



Contribution ID: 466

Type: Oral presentation

An experimental field approach to study climate warming effects on container-breeding mosquitoes

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

Climate change and urbanization facilitate the spread of container-breeding mosquitoes, increasing the risk of mosquito-borne disease outbreaks in previously unaffected regions. However, most knowledge of mosquito thermal biology is based on laboratory studies. Here, we present the first results of a novel field experiment assessing climate warming effects on urban mosquito populations. Using low-cost, open-source Arduino hardware, we developed an automated heating system to warm water in experimental containers relative to unmanipulated controls. At eight sites in Hamburg (Germany), four 90-L containers were installed: one control and three treatments maintained at +1.5°C, +3.0°C, and +4.5°C above the control, reflecting projected IPCC warming scenarios. From June to September 2025, weekly measurements included water level, pH, electrical conductivity, *Culex* egg rafts, and insect emergence. Approximately 40,000 insects emerged from the 32 containers. *Culex pipiens* s.s. and *Cx. torrentium* accounted for ~95% of specimens. *Culex* productivity was ~20% higher in the +1.5°C and ~10% higher in the +3.0°C treatments than in the control and +4.5°C treatment. In addition, the wing size of the emerging mosquitoes decreased significantly with increasing water temperature, suggesting fitness-related effects. This cost-effective field approach enables ecologically realistic experiments to assess climate change impacts on urban mosquitoes and other aquatic insects.

Keywords

Mosquitoes, Climate Change, Experimental Field Study

Registration ID

OHS26-60

Professional Status of the Speaker

Postdoc

Junior Scientist Status

No, I am not a Junior Scientist.

Author: SAUER, Felix (Bernhard Nocht Institute for Tropical Medicine)**Co-authors:** Mr BENDIG, Simon (Universität Hamburg); Mr NOLTE, Kristopher (Bernhard Nocht Institute for Tropical Medicine); Mr RAUHÖFT, Leif (Bernhard Nocht Institute for Tropical Medicine); Dr LÜHKEN, Renke (Bernhard Nocht Institute for Tropical Medicine)**Presenter:** SAUER, Felix (Bernhard Nocht Institute for Tropical Medicine)**Session Classification:** Session 1: Vectors I**Track Classification:** Vectors