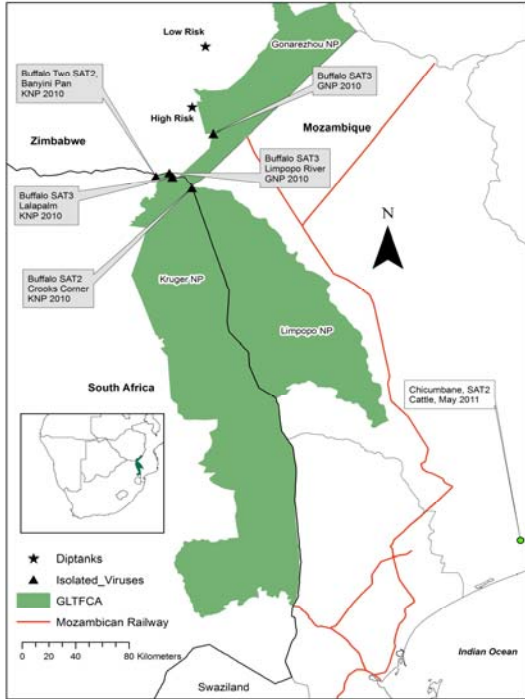


# MONITORING FOOT AND MOUTH DISEASE VIRUS DYNAMICS WITHIN THE GREAT LIMPOPO TRANSFRONTIER CONSERVATION AREA (GLTFCA)

Jori, F.<sup>1</sup>, Caron, A.<sup>1</sup>, Thompson, P.N.<sup>2</sup>, Dwarka, R.<sup>3</sup>, Foggin, C.<sup>4</sup>, De Garine-Wichatitsky, M.<sup>1</sup>, Hofmeyr, M.S., Van Heerden, J.<sup>3</sup> and Heath, L.<sup>3</sup>

<sup>1</sup>UPR AGIRs, CIRAD <sup>2</sup>PAS Department, University of Pretoria <sup>3</sup>ARC-OVI <sup>4</sup>Wildlife Veterinary Centre, Veterinary Technical Services, Harare, Zimbabwe. <sup>5</sup>Veterinary Wildlife Services, Kruger National Park, South Africa.



Map of the GLTFCA showing the areas where buffalo SAT2 and SAT3 viral strains were collected and where an outbreak of a genetically linked SAT2 occurred in cattle herds in Mozambique

## Introduction

In many parts of southern Africa, foot-and-mouth disease (FMD) is endemic due to the presence of large populations of infected buffaloes (*Syncerus caffer*), which are the major reservoir of the virus. The progressive development of transboundary conservation areas (TFCA's) in that region is increasing the risk of FMD outbreaks due to a higher probability of buffalo/livestock contacts (1,2) and subsequent movement of infected cattle within or between countries.

