

Challenges associated with sampling of buffalo in the SADC region

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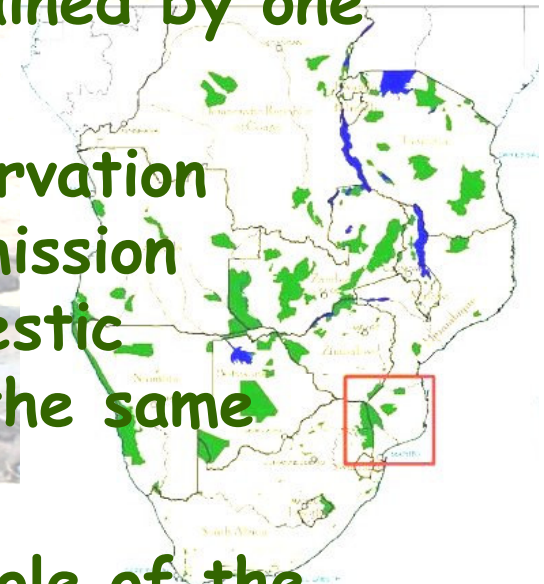
(Transboundary Animal Diseases Programme; ARC-OVI; South Africa)

Introduction

- The African continent is home to many endemic infections of livestock which are maintained by one or more wildlife hosts

- Taking into consideration all the conservation areas in SADC - interaction and transmission of infections between wildlife and domestic livestock is inevitable through sharing the same pastures and water sources

- The role of the African buffalo in the maintenance of foot-and-mouth (FMD) disease has been well documented

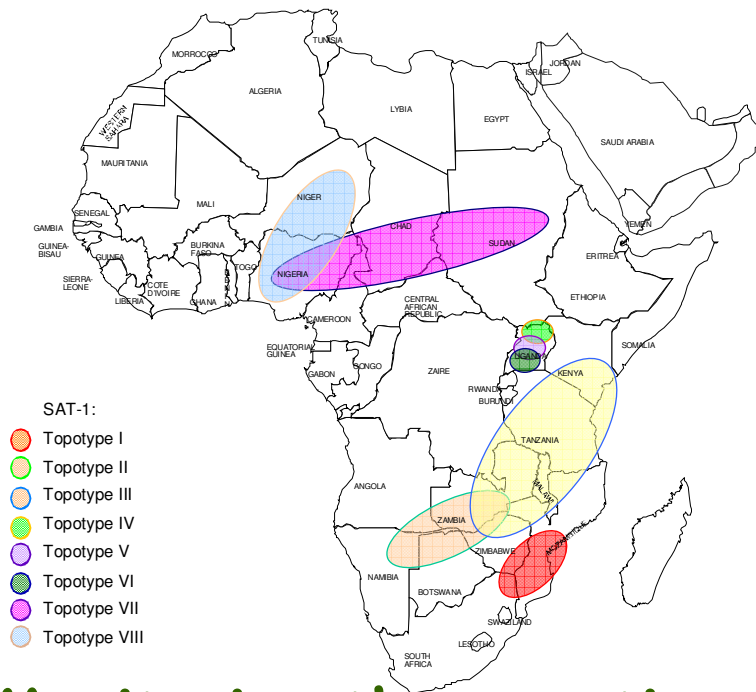


Role of the buffalo

- Infection is generally sub-clinical and a long term carrier state develops
- There is constant mutation of viruses (more than one serotype) in persistently infected African buffalo
- Buffalo are seasonal breeders - calving season occurs in summer
- Calves - born free of infection - 2-6 months protected by maternal antibodies
- During primary infection - calves shed large amounts of virus, rapid spreading among calves

Role of the buffalo

- Geographically distinct genotypes / topotypes occur for all FMD virus serotypes



- Origin of outbreaks in livestock can be traced if the knowledge of contemporary circulating viruses in a region exists

- Monitoring the genetic variability of different FMD field strains is crucial to the effective control by vaccination

Sampling challenges

- Effective surveillance in buffalo is critical towards understanding the molecular epidemiology
- Sampling challenges - Expensive operation
 - Planning well in advance and during the operation
 - Knowledge of different conservation areas - the terrain and the accessibility thereof
 - Choose a competent game capture team that is familiar with buffalo
 - Experienced veterinarians and technologists accustomed to sampling (blood & probang collection)
 - Maintenance of a cold chain

Sampling challenges

- The isolation of FMDV and genetic characterisation is dependent on the original sample
- Planning the operation - all stakeholders should meet a day before sampling to prepare equipment, marking blood collection tubes and explain the duties of everyone involved

