

## ***Microtrema barusi* gen. n. and sp. n. (Digenea: Phaneropsolidae) from *Prunella modularis* (Aves, Passeriformes) in the Czech Republic**

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### **Summary**

*Microtrema* gen. n. and *Microtrema barusi* sp. n. are described from the intestine of *Prunella modularis* in the Czech Republic. Genus and species have the following features: Body claviform, widest in region of ventral sucker. Tegument densely covered with tiny spines. Suckers small, widely separated. Oral sucker globular, subterminal. Ventral sucker globular, equatorial. Prepharynx very short or absent. Pharynx small, fine. Oesophagus divided into two short intestinal branches ending blindly anterior to testes. Testes globular, lateral, in region of ventral sucker. Vesicula seminalis small, genital pore in short distance before ventral sucker and opening of uterus. Bursa cirri and cirrus absent. Ovary globular, median, between testes. Mehlis' gland long oval, posterior to ovary. Vitellarium weakly developed, in two lateral clusters composed of small follicles. Uterus in posterior part of body, with many eggs, covering vitellarium and partly ventral sucker. Excretory vesicle V-shaped, pore terminal.

Keywords: Digenea; Phaneropsolidae; *Microtrema* gen. n.; *Microtrema barusi* sp. n.; passerine birds; Central Europe

### **Introduction**

Digeneans of the family Phaneropsolidae Mehra, 1935 are parasites of mammals and birds, rarely reptiles. The most common hosts are mammals (in total, 20 genera of the Phaneropsolidae have been reported), especially Chiroptera and Insectivora, rarely Rodentia and Primates. In reptiles, phaneropsolid species of two genera have been found, birds are known to host nine genera; most frequently the parasites are found in Passeriformes, Caprimulgiformes, Charadriiformes and Ralliformes. Four of the genera have been reported to occur alternatively in mammals, birds, or reptiles (Lotz & Font, 2008). Metacercariae of a phaneropsolid representative were described from insects (Besprozvannykh, 1994). During

the research conducted to make an inventory of the helminth fauna of birds in the Czech Republic (Sitko *et al.*, 2006; Sitko & Okulewicz, 2010; Sitko, 2011), a new species of a new genus of the Phaneropsolidae was collected. The main goal of this study is to describe this finding.

### **Material and methods**

In 1962 – 2011, 273 dead specimens of Dunnock (*Prunella modularis*) were examined in various months from March to October. In total, 1 124 digeneans of the family Phaneropsolidae in three hosts were found in April 2, 2010, April 8, 2011 and April 11, 2011. The parasites were fixed in 70 % alcohol, stained with borax carmine and mounted in Canada balsam. Drawings were made using a camera lucida. The type specimens (holotype No. P–P–1868/16/1 and paratypes No. P–P–1868/16/2–30) were deposited in the Comenius Museum Přerov, Czech Republic, paratypes No. 2012.1.19.1 in the Natural History Museum, London, U.K.

### **Results**

*Microtrema* gen. n.

Generic diagnosis

Phaneropsolidae. Body claviform, widest in region of ventral sucker. Tegument densely covered with tiny spines. Suckers small, widely separated. Oral sucker globular, subterminal. Ventral sucker globular or broadly oval, equatorial. Prepharynx very short or absent. Pharynx small, fine. Oesophagus divided into two short intestinal branches ending blindly anterior to testes. Testes lateral, at level of ventral sucker or partly anterior to it, just as large, globular or widely oval. Vesicula seminalis small, genital pore in short distance before ventral sucker and opening of uterus. Bursa cirri and cirrus absent. Ovary globular or widely oval, median, between or anterior to testes. Mehlis' gland

