



What's inside...

SECTORAL NEWS	1
RESEARCH ACCOMPLISHMENTS	1
OTHER ACTIVITIES	8
PUBLICATIONS	9
AWARDS	10
राजभाषा प्रकोष्ठ की गतिविधियां	11
PERSONNEL	12

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From Director's Desk...

Animal Husbandry and livestock sectors are the life lines for millions of rural households in our country and hence conservation and judicious utilization of livestock biodiversity is of paramount importance. NBAGR is the nodal agency which is spearheading the campaign on characterization and conservation of Animal Genetic Resources of the country. It gives me immense pleasure to present the first issue of the 11th Volume of the NBAGR Newsletter to our readers. This issue provides a glimpse of the activities of the Bureau undertaken during April to September, 2014. As lesser known animal genetic resources play significant role in supporting the rural economy of our nation, some inadequately explored breeds of farm animals viz. Kolhapuri and Kajli sheep, Chippiparai dog, Odisha buffalo, Ladakhi cattle, donkeys of Andhra Pradesh and indigenous chicken of Manipur were characterized through field surveys undertaken in their native habitats by the scientists of the Bureau. An attempt was made to study expression analysis of candidate genes that play important role in adaptation process by producing homeostatic responses to hypoxia in livestock species adapted to high altitude. Highlighting the responsibility of Bureau in conservation of AnGR, national gene bank at NBAGR was further strengthened by adding semen doses from two breeds each of cattle and buffalo. Annual meeting of IRC for reviewing the progress of the projects was held as per schedule. NBAGR celebrated International Biodiversity Day wherein farmers with animals of A2A2 genotype for β casein gene were felicitated and awarded. National workshop on Livestock Keepers' Rights and Breed Saviour Award ceremony was organized at NBAGR in collaboration with National Biodiversity Authority and Honey Bee Network of IIM, Lucknow. Twenty one livestock keepers were honored with Breed Saviour Award for rearing and conserving local livestock breeds. Three delegates from Pakistan also participated in the programme and interacted with scientists and farmers especially for conservation of Sahiwal cattle. Bureau also celebrated its XXXI Foundation Day on 20th September by inviting Dr. S. K. Bandyopadhyay for Foundation Day lecture and organizing awareness programme for local college students. Scientists of the Bureau published their research findings in scientific journals of national and international repute. Apart from this, various dignitaries from the country as well as abroad visited the institute and interacted with scientists.

I hope the current issue of the Bureau's newsletter will be informative on issues related to domestic animal biodiversity of the country. Suggestions for improvement are welcome on the director's address.



Arjava Sharma
(Arjava Sharma)



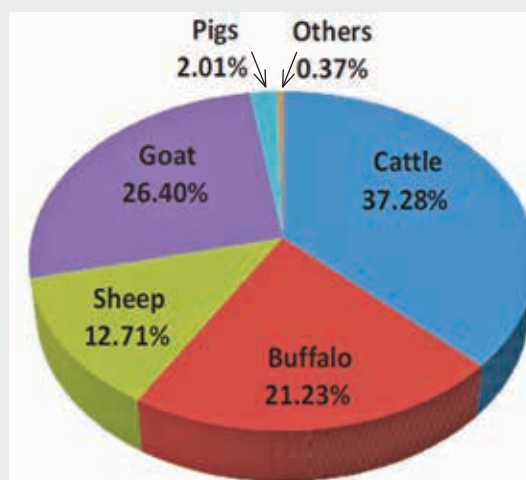
SECTORAL NEWS

19th Livestock Census -2012 data released

Animal Husbandry and livestock sectors are critical for the rural economy, especially the small and marginal farmers. They not only contribute to their income but also provide best insurance against any natural calamity. For planning purposes, the need for up to date and reliable data cannot be ignored. Livestock Census is a quinquennial complete enumeration process whereby data on number of livestock along with their sex composition, age distribution, utility wise distribution etc. are generated. The latest in this series is the 19th Livestock Census which has been released by the Department of Animal Husbandry, Dairying & Fisheries, Ministry of Agriculture, India. The salient findings of this census are:

- An overall decline of 3.33% was recorded in the total livestock population as compared to the previous census of 2007.
- The number of milch animals (in-milk and dry), cows and buffaloes, has increased from 111.09 million to 118.59 million; an increase of 6.75%.
- As compared to the previous census, there is an increase in the population of cattle, buffalo, horse, pony, mule, yak, mithun and poultry.
- There is a decline in the population of sheep, goat, pig, camel and donkey in comparison to the census in 2007.

