Population structure of the Chagas disease vector, <i>Triatoma infestans</i>, in an urban environment

Abstract:

The increasing rate of biological invasions resulting from human transport or human- mediated changes to the environment has had devastating ecological and public health consequences. The kissing bug, Triatoma infestans, has dispersed through the Peruvi- an city of Arequipa. The biological invasion of this insect has resulted in a public health crisis, putting thousands of residents of this city at risk of infection by Trypano- soma cruzi and subsequent development of Chagas disease. Here, we show that popu- lations of Tria. infestans in geographically distinct districts within and around this urban centre share a common recent evolutionary history although current gene flow is restricted even between proximal sites. The population structure among the Tria. infe- stans in different districts is not correlated with the geographical distance between dis- tricts. These data suggest that migration among the districts is mediated by factors beyond the short-range migratory capabilities of Tria. infestans and that human move- ment has played a significant role in the structuring of the Tria. infestans population in the region. Rapid urbanization across southern South America will continue to cre- ate suitable environments for Tria. infestans, and knowledge of its urban dispersal pat- terns may play a fundamental role in mitigating human disease risk.