

Midges 'actively spread' bluetongue epidemic

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Bluetongue disease in sheep. Credit: Fournure

The midges that spread bluetongue, a devastating livestock disease, across Europe in 2006 weren't 'passengers' on the wind but actively transported the disease, Oxford University scientists have found.

Bluetongue is a non-contagious virus that causes symptoms such as drooling, and swelling of the neck, head and tongue in sheep, cattle, goats, deer and other ruminants. It is transmitted between animals by the *Culicoides* midge.

It had been thought that the midges were 'passengers' carrying the disease wherever the wind blows them but now a team led by Oxford University scientists analyzing the 2006 outbreak has shown that active movements of the midges were responsible for around 40% of the spread of the epidemic.

A report of the research appears in [Proceedings of the Royal Society B](#).

"For the first time we can say that midges, under their own power, travel upwind as well as downwind during this kind of epidemic," said Dr. Luigi Sedda of Oxford University's Department of Zoology, who led the research with Professor David Rogers. "This has very important implications for the control of future epidemics as previously efforts had been targeted at preventing downwind infection."

The analysis was restricted to Northern Europe (France, Belgium, Netherlands, Germany, and Luxembourg). Nearly 40% of the midge's movements during the outbreak were attributed to their own activity with downwind and random movements, or combinations of upwind, downwind and random movements, accounting for the remainder of the infections.

Dr. Sedda said: "Our model can explain 94% of the over 2000 farm outbreaks of bluetongue in Northern Europe in 2006. Whilst some infected farms were the source of infections for up to 15 other farms, 70% of all the infected farms were transmission 'dead ends' – that is they did not infect other farms. These sorts of statistics could help to inform future control policies for bluetongue and other diseases that are spread in a similar way."

A report of the research, entitled 'A new algorithm quantifies the rôles of wind and midge flight activity in the bluetongue epizootic in North-West [Europe](#)', is published in this week's *Proceedings of the Royal Society B*. The work was carried out by a team including scientists from Oxford University, University of Tuscon, the NERC Centre for Ecology and Hydrology, the Met Office, and the Met Office at the Institute for Animal Health.

Provided by Oxford University

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