Species	State with highest Population
Cattle	Madhya Pradesh
Buffalo	Uttar Pradesh
Sheep	Andhra Pradesh
Goat	Rajasthan
Pig	Assam
Camel	Rajasthan
Yak	Jammu & Kashmir
Mithun	Arunachal Pradesh
Horse & Pony	Uttar Pradesh
Donkey	Rajasthan
Poultry	Andhra Pradesh



Distribution of livestock as per 19th Livestock Census

RESEARCH ACCOMPLISHMENTS

Classification of ecotypes of Deccani sheep

Deccani sheep is widely distributed over eight districts of Maharashtra: Pune, Ahmadnagar, Satara, Solapur, Sangli, Kolhapur, Nasik and Beed. Five ecotypes (Lonand, Sangamneri, Solapuri, Kolhapuri and Madgyal) of Deccani sheep have been reported in its distribution area in Maharashtra. These ecotypes have coarse fleece having different coat colour. Kolhapuri ecotype is found in Kagal and Hatkanangle talukas of Kolhapur district. The animals are medium sized and mottled (black coat colour mingled with varying



Flock of Kolhapuri sheep



Kolhapuri Ram

shades of tan and off white). The ears are medium to long, flat, drooping but alert. The hindquarter is heavier as compared to other ecotypes of the region. The animals are reared under extensive management system. Dhanger community chiefly rears these sheep. Besides sheep, most of the shepherds also keep goat, cattle, buffalo, horse, dog and chicken. Substantial sexual dimorphism is observed in Kolhapuri sheep. Analysis of seven body measurements (body weight, body length, height at withers, chest girth, paunch girth, ear length and tail length) on 253 ewes and 60 rams indicated that all body measures of males are higher than females except ear length. Adult body weight of Kolhapuri rams is 43.3 ± 0.92 kg whilst in the ewes it is 31.8 ± 0.26 kg. Chest girth in females and males is 75.4 ± 0.22 cm and 81.4 ± 0.58 cm, respectively. Body biometry of Kolhapuri ecotype is comparable to that of Lonand ecotype. Age at first breeding is 15-18 months while age at first lambing is 18-24 months. The lambing percentage varies from 75-85%. Twinning is rare. Sheep are sheared twice a year. The total wool harvest is 500-600 gms. Price of wool is Rs 20 per kg. Average flock size and flock purity of Kolhapuri sheep are 79.5 and 56.2, respectively.

(Contributed by Dr. D.K. Yadav, Principal Scientist)

Identification of two color variants of Kajali sheep of Punjab

Kajali sheep is distributed in Sangrur, Barnala, Ludhiana, Moga and adjoining districts of Punjab (India) and is reared for mutton production. It was observed that Kajali sheep has two types / variants



Two color variants of Kajali sheep

distinguished primarily on the basis of colour viz. Black (Kali) Kajali- with complete black or black brown body with about 40 % white tail, and White (Chitti) Kajali - with white body and black face and ear. The breed 'Kajali' derived its name from black circles (Kajal in human) around the eyes. The animals are found to be large in size with well-built body having roman nose, long and pendulous ears and long tail touching the ground. Both the sexes are polled, however, in some males horn are present. Out of total animals surveyed 61.48 % animals are of Kali Kajali type and 38.52 % are of White kajali (chitti Kajali) type. The flock size varies from 8 to 150. The females show sexual maturity at about 12 to 15 months. Adult body weight of males and females are 59.31 ± 1.27 and 44.04 ± 0.49 kg, respectively. The preliminary results indicate that the Kajali sheep is phenotypically different from other sheep breeds of the region.

(Contributed by Dr. A. K. Mishra, Principal Scientist)

Characterization of Chippiparai dogs

The survey on Chippiparai dogs was conducted in Madurai, Virudhunagar, Tirunelveli and Thoothukudi districts of Tamil Nadu. Chippiparai dogs are medium in size with coat colors varying from fawn to dark brown, brownish black and black. The animals with dorsal black coat have white markings on both sides above inner canthus of the eyes whereas animals with other coat color have black circle around the eyes particularly lower eyelids, sometimes extending up to head. The phenotypic data on twenty six morphometric traits was collected on 90 animals belonging different age and sex groups (dogs and bitches). The mean height at withers, height at base of the tail, body length, chest girth, paunch girth, head width, snout length, face length, neck length, tail length (in cms) and body weight (kg) are 64.61 ± 0.46 , 57.70 ± 0.45 , 57.38 ± 0.43 , 63.21 ± 0.56 , 42.24 ± 0.51 , 5.16 ± 0.07 ,



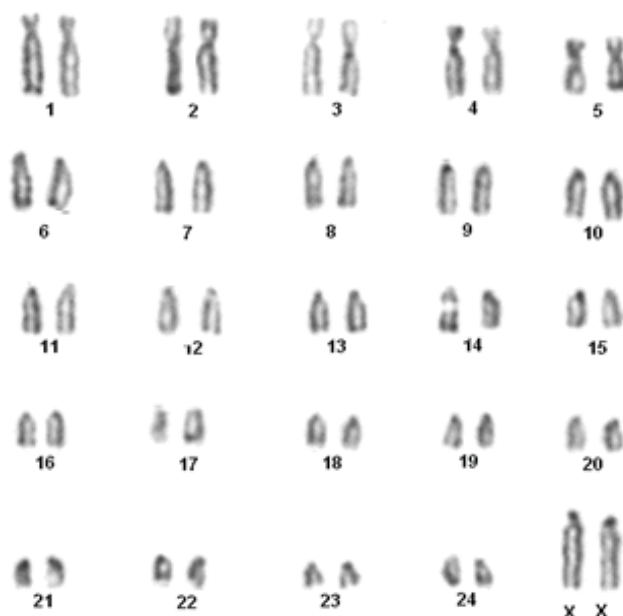
Chippiparai dog

11.82±0.15, 20.88±0.15, 19.79±0.18, 43.08±0.44 and 20.27±0.42, respectively. The bitches attain sexual maturity at an age of about 12-14 months and usually mating is not preferred at first heat. The age at first whelping is about 20 months. The age at sexual maturity in dogs ranges from 12-16 months. Most of the breeders do not sell puppies but give as gift to friends and relatives. Most of the breeders maintain their dogs with non-vegetarian food. Few breeders sell their puppies at a rate ranging from Rs 4000 to 10,000 according to the demand. The utility of animals is mostly for guarding and hunting but they are also kept as hobby and status symbol. Chromosome analysis of Chippiparai dog revealed common fundamental number (2n=78), with 38 pairs of acrocentric autosomes, one large sub metacentric X chromosome and a small sub metacentric Y chromosome.

