

Donkey Genetic Resources of India
SINDHI DONKEY

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Department of Animal Husbandry, Rajasthan



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Sindhi donkeys carrying water

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PREFACE

The donkey is a sure footed, docile, hard working animal. It provides us with useful draught power and is comparatively easy to maintain requiring minimum care. Although, with the development of the road network and increased mechanization, their population has come down drastically, they are still employed for transportation in the hilly and desert regions all over the world including our country. Despite their usefulness, especially for the marginal sections of the society, this species has remained neglected. Although little information has been generated on the type of donkeys or their breeds available in our country, some distinct populations and breeds of indigenous donkeys are known to exist in our country.

The Sindhi is one of such breeds. The Sindhi donkeys are reared in Barmer and Jaisalmer districts of Rajasthan. They are well adapted to the hot-arid environmental conditions of the region and provide useful draught and traction power. An attempt has been made to compile information on physical characteristics, management practices, geographical distribution, reproductive parameters, important ailments and genetic variability of the Sindhi donkeys. It is expected that this documentation will be useful to the researchers and policy planners in devising conservation strategies and undertaking breed improvement programmes for the Sindhi donkeys.

The authors take this opportunity to thank all the persons and agencies who have initially generated information on various aspects of the Sindhi breed of donkeys. We gratefully acknowledge the invaluable help received from Animal Husbandry Department, Rajasthan, especially, Director; Deputy Director, Barmer and Mr. Noor mohammed, LSA, VH, Mithra, Barmer in undertaking survey. We are also thankful to the Photography Section of the NBAGR for kindly providing the photographs.

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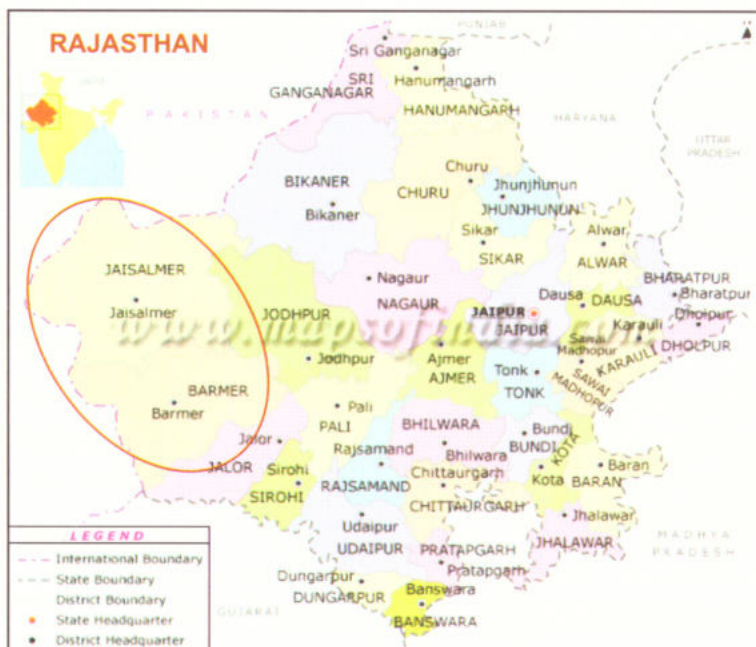
INTRODUCTION

The donkey (*Equus asinus*) is a sure footed draught animal used for carrying packs, pulling carts and even ploughing especially in the difficult terrains. As they require minimum care and input for their maintenance and productivity, they are very useful for the marginal and weaker sections of the society with limited resources at their disposal. Despite their significant contribution, the donkey has remained a neglected species often overlooked by extension workers, scientists, planners and policy makers in the livestock sector. Very little information is available regarding types or breeds of donkeys available in India as well as their physical characteristics, management practices etc. However, some distinct populations or breeds of donkeys are found in our country. The Sindhi is one of such breed of donkeys. The Sindhi donkeys have been reared in Barmer and Jaisalmer districts of Rajasthan, which border the Sindh province of Pakistan, since time immemorial. They are also known as the Marwari donkeys.

