

Bluetongue epidemiology in wild ruminants from Southern Spain

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Abstract Serum samples from 210 wild ruminants collected between 2006 and 2007 in southern Spain were tested for antibodies against bluetongue virus (BTV) by means of a competitive ELISA assay. Eighty-seven of the 210 wild ruminants analysed (41%) showed antibodies against BTV. Statistically significant differences were found in the seroprevalence among species: 66% (65 of 98) for red deer (*Cervus elaphus*), 50% (ten of 20) for fallow deer (*Dama dama*), 33% (three of nine) for mouflon (*Ovis aries musimon*) and 11% (nine of 83) for Spanish ibex (*Capra pyrenaica*). Overall, the sites where seropositive wild ruminants were found coincide with the areas where BTV had been detected in livestock, but in eastern Sierra Morena, the virus circulated in wild ruminants, although it had not been detected in domestic ruminants in the same areas. Wild ruminants over 1-year of age (sub-adults and

adults) had significantly higher seroprevalences than juvenile animals. Statistically significant differences were also observed between BTV seroprevalence and management (free-ranging vs. captivity) with higher prevalence in free-ranging animals. The high seroprevalences obtained suggest that BTV is widespread in wild ruminants in southern Spain. This factor could have an important influence on the evolution of the infection in domestic livestock and indicates the need to include wild ruminant species in BTV surveillance or control programs.

Keywords Bluetongue · Serosurvey · Wild ruminants · Spain

Introduction

Bluetongue virus (BTV) is a member of the genus *Orbivirus*, family *Reoviridae*, responsible for the bluetongue (BT), a non-contagious, infectious disease transmitted between vertebrate hosts by biting midges of the *Culicoides* genus (Diptera: Ceratopogonidae; Mellor and Wittmann 2002; Mertens et al. 2004).

The historical geographical distribution of the BT was between latitudes of approx. 40–50° N and 35° S, coincident with the presence of vector species of the *Culicoides* genus (Mellor and Wittmann 2002). However, during the recent outbreaks in north-western Europe, BTV spread far beyond its prior known upper northern limits anywhere in the world (Thiry et al. 2006). Twenty-four distinct serotypes have been identified, wherein seven are currently in Europe and the Mediterranean Basin (serotypes 1, 2, 4, 8, 9, 15 and 16; Mellor and Wittmann 2002; Anonymous 2007).

BTV-10 was detected for the first time in Spain and Portugal in 1956 (Lopez and Sánchez-Botija 1958) and

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