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REMOTE SENSING APPLIED TO THE STUDY OF THE TRIATOMINES DISPERSION DYNAMICS, CASE STUDY: INDIGENOUS COMMUNITIES OF PARAGUAYAN CHACO

**Abstract**

The species distribution models allow finding suitable areas for the development of the disease vectors with a low sampling effort either in time or in costs. The objective of this work is to determine the spatial distribution of triatomines based on the use of entomological and environmental variables using remote sensing tools. To determine the distribution, two main variables have been considered: the environmental variables and the entomological variable (presence of Chagas disease vector in the indigenous communities). For environmental variables were used: mean NDVI, mean temperature, maximum temperature and mean rainfall, all these derived from satellite images. For the entomological variable a total of 110 points of presence of the vector have been taken through manual collect of insects and the use of a real-time remote monitoring system for triatomine using traps with sensors wireless networking, this detection information is transmitted to the research centers through SMS, which means that its use is limited to areas with cellular coverage. This work also discusses a Store-and-forward mission as part of the BIRDS-4 satellite Project of Kyushu Institute of Technology to collect data from remote areas and expand the study area. As a result, a distribution model based on environmental variables has been obtained that predicts the suitable places for the studied triatomines to be present, being able to serve for the ecological and epidemiological surveillance of the indigenous communities at risk, generating early warning systems and serving as a support to the authorities for decision making. Likewise, the environmental variables suitable for the species have been compiled, considering the known points of presence, being able to cite a value of mean temperature around 20 C, a maximum temperature of 32 C, mean precipitation around 10 ml and NDVI values very close to zero, which corresponds to bare or with little vegetation.