

A mechanistic model to predict spatial-temporal patterns of *Culex pipiens s.s./Cx. torrentium* in Germany

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Mosquitoes are well known for their ability to transmit pathogens. These include a variety of arthropod-borne viruses (arboviruses) of medical and veterinary interest. Due to globalization and climate warming, the threat of (re)emerging arboviruses is increasing in Europe. This also applies to temperate regions, where the transmission of viruses is becoming possible due to an increase in ambient temperature, i.e. shortening the extrinsic incubation period. *Culex pipiens s.s.* and *Culex torrentium*, commonly found in and around human settlements, are the primary vectors of Usutu virus and West Nile virus in Germany. The prediction of the spatial-temporal occurrence of these mosquito species is needed for the assessment of arbovirus transmission risk and to timely organise intervention methods, such as vector control. On the basis of a pre-existing model, a mechanistic model was developed to predict the spatial-temporal occurrence of *Cx. pipiens s.s./Cx. torrentium* in Germany. The model output is driven by local rainfall and temperature data downloaded from the Open Data Server of the German Meteorological Service. In a nation-wide field study in 2021, population data on *Cx. pipiens s.s./Cx. torrentium* was collected and used to evaluate the model prediction. This evaluated mechanistic model can be used to simulate vector control measurements or the impact of increasing temperatures in cause of climate warming.

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Professional Status of the Speaker

PhD Student

Junior Scientist Status

Yes, I am a Junior Scientist.

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