

## Research Note

# Unusual finding of *Trichobilharzia* sp. in *Motacilla alba* in the Czech Republic

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### Abstract

Adult male worms of *Trichobilharzia* sp. recovered from a pied wagtail (*Motacilla alba*) in the Czech Republic were found to belong to a new species of the genus. The finding of *Trichobilharzia* sp. in a passeriform bird in Europe represents an important discovery, as only anseriform birds have thus far been reported as final hosts of the European *Trichobilharzia* species.

*Trichobilharzia*, the largest genus of the family Schistosomatidae, includes more than 40 species of bird parasites occurring in all continents except Antarctica. The natural and experimental final hosts for *Trichobilharzia* belong to the orders Anseriformes, Passeriformes, Podicipediformes, Coraciiformes, Ciconiiformes, Columbiformes and Galliformes (Horák *et al.*, 2002). To date, the European *Trichobilharzia* species utilize exclusively anseriform birds as their final hosts and the present finding is the first record of *Trichobilharzia* sp. in a passeriform bird.

From 1965 to 2004, 85 specimens of pied wagtail from Central Moravia (Czech Republic) were examined for helminth parasites. Schistosomes were fixed in 70% ethanol, stained in borax carmine, dehydrated in ethanol and xylene and mounted in Canada balsam. All measurements and morphological characterization were made on fixed and stained specimens.

The liver of one out of 85 *M. alba* examined was infected with adult male schistosomes. Measurements were made on 11 fragments and one entire male. The total length of the male is 11.5 mm. Adults have a filiform body of nearly uniform width. The anterior region (including gynecophoric canal) is covered with spines. The posterior region, starting from the level of testes, is covered with tubercles, about 2.5  $\mu\text{m}$  high and 5  $\mu\text{m}$  in diameter (fig. 1C). The gynecophoric canal is

850–900  $\mu\text{m}$  long. The posterior end of body is narrow and pointed (fig. 1D). There are more than 110 oval-shaped testes arranged in a single row, alternating on either side of the intestine. The seminal vesicle is divided into external and internal parts. The genital papilla lies on the left side of median line. The oral opening to the digestive tract is subterminal and surrounded by the oral sucker. The oesophagus passes to the caecal bifurcation which is situated just before the acetabulum (fig. 1A). The reunion of the caeca (fig. 1B) is located behind the acetabulum just before the seminal vesicle. The reunited intestine, which contains brown pigment, extends to the posterior region of the body. No females were recovered but, based on the morphology of the male, the schistosome was identified as *Trichobilharzia* sp.

*Trichobilharzia* sp. from *M. alba* differs from all species described to date, and the following comparison is focused on the visceral species of *Trichobilharzia* from Europe and Africa, as *M. alba* birds migrate between the Czech Republic and Africa (Hudec, 1983).

The caecal reunion is situated behind the seminal vesicle in *T. filiformis* (Szidat, 1938) McMullen & Beaver, 1945, *T. franki* Müller & Kimmig, 1994, *T. salmanticensis* Simon-Martín & Simon-Vicente, 1999, *T. berghei* Fain, 1955 and *T. schoutedeni* Fain, 1955. In *Trichobilharzia* sp., the caecal reunion is situated just behind the acetabulum in front of the seminal vesicle.

The body surface is covered by fine spines in *T. filiformis*, *T. szidati* Neuhaus, 1952, *T. berghei*, *T. cerylei* Fain, 1956, *T. schoutedeni* and *T. anatina* Fain, 1955, or exclusively the suckers and gynecophoric canal are covered by spines in

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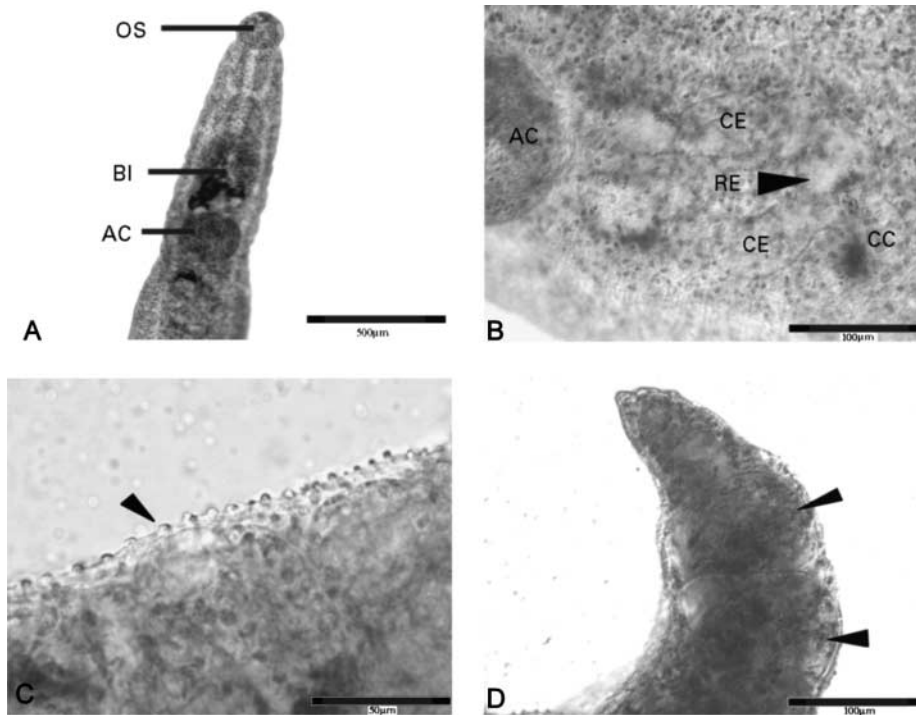