The donkeys of the Sindhi breed are very strong and well adapted to survive and work in hot-arid environmental conditions as well as feed, fodder and water scarcity endemic to this region. They have incredible stamina. They can easily move and cover fairly long distances on sandy tracts. The Sindhi donkeys are able to carry about 100 kg of load as back pack. They are also used extensively in carting and ploughing.

GEOGRAPHICAL DISTRIBUTION AND POPULATION

The Sindhi donkeys are mainly distributed in the Barmer and Jaisalmer districts of Rajasthan. This region forms part of the Thar desert having annual rainfall of less than 30 cm. So, the natural vegetation is sparse and xerophytic. The main crops grown in the tract are pearl millet (*Pennisetum typhoides*), moth (*Phaseolus aconitifolius*), bengal gram (*Cicer arietinum*) and barley (*Hordeum vulgare*). Psyllium (*Plantago ovata*) is grown as commercial crop.



Breeding tract (in circle) of Sindhi donkeys in Rajasthan state

As per 2007 livestock census, the donkey population in Barmer and Jaisalmer districts were 20875 and 10279, respectively and majority of them conform to the Sindhi phenotype. With the better road development and increased mechanization, the population of donkeys is showing a declining trend in this region also.

MORPHOLOGICAL CHARACTERISTICS

The donkeys of the Sindhi breeds are of the smaller size with leaner built. The predominant coat colour is light brown with small percentage of brown and grey animals. Within the light brown animals the dun dilution is predominant and silver, grey or roan dilution are also quite common. The belly, inner surfaces of legs, ventral side of neck and inner sides of ears are generally of lighter shade or white in most animals. The major white marking are around muzzle and around eyes. In some animals primitive dun markings are also present on legs and other parts of the body. The small manes are present which are usually of darker shade than the rest of the body colour.

The face is longer and thinner with an average length of 46.5 ± 3.22 and 45.8 ± 3.1 cm, in male and female Sindhi donkeys, respectively. The forehead is slightly convex. The nasal bone is straight to slightly concave. The ears are straight, erect with slightly lateral orientation having an average length of about 22.6 ± 1.63 in males and 22.3 ± 1.88 cm in females. The eye colour is dark brown or black.



Male donkey of Sindhi breed



Female donkey of Sindhi breed

The head is supported by strong neck having an average length of 34.2 ± 3.18 and 34.1 ± 3.95 cm in male and female animals. The heights at wither of male and female animals of this breed are 98.8 ± 3.9 and 97.9 ± 4.9 cm, respectively. The body lengths of male and female animals are 93.1 ± 5.02 and 93.4 ± 6.45 cm, respectively. The estimated weights (Parker, 2003), of adult (above 3 years) male and female animals are 84.9 ± 10.12 and 89.5 ± 14.57 kg, respectively. The chest girths of these donkeys are 104.3 ± 5.35 (males) and 106.5 ± 5.97 cm (females). The back is strong and straight to slightly concave. The fore arm and gaskin lengths in male animals are 35.2 ± 3.55 and 41.5 ± 3.32 cm. Whereas, in female animals, the fore arm and gaskin lengths are 33.9 ± 3.62 and 39.9 ± 3.13 cm. The canon lengths for fore and hind limbs vary between 16-23 and 26-32 cm, respectively. The hoof circumferences of fore and hind limbs are 22.5 ± 1.29 and 21.5 ± 1.28 cm, in male animals. Whereas, the hoof circumferences of fore and hind limbs of female animals are 21.7 ± 1.34 and 20.9 ± 1.26 cm, respectively. The Tail extends slightly beyond hocks. The tail lengths of male and female animals are 52.1 ± 4.42 and 51.1 ± 4.56 cm, respectively. The tail switch is distinguishable and of darker colour than rest of the body colour in most animals.

Although, no significant differences were found between male and female animals in the morphometric parameters of head and main body like height at withers, body length, heart girth, neck length, chest width and estimated body weight etc. However, significant differences were observed between male and female animals in some of the limb parameters like canon length, canon circumference, pastern circumference and hoof circumference with male animals showing higher values. The detailed morphometric parameters for the male and the female Sindhi donkeys are given in table 1.

