

LETTERS

***Culicoides chiopterus* as a potential vector of bluetongue virus in Europe**

SIR, – In August 2006 bluetongue appeared for the first time in northern Europe and by December had affected over 2000 sheep and cattle holdings in the five EU member states of Belgium, France, Luxembourg, Germany and the Netherlands. Following a mild winter, bluetongue recrudesced explosively in 2007, and by the end of the year 10 member states had reported over 55,000 outbreaks in total. While outbreaks in the Netherlands continued to occur in the previously affected southern regions, ever-increasing numbers of infections were being reported also from the central and more northerly parts of the country. To establish which species of *Culicoides* were involved in this northward movement of bluetongue virus (BTV), an entomological field study was conducted in the central district of Apeldoorn.

Between October 3 and 17, 2007, 45,912 *Culicoides* species were captured in 65 light trap collections made on one sheep and four cattle farms; after morphological identification and age-grading at the Plant Protection Service in Wageningen, 3138 non-engorged, parous and gravid female midges were selected and divided among 81 species-specific pools, represented by 1899 *Culicoides chiopterus* (44 pools), 738 *Culicoides obsoletus/scoticus* (18), 433 *Culicoides dewulfi* (14) and 68 *Culicoides punctatus* (5); each pool contained one to 65 individual midges. The pools were

code numbered and then screened by the Central Veterinary Institute, Lelystad, for the presence of BTV serotype 8 using an in-house developed, and extensively validated, reverse transcriptase-PCR (RT-PCR).

Among the 44 pools of *C chiopterus* one pool of 50 parous midges was found reproducibly PCR-positive to BTV in the RT-PCR assay. The field infection rate for *C chiopterus* thus approximates to 0.05 per cent based on the assumption that only one midge contained detectable levels of BTV. This finding is original in that *C chiopterus* has never before been linked to the transmission of BTV in Europe.

Aspects of the behavioural ecology of *C chiopterus* are known, the most pertinent from a veterinary point of view being that it attacks cattle and horses and breeds exclusively in their dung. For these reasons *C chiopterus* can be aligned with another coprophilic species, that is, *C dewulfi*, which is considered also to be a potential vector for BTV based on similar RT-PCR-positive results obtained during the 2006 phase of the outbreak. Within the Palaearctic biting midge fauna *C chiopterus* is a monophyletic taxon of the subgenus *Avaritia* but, like *C dewulfi*, is mostly erroneously placed within the so-called *C obsoletus* group or *Obsoletus* complex.

In 2006, a 'snapshot' survey revealed both *C chiopterus* and *C dewulfi* to be widely distributed across the Netherlands, occurring on approximately 70 per cent of 106 farms sampled; during the same survey the *Obsoletus* complex, another potential vector for BTV, and represented by two species (*C obsoletus* and *C scoticus*), was found on 94 per cent of the farms. This ubiquity of multiple vectors of BTV holds true for large parts of north-

ern Europe and could help explain the dramatic spread of bluetongue across the region. Of particular concern is that some proven world vectors of BTV are competent at transmitting another, and more devastating, pathogen, namely African horse sickness virus. Given the existence of some 400,000 horses in the Netherlands it is essential that the veterinary authorities now ascertain the population levels and biting behaviour of *C chiopterus* in the vicinity of stables. This recommendation applies to all member states and to other potential vectors, principally *C dewulfi* and the *Obsoletus* complex.

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