Fig. 1. Adult male of *Trichobilharzia* sp. from *Motacilla alba*. A, anterior part of body (scale bar = 500  $\mu\text{m}$ ); B, caecal reunion (scale bar = 100  $\mu\text{m}$ ); C, tubercles on the body surface (scale bar = 50  $\mu\text{m}$ ); D, posterior end of the body; testes marked with arrowheads (scale bar = 100  $\mu\text{m}$ ). AC, acetabulum; BI, bifurcation of intestine; CC, common caecum; CE, caecum; RE, caecal reunion; OS, oral sucker.

*T. franki* and *T. salmanticensis*; in these last two species, spination of the oral sucker is uncertain. In *Trichobilharzia* sp., the body surface is covered by spines in the anterior part and by tubercles in the posterior part.

The number of testes is lower, i.e. about 70 in *T. szidati*, 45–63 in *T. salmanticensis*, 40–65 in *T. berghei*, than in *Trichobilharzia* sp. (>110). The testes are arranged in 1–2

rows in *T. cerylei*, whereas in *Trichobilharzia* sp., testes are organized in a single row alternating on either side of intestine.

The posterior end of the body is broad in *T. szidati*, *T. filiformis*, *T. franki*, *T. salmanticensis*, *T. berghei*, *T. anatina* and *T. schoutedeni*, whereas in *Trichobilharzia* sp., the posterior end is pointed.

Table 1. Measurements of adult males of visceral species of *Trichobilharzia* described from Europe and Africa.

	Body length (mm)	Body width ( $\mu\text{m}$ )	Oral sucker ( $\mu\text{m}$ )	Acetabulum ( $\mu\text{m}$ )	Anterior end–acetabulum ( $\mu\text{m}$ )	Gynecophoric canal length ( $\mu\text{m}$ )	Testes ( $\mu\text{m}$ )
<i>Trichobilharzia</i> sp. (present study)	11.5	175–365	129–141	160–176 × 148–167	700–779	850–900	62–90 × 160–195
<i>T. filiformis</i> (Szidat, 1939; Van den Broek, 1965)	ND	120–150	75 × 50	75	650	390	80 × 60
<i>T. szidati</i> (Neuhaus, 1952)	3.05	20–70	28 × 18	19	430	220	20
<i>T. franki</i> (Müller & Kimmig, 1994)	3.2–4	120–130	51–77 × 46–65	46–51 × 56–69	485–530	212–291	95–106
<i>T. salmanticensis</i> (Simon-Martin & Simon-Vicente, 1999)	2.2–4.7	50–96	50–55	40–55 × 30–35	300–360	300–380	30–45
<i>T. anatina</i> (Fain, 1955)	7.05–8	65–122	35–42 × 35	36–43 × 43–52	310–390	1300–1500	30
<i>T. berghei</i> (Fain, 1955)	4.4–5.8	60–125	50 × 40	40–48	350–450	280–375	35–40
<i>T. cerylei</i> (Fain, 1956)	ND	200–275	110 × 115	150	815	550	60–150
<i>T. schoutedeni</i> (Fain, 1955)	5.1–6.79	90–190	60 × 51	75	420–560	500–620	35–45

ND, not determined.

European and African species of *Trichobilharzia* are generally smaller in comparison with *Trichobilharzia* sp. from *Motacilla alba*. This concerns especially the body length and the size of both oral and ventral suckers. (table 1).

In the majority of other *Trichobilharzia* species the final host belongs to the Anseriformes (*T. filiformis*, *T. szidati*, *T. franki*, *T. salmanticensis*, *T. anatina*, *T. berghei*, *T. schoutedeni*); several species were described from Coraciiformes (*T. cerylei*). *Trichobilharzia* sp. uses a passeriform bird.

Therefore in the present study, *Trichobilharzia* sp. from *M. alba* is regarded as a new schistosome species.

Because other developmental stages and the intermediate host specificity remain unknown, no species name has been given. The voucher specimen is deposited in the Natural History Museum, Vienna, Austria (no. NHMW-EvVaria-MikroPräp.4617). *Trichobilharzia* sp. from *M. alba* represents a unique finding, because passeriform hosts have been described only from North America and Asia. Thus, the present finding represents the first report of *Trichobilharzia* in a passeriform host in the European region. The discovery of new *Trichobilharzia* species and knowledge of their biology is important for estimating the potential health risk to avian and mammalian hosts, because the worms can cause severe diseases, as in the case of the neurotropic *T. regenti* from the Czech Republic (Horák *et al.*, 1998, 1999). Therefore, the findings of new bird schistosomes are worthy of attention from the point of view of human and veterinary medicine.

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