REPRODUCTIVE CHARACTERISTICS

The main breeding season for the Sindhi donkeys is from March to September but they are known to breed throughout the year. The age of puberty for the male animals is 1.5-2.0 years. The age at first service is 2.0-2.5 years. Natural breeding methods are adopted. It is preferred to mate the females with the selected Jack but

Table 1: Morphometric characteristics of donkeys of the Sindhi breed

Parameter	Male		Female	
	Mean (cm)	Range (cm)	Mean (cm)	Range (cm)
Body length	93.1±5.02	84-103	93.4±6.45	82-105
Height at wither	98.8±3.9	89-109	97.9±4.9	87-105
Heart girth	104.3±5.35	95-118	106.5±5.97	95-116
Face length	46.5±3.22	39-52	45.8±3.1	40-52
Face width	17.5±1.19	15-20	17.3±1.5	15-21
Ear length	22.6±1.63	20-26	22.3±1.88	19.5-26
Neck length	34.2±3.18	29-40	34.1±3.95	24-46
Chest width	20.6±2.41	16-26	20.4±1.67	16-22
Tail length	52.1±4.42	43-65	51.1±4.56	43-62
Fore arm length	35.2±3.55	23-40	33.9±3.62	27-39
Gaskin length	41.5±3.32	32-48	39.9±3.13	34-47
Canon length (FL)	19.7±1.42	16-23	19.0±1.38	16-22
Canon length (HL)	28.4±1.51	26-32	27.3±1.62	24-30
Canon circumference (FL)	12.7±0.78	11-14.5	12.0±0.96	10.5-15
Canon Circumference (HL)	13.3±0.84	11.5-15.5	12.7±0.75	11-14
Pastern length (FL)	7.2±0.96	6-10	7.5±0.96	6-9
Pastern length (HL)	7.0±0.69	6-8	7.0±0.71	6-8
Pastern Circumference (FL)	13.0±1.20	11-17.5	12.2±0.61	11-13.5
Pastern circumference (HL)	13.4±1.07	12-16.5	12.6±0.99	10.5-14
Hoof length (FL)	5.7±0.60	4.5-7	6.0±0.62	5-7
Hoof length (HL)	5.6±0.63	4-7	5.8±0.53	5-7
Hoof circumference (FL)	22.5±1.29	19.5-25	21.7±1.34	19-24.5
Hoof circumference (HL)	21.5±1.28	19-25	20.9±1.26	18-24
Estimated body weight (kg)	84.9±10.12	68.7-108.4	89.5±14.57	68.9-118.5

* FL-fore leg, HL-hind leg

not strictly followed as castration is not done in all the remaining males. The Jacks are selected on the basis of the criteria like general health of the animal, working ability, agility, good looks, erect ears, lustrous eyes etc.

The age of puberty for the females is 1.5-2.0 years. The duration of estrus is 4-10 days. The age at first conception is 2.0-3.0 years. Generally, two or three services are required for successful conception. The gestation period is 12-12.5 months. The age of first foaling is 3.0-4.0 years. The foals are allowed to move along with their mothers from very early age. About 8-10 foalings are expected in the life span of about 15 years.

