Nationale Expertenkommission STECHMÜCKEN

FRIEDRICH-LOEFFLER-INSTITUT
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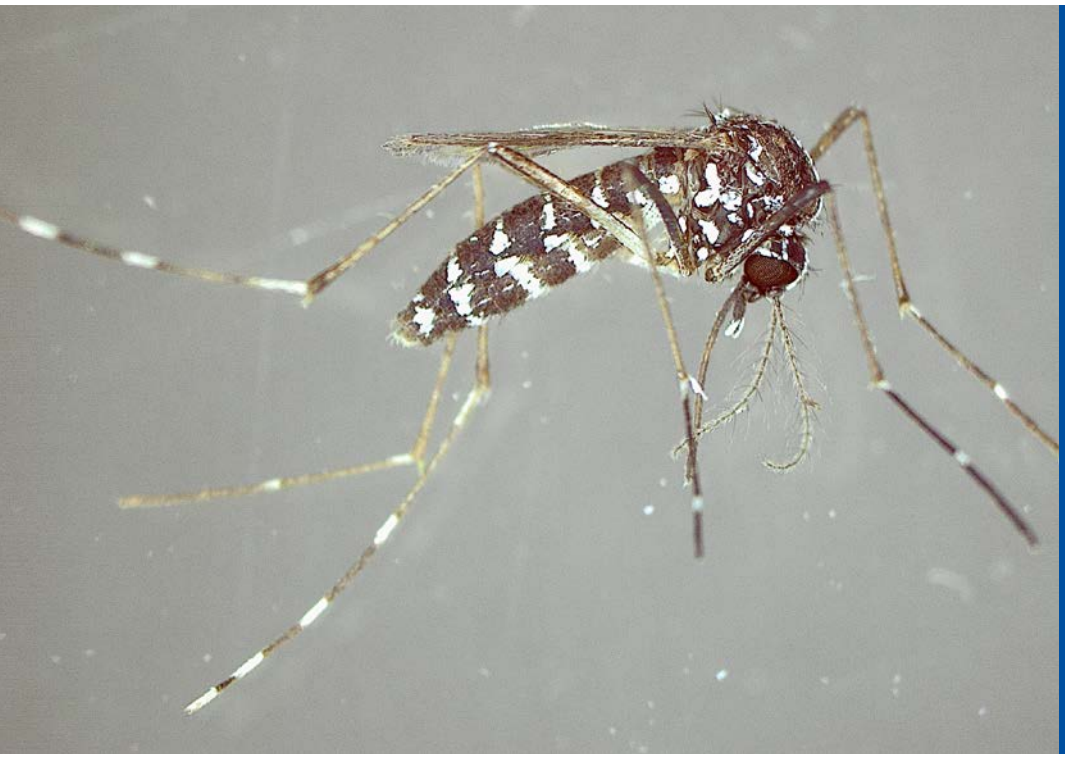
Federal Research Institute for Animal Health

FAQ

The role of mosquitoes in Germany in the transmission of Zika virus



FAQ: The role of mosquitoes in Germany in the transmission of Zika virus

How likely is a mosquito-borne Zika virus epidemic in Germany?

Currently, the risk of Zika virus transmission by mosquitoes is considered relatively low in Germany. First, the pathogen must become introduced into Germany by a traveler infected in an affected country. Moreover, a mosquito feeding on this person‘s blood in Germany must be vector-competent für Zika virus, i.e. it must be susceptible to the virus, to replicate and disseminate it in its body and to eventually carry it in its salivary glands in order to transmit it during another blood meal with its saliva. Further efficient transmission also depends on the density of vector-competent mosquitoes.

Are the yellow fever mosquito and the Asian tiger mosquito related species?

The Asian tiger mosquito *(Aedes albopictus)* and the yellow fever mosquito *(Aedes aegypti)* are two different mosquito species of the same genus *Aedes*. In Latin America, the yellow fever mosquito is considered the primary vector of Zika virus.

Is the Asian tiger mosquito able to transmit Zika virus?

Demonstrably, the Asian tiger mosquito is a highly efficient vector of numerous viruses, among them e.g. dengue and chikungunya viruses. Some of these viruses and Zika virus belong to the same virus family, i.e. they are closely related. Laboratory investigations indicate that the Asian tiger mosquito is able to also transmit Zika virus, however, only at tropical temperatures which are rarely achieved in Germany.

Does the Asian tiger mosquito represent a threat for a spread of Zika virus in Germany?

In South America, the yellow fever mosquito *Aedes aegypti* seems to be the main vector of Zika virus. While this species does not occur in western and Central Europe, the Asian tiger mosquito has recently succeeded in establishing populations in Germany (www.fli.de/de/kommissionen). The risk of an epidemic transmission of Zika virus by the tiger mosquito is presently considered negligible, though, since its spatial distribution is limited, its population densities are commonly relatively low, and the high temperatures apparently necessary for virus development in the mosquito are rarely given.

Are mosquitoes native to Germany able to transmit Zika virus?

To date, there are insufficient data on the vector competence of native mosquito species for Zika virus. Studies have demonstrated that the most frequent and widely distributed mosquito species in Germany, the common house mosquito *Culex pipiens,* is vector-incompetent. *Aedes vexans*, which may seasonally and locally develop high population densities as well, was experimentelly able a transmit the virus only after artificial thoracic injection, but not after natural feeding on infectious blood. By contrast, the Asian bush mosquito *Aedes japonicus,* which has recently spread considerably through southern and western parts of Germany, partly reaching high population densities, has shown vector competence in the laboratory when kept at continuously high tropical temperatures. In summary, the risk of Zika virus transmission by mosquitoes occurring in Germany can be considered negligible.

What do I do if I find a possibly "dangerous" mosquito?

Under the current climatic conditions, there is no reason for concern, as mosquitoes endemic in Germany do not appear to be very effective vectors of tropical viruses and the number of Asian tiger mosquitoes in Germany is very limited.

Often, the native banded house mosquito *Culiseta annulata* is mistaken for the Asian tiger mosquito, as it is very large and has tiger-like stripes (the Asian tiger mosquito has stripes, too, but is a particularly small species).

„Suspicious" mosquitoes can be captured and submitted for species identification to the citizen science project "Mückenatlas" (www.mueckenatlas.com) at the Leibniz Center for Agricultural Landscape Research/Friedrich-Loeffler-Institut, the Bernhard-Nocht-Institut for Tropical Medicine Hamburg (www.bnitm.de) or the Kommunale Aktionsgemeinschaft zur Bekämpfung der Schnakenplage (KABS) in Speyer (www.kabsev.de).

Are mosquito bites a reason for concern in Germany?

No. So far, the Asian tiger mosquito has only been found at few limited places in Germany. Generally, it is controlled wherever it emerges to keep population densities low or to even eliminate it.

To become infected with Zika virus, there must be a human source for the mosquito. After feeding blood on this person, the mosquito would have to be able to replicate the virus and to transmit it, and, moreover, to later feed on another susceptible human host. This cannot be excluded, but is highly unlikely.

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