CONTRIBUTIONS TO KNOWLEDGE OF THE INTERNAL PARASITES OF MUSKRAT (ONDATRA ZIBETHICA L., 1776) LIVING ALONG THE RIVER TISZA

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The muskrat got into the fauna of Europe more than half a century ago. It was introduced into a domain in Dobris, Bohemia. The species of great prolificity, of migratory inclination and of good acclimatizing capacity very soon spread in the whole Bohemia and simultaneously it began its European expansion.

In this country the first one got caught in Németísfalva (county Moson) just half a century ago (1914). At present it is generally known in the whole country and is a fur animal of great value of our fauna.

In its country of origin (North America) its inner parasite fauna had been studied thoroughly. The examinations began at the beginning of our century and go on in these days, as well. In Europe the revelation of its parasites began immediately after its introduction and we can find data referring here to almost in every European country. In this country, however, this is the first contribution about the internal parasites of muskrats.

The parasites found belong to the classes Trematoda: Echinostoma coilitum Barkes et Beaver, 1915; E. revolutum (Fröhlich, 1802), Dietz, 1909; Psilotrema marki Skworcowa, 1934; Plagiorchis (P.) proximus Barkes, 1915 — Cestoda: Aprostataandrya (A.) macrocephala (Douthitt, 1915) Spassky, 1949; Cysticercus taenia taeniiformis (Batsch, 1789) — Nematoda: Ascaris sp. (larva).

Material and method

The material necessary for examinations was obtained from professional collectors of muskrats. I have had a relatively small material at my disposal (Vásárosnamény: 13, Szeged: 12 pieces), so the result obtained cannot raise a claim to completeness being but of informative character in connection with this problem.

At autopsy the following course was kept. The cavity of animal was opened in a dissection-dish, below water. The several organs were put separately into Petri cups, thoracic and abdominal cavities of the animal were examined. Then the organs (brain, heart, lungs, liver, gall-bladder, pancreas, kidney, bladder, intestinal tract) were dissected and examined under microscope. The parasites found were cleaned in isotonic saline solution from possible contaminations.

For fixing, staining, and conserving the parasites I used the generally
employed techniques. The *Trematoda* and *Cestoda* were fixed and preserved in 70. p. c. alcohol. Fixation was carried out under topplate with a mild pressure on parasites where necessary. *Trematoda* were stained in borax-carmine alcoholic solution, *Cestoda*, however, in Grenacher-Delafield’s haematoxylin. The stained parasites were differentiated in hydrochloric alcohol, dehydrated in ascending alcohol-series, cleared in clove-oil and closed in Canada balsam. *Nematoda* were fixed and preserved in Barbagallo solution, cleared in lactic acid.

**Faunistic Part**

**Trematoda:**

*Family I. Echinostomatidae Dietz, 1909.*


The occurrence of the species is known all over the world. It occurs alike in vertabrate philogenetically distant. In North America it was described by Leidy (14) from muskrats (*Distomum echinatum Zeder, 1803*). In Europe it is mentioned by J. Grabda (12) from muskrats in Poland. I have found three ones in a unique specimen of test material from Vásárosnámény.

**Localization:** small intestine.

**Its hosts:** *Canis familiaris, Mus musculus, Ondatra zibethica, Sus scrofa, Nycticomus violaceus, Gallinula galeata, Crespiscus viridis, Columba livia, Anas platyrhynchos.*


It got to Europe on the occasion of the introduction of muskrat. In North America it is a common parasite of muskrat. In Europa Tenora (21) wrote the first time about the muskrat in Czech-Slovakia.

It is a corpulent parasite considerably lengthened. Its bodylength changes between 18—33 mm, its width between 1,3—2,3 mm. On the collar in front part of its body 35 spines may be observed. The mouth-sucker is spherical, of terminal location. Measure: 0,2—0,4 mm. The abdominal sucker is well developed, muscular, of 0,9—1,6 mm size. *Pharynx* is well developed, *oesophagus* relatively short. The intestinal branches are simple, reaching until the end of body.

The ovary is 0,2—0,6 mm, egg-shaped or oval. Its rim is normal or mildly wavy. It lies in the forefront of the posterior body-half. Testes are to be found in the middle line of body. Size of the first testis changes between 0,5—1,3 mm, that of the second one between 0,8—1,5 mm. *Cirrus-pouch* is well developed, it is placed before the posterior sucker. The orifice of the genital pore may be observed before the abdominal sucker, run until the end of body and fill the part of body behind the testes, as well. Uterus is well developed, it gets, with transversal tortuosity, into the genital pore. There are numerous oval ova. Their dimension is: 0,06—0,1×0,05—0,07 mm.
Localization: small intestine.
Spread: North America, Czecho-Slovakia, Hungary (Vásárosnamény).
Host: Ondatra zibethica, Apodemus flavicollis.

Family II: Psilotomatidae O d h n e r, 1913.

1. Psilotrema marki S k w o r c o w, 1934.

Sk w o r c o w has found this species in the small intestine of Arvi-
cola terrestris. From muskrat it is mentioned by S p a s s k y and co-wor-
kers the first time in 1949. And from muskrats in Poland the first pub-
lication is by J. G r a n d a in 1954.

