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EVALUATION OF THE IMPACTS OF A SECOND BLOOD FEEDING ON *LUTZOMYIA LONGIPALPIS* INFECTED WITH *LEISHMANIA INFANTUM*

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Abstract

Visceral leishmaniasis is a neglected disease in the Americas, caused by *Leishmania infantum*. Its transmission cycle involves the sand fly vector *Lutzomyia longipalpis*, and vertebrate hosts (humans and dogs), contributing to the persistent spread of the disease in urban areas of Brazil. During blood feeding, infected sand flies inoculate vertebrate hosts with the metacyclic promastigote forms of *Leishmania*. It is known that sand flies, like other hematophagous insects, take multiple blood meals throughout their life cycle. However, the impact of a second blood meal with uninfected blood on the parasite-vector interaction, and its implications for protozoan transmission, remains poorly understood. This study aims to assess the effects of a second blood meal on *Leishmania infantum*-infected sand flies by comparing parasite load and metacyclic promastigote forms between single and second-blood-fed groups, as well as monitoring post-infection mortality. Female sand flies reared at LAIPHE were artificially infected using parasite-laden dog blood. After six days, half of the surviving insects were offered a second blood meal with uninfected hamster blood. On Day 12 post-infection, midguts were dissected to quantify parasite load and metacyclic promastigote forms. The study hypothesizes that a second uninfected blood meal may enhance metacyclic promastigote differentiation in sand flies, thereby influencing the epidemiology of the disease and providing new avenues for research. Mortality was monitored daily, with a significant challenge being the maintenance of sand fly survival until Day 12. In the initial trials, 1,000 insects were used, with an average survival of 500 by Day 6. Of these, 250 sand flies were offered a second blood meal. Preliminary findings from Day 12 dissections indicate that the second-blood-fed group exhibited higher parasite loads and a greater number of metacyclic promastigotes compared to the single-blood-fed group.

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