MINI-HORSES IN CHINA

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SUMARY

Chinese minihorses were discovered at the end of the 1980s during a national census and investigation on animal genetic resources. The existence of such kind of horses was supported by evidence from body measurements, historical records and bone fossils. Blood polymorphism of local breeds of minihorses has been tested. Chinese minihorses are postulated to have a separate origin from minihorses China.

RESUME

Les poneys chinois ont été découverts vers la fin des années 80 lors d'un recensement national pour la recherche sur les ressources génétiques animales. L'existence de ce type de cheval avait été remarquée par des mesures corporelles, des indications historiques et des os fossilisés. On a réalisé des tests sur le polymorphisme du sang des races locales de poney. On pense que ces poneys chinois aient eu une origine diverse de celle du reste des poney que l'on rencontre en Chine.

1.0 HISTORICAL RECORDS

Chinese minihorses were discovered at the end of the 1980s during a national census and investigation on animal genetic resources. Having discovered these small ponies in southwestern China, some ancient archives were consulted. “Under fruit-tree horses” (Guoxi Ma) seems to have been the term used to describe this kind of horses in the Han dynasty (220-25 AD). These may be the ancient Chinese minihorses. Under fruit-tree horses were a kind of articles of tribute from minority tribes in south-western part of China to the enteral emperorship. Under fruit-tree horses served one kind of the emperor court as entertainment subjects, according to the literature. Ancient records state that special barns were established to develop the minihorses. The body heights were recorded from 2.5 to 3 che, which stood for 23 cm at Han dynasty, giving mean heights of 57.5 to 69 cm. In later dynasties this kind of horses are often mentioned in the archives. Descriptions are limited, but they were bay, small, low or short. A stone carved relief of a minihorse from the Ming dynasty may demonstrate the existence of an ancient Chinese local breed of minihorses.

2.0 DISTRIBUTION OF CHINESE MINIHORSES

During thle investigation in 1986-1990 the number of minihorses was found to be no more than 1 % of the horse population in the provinces Sichuan, Guizhou, Yunnan and Guangxi, or less than ten thousand animals. The minihorses may share pasture with horses of local pony breeds, while the minihorses are more often concentrated in hilly areas of volcanic origin, with the ponies being found in areas with better grazings. Habitats for minihorses are called “stone islands” locally. These habitats are usually 500-900 meters above sea level, and higher and with lower temperatures than the surrounding land, where the ponies are kept. The main counties where minihorses are found are Debao in the province of Gualngxi, Cexiang and Zhenfeng in the province of Guizhou, Wenshan in the province of Yunnan, Jinyang and Yanyuan in the province of Sichuan and Ningqiang in the province of Shanxi.

3.0 ORIGIN

Minihorses in China are supposed to originate from several locations in certain provinces. The development of each breed was affected by the customs of different nationalities such as the nation Yi or the national Qiang of old times. Even the minihorses from the isolated and far apart “stone islands” in most of the Han counties may originate from different sources. But for supporting this kind of viewpoints, a certain amount of research is necessary.

4.0 CHARACTERISTICS

The minihorses have compact conformation, proportional structure, middle size of head, well developed neck and rump, good leg movements, coarse guard hairs and coarse hairs in mane, tail and fetlocks. Body measurements shown in Table l.

TABLE 1:
Body measurements in cm of local breeds of minihorses

Name of breed	sex	n	body height	body lenght	chest girth cm	canon circumference cm
Debao	m	42	98.3	97.3	110.9	13.2
	f	52	96.1	97.3	110.8	12.7
Guizhou	m	140	104.0	104.6	119.9	13.4
	f	65	103.3	101.1	119.0	12.6
Yunnan	m	146	102.6	101.6	119.0	13.9
	f	146	102.2	102.8	117.5	13.4
Sichuan	m	11	97.9	100.4	111.2	12.6
	f	14	100.1	99.3	111.0	11.0
Ningqiang	m	-	98.3	96.0	103.5	11.4
	f	-	99.0	98.0	105.6	11.0

