



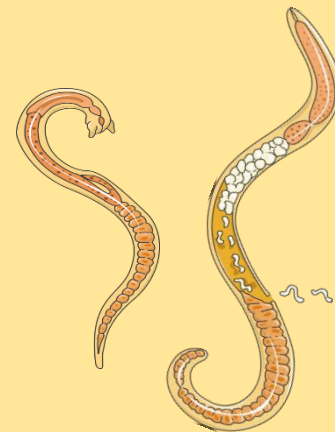
ANTIPARASITIC ACTION OF *LACTOBACILLUS CASEI* AND *LACTOBACILLUS BULGARICUS* STRAIN IN CD-1 MICE EXPERIMENTALLY INFECTED WITH *TRICHINELLA* SPP.

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Introduction

- Trichinellosis is a zoonotic parasitic disease caused by the larvae of nematodes of genus *Trichinella*.
- Two species of *Trichinella* are present in Romania: *T. spiralis* and *T. britovi*.
- The potential use of probiotics in controlling enteric infestations has gained interest over the years.



Aim

- The aim of this study was to evaluate the antiparasitic effect of *Lactobacillus casei* and *L. bulgaricus* in CD-1 mice experimentally infected with *T. spiralis* and *T. britovi*.



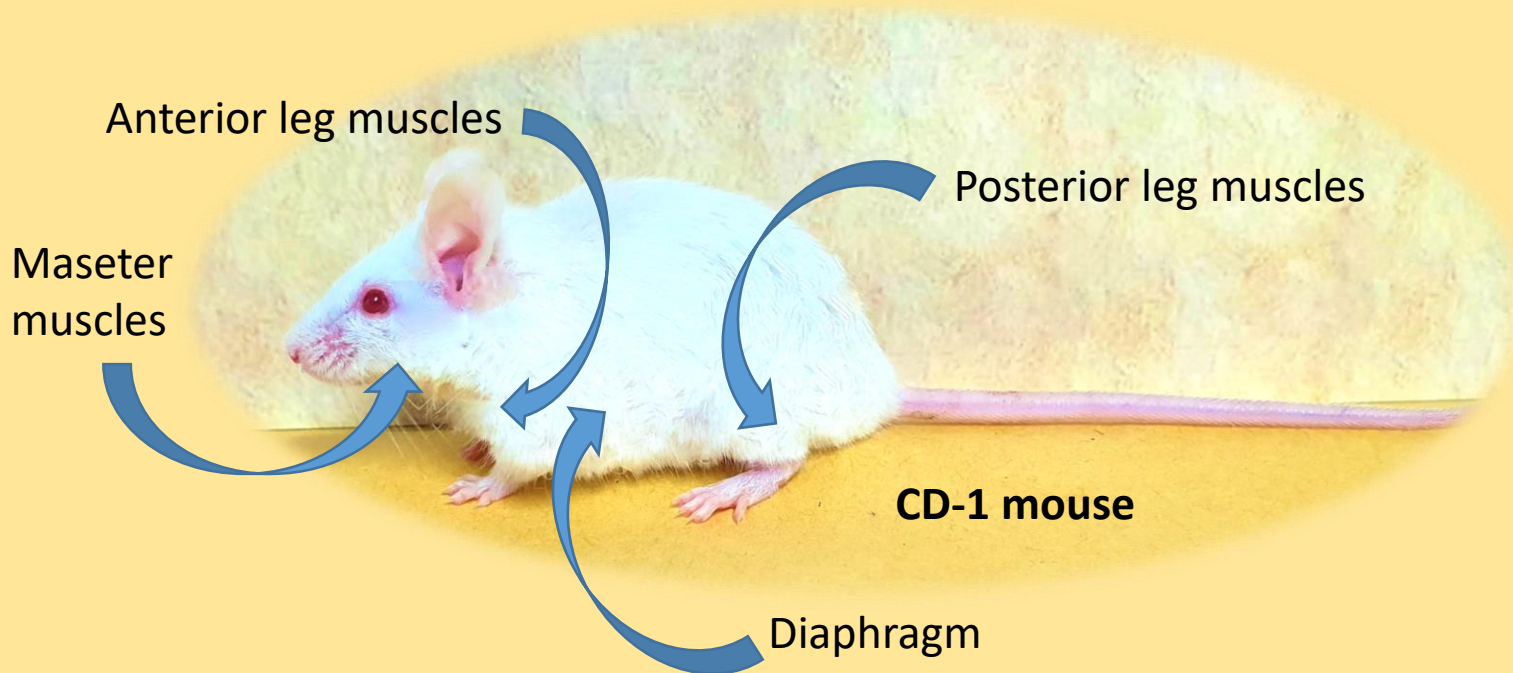
Materials and methods

Ten groups of six male CD-1 mice were used

Grups		Probiotic strain	Nr. animals	Probiotic dose/day	Nr. Larvea
1	Control negativ	-	6	-	-
2	Control <i>T. spiralis</i>	-	6	-	200 L <i>T. spiralis</i>
