



RABIES DIAGNOSIS

THE ROLE OF OIE RABIES REFERENCE LABORATORY

Virtual regional training workshop on the OIE procedures for the endorsement of official control programmes with regard to peste des petits ruminants (PPR) and dog-mediated rabies.

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05 May 2022

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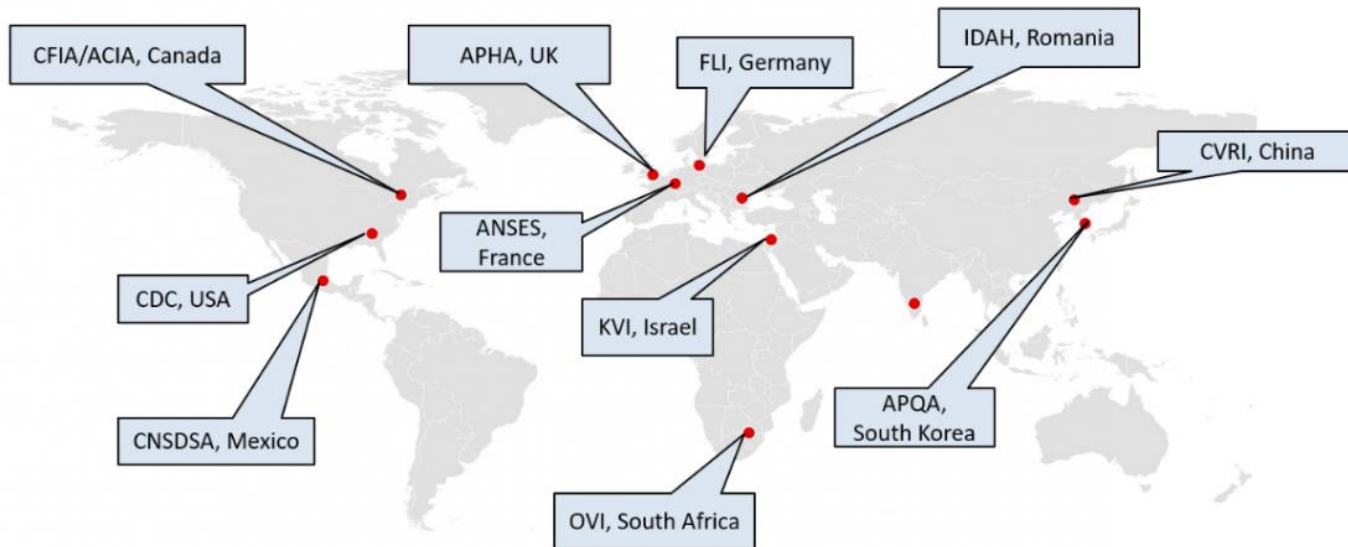


BACKGROUND

- OIE Reference Laboratories are designated by the **Director General** of the World Organization for Animal Health (OIE)
- These laboratories provides scientific and technical assistance and/or expert advice on rabies diagnosis and control
- Currently, there are at least **12 designated** OIE Reference Laboratory for Rabies around the world

OIE REFERENCE LABORATORIES FOR RABIES AROUND THE WORLD

OIE Reference Laboratories for Rabies



- ARC-Onderstepoort Veterinary Institute was designated as an OIE reference laboratory for rabies since 1993
- ARC-OVI also houses other OIE reference laboratories for other animal diseases



MAIN FUNCTIONS AS AN OIE REFERENCE LABORATORY

- To reinforce the surveillance and control of animal rabies in SADC member states
- Provision of **scientific** and **technical** training for personnel in the region
- Provision of diagnostic testing facility for the region
- Store and distribute the **biological reference materials** for diagnosis and control of the disease in the region
- To **develop** and **validate** new procedures or methods for the diagnosis and control of the disease in the region and elsewhere in the continent

CURRENT RECOMMENDED METHODS FOR RABIES DIAGNOSIS

Table 1. Test methods available for the diagnosis of rabies and their purpose

Method	Purpose					
	Population freedom from infection	Individual animal freedom from infection prior to movement	Contribute to eradication policies	Confirmation of clinical cases	Prevalence of infection – surveillance	Immune status in individual animals or populations post-vaccination
Identification of the agent						
DFA (antigen detection)	+++	–	+++	+++	+++	–
dRIT (antigen detection)	+++	–	+++	+++	+++	–
ELISA (antigen detection)	+	–	+	+	+	–
Cell culture (virus isolation)	+	–	+++	+++	+++	–
MIT (virus isolation)	n/a	–	+	+	+	–
Conventional RT-PCR (RNA detection)	+++	–	+++	+++	+++	–
Real-time RT-PCR (RNA detection)	+++	–	+++	+++	+++	–

ACTIVITIES AT OIE RABIES REFERENCE LABORATORY

- OIE Rabies Reference Laboratory was accredited according to **ISO Standard 17025** by SANAS
- There **two test methods** accredited being direct fluorescent antibody test (dFAT) and fluorescent antibody virus neutralization test (FAVNT)
- The laboratory use **other recommended method** for diagnosis of rabies
 - Rabies tissue culture isolation test (RTCIT)
 - Direct rapid immunohistochemical test (dRIT)
 - Reverse transcriptase polymerase chain reaction (RT-PCR)
 - Mouse inoculation test (MIT)