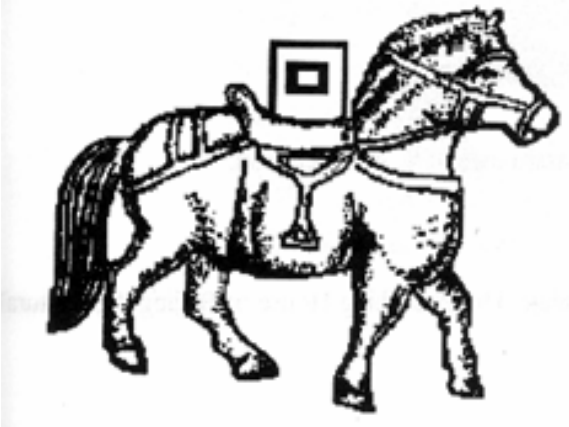
Animals are mostly bay, but some are chestnut

5.0 MAIN USE AND MANAGEMENT

The animals are used for packing goods. An individual of 100 cm height is able to carry 100 kg of goods on daily routes of 30-40 km in hilly areas, to pull a track with a 500 kg load, and is used for riding as well. No special care is taken by people locally. Usually no special stallion is used for breeding, but some males are used for 30 years for breeding and are recognized as breeding stallions. Mating is natural at pasture. Good longevity is a characteristic of the breed.

6.0 BLOOD POLYMORPHISM

Blood polymorphisms at Alb, Tf and Es loci for ponies in Guangxi (GX-D) and minihorses in Guanngxi (GX-S) were tested and some data from Shetland, Englalnd (SH), Hokkaido, Japan (HK) and Tokara, Japan (TK) are cited for comparison.



Stone carved picture in Ming Dynasty

TABLE 2:
Blood polymorphism

Loci	Factors	GX-D	GX-S	Breeds		SH
				HK	TK	
	n	32	46	105	34	105
Alb	A	0.4063	0.2826	03905	0.1324	0.3905
	B	0.5937	0.7174	0.6095	0.8676	0.6095
	A	0.0469	02935	02048	0.0735	0.0938
	B	0.5781	0.4457	0.3714	0.0735	0.3350
Tf	C	0.1094	0.0543	0.1857		
	D	0.1250	0.1087	0.0429		0.1406
	E	0.1406	0.0978	0.1952	0.8530	0.3906
	F	0.3281	03587	0.1722	0.8676	0.2655
Es	I	0.2344	0.3587	0.6278	0.1324	0.7344
	S	0.4375	0.2826	0.0143		
	O			0.1857		

Obviously the Guangxi minihorses are different from local pony and even more different from Shetland, Hokkaido and Tokara horses.

7.0 THE NATIONAL IMINIHORSES ASSOCIATION

In April 1987, The National Minihorse Association was established. In autumn 1987 the first herd book was published with 39 heads registered. In April 1988, The Guizhou minihorse association was founded. The first president of The National Minihorse Association is Professor Wang, Tiequan. This association is encouraging purifying the minihorse population and is interested in co-operation with international organisations.

8.0 ACKNOWLEDGEMENTS

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Investigation in Guangxi province

Debao minihorse

THE MALVI CAMEL: A NEWLY DISCOVERED BREED FROM INDIA

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SUMARY

This paper describes the Malvi camel, a very distinctive breed from northern Madhya Pradesh (India), which is characterized by considerable milk production potential. Although the Malvi camel has long been recognized as a distinct population by local camel breeders, scientists were previously not aware of the existence of this breed. Information about the distribution area, estimated population size, and physical characteristics of the Malvi camel is provided and the prevailing management and production system is described. It is concluded that the Malvi camel represents a valuable genetic resource and that steps are necessary to ensure its survival as a separate gene-pool. The way in which this breed was discovered also demonstrates the need for utilizing local indigenous knowledge in the identification and documentation process of animal genetic resources.

RESUME

Cet article présente une description du chameau de Malvi, un type très particulier de la race que l'on rencontre dans la zone nord de Madya Pradesh (Inde), caractérisé par son potentiel élevé de production de lait. Bien que le chameau de Malvi ait été reconnu come un animal particu ier par les éleveurs locaux, les chercheurs ne savaient pas de son ·existence. On donne ici l'information sur la distribution géographique, la taille estimée de la population et les caractéristiques physiques de cette race, ainsi qu'une description du mode de conduite et du système de production. On conclu que le chameau de Malvi représente une ressource génétique importante et qu'il est nécessaire d'entreprendre des actions pour assurer sa survie en tant que pool génétique. Le mode par lequel cette race a été découverte nous montre également la nécessité de maintenir des contacts étroits avec les populations indigènes et leurs connaissances pour nous aider dans les processus d'identification et de documentation sur les ressources animales.

