

Original papers

A record of *Pseudamphistomum truncatum* (Rudolphi, 1819) (Digenea, Opisthorchiidae) in the Eurasian otter (*Lutra lutra* L.) from Poland

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ABSTRACT. Opisthorchid digenean *Pseudamphistomum truncatum* (Rudolphi, 1819) was isolated from liver bile ducts of the Eurasian otter (*Lutra lutra*) found dead in the fishing pond complex near Wrocław (Lower Silesia, SW. Poland) in March 2009. Since this is the first record of the parasite in the otter from Poland, the description, biometrical data and figure are presented.

Key words: *Pseudamphistomum truncatum*, Eurasian otter, Digenea, Poland

Introduction

Opisthorchid digenean *Pseudamphistomum truncatum* (Rudolphi, 1819) is a typical and common parasite of wild carnivores. The most frequent hosts of this fluke are mustelids: ermine – *Mustela erminea* [1], European polecat – *M. putorius* [2,3], least weasel – *M. nivalis* [1], American mink – *Neovison vison* [4–7], European mink – *M. lutreola* [8,9] and Eurasian otter – *Lutra lutra* [6,10–13]. It has also been noted as the parasite of the red fox – *Vulpes vulpes* [14,15], arctic fox – *V. lagopus* [16], grey wolf – *Canis lupus* [17], racoon dog – *Nyctereutes procyonoides* [18], as well as two species of the seals: harbor seal (*Phoca vitulina*) and grey seal (*Halichoerus grypus*). *P. truncatum* is found mainly in the Central and Eastern Europe and in Russia, though it has also been observed in Denmark, Ireland, United Kingdom, Germany and the Southern Europe.

In Poland *P. truncatum* has been recorded twice as the fox parasite. In the 1950s and 1960s it was found in the wild red foxes near the Baltic Sea coast and in Wielkopolska region on the farm of arctic foxes where animals had been fed fishes from the Vistula Lagoon [16,19].

Material and methods

One adult male Eurasian otter found dead in March 2009 in the area of a fishing pond complex in Borowa Oleśnicka near Wrocław was subjected to standard helminthological dissection. The alimentary tract was divided into anatomical parts and each one was examined separately. Intestine, stomach and all associated internal organs (lungs, liver, heart, kidneys, urinary bladder and gall bladder) were cut out and macroscopically examined for parasites. Furthermore, the content was rinsed in 0.9% solution of NaCl, decanted and examined under the stereoscopic microscope (Nikon SMZ 800). The isolated flukes were preserved in 70% ethyl alcohol, stained with borax carmine, differentiated in acid alcohol, then dehydrated in a series of alcohol solutions and mounted in Canada balsam. Measurements and drawings were made according to the fixed preparations. Identification was based on Scholtz

