

EIRĀZIJAS BEBRS (*CASTOR FIBER*) KĀ NESPECIFISKS *TRICHINELLA BRITОВI* SAIMNIEKS

EURASIAN BEAVER (*CASTOR FIBER*) AS UNSPECIFIC HOST FOR *TRICHINELLA BRITОВI*

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ABSTRACT

Eurasian beaver (*Castor fiber*) population following the introduction especially in recent years has increased considerably in territory of Latvia. Functioning beaver settlement creates new trophic resources - felled trees and caves. These trophic resources attract small rodents which increases the number of predators in area. The only beaver predators can be wolf (*Canis lupus*), lynx (*Lynx lynx*), red fox (*Vulpes vulpes*) and dog (*Canis lupus familiaris*) in Latvia. Muscle samples from 65 Eurasian beavers were collected during hunting seasons in 2009 and 2012 for *Trichinella* spp. larval detection. The *Trichinella* spp. prevalence date of wild boars (*Sus scrofa*), red foxes, raccoon dogs (*Nyctereutes procyonoides*) and Eurasian lynx were collected from retained samples analyzes at Institute of Food Safety, Animal health and Environment "BIOR". *Trichinella britovi* larvae were detected in one of 65 analyzed beavers. The highest observed *Trichinella* sp. prevalence was observed in lynx following by red foxes, raccoon dogs and wild boars, 100 %, 70%, 40% and 1.4%, respectively. Despite *Trichinella* spp. is prevalent in Latvia this is the first when *T. britovi* was found in Eurasian beaver.

KEY WORDS: Eurasian beaver, *Trichinella britovi*, unspecific host.

INTRODUCTION

Eurasian beavers are monogamous animals that live in families and they are camp animals which are related to freshwater reservoirs and coastal zone. Beavers improved the occupancy when settling in a new area –build up dams and houses, dig burrows. Other cave animals use abandoned or still inhabited beaver caves, but avoid active beaver disturbance. Functioning beaver settlement creates new trophic resources - felled trees and caves. New trophic resources attract small rodents which increase the number of predators in area. The only beaver predators can be wolf (*Canis lupus*), lynx, fox and dog (*Canis lupus familiaris*) in Latvia (Скалон, 1951; Spuris, 1966; Дьяков, 1975; Балодис 1990).

Beaver population following the introduction has increased considerably in territory of Latvia. Bearers became strictly protected (Directive 92/43/EEC) in 1995, but after dramatic increase of their population it became unlimited game species with fixed hunting season form 1st of August till 31st of April (MK rules Nr. 760).

Nematode worms belonging to the genus *Trichinella* are the etiological agents of the zoonosis named trihinelosis. These parasites are widespread in wildlife in all continents but Antartctica, and in domestic pigs of many countries, with omnivores representing the most

important reservoirs. (Pozzio, Murell, 2006). Previously *T. spiralis* and *T. nativa* has been detected in the Canadian beaver (*Castor canadensis*) but there are no previous findings of *Trichinella* spp. in Eurasian beaver (Ромашов, 1969, Samuel et al. 2001).

The aim of this study was to analyze the beaver muscle samples for *Trichinella* spp. presence and to compare the *Trichinella* spp. prevalence in other host animals as a potential source of infection for beavers.

MATERIAL AND METHODS

Muscle samples from 65 beavers were collected during hunting seasons in 2009 and in 2012 from different parts of Latvia using hunting method with dogs and Caniberous type traps.

The *Trichinella* spp. prevalence date of wild boars (n=2311) red foxes (n=119), raccoon dogs (n=46) and Eurasian lynx (n=2) were collected from retained samples analyzes at Institute of Food Safety, Animal health and Environment “BIOR” during 2011.

All samples for *Trichinella* spp. larvae detection was analyzed in accordance with the requirements in Annex I of the Commission Regulation (2005). Meat sample of at least 25 g material consists of muscle tissue taken either from the pillar of the diaphragm or he tongue, or foreleg or a mix of these tissues. All meat samples were stored frozen at -20°C until analyzes.

Trichinella spp. species identification was done by PCR methods in European Union Reference laboratory for Parasites in Rome, Italy.

RESULTS AND DISSCUSSION

Trichinella britovi larvae were found in one adult male beaver with 20 k of weigh reaching the overall prevalence 1.5 %. The infection intensity per one gram of muscle was 5.8 larvae. This is the first report of *T. britovi* larvae in Eurasian beaver in Latvia and also in Europe. The highest observed *Trichinella* sp. prevalence in other wild animals was observed in lynx following by red foxes, raccoon dogs and wild boars, 100.0%, 70.0%, 40.0% and 1.4%, respectively. Also in those animals mainly *T. britovi* larvae was detected. *Trichinella britovi* are the most widespread etiological agents of *Trichinella* infection in wild and domestic animals (Poizio, 2007). Among the sylvatic species, *T. britovi* has the widest geographical range, occurring wildlife of the temperate areas of the Europe and Asia. In Europe, it has been identified in 83%, 30% and 11% of isolates from red fox, wild boars and domestic pigs (*Sus scrofa domestica*), respectively. Infections in brow rats (*Rattus norvegicus*) living in farms or garbage dumps have been reported in Italy and Estonia although larvae of this species have a very short survival time in this host. This species can be transmitted from animal to animal through consumption of meat from wild boar, red fox or feed with scraps from sylvatic carnivores (Pozzio, Murell 2006).

Beavers are herbivores but some insects and mollusks it consumes only by a chance along with aquatic plants on which they are located (Балодис, 1990). Beavers *T. britovi* infection may acquired while protecting his territory or himself from the predator animals. Beaver is characterized by high aggression (Пак и др., 1975; Балодис, 1990). Beaver carcasses bites and scars are typical injuries in territorial battles between the beavers and in overcrowding conditions, it often happens that beavers are bitten by wild animals and survive after injuries (Дьяков, 1975). Eurasian lynx, red foxes and raccoon dogs are the predators, which can attack to beavers (Скалон, 1951; Spuris, 1966; Дьяков, 1975; Балодис, 1990). Other cave animals, such as red foxes and raccoon dogs, used to live in beaver abandoned or still inhabited caves (Балодис, 1990; Дьяков, 1975). The food competitors, such as wild boar, can become livestock, if animal feed on beaver activity area (Дьяков, 1975). Also small rodents are common at beaver sites, but

there are no representative data in Latvia about infection with *Trichinella* sp. in small rodents. The other mechanism for beaver to acquire *Trichinella* infection is by chance with aquatic plants or with some parts of putrefying flesh from small rodents or wild carnivores. For *Trichinella* spp. larvae the anaerobic metabolism favouring the survival in putrefying flesh, along with the ability to larvae of some species to survive freezing, are two separate mechanisms that strongly increase the survival of parasite in nature (Pozzio, Murell, 2006).

This study shows that beavers can be an unspecific *T. britovi* host in Latvia considering into account the high *T. britovi* prevalence in other wild animals and the high beaver abundance in territory of Latvia.

CONCLUSIONS

1. The study shows that the Eurasian beaver, although not carnivorous, can be infected with *T. britovi*.
2. *Trichinella britovi* is prevalent parasite in Latvia.
3. Beavers could acquire *T. britovi* infection while protecting their territory or accidentally ingesting putrefying flesh from other wild animals.

ACKNOWLEDGE

Authors warmly thank to Edoardo Pozio and Gianluca Marucci for help in molecular studies and also hunters for providing the samples.

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