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PROGRAM AND ABSTRACTS

Vector Ecology & Behavior category

Influence of temperature on the biology of *Aedes koreicus*: an experimental and modelling study

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Aedes koreicus, an Asian mosquito species, was detected in Europe for the first time in Belgium in 2008 and in Italy 2011. It has since established in northeastern Italy (Trentino and Veneto regions), thanks to its adaptation to temperate weather conditions. Since it is a relatively new invasive species, few studies have been conducted so far to investigate its biology and dynamics. Using laboratory colonies established from larvae and pupae collected in Trentino region (our study area), we carried out standard laboratory experiments to assess how different temperatures (T=4, 8, 13, 18, 23, 28, 33°C) affect immature stages (eggs, larvae and pupae) development and survival. Moreover, we estimated adult survival and the gonotrophic cycle length at 18 and 23°C. We then designed a mechanistic mathematical model, based on our experiments findings, to fit the adult captures recorded in 2016 and 2017 in the considered region. We found that the egg hatching rate is lower at 8°C, while it is about 50% for the other considered temperatures. Larval survival is quite high and seems little affected by temperature changes, while pupae mortality increases exponentially at 33°C. Our mosquito population model fits the time series of adult mosquitoes captured over the season quite well, and thus it provides a good framework to investigate how different climatic conditions might affect *Ae. koreicus* dynamics during its breeding season. Our findings can help at defining the future geographical expansion of this species, also by taking into account possible climatic changes.