Bluetongue in springboks and wildebeests in the Etosha National Park (Namibia): circulating strains and epidemiology.

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Bluetongue virus (BTV) is a double strand RNA virus belonging to the Orbivirus genus in the Reoviridae family which can infect both domestic and wild ruminants. However, little information is available on BTV circulation in wildlife species. The present work aims to study the BTV serotypes circulation in both springboks and wildebeest species in the Etosha National Park (Namibia). The study included collecting blood samples from springboks and wildebeest with springbok prevalence 50/50 (100%; 95% CI: 94.3 to 100) and 171/182 springboks (94%; 95% CI: 89.50 to 97.67) showed BTV antibodies when tested by ELISA. Neutralizing antibodies were also detected in all the wildebeest sera (100%; 95% CI: 94.3 to 100) and in 133/182 springboks (73%; 95% CI: 66.19 to 78.99). Antibodies against all the tested BTV serotypes were detected at least once in both species. This study was also attempted on RT-PCR positive samples according to Savini et al. (2008) was used to detect BTV antibodies in the serum samples whereas the real time RT-PCR as described by Hoffman et al. (2008) was used to detect BTV RNA in EDTA blood samples. Due to the unknown performance of the ELISA test on wildlife sera, all sera were also tested by serum neutralization assay. This gave the opportunity to evaluate the presence of antibodies against 25 out of 26 known serotypes in springbok and in wildebeest.

**Results**

BTV RNA was detected in 120/182 springboks (66%, 95% confidence interval [CI]: 58.77 to 72.43) and in 9/50 (18%, 95% CI: 9.82 to 30.87) wildebeests. The attempts to isolate the virus failed. All the sampled wildbeests 50/50 (100%; 95% CI: 94.3 to 100) and 171/182 springboks (94%; 95% CI: 89.50 to 97.67) showed BTV antibodies when tested by ELISA. Neutralizing antibodies were also detected in all the wildebeest sera (100%; 95% CI: 94.3 to 100) and in 133/182 springboks (73%; 95% CI: 66.19 to 78.99). Antibodies against all the tested BTV serotypes were detected at least once in both species.

**Discussion and Conclusions**

The present work first provides information on the BTV serotypes circulating in the Etosha National Park (Namibia). Most of the tested wildbeests and springboks showed either BTV antibodies or RNA. On one hand this result confirmed the susceptibility of these species to BTV infection. The study also revealed the presence of an endemic situation for Bluetongue in which wild ruminants and redgaz are capable of maintaining the infection in the park environment. This endemic cycle appears to be efficient for all tested serotypes including those never detected in the Southern part of Africa like BTV-17, BTV-20, BTV-21, BTV-26. No data concerning BTV serotype circulation is available for Namibia and therefore results from this study are only available. It is the first time that BTV-26 is proved to circulate outside Kuwait and whether it originated in the Sub-Saharan Africa and then spread to Kuwait, or originated in Kuwait and subsequently spread to Africa, is hard to say. Similarly is it difficult to assess the origin of the other serotype first detected in this part of Africa.

Wild ruminants are naturally subjected to a rapid turnover and within ENP the life expectancy of springboks is generally much shorter than that of wildebeests. This probably explains the significantly lower number of serologically positive springboks compared to the wildebeests and also provides information on possible recent and past infections. Currently, we are not aware whether, Namibia, in BTV in wildebeest follows the pattern observed in domestic animals. This study, however, is a first attempt to identify the factors that might influence the BT dynamics in the natural context of the sixth largest National Park in Africa.

Further studies, based on a larger number of wildlife species including also domestic livestock, are required to better understand BT epidemiology and to investigate how environmental factors influence vector dynamics at the wildlife/livestock interface.