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Influence of humidity and temperature variation of natural breeding sites on abundance of Leishmaniasis vector *Phlebotomus argentipes* population in Anuradhapura District

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Cutaneous leishmaniasis (CL) is an endemic public health problem in Sri Lanka. *Leishmania donovani* is the suspected causative agent of the disease and this parasite is transmitted by a dipteran fly species; *Phlebotomus argentipes*. Studies on vector behavioral and ecological aspects, although important for better understanding of disease transmission, are still limited. The present study is an attempt to uncover the vector ecological aspects focusing on the successful vector control interventions.

This study is being carried out in Anuradhapura district, Sri Lanka; where there is a high disease prevalence of CL. Three sampling sites; Thalawa, Wijayapura and Padawiya were selected. Adult sand flies were collected monthly over a six months duration using CDC light traps (5) and yellow sticky traps (30). In the meantime, relative humidity and air temperature were measured using hygrometer and thermometer in each site. The collected sand flies were identified up to the species level using standard keys. Percentage composition of each of the species was calculated. Temporal variations of primary vector, *Phlebotomus argentipes* along with the dynamics of temperature and relative humidity was determined using regression analysis.

Phlebotomus argentipes was the dominant sand fly species found in the study sites. The percentage composition of the primary vector exhibited a variation during the study period and maximum percentage composition was recorded during May and June, 2016. The relationship between percentage composition of *Ph.argentipes* versus mean temperature was significant ($P = 0.000$, $R^2 = 97.7\%$) and elevated percentage composition were recorded under lower temperature. Further, percentage composition of *Ph.argentipes* exhibited an increasing trend with higher humidity levels ($P = 0.000$, $R^2 = 98.4\%$). In conclusion, the primary vector populations of leishmaniasis are increased with lower temperature and higher humidity. As such, this relationship will helpful to predict the variation of vector population with the changes of ecological parameters and finally a successful vector management strategy can be implemented with the thorough knowledge of its life history parameters and behavioral pattern.

Keywords: Relative humidity, Air temperature, *Phlebotomus argentipes*, Vector control