

Viral interaction between West Nile virus and Usutu virus during simultaneous co-infections in frequent German mosquito species

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The two closely related flaviviruses West Nile virus (WNV) and Usutu virus (USUV) co-circulate in many European countries including Germany. Both viruses circulate in an enzootic cycle between birds and mosquitoes as biological vectors. In addition, transmission to vertebrate species such as horses and humans is possible. Infections can lead to serious illnesses, and WNV in particular poses a risk to the safety of blood donations. Co-infections with WNV and USUV in hosts and vectors could have unexpected consequences for their transmission, however, these potential impacts are to date mostly unknown. Therefore, simultaneous co-infections in the mosquito species *Culex pipiens* biotype *pipiens* (CxP), *Culex pipiens* biotype *molestus* (CxM) and *Aedes vexans* (AeV) were performed.

The results showed that both viruses appear to interact during replication in the mosquito. This interaction led to a reduction in USUV susceptibility in CxP but to an increase in USUV susceptibility in AeV. In contrast, no mutual influence between WNV and USUV could be detected in CxM. In addition, potential co-transmission of both viruses was detected in CxM.

Thus, it could be shown that even a non-vector-competent species (AeV) might play a role in transmission of WNV and USUV in the presence of co-infections. In addition, the outcome of viral interaction seems to vary between different mosquito species. These results should be included in future WNV and USUV surveillance strategies in Germany.

Keywords

Culex pipiens, *Aedes vexans*, West Nile virus, Usutu virus, co-infections

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Yes, I am a Junior Scientist.

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