



Mapping of risk factors to determine visceral leishmaniasis vulnerability in Marsabit County, Northern Kenya

Damaris Matoke-Muhia, Tobias Landmann, Christian Mumo, Allan Ramogo, Daniel Masiga
International Centre of Insect Physiology and Ecology (*icipe*)
dmatoke@icipe.org

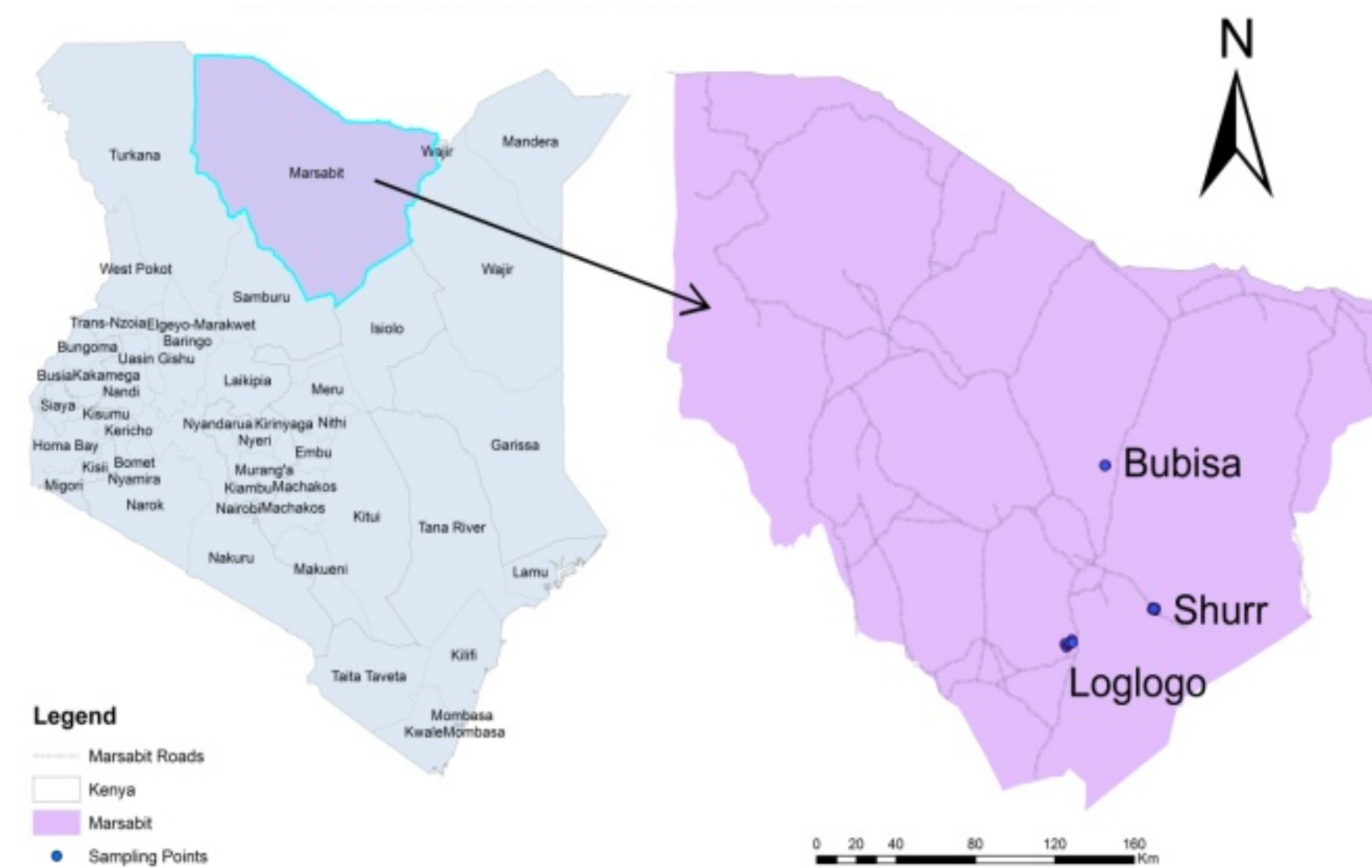
INTRODUCTION

Visceral leishmaniasis (VL) is a neglected tropical disease that has been reported in Marsabit County. Sandflies are the proven vectors of VL. Understanding sandfly (vector) habitat suitability and dynamics is key to assessing epidemiological and vector control. Ecological variables are used as proxies for habitat suitability and provide leads to VL risk areas, containment zones and other management strategies. This study explored morphological identification of sandfly species together with innovative time series ecological variables from remote sensing observations. We processed and analyzed 30-m Landsat biannual data and 'hyper temporal' MODIS (Moderate Resolution Imaging Spectroradiometer) 250-m time series metrics.

OBJECTIVES

- To compare sandfly diversity and abundance with ecological variables from time series satellite data
- To map and identify risk factors and transmission pathways in Marsabit County for effective intervention.

