

## The Use of Sex Pheromone in the Control of the *Lutzomyia Longipalpis* (Psychodidae: Phlebotominae), the Vector of *Leishmania Infantum* in the New World

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Visceral Leishmaniasis (VL) is the most severe form of leishmaniasis with high global annual incidence of human cases. This disease is concentrated mainly in India, Bangladesh, Sudan, South Sudan, Ethiopia and Brazil [1] with a significant morbidity and mortality in rural and urban areas of Latin America.

The causative agent of VL is the protozoan parasite *Leishmania infantum*, that is disseminated in the Americas by the sand fly *Lutzomyia longipalpis* [2] and domestic dogs are the main reservoir of the parasite.

Chemical communications among individual organism in the same species are mediated by pheromones and it has been found across the animal kingdom and highly exploited by insects in a complex system. The most common features mediated by pheromones include attraction of the conspecific sex for mating, aggregating both sexes to a specific site for feeding and/or mating, and marking sites or forming trails [3]. Sex pheromones are chemicals produced either by females to attract males or males to attract females and are widely used in Agriculture for controlling insects pests. Although used with success against insects of commercial interest, virtually very little of this technology have been used against insects of medical interest.

Considered a complex of sibling species, *Lutzomyia longipalpis* (Figure 1) can be found in different habitats from Central Mexico to northern Argentina with a highly success of dispersion to urban areas [2,4,5]. *Lutzomyia longipalpis* uses male produced sex pheromones for mate recognition and females recognize and respond to the specific pheromone over a few meters [6]. Males *Lutzomyia longipalpis* aggregation occurs near or on vertebrate hosts during females' blood-feeding. Males arrive to the vertebrate hosts, before females, activating attraction to the opposite gender. The sex pheromones of *Lutzomyia longipalpis* are terpenoid compounds with 16 carbons (Homosesquiterpenes) or 20 carbons [7,8]. With the synthesis of (S)-9-methylgermacrene-B (Figure 2), the sex pheromone of one of the members of the complex, and its analogue (+/-)-9-methylgermacrene a new possibility was open for the development of novel strategies for mating disruption and consequently, sand fly population management.

More recently, this new strategy is now been applied in an area of visceral leishmaniasis in Brazil showing the attractiveness of the

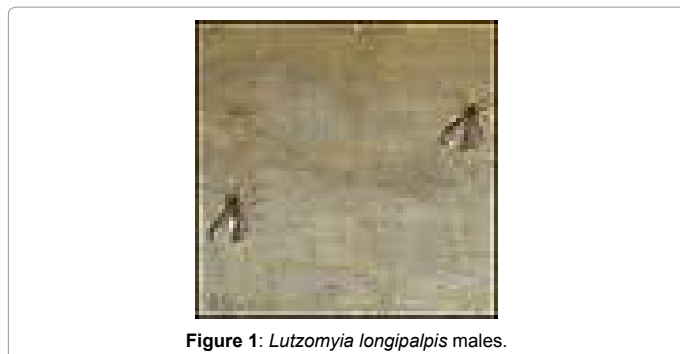


Figure 1: *Lutzomyia longipalpis* males.

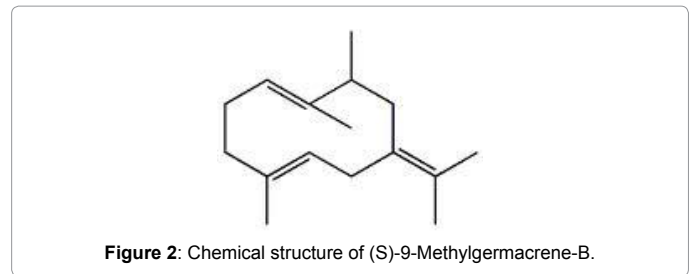


Figure 2: Chemical structure of (S)-9-Methylgermacrene-B.

synthetic sex pheromone to female *Lutzomyia longipalpis* suggesting a valid alternative for the control of this sand fly in a medium term [9,10].

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