

A record of *Crenosoma vulpis* (Rudolphi, 1819) (Nematoda, Crenosomatidae) from the Eurasian badger (*Meles meles* L.) from Poland¹

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ABSTRACT. Three specimens of the nematode *Crenosoma vulpis* (Rudolphi, 1819) were isolated from the lungs of the Eurasian badger (*Meles meles* L.) found dead on a road in the north-western part of Wrocław (Lower Silesia, SW. Poland) in August 2008. Since this is the first record of the parasite in the badger from Poland, description, biometrical data and figures are given.

Key words: *Crenosoma vulpis*, badger, *Meles meles*, parasites, Poland

Introduction

Among the fifteen carnivore species occurring in Poland, only the fox (*Vulpes vulpes* L.) has been sufficiently studied with respect to its helminth fauna. The remaining species have been subject to at least some helminthological studies but, as rightly remarked by Pojmańska et al. [1], the gaps in the knowledge are still extremely numerous.

The research of the native parasites of the badger (*Meles meles* L.) are limited to three reports from the Lublin Upland [2], Wielkopolsko-Kujawska Lowland [3] and Białowieża Forest [4]. The list of badger endoparasites comprises three species, including protozoans (*Isospora melis*), trematodes (*Isthmiophora melis*), nematodes (*Uncinaria criniformis*) and a few imprecisely identified helminths taxa described as *Opistorchis* sp., „or” *Metorchis* sp., *Aonchotheca putorii*, „or” *Capillaria mustelae*, *Uncinaria* spp., Taeniidae sp. and Trematoda.

The list of badger parasites from Europe and Asia is much longer and includes 15 species of trematodes, 6 tapeworms, 30 nematodes and one acanthocephalan [5–11]. It can be thus suspected that the small set of native badger parasites is a result of insufficient research.

The legal conservation status of the host precludes shooting individuals for parasitological studies. It seems that, apart from coproscopic methods, using roadkill is the only way of gaining information on the badger parasites.

Material and methods

An adult male badger found dead on a road in the north-western of Wrocław in June 2008 was subject to standard helminthological dissection. The alimentary tract was divided into anatomical parts and each was dissected separately. Each fragment was cut longitudinally and macroscopically examined for parasites. The contents was rinsed in 0.9% physiological solution, decanted and examined under the microscope. Internal organs (lungs, liver, heart, kidneys, urinary bladder and gall bladder) were cut along blood vessels to the maximum narrowing of their lumen, and the contents were decanted.

The isolated nematodes were preserved in 70% ethyl alcohol, cleared in glycerol, measured, drawn and photographed. The identification was based on the papers of Kontrimavicius et al. [12], Kozlov [13], Anderson [14] and Jancev and Genov [15].

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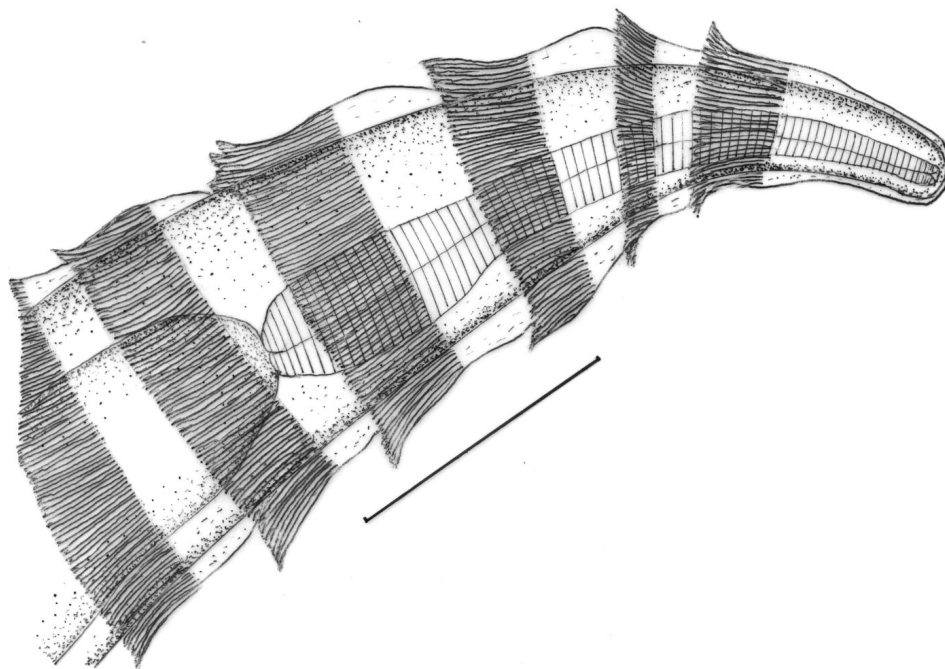


Fig. 1. *Crenosoma vulpis* (Rudolphi, 1819), anterior end of male. Scale bar: 100 μm .