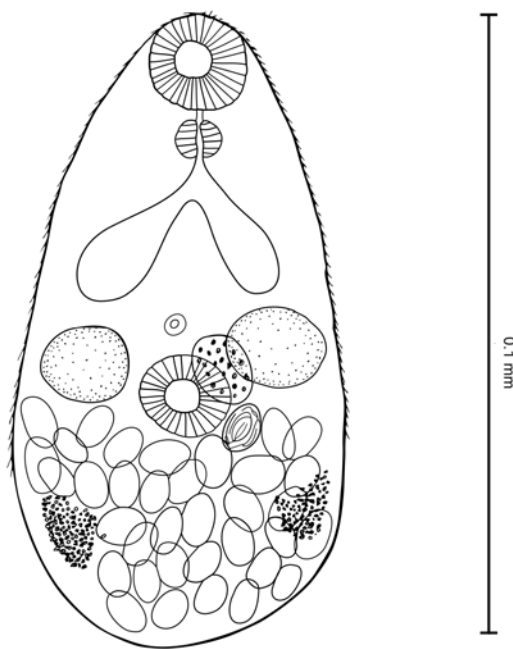


Fig. 1. *Microtrema barusi* sp. n.

long oval, posterior to ovary. Vitellarium in two lateral clusters of small follicles, in posterior quarter of body. Uterus with many eggs in posterior part of body, ventrally covering vitellarium and often posterior margin of ventral sucker. Excretory vesicle V-shaped, pore terminal. Parasites of the intestine of birds (Passeriformes: Prunellidae), type species *Microtrema barusi* sp. n.

#### *Microtrema barusi* sp. n.

Description (holotype, 30 paratypes; dimensions in parentheses are range and mean  $\pm$  standard deviation; all dimensions are in  $\mu\text{m}$ ). Body claviform, 180 long (holotype, Fig. 1) (173 – 209, 191  $\pm$  10), widest in region of ventral sucker 115 (91 – 132, 111  $\pm$  11). Tegument covered with tiny spines that are longer (5) and in dense rows in anterior part of body, and shorter (2) and sparser posterior to testes. Suckers small 72 (58 – 120, 86  $\pm$  14), widely separated one from another. Oral sucker subterminal, globular 26 (19 – 39, 26  $\pm$  3)  $\times$  26 (24 – 31, 28  $\pm$  2). Ratio of sucker lengths 0.90 (0.79 – 1.53, 1.02  $\pm$  0.179), widths 0.90 (0.83 – 1.32, 1.06  $\pm$  0.117). Ventral sucker in centre of body, rarely anterior, often at beginning of second half of body, globular, more rarely oval 29 (19 – 31, 26  $\pm$  3)  $\times$  29 (22 – 34, 27  $\pm$  3)). Prepharynx very short or absent 3 (2 – 5, 3  $\pm$  1)). Pharynx small, fine 17 (14 – 19, 16  $\pm$  2)  $\times$  19 (12 – 24, 18  $\pm$  3). Oesophagus 16 (14 – 19, 15  $\pm$  2) long, divides into two short intestinal branches: right 60 (29 – 72, 50  $\pm$  10) long, left 53 (31–74, 51 $\pm$ 10) long; their width is 24 (17 – 24, 20  $\pm$  3). Intestinal branches end blindly well anterior to and are never adjacent to testes. Testes globular, rarely broadly oval, symmetrical, lateral at level of ventral sucker or partially beyond, never adjacent to ventral sucker; left testis 29 (22 – 34, 26  $\pm$  4)  $\times$  24 (24 – 36, 28  $\pm$  3), right

testis 29 (22 – 31, 25  $\pm$  3)  $\times$  24 (24 – 36, 28  $\pm$  3). Vesicula seminalis small, genital pore in short distance before ventral sucker and opening of uterus. Bursa cirri and cirrus absent. Ovary globular or broadly oval, median in area of ventral sucker, between testes or in front of them, 24 (14 – 29, 24  $\pm$  4)  $\times$  34 (22 – 34, 28  $\pm$  2). Mehlis' gland long oval, median, 19 (17 – 026, 21  $\pm$  3)  $\times$  19 (17 – 26, 21  $\pm$  3). Vitellarium consisting of small follicles in two lateral clusters in posterior quarter of body, 19 (19 – 48, 29  $\pm$  5) long. Vitelline reservoir not seen. Uterus with many eggs in posterior part of body, ventrally covering vitellarium and often posterior margin of ventral sucker. Eggs with operculum, 19 (16 – 24, 19  $\pm$  2)  $\times$  0.014 (12 – 17, 15  $\pm$  2). Excretory vesicle V-shaped, pore terminal.