(Contributed by Dr. K. N. Raja, Scientist)

Cytogenetic characterization of Odisha buffaloes

Two buffalo populations (Kalahandi and Paralakhemundi) of Odisha state, were surveyed in the breeding tract. Karyotypes of both the buffalo populations indicated 50 chromosome numbers (24 pairs of autosomes and two sex chromosomes), typical of riverine buffalo. The study confirms the riverine status of both the buffalo populations, contrary to earlier reports of Paralakhemundi buffalo being a swamp type buffalo.



*Representative riverine karyotype of female
Paralakhemundi buffalo of Odisha*

(Contributed by Dr. R. S. Kataria, Principal Scientist)

Phenotypic characterization of indigenous chicken (Coman) of Manipur

Survey was initiated in Thoubal and Imphal West districts of Manipur. Information collected on phenotypic characters and body weights indicated: plumage colour black or brown with patches of white, black or golden feathers, comb red in colour and of pea type. Body weight is about 2.5 to 3 kg. Egg production is about 35 to 45 per annum. These are fighting type birds and look similar to other such birds like Aseel, Danki, etc. but are better adapted and can fight for longer duration as compared to Aseel.



Indigenous chicken of Manipur

(Contributed by Dr. P. K. Vijh, Principal Scientist)

Characterization of donkeys of Andhra Pradesh

Majority of the donkeys found in Andhra Pradesh, especially in the districts of Kurnool and Anathapur of Rayalseema region, are predominantly of light brown to brown coat colour. Bellies of these animals are lighter than the dorsal aspect of the body. Some animals have white markings around muzzle and eyes. The animals of light brown or brown coat colour are found admixed with some percentage of animals with grey coat colour. The donkeys in Andhra Pradesh are mainly reared by Washerman, Chenchu and SC communities. The housing is mainly thatched type with some households having either pucca or open housing. They are raised both on grazing and stall feeding. They are also provided with some green fodder and concentrate which is mainly sorghum and rice polish. Water is provided twice a day. Open mating is practiced. No vaccination or deworming is practiced.



Brown type female donkey of Andhra Pradesh



Grey type female donkey of Andhra Pradesh

Data on mean heights at wither, body length, heart girth, estimated weight, mean forearm/gaskin length, canon length for fore/hind limbs, mean canon circumferences for fore/hind limbs and hoof circumferences of fore and hind limbs was collected for both males and females. The animals with grey coat colour are significantly larger and heavier. They are mainly used as pack animals for carrying clothes for washing and transportation of bamboos from the forest area, construction material like soil and sand etc. Some income is also generated by selling milk of these animals which is supposed to have medicinal value and is used for treatment of asthma. They are able to carry about 100 kg load for 20-25 km. Male animals are preferred over females for long haulage like bringing bamboos from the forest. Young animals are cost about Rs 3000/- per animal whereas adults are priced around Rs.10000/-. Males fetch little higher price.

(Contributed by Dr. Rahul Behl, Senior Scientist)

Characterization of Ladakhi cattle adapted to high altitude

During the period under report, visit was conducted to 11 villages of Ladakh region and farmers were interviewed to know the habitat, status, management and utility of Ladakhi cattle adapted to high altitude. Data on physical traits, morphometric measurements, was collected. Animals of Ladakhi cattle are small in size with cylindrical type of body. Body colour varies from black, brown and black with white patches. Horns are curved with upward, outward then forward orientation with pointed tips. Hump and dewlap are small. Head is small. Face is short and concave. Ears are small to moderate in length and horizontal in orientation. Udder is small, not well developed and milk veins are not prominent. Tail is long, touching almost to ground with black and brown switch. Temperament of the animal is docile. The average body length, height at wither, horn length, horn width, ear length, face length, face width, tail length without switch and with switch in cows are 86.22 ± 1.44 cm, 93.24 ± 0.88 cm, 15.08 ± 1.06 cm, 9.8 ± 0.25 , 14.25 ± 0.33 cm, 36.43 ± 0.45 cm, 14.36 ± 0.19 , 63.26 ± 1.53 cm and 88.95 ± 2.03 cm, respectively.



