

भाकृअनुप-रापअनुसंब्यूरो समाचार-पत्र

ICAR-NBAGR Newsletter

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 75
 Azadi Ka
 Amrit Mahotsav


From the Director's Desk

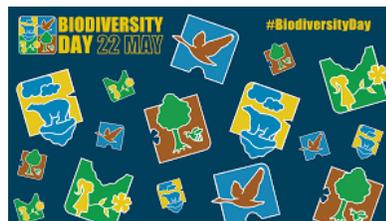
ICAR-National Bureau of Animal Genetic Resources (NBAGR) prides itself in being the only national institution entrusted with the sole responsibility of safeguarding the unique Indian livestock and poultry germplasm that feeds and sustains us in an environment-friendly and economically inclusive way. During the reported period, the Bureau was on a mission to protect and conserve indigenous Farm Animal Genetic Resources and hence shouldering the country's responsibility towards national and international commitments. We are marching ahead with a target of zero non-descript AnGR in the country by sensitizing and taking up a country-wide survey in synergy with State AHDs, SAUs, NGOs, and stakeholders. We are active learners and continue to seek participation and involvement from the whole livestock community. As a result, identification and characterization of native animal germplasm continued pan India inclusive of the remotest of the remote places of the country. Bureau is the only national repository for cryopreserved livestock germplasm as also included under SDG Indicator 2.5.1. The acquaintance of genetic diversity and genomic uniqueness of native breeds has been enriched through ever-evolving and revolutionizing genomic approaches. The cutting-edge research resulted in the delineation of the whole mitogenome-based genetic diversity status of Indian sheep. Unique traits of indigenous livestock such as thermotolerance, endurance as well as the uniqueness of their products are being explored for adding value to



the native breeds. Scientific investigations lead to the characterization of colostrum of native cattle and yak of the high-altitude region. Bureau is actively involved in creating awareness about the indigenous livestock, their upkeep, and conservation through interactions with the real custodians of AnGR, and animal farmers. The Bureau has borne the greatest responsibility towards protecting the precious national livestock biodiversity and their keepers due to the firm conviction, dedication, and professionalism of its scientists, the enthusiasm of its staff, and the high level of support provided by stakeholders and community members. I sincerely hope that with your suggestions, we shall continue to excel in all spheres of the mandate of the Bureau.

Please feel free to contact me at director.nbagr@icar.gov.in.



 [B.P. Mishra]


Biodiversity starts in the distant past and it points toward the future.

– Frans Lanting

HIGHLIGHTS OF THIS ISSUE...

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Institute Profile

With the realization of the unique significance of native animal and poultry genetic resources and their potential utilization at global level, a need was felt by the ICAR in 1960s for establishing an organization which could undertake the responsibility of evaluating, certifying and conserving the country's rich and diverse germplasm resources. The establishment of two different institutes- National Bureau of Animal Genetic Resources (NBAGR) and National Institute of Animal Genetics (NIAG) was approved, in principle, during IV Five-Year-Plan. The Institute was set up on 21st September, 1984 at the campus at National Dairy Research Institute (Southern Regional Station), Bangalore and further shifted to Karnal on 19th July, 1985. Finally, NBAGR and NIAG were merged in 1995.

Mission

To protect and conserve indigenous Farm Animal Genetic Resources for sustainable utilization and livelihood security.

Mandate

- ◆ Identification, evaluation, characterization, conservation and sustainable utilization of livestock and poultry genetic resources of the country.
- ◆ Coordination and capacity building in animal genetic resources management and policy issues.

Objectives

- ◆ To conduct systematic surveys to characterize, evaluate and catalogue farm livestock and poultry genetic resources and to establish their National Data Base.
- ◆ To design methodologies for *ex-situ* conservation and *in-situ* management and optimal utilization of farm animal genetic resources.
- ◆ To undertake studies on genetic characterization using modern techniques of molecular biology.
- ◆ To conduct training programmes as related to evaluation, characterization and utilization of animal genetic resources.

Major activities

Identification, characterization and documentation of native AnGR in country

- ◆ Survey and documentation of entire livestock and poultry population in the country with a target of Zero Non- Descript AnGR.
- ◆ Identification and characterization of homogenous populations qualifying for breed.
- ◆ Registration and notification of all types of livestock and poultry populations.

Conservation of native breeds of livestock and poultry species

- ◆ *In situ* conservation of threatened breeds of livestock and poultry.
- ◆ Cryopreservation of germplasm of all registered breeds
- ◆ Assessing risk status of native breeds.

Genomics for population structure and diversity of native AnGR

- ◆ Assessing genomic diversity and uniqueness of all registered livestock and poultry breeds.
- ◆ Developing molecular signature for breed standard of

native breeds.

- ◆ Creation of genome assemblies for native breeds of high importance.

Trait identification and characterization of native AnGR for value addition

- ◆ Characterization of unique products and identification of biomolecules in milk and meat of native germplasm and their effect/utility for human nutrition and health.

- ◆ Transcriptome and metabolome for evaluating adaptive and endurance traits of native breeds.