METHODS

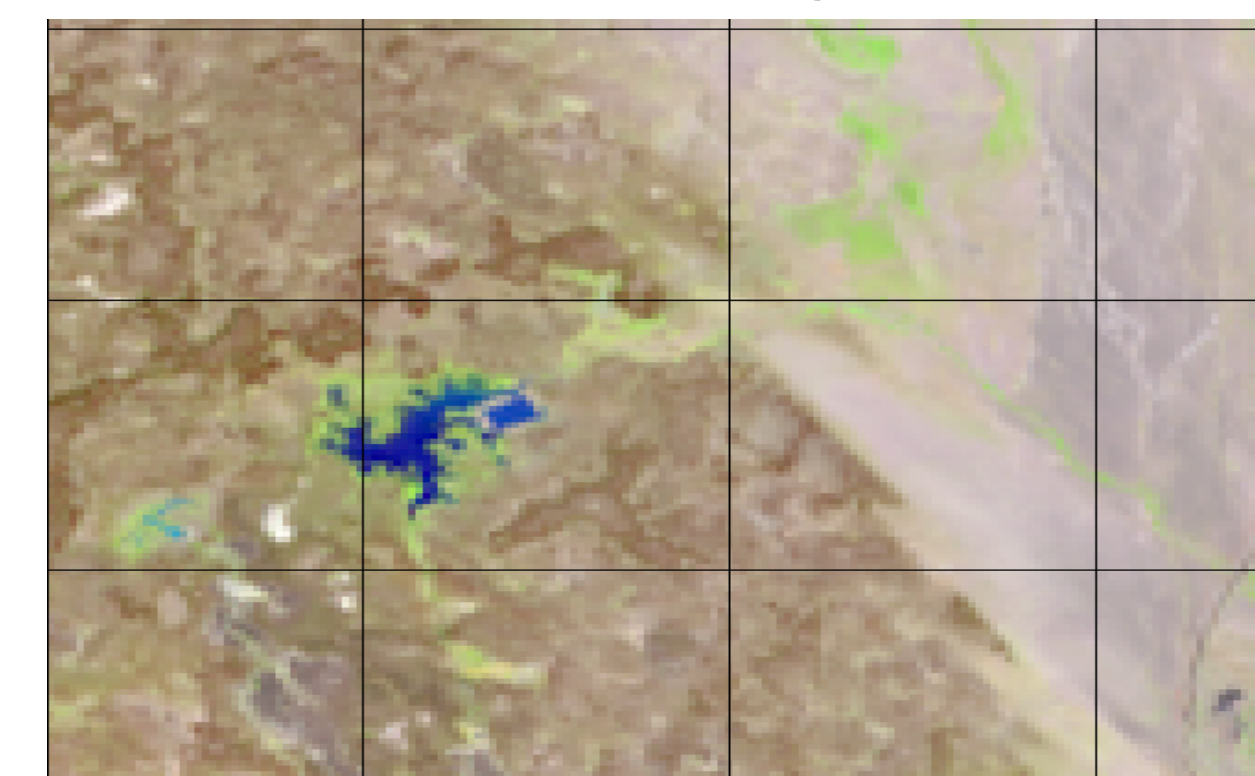


Map showing vector sampling sites in Marsabit County