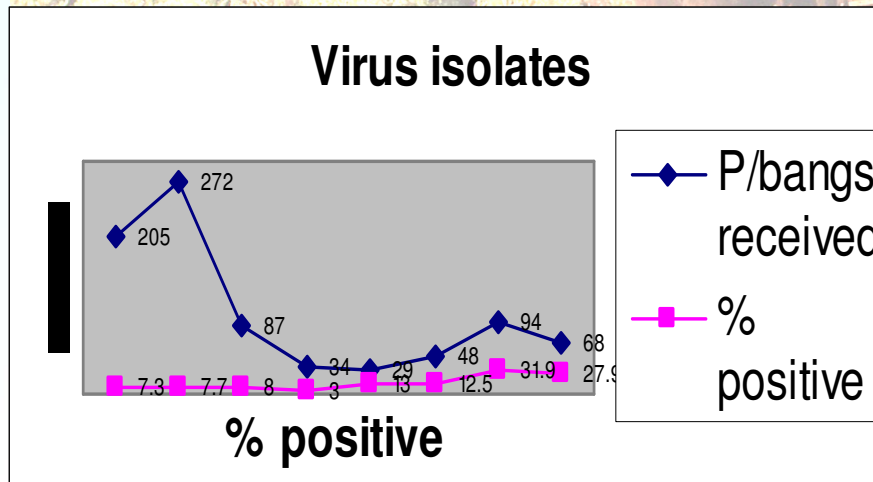


- Paint or tags for marking buffalo
- All blood tubes bundled together for each animal
- Containers for equipment



Buffalo probang sampling

- Sampling method - Oropharyngeal scraping (probang)
- Experience - method not so sensitive - sampling buffalo of all ages resulted in a success rate for virus isolation of <10%
- Adopt a policy to selectively sample buffalo between ages of 9 months - 3 years



Year	P/bangs	% positive	Virus isolated
1996	205	7.3	15
1998	272	7.7	21
2003	34	3	1
2005	29	13	4
2006	48	12.5	6
2007	94	31.9	30
2008	68	27.9	19

Sampling challenges

Rinsing of probang cups between sampling
- to prevent cross-contamination →



Even terrain
(Bomas) – buckets

- Disinfectant
- Water
- PBS



Uneven terrain

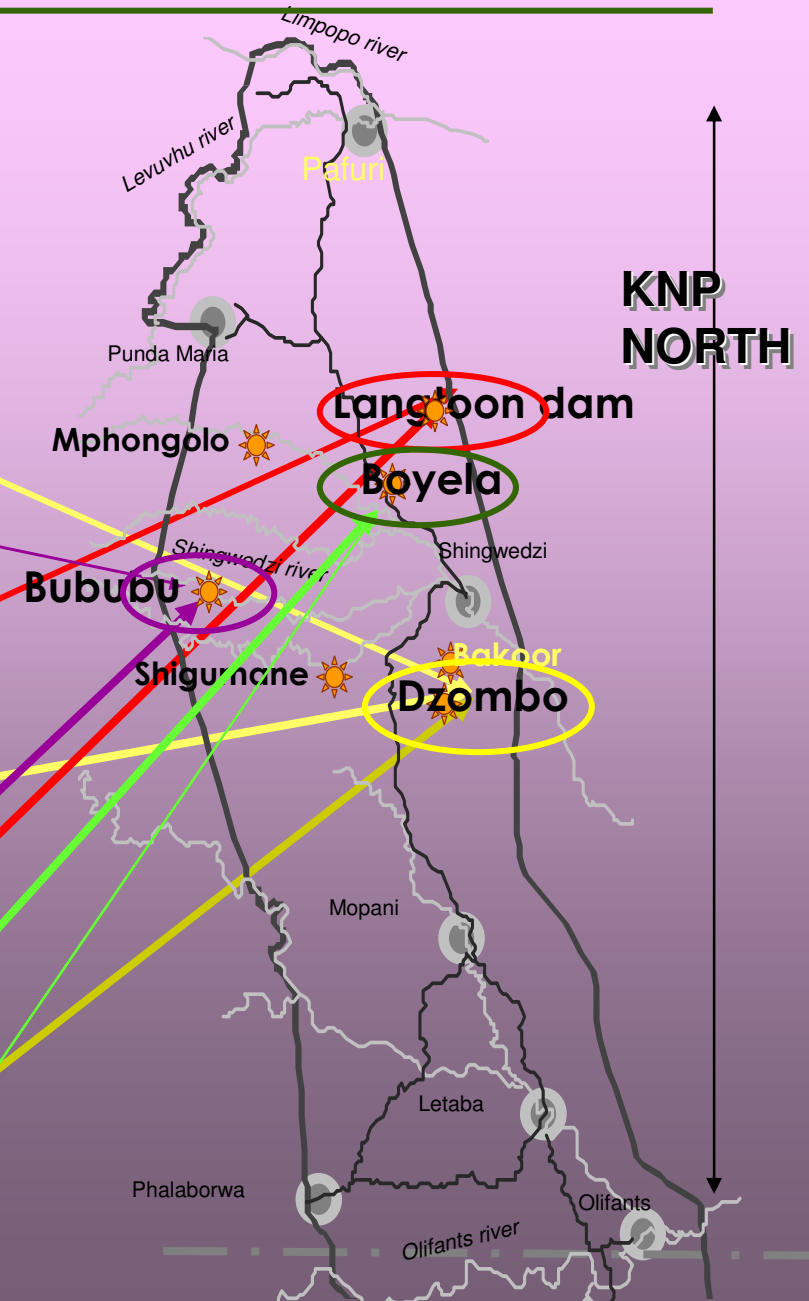
- Large water container ←
 - Cooldrink bottles with water, PBS and disinfectant →
- easy to carry & effective