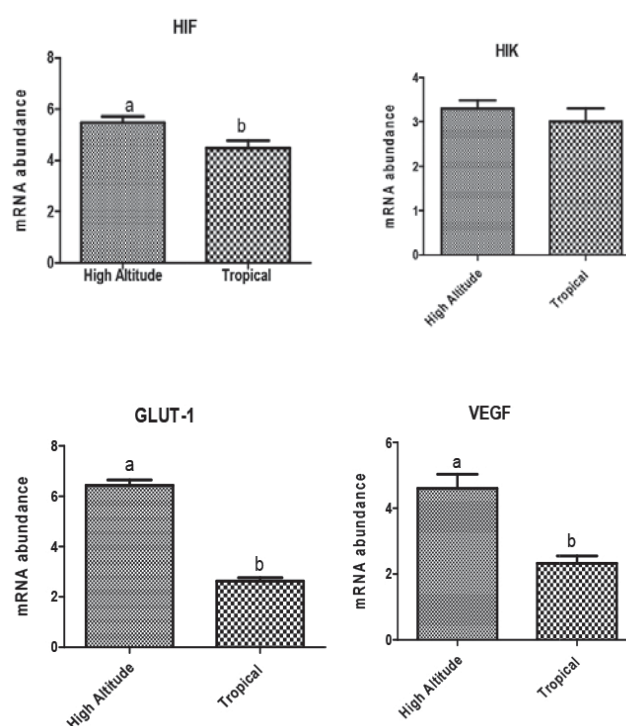
Typical Ladakhi cattle

Microsatellite based genotypic data recorded across the 20 markers was analysed to estimate the genetic variability in terms allelic diversity and heterozygosity values. A total of 200 alleles were detected across the 20 loci with mean number of 9.95 alleles per locus. The various within breed diversity measures in terms of observed number of alleles (9.95), effective number of alleles (4.84), observed heterozygosity (0.75) and expected heterozygosity (0.79) for Ladakhi cattle revealed sufficient genetic variability. To assess the overall genetic structure of Ladakhi and other cattle breeds, various estimates for F -statistics were calculated. The values were significantly different from zero ($P < 0.05$). The average inbreeding coefficient (F_{IS}) in Ladakhi cattle was 0.037. The interbreed differentiation between Ladakhi and other cattle populations depicted by F_{ST} reflected high genetic divergence between different cattle breeds.

(Contributed by Dr. Monika Sodhi, Principal Scientist)

Expression analysis of Hypoxia inducing factor (HIF) and its regulatory genes in high altitude adapted cattle

The mRNA level of hypoxia inducing factor-1 ($HIF-1$) and its regulated genes were measured in PBMCs samples of cattle that are adapted to high altitude conditions ($>12,500$ feet). The study included 10 PBMCs samples each of Holstein Friesian, Jersey and Ladakhi local cattle from high altitude and 10 samples each of Sahiwal and Karan Fries cattle from tropical conditions for comparative evaluation. The qPCR performance in terms of slope of the 6



mRNA level of hypoxia inducing factor-1 (HIF-1) and its regulated genes in PBMCs of high altitude and tropically adapted cattle breeds

point standard curve, coefficient of determination of standard curve (R^2) and efficiency of amplification [$E=10(-1/\text{slope})$] for each gene showed high quality data. The combined data set of animals adapted to normoxic and hypoxic conditions indicated increased expression of $HIF-1$ and its regulated genes viz., glucose transporter 1 ($GLUT1$), vascular endothelial growth factor ($VEGF$) and hexokinase (HIK). The data indicated that $HIF-1$ mRNA gets accumulated under hypoxic conditions and probably an essential

adaptive component for the animals of high altitude. *HIF-1* gene which is a major transcription factor and its regulatory genes controlling glucose metabolism, cell proliferation, and vascularisation could be termed as important candidate genes that are supposed to be playing major role in producing homeostatic responses to hypoxia in livestock species adapted to high altitude.

(Contributed by Dr. Manishi Mukesh, Principal Scientist & National Fellow)

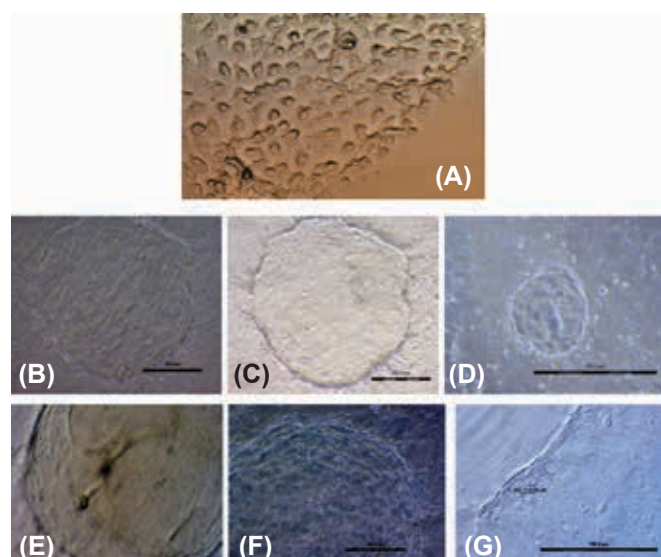
Development of three dimensional (3D) cell culture of buffalo mammary epithelial cells (NAIP Project)