#### Taxonomic summary

Type host: *Prunella modularis* (Linnaeus, 1758).

Type locality: Záhlnice, 6770, 49°17'06"N/17°28'41"E, District Kroměříž, Moravia, Czech Republic, Central Europe.

Site of infection: beginning of the large intestine.

Prevalence and intensity of infection: In three hosts out of 273 dissected (1.1 %) 275, 324, and 525 specimens, respectively.

Etymology: The species is named after the distinguished Czech parasitologist, Professor Vlastimil Baruš, who contributed greatly to the knowledge of the systematics, taxonomy and biology of helminths parasitizing the vertebrates.

#### Differential diagnosis

Lotz and Font (2008) included a total of nine valid genera of the family Phanerosolidae that parasitize birds: *Lecithodoliffusia* Odening, 1964, *Pseudocephalotrema* Combes and Jourdane, 1969, *Pseudocryptotropa* Yamaguti, 1958, *Echinuscodendrium* Skarbilovich, 1943; *Moesia* Travassos, 1928; *Ornithodendrium* Oshmarin and Dotsenko, 1950, *Passeritrema* Sitko, 2004; *Phaneropsolus* Looss, 1899; *Pleuropsoloides* Goodman, 1990. Last six listed genera have been reported from passeriform birds; out of them, *Moesia*, *Ornithodendrium*, and *Passeritrema* occurred in Europe, while *Phaneropsolus* is cosmopolitan and *Pleuropsoloides* was reported from Africa (Sitko *et al.*, 2006; Lotz & Font, 2008).

Genus *Microtrema* n. gen. differs from all the above genera in the following features: Smallest body size (0.1 – 0.2 mm); all species of the other genera have longer body (0.5 – 4 mm). The genera *Microtrema*, *Echinuscodendrium*, *Passeritrema* and *Pleuropsoloides* lack bursa cirri and cirrus, whereas these are well developed in *Lecithodoliffusia*, *Moesia*, *Ornithodendrium*, *Phaneropsolus* *Pseudocephalotrema* and *Pseudocryptotropa*. *Microtrema* has vitellarium composed of small follicles and located close to the posterior end of body. In *Pseudocryptophora*, vitelline follicles are all over the body; *Passeritrema* has two elongated groups of follicles posterior to testes and

reaching to  $\frac{3}{4}$  length of body. In *Echinuscodendrium*, *Lecithodollfusia*, *Mosesia*, *Ornithodendrium*, *Phaneropsolus*, *Pleuropsoloides* and *Pseudocephalotrema*, vitellarium is situated between testes and oral sucker and consists of large follicles. In *Microtrema*, oesophagus is as long as pharynx, whereas in *Echinuscodendrium*, *Lecithodollfusia*, *Ornithodendrium*, *Phaneropsolus*, *Pleuropsoloides*, *Pseudogryptotropa*, *Mosesia*, *Passeritrema*, and *Pseudocryptophora*, oesophagus is twice and more times as long as the pharynx. In *Microtrema*, the intestinal branches are short, whereas in *Passeritrema*, *Phaneropsolus*, *Pleuropsoloides*, *Pseudocephalotrema*, and *Pseudocryptotropa*. In *Echinuscodendrium* and *Mosesia*, they extend to ventral sucker, and in *Ornithodendrium* and *Lecithodollfusia*, they extend to the end of the body. Eggs in *Microtrema* are large in relation to small body size, reaching half the length of the ovary, testes and suckers. Thus, *M. barusi* n.sp. represents the type species of the new genus.

### Discussion

In the type locality of the new species (Záhlinice, Moravia, Czech Republic), several bird flukes of the family Phaneropsolidae have been found to date in Passeriformes. They are four species of *Mosesia* from various birds, and *Passeritrema rysavyi* Sitko, 2004 from robins and wagtails (Sitko *et al.*, 2006). All of them are very rare parasites that can be found just shortly after the spring arrival of birds wintering in the Mediterranean and other warmer regions. The flukes are likely short-lived, disappearing from the host bird within 1 – 2 weeks. Due to their small body size and low infection rates, infections of the phaneropsolids can be easily overlooked.

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