Applying this strategy in practice is feasible

- DZOMBO - SAT-1, SAT-2 & SAT-3
- LANGTOON DAM - SAT-1 & SAT-2
- BUBUBA - SAT-1 & SAT-2
- BOYELA - SAT-2 & SAT-3

SAT - 1	
KNP/3/07	Dzombo
KNP/5/07	Dzombo
KNP/10/07	Bububu
KNP/19/07	Langtoon Dam
KNP/21/07	Langtoon Dam
SAT - 2	
KNP/4/07	Dzombo
KNP/11/07	Bububu
KNP/20/07	Langtoon Dam
KNP/25/07	Boyela
SAT - 3	
KNP/2/07	Dzombo
KNP/26/07	Boyela



Sampling challenges

- Different terrains & competency of game capture team
- Mozambique - wetland area, inaccessible to vehicles
- - experienced game capture team



• Buffalo first immobilised from the air

• Sampling team brought in afterwards



Sampling challenges

- **Malawi - even terrain - boma technique-very effective**
- **Buffalo were manoeuvred into a boma from the air and then immobilized on ground level**



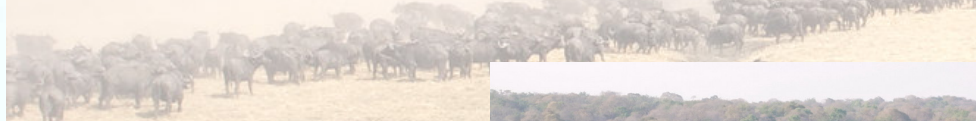
Sampling challenges

- Zambia uneven terrain - flood plains-access difficult
 - efficient game capture team
 - buffalo immobilized far distances apart - resulting in difficulty for sampling team
 - enough vehicles were available to assist



Sampling challenges

- Tanzania - VERY uneven terrain - flood plains
 - experienced game capture team - well organized
 - buffalo immobilized far distances apart - resulting in difficulty for sampling team
 - not enough vehicles were available to assist



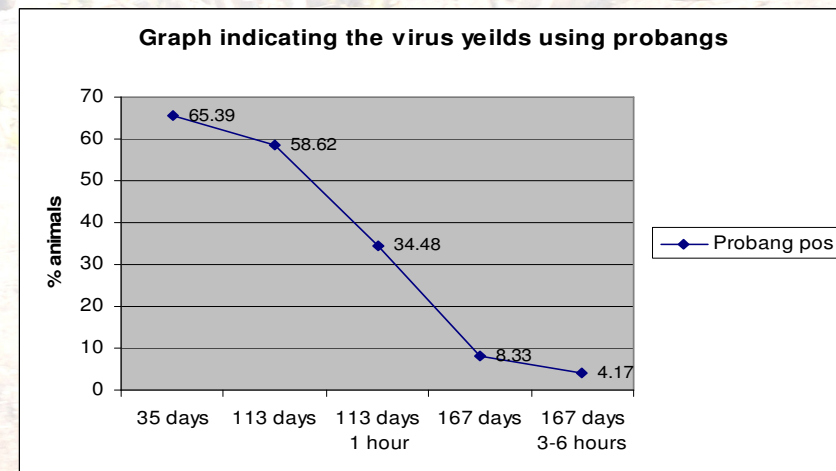
Sampling challenges

- **Cold chain – importance of freezing probang samples as soon as possible**

Example

- **Natural infection in a captive herd of buffalo**
- **An outbreak of SAT-1 occurred in the group**
- **Virus could be isolated for 167 days post-infection**
- **Day 113 - direct freezing & freezing after one hour**
- **Day 167 - direct freezing & freezing after 3-6 hours**

	% Probang pos
35 days	65.39
113 days	58.62
113 days 1 hour	34.48
167 days	8.33
167 days 3-6 hours	4.17