Mammary epithelial cells (MECs) grown on plastic surface (2D) usually lose their tissue specific function, and are low responsive to lactogenic hormones. The use of extracellular matrix for growing MECs in three-dimensional (3D) condition could provide a unique opportunity to model the architecture of epithelium *in vitro*. Hence, an effort was made to establish and characterize mammary epithelial cells in 3D culture using extracellular matrix. Also, the relative mRNA abundance of some of the key genes related to milk protein (*CSN1S1*, *CSN1S2*, *CSN2* & *CSN3*) and fatty acid metabolism (*BTN1A1*, *GPAM*, *FABP3* & *SCD*) was assessed in 3-D culture *vis a vis* traditional monolayer culture. The purified mammary epithelial cells generated after several passages were used to establish both 3-D culture using Geltrex matrix and

monolayer MEC culture. BMECs in both monolayer and 3D culture system were characterized by immunofluorescence using cytokeratin-18, collagen, β -casein antibodies. Initial results demonstrated that MECs grown on Geltrex matrix formed polarized acinus like structure within 15 days of culturing. By day 5, the BuMEC organized into desirable epithelial structures (2A), and formed lumen-like and dome-like structures (Fig 2B-D). Subsequently, by day 7, typical acinar and tubule-like structures were formed (Fig. 2E-F). The size of the acinar and duct-like structures increased over time, especially during the second week. In addition, these epithelial structures exhibited significantly enhanced functional differentiation in comparison to the monoculture compartment as evidenced by morphological analysis. After 2 weeks of culturing, the BuMECs plated on Geltrex matrix (3D) showed complete differentiation and formation of mammospheres or acinus-like structures (2G). These observations suggested that BuMEC grown in 3D recapitulate numerous features of glandular epithelium *in vivo*.

Expression analysis results demonstrated that 10 day MECs culture grown on Geltrex matrix showed remarkably higher abundance of *CSN1S1*, *CSN1S2*, *CSN2* and *CSN3* mRNA as compared to monolayer culture. Likewise, the mRNA of *BTN1A1*, *GPAM*, *FABP3* and *SCD* showed higher induction in 3D than 2D culture. Using immunofluorescence staining, β -casein was detected with more intensity in 10 days old 3D culture than 20 days culture. On the other hand, the mRNA for casein genes could not be detected in 2D culture. These results suggest that 3D organization of epithelial cells has favourable effect on induction of genes related to milk and fatty acid metabolism.

(Contributed by Dr. Manishi Mukesh, Principal Scientist & National Fellow)



Growth characteristics of BuMEC in 3 D culture

Strengthening of National Gene Bank for *ex-situ* conservation

As a part of *ex-situ* conservation programme, 2830 semen doses of breeding males belonging to Gaolao cattle (200), Sahiwal cattle (100), Toda buffalo (100), Nagpuri buffalo (800), Jafarabadi buffalo (1630) were added to the National Genebank at NBAGR.

OTHER ACTIVITIES

IRC Meeting

Institute Research Committee (IRC) meeting was held on 19th and 21st April, 2014 under the Chairmanship of Dr. Arjava Sharma, Director, NBAGR. Final reports of completed research projects were discussed and approved. New project proposals were also discussed and approved by the committee.

International Biodiversity Day

NBAGR celebrated International Biodiversity Day on 22nd May, 2014. Dr. M.P. Yadav, Former Director, ICAR-IVRI was the Chief Guest for the day.



Lighting of the ceremonial lamp



Livestock keepers being awarded on the occasion

Dr Inderjeet Singh (Director, ICAR-CIRB, Hisar) and Dr Shakti Singh (Deputy Director, Department of Animal Husbandry & Dairying, Karnal) were the guests of honor. The Bureau genetically screened more than 200 indigenous and crossbred cows, for the presence of A2A2 type animals. Farmers (68) having animals with the A2A2 genotype were felicitated and awarded with the certificates. An Exhibition on AnGR was also organized on this occasion. A poster competition on

the theme "Livestock Diversity for Human Welfare" was held in which the students of different colleges of Karnal participated actively.

Independence Day

The NBAGR staff and families celebrated the Independence Day on 15th August, 2014 in the Bureau campus. Dr. D. K. Sadana, Head, Animal Genetic resources Division, NBAGR hoisted the tricolor and addressed the gathering.

National workshop on Livestock Keepers' Rights and Breed Saviour Award ceremony

National workshop on Livestock Keepers' Rights was organized at NBAGR on 8-9th July, 2014 wherein 21 livestock keepers were honored with Breed Saviour Award for rearing and conserving local livestock breeds. The awards were arranged by SEVA NGO with financial support from National Biodiversity Authority and Honey Bee Network of IIM, Lucknow. Honorable Dr. Suresh Honnappagol, Dr. S.L. Goswami, Prof Anil Gupta and Mr. P.Vivekanandan graced the occasion.



Recipient of Breed Saviour Award

Foundation Day Celebration

The Bureau celebrated its XXXI Foundation Day on 20th September, 2014. Dr. S. K. Bandyopadhyay, Member, Agricultural Scientist Recruitment Board, New Delhi who was the Chief Guest on this occasion delivered the Foundation Day lecture. Dr (Mrs.) Indu Sharma (Director, ICAR-DWR) and Dr. D. K. Sharma (Director, ICAR-CSSRI) were the guests of honor. In order to ignite the minds of young budding scientists of India by spreading awareness about the Animal Genetic Resources (AnGR) of the country, local



Lighting of the lamp by the chief guest

college students were also invited to be the part of the celebration.

