

## MORPHOLOGICAL FEATURES OF *MICROSOMACANTHUS BAERI* CZAPLINSKI & VAUCHER 1977 (CESTODA, HYMENOLEPIDIDAE)

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**Abstract.** During standard parasitological research on West Pomeranian ducks, conducted by the Laboratory of Biology and Ecology of Parasites in the years 2000–2011, 16 tapeworms were found in the intestines of five Mallards (*Anas platyrhynchos*) and one Tufted Duck (*Aythya fuligula*). The tapeworms were classified as *Microsomacanthus baeri* Czaplinski & Vaucher 1977 on the basis of the segments' internal structure. The presence of this tapeworm in Polish fauna has been indicated beforehand, however, the reports were merely of a contributory character, thus the aim of this thesis was a morphometric characteristic of this parasite.

**Key words:** *Aythya fuligula*, *Anas platyrhynchos*, Cestoda, *Microsomacanthus baeri*, Poland

### INTRODUCTION

The genus *Microsomacanthus* Lopez-Neyra, 1942, is a group of tapeworms abundant with species, which inhabits small intestines of birds [Pojmańska and Cielecka 2001]. In Europe, 39 species of this genus were noted, 17 species were noted in Poland [<http://www.faunaeur.org>]. The tapeworms are characterized by a retractile snout with ten hooks of diorchis or arcuatus type and unarmed suckers. In male and hermaphroditic segments there are three testicles arranged in a line

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or in a triangle. The cirrus is usually armed, the cirrus pouch can have different lengths. An additional cirrus sac is not present. Parasites belonging to this genus have an ovary divided into lobes (bi-, tri-, or multilobed).

As it is stated in the sources [Ryzhikov et al. 1985, Maksimova 1989], final hosts of *M. baeri* Czaplinski & Vaucher 1977 can be almost all species of ducks belonging to 7 genera from three tribes: Anatini (genus *Anas*), Aythyini (*Aythya* and *Netta* genera) and Mergini (*Bucephala*, *Melanitta*, *Mergellus*, *Mergus* and *Somateria*). The intermediate hosts of this parasite are Copepoda, including *Mesocyclops oithonoides*, *M. crassus*, *M. leuckarti*, *Acanthocyclops viridis*, *Cyclops strenuous*, *Diaptomus graciloides* and Amphipoda (*Gammarus lacustris*). The presence of *M. baeri* in Polish fauna was reported in earlier publications, however, they were merely of a contributory character [Kavetska et al. 2003, Korniyushin et al. 2003] and a comparative ecological analysis of Mallard (*A. platyrhynchos*) tapeworm grouping in Poland and in Ukraine [Korniyushin et al. 2004]. Thus the aim of this thesis was to present a morphometric characteristic of *M. baeri* conducted on the entire gathered material.

## MATERIAL AND METHODS

During the research of West Pomeranian wild ducks cestode fauna, conducted by the Laboratory of Biology and Ecology of Parasites in the years 2000–2011, presence of a new tapeworm in Polish fauna – *Microsomacanthus baeri* Czaplinski & Vaucher 1977 – was discovered in the gastrointestinal tracts of the Mallard and the Tufted Duck. The parasites were isolated from 4 young males and one adult female Mallard (*Anas platyrhynchos*) from the area around Słońsk (currently Warta Mouth National Park) and ponds around Szczecin, and one young female Tufted Duck from Dąbie Lake.

The research material was constituted by 16 tapeworms, which were classified as *M. baeri* on the basis of their internal structure. The isolated parasites were fixed and stored in 70% ethanol. Part of the tapeworms were cleared in Hoyer's solution [Cielecka et al. 2009], the remainder was used to make specimens stained with acetocarmine according to a modified Goergiev et al. [1986] method.

The tapeworms were classified with the use of available identification keys and original works [Spasskaja 1966, Ryšavý 1982, Ryzhikovi in. 1985, Maksimova 1989], and selected elements of their anatomy were measured with a ocular micrometer in a biological Zeiss microscope.

## RESULTS AND DISCUSSION

35 364 tapeworms were isolated from the gastrointestinal tracts of 1005 researched ducks, 1363 (3.8%) of which belonged to the genus *Microsomacanthus*. Only 16 specimens in this group (1.2%) were identified as *M. baeri*. During the identification, special attention was paid to the very characteristic cirrus sac, which is shaped like a bulb (Fig. 1, 2). The measurement results, on the basis of which the species was identified, are presented in Table 1.