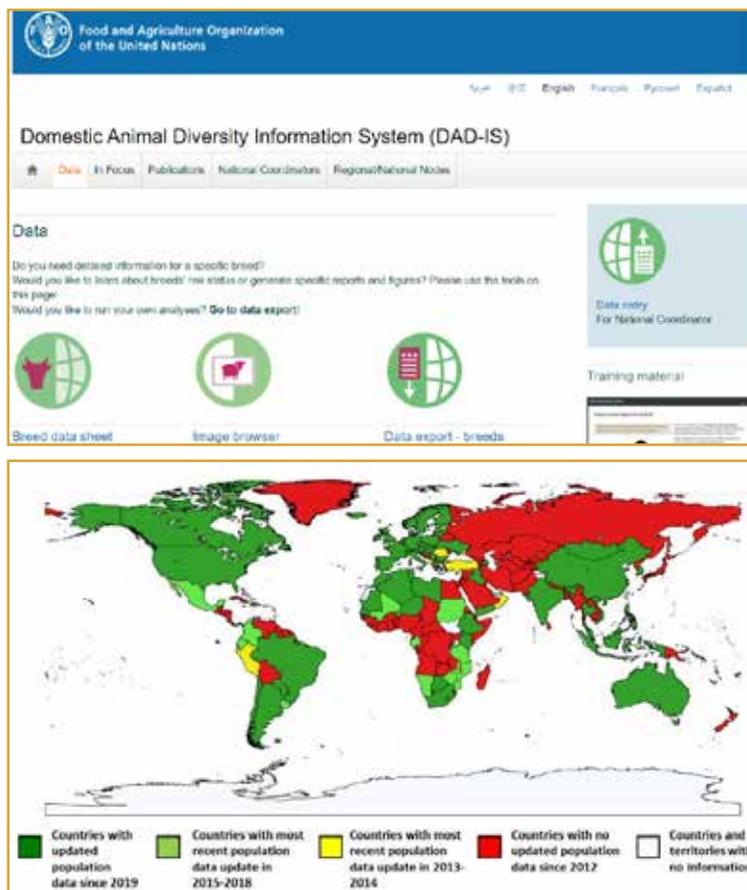
Policy support and capacity building for AnGR management

- ◆ Creation of databases and other ICT on AnGR for policy support in the country.
- ◆ Developing policy support for AnGR management in states.
- ◆ Organizing training and sensitization programs for AnGR management.
- ◆ Providing consultancy services to government agencies for policy support.

Sectoral News

FAO's DOMESTIC ANIMAL DIVERSITY INFORMATION SYSTEM (DAD-IS)

Livestock diversity is a raw material for improving breeds and adapting to changing environmental conditions. Currently, approximately 28% of livestock breeds are at risk of extinction. This is a matter of great concern because the list may include breeds that are well adapted to harsh environmental conditions and may be the most important breeds in the future. Recognizing the importance of animal genetic resources, Food and Agriculture Organization (FAO) has developed Domestic Animal Diversity Information System (DAD-IS) to aid countries in monitoring and evaluating the conservation and sustainable usage of indigenous and exotic breeds, and production environments. It helps to monitor not only breeds but also the status of the attainment of internationally set goals and targets, such as the Sustainable Development Goals (SDGs). It is the primary communication and information tool for implementing the Global Strategy for Farm Animal Genetic Resources Management (AnGR). It allows us to analyze the diversity of livestock breeds at the national, regional, and global levels, as well as the status of breeds in terms of extinction risk. It also serves as a source for the preparation of the World Watch List for Domestic Animal Diversity. DAD-IS currently contains the data and information provided by 182 countries on more than 8800 breeds representing 40 species. Additionally, it offers countries a secure way to manage the entry, updating, and access to their national data. DAD-IS enables countries to calculate two very important SDG indicators: the cryoconservation of genetic material in livestock breeds and the percentage of local breeds at the risk of extinction.



Population update in DAD-IS

Mission Activities

Mission towards zero non-descript AnGR of India

ICAR-NBAGR initiated the Mission towards Zero Non-descript AnGR of India intending to document native livestock and poultry genetic resources and identifying potential breeds to reduce the percentage of non-descript AnGR population in the country. The mission was initially launched on 11th August 2021 by Dr. T. Mohapatra, Secretary, DARE & Director General, ICAR. Under the mission, the Bureau has also organized Interface Meet with 12 states- Chhattisgarh, Jharkhand, Maharashtra, Rajasthan, Uttar Pradesh, Punjab, Haryana, Madhya Pradesh, West Bengal, Himachal Pradesh, Bihar, Telangana and one Union Territory (Ladakh) in one year.

The Bureau has initiated state-specific AnGR documentation projects in 22 states in collaboration with SAHD, KVKs, SAUs/SVUs. Bureau scientists have initiated a survey in the 18 states/UT after the Mission was launched. A total of 22 new populations of native livestock and poultry have been identified after the launch of the mission, which are being characterized by their respective breeding tracts falling in various states.



State Interface Meet under the Mission

To fulfill the targets of the ambitious mission, ICAR-NBAGR organized interface meets with different states to chalk out the strategy for documentation of AnGR diversity. Representatives of State Animal Husbandry Departments and Biodiversity Boards, State Veterinary and Agricultural Universities, experts from ICAR, and NGOs participated in the interaction. Six states were sensitized within six months. During each interface

meeting, a panel of experts provided important inputs for the documentation of non-descript AnGR and approaches for the conservation of native breeds of the respective state. It was reiterated that there is a need to identify the biodiversity hotspots in each state and to ensure coordination among various agencies to accomplish the objective of the mission.

