

## Curriculum Vitae

### Dr. Pramod Kumar Rout

Senior Scientist , Genetics and Breeding Division,

CIRG, Makhdoom, Farah,

Mathura-281122, UP, India

Tel: 91-565-2763280(245), 91-565-2430261(res),919412826676(M)

E-mail: [pramod@cirg.res.in/](mailto:pramod@cirg.res.in) rout\_ctc@hotmail.com

### Academic

**1987** B.V.Sc & A. H, Orissa Veterinary College, Bhubaneswar

**1990** M.V. Sc (Animal Genetics and Breeding, Indian Veterinary Research Institute, Izatnagar, Bareilly)

**1995** Ph. D (Animal Genetics, Indian Veterinary Research Institute, Izatnagar, Bareilly)

### Research Interest

1. Genetics of Disease Resistance: Genetic resistance to viral and parasitic disease is an alternative method to control the diseases and to attain sustainable yield.
2. Gene marker studies in livestock for enhancing productivity: Neutral markers, SNP analysis, y-chromosomal marker and mt-DNA sequencing are being used for characterization as well as uniqueness of the breed.
3. Genetics of milk protein polymorphism in Indian goats-Transcriptomic analysis for is being used
4. Improvement and conservation of goat germplasm in their natural habitat

### Employment Record

1. Scientist and Senior Scientist, **Indian Council of Agricultural Research, New Delhi** (CIRG, Makhdoom), Continuing till to date (September, 1995)

2. Post-doctoral Fellow, Director, **National Institute of Immunology, New Delhi**. (February, 1994- September 1995)

### Significant contribution

- Studied the resistance pattern in indigenous chicken breeds, guinea fowl, quail and Bantam birds in response to RNA tumour virus(RSV and LLV), interrelationship between induced tumour expressing genes with economic parameters of high producing chicken lines and proposed a new concept for genetic control of lymphoid leucosis.
- Indicator traits for resistance to gastro-intestinal nematodes have been established in Indian goats. Our findings showed the variability in resistance pattern in response to natural *H. contortus* infection in selected flocks of Barbari and Jamunapari goats and established genetic correlation with indicator traits and growth parameter.
- We proposed a more complex origin for domestic goats than earlier studies by analyzing mitochondrial (mt DNA) HVRI (hyper variable) region in 363 samples of 10 Indian goat breeds from different agroclimatic region. Our study showed that there were additional lineages in Indian goats indicating that considerable additional diversity exists within Indian domestic goats. We find evidence for population structure and novel divergent lineages in Indian goats.
- The usefulness of microsatellites for genetic diversity and breed differentiation study in Indian goats was carried out . Genotypic data from microsatellite markers were used to assess genetic diversity and relationship among 8 Indian goat breeds. The phylogenetic tree and the plot for principal component analysis grouped the Indian goats according to their geographic origin and distances between populations were significantly different from each other.
- We established that the allelic distributions of the CSN1S1 ( $\alpha_1$ -casein) in the Indian goats are quite different from European goat breeds. Neighbor-Joining tree was constructed basing on CSN1S1 gene frequency and breed diversity was analysed. Therefore the variability at CSN1S1 locus can be utilized for conservation as well as genetic improvement of Indian goat breeds for increasing both quality and quantity of milk production.

**Concepts proposed:**

1. We have established genetic origin of Indian goats by finding novel divergent lineages in Indian goats. Thus, we propose a more complex origin for

domestic goats than earlier studies. Moreover our domestic goats formed distinct monophyletic group from available wild goat population. The analysis showed that the Indian domestic goats might have originated from unknown wild population that may be now rare or extinct. Therefore further investigations of wild goats and archaeological specimens are necessary to investigate our ancestors. As goat evolution and history is linked with human evolution, therefore it may throw some new light in that direction.

2. Age related Immunity to nematodes (*H. contortus*) does not exist in Indian goats as observed in sheep. The age related immunity is quite contradictory in both sheep and goat. In case of lamb faecal egg count (FEC) at weaning age was higher and susceptibility to *H. contortus* can be predicted based on FEC at 3 months of age. However, it has been found that age acquired immunity is not existing or much less pronounced in goats.
3. We have proposed a new concept for genetic control of lymphoid leucosis. Studied the resistance pattern in indigenous chicken breeds, guinea fowl, quail and Bantam birds in response to RNA tumour virus. Also interrelationship between induced tumour expressing genes with economic parameters of high producing chicken lines has been studied.

### **Scientific Leadership**

Member, Editorial board, Indian Journal of Small Ruminants, Indian society for Sheep and Goat Production and Utilization

Worked as Executive member of Indian society of sheep and goat production and utilization (ISSGPU), CSWRI, Avikanagar, Rajasthan.

Working as reviewer for international journal like Animal Genetics .

Chair the technical session V at National conference on Biotechnology at Maharshi Dayanand University, Rhotak, 20-21<sup>st</sup> August, 2007.