PATENTS

Following three patent applications were published in Indian Patent Office Journal:

Patent Application Number	Inventors	Title of Patent
50/DEL/2013	Dr. R.K. Vijh, Priyanka Banerjee, Jyoti Joshi, Shivani Rana, Upasna Sharma	A Kit for parentage verification in Goats
298/DEL/2013	Dr. R.K. Vijh, Priyanka Banerjee, Jyoti Joshi and Upasna Sharma	A Kit for parentage verification in Indian Ruminant Livestock
607/DEL/2013	Dr. R.S. Kataria, P.K. Dubey, Dr. S.K. Niranjana and Dr. Monika Sodhi	PCR based DNA test for the differentiation of cattle and buffalo meat and milk

PUBLICATIONS

Documents developed and published:

1. A leaflet on Harringhata Black Chicken by P.K. Vij, M.S. Tania, S. Pan, R.K. Vijh
2. Technical Bulletin on "Establishment of three dimensional (3D) culture of buffalo mammary epithelial cells" by Umesh Kumar *et al.*
3. Technical Bulletin on "Reference Gene Panels or application in transcriptomic Research in Indian cattle and buffalo" by Manishi Mukesh *et al.*



4. A breed monograph " Bundelkhandi Goat – An important germplasm of Bundelkhand region" by NK Verma and Priyanka Mishra

Research papers

1. Ahlawat S., Sharma R., Maitra A., Roy M. and Tania M.S. (2014) Designing, optimization and validation of tetra-primer ARMS PCR protocol for genotyping mutations in caprine *Fec* genes. *Metagene* 2: 439-449.
2. Dhingra J., Sharma A., Kataria R.S., Verma N.K., Kimothi S.P., Bhatia A.K., Sodhi M., Behl R. and Joshi B.K. (2014). Genetic Polymorphisms in the bovine Toll like receptor 4 (TLR 4) and Monocyte Chemo Attractant Protein-1 (CCL2) genes: SNPs distribution Analysis in Bos indicus Sahiwal cattle breed., *Animal Biotechnology*, 25:4, 250 – 265.
3. Dubey P.K., Goyal S., Yadav A.K., Sahoo B.R., Kumari N., Mishra S.K., Niranjana S.K., Arora R., Mukesh M., Kataria R.S. (2014). Genetic diversity analysis of the thyroglobulin gene promoter in buffalo and other bovines. *Livestock Science* 167: 65-72.
4. Iquebal M.A., Ansari M.S., Sarika, Dixit S.P., Verma N.K., Aggarwal R.A.K., Jayakumar S., Rai A. and Kumar D. (2014). Locus minimization in breed prediction using artificial neural network approach. *Animal Genetics* doi10.1111/age.12208.
5. Jatav P.K., Sodhi M., Sharma A., Umesh KS, Kishore A., Mohanty A., Mishra B.P., Maan S., Kataria R.S., Kaushik J. and Mukesh M. (2014). Expression Analysis of Solute Carrier (SLC2A) Genes in Milk Derived Mammary Epithelial Cells during Different Stages of Lactation in Sahiwal (Bos indicus) Cows. *Advances in Dairy Research* 2: 117. doi: <http://dx.doi.org/10.4172/2329-888X.1000117>.
6. Kumari N., Goyal S., Dubey P.K., Singh S., Niranjana S.K., Gupta N., Prasad A. and Kataria R.S. (2014). Cloning and sequence characterization of lactoferrin gene of Indian riverine buffalo. *Indian Journal of Animal Sciences* 84: 761-766.

7. Maitra A., Sharma R., Ahlawat S., Tandia M.S., Roy M. and Ved Prakash (2014) Association analysis of polymorphisms in caprine *KISS1* gene with reproductive traits. *Animal Reproduction Science*. DOI: 10.1016/j.anireprosci.2014.09.013.
8. Mann S., Jatav P., Sodhi M., Shandilya U., Sharma A. and Mukesh M. (2014). An overview of solute carrier family (facilitated glucose transporter) genes and their role in bovine mammary gland functioning. *International Journal of Animal Biotechnology*, Vol.4 (2014) ISSN:2277.
9. Pundir R.K., Malik S., Singh P.K., Sharma D., Sadana D.K. (2014) Indigenous cattle of Tripura: Characterization and performance evaluation. *Indian Journal of Animal Sciences*. 84(9): 974-977.
10. Sahoo B.R., Dubey P.K., Goyal S., Bhoi G.K., Lenka S.K., Maharana J., Pradhan S.K., Kataria R.S. (2014). Exploration of the binding modes of buffalo PGRP1 receptor complexed with meso-Diaminopimelic acid and Lysine-type peptidoglycans by molecular dynamics simulation and free energy calculation. *Chemico-Biological Interactions* 220: 255-268.
11. Shandilya U., Sodhi M., Sharma A., Kapila N. and Mukesh M. (2014). Understanding mammary gland functioning in livestock species using in-vitro mammary epithelial cells model -An overview. *Journal of Advances in Biotechnology* 04/2014.
12. Sodhi M., Kishore A., Sobti R.C., Kataria R.S., Mishra B.P. and Mukesh M. (2014). Analysis of genetic variations across regulatory and coding regions of kappa-casein gene of Indian native cattle (*Bos indicus*) and buffalo (*Bubalus bubalis*) *Meta Gene* 2: 769-781.
13. Verma N.K., Aggarwal R.A.K., Sharma R., Dangi P.S. and Bhutia N.T. (2014) Sikkim Black goat: A newly explored germplasm of Sikkim state. *Journal of Veterinary Sciences and Technology* 5 (3): 110.

