

Factors affecting spread of sparganosis (*Spirometra erinaceieuropaei*, Cestoda: Diphylobothridae) in carnivores in NE Poland – preliminary results

Eliza Kondzior^{1,2}, Marta Kołodziej-Sobocińska¹, Rafał Kowalczyk¹

¹ Mammal Research Institute, Polish Academy of Sciences, 17-230 Białowieża, Poland; ² Institute of Biology, University of Białystok, 15-245 Białystok, Poland

Sparganosis is a severe food- and water-borne disease caused by tapeworm *Spirometra erinaceieuropaei* with a complex life cycle with two intermediate and a definitive host, which may also involve paratenic hosts. The host species vary according to the climate zone. The definitive hosts are feline and canine. In north-eastern Poland, the presence of adult tapeworms or their eggs in faeces was found in lynx (*Lynx lynx*), grey wolf (*Canis lupus*) and red fox (*Vulpes vulpes*). The first intermediate hosts are planktonic copepods (*Cyclops* sp.) and the second intermediate hosts are amphibians and reptiles. Rodents (Rodentia), insectivorous mammals (Insectivora), weasels (Mustelidae), wild boar (*Sus scrofa*), raccoon dog (*Nyctereutes procyonoides*), and humans were recorded as paratenic hosts. These hosts are unnecessary for the cycle's completion but they may play a role in the transmission of the parasite.

We studied spread of sparganosis in wildlife. The aims of the study were: 1) to identify hosts of *S. erinaceieuropaei*; 2) to analyse the influence of biological and environmental factors on prevalence and intensity of infections in two common species of carnivores: a native – the badger *Meles meles*, and introduced from eastern Asia – the raccoon dog in several locations in north-eastern Poland.

A total of 529 animals: 332 raccoon dogs, badgers, 30 pine martens (*Martes martes*), 23 stone martens (*Martes foina*), 13 red foxes, 4 American minks (*Neovison vison*), 4 European polecats (*Mustela putorius*), 3 lynxes and 3 river otters (*Lutra lutra*) were collected in five localisations in north-eastern Poland, from 2013 to 2019. All specimens were measured, sexed, necropsied and checked for the presence of *S. erinaceieuropaei* larvae. Stomachs for diet analyses and canine for age analyses were prepared. The *S. erinaceieuropaei* larvae found in the subcutaneous tissue were isolated, counted, measured and preserved in 99% ethanol for genetically analyses. To identify the species of isolated larvae 18S rRNA gene fragment were analysed.

During autopsies *S. erinaceieuropaei* larvae were found in 165 individuals of 7 species: American mink, badger, European polecat, pine marten, raccoon dog, red fox, river otter. Prevalence was similar in badgers and raccoon dogs (37.6% and 32.2% respectively), while mean infection intensity was significantly higher in badgers – 40 ± 57 (range: 1–276) than in raccoon dogs – 4 ± 4 (range: 1–23). In both badgers and raccoon dogs no significant influence of the host sex on the level of infection was observed. Badgers showed an increase in the probability of infection and the number and size of larvae with age. No such relationships were observed in raccoon dogs. It may be related to raccoon dog's acquisition of resistance to *Spirometra* sp. infection as a result of coevolution. This may also be due to the fact that raccoon dogs have a more varied diet and at

a younger age they start to eat food of animal origin. As a result, they reach the maximum rate of infection earlier than badgers.

Further research will be carried out to examine the relevance of the selected factors.

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