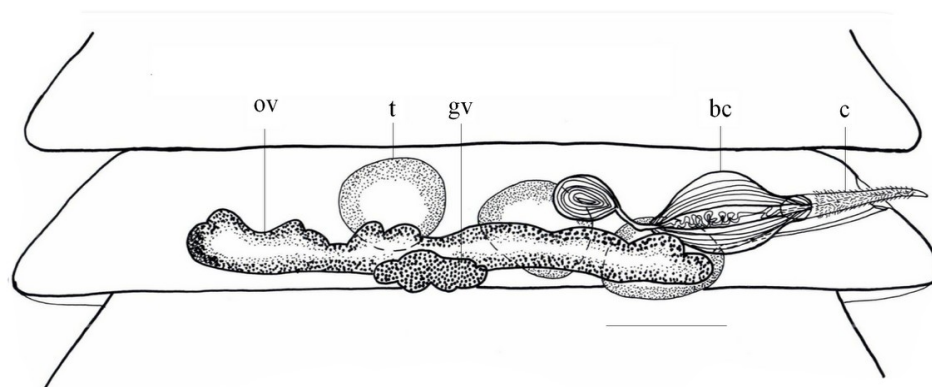


Fig. 1. Hermaphroditic segment of *M. baeri* Czaplinski & Vaucher 1977. Scale bar: 65  $\mu$ m; explanations: ov – ovary, t – testis, gv – vittellarium, bc – cirrus sac, c – cirrus

Rys. 1. Człon hermafrodytyczny *M. baeri* Czaplinski & Vaucher 1977. Skala: 65  $\mu$ m; legenda: ov – jajnik, t – jądro, gv – żółtnik, bc – bursa cirrusa, c – cirrus

**Strobila.** Among all researched tapeworms it was impossible to isolate a specimen with a scolex. The strobila consists of segments presenting craspedote arrangement. Its length ranges from 3.6 to 7.74 mm. Proglottids are 5 times wider than long and rounded at the ends. They do not adhere to each other at full length, and the border between neighboring segments is very clear. Their maximal width (at the height of the hermaphroditic segment) amounted to 810  $\mu$ m.

**Male reproductive system.** The middle part of the hermaphroditic segment (Fig. 1), which dimensions are 110.0–162.0x360.0–684.0  $\mu$ m, is occupied by three almost spherical testicles, arranged in a single line. Their dimensions are 60.0–65.0x55.0–60.0  $\mu$ m. The cirrus sac, sized 200.0–225.0x45.0–75.0  $\mu$ m, is short, wide, very muscular, and does not reach the middle of the segment (it only reaches half of the poral testicle). The cirrus sac sizes of our parasites are the closest to those given by Ryšavý et al. [1982] and Ryzhikov et al. [1985]. The cirrus (162.0–205.0x12.0–15.0  $\mu$ m) is covered with small spikes (of equal size on the entire

length of the cirrus), except for the distal part. It narrows gradually and is pointed (Fig. 2). The cirrus of the specimens analyzed by us is definitely longer than stated by the sources [Ryzhikov et al. 1985, Maksimova 1989].