3	Control <i>T. britovi</i>	-	6	-	200 L <i>T. britovi</i>
4	Control <i>T. spiralis</i> + <i>T. britovi</i>	-	6	-	100 L/species
5	Experimental <i>T. spiralis</i>	<i>L.. casei</i>	6	10 ⁹ ufc/ml in 100μl	200 L <i>T. spiralis</i>
6	Experimental <i>T. britovi</i>	<i>L. casei</i>	6	10 ⁹ ufc/ml in 100μl	200 L <i>T. britovi</i>
7	Experimental <i>T. spiralis</i> + <i>T. britovi</i>	<i>L. casei</i>	6	10 ⁹ ufc/ml in 100μl	100 L/species
8	Experimental <i>T. spiralis</i>	<i>L bulgaricus</i>	6	10 ⁹ ufc/ml in 100μl	200 L <i>T. spiralis</i>
9	Experimental <i>T. britovi</i>	<i>L bulgaricus</i>	6	10 ⁹ ufc/ml in 100μl	200 L <i>T. britovi</i>
10	Experimental <i>T. spiralis</i> + <i>T. britovi</i>	<i>L bulgaricus</i>	6	10 ⁹ ufc/ml in 100μl	100 L/species

Materials and methods

Muscles from 4 regions were used:

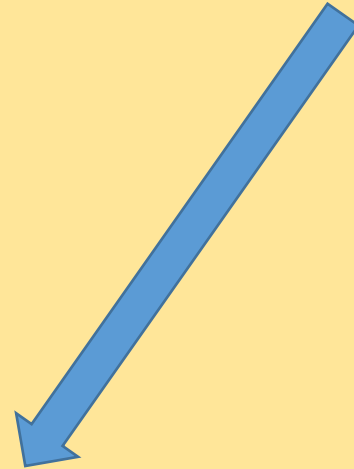
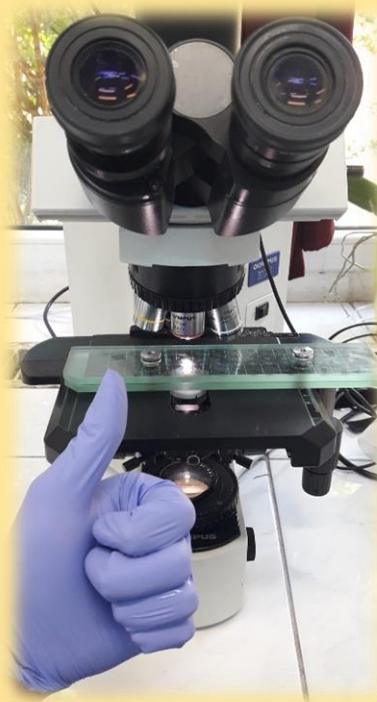


The animals were tested on day 18 and 32 p.i.

Materials and methods



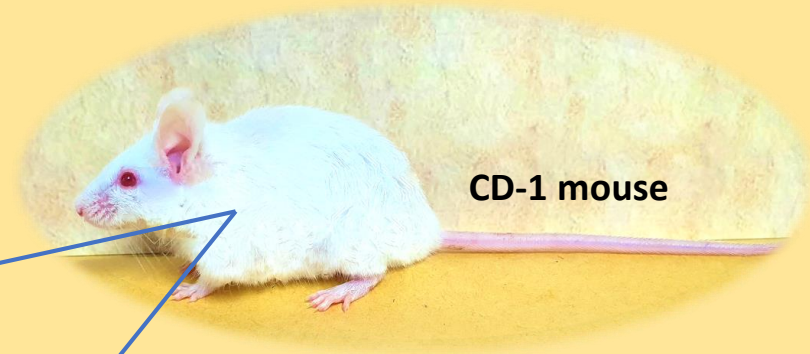
Trichinelloscopy



Results



Day 18 p.i.



