

DANGI

CATTLE OF HEAVY RAINFALL TRACT OF WESTERN
GHAT (MAHARASHTRA) INDIA



Dr. P.J. Kapadnis
Deputy Director Research

Introduction

Livestock is an integral part of agriculture in India, cattle genetic resources is an important component of farm animal genetic resources. It comprises 190.90 million cattle 37.28% of the total livestock population. (Livestock Census 2019) and its diversity is represented by 39 well characterized breeds. Dangi is one of them (NBAGR). These cattle contribute in terms of nutritious milk, draught power, dung and in other agriculture operations. However, by each passing day, huge cattle genetic resources of India is either depleted because of facing varying degrees of threat of extinction in the absence of suitable model for genetic improvement and conservation. Depletion of cattle genetic resources is also evident from figures of 19th livestock census report where, it has been mentioned that cattle genetic resources of India has decreased by 3.14% during 2007 to 2012, with an overall decline of 3.3% in total livestock population (Livestock Census (2019)).

Dangi breed of cattle had taken its name from a tract of the country in Gujarat state known as Dangs. This is the home tract of this breed. Another thought is that “Dang” means mountain (Marathi) and these animals generally live in hilly areas. The breed is considered as an outcome of breeding between local and Gir cattle. The area is covered by the northern portion of Western Ghats. This tract comprises the hilly and heavy rainfall areas of Ahmednagar (Akole tehsil), Nasik (Sinner and Igatpuri tehsils), Thane (Jawhar) districts of Maharashtra and Dangs of Gujrat states. Generally, these animals are found near the hilly tract where forest covers the ranges of Sahyandry (Western Ghat). The Dangi animals are well adapted to heavy rainfall conditions as their skin exudes an oily secretion which protects them from heavy rain.

History/Habitat

The communities responsible for developing the Dangi breed are Hatwar Kanadi, Talwar Kanadi, Konkana, Mahadeo Koli and tribal like Katkari, Vanjari and Thakur.

The kanadies migrated with their Dangi animals from Telangan region of Andhrapradesh and Bijapur, Gulbarga districts of Karnataka. During Nizam’s rule these people, who loved their animals were compelled to take their animals and migrate to different areas wherever the forest existed. The Kanadies are divided into Talwar and Hatwar Kanadi. Talwar Kanadies are known as fighters. 40 villages in Akole taluka earlier were known as Danganpatta and therefore probably the breed is named Dangi. Talwar kanadies migrated towards Ahmednagar district (Akole, Sinner, Nandgaon, Yeole and Shahapur), While the others (Hatwar etc.) stayed near Kondavan Dongar (Kodhani & Akole) and in the basin of rivers Pravara, Mula and Andhala. The kanadies rear the animals and basically are farmers who worship the Dangi cow as goddess “Laxmi” (*Survey, Evaluation and Characterization of Dangi Cattle Breed, Network Project by NBAGR/BAIF, 2003*).





Fig 1. Geographical Map of Maharashtra state (Dangi animals’ distribution)

