Psittacine birds (Aves: Psittaciformes) as new hosts of *Baruscapillaria obsignata* (Nematoda: Capillariidae)

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Abstract

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The first record of *Baruscapillaria obsignata* (Capillariidae) in small intestine of three psittacine birds (*Barnardius zonarius, Agapornis roseicollis* and *Melopsittacus undulatus*) kept in captivity in the Czech Republic is described. Morphometry of nematode species parasitizing psittacine birds was found to be identical with that of the parasites from typical hosts, domestic and free-living columbiform birds. Epizootiological aspects of interchange of this nematode species, and others (ascariids, capillariids, oxyurids) among domestic birds (Galliformes, Columbiformes), free-living birds (Passeriformes) and psittacine birds (Psittaciformes) kept in captivity are discussed.

Psittacine birds, Baruscapillaria, *capillariids, Czech Republic*

Findings of capillariid eggs in coprological examinations of psittacine birds in captivity are relatively frequent (Kronberger 1973; Landelius et al. 1978; Martinez et al. 1999; Patel et al. 2000). On the contrary, the data on taxonomy and systematics of these nematodes parasitizing hosts of the order Psittaciformes are very rare. For psittacine birds, a specific capillariid is probably *Capillaria plagiaticia* Freitas et Mendonça, 1959, found in Brazil (Freitas et al. 1959) and New Zealand (Wakelin 1967). Schock and Cooper (1978) mention also the oesophageal capillariid *Eucoleus contortus* (Creplin, 1839) in budgerigars. According to the revision by Baruš and Sergeeva (1989) and Okulewicz (1993), the valid name *E. dispar* (Dujardin, 1845), is used here for a frequent cosmopolitan parasite in birds of the orders Passeriformes, Falconiformes and Strigiformes.

In this paper we report the first finding of other capillariid species parasitizing psittacine birds.

Materials and Methods

During the years 2002-2004, 143 psittacine birds of thirty species kept in captivity in the Czech Republic were investigated post-mortem for the infestation with nematodes. In three specimens, one *Barnardius zonarius* (Shaw, 1805), one *Agapornis roseicollis* (Vieillot, 1818) and one *Melopsittacus undulatus* (Shaw, 1805), infestation of capillariids (15 males and 3 females specimens) was found in the small intestine.

All nematodes were fixed in 4% formaldehyd and cleared in glycerine-water solution for examination. It was used a light microscope with differential interference contrast (DIC) and digital image analysis system (ProPlus 1.3 for Windows 95) for measuring. Drawings were prepared by the camera lucida. All measurements are given in millimetres.

Results

All nematodes were identified as *Baruscapillaria obsignata* (Madsen, 1945) Moravec, 1982. Morphometrical characters (Fig. 1, Table 1) of nematode specimens correspond also to the redescription of *B. obsignata* provided by Baruš (1966) and Baruš and Sergeeva (1990) based on specimens from pigeons and free-living columbiform birds.

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Table 1. Dimensions (in mm) of the selected determination features of *Baruscapillaria obsignata* parasitizing psittacine birds (our data) and birds of the order Columbiformes (according to Baruš 1966; Baruš and Sergeeva 1990).

Hosts	Psittaciformes		Columbiformes	
Parasite (number of specimens)	Male (n = 15)	Female (n = 3)	Male (n = 12)	Female (n = 21)
Dimensions	Range; mean	Range; mean	Range	Range
Body length	8.75-12.25; 10.25	(Fragments only)	6.50-11.64	9.13-18.64
Width at oesophagus end	0.030-0.045; 0.036	0.050 - 0.060 0.053	0.038-0.042	0.062-0.079
Muscular oesophagus length	0.42-0.61; 0.51	-	0.32-0.38	0.38-0.43
Stichosome length	3.85-5.25; 4.41	-	2.75-4.40	3.73-6.78
Stichocyte number	34-39; 37	-	34-47	43-48
Spicule length	1.29-1.63; 1.47	-	1.18-1.53	-
Bursa length	0.013-0.035; 0.024	-	0.022-0.027	-
Bursa width	0.025-0.043; 0.032	-	0.033-0.038	-
Oesophagus end-vulva distance	-	0.090-0.100 0.097	-	0.080-0.150
Anus-body end distance	-	0.008-0.013 0.011	-	0.008-0.015
Eggs	-	0.053-0.058 × 0.027-0.028 0.054 × 0.028	-	0.047-0.053 × 0.027-0.033