SUPPORT GIVEN TO THE SADC REGION

1. TRAINING OF DIAGNOSTIC METHOD

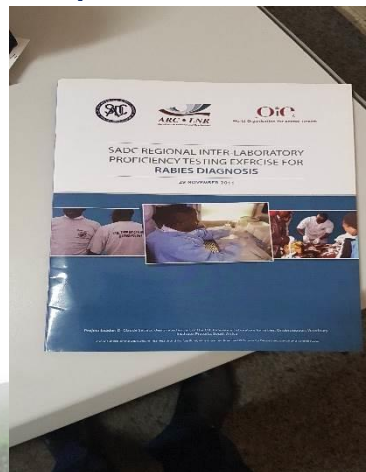
- The laboratory conducted regional theoretical and practical training on rabies diagnosis
- Only **14 rabies diagnosticians** from all SADC countries attended the training workshop except Mauritius
- Overall, the **skills and knowledge** on the recommended basic method for rabies diagnosis were enhanced
- However, there **gaps identified** during training and it was recommended that such gaps should be addressed during the next individual or group training
- Technical visits made to Swaziland and Democratic Republic of Congo in 2016 and Ethiopia, Mozambique and Nigeria in 2018



SUPPORT GIVEN TO THE REGION OVER THE YEARS (Cont.)

2. HARMONIZATION OF RECOMMENDED DIAGNOSTIC METHOD FOR THE REGION

- The laboratory led the rabies diagnostic test method (FAT) together with rabies testing laboratories from Namibia and Tanzania
- Ten **standard operating procedures** were collected from different SADC countries for harmonization
- The final and complete standard operating procedure was submitted and recommended for implementation in the region



SUPPORT GIVEN TO THE REGION OVER THE YEARS (Cont.)

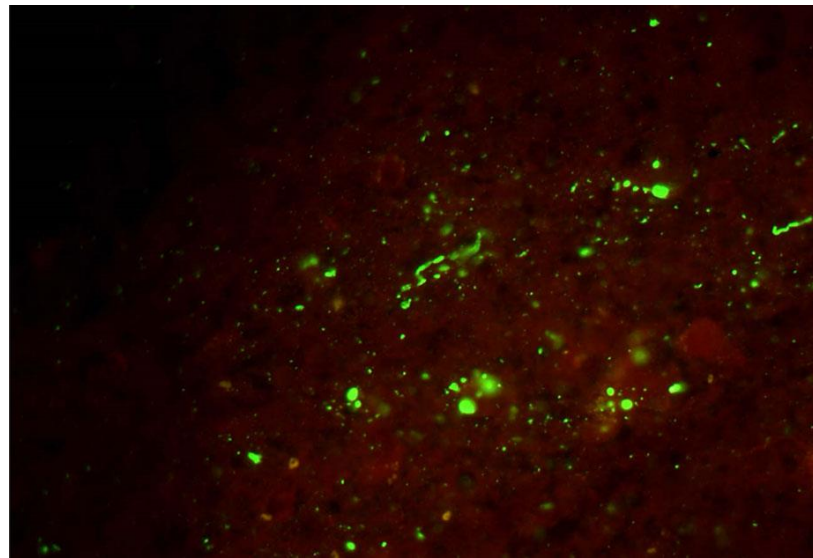
3. ESTABLISHMENT OF PROFICIENCY TESTING SCHEME AN PREPARATION OF A PANEL OF SAMPLES

- There were **16 rabies testing laboratories** invited to participate in the PT scheme organized by OVI and only 12 participated (2011)
- Most laboratories produced satisfactory results
- However, there were a great proportion of **false negatives and false positives**, which were of a concern
- The incorrect results were could have been attributed to (i) not adhering to the protocol; (ii) microscope problems and/or (iii) inexperienced readers of the results
- To date, only **two countries** from the region are participating in the inter-laboratory testing (RSA and Namibia)
- The laboratory participates in proficiency test organized by anses

SUPPORT GIVEN TO THE REGION OVER THE YEARS (Cont.)

4. DISTRIBUTION OF BIOLOGICAL CONJUGATES

- Good and high quality of **biologicals** is key to successful diagnosis confirmation
- The laboratory has distributed at least 50 biological conjugate vials to 5 SADC member states and 2 national laboratories



SUPPORT GIVEN TO THE REGION OVER THE YEARS (Cont.)

5. DIAGNOSTIC SUPPORT OR CONFIRMATION

Year	Name of OIE Member Country seeking assistance	No. samples received for provision of diagnostic support
2017	Namibia	12
	Tanzania	31
2018	Malawi	1
	Namibia	29
	Tanzania	2
2019	Namibia	1
	Tanzania	1

CONCLUDING REMARKS

- The OIE Reference Laboratory for Rabies at ARC-OVI has been supporting and collaborating with regional laboratories
- It has successfully completed a **OIE Laboratory twinning project** with National Veterinary Research Institute (NVRI), Nigeria in 2012
- Currently, a **new laboratory twinning agreement** of rabies with the Animal Health Institute (AHI) in Sebeta, Ethiopia on the standard diagnosis (2021-2022)
- The activities performed at the laboratory contributes to the **surveillance** and **control** of rabies in the region and elsewhere in the continent
- Further, **capacitate** the regional rabies laboratories to perform basic rabies diagnostic tests