Working as reviewer of Project proposal for Department of Biotechnology, New Delhi.

Invited as subject matter specialist for formulating Super Buffalo programme by ICAR, New Delhi.

Invited by CABI, UK for contributing an article/data sheet on Avian Sarcoma Virus for **Compendium on Animal Health and Production** by CABI, UK.

Invited for CAB Reviews in “Perspectives in Agriculture, Veterinary Science, Nutrition and Natural Resources” on “Micro livestock/goats in India and their role in the future animal production in an era of climatic change”.

### ***Membership of professional bodies/societies***

Executive member, Indian society for sheep and Goat production and utilization  
Member, Association for the promotion of DNA Fingerprinting and Other DNA Technologies  
Member, Indian Veterinary Association  
Member, Indian Association of Animal Production  
Member, Society for Domestic animal diversity and conservation

### **Member of important committees**

Member, Editorial board, Indian Journal of Small Ruminants, Indian society for Sheep and Goat Production and Utilization

### ***Honors and Awards***

Fellowship award by Bioved Research society, Allahabad in recognition to contribution in the field of Animal Genetics and Breeding.

Science and Engineering Research Council's **Visiting Fellowship** by DST, New Delhi

Recipients of National scholarship, **ICAR** junior and Senior fellowship.

Best contributory paper Award (as co author) - V National seminar on strength, challenges and opportunities in small ruminant disease in new millennium, 30-31 December 2002, Jaipur

Worked as Executive member and member of editorial board of Indian society of sheep and goat production and utilization (ISSGPU), CSWRI, Avikanagar, Rajasthan

### **Publication**

1. Rout, P.K, A. Kumar, A Mandal, S. K, Singh and R. Roy(2010) Characterization of casein gene complex and genetic diversity analysis in Indian goats. *Animal Biotechnology* **Animal Biotechnology, 21: 122–134, 2010**
2. Singh, S.K and Rout,P.K et al (2009) Characterization of exon 2 and intron 2 of leptin gene in Indian goats. *Animal Biotechnology* **20:2, 80 — 85 .**
3. Kumar A, P.K.Rout\* , A. Mandal, R.Roy (2009) Kappa-casein gene polymorphism in Indian goats. *Indian Journal of Biotechnology*, **Vol 8, 214-217.**

4. R Agarwal, P K Rout\* and S K Singh(2009). Leptin: A biomolecule for enhancing livestock productivity. **Indian Journal of Biotechnology, Vol 8, 169-176.**
5. N. Garg, Singh, S.K., Rout, P.K., Mandal A (2009). Genetic polymorphism of milk proteins in Barbari goats. *Tropical and Subtropical Agroecosystem*, 11,181-183.
6. Rana, R, Aggarwal, J, Rout, P.K, Kumar V, Kumar A and Vihan, V.S(2009). Latest diagnostic technique in detection of *Mycoplasma mycoides* sudsp *Capri* from goat pneumonia outbreak. *Indian J. Vet. Med.*,29(1), 47-48.
7. **Mandal, A.**, Neser, F.W.C., Rout, P.K., Roy, R. and Notter, D.R. (2009). Estimation of direct and maternal genetic parameters for greasy fleece weights in Muzaffarnagari sheep. *Journal of Animal Breeding & Genetics*, 126 (209): 22- 29.
8. P K. Rout, M B. Joshi, A Mandal, D. Laloe, Lalji Singh, K Thangaraj (2008) Microsatellite-based phylogeny of Indian domestic goats. **BMC Genetics 2008, 9:11**
9. P. K. Rout, Ajay Kumar, A. Mandal and R.Roy (2008) Characterization of CSN1S2 locus by PCR-RFLP in Indian Goats. *Indian journal of Animal Sciences* 78(3),29-32.
10. A. Mandal, R.Roy and P.K.Rout (2008) Direct and maternal effects for body measurements at birth and weaning in Muzaffarnagari sheep of India. **Small Ruminant Research,75,123-127.**
11. Mandal, A., Yadav, N.K., Sharma, D.K., Rout, P.K. and Roy, R. (2008). Transformation methods for analysis of data on faecal egg count in sheep. *Indian Journal of Animal Sciences*, 78(4): 364-366.
12. Mandal, A., Kumar, D., Rout, P.K., Yadav, N.K. and Roy, R. (2008). Genetic polymorphism of milk protein and its effects on milk composition traits in Muzaffarnagari sheep. *Indian Journal of Animal Sciences*, 78 (11):1302-1304.
13. Yadav, N.K., Mandal, **A.**, Sharma, D.K., Rout, P.K. and Roy, R. (2008). Influence of reproductive stages on gastrointestinal nematodes of sheep. *Indian Journal of Animal Sciences*, 78(2): 161-162.
14. A Kumar, P K Rout, A. Mandal and R.Roy (2007) Identification of the CSN1S1 allele by PCR-RFLP method in Indian Goats, **ANIMAL,1:8,1099-1104,2007.**
15. Mondal, A; Rout, P.K. Roy, R. (2007). Genetic analysis on growth of body dimensions in Muzaffarnagari sheep. *Indian Journal of Animal sciences* 77(9), 902-906.