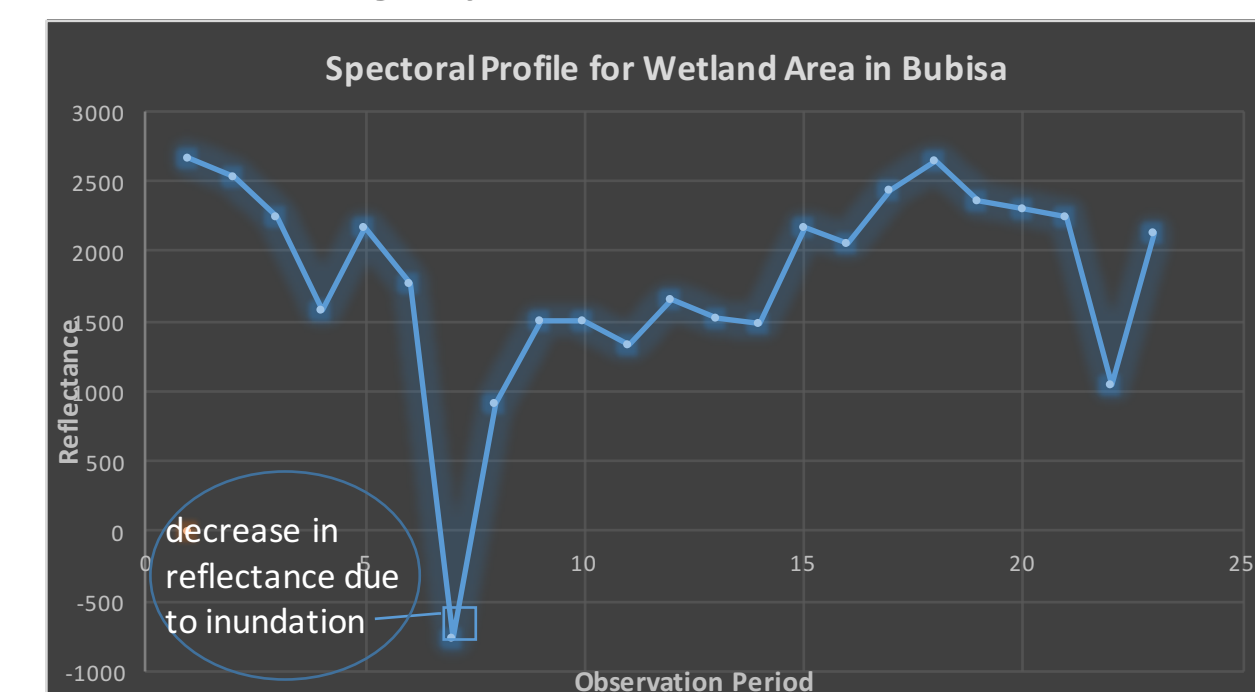
Sandfly trapping using CDC-LT and sticky papers



