

Vector competence of Belgian *Culex pipiens* and *Anopheles plumbeus* mosquitoes for West Nile virus under different temperature conditions

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Intro

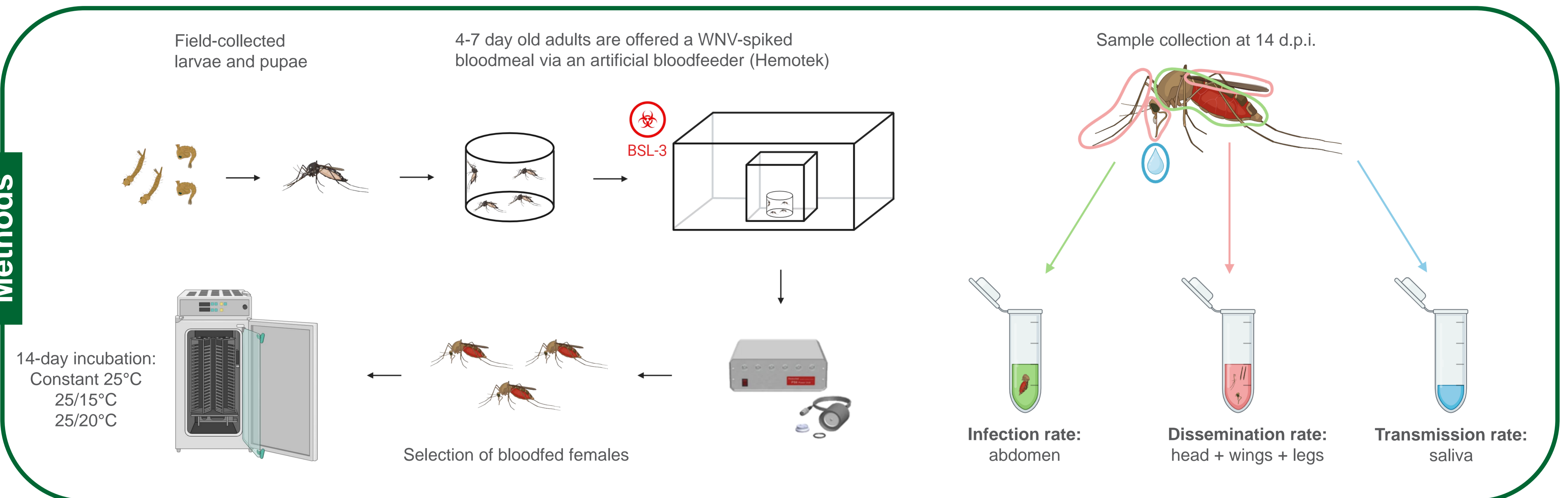
- WNV has been detected in neighbouring countries¹
- Proven vector competence of *Cx. pipiens* for WNV in Europe²
- *An. plumbeus*: nuisance species with human and bird biting behaviour³
- Climate change will lead to changes in temperature, which can impact vector competence⁴



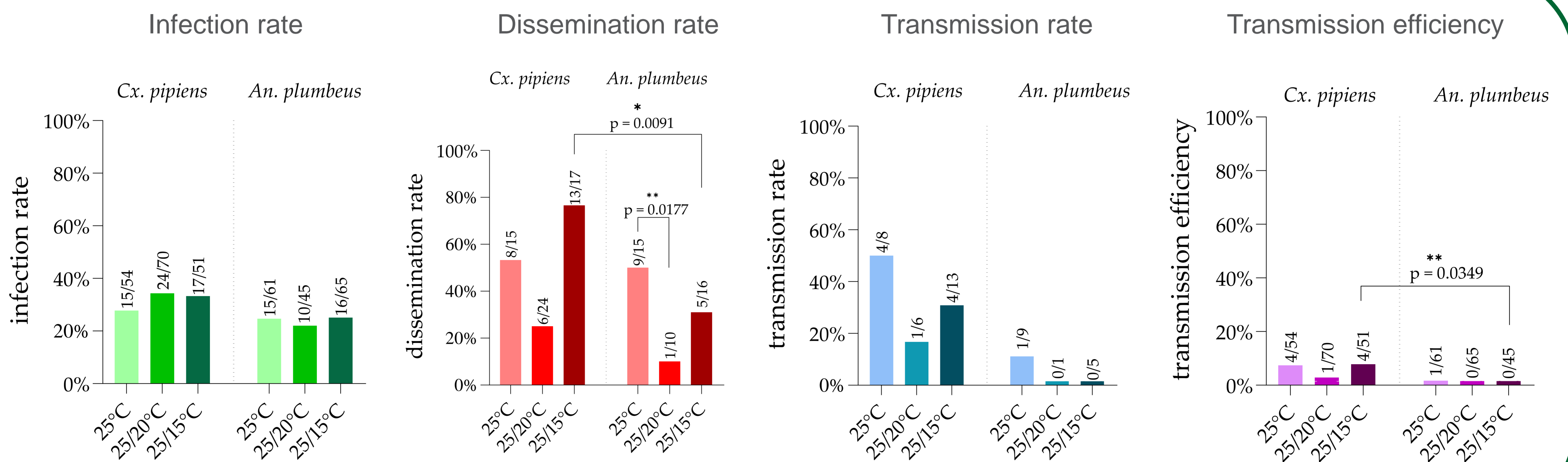
Are Belgian *Cx. pipiens* and *An. plumbeus* mosquitoes competent vectors for WNV?

Does temperature affect the competence of these species?

Methods



Results



Chi square and Fisher exact tests were used to compare infection, dissemination and transmission rate between the constant 25°C and the gradient temperature conditions. * Chi-square test (p-value < 0,05); ** Fisher's exact test (p-value < 0,05)

Conclusions

1. Gradient temperature conditions seem to reduce dissemination of WNV in *An. plumbeus* compared to constant 25°C; However, this effect is less pronounced in *Cx. pipiens* and requires further study
 2. Upon a WNV introduction in Belgium under current climatic conditions, *Cx. pipiens* is expected to serve as an important vector for transmission of the virus, whereas *An. Plumbeus* is anticipated to have a limited role in its spread
- *Cx. pipiens* was a competent vector for WNV at all tested temperature conditions; *An. plumbeus* was only competent at the constant 25°C condition
 - Belgian *Cx. pipiens* mosquitoes seem more competent for WNV than *An. plumbeus* mosquitoes
 - *Cx. pipiens* appears to be more competent for WNV than Japanese encephalitis virus⁵; vector competence of *An. plumbeus* for WNV was comparable to that for JEV⁶

Future

Underlying mechanisms which account for the observed differences in vector competence between both mosquito species and the influence of temperature on these mechanisms

REFERENCES

- ¹Lu et al. "West Nile virus spread in Europe: Phylogeographic pattern analysis and key drivers."
- ²Vogels et al. "Vector competence of European mosquitoes for West Nile virus."
- ³Bueno-Mari and Jiménez-Peydró, "Anopheles Plumbeus Stephens, 1828."
- ⁴Bellone et al., "Climate change and vector-borne diseases: a multi-omics approach of temperature-induced changes in the mosquito"
- ⁵Van den Eynde et al., "Relevant Day/Night Temperatures Simulating Belgian Summer Conditions Reduce Japanese Encephalitis Virus Dissemination and Transmission in Belgian Field-Collected Culex Pipiens Mosquitoes."
- ⁶Van den Eynde et al., " Belgian Anopheles plumbeus Mosquitoes Are Competent for Japanese Encephalitis Virus and Readily Feed on Pigs, Suggesting a High Vectorial Capacity."