The male posterior end is terminated with a relatively large and rounded membranous bursa, supported on either side by a small lateral papilla (Fig. 1A). One tubular spicule, thin and well sclerotized is present. The proximal end of the spicule (Fig. 1B) is markedly broader in diameter (0.023 – 0.035 mm), the distal end (Fig. 1C) is rounded and somewhat narrowed (0.008 – 0.009 mm). The spicular sheath is long, unarmed, with transverse striations. The slit-like opening of the cloaca lies sub-terminally on the ventral side of the body and at the level of the upper edge of the bursal processes. Female with the vulva forming a transverse slit which does not rise above the surface of the body. The vulvar appendage is absent (Fig. 1D). The vagina is straight and muscular. The anal opening is situated sub-terminally at the ventral side of body (Fig. 1E). Mature eggs are oval with protruding polar plugs (Fig. 1F). The surface of the external membrane of eggs looks as being covered with inconspicuous scales.

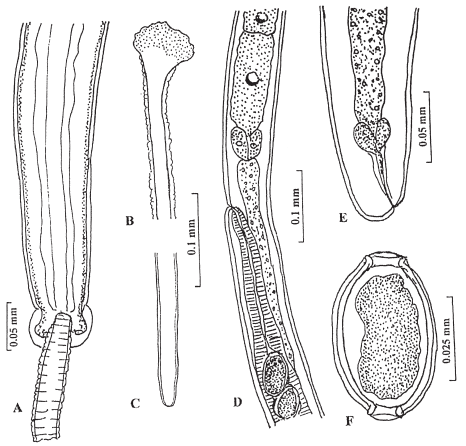

Fig.1. *Baruscapillaria obsignata* from psittacine birds.
A – male posterior end (ventral view); B – proximal end of spicule; C – distal end of spicule; D - female vulva region (lateral view); E - female posterior end (lateral view); F - egg. Original.

Discussion

Comparison of morphological and metrical features (Table 1) of the nematode specimens from psittacine birds and those from typical hosts (Columbiformes: *Columba livia* f. *domestica, Streptopelia turtur* (Linnaeus, 1758) and *S. decaocto* (Frivaldszky, 1838)) suggests their taxonomical identity. The species *B. obsignata* is cosmopolitan in distribution, with typical hosts in bird orders Columbiformes and Galliformes (both free-living and domesticated), rarely in Passeriformes and Anseriformes (Baruš and Sergeeva 1990). According to review by Moravec et al. (1987), the development of *B. obsignata* is direct, without any intermediate or paratenic hosts. From the aspects of nematode biology, there is no obstacle for the transfer of infestation. The possibility of mutual contacts among hosts (kept in captivity, farm breeding) influencing the infestation by the species *B. obsignata* is confirmed by rare findings in birds of Passeriformes (Baruš 1965; Wakelin 1966; Rosický et al. 1974; Okulewicz 1993, 1997). A possibility of obtaining infestations by nematode species with a direct life cycle from various hosts (mainly domesticated Galliformes and Columbiformes) is indicated by the demonstrate findings of *Ascaridia galli* (Schrank, 1788) in psittacine birds in England (Peirce and Bevan 1973) and *A. columbae* (Gmelin, 1780) in Australia (Johnston and Mawson 1941; Mines and Green 1983) and in Brazil (Ferrola et al. 1976). These authors noted that psittacine birds were kept close to the gallinaceous and columbiform birds, and thus the spread of infestation was facilitated. In budgerigars, *M. undulatus*, also the species *Heterakis gallinarum* (Schrank, 1788) is mentioned (Schock and Cooper 1978).

The psittacine birds in our study came from different private breeders. We have no evidence about contact among these psittacine birds and columbiform birds, but such possibility cannot be ruled out.

The infestation of psittacine birds by *B. obsignata* takes place by the same way as mentioned for ascarids and others geohelmiths. In any case, our findings document that psittacine birds are new hosts of *B. obsignata,* and that this parasite can be agent of capillariosis of these birds kept in captivity also.

Papoušci (Aves: Psittaciformes) jako noví hostitelé hlístice *Baruscapillaria obsignata* (Nematoda: Capillariidae)

V této práci je popsán první nález *Baruscapillaria obsignata* (Capillariidae) v tenkém střevě tří papoušků (*Barnardius zonarius, Agapornis roseicollis* a *Melopsittacus undulatus*) chovaných v České republice. Popisovaná morfometrie této kapilárie je identická jako u kapilárií získaných z typických hostitelů *B. obsignata*, kterými jsou domácí i volně žijící ptáci z řádu měkkozobí. Současně je diskutována otázka epizootologických aspektů přenosu *B. obsignata* a jiných druhů hlístic (škrkavky, kapilárie, roupi) mezi domácími ptáky (Galliformes, Columbiformes), volně žijícími ptáky (Passeriformes) a papoušky (Psittaciformes) chovanými zajetí.

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