

Patterns of mosquito species biodiversity in Europe based on current and future environmental suitability

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Non-native and native vector mosquito species in Europe are concerned with increasing health risks of mosquito-borne diseases in regions regarded as MBD-free under climate change. The role of mosquito diversity is unclear. For effective control strategies to prevent MBD, updating and predicting the distribution of MBD vectors in Europe under current and potential future climatic conditions is crucial. This study aims to evaluate the current and future distribution of the area suitable for mosquito species (vectors and non-vectors) in Europe, estimate biodiversity hotspots, and assess environmental niche overlaps of mosquito species. We use the ecological niche modeling approaches (MaxEnt) to estimate projections of suitable habitats for over 60 mosquito species in Europe. We used occurrence records from literature and open databases (GBIF, Vectorbase, Mosquito alert) and relevant environmental variables. We highlighted the important environmental covariates influencing mosquito species distribution. We compare current and future distributions, specifically in the 2050s and 2070s, using the latest emissions scenarios based on “Shared Socioeconomic Pathways” (SSPs) from the Intergovernmental Panel on Climate Change. Our findings contribute to understanding mosquito species distribution in Europe, a crucial step towards effective decision-making for mosquito control and disease prevention strategies.

Keywords

vector mosquito species, ecological niche modeling, MaxEnt, biodiversity hotspot, niche overlap, climate change, public health, Europe

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Yes, I am a Junior Scientist.

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