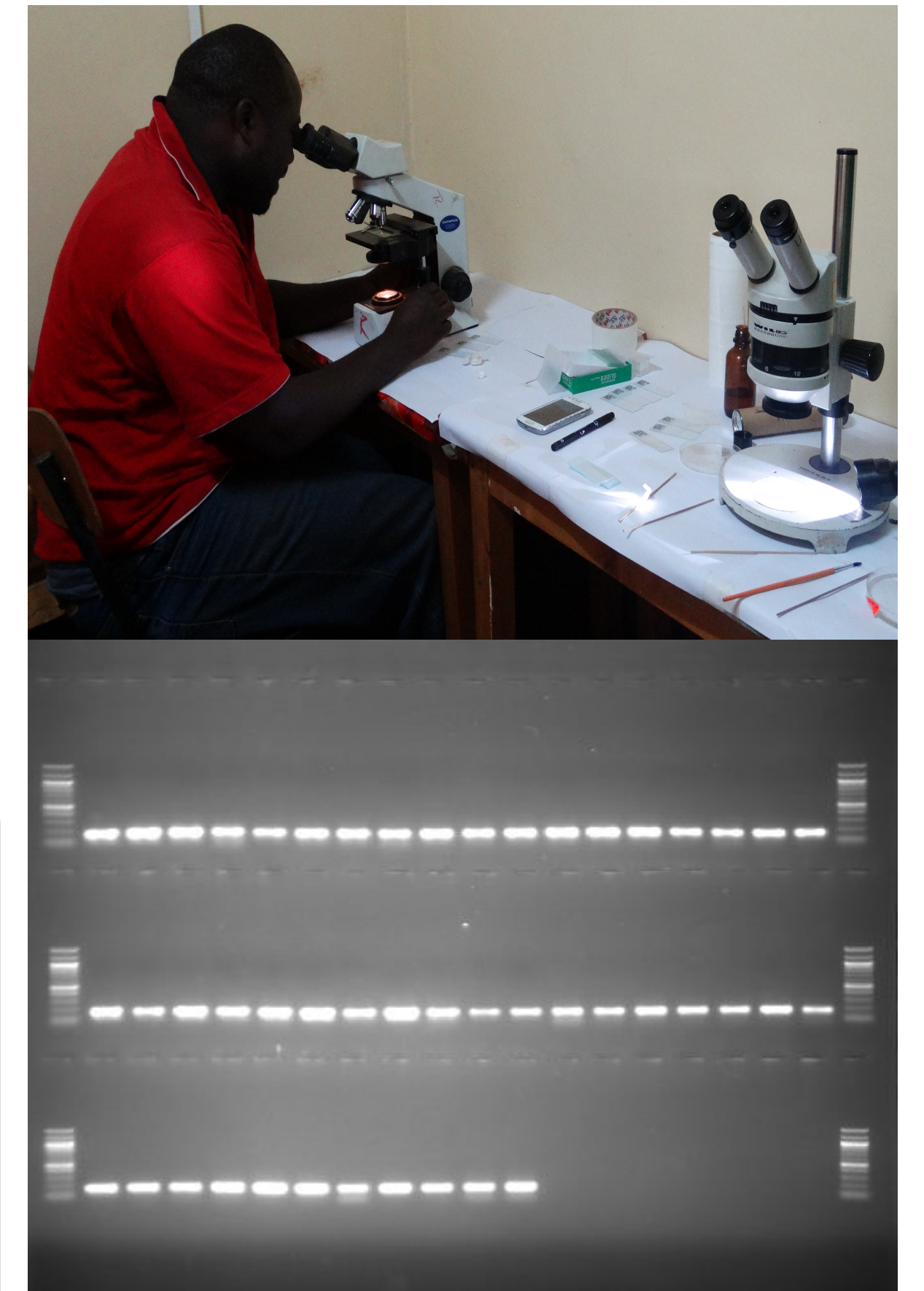
30-Landsat map for Bubisa. The wetland area (sandfly sampling site area) in blue and green shades



Using 250-m MODIS imagery to map flooding, visible as a trough in the time-series imagery