Delegates from Pakistan visited NBAGR

Delegates from Sahiwal Society of Pakistan attended the “Livestock Keepers’ Rights and breed Saviour Award Ceremony”. Sardar Mohammad Aftab Ahmad Khan Wattoo was honored for conserving Sahiwal cattle in Punjab state of Pakistan. The delegates also visited a Gaushala at Uplana which has been upgrading the non-descript cattle by crossing with Sahiwal, Hariana and Tharparkar bulls through systematic breeding procedure under the guidance of NBAGR, Karnal.



AWARDS

- ♦ Dr. P. G. Nair Award for the year 2014 was conferred upon Dr Monika Sodhi for outstanding scientific contribution in the field of Animal sciences.
- ♦ Dr Monika Sodhi received Gold medal of Indian academy of Environmental Sciences, Haridwar in recognition of her valuable contribution to the discipline of Animal Biotechnology in general and cattle genomics in particular.
- ♦ Preeti Verma, M Mukesh, Prabhat Kumar, Vijay K Bharti, Deepak Gagoi, B Prakash, Sandeep Mann, Parvesh Kumari, Monika Sodhi received first best poster award at the International conference on Animal and Dairy Sciences held at Hyderabad, September 15-17, 2014 for the research presentation “*Molecular Characterization of candidate genes affecting milk production traits in Leh Cattle adapted to high altitude*”.
- ♦ Manjula Miglani, Monika Sodhi, Ankita Sharma, Umesh Shandilaya and M Mukesh received first best poster award at the “International conference on Animal and Dairy Sciences” held at Hyderabad, September 15-17, 2014 for the research presentation “*Expression Kinetics of different classes of proteases in milk derived somatic cells during lactation cycle of Sahiwal cows and Murrah buffaloes*”.

भाकृअनुप-राष्ट्रीय पशु आनुवंशिक संसाधन ब्यूरो, करनाल में हिंदी चेतना सप्ताह का आयोजन

प्रत्येक वर्ष की भांति इस वर्ष भी हिंदी दिवस के अंतर्गत ब्यूरो में 12-20 सितम्बर 2014 तक राजभाषा के प्रचार प्रसार व क्रियान्वयन के प्रति स्टाफ सदस्यों में जागरूकता बढ़ाने हेतु विभिन्न हिंदी कार्यक्रमों का आयोजन किया गया। इस अवधि के दौरान आयोजित की गयी विभिन्न गतिविधियों का विवरण निम्नलिखित है:

प्रतियोगिता	पुरस्कार
शब्दार्थ व अनुवाद	प्रथम: डॉ. आर्जव शर्मा द्वितीय: डॉ. साकेत निरंजन व श्री कर्मबीर मालिक तृतीय: श्री योगेंदर
निबंध लेखन विषय: भारतीय कृषि अर्थ व्यवस्था में महिलाओं का योगदान	प्रथम: डॉ. सोनिका अहलावत द्वितीय: श्री कर्मबीर मालिक तृतीय: डॉ. मोनिका सोढ़ी व श्रीमती करुणा असीजा
पत्र लेखन विषय: परित्यक्त पालतू पशुओं से शहर में पैदा होने वाली समस्याओं की ओर ध्यान आकर्षित करते हुए इसके समाधान हेतु उपयुक्त महोदय को पत्र	प्रथम: श्री कर्मबीर मालिक द्वितीय: डॉ. साकेत निरंजन तृतीय: श्रीमती प्रवेश कुमारी
टिप्पणी मसौदा लेखन	प्रथम: श्री योगेंदर द्वितीय: श्री कर्मबीर मालिक तृतीय: अरुण कुमार
शोध-पत्र भाषण	प्रथम: डॉ. आर.के. पुंडीर व सहयोगी द्वितीय: डॉ. मोनिका सोढ़ी तृतीय: डॉ. प्रताप सिंह पंवार
आशु भाषण	प्रथम: डॉ. कर्णवीर सिंह द्वितीय: डॉ. मोनिका सोढ़ी तृतीय: श्रीमती अनीता चंदा
वाद विवाद विषय: पश्चिमी सभ्यता का भारतीय संस्कृति पर प्रभाव	पक्ष में बोलने हेतु प्रथम: डॉ. रेखा शर्मा द्वितीय: डॉ. मोनिका सोढ़ी विपक्ष में बोलने हेतु प्रथम: डॉ. कर्णवीर सिंह द्वितीय: डॉ. अरुण कुमार
वर्ष 2013-14 में हिन्दी में उत्कृष्ट कार्य हेतु पुरस्कार	प्रथम: श्री कर्मबीर मालिक द्वितीय: श्री बाबु राम तृतीय: श्री हरविंदर सिंह व श्री सोपाल