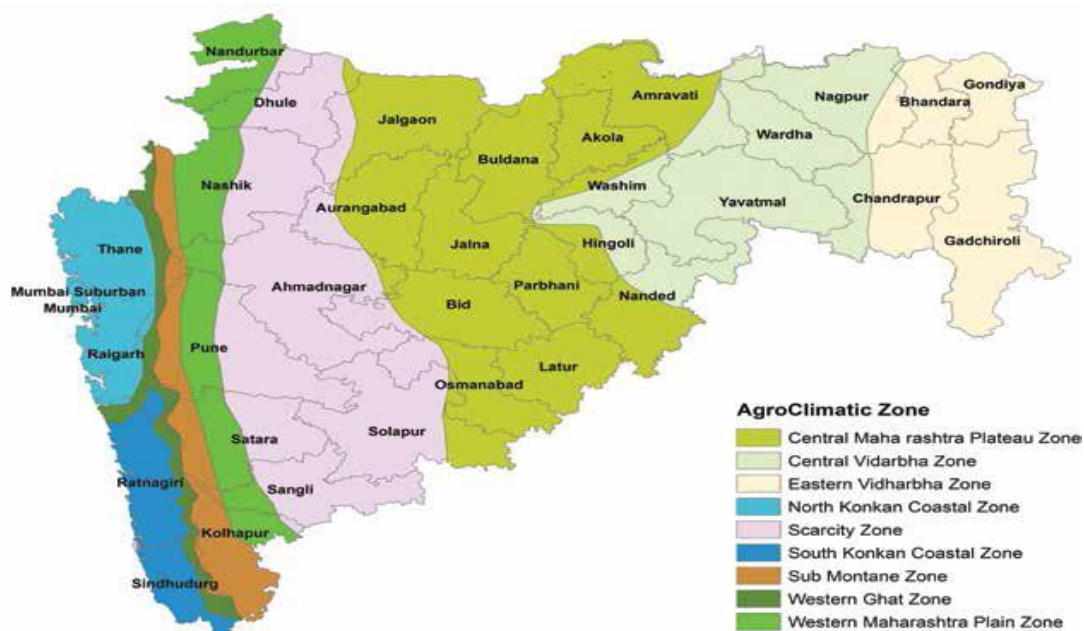


Fig.2 Map of Maharashtra state with different agro climatic zones

(Western Ghat Zone: Nasik-Igatpuri & Sinner, Ahmednagar-Akole and Thane-Jawhar, Dangi animals breeding tract)

Populations Size:

The total Dangi cattle population in Maharashtra state was recorded to be 90.2 thousand. The district wise availability of Dangi animals was recorded as 29.5 thousand in Ahmednagar, 26 thousand in Nasik and 26.5 thousand in Thane districts as per 18th Livestock census (Livestock Census (2007).

Breeding tract and climate: The Dangi cattle breed is distributed in the Western Ghat region of Maharashtra state in the area of 34,286 sq. km. The breeding tract lies at north latitude from 18⁰²’ to 20⁵²’ and 73⁰¹⁶’ to 75⁰⁵’. The soil varies from black to grey and is of inferior quality having poor quality of fertility. The soil is undulating and very coarse at higher elevation and having poor fertility. The land elevation from mean sea level ranges from 500 to 1900 meters. The average

temperature degree varies from 7.6⁰C to 39.37⁰ C. The humidity range is between 14% to 94% with the average rainfall of 668 mm. The maximum land is covered by forests and only a small percentage of land is under farming. Main cultivated cereals/pulses are Rice, Bajara, Millet, Jawar, Maize, Tur, Gram, Mung and Udid . Cereals and pulses are used for human consumption and straws are used for animal feeding as dry fodder. Major fodder source for animals is the grasses. The grasses of Kunda, Pavana, Ber, Marvel, Kusali and Dashrath are found in the forest for grazing. The tree leaves of UMBER, Bhendi, Subabhul, Bibla and Bamboo are consumed by animals. The concentration of Dangi animals are found more in Sinner and Iगतपुरी tahsila of Nasik, Akole tahsil of Ahmednagar and Jawhar tehsil of Thane district of Maharashtra state. These animals are also found in Dang district of Gujarat state.

Socioeconomic status of the farmers:

Majority of the Dangi animal rears are involved in agriculture farming activities and most of them are farmers and agriculture labours nourishing the Dangi animals for agriculture purpose and their livelihood.



Photo1. Preparation of land for Rice cultivation

Physical and Qualitative Characters of Dangi Animals:

Colour Pattern: Six different hair colour patterns were found in Dangi animals. Skin colour of Dangi animal is white but black, red colours spots are distributed all over the body. According to coat colour there are six different strains of dangi animals. These strains are known by local names.

BAHALA (white with black patches)

Photo 2. PARA-BAHALA (Para): (80/70 % white & 20/30 % black)

