

Activities of National Reference Laboratory for Parasites of Hungary, 2009-2018

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Monitoring of *Trichinella* spp. in swine



In 2018, trichinellosis was not detected in 4.7 million pigs slaughtered. In the past decade, 3.1 and 4.7 million fattening and breeding pigs were slaughtered and examined for *Trichinella* infection per year. *Trichinella spiralis* was detected only in the backyard pigs of a ranger in 2009. The animals were fed on the offal of wild animals shot near to the Romanian border.

Reference: Veterinary Parasitology 2012. 183: 393-396.

The majority of laboratories ($n = 91$) passed the test. The laboratories with unsatisfactory results received the description of the critical points of the method with validation samples, and corrective actions were requested. In the second PT, only small number of laboratories ($n = 6$) failed to pass the test. The results were similar to that seen in 2017.

Monitoring of *Trichinella* spp. in wildlife



Out of 69000 wild boars examined, *Trichinella* infection was detected in 20 animals in 2018. *Trichinella spiralis* was identified in 14 animals originated from a game preserve located on the Romanian border. The rest of the wild boars coming from different regions of the country were infected with *T. spiralis* ($n = 2$), *Trichinella britovi* ($n = 3$) and *Trichinella pseudospiralis* ($n = 1$). Out of 434 red foxes, *T. britovi* was detected in 3 foxes, and *T. spiralis* was identified in a single fox in 2018. These figures differed from that seen in wildlife in the previous decade. The prevalence of infection was low (0.01%) in wild boars and relatively high in red foxes (2.1%) between 2009 and 2018. The dominant species was *T. britovi* in both wild boars (51% of the isolates) and red foxes (79% of the isolates). *T. spiralis* was found less frequently in wild boars (41% of the isolates) and foxes (9% of the isolates). *T. pseudospiralis* was also detected in three wild boars. The prevalence of trichinellosis was high (9.1%) in golden jackals. In this host, *T. spiralis* is the dominant species (37% of the isolates). As jackals migrate for long distances, they may play a significant role in the long distance spread of *T. spiralis* from the surrounding endemic countries.

Reference: Veterinary Parasitology 2014 . 204: 4296-4299.

Monitoring of *Echinococcus* spp. in farm animals



Echinococcosis was confirmed in 80 animals between 2015 and 2018. *Echinococcus intermedium* ($n = 43$), *Echinococcus granulosus sensu stricto* ($n = 4$), and *Echinococcus multilocularis* ($n = 3$) was identified in swine. In cattle, only *E. granulosus s. s.* ($n = 21$) was detected. *E. granulosus s. s.* ($n = 7$) was the dominant species in sheep; nevertheless, *E. intermedium* was also identified in two animals. *E. granulosus s.s.* ($n = 32$) and *E. intermedium* ($n = 45$) were classified in 13 and three haplotypes, respectively. The genetic diversity and haplotype network of *E. granulosus s. s.* were similar to that observed in some other countries of Eastern Europe. The genetic diversity of *E. intermedium* was low with a single dominant haplotype. Cysts were fertile in nine sheep (100%), 30 swine (64%), and three cattle (14%) indicating that all three species play a role in some extent in the epidemiology of cystic echinococcosis in Hungary. Based on the number of animals killed in the slaughterhouses involved in the present study, the rate of infection was 0.012% in sheep, 0.007% in cattle, and 0.001% in swine. As animals with hydatidosis originated from family farms, control programs should mainly focus on these facilities.

Reference: Parasitology Research 2018. 117: 3019-3022.

Monitoring of *Echinococcus multilocularis* in wildlife



In 2018, six foxes were tested and only a single animal was found to be infected. Out of 2677 foxes, *Echinococcus multilocularis* infection was detected in 227 animals (prevalence: 8.5%) between 2009 and 2018. Out of 15 golden jackals, one individual was infected with *E. multilocularis* (prevalence: 6.7%). The prevalence of infection was almost four times higher in the north-western half of the country than in the south-eastern half. In some northern areas, the prevalence was 35-40%.

Reference: Veterinary Parasitology 2013. 198: 292-297.

Trichinellosis in man



In 2018, two trichinellosis cases imported from Romania were described. The annual incidence of trichinellosis in man was 0.001 (range: 0-0.08) case per 100,000 people between 2009 and 2018. Eight autochthonous and three imported cases were reported. All autochthonous cases were related to a single outbreak in 2009 (see monitoring of *Trichinella* spp. in swine).

Echinococcosis in man



In 2018, nine echinococcosis cases were described in man. The annual incidence of echinococcosis was 0.068 (range: 0.02-0.14) case per 100,000 people between 2009 and 2018. The majority of cases were caused by *E. granulosus sensu lato*; nevertheless, autochthonous alveolar echinococcosis was also reported in man.

Trichinella proficiency tests



Trichinella proficiency test (PT) was organized according to the protocol of the European Union Reference Laboratory for Parasites and the guidelines of the International Commission on Trichinellosis for 109 *Trichinella* laboratories in Hungary in 2018.