MORPHOMETRIC CHARACTERISTICS OF YOUNG ANIMALS

The detailed morphometric measurements for the young animals of the Sindhi breed at different age groups are given in table 2. The mean heights at withers of less than 1 year, 1-2 years and 2-3 years old animals are 84.0 ± 2.0 , 89.8 ± 2.75 and 91.0 ± 2.20 cm, respectively. The heart girths at these age groups are 83.7 ± 4.73 , 90.8 ± 5.12 and 94.2 ± 5.86 cm. The body length increases from 71.8 ± 4.62 (<1year) to 78.5 ± 3.7 (1-2 years) and 84.6 ± 2.2 cm (2-3 years). The fore arm length increases from 27.8 ± 1.18 (< 1year) to 30.5 ± 2.65 (1-2 years) and 37.0 ± 2.12 (2-3 years). The gaskin length increases from 34.5 ± 2.12 (< 1year) to 36.3 ± 1.26 (1-2 years) and 37.7 ± 2.14 cm (2-3 years). The canon lengths for the fore/hind limbs are $18.3 \pm 0.35/25.4 \pm 1.06$, (1year), $18.3 \pm 1.71/27.1 \pm 1.65$ (1-2 years) and $18.6 \pm 0.98/26.1 \pm 1.69$ cm (2-3 years). The canon circumferences for the fore limbs of animals of less than 1 year, 1-2 years and 2-3 years of age are 9.5 ± 0.71 , 11.38 ± 0.48 and 11.0 ± 0.41 cm, respectively. The canon circumferences for the hind limbs at these age groups are 10.3 ± 0.35 , 11.6 ± 1.18 and 12.0 ± 0.71 cm. The hoof circumferences for the fore limbs at less than 1 year, 1-2 years and 2-3 years of age are 17.3 ± 0.35 , 20.1 ± 0.85 and 20.1 ± 0.69 cm, respectively. The hoof circumferences for the hind limbs at these age groups are 16.3 ± 0.35 , 19.1 ± 1.65 and 19.1 ± 0.93 cm. The mean estimated weights of Sindhi donkeys of less than 1 year, 1-2 years and 2-3 years, calculated using formula for the horses, are 42.0 ± 6.3 , 54.4 ± 7.03 and 63.2 ± 7.5 kg, respectively.

Table 2 : Morphometric characteristics (cm) for young animals of the Sindhi breed

Parameter	< 1 year		1-2 years		2-3 years	
	Mean	Range	Mean	Range	Mean	Range
Body length	71.3±4.62	66-74	78.5±3.7	75-83	84.6±2.20	81-88
Height at wither	84.0±2.0	82-96	89.8±2.75	87-93	91.0±2.93	87-96
Heart girth	83.7±4.73	80-89	90.8±5.12	84-96	94.2±5.86	83-106
Face length	38.0±4.0	34-42	38.3±5.06	32-44	42.1±3.21	37-46
Face width	14.7±1.53	13-16	15.5±0.58	15-16	15.2±1.52	13-18
Ear length	20.7±2.08	19-23	19.8±2.99	16-23	20.5±1.41	19-22
Neck length	26.3±3.06	23-29	31.8±3.30	28-35	29.4±3.95	24-35
Chest width	17.3±2.31	16-20	18.0±2.94	15-22	17.1±1.30	15.5-19
Tail length	38.7±1.53	37-40	44.8±1.89	42-46	46.9±4.60	40-55
Fore arm length	27.8±3.18	25.5-30	30.5±2.65	27-33	32.2±2.1	229-35
Gaskin length	34.5±2.12	33-36	36.3±1.26	35-38	37.7±2.14	34-40
Canon length (FL)	18.3±0.35	18-18.5	18.3±1.71	16-20	18.6±0.98	17-20
Canon length (HL)	25.3±1.06	24.5-26	27.1±1.65	25-29	26.1±1.69	24-28
Canon circumference (FL)	9.5±0.71	9-10	11.4±0.48	11-12	11.0±0.41	10.5-11.5
Canon circumference (HL)	10.3±0.35	10-10.5	11.6±1.18	10-12.5	12.0±0.71	11.5-13
Pastern length (FL)	6.3±1.06	5.5-7	6.9±0.85	6-8	6.9±0.85	6-8
Pastern length (HL)	5.5	5.5	5.9±0.63	5-6.5	6.6±1.09	5.5-8
Pastern circumference (FL)	9.8±0.35	9.5-10	11.4±1.25	10-13	11.6±0.38	11-12
Pastern circumference (HL)	10.0	10.0	11.6±1.25	10-13	11.9±0.75	10.5-13
Hoof length (FL)	4.5±0.71	4.5-5.5	5.3±0.65	4.5-6	5.6±0.53	5-6.5
Hoof length (HL)	5.0	5.0	5.1±0.63	4.5-6	5.7±0.49	5-6
Hoof circumference (FL)	17.3±0.35	17-17.5	20.1±0.85	19-21	20.1±0.69	19-21
Hoof circumference (HL)	16.3±0.35	16-16.5	19.1±1.65	17-21	19.1±0.93	18-20
Estimated body weight (kg)	42.0±6.3	37.2-49.2	54.4±7.03	45.0-61.8	63.2±7.5	49.1-72.4