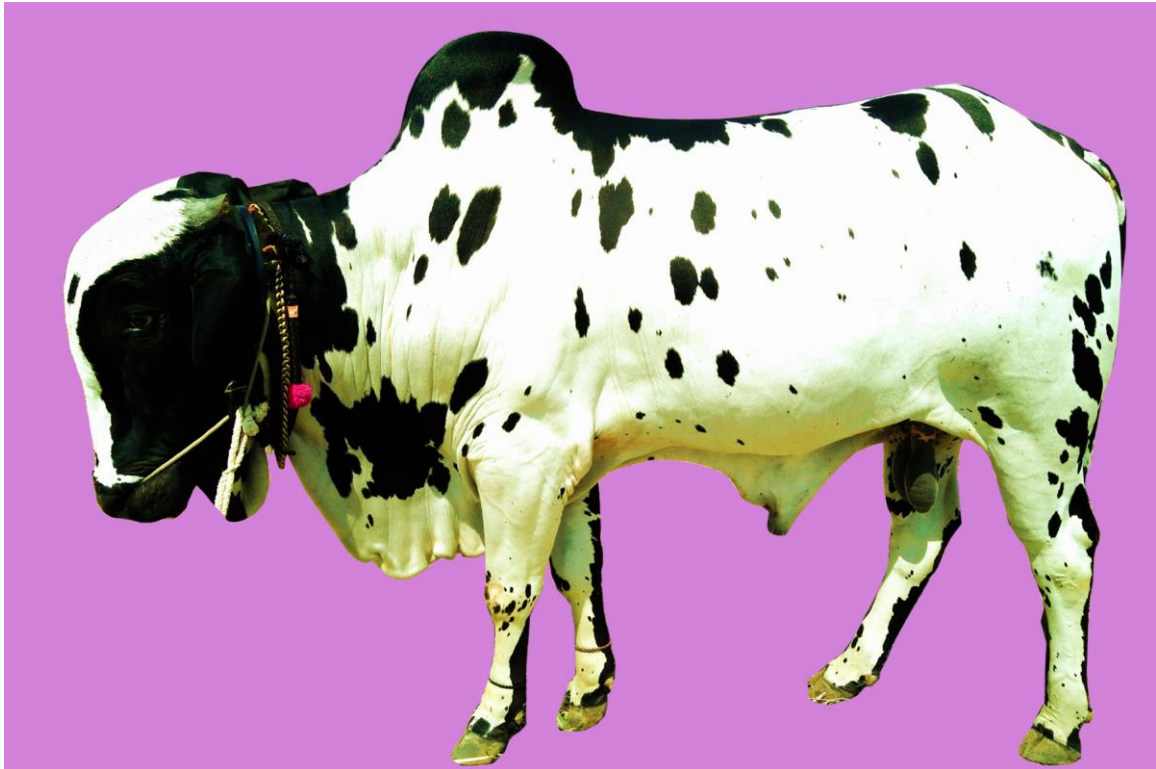


Photo 3. NILA –BAHALA (Kala Bahala): (50/60 % black & 50/40 % white)



Photo 4. KAALA MOGRA(Maneri): (95/100% black with slight white spot 5%)



Photo 5. KHAIRA BANDA/PARA MASOORA: [90 % grey with sparse black spots (Rare 2/3 %)]



Photo 6: LAAL BANDA- (tan/red 40/50% remaining portion white)



Photo 7. SHEWRA- (dense black small spots on almost all body parts 90%)



Though there is a distinct colour pattern, their body confirmations remain almost same. However, para-bahala is being treated locally as the purest form of dangi animals fetching high market price.



Hair characters: -

Length - short

Sheen - glossy

Curl - straight

Horn: Short, Medium size, Thick, Black to Blackish in colour, half-moon shape, Erupting close to pole orientation, Backward pointing but tip are forward directed.

Head: Small disc shape, slightly bulging forward, convex with ridge in center straight up to muzzle, White star on forehead in majority of animals.

Chick, muzzle, eyelid, hooves & tails witch: Black in almost all animals except tan coloured in which they are tan colour.

Ear: Black, medium size, vertically/horizontally oriented.

Hump: Large to Medium in males & Medium to Small in female animals.

Dewlap: Large to Medium pendulous in males & Medium in female

Naval flap: Medium

Penile sheath: Large to Medium

Udder: Bowl shape medium to small in size, compact, mostly fore udder slightly larger than hind udder, milk vein not prominent, Teats are medium to small in size, cylindrical in shape, tips are pointed.

Biometry of Dangi animals:

Sr. no	Particular	Male	Female
1	Height (Avg.cm)	117	113
2	Body Length (Avg.cm)	129	122
3	Heart Girth (Avg.cm)	154	139
4	Weight (Avg. Kg)	317	228
5	Birth Weight (Avg Kg)	18.2	16.8
6	Pre- weaning weight	66.86	67.03
7	12 months weight	98.12	101
8	24 months weight	133.12	130.31
9	Weight at first mating	277.59	-----
10	Weight at first calving	-----	253.69

Management Practices: -

Herd Size: -The number of Dangi cattle in a farmer’s herd varied from 10 to 100 animals. The ratio of breedable male and females in the herd is about 1:10. The young calves generally do not form the part of herd sent for grazing.

Housing: -Majority of the farmers are providing housing to the animals during night time only. Whenever housing is provided, majority of the respondent were keeping their animals in close housing, just beneath their residence. The housing for the animals was kaccha type and made up of woods and dry fodder or the tree leaves. Very few farmers were providing pacca housing facilities. Flooring of the housing was mostly Kaccha type made up of mud and stones. The majority of the farmers having their animal’s houses near residence or as a part of their residence was with full housing for the protection of their animals from the rain, wind and wild animals.

