The new parasite species of the genus *Taenia* in Poland

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ABSTRACT

The study of the new species requires a combination of traditional methods and modern molecular techniques. The combination of the basics of science and modern biotechnology in this work has led to the identification and characterization tapeworm of the *Taenia* sp. described for the first time in the world (Finland) in 2016. Experiments were based on classical microscopic analysis and the use polymerase chain reaction (PCR) to amplified the mitochondrial DNA cox 1 gene of the parasite, which intermediate host is a roe deer - *Capreolus capreolus* (Fig. 1), and final host is a eurasian lynx – *Lynx lynx* (Fig. 2) (1).

MATERIALS

During our study we examined the larva of a tapeworm of the genus *Taenia*. The larva was found during the hunting season 2017/2018 at Strzałowo Forest District in the Pisz Forest in lungs of one of the 22 culled roe deers (Fig. 3, 4).

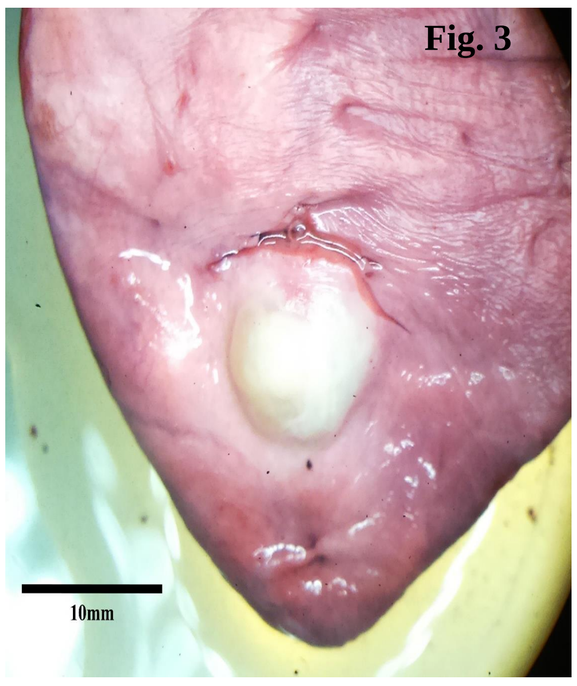

Fig. 3 Lung of roe deer with cyst of tapeworm

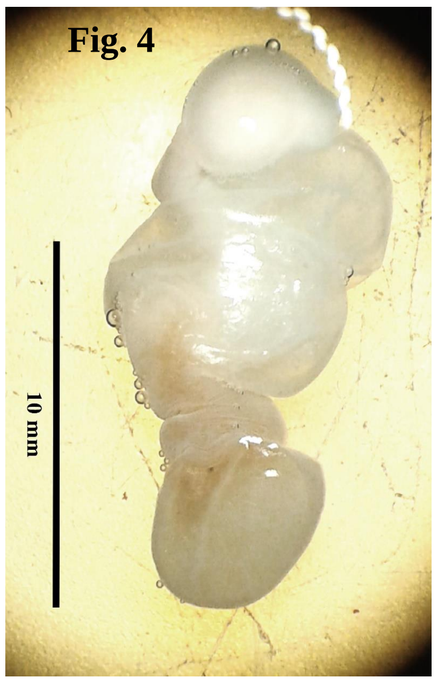

Fig. 4 Cysticerci of tapeworm

Fig. 1 Roe deer – *Capreolus capreolus* (fot. Ż. Steiner – Bogdaszewska IP PAN)

Fig. 2 Eurasian lynx – *Lynx lynx* (carnivores.eu)

METHODS

In cysticerci and adult tapeworms, a crown and a hooks on scolex are a characteristic and diagnostic marks. To localise the crown, the cysticerci with introverted scolex, was mounted in Faure's fluid. For morphological identification, the rostellar hooks were liberated from the crown using an aqueous solution pepsin and HCl. After that all hooks were mounted in Canadian balm. The rostellar hooks were examined according to Gubányi (1995) (2).

The DNA was isolated using the DNA Mikro Kit (Syngen) according to the manufacturer's protocol. The primers for PCR: Thg452F and Thg1326R (3) were used to obtain a 874 bp fragment of the mitochondrial cytochrome c oxidase subunit 1 gene (cox1). The PCR products were visualized on a 1.0% agarose gel (Promega) stained with SimplySafe (EURx). Visualization was performed using ChemiDoc, MP Lab software.

RESULTS

The crown consisted of 32 hooks in two rows, 16 small and 16 large hooks (Fig. 6). Small hooks had 127,2 μm and the large hooks had 219,5 μm (medium length) (Fig. 7, 8). Basing on the number of hooks and their sizes, it was not possible to clearly classify this tapeworm to a particular species. Based on this result, the tapeworm could belong to the species: *Taenia taeniaeformis*, or the new species *T. lynciscapreoli* (4). Molecular analysis of the tapeworm clearly determined the species. The obtained DNA sequence (874 bp) (Fig. 5) coincided with a fragment (396 bp) of DNA tapeworm described for the first time in the world in 2016. On this basis, the species was identified as ***Taenia lynciscapreoli***. This is the first report of this tapeworm in Poland and the second in the world.