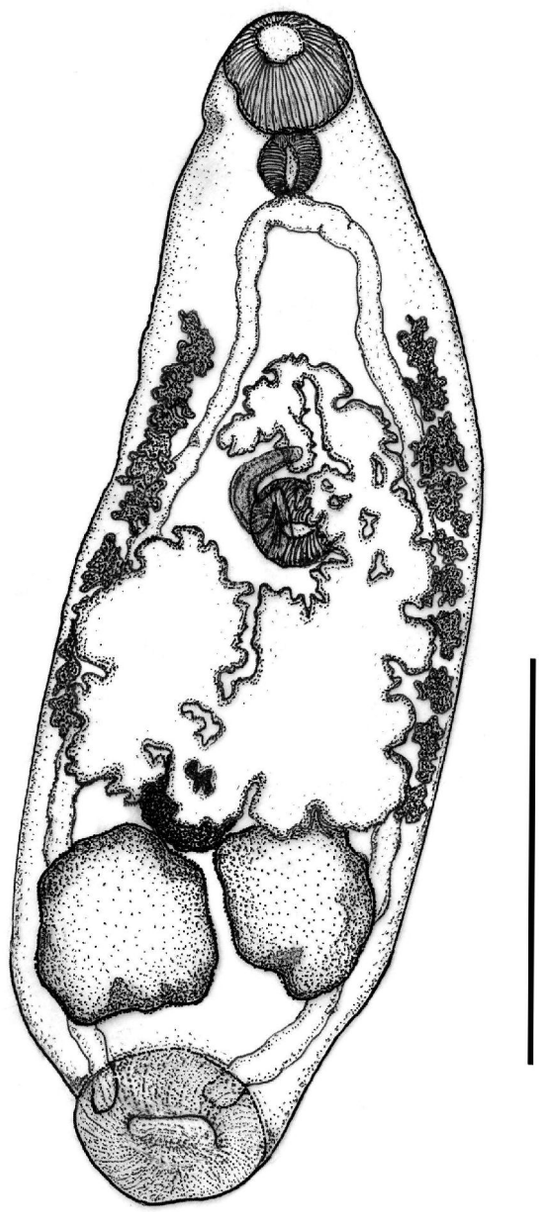

Fig. 1. *Pseudamphistomum truncatum* (Rudolphi, 1819) from *Lutra lutra*. Scale bar: 500 μm

[20] and Skryabin [21] studies. Specimens are deposited in helminthological collection of the Department of Parasitology, Wrocław University.

Results and discussion

Dissection resulted in isolation of 16 flukes from liver bile ducts; they were identified as *Pseudamphistomum truncatum* (Rudolphi, 1819). Information given below concerns morphology and biometrics of this species, since no such data has been found in Polish literature.

Description (measurements in μm on the basis of 4 mature specimens; mean in parenthesis). Body elongate 1300–1550(1412)×27–475(443), covered by tiny spine-like scales, tapering at the anterior end. Posterior end truncated with sucker-like terminal depression (Fig. 1). Oral sucker subterminal, slightly oval, 130–150(135)×140–150(142) in size. Prepharynx absent. Pharynx oval, 50–73(63)×50–65(55), adjoining oral sucker. Oesophagus very short, almost invisible. Bifurcation of caeca just below pharynx. Intestinal caeca wide, slightly sinuous, reaching near posterior end. Ventral sucker, 110–130(120)×120–135(131) smaller than oral sucker. Distance of anterior end of body to ventral sucker 510–700(607). Testes oval, slightly diagonal or nearly symmetrical, close to each other. Anterior testis, 195–210(206)×160–210 (195). Posterior testis slightly bigger than anterior, measurements: 190–220(202)×180–210(200). Cirrus sac elongate and curved downward, situated at the level of ventral sucker and reaching over its anterior margin. Genital pore located just anterior to ventral sucker pore. Ovary and seminal receptacle pretesticular, partially or completely covered. Seminal receptacle, 150×165, adjacent to the testes, posterolateral to ovary. Vitellarium slightly asymmetrical, consist relatively large follicles. It begins at the midline between oral and ventral sucker and extended laterally to the level of proximal margin of posterior testes. Distance of anterior end of body to margin of vitellarium 340–580(480). Length of left band of vitellarian follicles 480–620(542), right 490–560(530). Uterus strongly coiled, with numerous eggs, extends space in body between anterior region of ventral sucker and anterior margin of testes. Eggs oval, 26–28(27)×13–16(14).

Morphology and anatomy of all the analysed idividuals correspond to descriptions found in Skryabin [21], or in recent publication by Simpson et al. [22]. Differences concern only body measurements and some internal organs.

Data analysis (Table 1) indicates biometric variability, which seems to be related mainly to the age of studied specimens. The examined flukes measurements are smaller than the ones given by Skryabin [21]. Still, they are considerably bigger than those described by Simpson et al. [22] or Dollfus, cited after Skryabin [21], who also examined premature specimens [21].