Date	State	Agencies Partipated	Number of participants
10.01.2022	Telangana	ICAR, Telangana Animal Husbandry Department and Telangana State Biodiversity Board, PVNR Telangana Veterinary University, NGOs.	223
08.02.2022	Punjab	ICAR, Guru Angad Dev Veterinary & Animal Science University, Animal Husbandry Department, Punjab, NGOs	49
10.02.2022	Haryana	ICAR, Lala Lajpatrai University of Veterinary & Animal Science, Animal Husbandry Department, Haryana, NGOs	127
03.03.2022)	Madhya Pradesh	ICAR, NDVASU, Animal Husbandry & Dairying Department-MP MPSPDC, MP state Biodiversity Board and delegated of NGOs	140
19.04.2022	West Bengal	ICAR, WBUAFS, Department of Animal Husbandry and Veterinary Services and Animal Resource Development, West Bengal, NGOs	200
20.04.2022	Himachal Pradesh	ICAR, CSKHPKV, Palampur and Department of Animal Husbandry, Government of Himachal Pradesh	60

Survey under the Mission

Madhya Pradesh: Survey was conducted in the Bhind, Morena, and Sheopur districts of Madhya Pradesh. Two distinct populations - **Lahuri goat and Dang sheep** were explored in the ravines of the Chambal River, which are mainly reared under the pastoral system. Both populations were further characterized.

Uttar Pradesh: Survey was carried out in the Agra, Mathura, and Noida districts of Uttar Pradesh leading to the identification of one lesser-known goat population (**Battisi goat**) and a local buffalo population which was found to be unique. Characterization of these populations has also been initiated.

Tripura: Survey for the characterization of native chicken was conducted in the Sepahijala, Khowai, and Dhalai districts of Tripura. Phenotypic characters, reproduction performance, and utility of 105 indigenous chickens were recorded.

Tamil Nadu: Another survey to characterize the **Kombai dog** of Tamil Nadu was conducted in Chennai, Madurai, Thenni, and Thoothukudi districts. During the survey, information on body biometry, phenotypic characters, and management practices followed for about 105 adult dogs and bitches was recorded.

Himachal Pradesh: Characterization work of one native goat population, namely **Kotdhar** (Shiwalik) was initiated in

the Kangra, Bilaspur, and Hamirpur districts of Himachal Pradesh.

Nagaland: Phenotypic attributes and management practices on native pigs were recorded during the survey in the Dimapur, Peren, and Kohima districts of the state.

Bihar: Survey was conducted in various villages of Smastipur, Muzzafarpur, Sitamari, East and West Champaran, Gopalganj, Buxor, and Kaimur (Bhabhua) districts of Bihar for characterization and documentation of AnGR in the state. One goat, two pigs, and a poultry population were found to be uniform and will be taken up for further characterization.

Odisha: A survey for documentation of native AnGR was conducted in the Koraput, Malkangiri, and Puri districts of Odisha. Two new pig populations (**Burudi and Golla**) and one pony population (**Malkangiri**) were identified for further characterization.

Arunachal Pradesh: Four districts of the Siang and Debang regions of Arunachal Pradesh were surveyed for documentation of native AnGR. Two new populations - Native dog (**Eki**) and goat (**Arunachali**) were identified in the Siang region. Characterization of Eki dog, used for guarding, sniffing, and tracking Mithun has been initiated.

Research Accomplishments

Characterization of native goat and sheep of Chambal Division of Madhya Pradesh

A survey was conducted in 4 districts of the Chambal region of Madhya Pradesh in March 2022. Two new populations - **Lahuri goat** and **Dang sheep** were identified and further characterized.

Lahuri goat: Highly homogenous goat, distributed in the Sabalgarh area of Morena and Vijaipur, Birpur of Sheopur districts. These goats are medium type and both sexes are horned. Ear length is exceptionally long, reaching up to 28 cm in many cases. Horns are highly coiled. The goat is reared for meat purposes only. The goats are adapted for grazing in Dang-ravine areas of Chambal.



Lahuri goat

Dang sheep:

This native sheep population is distributed in the Bhind, Morena, and Shopur districts of the Chambal division. The population is more than 10 thousand animals. Sheep is medium in size and its wool is medium in thickness, dense, and slightly curled. The body color is creamish white with brownish patches on the face. Ears are leafy and folded from the midline. The tail is medium in length, not reaching beyond the hock. It is primarily reared for meat purposes.



Dang sheep

(Contributed by Dr. SK Niranjan)

Characterization of indigenous livestock and poultry genetic resources of Tripura

The survey for indigenous chicken was conducted in the villages of West Tripura, Gomati, Sepahijala, Khowai, and Dhalai districts.

During the survey, phenotypic characters, reproduction performance, utility, and management practices of about 180 local chickens were recorded from 73 farmers. The native chickens are mostly raised under the semi-intensive system of rearing, fed with broken rice and kitchen waste. Farmers reported 40-50% chick mortality up to 1 week of age which gradually decreases as the age advances. Diseases like Ranikhet, Infectious Bursal disease, enteritis, and



Indigenous poultry of Tripura

Salmonellosis are prevalent. Birds are provided with housing only during night time. The plumage pattern in most of the birds is of spotted type with varying plumage colors from brown, black, white etc. The tail feathers are sickle-shaped. More than 95% of the birds had medium to large-sized red-colored single comb. About 73% of the surveyed birds had yellow shanks and the remaining had grey to the grayish-yellow shank. All the birds had clean shanks i.e without feathers. The annual egg production ranged from 40-45 eggs and the laying period ranges from 12-15 days. The age at first egg ranges from 12-16 months with three clutches in a year with brooding. When the birds are not allowed for brooding, the clutch number may increase up to four in a year. Many farmers allow the hens to brood duck eggs also.

