

OTR2. IMMUNOMODULATORY EFFECT OF BACILLUS CEREBUS VAR. TOYOI IN MICE EXPERIMENTALLY VACCINATED AGAINST LEISHMANIA INFANTUM CHAGASI.

Keila Patrícia Mota Souza¹; Ana Paula Presley Oliveira Sampaio¹; Joelson Spusa Lima¹; Flávio da Silva¹; Maiara Vasconcelos Monteiro¹; Carina Martins de Moraes¹; Talita Bandeira Roos¹.

¹ Laboratório de Microbiologia e Imunologia. Universidade Federal do Pará / Campus Castanhal-Instituto de Medicina Veterinária.

INTRODUCTION Immunization through vaccination is the demonstrably more efficient alternative for controlling infectious diseases such as canine visceral leishmaniasis. However, some of these vaccines do not have the necessary effectiveness for the protection of individuals. Thus, the probiotic supplementation has been shown to be an important tool to improve the vaccine immune response.

OBJECTIVE To evaluate the immunomodulatory effect of *Bacillus cereus* var. Toyoi in mice experimentally vaccinated against *Leishmania infantum chagasi*.

METHODOLOGY For this work 17 isogenic mice were used, species *Mus musculus*, race albino Balb C, at 21 days of age, females, divided in two groups: supplemented with the probiotic and control (unsupplemented). The supplemented group received feed with probiotic *Bacillus cereus* var. Toyoi in the concentration of 10^6 UFC.g⁻¹ and the control group the same feed without addition of probiotic, and the animals were adapted to their diet (with or without probiotic) 14 days before the first dose of vaccine. All animals were vaccinated on days 0 and 28 with the *Leishmania infantum chagasi* particulate antigen, and blood collection to obtain serum was performed weekly to research the kinetics of antibody production by Enzyme-linked Immunosorbent Assay (ELISA) Indirect. To evaluate probiotics effects on the cellular immunity of the animals, the amplification of cytokine gene fragments (IL-12, IL-10 and IL-4) using cDNA obtained from RNA of splenocytes by quantitative method, Polymerase Chain Reaction (qPCR). Both serology data and differences on gene expression were analyzed by analysis of variance (ANOVA) and the means were compared by Tukey test ($p < 0.05$), with BioEstat 5.0.

RESULTS The evaluation of the immune response conducted by the ELISA

shown in the supplemented group had a seroconversion average of 1.42 times higher than the group that did not received probiotic. In the evaluation of cytokine profile, the group supplemented with *B. cereus* var. Toyoi showed higher expression of IL-12 and IL-4 than the control group ($p < 0.01$) and lower IL-10 expression ($P < 0.01$) as compared to the group not supplemented (Fig. 2). The supplemented group showed IL-4 expression 2.6 times higher than the control group, while IL-12 was 8.3 times higher than the control group. Finally, IL-10 expression was 0.58 times lower than the control group.

CONCLUSION Based on the results and literature, we suggest that the probiotic *Bacillus cereus* var. Toyoi presents evidence of the modulation of the immune system and vaccine responses. Thus, it may support the modulation of adequate and efficient vaccine response for the control of canine leishmaniasis.

KEYWORDS probiotics, immunomodulatory vaccine, canine leishmaniasis.