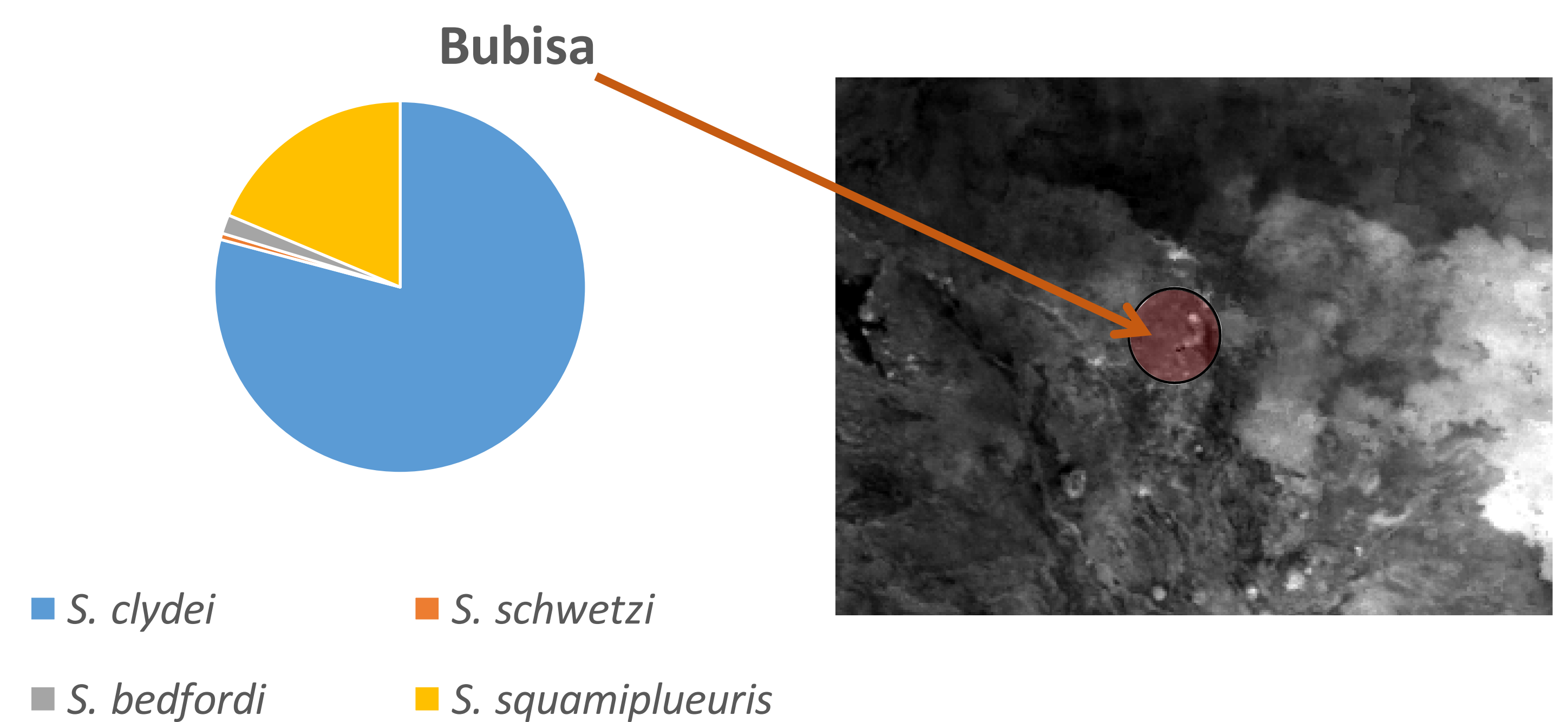
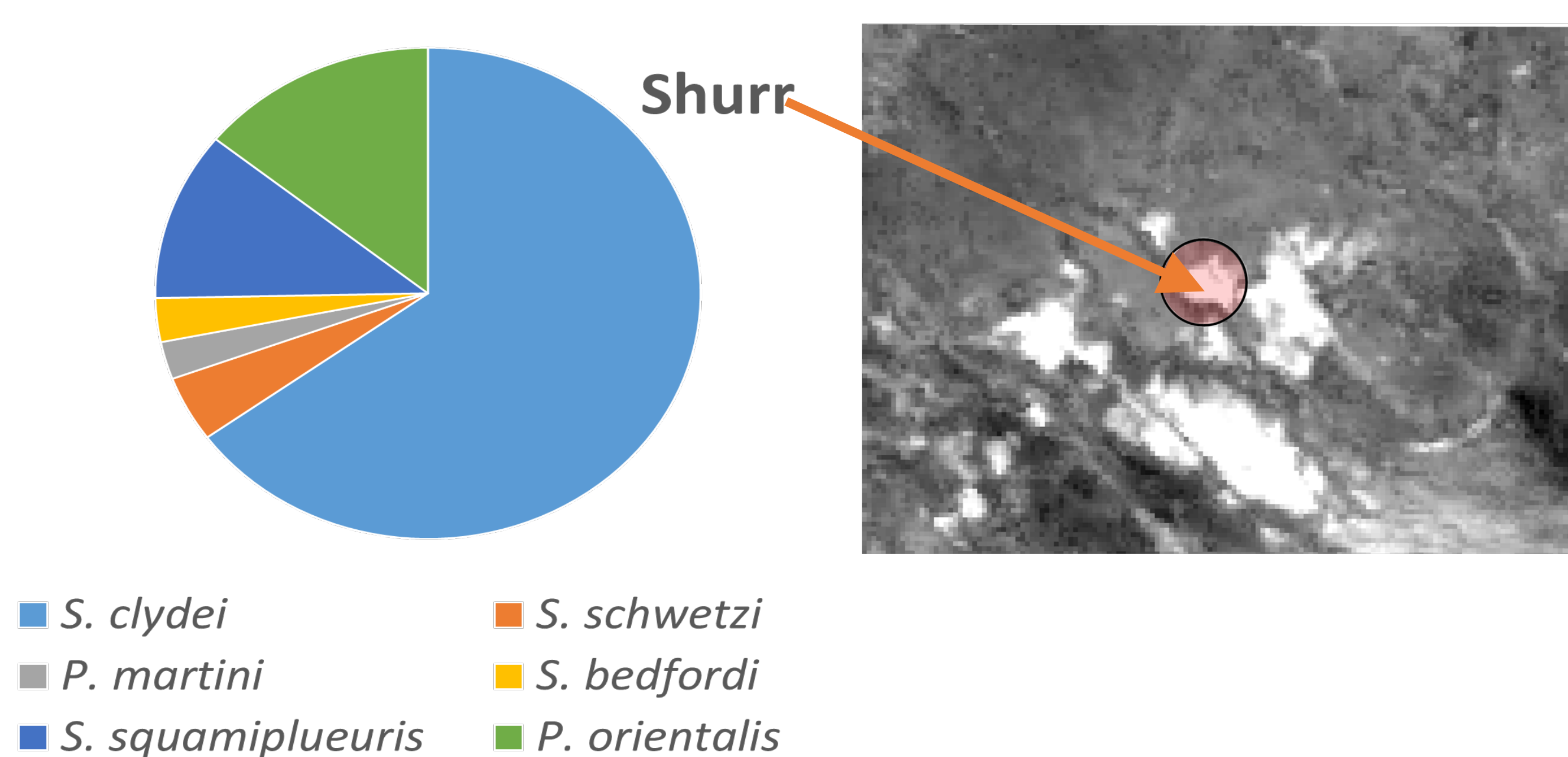


Sandfly morphological and molecular identification



RESULTS

- There is variation of sandfly diversity determined by underlying ecological conditions mapped using satellite variables, e.g. NDVI (satellite derived vegetation greenness) and land cover (mapped from satellite imagery).
- High confidence regularly flooded wetlands mapped for Bubisa corresponded to lower diversity, low vector abundance and no potent leishmania vector.
- In Shurr, sandy soils with sparse acacia trees corresponded to a large occurrence of the VL potent vector (*P. orientalis*), and recorded moderate diversity and higher vector occurrence compared to Bubisa.



CONCLUSIONS

- This is the first study reporting on 'actual' ecological conditions (from satellite data) as key determinants of VL vector habitat suitability.
- There is need to investigate other sites with similar ecological factors to cross verify the vector diversity in the results herein.
- Further work is needed on how the ecological habitat suitability factors can be utilised for mapping VL risk zones.

ACKNOWLEDGEMENT

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