The first finding of *Moniliformis moniliformis* (Acanthocephala, Moniliformidae) in Belarus

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Received: 20 February 2018 / Accepted: 23 March 2018 / Published online: 30 March 2018
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Abstract Information on the detection of acanthocephalan *Moniliformis moniliformis* (Bremser, 1811) in a striped field mouse in Belarus and the short description of this parasite is given. The first finding of this helminth in Belarus (Malorita district of Brest region, south-western part of Belarus) is reported. The functioning of the centre of moniliformosis on the drainage system in the Malorita district is described. Rodents, as well as other animals as definitive hosts and insects as intermediate hosts of acanthocephalan *Moniliformis moniliformis*, take part in centre formation. This helminth has a medical significance because parasitize not only animals but also humans.

Keywords *Moniliformis moniliformis* · Acanthocephalan · Striped field mouse · Belarus

Introduction

The acanthocephalan *Moniliformis moniliformis* (Bremser, 1811) is intestine parasite of rodents, mainly mice, rats and voles (Ryzhikov et al. 1979; Kaufman 2000). The intermediate hosts of this helminth are insects (cockroaches, beetles). Larvae of this acanthocephalan were found in reptiles (Sharpilo 1976) and soricid mammals (Kirillova 2004). The facultative definitive hosts can be carnivores of the families Canidae, Felidae and Mustelidae

(Kontrimavichus 1969; Kozlov 1977), also birds (Petrochenko 1958) and hedgehogs (Khaldi et al. 2012). Cases of human infection with this parasite have been described (Muller and Wakelin 2002; Berenji et al. 2007).

Thirteen species of acanthocephalans have been found in animals in Belarus (Merkusheva and Bobkova 1981; Kukar and Subbotin 2013; Shimalov 2017). They belong to families Echinorhynchidae (4 species), Gigantorhynchidae (2 species), Filicollidae (1 species), Neoechinorhynchidae (1 species), Oligacanthorhynchidae (2 species) and Polymorphidae (3 species).

Materials and methods

The material for this report was collected by me during 2015–2017 in the South-West Belarus (Brest region: Brest, Zhabinka and Malorita districts). Small mammals (soricids and rodents) were caught by mousetraps placed in lines along the banks of drainage channels passing through mixed forests and arable land. Twenty-five traps were put up for 4 days, which corresponded to 100 mousetrap-days. The total number of mousetrap-days was 2000. A total of 364 specimens of small mammals were investigated: the bicolored white-toothed shrew *Crocidura leucodon* (1), the common shrew *Sorex araneus* (52), the lesser shrew *Sorex minutus* (4), the hazel dormouse *Muscardinus avellanarius* (1), the common vole *Microtus arvalis* (103), the root vole *Microtus oeconomus* (15), the red-backed vole *Myodes glareolus* (78), the striped field mouse *Apodemus agrarius* (41), the yellow-necked mouse *Apodemus flavicollis* (66) and the wood mouse *Apodemus sylvaticus* (3).

The animals were subjected to a full helminthological examination: dissection and organ compression.

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Results and discussion

One specimen of acanthocephalan *Moniliformis moniliformis* was detected by me in the intestine of the sexually mature male of the striped field mouse. This animal was caught on July 17, 2017 on the bank of drainage channel that passes through a rye field in the Malorita district. The drainage system is located at the 20 km of the Brest-Kovel road. Identification of helminth was carried out with the aid of Ryzhikov et al. (1979) and Genov (1984).

It was a male of acanthocephalan *Moniliformis moniliformis* that had a well-expressed false segmentation of the body and proboscis with curved hooks arranged in 12 rows of 7 hooks each.

This helminth was placed in physiological saline, in which it immediately curled into a ring. It remained viable for 2 h. This is the time of my observation. The length of the live specimen was 5.5 cm. The dead one was 6.7 cm. Then it was fixed in ethanol absolute.

This is the first case of finding the acanthocephalan *Moniliformis moniliformis* in Belarus.

The fact that I detected the acanthocephalan *Moniliformis moniliformis* in the striped field mouse indicates the existence of a centre of moniliformosis on the drainage system in the Malorita district, Brest region. It requires study of the intensity of this centre. It can involve rodents, as well as other animals (birds, mammals) as definitive hosts and insects as intermediate hosts of acanthocephalan *Moniliformis moniliformis*.

The detection of acanthocephalan *Moniliformis moniliformis* is of human health interest, as this species can cause disease moniliformosis in humans. This helminth may be potential causative agent of human moniliformosis in Belarus.

Compliance with ethical standards

Conflict of interest The author declare that they have no conflict of interest.

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