

## The occurrence of embedded nematodes *Capillaria* spp. in the stomachs of mallard ducks (*Anas platyrhynchos* L.)

Rajmund Sokół<sup>1</sup>, Mirosław M. Michalski<sup>1</sup>, Michał Gesek<sup>2</sup>, Daria Murawska<sup>3</sup>,  
Vladimir Hanzal<sup>4</sup>, Paweł Janiszewski<sup>5</sup>

<sup>1</sup>Department of Parasitology and Invasive Diseases, Faculty of Veterinary Medicine, University of Warmia and Mazury in Olsztyn, ul. Oczapowskiego 5, 10-719 Olsztyn, Poland

<sup>2</sup>Department of Pathological Anatomy, Faculty of Veterinary Medicine, University of Warmia and Mazury in Olsztyn, ul. Oczapowskiego 5, 10-719 Olsztyn, Poland

<sup>3</sup>Department of Commodity Science and Animal Improvement, University of Warmia and Mazury in Olsztyn, ul. Oczapowskiego 5, 10-719 Olsztyn, Poland

<sup>4</sup>Department of Landscape Management, Faculty of Agriculture, University of South Bohemia in Ceske Budejovice, Studentska 13, 370-05 Ceske Budejovice, Czech Republic

<sup>5</sup>Department of Fur-Bearing Animal Breeding and Game Management<sup>5</sup>, University of Warmia and Mazury in Olsztyn, ul. Oczapowskiego 5, 10-719 Olsztyn, Poland

Corresponding Author: Mirosław Michalski; e-mail: michmm@uwm.edu.pl

Hairworm nematodes of the genus *Capillaria* (*Trichurida*) have been shown to invade numerous species of birds in Poland. Mallard ducks (*Anas platyrhynchos* L.) are most frequently infected by the nematode species *Capillaria anatis* and *C. contorta* (*Eucoleus contortus*). The former typically invades the blind intestines, more rarely the small intestine, while the latter, similarly to *C. annulata*, lodges mainly in the esophagus and the crop. The birds become infected *per os* during feeding from the bottom of bodies of water, ingesting eggs and larvae which then develop in their gastrointestinal tract. The nematode eggs are thick-shelled, oval (approximately 30 x 70 µm) yellowish or brown, with cones (polar plugs) on both poles. The infection is usually asymptomatic but capillariosis of the beak cavity, esophagus and crop can cause difficulty in swallowing and shortness of breath. Mallard ducks were kept in an aviary system with access to pond water. Beginning from the age of four weeks, 10 birds (five males and five females) were sacrificed every 14 days. Their stomachs and intestines were searched macroscopically for adult parasites and/or larvae. Among the total of 130 gastrointestinal tracts checked, hard tumours, initially of unknown origin, were found in two glandular stomachs. The tumours were seated in the mucosa, both were approximately 6 x 12 mm, with openings at the top. In the openings, parasite material was visible. This material was extracted for histopathological examination to determine the genus and species of the parasites. After fixing in 10% formalin, microtome sections were obtained and stained with haematoxylin and eosin. Histopathological evaluation of specimens from the distal portion of the oesophagus and the initial segment of the proventriculus revealed the presence of *Capillaria* spp. between epithelial cells. An extremely hyperplastic epithelium with hyperkeratosis between the oesophagus and proventriculus contained adult forms of the nematode with visible uteri filled with eggs, as well as free eggs with characteristic bipolar caps. Additional observations include hyperaemia, infiltration of lymphoid cells, proliferation of connective tissue within the mucosa, and oedema of the submucosa.