The local ducks are phenotypically similar to the Patti duck (registered duck breed) of Assam. Characterization of native Tripura buffalo has already been completed by ICAR-NBAGR. The indigenous pigs mainly belong to the Mali breed, which is a registered breed. The local indigenous chicken population has an admixture of plumage color and plumage pattern and does not have homogeneity in phenotypes. Hence, it cannot be categorized as a distinct population/breed.

(Contributed by Dr. KN Raja)

Characterization of Shivalik Hill goat of Himachal Pradesh

A visit was undertaken from 10th to 15th May 2022 to identify unique and uniform populations of different indigenous livestock species of Himachal Pradesh. During this visit, 3 districts viz. Kangra, Bilaspur, and Hamirpur were surveyed. A total of 36 Farmers of 17 villages of 4 Tehsils were interviewed. One uniform population of native goats was identified in the Bilaspur and Hamirpur districts. The characteristic of this goat is that it is small-sized (about 30 Kg body weight in male and 20-25 Kg in female) with white coat color with black spots or brown with white spots (mosaic pattern). Animals of brown, white, and black, colors with different color markings were also observed. The head is medium-sized, the forehead is straight in most animals, and the nose line is straight or slightly convex. Some animals have white strip lines on either side of the face from horns to nostrils. Horns are small, curved backward, and twisted. Ears are medium-sized; drooping, sometimes

tubular in shape, and comparatively smaller in comparison to Beetal. Hooves are dark grey or black.

Beetal bucks are supplied by the State animal husbandry department to upgrade the native goats which are diluting the local goat population unique to the Shivalik hill range. However, the farmers reported that there is less mortality due to diseases in the Desi goats. Long ears of the Beetal cause hindrance while moving through the bushes and trees of the hills during browsing. Ears are often lacerated during grazing. Therefore, farmers cut the long ears of the Beetal goat. On the other hand, desi goats with small body sizes and ears can move and graze more comfortably in this region. Farmers reported about 40% twinning and 50-55% dressing percentage for these goats. The kids are sold at the rate of Rs 5000-7000 /kid (<3 months) or Rs 10,000-12,000 per adult goat which is the main



Shivalik Hill goat

source of income (@Rs 500/ Kg live weight). Goats produce about 0.5 to 1 liter of milk per day which is mainly used to feed the kids.

(Contributed by Dr. Sanjeev Singh)

Characterization of Changkhi dog of Ladakh (UT)

A survey visit was undertaken in the Changthang area of Ladakh to characterize indigenous shepherd dog populations reared by Changpa nomads at an altitude of more than 14000-15000 feet. These nomads are also rearing native dogs locally known as Changkhi as a watch dog to guard their livestock including Changthangi sheep and Pashmina goat from wild animals and other predators. Two types of coat colors are observed in Changkhi dog viz. one with complete fawn or light brown color and animals

with a complete black coat with fawn or brown patches around eyes and face. The mean of height at withers, body length, chest girth, paunch girth, and tail length (in cms) were 63.31 ± 0.83 , 70.38 ± 1.10 , 73.15 ± 1.10 , 42.24 ± 0.51 , and 34.06 ± 0.67 , respectively. The age at sexual maturity in dogs ranges from 12-16 months. The age at first whelping is about 20 months. The utility of animals is mostly for guarding/ staking/herding the Changthangi sheep and goat breeds of the nomadic people of the Changthang region.



Changkhi dog

(Contributed by Dr. KN Raja)

Characterization of Combai dog of Tamil Nadu

One survey visit to characterize the Combai dog was conducted in various districts of Southern Tamil Nadu. Combai dogs are believed to be originated from

a village called Combai in the Theni district of Tamil Nadu and are reared by dog lovers as guard dogs for agricultural fields and farmhouses. They are found



Combai dogs

to be fairly distributed throughout Tamil Nadu. The animals are with a short coat and the coat color in the majority of dogs was observed to be reddish brown to light brown with a black muzzle and nostrils. Ears are medium in size and in

most animals they are drooping or semi-drooping type. The tail is long, tapering, and slightly curved in the distal portion. The dogs are alert, very aggressive, and loyal to their owner. Important biometric traits viz. height at withers,

body length, chest girth, paunch girth, and tail length, (in cms) are 54.14 ± 0.42 , 52.62 ± 0.38 , 63.03 ± 0.42 , 48.64 ± 0.60 and 32.41 ± 0.27 , respectively. The dogs are mainly utilized for guarding farmhouses.

(Contributed by Dr. KN Raja)

Characterization of colostrum of native cattle and yak of high-altitude region

Metabolomic fingerprints of milk colostrum were studied between two native bovines adapted to the high altitude of Leh-Ladakh: Ladakhi cows (LAC) and Ladakhi yak (LAC), in comparison to Sahiwal (SAC). A total of 45 defatted colostrum samples collected on the 0, 2nd, and 4th days of calving were lyophilized and subjected to NMR-based spectroscopy for metabolome data generation. The concentration of 46 metabolites was quantified in each spectrum and the resulting spectra were analyzed using the PROFILER-Module of CHENOMX. Partial least square discriminate analysis revealed a clear distinction of metabolic profile of milk colostrum of cows and yak from high altitude and tropically adapted Sahiwal cows. The majority of the metabolites were elevated immediately after calving (0 days) as compared to the 2nd and 4th

days in LAC, LAY, and SAC. Multivariate analysis demonstrated distinct clustering of colostrum metabolome in the subsequent days post-parturition. Additionally, the antioxidant data (DPPH, FRAP, and GSH assay, n=50) was recorded. The antioxidant content was maximum on 0 days and subsequently declines across all the breeds. The total available minerals were analyzed using Atomic Absorption Spectroscopy. Most of the minerals especially, Zn, Fe, Cu, and Mg were high in yak colostrum in comparison to Ladakhi and Sahiwal cows.