1.0 INTRODUCTION

The one-humped camel *(Camelus dromedariusj* is bred in the western part of lndia. Over 70% of India's population of 1.5 million camels is at home in Rajasthan, with the remainder being distributed over the adjoining states, including Gujarat, Haryana, Punjab, Uttar Pradesh, and Madhya Pradesh (Khanna and Rai, 1995). While isolated camels also occur in other parts of India as far east as Bengal, and in southern India, breeding is restricted to these states.

In most parts of the world, camel breeds are named after the tribal populations they are associated with; by contrast Indian camel breeds are identified according to the areas in which they have originated. The socio-historical reasons for this circumstance include the fact that earlier camel breeding was conducted on a large scale by the local Maharajahs and most existing breeds are named after their former kingdoms (Kohler-Rollefson,1992a). However, there is no consensus among authors which regional populations of camels in India should be regarded as representing discrete breeds. Only the Bikaneri and Jaisalmeri camels are universally accepted as distinct. Acharya and Bhat (1984) also recognized the Sindhi camel; Rathore (1986) referred to Mewari and Kacchi breeds, while Khanna (1988) enumerated Marwari, Mewati and Kutchi breeds, but later also included Shekhawati, Mewari, Sindhi, Riverine breeds/strains (Khanna and Rai, 1995). Camel pastoralists interviewed in the context of the Camel Husbandry Improvement Project also considered Sirohi, Jalori, Sanchori, and Malvi camels as distinct. While we are not able to phenotypically distinguish the first three "breeds", we can confirm the claim as regard the Malvi camel.

2.0 HISTORY OF DISCOVERY

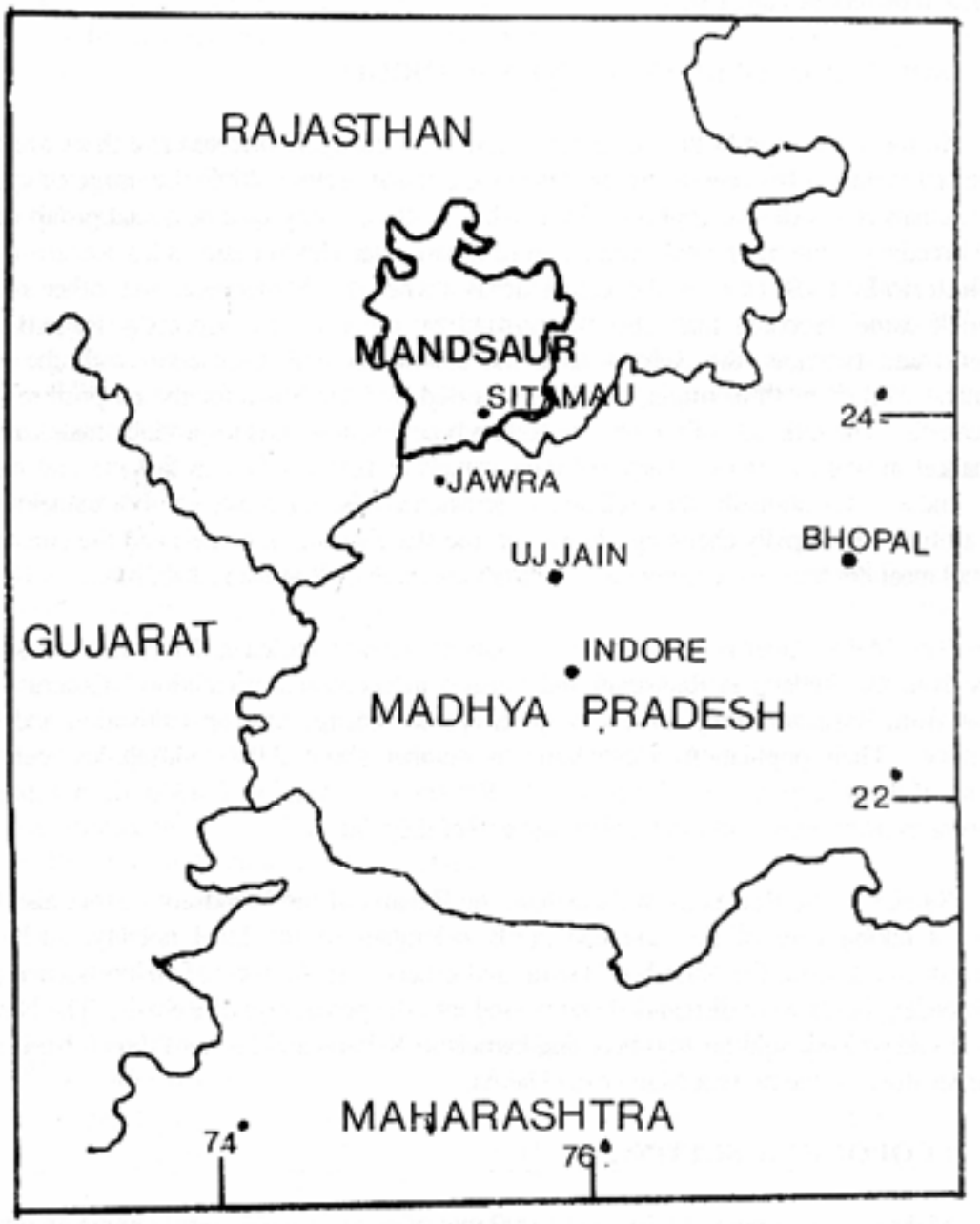
In April I994 we heard the first references by members of the local Rebari camel breeding caste from the Chittorgarh area in Rajasthan to the Malvi nasl (i.e. breed, strain in Hindi language). During a subsequent visit in May 1994 to the town of Jawra in the Mandsaur district of northern Madhya Pradesh, we encountered the first specimens of this breed. It was imediately obvious that the Malvi camel is easily distinguishable from all other Indian camel breeds by colour, height, and conformation and may represent the phenotypically most distinct group among the Indian camel population. Through interviewing Rebari camel owners we attempted to outline the breeding area and population size of the Malvi camel and collected information regarding its productivity, management and production system. In a return visit in May 1995 we visited several Malvi breeding herds and were able to take body measurements and to gather additional data.