According to Pojmańska et al. [19], Eurasian otter is the only species out of Polish mustelids that

Table 1. Measurements (in μm) of *Pseudamphistomum truncatum* (Rudolphi, 1819) from *Lutra lutra* in relation to the data of others authors

Characters	Dollfus (after Skryabin) [21]	Skryabin [21]	Simpson et al. [22]	Own material (n=4)
Body length	1700	1640–2500	1020–1280	1300–1550
Max body width	320	600–1000	180–360	425–475
Oral sucker length	110	139–152	108–144	130–150
Oral sucker width	116	152–186	72–136	140–150
Distance front of body–ventral sucker	775	—	—	510–700
Pharynx length	60	77–96	56–60	50–75
Pharynx width	—	68–78	40–48	50–65
Ventral sucker length	120	183–211	98–116	110–130
Ventral sucker width	128	183–211	100–124	120–135
Testis I length	270	279–288	112–168	190–220
Testis I width	90	279–288	140–176	180–210
Testis II length	230	279–288	140–200	195–210
Testis II width	110	279–288	156–208	160–210
Ovary length	90	174	140–160	—
Ovary width	60	195	110–136	—
Distance front of body–anterior margin of vitellaria	—	455–655	408–544	477–485
Eggs length	25	27–35	24–30	26–28
Eggs width	16	12–16	12–14	12–16

has not yet been thoroughly examined for helminths. Data on parasites of the domestic otters come from two works of Górski et al. [23,24] based on coprological examination. *Pseudamphistomum truncatum* was not found among all the fluke species mentioned in both the works (i.e. *Alaria alata*, *Opistorchis* sp. or *Metorchis* sp.), therefore this species appears to be a new one for the Eurasian otter in Poland.

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References

[1] Shimalov V.V., Shimalov V.T. 2001. Helminth fauna of the stoat (*Mustela erminea* Linnaeus, 1758) and the weasel (*M. nivalis* Linnaeus, 1758) in Belorussian Polesie. *Parasitology Researc*h 87: 680-681.

[2] Shimalov V.V., Shimalov V.T. 2002. Helminth fauna of the European polecat (*Mustela putorius* Linnaeus, 1758) in Belorussian Polesie. *Parasitology Research* 88: 259-260.

[3] Anisimova E.I. 2002. Comparative analysis of the helminthocenoses of the otter (*Lutra lutra*) and polecat (*Mustela putorius*) in Belarus. *Helminthologia* 39: 87-90.

[4] Shimalov V.V., Shimalov V.T. 2001. Helminth fauna of the American mink (*Mustela vision* Schreber, 1777) from Belorussian Polesie. *Parasitology Research* 87: 886-887.

[5] Sidorovich V.E., Anisimova E.I. 1997. Peculiarities of helminthocenosis in the American mink population inhabiting a severely polluted rivers ecosystem (the Svisloch river, Belarus). *Helminthologia* 34: 45-52.

[6] Hawkins C.J., Caffrey J.M., Stuart P., Lawton C. 2010. Biliary parasite *Pseudamphistomum truncatum*

(Opisthorchiidae) in American mink (*Mustela vision*) and Eurasian otter (*Lutra lutra*) in Ireland. *Parasitology Research* 107: 993-997.

[7] Skov J., Kania P.W., Jørgensen T.R., Buchmann K. 2008. Molecular and morphometric study of metacercariae and adults of *Pseudamphistomum truncatum* (Opisthorchiidae) from roach (*Rutilus rutilus*) and wild American mink (*Mustela vison*). *Veterinary Parasitology* 155: 209-216.

[8] Anisimova E.I. 2004. Study of the European mink *Mustela lutreola* helminthocenoses in connection with the Amercian mink *M. vison* expansion in Belarus: story of the study and review of the results. *Helminthologia* 44:193-196.