Since cow colostrum is a rich source of lactoferrin, an *in-silico* approach was followed to investigate the interaction of 47 bovine lactoferrin peptides (BLP) with the human ACE2 receptors, which is crucial for host-SARS-COV2 attachment and internalization. These

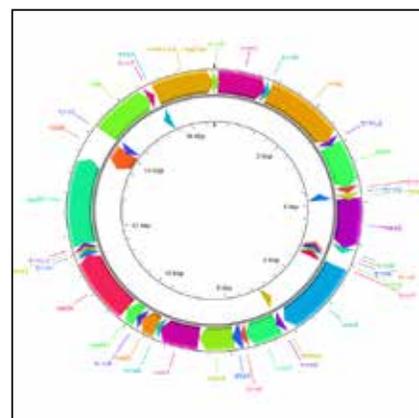
47 BLPs generated through the *in-vivo* digestion of bovine-lactoferrin and their 1507 spatiomers were modeled. The multi-microsecond, molecular dynamics simulation (MDS) trajectories of human ACE2 receptors were analyzed to generate the conformational representatives of the dynamic human ACE2 and, further to identify the top peptides with the highest binding affinity. The results suggest the strong binding potential of some of the bovine lactoferrin peptides and necessitate their evaluation as potential anti-viral agents against SARS-COV2. The study would provide a basis to develop strategies to utilize the milk of cows as a viable source of health-promoting bioactive peptides to increase resistance against SARS-COV-like viral infections.

(Contributed by Dr. Manishi Mukesh)

Whole mitogenome-based genetic diversity analysis of Indian sheep

Mitochondrial DNA (mtDNA) analysis is a widely used approach for assessing the maternal diversity, phylogeny, and population structure of livestock species. D loop and cytochrome b genes are the most extensively exploited regions of the mitogenome for unraveling molecular diversity and domestication events. The advent of next-generation sequencing technologies has opened vistas for elucidating the evolutionary relationships at the genome-wide scale. The complete mitochondrial genome sequences of 88

Indian sheep representing 22 breeds/populations (Bandur, Chevadu, Chokla, Chotanagpuri, Deccani, Ganjam, Garole, Jalauni, Katchaikatty Black, Kendrapada, Kheri, Hassan, Madgyal, Magra, Muzaffarnagari, Nellore, Patanwadi, Ramnad White, Sangamneri, Tiruchi black, Yalaga, and Rampur Bushair) were analyzed for the first time to get a comprehensive picture of the maternal diversity in the sheep genetic resources of India. The mitochondrial DNA sequence of all Indian sheep was observed to be



Representative structure of Indian sheep mitogenome

16617 bp long and contained 37 genes, including 13 protein coding genes, 2 rRNA genes, 22 tRNA genes, and a control region. Except for NAD6 gene and eight tRNA genes, all other genes were encoded on the heavy strand of the mitogenome. Sequence analysis of all 88 samples yielded a total of 84 novel haplotypes in Indian sheep, with an

overall haplotype diversity (Hd) value of 0.999, and nucleotide diversity (π) equal to 0.00183. The AMOVA analysis between the four separate clusters representing northern temperate, southern peninsular, eastern, and north-western arid and semi-arid regions attributed maximum genetic variance within the clusters and less variance between the

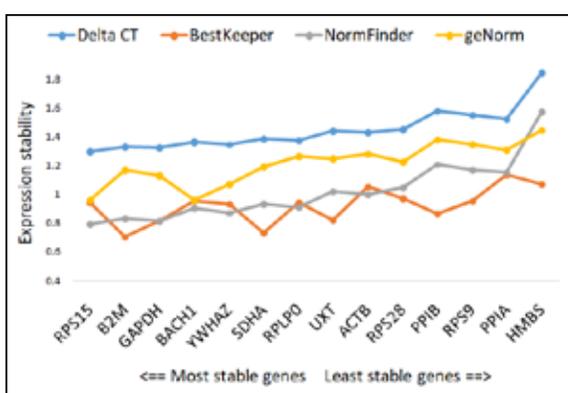
clusters. Phylogenetic relationships of Indian sheep were explored with five established ovine haplogroups (A-E) as well as wild sheep, which revealed a clear separation of domestic sheep from wild ones. Indian sheep showed conformity to haplogroups A and B reported across the world.

