

# ORAL SUSCEPTIBILITY: AHSV SEROTYPES AND ISOLATES, AND GEOGRAPHIC POPULATIONS

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The most abundant *Culicoides* species in an area is not inevitably the most competent vector species for a specific virus. Oral susceptibility, as an indicator of vector competence, is a measure of the portion of vectors taking a blood meal from an infected host that actually becomes infective. Cumulative laboratory oral susceptibility results from South Africa indicate a multivector potential for bluetongue virus (BTV) as well as for African horse sickness virus (AHSV). Considering the unique biology of potential vector competent *Culicoides* species one can appreciate the complex epidemiology of these diseases. The oral susceptibility of *C. imicola*, a proven vector of AHSV and BTV, was relatively low for most of the viral isolates and even appeared to be refractory to infection with some of the isolates used. This relatively low oral susceptibility may partly explain the low field infection prevalence of AHSV and BTV recorded in field collected midges. In South Africa, the relatively low oral susceptibility as determined for some of the isolates is easily compensated for by the high abundance of *C. imicola*. Differences found in the virus recovery rates of various AHSV serotypes/isolates from the various *Culicoides* species and even different populations of the same species emphasize the fact that,

although oral susceptibility tests provide important information about a specific vector population, it provides no predictability about the behaviour of other populations with different strains of virus. Differences found in the oral susceptibility of *C. imicola* and *C. bolitinos* for isolates of the same serotypes of AHSV suggest coadaptation between orbiviruses and vectors present in a given locality. Real-time monitoring of vector competence might be difficult as it would require assessing local *Culicoides* populations using variants of orbiviruses currently in circulation. It needs to be emphasized that laboratory demonstration of oral susceptibility is not the only necessary step to implement a competent vector. It is, however, an indication of the ability of a vector to support virus replication and one of the critical components of vectorial capacity. Vector capacity is the relative measure of a vector population to transmit a virus to a vertebrate population. In addition to vector competence, vectorial capacity depends on the biting rate, host selection, vector survivorship, and the extrinsic incubation period of the virus.

**KEYWORDS:** *CULICOIDES* – AFRICAN HORSE SICKNESS VIRUS – BLUETONGUE – VECTOR – BITE – DISEASE TRANSMISSION.

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