CD-1 mouse



 *Trichinella* spp. migratory larva

Results

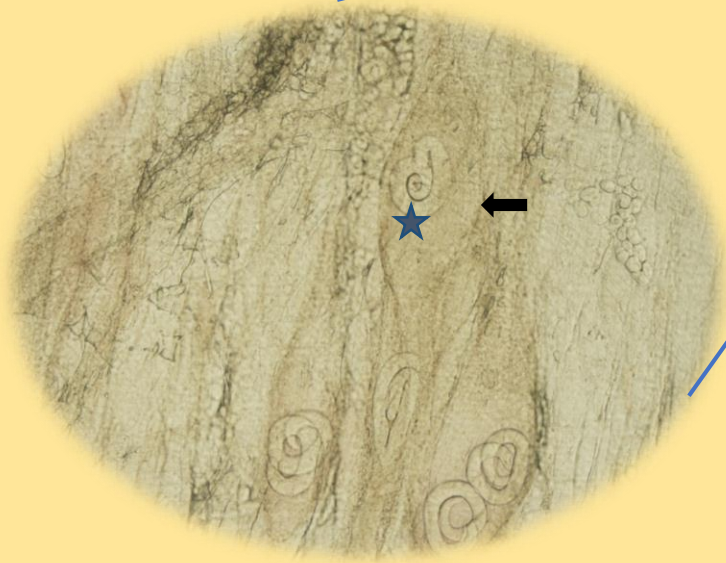
Day 18 p.i.

Grups		Average larvae (L)	
Control groups	1	Control negativ	0 L
	2	Control <i>T. spiralis</i>	6.6 L
	3	Control <i>T. britovi</i>	1 L
	4	Control <i>T. spiralis</i> + <i>T. britovi</i>	0.3 L
Lactobacillus casei	5	Experimental <i>T. spiralis</i>	1 L
	6	Experimental <i>T. britovi</i>	0.3 L
	7	Experimental <i>T. spiralis</i> + <i>T. britovi</i>	4.6 L
Lactobacillus bulgaricus	8	Experimental <i>T. spiralis</i>	3.6 L
	9	Experimental <i>T. britovi</i>	0 L
	10	Experimental <i>T. spiralis</i> + <i>T. britovi</i>	0 L



Results

Day 32 p.i.



- ★ *Trichinella* spp. larvea
- ← Cyst wall

Results

Day 32 p.i.

Control groups

Lactobacillus casei

Lactobacillus bulgaricus

Grups		Average larvae (L)
1	Control negativ	0 L
2	Control <i>T. spiralis</i>	267.6 L
3	Control <i>T. britovi</i>	64.6 L
4	Control <i>T. spiralis</i> + <i>T. britovi</i>	188.6 L
5	Experimental <i>T. spiralis</i>	314 L
6	Experimental <i>T. britovi</i>	40.3 L
7	Experimental <i>T. spiralis</i> + <i>T. britovi</i>	160.3 L
8	Experimental <i>T. spiralis</i>	255.3 L
9	Experimental <i>T. britovi</i>	61.3 L
10	Experimental <i>T. spiralis</i> + <i>T. britovi</i>	147 L



Results

- On day **18 p.i.** larvae were found in all groups (except Control negative; *T. britovi* + *L. bulgaricus*; *T. spiralis* + *T. britovi* + *L. Bulgaricus* groups). The **highest larval burden** was in the **Control *T. spiralis* group** (mean 6.6 larvae/compressor).
- On day **32 p.i.** larvae were found in all groups (except Control negative group), with the **highest larval burden** in the ***T. spiralis* + *L. casei* group** (mean 314.0 larvae/compressor) and the **lowest** was in ***T. birtovi* + *L. casei* group** (mean 40.3 larvae/ compressor).



Results



- On **day 18 p.i.** the **highest number** of migratory larvae in all groups were found in the **diaphragm muscles** (except the control *Trichinella spiralis* grup) with a **total absence** in the **posterior left leg muscles**.
- On **day 32 p.i.** the **highest number** of larvae in all groups were found in the **diaphragm muscles** but the **lowest number** were found in the muscles from the **posterior legs**.



Discussions

- E. Dvorožňáková et al., in 2016 found that on day 18 p.i. the number of *T. spiralis* larvae were under 10/mouse.
- The oral administration of viable *L. casei* to mice during seven days before *T. spiralis* infection induces a significantly protective response against Trichinellosis (Randazzo and Costamagna, 2005).

References

Dvorožňáková, E., Bucková, B., Hurníková, Z., Revajová, V., & Lauková, A. (2016). Effect of probiotic bacteria on phagocytosis and respiratory burst activity of blood polymorphonuclear leukocytes (PMNL) in mice infected with *Trichinella spiralis*. *Veterinary Parasitology*, 231, 69-76.

Randazzo, V. Costamagna, S.R. 2005. Effect of oral administration of probiotic agents on *Trichinella spiralis*-infected mice. *Revista de Patologia Tropical/Journal of Tropical Pathology*, 34(2).

Conclusions



- The tested probiotics might have an influence on the time of larval migration from the intestines to the muscles.
- There is a need for further and more detailed studies using more controlled variables.





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Thank you for your attention!

