



Climatic suitability of aedes albopictus in europe referring to climate change projections: Comparison of mechanistic and correlative niche modelling approaches

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Abstract: The Asian tiger mosquito, *Aedes albopictus*, is capable of transmitting a broad range of viruses to humans. Since its introduction at the end of the 20th century, it has become well established in large parts of southern Europe. As future expansion as a result of climate change can be expected, determining the current and projected future climatic suitability of this invasive mosquito in Europe is of interest. Several studies have tried to detect the potential habitats for this species, but differing data sources and modelling approaches must be considered when interpreting the findings. Here, various modelling methodologies are compared with special emphasis on model set-up and study design. Basic approaches and model algorithms for the projection of spatio-temporal trends within the 21st century differ substantially. Applied methods range from mechanistic models (e.g. overlay of climatic constraints based on geographic information systems or rather process-based approaches) to correlative niche models. We conclude that spatial characteristics such as introduction gateways and dispersal pathways need to be considered. Laboratory experiments addressing the climatic constraints of the mosquito are required for improved modelling results. However, the main source of uncertainty remains the insufficient knowledge about the species' ability to adapt to novel environments.

Resource Description

Exposure

Ecosystem Change, Meteorological Factor, Precipitation, Solar Radiation, Temperature

Climate Change and Human Health Literature Portal

- **Ecosystem Change, Meteorological Factor, Precipitation, Solar Radiation, Temperature:** Variability

Geographic Feature

General Geographic Feature

Geographic Location

Non-United States

- **Non-United States:** Europe

Health Impact

Infectious Disease

- **Infectious Disease:** Vectorborne Disease
 - **Vectorborne Disease:** Mosquito-borne Disease
 - **Mosquito-borne Disease:** General Mosquito-borne Disease, Chikungunya, Dengue Mosquito-borne Disease
- Vectorborne Disease

Model/Methodology

Exposure Change Prediction, Methodology, Other Model/Methodology Type, Specify

- **Exposure Change Prediction, Methodology, Other Model/Methodology Type, Specify:** Mosquito habitat

Model Timescale

Long-Term (>10 years)

Resource Type

Review Article

Climate Change and Socioeconomic Scenarios

Special Report on Emissions Scenario (SRES)

