

**Vector-Borne Diseases: Impact of Climate Change on Vectors and Rodent Reservoirs**  
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## **Biting midges as vectors of blue tongue virus in Germany**

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In August 2006 an outbreak of Blue-tongue-disease (BTD) occurred in Germany along the border to Belgium and the Netherlands spreading constantly eastwards reaching in September 2007 rather East regions in Germany.

The virus was described by the Friedrich Löffler Institute (FLI) as serotype 8, which is one of the twenty other types found in South Africa, where the midges of the species *Culicoides imicola* were known as (main) vector.

Thus from the early beginning it was needed to find out the vectors in Germany. Was it also *C.imicola*, which is only found in rare cases at the Northern border of the Mediterranean Sea- having migrated undercover to the north or were other *Culicoides* species involved?

Catches at two farms- a conventional one and a biofarm- using ultraviolet light traps, showed that mainly (>90%) *C.obsoletus* occurred joined by a few specimens of *C.pulicaris* and even fewer *C.nubeculosus* and *C. festivipennis*. The caught female specimens of the midges were separated according to their species relations and the status of feeding- fed or unfed. Then they were sent to FLI for PCR investigations with respect to the occurrence of the BT-virus and its serotype. It turned out- beginning after 3 weeks of daily catching midges, that pooled (20-50 specimens) *C. culicoides* were proven positive for BTV-virus type 8. The virus was found in both fed and unfed groups. *C.pulicaris* pools were never positive, even when coming from a third farm, where huge numbers of *C. pulicaris* were caught due to the presence of many horses.

Thus it is concluded that the African vector *C. imicola* has not migrated to the North (as follower of global warming), but that the most common species (*C. obsoletus*)

is apparently able to act as vector. They are perhaps supported by related species, of which 8-10 were caught in very small numbers during the Midges-Monitoring-System established in March 2007 at 90 German farms by the German Ministry of Agriculture, Food and User Protection. Although the number of BTD-involved farms increased more than sevenfold (1000 in 2006/ 7000 until Sept. 2007) the Monitoring in 2007 confirmed the species spectrum (as in 2006), but did not detect any BTV infected pool in 2007. However, at present only pools until July had been PCR-checked, while in 2006 the main findings of the virus were obtained at the end of September and at the beginning of October. Thus there is apparently a still open frame.

Evaluating the findings until now- September 2007- the import of the Blue Tongue Virus is apparently based on the globalisation with an intensive , world wide animal transportation, while the local spread, however was facilitated of course by a warm, long summer 2006 and a short, warm winter in 2006/2007.

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