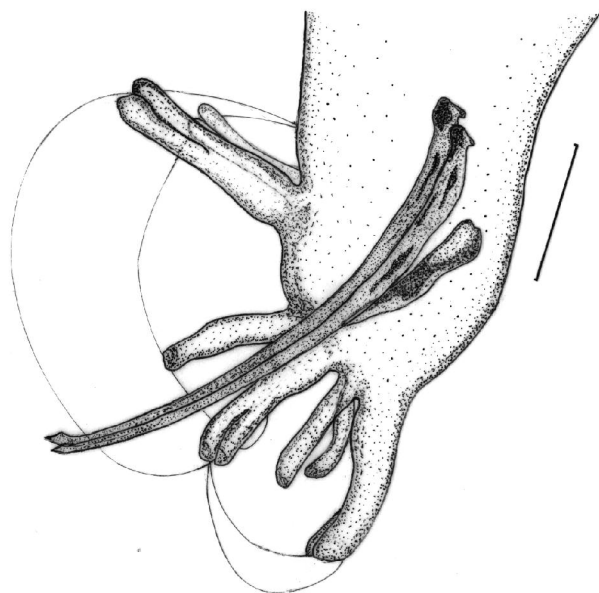


Fig. 2. *Crenosoma vulpis* (Rudolphi, 1819), caudal bursa, lateral view. Scale bar: 100 μm

Results and discussion

Three male nematodes were found in the badger's lungs and identified as *Crenosoma vulpis* (Rudolphi, 1819). Since no detailed information on the morphology of the species could be found in the pertinent

Polish literature, the description, illustrations and main biometrical characters are presented below (Figs. 1–2).

Description (n=3). Body cylindrical, slightly tapered on both ends. Body length 2.849–3.940 μm , maximum width 214.4–240.2 μm . Oesophagus length 251–288 μm , width at its posterior part 37.9–43 μm . Cuticle on anterior body part forms a series of longitudinally striated crenated folds (Fig. 1), extending between the 1st and 14–15th rings. Bursa relatively wide. Ventral ribs are the longest (121–142 μm), originating as a common trunk at base, then separating somewhat above the middle and reaching bursa edge (Fig. 2). Length of anteroventral rib 128–142 μm ; posteroventral rib 121–139 μm . Three lateral ribs also originate as a common trunk; the first of them – anterolateral – separates close to the base. Length of anterolateral rib 82–83 μm . The remaining two ribs continue as a common trunk and separate at 3/4 of their length. Length of the longer, mediolateral rib, reaching the edge of bursa, 96–101 μm , the shorter, posterolateral – 86–87 μm . Externodorsal rib originates separately, its length 61–80 μm . Dorsal rib relatively long: 119–127 μm , wider than remaining ribs, reaching posterior margin of bursa. On its end a poorly visible process. Spicules nearly identical (length 320–334 μm), slightly curved, wider at proximal end, tapered distally. Distal end of spicules bifurcated in a poorly visible way, one of the branches being very thin. Gubernaculum distinctly shorter and wider, its length 109–122 μm , width 22–24 μm ; its distal end adjoins spicules.

The morphology and anatomy of the specimens are in complete agreement with the data contained in the key of Kontrimavicius et al. [12] and the paper of Jancev and Genov [15]. The only slight differences pertain to some biometric characters. The authors report morphometric

data of nematodes from various hosts, among others fox (*Vulpes vulpes*) and black bear (*Ursus americana*). The maximum body width, oesophagus width and length of anteroventral ribs, gubernaculum and spicules of the three examined specimens are slightly smaller than in those from the fox and bear [15]. *Crenosoma vulpis* has not been previously recorded from the badger in Poland, though such records are known in European literature [16,17]. Other species of the genus found in the badger are *Crenosoma schulzi*, *C. taiga* [5], *C. melesi* described from this host [8,15] and nematodes described as *Crenosoma* sp. [9,18].

