

Original papers

The first report of *Aelurostrongylus falciformis* (Schlegel, 1933) (Nematoda, Metastrongyloidea) in badger (*Meles meles*) in Poland

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ABSTRACT. *Aelurostrongylus falciformis* belongs to the superfamily of Metastrongyloidea. This nematode occurs in European badgers and locates in lungs, in respiratory tract. Numerous species of land snails are intermediate hosts of the parasite. In 2015, parasitological necropsy of 9 badgers, shot in the Forest District Głęboki Bród in Augustowska Primeval Forest, was performed. Two examined animals were infected with nematodes *A. falciformis*. In the lungs of each badger two specimens of nematodes were detected (male and female). In the following article, description, morphometrical data and figures are presented. This is the first report of *A. falciformis* infection in badgers in Poland.

Key words: *Aelurostrongylus falciformis*, badger, *Meles meles*, Augustowska Primeval Forest

Introduction

Nematodes belonging to the genus *Aelurostrongylus* are observed in Poland occasionally. First stage larvae of *Aelurostrongylus abstrusus* were found for the first time in the faeces of one from four examined lynx from Białowieża Forest [1]. Later, in 2005, first clinical case of aelurostrongylosis was diagnosed and described in a domestic cat in Lower Silesia [2]. In 2008, analysis of lynx faeces from Białowieża Forest revealed that 17% of animals were infected with *A. abstrusus* [3]. In 2013, presence of infective larvae of *A. abstrusus* was detected using microscopic and molecular analysis in snails *Arion lusitanicus* in Pomerania and rodents *Apodemus agrarius* from Lower Silesia [4]. Another case of aelurostrongylosis, resulting in animals death, was diagnosed in two cats from Warsaw with signs of pneumonia [5]. According to recent studies, rare case of complete recover of cat from aelurostrongylosis has been also described [6].

Nematodes from the genus *Aelurostrongylus* has not been reported in badgers from Poland so far. The aim of this work was to describe nematode *A. falciformis* identified in badgers from Augustów Primeval Forest in Poland.

Materials and Methods

Study area covers the Forest District Głęboki Bród in Augustowska Primeval Forest (53°58'N 23°17'E). In 2015, 9 badgers were investigated. Animals were collected through shooting. Parasitological examination of the respiratory tract was carried out. Then, the lungs were rinsed thoroughly in water, and the liquid was subjected to decantation several times. Then, after obtaining the transparency of the supernatant it was examined using a stereoscopic microscope to detect and isolate the parasite. The nematodes were preserved in 70% alcohol with the addition of 5% glycerol. After alcohol evaporation, temporary microscopic preparations were made of the nematodes in glycerol, and then used for morphological examinations and for measurements. Microphotographs and measurements were performed using OLYMPUS 50 BX microscope and Cell D program. Nematode species was determined based on morphometric features. The material has been stored in the collection of the W. Stefański Institute of Parasitology of the Polish Academy of Sciences in Warsaw.

Results and Discussion

Two out of nine examined badgers were infected with the nematode *Aelurostrongylus falciformis*. In the lungs of each animal two specimens of nematodes were detected (male and female).

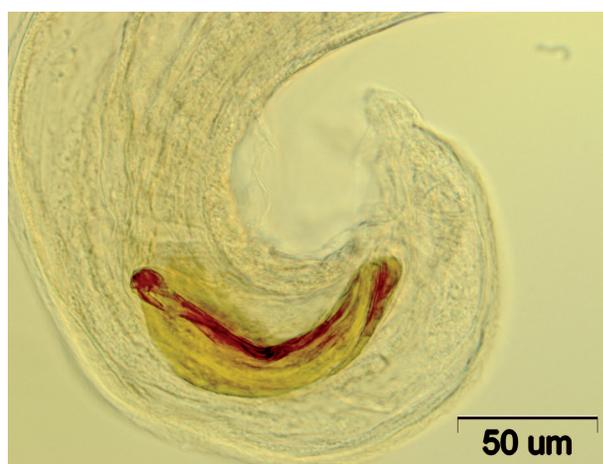
Description (all dimensions in mm).