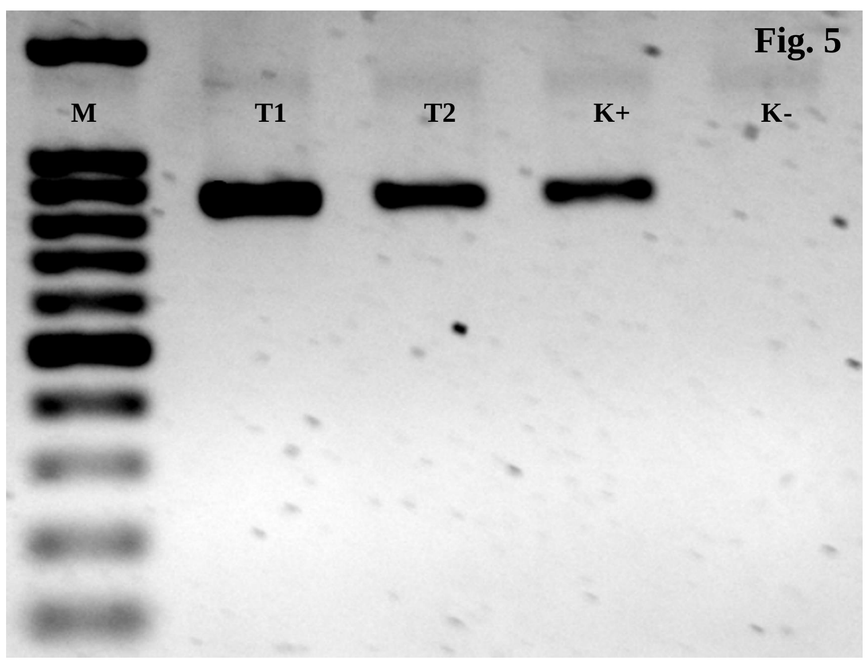

Fig. 5 The PCR products on agarose gel. The product is about 870 bp

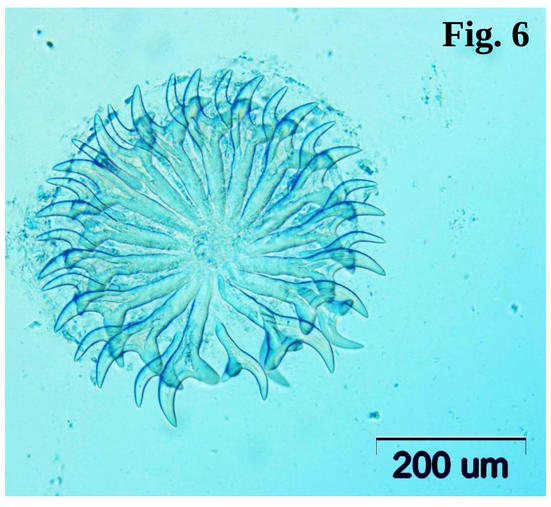

Fig. 6 The crown with rostellar hooks (32) of *Teania lynciscapreoli*

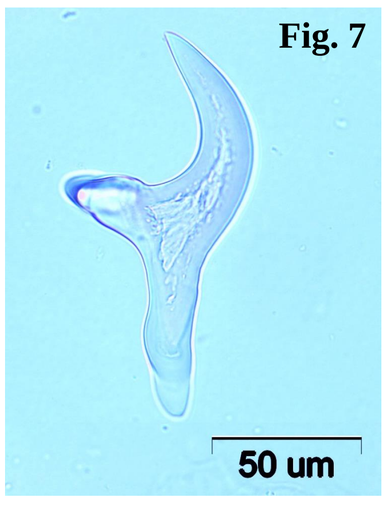

Fig. 7 The small hook of *Teania lynciscapreoli*

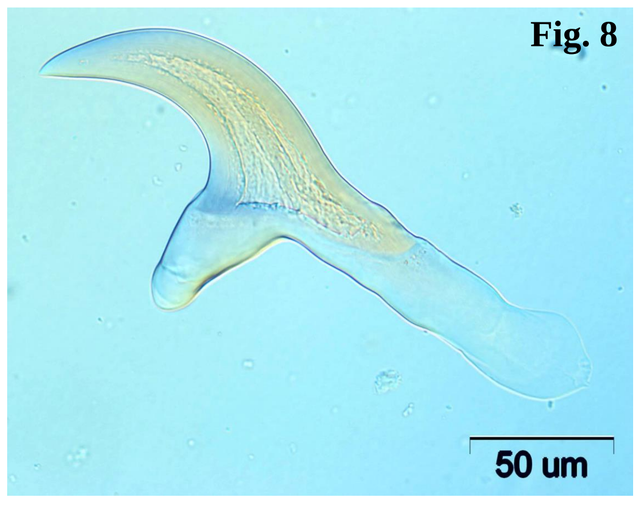

Fig. 8 The large hook of *Teania lynciscapreoli*

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symbioza Międzyuczelniane Sympozjum Biotechnologiczne