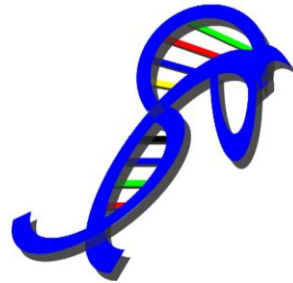


# RhODIS

## DNA profiling and a DNA database as a tool to protect the Rhino



Dr Cindy Harper  
Veterinary Genetics Laboratory  
Faculty of Veterinary Science  
University of Pretoria  
Onderstepoort



UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA



# DNA profiling: Rhinoceros

- DNA profiling test for rhinoceros – black and white
- Single database of DNA profiles maintained at VGL at Onderstepoort
- Main function as forensic tool to assist rhino poaching investigations

• How?



# DNA profiling of rhino horn

- DNA profiles from rhino horn directly
- Match recovered horn to individual rhinos and poached rhinos – link poachers, traffickers, horn from consumer countries
- Individually identify stockpiled horns
- Profiled horns can be returned to owners if recovered
- Legal sale – can identify legal horn – tool to manage and control
- DNA cannot be removed, changed or destroyed – compare microchips



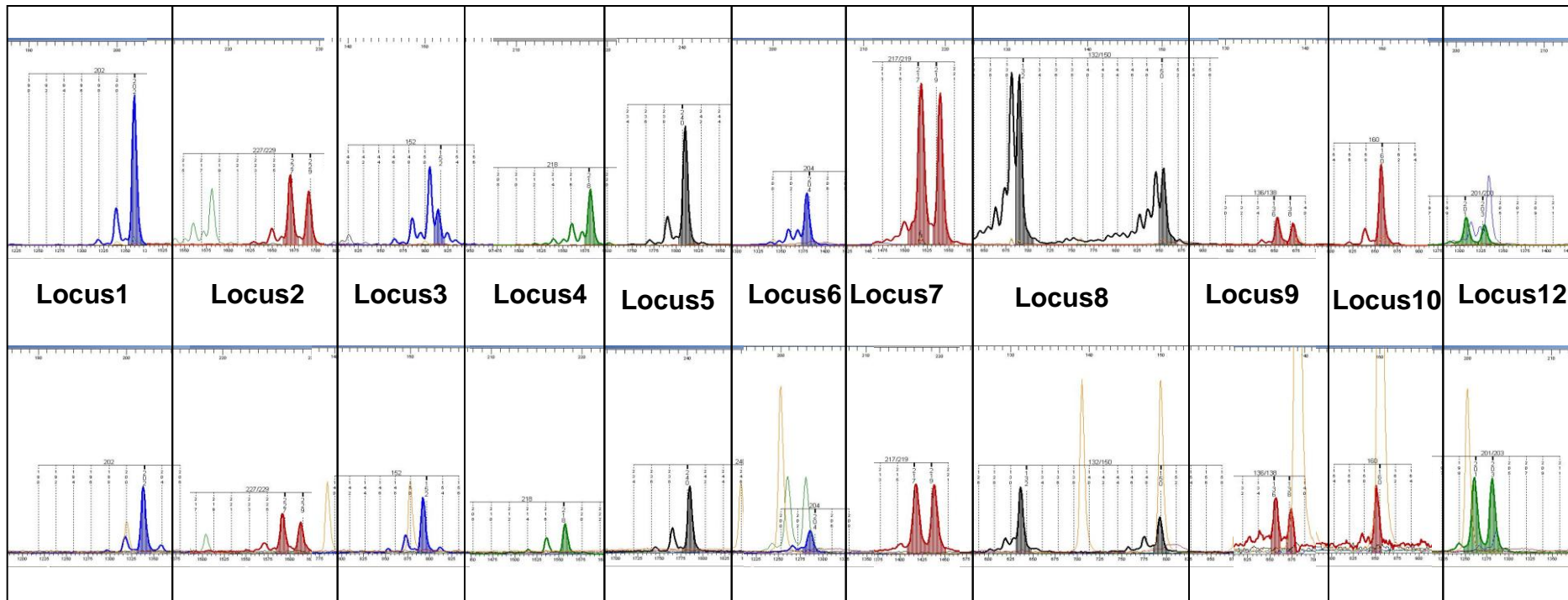
# How efficient is DNA extraction from the horn?