The nematode is slender, attenuated at extremities (Fig. 1). Buccal aperture small, surrounded by two pairs of cephalic papillae. Intestinal diameter wider than the esophageal (Fig. 1).



Fig. 1. Anterior end of *A. falciformis*

Males. Body length 27–29. Nerve ring is situated at a distance of 0.096–0.105 and excretory pore at 0.108–0.110 from the anterior end of the body. Length of esophagus 0.198–0.206 and its maximum width 0.018–0.025. Width at esophagus end 0.062–0.065, maximum width 0.118–0.122 and width in front copulatory bursa 0.065–0.070. The males had a very small copulatory bursa with two symmetric lateral lobes. Copulatory bursa is narrow, fitted with gentle rays. Dorsal ray is shorter and wider than the others, with two oblique and laterally located branches at the distal end. Externo-dorsal rays, located on both sides of the dorsal ray, are straight, without any branches. Three lateral rays have a common base and separate in the middle of their length. Two ventral rays lie distally to each of lateral ray. Lateral and ventral rays, like extero-dorsal rays, does not have any branches. Distal tips of rays are rounded and do not reach bursal margin. Spicules are equal length, short, massive and yellow-brown. Their length is 0.125–0.128 and maximal width reaches 0.020–0.026. Proximal tip of spicules is nodulous extended, distal tip is



Figs 2, 3. Posterior end of male

pointed (Fig. 2,3). Gubernaculum is light brown. It has an oval-shaped broadening at distal end, which narrows towards the front.

Females. Body length 85–96. Width at esophagus end 0.072–0.085, maximum width 0.156–0.174. Nerve ring is situated at a distance



Fig. 4. Posterior end of female

0.122–0.128 and excretory pore at a distance 0.135–0.140 from the anterior end of the body. Length of esophagus 0.221–0.226 and its maximum width 0.028–0.034. Vulva is situated at a distance of 0.055–0.062 from the posterior end of the body. Length of tail 0.033–0.035. (Fig. 4). Uterus is filled with larvae (Fig. 5).

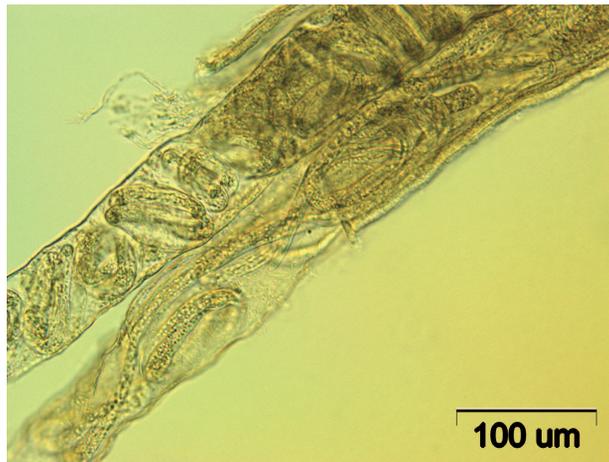


Fig. 5. Uterus filled with larvae

Presented morphometric characteristics correspond to data given by other authors [7–9] and show that examined nematodes belong to the species *A. falciformis*.

Nematodes *A. falciformis* are rarely reported in Europe. In Italy, mature nematodes were found in 10 of 19 badgers, which constitutes 53% of examined animals [10]. In the area of Great Britain, in Cornwall, during examination of 118 badgers, nematodes *A. falciformis* were found only in one animal [11]. As a result of parasitological necropsy of 26 badgers in Northern Spain (Basque Country), nematodes *A. falciformis* were not found. However, analysis of faeces revealed the presence of larvae identified as *Angiostrongylus vasorum* in 24 of 26 samples [12]. Other studies of badgers from Spain revealed the infection with nematode *Aelurostrongylus pridhami*, typical for American mink *Mustela vison* [13]. Nematodes *A. falciformis* has been also observed in badgers in the former Soviet Union, in Karelia, Crimea and the Caucasus (Kontrimavichus i Delamure 1985). To our knowledge, this is the first report of the presence of nematodes *A. falciformis* in badgers in Poland.

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