* FL-fore leg, HL-hind leg



A Young foal of Sindhi breed



Two years old filly of Sindhi breed

MANAGEMENT PRACTICES

The Sindhi donkeys are mainly reared by Kumhar community and to some extent by Sansi and Bhil communities. About 1-6 donkeys are kept per household. They are housed either in open space under trees or in open sheds covered with thatched, tin or tarpaulin roofs. The Spiti donkeys are raised both on grazing and stall feeding.



A jenny and a foal of Sindhi breed grazing in fields not under crops along with other livestock

They are allowed to graze in the waste lands near villages or the fields not under crops. Besides grazing, they are also supplemented with some amount of dry or green fodder (about 2-5 kg). Some of the donkey keepers also provide them with about 250 gm of concentrate per day. The amount of concentrate is increased when they are employed for rigorous work and also to the pregnant or nursing female animals. The dried fodder mostly consists of crop residues of pearl millet, moth and other crops grown in the region. The concentrate mainly consists of locally available grains and grain husks. The water is provided thrice a day. Rock salt lick is also provided to the Sindhi donkeys.

The Sindhi donkeys are said to rarely suffer from diseases. In the event of any ailment, ethno-veterinary treatment is also used beside professional veterinary care. The helminth worms of gastro-intestinal tract are reported to be quite common. Regular deworming is done only by some keepers whereas in most cases it is done at the initiative of Animal Husbandry Department.

The breeders/owners of these donkeys sell them amongst themselves and also to interested buyers from other regions. The local fairs provide platform and opportunity for such type of activity. Depending upon the health of the animal an adult male or female Sindhi donkey fetches a price of Rs. 5000-10000 and 5000-7000, respectively. Foals fetch between Rs. 500-1000.



Housing practices

UTILITY

The donkeys of the Sindhi breeds are used to carry out following activities.

1. As pack animals they are used for transportation of various items like water, soil, earthenware (pottery), construction material, fodder etc. They are able to carry about 1-1.5 quintals of weight.
2. They are extensively used in carting. They can pull about 5-6 quintals in carting.
3. They are also used for ploughing by small and marginal farmers with small landholding.
4. Some income is also generated by selling these animals.

So, they play their own important role in the economy and lives of the people inhabiting this region.



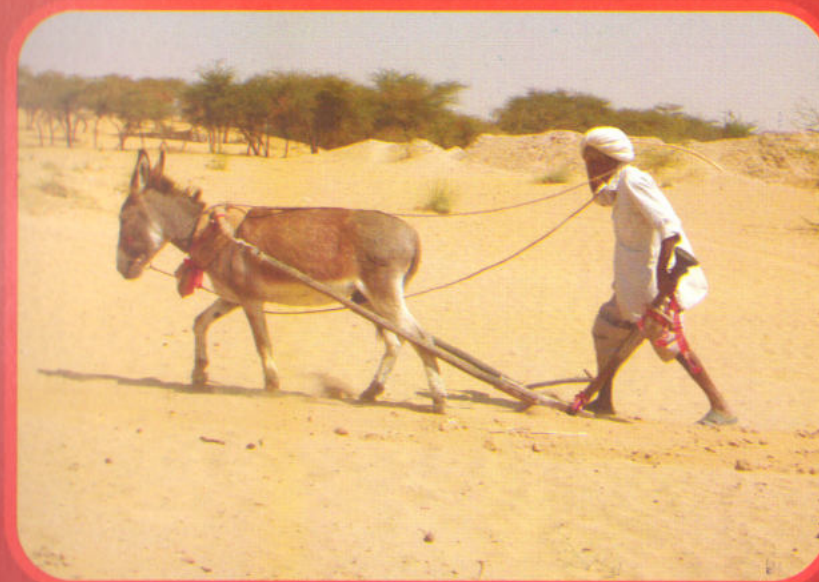
Sindhi donkeys carrying load



Sindhi donkey in carting

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Sindhi donkeys in ploughing



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