(Contributed by Dr. Reena Arora)

Identification of reference genes for haemoprotzoan diseases in bovines

Tick-borne diseases are known to cause a huge economic loss to the livestock industry throughout the world. Anaplasmosis, babesiosis, theileriosis, and trypanosomiasis are the four most prevalent haemoprotzoan diseases commonly occurring in the tropical and subtropical regions of the world. An attempt was made to identify suitable reference genes for gene expression studies on haemoprotzoan diseases in bovines. A total of 38 blood samples were collected from healthy as well as diseased cattle and buffaloes representing different tick-borne diseases. A systematic assessment of 14 potential reference genes (*RPLP0*, *ACTB*, *RPS28*, *YWHAZ*, *SDHA*, *PPIA*, *RPS9*, *RPS15*, *UXT*, *GAPDH*, *B2M*, *BACH1*, *HMBS*, and *PPIB*) was carried out for

the identification of the most stable normalizers for qRT-PCR of target genes in peripheral blood mononuclear cells (PBMCs) of bovines for diseases such as anaplasmosis, babesiosis, theileriosis, and trypanosomiasis. The comprehensive ranking of the genes was accomplished by the RefFinder tool that integrates the results of three algorithms (geNorm, NormFinder, and BestKeeper) and the comparative CT method. *RPS15*, *B2M*, and *GAPDH* were ranked to be the most stable genes, whereas, *PPIA* and *HMBS* emerged to be the least suitable genes. A panel of three reference



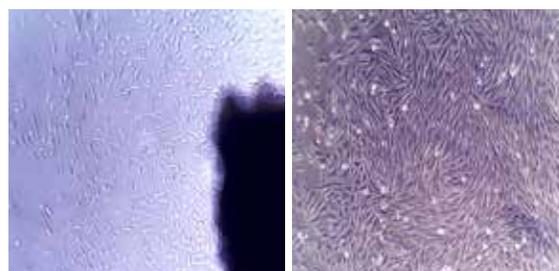
Gene expression stability values of all the selected reference genes for haemoprotzoan diseases

genes, including *RPS15*, *B2M*, and *GAPDH* could prove useful in delineating the transcriptional landscape of PBMCs for tick-borne diseases in bovines.

(Contributed by Dr. Sonika Ahlawat)

Germplasm cryopreservation

The germplasm repository at National Gene Bank, ICAR-NBAGR is being strengthened by preserving the diversified forms of animal germplasm (semen, somatic cells, and DNA) of indigenous livestock and poultry. During the period, a total of 44,860 semen doses of 17 native livestock breeds, including nine of cattle (Red Sindhi, Badri, Red Kandhari, Nimari, Deoni, Gaolao, Bhijarpuri, Ghumsar, Khariar) and 8 of goat (Ganjam, Jamnapari, Beetal, Berari, Osmanabadi, Sirohi, Sangamneri and Barbari) were cryopreserved in the National Gene Bank. Also, 540 somatic cell vials of 4 native breeds- Ghoongroo, Doom, Purnea Pig, and Purnea cattle were cryopreserved for long-term storage. Currently, the National Gene Bank has a repository of 24 native breeds/populations of livestock and poultry in the form of somatic cells and a total of 2,65,738 semen doses of 50 native livestock breeds.



a) Outgrowth of cells from tissue explant (dark) b) Fibroblast cells in culture

(Contributed by Dr. RAK Aggarwal and Dr. Rekha Sharma)

Important Activities

Population verification for breed registration

Scientists /experts visited the breeding tract of Kathani cattle in Garhchiroli and Gondia districts of Maharashtra and Sanchori cattle in Sanchor and Bhinmal block of Jalore district of Rajasthan for breed registration purposes. Similar visits were made for several other populations whose applications were in process during the period.

Outreach among farmers and public

Two teams of scientists visited rural areas of the Chambal division of Madhya Pradesh and Braj region of Uttar Pradesh and interacted with the livestock owners and veterinary field functionaries. The teams sensitized the people about the scientific management of the native AnGR. Bureau also participated in the State Livestock show held at Bhiwani from 25-27 February, 2022 and demonstrated the activities of the Bureau. About 20,000 visitors visited the NBAGR stall. Under "Mera Gaon Mera Gaurav", distribution of mineral mixture and deworming tablets was done among livestock rearers.

SCSP programme

Three interactive meeting camps were arranged in the villages of Sepahijala, Khowai, and Dhalai districts of Tripura under the SCSP program. A total of 30 beneficiaries belonging to the SC category were provided the kits containing the medicines, mineral mixture, feed, feeder, etc. Scientists along with AHD officers also interacted with farmers about the management and health practices to be followed in the animal husbandry sector. An awareness programme for the livestock keepers of Sikkim was also organized under the scheme.



Interactions with livestock keepers under the SCSP scheme

Linkages with state departments

Under the Mission towards zero non-descript AnGR of India, ICAR-NBAGR organized Interface Meets with six different states to develop linkages with the state animal husbandry departments. During the period under the report, linkages were established with Telangana, Punjab, Haryana, Madhya Pradesh, West Bengal, and Himachal Pradesh.

Activities in Ladakh (UT)

Meeting with hon'ble Lt. Governor & CEC

Director NBAGR along with Bureau scientist met the Hon'ble Lieutenant Governor of Ladakh (UT) Sh. RK Mathur at Raj Niwas on 27th May 2022 and apprised him about the characterization of native AnGR in the region. Lt. Governor lauded the efforts of the Bureau for Zero Non-descript AnGR mission in Ladakh. Bureau scientists also visited Sh Tyashi Gyalson, Hon'ble Chief Executive Councilor, Ladakh Autonomous Hill Development Council (LAHDC), Leh, and discussed the way forward for the Zero Non-descript AnGR mission in Ladakh.



