and SZTOJKOV (1994) study demonstrated its frequent presence in deer from the Szigetkoz area. It has to be mentioned that Hungarian hunters have repeatedly seen flukes in Szigetkoz deer over a period of about three years. However, they regarded them as common liver fluke (MAJOROS and SZTOJKOV, 1994). The same situation probably occurred in the Baranja region also. The date of its introduction is completely uncertain. The unnoticed spread of the fluke to our region is probably the result of a very low awareness of the problem among hunters as well as the difficult diagnosis of early infections which are clinically unapparent. For non-experts the size and shape of the fluke usually resembles the morphology of *Fasciola hepatica*, which is regarded common in the Baranja region. It is also considered than in Eurasian deer

Table 1. Specification of myomorphus mammals examined by renoculture and microscopic agglutination according to the trapping area with corresponding results

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the giant liver fluke is of a smaller size than in American deer. According to KOTRLA and KOTRLY (1980) this phenomenon, occurring in a non-indigenous host and a new habitat, may sometimes render accurate species identification more difficult. In addition to deer, the fluke may have been brought to Baranja by intermediate hosts such as snails carried away by flood waters (MAJOROS and SZTOJKOV, 1994).

According to our findings the intensity of infection seems to be fairly high. It is worth mentioning that the natural host - white tailed deer (*Odocoileus virginianus*) usually harbours not more than five flukes (FOREYT et al., 1977).

F. magna infection of the deer population in Baranja is an important and economy-related problem since it poses the risk of widespread infection of the game population of various species. It is further worth mentioning that even after a single infection, deer will shed eggs from the fluke containing cysts through the biliary ducts throughout their whole life (FOREYT et al., 1977).

Eggs may lie dormant over winter (ERHARDOVA, 1965) and may be carried away by water to distant sites. The specific intermediate host, *Lymnaea truncatula*, is very common in that faunal region of Baranja, and depending on the climate the developmental stages of *F. magna* can survive in snails for several months.

The wild boar (*Sus scrofa*) act as an aparatenic host of the fluke and do not shed fluke eggs (FOREYT et al., 1975). The fallow deer (*Dama dama*) is also at risk of infection (PFEIFFER, 1982). The large American liver fluke is an important factor in domestic animals also. Within a closed cyst, flukes produce chronic liver lesions in cattle (PRICE, 1953). Sheep and goats usually succumb to infection in the acute stage. Potential egg shedding from sheep was reported by CAMPBELL and TODD (1955) although it was considered exceptional and with no epidemiological significance.

It has to be stressed that although *F. magna* will certainly not cause a fatal outcome frequently in deer it may lead to a significant loss of body condition and deterioration in value of the trophy.

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Received: 27 November 2002
Accepted: 20 December 2002

MARINČULIĆ, A., N. DŽAKULA, Z. JANICKI, Z. HARDY, S. LUČINGER, T. ŽIVICNJAK: Prvo izvješće o nalazu velikog američkog metilja (*Fascioloides magna*, Bassi, 1875) u Hrvatskoj. Vet. arhiv 72, 319-325, 2002.

SAŽETAK

Tijekom siječnja 2000. godine po prvi puta je ustanovljena prisutnost velikog američkog metilja (*Fascioloides magna*) u Hrvatskoj. Sumnja na njegovu prisutnost u populaciji jelena običnog (*Cervus elaphus* L.) postavljena je tijekom zime 1999. godine u istočnom dijelu Hrvatske, odnosno Baranje. Dostavljeni i pregledani uzorak jetre jelena običnog s tog područja sadržavao je 22 odrasla parazita. Paraziti i zrela jajašca determinirani su kao *Fascioloides magna*. Paraziti su vjerojatno uneseni na područje Baranje prirodnom migracijom jelena iz susjedne Mađarske.

Ključne riječi: *Fascioloides magna*, jelen obični, Hrvatska