[9] Torres J., Miquel J., Fournier P., Fournier-Chambrillon C., Liberge M., Fons R., Feliu C. 2008. Helminth communities of the autochthonous mustelids *Mustela lutreola* and *M. putorius* and the introduced *Mustela vison* in south-western France. *Journal of Helminthology* 82: 349-355.

[10] Shimalov V.V., Shimalov V.T., Shimalov A.V. 2000. Helminth fauna of otter (*Lutra lutra* Linnaeus, 1758) in Belorussian Polesie. *Parasitology Research* 86: 528.

[11] Torres J., Feliu C., Fernández-Morán J., Ruíz-Olmo J., Rosoux R., Santos-Reis M., Miquel J., Fons R. 2004. Helminth parasites of the Eurasian otter *Lutra lutra* in southwest Europe. *Journal of Helminthology* 78: 353-359.

[12] Sherrard-Smith E., Cable J., Chadwick E.A. 2009. Distribution of Eurasian otter biliary parasites, *Pseudamphistomum truncatum* and *Metorchis albidus* (Family Opisthorchiidae), in England and Wales. *Parasitology* 136: 1015-1022.

[13] Simpson V.R., Tomlinson A.J., Molenaar F.M. 2009. Prevalence, distribution and pathological significance of the bile fluke *Pseudamphistomum truncatum* in Eurasian otters (*Lutra lutra*) in Great Britain. *Veterinary Record* 164: 397-401.

[14] Shimalov V.V., Shimalov V.T. 2003. Helminth fauna of the red fox (*Vulpes vulpes* Linnaeus, 1758) in southern Belarus. *Parasitology Research* 89: 77-78.

[15] Schuster R., Bonin J., Staubach Ch., Heidrich R. 1999. Liver fluke (Opisthorchiidae) findings in red foxes (*Vulpes vulpes*) in the eastern part of the Federal State Brandenburg, Germany – a contribution to the epidemiology of opisthorchiidosis. *Parasitology Research* 85: 142-146.

[16] Malczewski A. 1962. Helminth parasites of bred foxes and minks in Poland. *Acta Parasitologica Polonica* 10: 213-260.

[17] Shimalov V.V., Shimalov V.T. 2000. Helminth fauna of the wolf (*Canis lupus* Linnaeus, 1758) in Belorussian Polesie. *Parasitology Research* 86: 163-164.

[18] Shimalov V.V., Shimalov V.T. 2002. Helminth fauna of the racoon dog (*Nyctereutes procyonoides* Gray, 1834) in Belorussian Polesie. *Parasitology Research* 88: 944-945.

[19] Pojmańska T., Niewiadomska T., Okulewicz A. 2007. Pasożytnicze helminty Polski. Gatunki. Żywiciele. Białe Plamy. Polish Parasitological Society, Warszawa.

[20] Scholz T. 2008. Family Opisthorchiidae Loss, 1899. In: *Keys to the Trematoda. Vol. 3.* (Eds. R. Bray, D. Gibson, A. Jones). CAB International and Natural History Museum, London: 9-50.

[21] Skryabin K.I. 1950. Trematody zhivotnykh i cheloveka. Osnovy trematodologii. Vol. IV. Izdatielstvo AN SSSR, Moskva, Leningrad.

[22] Simpson V.R., Gibbons L.M., Khalil L.F., Williams J.L.R. 2005. Cholecystitis in otters (*Lutra lutra*) and mink (*Mustela vison*) caused by the fluke *Pseudamphistomum truncatum*. *Veterinary Record* 157: 49-52.

[23] Górski P., Zalewski A., Łakomy M. 2006. Parasites of carnivorous mammals in Białowieża Primeval Forest. *Wiadomości Parazytologiczne* 52: 49-53.

[24] Górski P., Zalewski P., Kazimierczak K., Kotomski G. 2010. Coproscopical investigations of the European otter (*Lutra lutra*) from Białowieża Primeval Forest. *Wiadomości Parazytologiczne* 56: 179-180.

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