Feeding:-Dangi cattle go for grazing in the morning and return in the evening. Women farmer play an active role in rearing of Dangi cattle. Green fodders for the animals were available mostly in the form of green grass. The other sources of green fodder like maize and sorghum were also noticed. Dry grass sorghum straw and Paddy straw were the major source of dry fodder for the Dangi animals. The concentrates provided to the animals were cake and husk of sorghum and rice.

Well is the major source of water for the animals followed by river, nala, lake, and house.

Health care:-No specific disease pattern noticed in breeding tract, however, the incidence of the FMD, HS and BQ is observed. The other disease conditions observed were enteritis, pneumonia. A very few farmers used to vaccinate animals for FMD, HS and BQ.

Breeding:-Dangi breeding bulls are used to propagate the population through natural service. Good breeding bulls are present in the field. The breeding bulls, bull calves are distributed to the farmers from cattle breeding farm, and Igatpuri. A very few cattle owners are aware of Artificial Insemination.

Production and Reproduction: -Dangi cattle is draft purpose breed and poor milkers. The milk yield and other production parameters are given below-

Production and Reproduction performance of Dangi animals

Particular	Average
Age at first estrus	43.31
Oestrous cycle duration(days)	20
Oestrous duration (hrs)	24
Age at first calving(months)	52
Number of services per conception	2.21

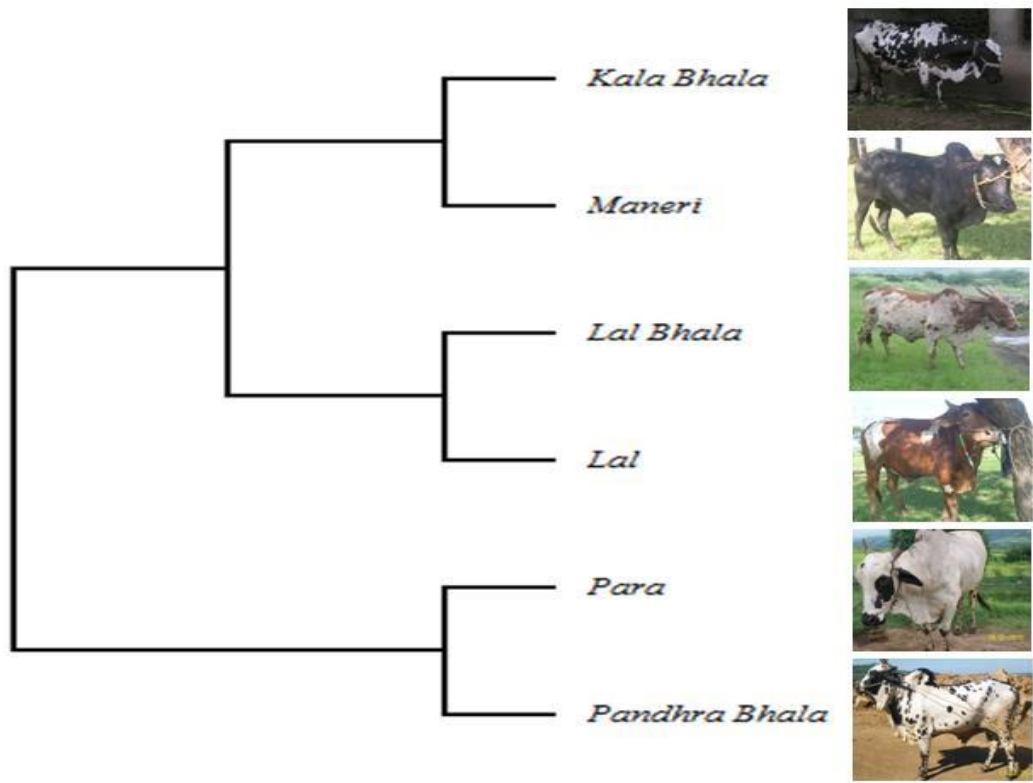
Service period(days)	295.72
Calving interval(months)	19
Gestation length(days)	275.11
Male-Age at first ejaculation (days)	1123
Age at first mating (days)	1256
Dairy Performance	
Daily milk yield (lits)	1.53
Peak milk yield(lits)	2.75
Lactation length(days)	248
Milk yield per lactation (Kg)	343
Milk Fat (Percent)	4.3

(Source: Network Project on AGR 2003)