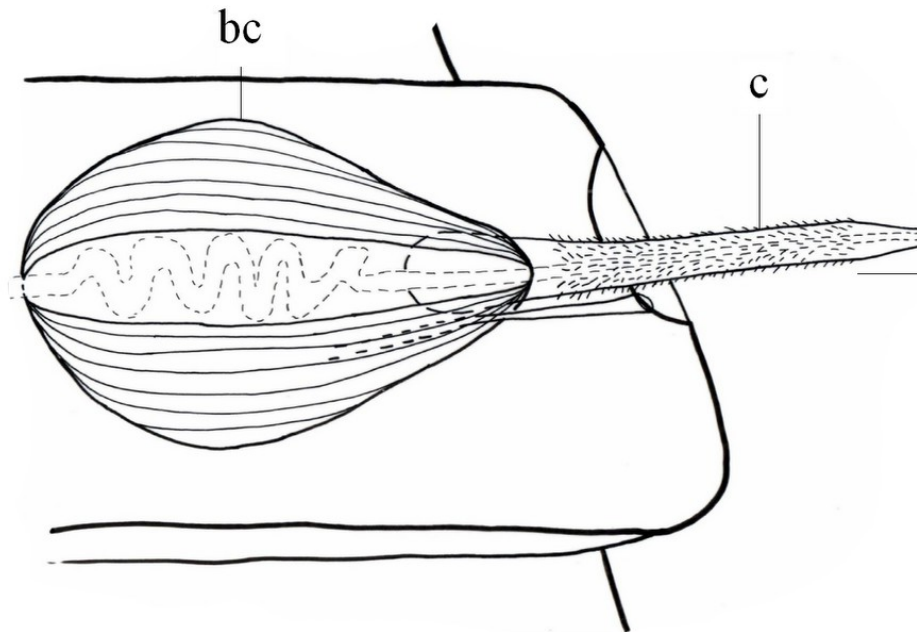


Fig. 2. Cirrus of *M. baeri*. Czaplinski & Vaucher 1977. Scale bar: 25  $\mu$ m; explanations: bc – cirrus sac, c – cirrus

Rys. 2. Cirrus *M. baeri* Czaplinski & Vaucher 1977. Skala: 25  $\mu$ m; legenda: bc – bursa cirrusa, c – cirrus

**Female reproductive system.** The tapeworm's ovary is wide, lobed, it stretches along the testicles and crosses the antiporal testicle line. The size of the ovary varies depending on the host. Ovary of the tapeworm isolated from the Tufted Duck is twice the size of the ovaries belonging to the tapeworms isolated from the Mallard (Table 1). The differences are statistically significant ( $P \leq 0.05$ ). Perhaps it is a quality originating from the influence of the host species, however, this thesis requires confirmation on a larger amount of research material. A small, compact vittellarium is divided into small lobes and it reaches a size of  $32.5\text{--}60.0 \times 18\text{--}20.0 \mu\text{m}$ .

The uterus was very weakly visible in our specimens.

Table 1. Morphological features of *M. baeri* Czaplinski & Vaucher 1977,  $\mu\text{m}$ Tabela 1. Charakterystyka morfometryczna *M. baeri* Czaplinski & Vaucher 1977,  $\mu\text{m}$ 

Feature Struktura	Ryšavý et al. 1982	Ryzhikov et al. 1985	Maksimova 1989	Own material Materiał własny	
				<i>Anas platyrhynchos</i>	<i>Aythya fuligula</i>
Testis, width x length Jądro, szerokość x długość	114–118	110–170	60–110x50–150	65x60	60–65x55–60
Cirrus, length Cirrus, długość	–	120	96–115	175	162–205
Cirrus, width Cirrus, szerokość	–	15–16	12–15	12	15–16
Cirrus sac, length Bursa cirrusa, długość	154–284	150–290	140–210	200	200–225
Cirrus sac, width Bursa cirrusa, szerokość	50–82	50–80	50–70	45	60–75
Jajnik, długość Ovary, length	284–312	340	–	175	375–400
Ovary, length Jajnik, szerokość	–	–	–	30	50–65
Vitellarium width x length Żółtnik szerokość x długość	32–40	90	–	50x18	32,5–60x19–20

## CONCLUSIONS

The conducted research displayed statistically significant differences in ovary size of *M. baeri*, depending on the host species. This points to a necessity to conduct similar research on a larger number of parasites coming from different birds.

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## CHARAKTERYSTYKA MORFOMETRYCZNA *MICROSOMACANTHUS BAERI* CZAPLINSKI & VAUCHER 1977 (CESTODA, HYMENOLEPIDIDAE)

**Streszczenie.** Podczas standardowych badań parazytologicznych dzikich kaczek Pomorza Zachodniego prowadzonych w Pracowni Biologii i Ekologii Pasożytów w latach 2000–2011 w jelitach pięciu krzyżówek (*Anas platyrhynchos*) i jednej czernicy (*Aythya fuligula*) stwierdzono obecność 16 tasiemców, które na podstawie budowy wewnętrznej członów oznaczono jako *Microsomacanthus baeri* Czaplinski & Vaucher

1977. O obecności tego tasiemca w krajowej faunie informowano już wcześniej, doniesienia miały jedynie charakter przyczynkowy, dlatego celem niniejszej pracy była charakterystyka morfometryczna tego pasożyta.

**Słowa kluczowe:** *Anas platyrhynchos*, *Aythya fuligula*, Cestoda, *Microsomacanthus baeri*, Polska

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