Sampling challenges

Cold chain

• Blood samples placed in cold container with cold bricks



• Probangs - directly into cryotube with buffer
- place in stockings directly into LN₂



Vapour cryo shipper

- 966 x 2.0ml tubes
- 14 days holding time
- IATA and UN approved



Shipper

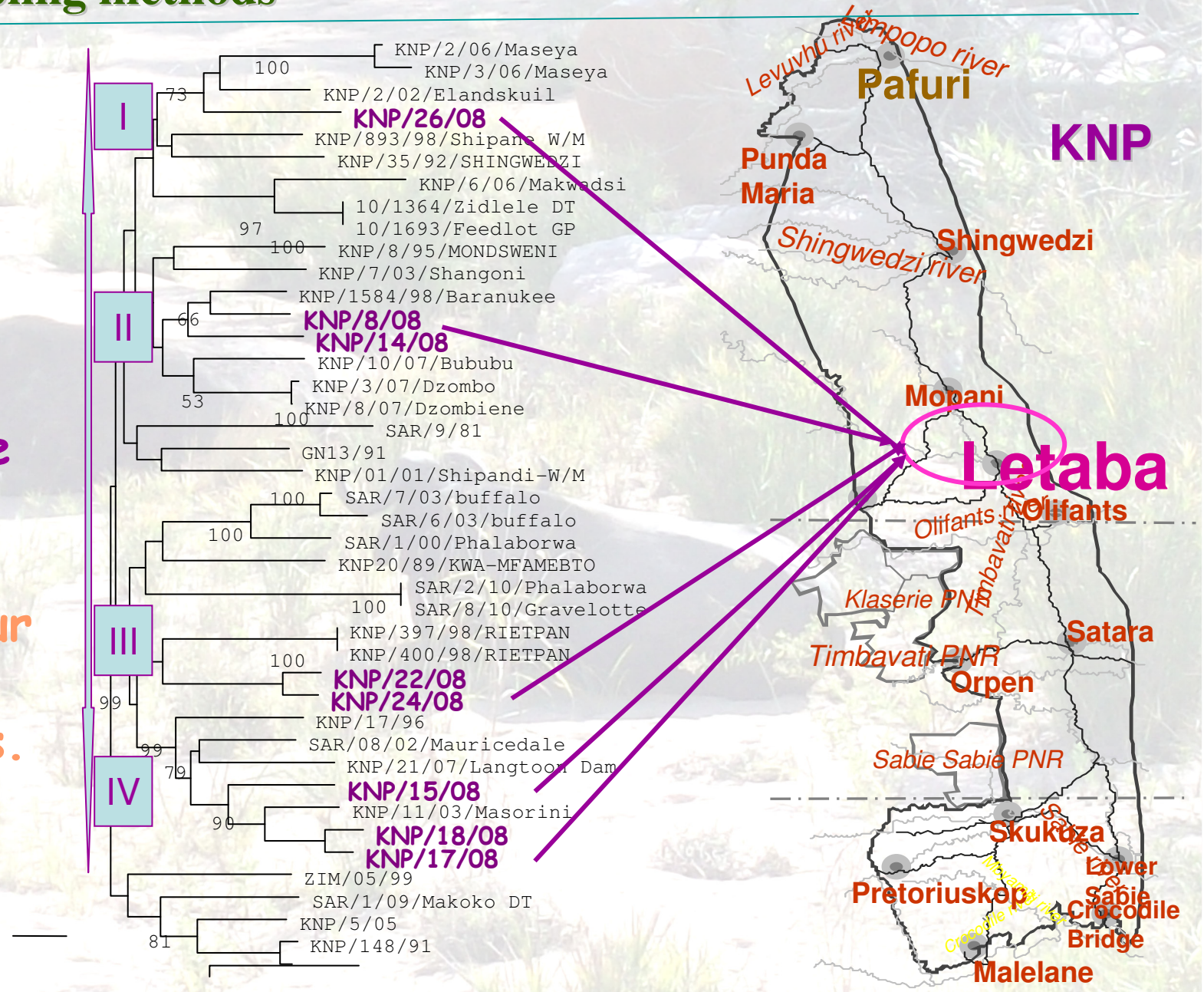
Cryo Shipper XC

MVE Vapor Shippers

Phylogenetic analysis of the 1D gene demonstrate the success of sampling methods

SAT-1
(2008)

Isolates cluster within the Southern topotype, but in four different genotypes.



Conclusions

- Sampling of buffalo herds throughout SADC regions should be encouraged, however, lack of funding for large projects
- Planning of sampling operations is important
- Choosing of experienced and competent game capture teams is of utmost importance
- Sampling difficulties can be overcome

Acknowledgements

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GFRA

SANP

