Contribution ID: **391** Type: **Oral presentation**

Human presence shapes mosquito community composition and virus abundance in a Savannah ecosystem

Monday, October 5, 2026 2:30 PM (15 minutes)

Anthropogenic land-use change reshapes mosquito communities with implications for arbovirus ecology. However, joint assessments of mosquito and virus communities across land-use types remain rare, particularly in African savannah ecosystems. We characterized both communities along an anthropogenic disturbance gradient in the Kavango Zambezi Transfrontier Conservation Area in Namibia.
In 2023, 7,727 mosquitoes (54 species) were collected across six land-use categories (national park, communal conservation area, rangeland, agriculture, village, town), using BG-Sentinel, CDC light and gravid traps. Urban sites showed the highest abundance and lowest diversity of mosquitoes, accompanied by a pronounced shift towards anthropophilic vector species, particularly Culex quinquefasciatus. Human presence was identified as a key driver for variations in mosquito community composition. Mansonia uniformis, common in intermediately disturbed habitats, harbored twice the virus richness and much higher infection rates than the more abundant Cx. quinquefasciatus, highlighting mosquito species identity as a major determinant of virus abundance. Virus communities, comprising mostly insect-specific viruses, were closely linked to mosquito community patterns.
Our results demonstrate that land-use change influences virus abundance primarily through restructuring mosquito communities, with anthropophilic vector species dominating in human settlements suggesting elevated arbovirus transmission risk.

Keywords

land-use change, mosquito community composition, arbovirus, insect-specific virus, anthropogenic disturbance, KAZA, savannah ecosystem

Registration ID

OHS26-81

Professional Status of the Speaker

PhD Student

Junior Scientist Status

Yes, I am a Junior Scientist.

Author: MUNZEL, Hannah (Institute of Virology, Charité - Universitätsmedizin Berlin, Corporate Member of Freie Universität Berlin, Humboldt-Universität zu Berlin, and Berlin Institute of Health, Berlin, Germany.)

Co-authors: TRUONG, Tuan Huy (Institute of Virology, Charité - Universitätsmedizin Berlin, Corporate Member of Freie Universität Berlin, Humboldt-Universität zu Berlin, and Berlin Institute of Health, Berlin, Germany); LUCAS, Leo Tileni (Department of Preclinical Veterinary Studies, School of Veterinary Medicine, Faculty of Health Sciences and Veterinary Medicine, University of Namibia, Windhoek, Namibia); Prof. MFUNE, John K E (Department

of Environmental Sciences, University of Namibia, Windhoek, Namibia); Prof. BORGEMEISTER, Christian (Center for Development Research (ZEF), Ecology and Natural Resource Management, University of Bonn, Bonn, Germany); Prof. JUNGLEN, Sandra (Institute of Virology, Charité - Universitätsmedizin Berlin, Corporate Member of Freie Universität Berlin, Humboldt-Universität zu Berlin, and Berlin Institute of Health, Berlin, Germany)

Presenter: MUNZEL, Hannah (Institute of Virology, Charité - Universitätsmedizin Berlin, Corporate Member of Freie Universität Berlin, Humboldt-Universität zu Berlin, and Berlin Institute of Health, Berlin, Germany.)

Session Classification: Session 1: Vectors I

Track Classification: Vectors