Meeting with hon'ble Lt. Governor of Ladakh (UT)

Vichar Gosthi and Awareness camps

ICAR-NBAGR Karnal in coordination with the Animal Husbandry department of Ladakh (UT) organized four *Vichar Gosthi* and Awareness camps for the native farmers/ livestock keepers in different regions of Leh-Ladakh (UT) during 28-30 May 2022. The programs were organized in Khardung village with cattle and yak farmers; in Hunder village of Nubra valley with double hump camel owners; in Chibra village of Khargyam region with yak keepers; and Pholonglay village of Durbuk sector with Ladakhi cattle farmers.



Awareness camp at Khardung village of Ladakh (UT)

Azadi ka Amrit Mahotsav Lecture Series

Under the Azadi ka Amrit Mahotsav, webinars were organized through virtual conferencing for the benefit of staff and research scholars of ICAR-NBAGR as well as other ICAR institutes.

Webinars organized under AKAM

SN	Date	Speaker	Topic	No. of participants
1	14.01.2022	Prof. Vageshwari Deswal Faculty of Law, Delhi University	How contemporary India interprets gender equality?	73
2	27.01.2022	Dr. DK Sadana Principal Scientist (Retired) ICAR-NBAGR and Founder, Indigenous Livestock Society - India.	Pastoralism: Status and Future	88
3	25.02.2022	Dr. Subeer S. Majumdar Distinguished Professor, National Institute of Animal Biotechnology, Hyderabad.	Application of biotechnology for animal productivity enhancement	53
4	29.03.2022	Dr Smita Sirohi Adviser (Agri. & Marine Products), Embassy of India to the EU, Belgium and Luxembourg	Animal identification, animal breeding and international trade: EU legislation on Zootechnics	74
5	28.05.2022	Dr. BP Mishra Director, ICAR-NBAGR	Building a shared future with animal genetic resources biodiversity	47
6	01.06.2022	Sh. Rudra Dev Sharma Chief Manager, SBI, Model Town Branch, Karnal	Cyber security	35

Celebrations

Republic Day

On the occasion of Republic Day, Best Division, Best Section, and Best Employee (Technical, Administration, and supporting staff category) awards were conferred. The Animal Genetic Resources division was judged as the Best Division of the institute this year.



Republic Day celebrations

International Biodiversity Day, 2022

Bureau celebrated the "International Biodiversity Day" on 22nd May 2022. A webinar was organized on the topic "Building a shared future with Animal Genetic Resources biodiversity" and the talk was delivered by Dr. BP Mishra, Director, ICAR-NBAGR. Earlier, on 21st May 2022, Poster and Impromptu Speech competitions were also organized to create awareness about animal biodiversity conservation. The events attracted around 100 participants. All the winners were awarded on the occasion of International Biodiversity Day. The event was coordinated by Dr. Reena Arora and Dr. Sonika Ahlawat.



Glimpses of the International Biodiversity Day Celebrations

International Yoga Day

Bureau celebrated the "International Yoga Day" on 21st June 2022 and organized a Yoga session in the campus which was attended by the Bureau staff members.



Yoga session at the Bureau

Meetings

Research Advisory Committee

An online meeting of the Research Advisory Committee (RAC) of ICAR-NBAGR was held on 22nd February 2022 under the chairmanship of Dr. P Thangaraju, former Vice Chancellor, TANUVAS, Tamil Nadu. Current research programmes along with future activities of the institute were discussed.

IRC Meeting

The Institute Research Committee (IRC) meeting was held on 29th April, 2022 under the chairmanship of Dr. BP Mishra, Director, ICAR-NBAGR; wherein the ongoing and completed research projects were reviewed. New project proposals were also discussed during the meeting.

Visitors

- ♦ Dr. VK Saxena, ADG (AP&B), Indian Council of Agricultural Research, Krishi Bhawan, New Delhi visited on 17-18.02.2022.

- ♦ Sh. Pankaj Kumar, Director (AS), Indian Council of Agricultural Research, Krishi Bhawan, New Delhi visited on 19.05.2022.



Director (Finance), ICAR interacting with the scientists

- ♦ Sh. GP Sharma, Director (Finance), Indian Council of Agricultural Research, Krishi Bhawan, New Delhi visited on 04.06.2022.

- ♦ A group of 25 students of Diploma courses from Guru Nanak Khalsa (PG) College, Yamunanagar under NSQF scheme of UGC visited on 04.06.2022 for understanding the importance of animal genetic resources.

- ♦ Mr. Mariano J. Beillard, Senior Regional Agricultural Attache, and Dr. Santosh Kumar Singh, Senior Agricultural Specialist of U.S. Embassy, New Delhi visited ICAR-NBAGR, Karnal on 22.06.2022.



US Embassy delegates with the Director, ICAR-NBAGR

Personnel

- ♦ Sh. Ranjit Singh, Administrative Officer, superannuated on 28th February, 2022.



Best wishes to Sh. Ranjit Singh

- ♦ Dr. RS Gandhi, Principal Scientist & Head, AGR Division, ICAR-NBAGR, Karnal superannuated after completing about 36 years long professional journey and 27 years of service to the ICAR, on 30th April 2022. Dr. Gandhi joined NBAGR in March 2020 as a Principal Scientist. Previously he was Assistant Director General (Animal Production & Breeding), at ICAR Headquarters, New Delhi (Sept. 2013 - March 2020).



Bidding adieu to Dr RS Gandhi

- ♦ Sh. Anil Kumar, Administrative officer and Sh. Randhir Singh, Finance and Accounts Officer joined ICAR-NBAGR, Karnal on 21st May, 2022.