डॉ. अरुण कुमार पुरस्कार प्राप्त करते हुए

दिनांक 12-19 सितम्बर के दौरान हुई लिखित व मौखिक प्रतियोगिताओं के विजेताओं को दिनांक 20-9-2014 को ब्यूरो के स्थापना दिवस समारोह के अवसर पर पुरस्कृत किया गया। इस अवसर पर मुख्य अतिथि डॉ. एस.के. बंधोपाध्याय, माननीय सदस्य, भारतीय कृषि वैज्ञानिक चयन मंडल ने विजेताओं को पुरस्कार वितरित किये। वार्षिक राजभाषा पुरस्कार वितरण समारोह के दौरान ही संस्थान की वार्षिक हिंदी पत्रिका पशुधन प्रकाश के चतुर्थ अंक वर्ष 2013 में छपे शोध लेखों में से तीन श्रेष्ठ लेखों को पुरस्कृत किया गया।

- प्रथम पुरस्कार: डॉ. पी. के. विज, डॉ. एस. के. निरंजन, डॉ. एम. एस. तांतिया व डॉ. बी. के. जोशी, एन.बी.ए.जी.आर. करनाल, के शोध पत्र "पशुधन नस्ल पंजीकरण - राष्ट्रीय संपदा की सुरक्षा"
- द्वितीय पुरस्कार: डॉ. प्रदीप कुमार डोगरा, संजीत कटोच, यशपाल ठाकुर, वरुण संख्यान एवं राकेश कुमार, पशु चिकित्सा कॉलेज, हि.प्र.कृ.वि.वि. पालमपुर के शोध पत्र "हिमाचल प्रदेश की अमूल्य धरोहर - चमुर्थी घोड़ा"



डॉ. देव व्रत सिंह पुरस्कार प्राप्त करते हुए

- तृतीय पुरस्कार: डॉ. देव व्रत सिंह, पशु चिकित्सा व पशु विज्ञान महाविद्यालय, गो.ब.पं. कृषि व प्रो. वि.वि., पंतनगर के शोध पत्र "पशुओं का उचित रख-रखाव"

इस अवसर पर ही संस्थान की वार्षिक हिंदी पत्रिका "पशुधन प्रकाश" के पंचम अंक (2014) का विमोचन माननीय मुख्य अतिथि डॉ. एस. के. बंधोपाध्याय जी द्वारा किया गया।

DISTINGUISHED VISITORS

1. Dr. R. Kasiraj, General Manager (AB), National Dairy Development Board, Anand visited on 25.04.2014.
2. The Students from RPIIT Technical Campus, Bastara visited on 11.08.2014.
3. The World Bank Team consisting of Dr Mohinder S. Mudahar and Dr Miki Terasawa, World Bank Experts accompanied by NAIP Team consisting of Dr. S. Kochhar, National Coordinator, Component-4, Dr. P. S. Pandey, National Coordinator, Component-1 and Dr. P. Katihaa, Principal Scientist visited on 23.08.2014.
4. Ms. Manjula Chawla, Serials Librarian, U.S. Library of Congress, American Center visited on 29.08.2014.
5. Mr. Paisho Keishing from North East Border Area Development Organization (NEBADO) Kasom Khillen Sub Division, Manipur visited on 15.09.2014.

PERSONNEL

PROMOTIONS

1. Dr. Manishi Mukesh, National Fellow promoted to the next higher post of Principal Scientist w.e.f. 09.09.2012.
2. Dr. Vikas Vohra, Senior Scientist promoted to the next higher grade of Rs. 37400-67000+RGP 9000/- w.e.f. 02.04.2014.
3. Dr. S. K. Niranjana, Senior Scientist promoted to the next higher grade of Rs. 37400-67000+RGP 9000/- w.e.f. 04.04.2014.
4. Dr. Indrajit Ganguly, Senior Scientist promoted to the next higher grade of Rs. 37400-67000+RGP 9000/- w.e.f. 21.04.2014.

5. Dr. Sanjeev Singh, Senior Scientist promoted to the next higher grade of Rs. 37400-67000+RGP 9000/- w.e.f. 29.06.2014.
6. Sh. Ramesh Kumar, Senior Technical Assistant promoted to the next higher grade of Technical Officer w. e. f. 16.09.2013.
7. Sh. Harvinder, Technical Officer promoted to the next higher grade of Senior Technical Officer w.e.f. 14.05.2014.

TRANSFER

Dr. Birham Prakash, Principal Scientist relieved from ICAR-NBAGR, Karnal on 14.08.2014 (AN) to join the post of Director, ICAR-Central Institute for Research on Cattle, Meerut.



Director NBAGR congratulating Dr. B. Prakash

RETIREMENT

Sh. Moti Ram, Technical Officer superannuated on 30.06.2014.



Bidding farewell to Sh. Moti Ram

FORTHCOMING EVENT

Tamil Nadu Veterinary and Animal Sciences University, Chennai and Society for Conservation of Domestic Animal Biodiversity (SOCDAB), NBAGR, Karnal are organizing an International Symposium on Sustainable Management of Animal Genetic Resources for livelihood security in developing countries and XII annual convention of Society for Conservation of Domestic Animal Biodiversity at Madras Veterinary College, TANUVAS from 13th to 14th February, 2015. All are invited for active participation and contribution towards the theme to make the Symposium a grand success.