ABSTRACT

Leishmania of the subgenus *Viannia* are protozoan parasites transmitted by phlebotomine sandflies (Diptera: Phlebotominae). They occur in tropical and subtropical areas in South America, where they cause cutaneous and mucocutaneous leishmaniasis. In this thesis, we studied developmental pattern of *Viannia* group and factors affecting its development within the sand fly gut.

First, we investigated *Leishmania braziliensis* development within the *Lutzomyia longipalpis* digestive tract. Using GFP-labeled strain we demonstrated peripylar development: promastigotes escaped from the endoperitrophic space, colonized the hindgut and then migrated anteriorly. Four morphological forms were found within the *Lu. longipalpis* digestive tract: elongated nectomonads, short nectomonads, metacyclic promastigotes and paramastigotes. Furthermore, using the histological methods we demonstrated parasite attachment in pylorus region, while there were only free promastigotes in the midgut; neither form was found attached to the midgut epithelium.

The next part was devoted to the effect of temperature on *Viannia* in *Lu. longipalpis*. We compared development of two closely related species *L. peruviana* and *L. braziliensis* at 20 °C and 26 °C. *Leishmania braziliensis* developed well in both temperatures tested, *L. peruviana* developed late-stage infections only at 20 °C. These results suggest that *L. peruviana* is adapted to lower temperature and is unable to survive vector’s faster digestion and earlier defecation at higher temperature.

In the third part of the thesis we tried to clarify the effect of RNA interference (RNAi) on *L. braziliensis* development within the *Lu. longipalpis* digestive tract. We compared development of wild type with knock-downs c14 and c16 an add-backs c401 and c605. Knock-downs had inactivated RNAi pathway through deletion of the Argonaute gene. Unexpectedly, we found that all tested lines of M2903 strain, including the wild type, did not develop in the later stages of infection. Therefore, the question whether the RNA interference affects *L. braziliensis* development within the sand fly *Lu. longipalpis* remains unanswered.

**Key words:** *Viannia*, development, vector, temperature, RNA interference