हिंदी प्रकोष्ठ

- ♦ संस्थान में राजभाषा हिंदी के प्रचार-प्रसार और राजकीय कार्यों में इसके प्रगामी प्रयोग को बल देने हेतु संस्थान में 26 मार्च 2022 को एक हिंदी कार्यशाला का आयोजन किया गया।



हिंदी कार्यशाला

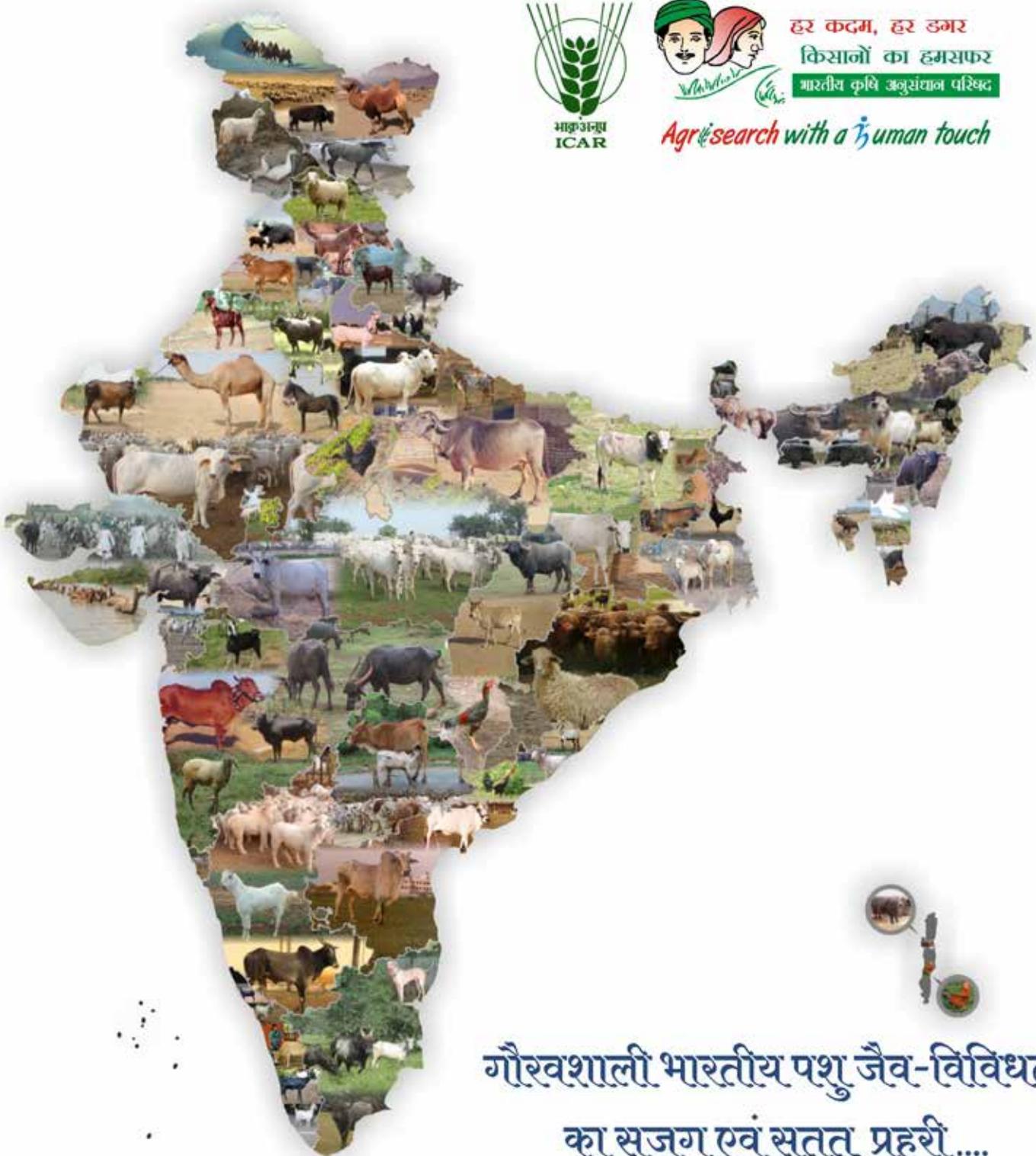
- इसका विषय "राजभाषा हिंदी : नियम, अधिनियम एवम विनियम" रखा गया था। इस कार्यशाला हेतु भाकृअनुप-राष्ट्रीय डेरी अनुसंधान संस्थान के उप-निदेशक (राजभाषा) श्री धीरज शर्मा वक्ता रहे। संस्थान के सभी वर्ग के कार्मिक इस कार्यशाला में उपस्थित रहे।
- ♦ हिन्दी में उत्कृष्ट कार्य हेतु संस्थान राजभाषा शील्ड पुरस्कार से सम्मानित: वर्ष 22-2021 के दौरान राजभाषा में उत्कृष्ट कार्य हेतु राष्ट्रीय पशु आनुवंशिक संसाधन ब्यूरो को नगर राजभाषा कार्यान्वयन समिति (करनाल) द्वारा 75वीं बैठक में दिनांक 7.6.22 राजभाषा शील्ड (द्वितीय) पुरस्कार से सम्मानित किया गया।

ICAR-NBAGR



हर कदम, हर डगर
किसानों का हमसफर
भारतीय कृषि अनुसंधान परिषद

*Agri*search with a *ह*uman touch



गौरवशाली भारतीय पशु जैव-विविधता
का सजग एवं सतत प्रहरी....