## Material and methods

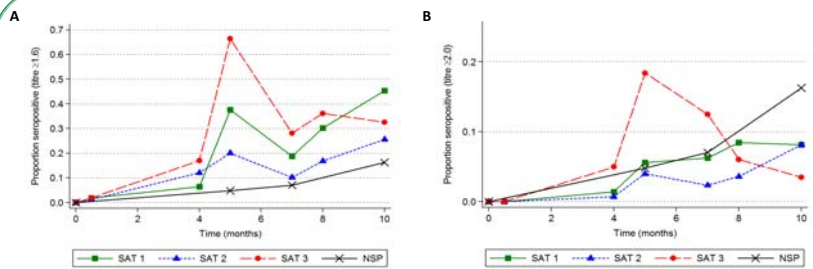
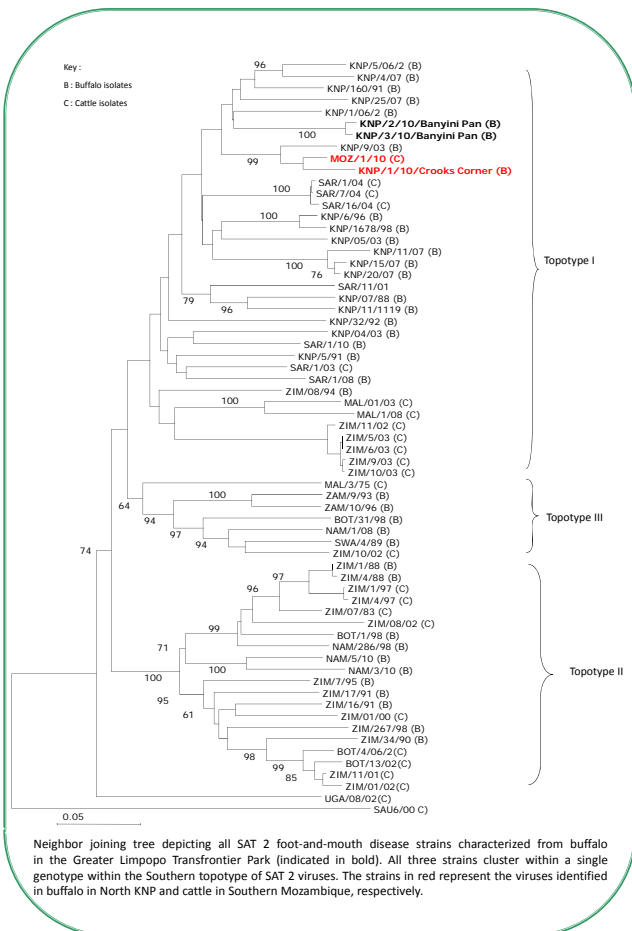
In order to investigate the dynamics of FMD in buffalo herds within the GLTFCA, five herds of buffaloes were captured and sampled to characterize circulating viruses in the area between South Africa and Zimbabwe. In addition, two groups of 100 cattle were serologically monitored during one year in a different location at the interface of Gonarezhou National Park (GNP) in Zimbabwe, using the liquid-phase blocking ELISA (LPBE) and a test for antibodies directed against the non-structural proteins (NSP).



## Results

Three SAT 2 and three SAT 3 isolates were obtained from buffalo herds in Zimbabwe and South Africa, two of which were genetically linked to a recent cattle outbreak reported in Mozambique in September 2010.

Antibody responses against SAT 3 and SAT 1 strains were detected in a large proportion of the monitored sentinel cattle that were unrelated to the outbreaks, while NSP reactions were detected 5 to 16% % of animals (see Figure 2). However, no clinical signs were reported.



Titres	SAT 1	SAT2	SAT3
<1,3	8,7	4,5	5,3
1,6	-	-	2,3
1,7	-	2,3	-
1,8	6,5	2,3	-
1,9	4,3	-	4,7
2,1	4,3	9,1	2,3
2,2	2,2	-	-
>2,2	73,9	81,8	81,4
TOTAL	100	100	100

Antibody titers against the different SAT types reported in the sera of the buffalo analyzed with the LPB ELISA. Titers equal or higher than 1.6 are highlighted in light grey. Titers higher than 2 are highlighted in dark grey

## Discussion

The serological response observed in sentinel cattle suggests that a SAT 3 and possibly a SAT1 outbreak with very mild clinical expression occurred during the study period. The genetic characteristics of the viruses isolated in buffalo and their links with recent outbreaks suggest that buffalo in TFCA's act as a source of virus and that infected cattle from adjacent areas act as disseminators of FMD virus for other regions or countries. Further efforts of surveillance and control of FMD should be targeted towards wildlife/livestock interface areas surrounding TFCA's in southern Africa.

## References

- Jori, F., Vosloo, W., Du Plessis, B., Bengis, R.G., Brahmhatt, D., Gummow, B., Thomson, G.R., 2009. A qualitative risk assessment of factors contributing to foot and mouth disease cattle outbreaks along the western boundary of Kruger National Park. *Revue Scientifique et Technique, Office Internationale Epizooties* 79, 917-933.
- Vosloo, W., Bastos, A., Sangare, O., Hargreaves, S., Thomson, G., 2002. Review of the status and control of foot and mouth disease in sub-Saharan Africa. *Revue Scientifique et Technique Office Internationale Epizooties* 21, 447-449.