It is a worm of small body. Hinder bodypart becomes thin in a les-
sor, the frontal one in a greater degree. Its length is 1,11—1,37 mm,
width 0,67 mm. Mouth-sucker is of subterminal location. Size: 0,14—
0,16×0,15 mm. The abdominal sucker is round, it can be found in the
second quarter of the bodylength. Its diameter is 0,19—0,16 mm. Phary-
ynx is considerably developed, immediately after it the oesophagus is
divided into two intestinal branches. The intestinal branches are simple,
they reach till the end of body.

Ovary is to be found a little right from the middle line of body, be-
tween the abdominal sucker and the first testis. Size: 0,11—0,15×0,09—
0,16 mm. The testes are in the hinder part of body, behind each other.
The first testis is 0,09—0,19×0,14—0,16 mm, the other one 0,13—0,20×
0,16—0,19 mm. The genital pore can be found in height of the pharynx.
Uterus is short, number of ova little. Ova are of a little oval shape.
Size: 0,095×0,11 mm. Localization: small intestine.

Spread: Soviet Union, Poland, Hungary (Vásárosnamény).
Host: Arvicol a terrestris, Ondatra zibethica.

Family III: Plagiorchiidae L ü h e, 1901.

1. Plagiorchis (P.) proximus B a r k e r, 1915.

It got to Europe simultaneously with the muskrat. S c h u l t z men-
tions it from muskrat living in the Soviet Union in 1932, J. G r a b d a
from Poland in 1954, Erhardova from Czecho-Slovakia in 1958. Body-shape and size of European ones differ from data published by Barker.

It is a worm of small body. Bodylength 1.30—4.60 mm, width 0.49—1.10 mm. Its mouth-sucker is of subterminal location. Size: 0.08—0.28×0.04—0.17 mm. Abdominal sucker is to be found on the dividing line of the first and second quarters of body, of size 0.06—0.15×0.07—0.14 mm. Pharynx is connected immediately to the oral aperture and goes on in the intestinal branches. The intestinal branches are simple, reaching till the end of body.

Ovary is round or oval, a little right from the middle line of body, immediately besides the cirrus pouch. Size: 0.085—0.17×0.1—0.3 mm. Testes are round or oval, of normal rim. They lie in the forepart of the hinder body-part. The first testis 0.12—0.22 mm, the second one 0.20—0.25 mm. The cirrus pouch is well developed, pear shaped, its basic part reaches till the level of ovary. The vitelline glands take place close to one another from the intestinal bifurcation until the end of body.

Ova are numerous, of straw-yellow colour. Size: 0.032—0.037×0.016—0.024 mm.

Localization: small intestine.

Spread: North America, Soviet Union, Poland, Czecho-Slovakia, Hungary (Vásárosnamény, Szeged).

Host: Ondatra zibethica.

Cestoda:

Family I. Anoplocephalidae Cholodkowsky, 1902.


Worm of middle size. The scolex is more or less round. On it round and oval suckers are to be found. The segments go on increasing, departing from scolex. Their highest width is to be found at segments containing the matured genitals. Cuticle is rather thin, parenchyma muscles are well developed.

There are numerous testes (40—100 pieces), taking place at most apolarly. The female genitals are of semicircle structure, lying in the middle of segment. Ovary consists of numerous, club shaped labes. The vitelline glands take place among the lobes of ovary.

Ova are round or oval, their size is: 0.03—0.04 mm.

Localization: small intestine.


Host: Geomyys bursarius, Microtus arvalis, Mus agrestis, Microtus oeconomus, Clethrionomys glareolus, Arvicola terrestris, Ondatra zibethica.

Family II: Taeniidae Ludwig, 1886.

1. Cysticercus taenia taeniaeformis (Batsch, 1786).

It is a frequent parasite of muskrats. The cysts sometimes covered the surface of liver almost thoroughly. Their number changed, as a rule, between 8—32.
Aprostodrya (A.) macrocephala
(Douthitt, 1915) Spassky, 1949

The sexually mature worms sponge on the intestinal tract of the species of families Canidae, Felidae, Mustelidae.
Spread: North America, Soviet Union, Great Britain, Poland, Czecho-Slovakia, Hungary (Vásárosnamény, Szeged).
Nematoda:

Family I: Ascaridae Baird, 1853.

1. Ascaris sp. (larva).

We have found a female worm in the intestinal tract of a single animal of the material of examination from Vásárosnamény.

Summary

From the relatively small material of examination from the two banks of Tisza (Vásárosnamény, Szeged) we have obtained the following parasites: Trematoda: Echinostoma coelitum Barker et Beaver, 1915; E. revolutum (Fröhlich, 1802) Dietz, 1909; Psilotrema marki Skwarncow, 1934; Plagiocotys (P.) proximus Barker, 1915; Cestoda: Aprostotrema tetraptera (A.) macrocephala (Dünnitt, 1915) Spassky, 1949; Nematoda: Ascaris sp. (larva).

The occurrence of the above species in small mammals and muskrats is generally known in Europe.

After extending the examinations to the whole year and employing a larger material, the number of parasites of muskrats living the vicinity of Tisza will certainly be higher.

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