



# KrishiKosh (कृषिकोश)

(/) An Institutional Repository of Indian National Agricultural Research System


[Advanced Search \(/advanced-search\)](#)

[Krishikosh \(/\)](#) / [Birsa Agricultural University, Ranchi \(/handle/1/93542\)](#) / [Thesis \(/handle/1/93550\)](#)

Please use this identifier to cite or link to this item: <http://krishikosh.egranth.ac.in/handle/1/5810026647>

Authors: KUMARI, NANDANI (/browse?type=author&value=KUMARI%2C+NANDANI)

Advisor: SINGH, L. B. (/browse?type=author&value=SINGH%2C+L.+B.)

Title: MOLECULAR CHARACTERIZATION OF GOAT GENETIC RESOURCES OF WEST BENGAL AND JHARKHAND

Publisher: Birsa Agricultural University, Kanke, Ranchi, Jharkhand

Language: en\_US

Type: Thesis

Keywords: MOLECULAR CHARACTERIZATION OF GOAT GENETIC RESOURCES OF WEST BENGAL AND JHARKHAND

**Abstract:** Two goat breeds, Black Bengal and Black Bengal type goats of Jharkhand were characterized by using RAPD markers in the present investigation. DNA was extracted from 50 blood samples each for Black Bengal and Jharkhand Black i.e. total of 100 examples. Goat is an important asset for the livestock breeders as well as the poor farmers. It is the earliest ruminant domesticated around 9000 to 7000 B.C. Black Bengal goat found in the entire area of Jharkhand (referred to as Jharkhand Black in my thesis for simplicity) have similarities as well as differences with the original Black Bengal goats of West Bengal, yet it has no identity of its own. Genomic DNA was isolated and purified from white blood cells using Proteinase K digestion and standard phenol: chloroform extraction method as per the standard protocol described by Sambrook et al (1989). Agarose gel electrophoresis for checking the quality of isolated genomic DNA samples was done by diluting the DNA samples in ratio of 1:10. This was followed by Polymerase chain reaction. And PCR technique was used to amplify the chosen marker. For this, optimization of PCR technique was followed by Agarose gel electrophoresis of PCR amplified product of DNA. The amplified product were statistically analyzed to measure the between and within population diversity. The genetic diversity within and between population was analyzed as the observed and expected number of alleles and Shannon's information Index using popgene software. Ewan's Watterson test was performed to test the neutrality for RAPD markers; the statistics F (sum of square of allelic frequency) and limit (upper and lower) at 95% confidence region for the test were calculated using the algorithm by mainly using 100 simulated samples and implemented in popgene software package. In order to quantify the percentage of molecular variance due to differences among the difference among different populations and significance was tested by a non-random permutation approach using AMOVA programme included

in Arlequin software package. Migration rate which showed the gene flow per generation was also found out. A dendrogram by UPGMA method was constructed. The result can be summarized as follows- \*Gene frequency:-Gene frequency in Black Bengal ranged from 0.125 to 0.729 for allele 0 and from 0.271 to 0.875 for allele 1. Similarly in case of Jharkhand Black , Gene frequency ranged from 0.146 to 0.625 for allele0 and from 0.375 to 0.854 for allele 1. \*Polymorphic information content:-Polymorphic information content (PIC) or expected heterozygosity scores varied from 0.219 to 0.486 with overall mean 0.411 in Black Bengal and from 0.278 to 0.496 with overall mean 0.413 in Jharkhand Black goat. \*Mean observed and effective number of alleles:-Mean observed number of alleles was 2 in both Jharkhand Black and Black Bengal with mean effective number of alleles was 1.6991 for Black Bengal and 1.6935 for Jharkhand Black. \*Nei's gene diversity value (h):-Nei's gene diversity value was 0.3750 for Black Bengal and 0.4022 for Jharkhand Black. \*Shannon's Information Index:-Shannon's Information Index was 0.6792 for Black Bengal and 0.5898 for Jharkhand Black \*Gene flow:-Gene flow (Nm) value was 25.68 , Hs(Mean sample gene diversity) between two population was 0.412and Ht (Total gene diversity )in total sample was 0.420. \*Genetic Identity and Genetic Distance:-Nei's genetic identity was found to be 0.9727 and genetic distance was 0.0276. \* Evan's Watterson's test of neutrality:-Not even a single locus showed the F value beyond the standardized range of U95 and L95 at 95% confidence level and so all the locus were neutral to selection pressure when these were taken separately but when combined together the two locus SIGMA06-4 AND SIGMA10-1 were not found neutral to selection pressure. \*Dendrogram:-The clustering between the breeds was not very sharp with their intermingling at a few places .This showed the dilution between the gene pools of Black Bengal and Jharkhand Black. \*AMOVA:-The analysis of molecular variance (AMOVA) showed 1.69983 % among population variation and 98.30017 %between population variation. A significant amount of differentiation among the two breeds and high level of gene flow between Jharkhand black & Black Bengal was observed. As Jharkhand black Goat also shows significant gene diversity, it should be given a separate identity. The result was crucial for in situ conservation and on the basis of this result, it can be recommended that within breed diversity is actively maintained to enable these extensively unmanaged stockists to adapt to further demands and conditions and there is ample scope for further improvement in its productively through appropriate breeding strategies. The results presented added important information on the puzzle of goat genetic diversity and conservation in India where it is of crucial economic relevance to increasingly marginalized rural communities. Therefore, it can be recommended that within-breed diversity is actively maintained to enable these extensively unmanaged stocks to adapt to future demands and conditions and there is ample scope for further improvement in its productivity through appropriate breeding strategies. On an whole it was concluded that Jharkhand black shows considerable amount of similarities and few of dissimilarities and so Jharkhand black may be a strain or the derivative of Black Bengal and should be given a separate identity considering the importance of gene conservation amidst high gene flow due to geographical closeness.

Description: MOLECULAR CHARACTERIZATION OF GOAT GENETIC RESOURCES OF WEST BENGAL AND JHARKHAND

Subject: Animal Breeding and Genetics

These Type: M.V.SC

Issue Date: 2010

Appears in Thesis (/handle/1/93550)

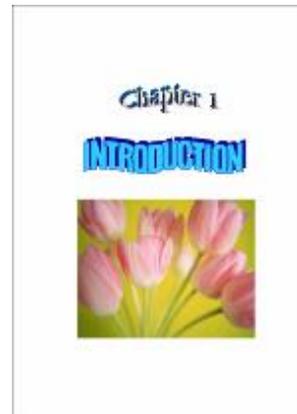
Collections:

Files in This Item:

File	Description	Size	Format
------	-------------	------	--------

1256 Nandani Kumari.pdf

3.27 MB Adobe PDF



[View/Open \(/displaybitstream?handle=1/5810026647\)](/displaybitstream?handle=1/5810026647)

[Show full item record \(/handle/1/5810026647?mode=full\)](/handle/1/5810026647?mode=full)

 [\(/handle/1/5810026647/statistics\)](/handle/1/5810026647/statistics)

Items in DSpace are protected by copyright, with all rights reserved, unless otherwise indicated.