



**V 26 Infection with tick-borne encephalitis virus changes responses of *Ixodes ricinus* nymphs and adults to mammal odours**

Doreen Vollandt<sup>a</sup>, Daniel Ruzek<sup>b</sup>, Hans Dautel<sup>c</sup>, Torsten Meiners<sup>d</sup>, Matthias Niedrig<sup>a</sup>

<sup>a</sup> Center for Biological Safety (ZBS-1), Robert Koch-Institute, Berlin, Germany

<sup>b</sup> Institute of Parasitology, Biology Centre of the Academy of Sciences of the Czech Republic, České Budějovice, Czech Republic

<sup>c</sup> IS Insect Services GmbH, Berlin, Germany

<sup>d</sup> Angewandte Zoologie/Ökologie der Tiere, Freie Universität Berlin, Germany

Although big efforts have been made in recent years to investigate the tick-borne encephalitis virus (TBEV) and its vector *Ixodes ricinus* in more detail, practically nothing is known about the behaviour of ticks in the light of a TBEV infection. However, several examples are known where the behaviour of animals is affected by parasites, and work with borrelia-infested nymphs suggests that the same phenomenon is present in *I. ricinus*.

To examine if a TBEV infection of *I. ricinus* changes the host-seeking behaviour of nymphs and adult ticks, several olfactory stimuli of potential mammal hosts (carbon dioxide, odour of mice, odour of dogs) were offered to TBEV-infected and non-infected ticks on a locomotion compensator. Ticks were previously experimentally infected via a blood meal on infected mice and finally analyzed by PCR for TBE infection.

TBEV-infected nymphs and adult ticks responded differently to the offered olfactory host stimuli in comparison to non-infected ticks. While non-infected nymphs were attracted by each tested stimulus, TBEV-infected nymphs were attracted to the odour of mice and carbon dioxide, but not to the odour of dogs. Non-infected adult ticks showed a positive chemotaxis towards carbon dioxide and dog odour, but not to odour of mice. However, the behaviour of infected females (but not that of infected males) was different; they avoided dog odour and orientated towards mice odour, which is astonishing, since mice do not belong to the hosts of this life stage.

Taking into account that mice and other small mammals are considered as main reservoir hosts of the TBEV, our results support the idea that the virus might be able to manipulate its vector for its own benefit.