16. V. Gupta, P.K. Rout, V. Vihan (2007) Induction of immune response in mice with a DNA vaccine encoding outer membrane protein (omp31) of *Brucella melitensis* 16M. **Research in Veterinary Science**, Volume 82, Issue 3, Pages 305-313
17. Mandal, A; Dutta, T.K, Rout, P.K. Roy, R and Sharma, N. (2007) Voluntary nutrient intake and growth performances of Muzaffarnagari lambs under intensive feeding system. *Indian Journal of animal Sciences*, 77(10), 1034-1038.
18. A. Mandal, Neser, F.W.C, Rout, P.K, Roy, R, D.R. Notter (2006). Estimation of direct and maternal (co) variance components for pre-weaning growth traits in Muzaffarnagari sheep. **Livestock Science**, **99**:79-89.
19. Ajay Kumar, Pramod K Rout and Ramadhar Roy. Polymorphism of  $\beta$ -lactoglobulin gene in Indian goats and its effect on milk yield. **J. Applied Genetics.**, **47**:49-53.
20. Mondal, A; Roy, R.; Rout, P.K. and Sharma, Nagendra. (2006) The Effect of Inbreeding on Growth of Body Dimensions of Muzaffarnagri Sheep. 8<sup>th</sup> World Congress on Genetics Applied to Livestock Production. August 13-18, 2006, Belo Horizonte, MG, Brazil.
21. Yadav, N.K, Mandal, A; Sharma, D.K; Rout, P.K. and Roy. R. (2006) Genetic Studies on Faecal Egg Counts and Packed Cell Volume Following Natural *Haemonchus Contortus* Infection and Their Relationship with Live weight in Muzaffarnagari Sheep. **Asian-Australian Journal Science Vol.** 19 No 11: pp1524-1528, November 2006.
22. V.K. Gupta, D Verma, P.K.Rout, S.V.Singh and V.S. Vihan(2006) Polymerase chain reaction for detection of *Brucella melitensis* in goat milk. **Small Ruminant Research**, vol.65 (1-2), 79-84.
23. S.K.Singh, P.K. Rout and B.U.Khan (2005) Performance evaluation and genetic parameters of early life growth, lactational and reproduction traits in Barbari does. *Indian Journal of Animal Genetics and Breeding*, 26(1-2), 68-75.

24. V.K. Gupta, Deepak Kumar, P.K.Rout and V.S. Vihan (2005) Detection of *Brucella melitensis* in goat's milk by PCR. *Indian Journal of Animal Sciences*, 75(10), 1163-1165.
25. Joshi, M.B., Rout, P.K., Mandal, A., Thangaraj, K. and Singh, L. (2004). Phylogeography and origin of Indian domestic goats. ***Molecular Biology and Evolution*** 21(3):454–462. 2004
26. Rout, P.K , Singh, M.K; Roy,R; Sharma, N and Haenlein, G.F.W(2004) Jamunapari-a diary goat breed in India, ***Dairy goat Journal (USA)***, 82(3), 37-39.
27. Mandal, A., Pant, K.P., Rout, P.K and Roy, R (2004) Effect of inbreeding on lamb survival in a flock of Muzaffarnagari sheep. ***Asia-Australasian Journal of Animal Science***, 17(5):594-597.
28. Gupta, V.K, Rout, P.K, Chndrasekhar, T and Vihan, V.S. (2004). Induction of immuneresponse in goats immunized with *Brucella melitensis* 16M DNA. *Indian Journal of Animal Sciences*, 74:813-817.
29. Gupta, V.K., Rout, P.K., Chndrasekhar, T and Vihan, V.S. (2005). Induction of cytotoxic T cell response in goats immunized with *Brucella melitensis* 16M DNA. *Indian Journal of Animal Sciences*, 75, 1,168-171.
30. Mandal, A; Barua, S; Rout, P.K; Roy, R (2005) Factors affecting the prevalence of mortality associated with pnemonia in flock of Muzaffarnagari sheep, *Indian Journal of animal Sciences* ,75,2,407-410.
31. Mandal, A; Pant, K.P; Notter, D.R; Rout, P.K; Roy, R and Sharma, N (2005) Effects of inbreeding on body weights and fleece yield of Muzaffarnagari sheep. ***Asia-Australasian Journal of Animal Science***, 17(5):594-597.
32. K.K.Chauhan, P.K.Rout, Singh, P.K., Mandal, A., Singh, S.K and Roy, R (2003) Genetic resistance of Barbari and Jamunapri kids to natural infection with gastro-intestinal nematodes. ***Tropical Animal Health and Production***. 35(5), 397-408.

