

DIFFERENTIATION OF INDIGENOUS VELD GOATS (IVG) BREED IN SOUTH AFRICA

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INTRODUCTION

- Goat production plays an important role in eradicating poverty and promoting food security.
- In South Africa, rural areas are dominated by the Indigenous Veld Goat (IVG) breeds and their uncharacterised crosses.
- These breeds are adaptable to low input production sector and prevailing environmental conditions.
- Therefore, making the more valuable genetic resources to smallholder farmers.

AIM

- The study aims to identify the differentiation SNPs and genomic regions of the South Africa Indigenous Veld goat (IGV) breeds.

STUDY METHODS

Sampling



Figure 1: Indigenous Veld goats used for sampling

DNA extraction and Genotyping



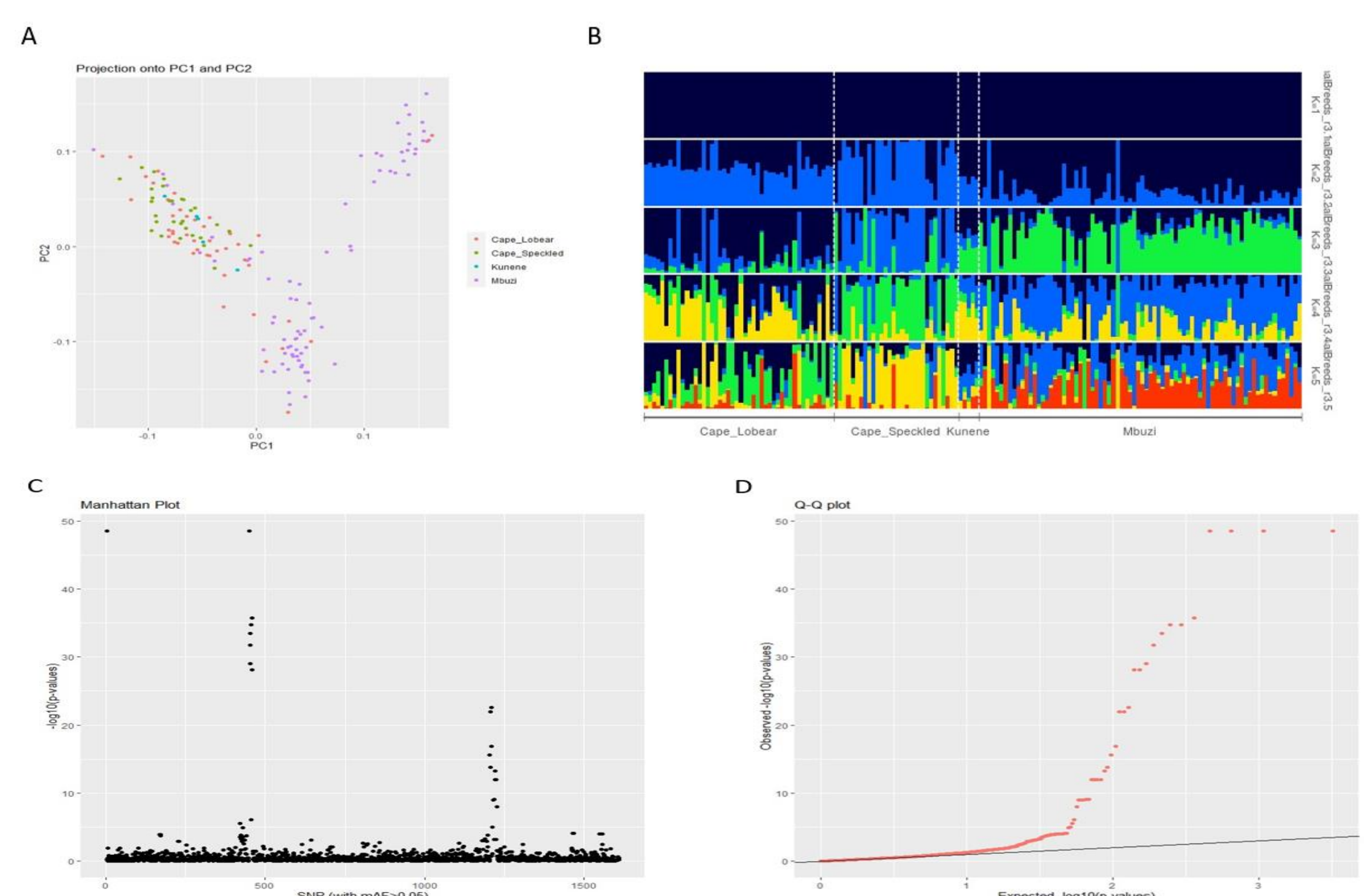
Figure 2: DNA extraction and genotyping protocols

Data analysis



Figure 3: Data analysis procedures

RESULTS



Figures 4: A: PCA, B: Admixture, C: Manhattan plot, D: Q-Q plot for the distribution of the p-values for the Indigenous Veld Goats

Table 1: Single Nucleotide polymorphism for the estimated chromosomes and genes using Fst.

Marker	CHR	Position	F _{ST}	Gene	Gene Description
snp28078-scaffold300-3412212	8	38197294	0.72	UHRF2	ubiquitin like with PHD and ring finger domains 2
snp19368-scaffold1958-104157	6	8034538	0.71	-	-
snp3556-scaffold1110-106176	9	59365070	0.70	-	-
snp19366-scaffold1958-28303	6	8110392	0.69	-	-
snp28077-scaffold300-3369813	8	38154895	0.69	GLDC	glycine decarboxylase
snp51703-scaffold760-153052	6	7438269	0.68	NDST3	N-deacetylase and N-sulfotransferase 3
snp32526-scaffold371-1443673	13	39230563	0.68	CFAP61	cilia and flagella associated protein 61
snp48555-scaffold690-432877	6	104631767	0.67	-	-
snp49002-scaffold7-1603772	13	30788222	0.67	CUBN	cubilin
snp49005-scaffold7-1739012	13	30652982	0.66	CUBN	cubilin

Table 2: Outliers SNPs using principal components.

Marker	Chromosome	Position	PC
snp2141-scaffold1065-308545	10	74803720	2
snp32432-scaffold37-603475	15	12584499	2
snp32448-scaffold37-1273016	15	13254040	2
snp34005-scaffold40-2680622	20	50848470	2
snp15603-scaffold165-514510	21	53972419	2

PC—principal component.

DISCUSSION AND CONCLUSION

- The ability to withstand and survive harsh conditions is the genetic diversity of the Indigenous goats and they enhance conservation.
- This study provided the genetic diversity and population structure of the Indigenous Veld goats using the differentiating SNPs.
- This study has added to the emphases of the natural genetic diversity and adaptability of the Indigenous goats.
- The study animals showed a promising gene flow and shared genome ancestry amongst each other, however, further research is required using a larger population size.

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