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Ngari virus: a natural Bunyamwera and Batai virus reassortant

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Ngari virus (NRIV), Bunyamwera virus (BUNV) and Batai virus (BATV) are arthropod-borne viruses of the Bunyamwera serogroup in the Orthobunyavirus genus of the Peribunyaviridae family. They are characterized by a tri-segmented, enveloped negative-strand RNA genome. Sequence analysis showed that NRIV is a natural reassortant resulting from co-infection of BUNV and BATV, as NRIV possesses the M segment of BATV combined with the S and L segments from BUNV. This reassortment probably led to an increased virulence, which is associated with hemorrhagic fever in humans and ruminants. So far, NRIV was isolated only from sub-Saharan Africa, whereas BATV and BUNV are distributed almost worldwide. The aim of the present study is to develop discriminatory serological and molecular biological diagnostic tools for these three viruses and to determine potential cross-reactions. For this purpose NRIV, BATV and BUNV derived antibody-positive sera will be tested in an ELISA based on the glycoprotein Gc of BATV, BUNV and NRIV. The results from the ELISAs will be verified in specific serum neutralizing tests using BATV, BUNV or NRIV as homologous viruses. Furthermore, a quantitative real-time reverse transcription PCR for simultaneous detection of NRIV, BATV and BUNV will be established and evaluated.