Development of a multispecies ELISA for the specific detection of antibodies against Shuni virus

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The orthobunyavirus Shuni virus (SHUV) may cause neurological signs in horses and cattle or it might induce severe fetal malformation or abortion when naïve ruminants are infected during a critical phase of gestation. The virus was originally isolated in Nigeria in the 1960s and since 2014, it is also present in the Middle East. However, the actual distribution is largely unknown. Here, we describe the development and evaluation of a glycoprotein Gc-based ELISA for the detection of anti-SHUV antibodies, which could be a valuable tool for sero-epidemiological studies in affected regions, but also for surveillance in not yet endemic countries. Moreover, the newly developed SHUV-specific ELISA was combined with likewise Gc-based ELISA systems for Akabane virus (AKAV) and Schmallenberg virus (SBV), allowing the differentiation of antibodies directed against these closely related viruses in an alternate approach to traditional antibody differentiation by serum neutralization tests. The optimal test conditions were defined and, subsequently, sensitivity and specificity were evaluated using sera from either vaccinated or infected, convalescent animals. No cross-reactivity was observed between the SHUV, AKAV, and SBV antibody detection systems. Hence, this assay can be used for the surveillance of SHUV spread and the antibody-based differentiation in areas with viral co-existence.

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