

Synopsis of PhD research project: A.C.T. Wijerathna (FGS/05/PhD/09/2016/51)

Title: Bionomics and systematics of leishmaniasis vector sand flies (Diptera: Psychodidae) and the incidence of leishmaniasis in Kurunegala District, Sri Lanka.

Sand flies are the only confirmed vectors of leishmaniasis throughout the world. Leishmaniasis is an infectious disease caused by protozoan parasites of genus *Leishmania*. The disease has three main clinical manifestations: visceral leishmaniasis, cutaneous leishmaniasis and muco-cutaneous leishmaniasis. Sri Lanka is one of the 98 endemic countries for cutaneous leishmaniasis in the world. Causative agent for this disease in Sri Lanka is *L. donovani* and the main suspected vector is *Phlebotomus argentipes*. Although leishmaniasis has become one of the main areas of interest among researchers in Sri Lanka during the recent years, many aspects including risk factors of the disease, biology, bionomics and systematics of sand flies were not addressed adequately. My Ph.D. project was aimed at addressing these gaps of understandings, which are essential for planning and implementing disease control activities. Therefore, main objectives of my study was the assessment of risk factors associated with leishmaniasis in Kurunegala District, Sri Lanka, establishment of a colony of sand flies in the laboratory, study of biological and bionomic characteristics of sand flies, morphological and molecular characterisation of Sri Lankan sand fly fauna, and determination of infection rates of sand flies in the wild. My study revealed that females and children are more prone to the leishmaniasis infection. Furthermore, being a housewife or a construction worker has higher odds of acquiring the disease. As seen in many of the neglected tropical diseases, leishmaniasis in this area had also affected the poor population. Field based entomological studies showed the presence of two species of sand flies in this area: *Phlebotomus argentipes* and *Sergentomyia punjabensis*. The former was abundant than the latter and both species had male biased sex composition. The commonly known vector for *L. donovani* in other countries, *P. argentipes*, was the only species found to harbor *L. donovani* parasites (infection rate = 2.04%). Moreover, I was able to successfully colonize *P. argentipes* inside the lab and the conditions for laboratory rearing of sand flies were optimized. This was the first successful attempt in colonizing sand flies in Sri Lanka. A simplified and illustrated morphological identification key for Sri Lankan sand flies was prepared after examination of archived specimens, collected specimens and specimens referred to us for identification by entomological teams around the country.