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References

- [1] Pojmańska T., Niewiadomska K., Okulewicz A. 2007. Pasożytnicze helminty Polski. Gatunki, żywiciele, białe plamy. Polskie Towarzystwo Parazytologiczne, Warszawa.
- [2] Sołtys A. 1962. Helminth parasites of Mustelidae of the Lublin Palatinate. *Acta Parasitologica Polonica* 10: 73–76.
- [3] Machnicka-Rowińska B., Rocki B., Dziemian E., Kołodziej-Sobocińska M. 2002. Raccoon dog (*Nyctereutes procyonoides*) – the new host of *Echinococcus multilocularis* in Poland. *Wiadomości Parazytologiczne* 48: 65–68.
- [4] Górski P., Zalewski A., Łakomy M. 2006. Parasites of carnivorous mammals in Białowieża Primeval Forest. *Wiadomości Parazytologiczne* 52: 49–53.
- [5] Hancox M. 1980. Parasites and infectious diseases of the Eurasian badger (*Meles meles* L.): a review. *Mammal Review* 10: 151–162.
- [6] Jones G.W., Neal C., Harris E.A. 1980. The helminth parasites of the badger (*Meles meles*) in Cornwall. *Mammal Research* 10: 163–164.
- [7] Priemer J., Lux E. 1994. *Atriotenia incise* (Cestoda), a parasite of the badger, *Meles meles*, and the raccoon *Procyon lotor*, in Brandenburg, Germany. *Canadian Journal of Zoology* 72: 1848–1853.
- [8] Torres J., Miquel J., Motje M. 2001. Helminth parasites of the Eurasian badger (*Meles meles* L.) in Spain: biogeographic approach. *Parasitology Research* 87: 259–263.
- [9] Milan J., Sevilla I., Gerrikagoitia X., Garcia-Perez A.L., Barral M. 2004. Helminth parasites of the Eurasian badger (*Meles meles* L.) in the Basque Country (Spain). *European Journal of Wildlife Research* 50: 37–40.
- [10] Davidson R.K., Handeland K., Gjerde B. 2006. The first report of *Aelurostrongylus falciformis* in Norwegian badgers (*Meles meles*). *Acta Veterinaria Scandinavica* 48: 6–10.
- [11] Rosalino L.M., Torres J., Santos-Reis M. 2006. A survey of helminth infection in Eurasian badgers (*Meles meles*) in relation to their foraging behavior in a Mediterranean environment in southwest Portugal. *European Journal of Wildlife Research* 52: 202–206.
- [12] Kontrimavicius V.L., Delyamure S.L., Boev S.N. 1976. *Metastrongyloidei* domašnih i dikich životnyh. *Osnovy Nematodologii* vol. 26 (Ed. K.M. Ryzhikov). Izdatelstvo Nauka, Moskva.
- [13] Kozlov D.P. 1977. *Opredelitel' gel'mintov khishchnykh mlekopitaiushchikh SSSR*. Izdatelstvo Nauka, Moskva.
- [14] Anderson R.C. 1978. Keys to the genera of the Superfamily Metastrongyloidea. In: *CIH Keys to the nematode parasites of Vertebrates*. No. 5. (Eds. R. Anderson, A.G. Chabaud, S. Willmott). Commonwealth Agricultural Bureaux, Farnham Royal, Bucks, England.
- [15] Jancev J., Genov T. 1988. On the morphology and taxonomy of species from the genus *Crenosoma* Molin, 1861 (Nematoda: Crenosomatidae) in Bulgaria. *Helminthology* 25: 45–63.
- [16] Rudolph R. 1968. Ceroid formation and its etiology in the lungs of badgers. *Berliner und Münchener Tierärztliche Wochenschrift* 81: 13–15.
- [17] Boch H., Schneidawind H. 1988. *Krankheiten des Jagdbaren Wildes*. Parey, Berlin.
- [18] Alvarez F., Iglesias R., Bos J., Rey J., Sanmartin Duran M.L. 1991. Lung and heart nematodes in some Spanish mammals. *Wiadomości Parazytologiczne* 37: 481–490.

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