



NEUROLOGICAL ALPHAVIRUS INFECTIONS IN HORSES AND WILDLIFE IN SOUTH AFRICA: A SURVEY (2019 – 2021)

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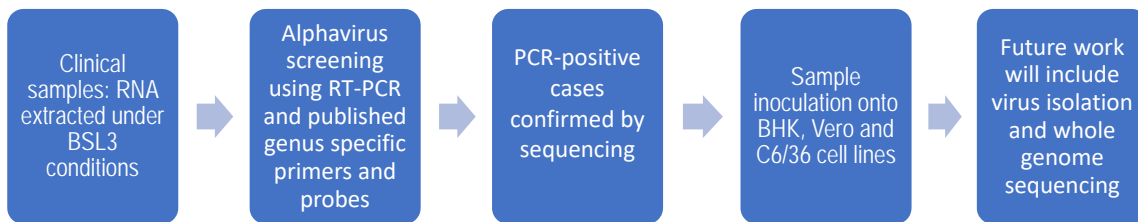


Background

Alphaviruses can be divided into the New World alphaviruses that are associated with encephalitis in animals and humans in the Americas, and the Old World alphaviruses, which are mostly believed to be associated with arthralgia in humans but less data is available as to their importance in animals. Recent reports from the Zoonotic Arbo and Respiratory Research group, identified neurological infections in animals and some human cases that were associated with Old World alphaviruses such as Middelburg virus (MIDV) and Sindbis virus (SINV) in South Africa. This renewed interest in the potential of these viruses as zoonotic pathogens. Investigation of animal cases can act as an early warning system for outbreaks in humans.

AIM: To investigate alphaviruses as the cause of neurological infections in horses and wildlife submitted to the ZARV, 2019-2021 from across South Africa.

Methodology



Results

Table1: Alphavirus positive cases detected amongst 333 submissions (Jan 2019- July 2021)

ZRU Number	Sample type	Species	Location	Clinical symptoms	Virus detected
ZRU070/19	EDTA	White rhino	Madiwe, North West	Paralysis, recumbency, paddling, fatal	MIDV
ZRU011/20/2	Brain and SC	Wilbebeest	Thabazimbi, Limpopo	Fever 39°C, paresis, hind- and foreleg paralysis	MIDV
ZRU059/20	EDTA	Horse	Pietermaritzburg, KwaZulu-Natal	Fever 39°C	MIDV
ZRU114/20	EDTA	Rhino	Barberton, Mpumalanga	Anorexia, ataxia, paresis, hindleg paralysis and recumbency	MIDV
ZRU118/20	EDTA	Buffalo	Thabazimbi, Limpopo	40°C fever and ataxia	EILV related
ZRU027/21	EDTA	Horse	Blue Hills, Gauteng	Anorexia, ataxia, paresis, head tilt, fatal	SINV
ZRU028/21	EDTA	Horse	Bloemfontein, Free State	Fever 39.5°C, anorexia, anaemia, icterus, hepatitis, ataxia, congested mucous membranes	MIDV
ZRU029/21	EDTA	Horse	Summerveld, KZN	Fever 40.4, anorexia, anaemia, icterus, ataxia, weakness	SINV
ZRU030/21	EDTA	Horse	Wellington, Western Cape	Fever 38.7°C, anorexia, icterus, ataxia, paresis, congested mucous membranes	MIDV

Clinical samples: total of 10/333 animal cases tested positive for alphavirus RTPCR and included 4/39 wildlife and 6/275 horse cases; MIDV positives were identified in a wildebeest, 2 rhinoceros and 3 horses, whereas SINV positives were obtained in 3 horses. A buffalo tested positive for a virus that is closely related to the mosquito specific Eilat virus; Neurological symptoms were identified in 8/10 cases and included fore-and hindleg paralysis, paresis, ataxia, paddling and recumbency, 2/10 animals only presented with a fever and 2/10 cases were fatal.

We identified Middleburg and Sindbis virus in horses and wildlife and a possible new virus in a buffalo (Thabazimbi) with neurological signs using a genus specific RTPCR. This virus had 95% identity to Eilat virus in the NSP4 region used for sequencing and was designated Eilat-like. Eilat virus was previously identified in mosquitoes in Israel. We also identified this virus in mosquitoes (Limpopo province, 2015) and collected them in the Okavango swamps in Botswana. Further characterisation through virus isolation and whole genome sequence is planned.

CONCLUSION:

This study confirmed MIDV and SINV and an Eilat like virus as causes of neurological disease in wildlife and equine species in urban and rural areas in South Africa between 2009-2018. Human cases should be investigated in the same areas.

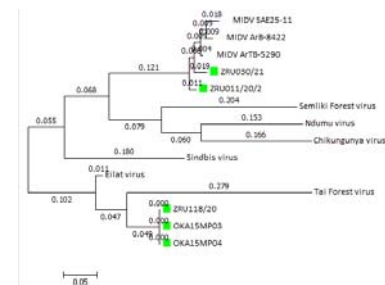


Figure 1. Molecular Phylogenetic analysis by Maximum Likelihood method of non-structural protein 4 genes.