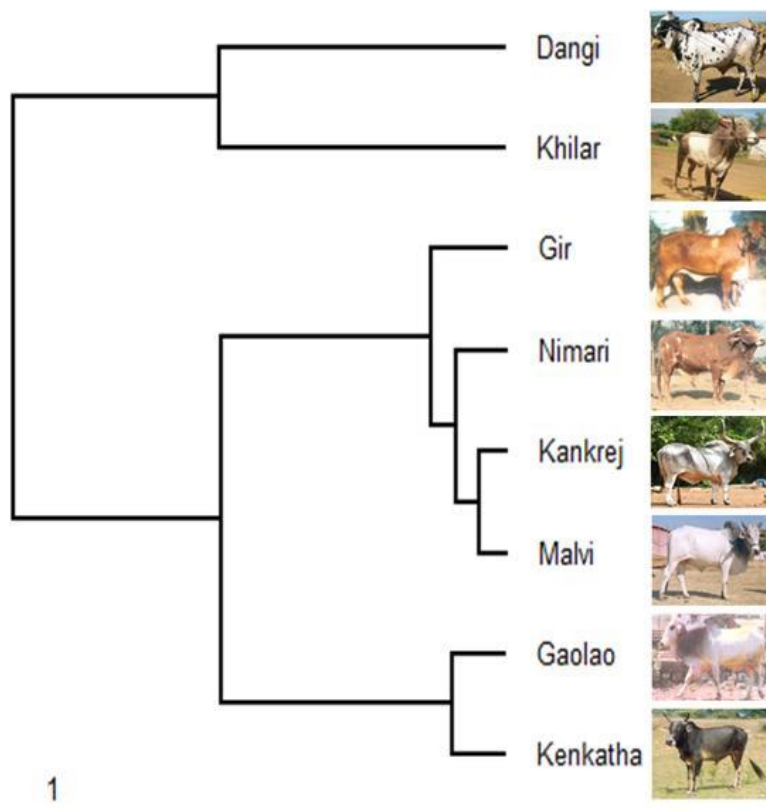
Molecular Characterization:

Molecular characterization of Dangi cattle was carried out by collecting 148 blood samples from the Tahasil - Igatpuri from Nasik District, Tahasil -Akole from Ahemadnagar District of Maharashtra and Dang- District from Gujrat. For genetic characterization of Dangi cattle breed, 25 fluorescently labeled Microsatellite DNA markers (recommended by FAO, MoDAD programme) were used, of which 24 pairs showed good amplification. The phylogenetic analysis of five different strains of Dangi cattle revealed *Phandhra Bhala* and *Para* make one group, similarly *Kala Bhala and Maneri* and *Lal Bhala and Lal*, which represent that their considerable mixture with their pure strain. The result denotes three distinct groups of Phandhra Bhala and Para, Kala Bhala and Maneri and Lal Bhala and Lal strains of Dangi breed of cattle. The close kinship between these strains might suggest past crossing between these geographically close different strains of breeds which suggest the possibility of genetic admixture between these different strains of breeds.

Dendrogram showing Genetic Distances between different strains of Dangi Cattle populations.



Dendrogram showing Genetic distances between Dangi, Khillar, Gir, Kankrej, Malvi, Nimari, Gaolao and Kenkatha Cattle populations.



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Cytogenetic Characterization

The cytogenetic characterization of Dangi cattle revealed diploid chromosome complement $2n = 60$. It comprised of 29 pairs of autosomes and one pair of sex chromosome. The X chromosome was submetacentric and found to be second largest in the complement. The Y chromosome was acrocentric and occupied position between 27th to 29th pair of autosomes among the Dangi cattle complement. The mean relative length (MRL) of autosomes varied from 1.856 to 6.006 per cent in male and 2.081 to 5.788 percent in female Dangi cattle. The MRL of X chromosome was 5.768 in male and 4.981 per cent in female. The MRL of Y chromosome was 1.930 per cent in Dangi cattle. The GTG band pattern of X chromosome showed distinct negative G band at centric region of q arm while Y chromosome showed a prominent dark band near the centromere (Project report 2011).



GTG banded karyotype of male Dangi Cattle

Complete blood count of Dangi cattle of Cattle Breeding Farm, Igatpuri was made. The average values found were given in table-

Hb g%	RBCx 10 ⁶ /cmm	WBC X10 ³ /cmm	PLT X10 ⁵ /cmm	PCV%	MCV fl	MCH pg	MCHSg/dl	N%	E%	L%	M%
9.93	6.20	9.06	225.46	29.55	49.15	13.54	33.57	37.71	2.68	54.7	0.71

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