Smallest pieces: 5 - 20mg of horn

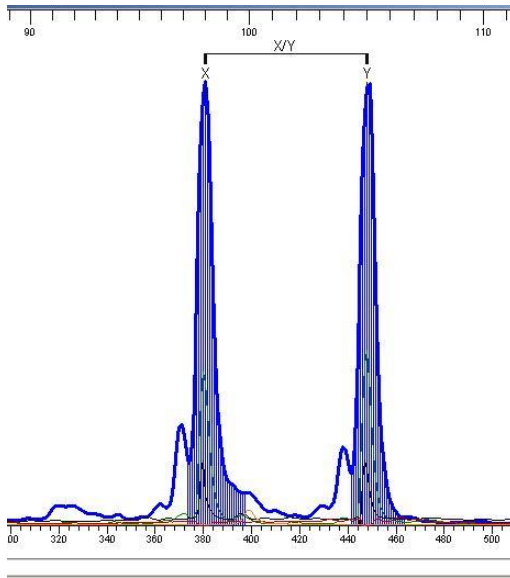
# Comparing Blood and Horn Profiles from the same animal

## Blood sample

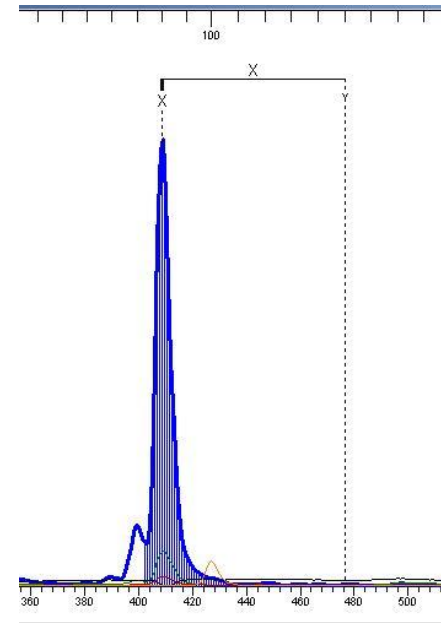


## Horn sample

# Gender test - Rhinoceros



**XY**



**XX**

- Excludes 50% of the population

Published: Peppin L *et al*, 2009



# Information from the DNA profile

- Rhinoceros
- Unique to each individual animal
- Species: white or black
- Male or Female
- Population and pedigree analysis: management tool



# DNA as traceability tool

- DNA is a traceability tool
- Identify individual animal – compare microchip
- Microchip primary ID with DNA as confirmatory ID (cannot be changed or destroyed)
- Track animal movement from source population
- Each intervention requires permit – permit condition – DNA collection
- DNA to ensure hunt permit compliance





# Compare Horse Industry

- Each TB horse microchipped and DNA profiled and has passport with info
- Scanned and confirmed at each sale / race
- Microchip fails – DNA redone to confirm ID
- Microchip failure rate horses – 2%



# RhODIS™: What is it?

- Central standard secure database of rhinoceros DNA profiles for forensic purposes
- RhODIS – Rhino DNA Index System / CODIS – Combined DNA Index System (FBI humans)
- Traceability system of individual rhinoceros
- Traceability system of individual rhinoceros horns



# RhODIS™: Where are we?

- DNA profiles of rhinos from provincial and national parks and private owners in South Africa
- DNA profiles from all poaching cases
- DNA profiles from recovered horns and stockpile horns
- Also includes DNA profiles from rhinos from Zimbabwe, Botswana, Namibia
- Over 5000 datapoints on database in approximately 1 year





# RhODIS™: DNA Sample collection Kits

- Forensic sample collection kits developed in collaboration with SAPS forensic laboratory, National Wildlife Crime Reaction Unit and SANParks
- 2000 kits produced at the Veterinary Genetics Laboratory and approximately 1900 distributed
- Ensures chain of custody from sample collection to evidentiary report



# RhODIS Case 1 - SA

## Vietnamese man gets hefty sentence for rhino horn smuggling

Alex Eliseev | 2010/06/30 01:16:01 PM

A Vietnamese man has been jailed for 10 years after being arrested while trying to smuggle almost R900,000 worth of rhino horns out of South Africa.

The sentence is an unusually harsh one for a crime often punished with fines and suspended sentences.

Xuan Hoang was sentenced on Wednesday morning at the Kempton Park Magistrate's Court.

The 29-year-old security guard flew to South Africa in March to collect seven rhino horns and sneak them back home. The horns weighed 16 kilograms and two were matched to rhino carcasses killed just days earlier through DNA.



The court said the value of the horns is just under R900 000 but customs officials estimate they could fetch up to R2 million on the black market.

Magistrate Prince Manyathi said a strong message needs to be sent to Vietnam where most of the rhino horns are smuggled. This year has seen a dramatic spike in the number of poaching cases around South Africa.

Manyathi ignored the defence's plea for mercy and said a fine is simply not enough to stop the scourge.



# Recent Successes



[Print this](#)

## Mozambican poachers get 16-year sentences

2011-06-02 19:09

Makamu was sentenced to 11 years imprisonment and Makhabo to five years on Wednesday, with no possibility of suspension.

The sentencing came after they were arrested with two others in separate incidents last year.

"During the arrests, the four were granted bail but two of them have since skipped bail and police are still trying to locate them," Mhaga said.

Police managed to link the DNA of seized horns to the DNA of a carcass in the park. It was revealed during the trial that the men had been sent by a Mozambican national to hunt the rhinos and remove their horns.

Acknowledgement:



SYMCO



This is what the rhino does with it's horn, **what do YOU do with it?**