3.0 DISTRLBUTION AREA AND POPULATLON SIZE

The Malvi camel is named after the Malwa (Malva) region, a distinct physiographic and historic-cultural area in Central India (27° 70' - 25" 10'N and 73" 45' - 79" 14' E) that is largely located in Madhya Pradesh, but also extends into Southeastern Rajasthan and into northern Maharashtra. The Malvi camel appears to be bred only in the Mandsaur district which is located in the northwestern corner of Madhya Pradesh. The following villages were listed by Rebaris as having Malvi breeding herds (with estimated populations in brackets): Niakhera (300), Aaspura (100), Haripura (200), Parapipli (100), Raypuria (400), Bhamesar (200), Banjhad ki dhani (65),

Shahkeri (100), Eriya ki dhani (120), Aaantri (200), Bhamarkhera (400), Borkhera (I 00), Majiriya (300). If one accepts these figures provided by the Rebaris at face value, the total size of the Malvi camel breeding population can be assumed to number between 2 500 and 3 000 camels, including juveniles. In addition, a small number of female Malvi camels is in the possession of Rebaris from southem Rajasthan. Male camels used as work animals are not included in the above calculation.

Location of the Malvi camel breeding area (Mandsaur District)



4.0 SOCIOECONOMIC CONTEXT AND ORLGIN

In India, camel utilization is almost exclusively transport-oriented and therefore there is a distinct separation between camel producers and camel users. While the usage of camels as work animals is a widespread phenomenon not restricted to any specific social group or caste, camel breeding is the traditional occupation of a particular Hindu caste called Rebari or Raika, who historically took care of the camel herds owned by Maharajahs and other nobility. Although camel breeding may also be pursued by other castes, especially Rajputs, Sindhi Muslims, and Bishnois, the Rebaris have the closest cultural association with the camel. According to their myth of origin, they were created by Lord Shiva for the purpose of looking after camels. The rationale of the present Rebari breeding system is to produce male camels for the market in work animals. They sell their camels at fairs *(melas) to* farmers and transport entrepreneurs. Traditionally, they sell neither female camels, nor camel wool or camel milk, but these attitudes are rapidly changing. However, the slaughtering of camels and the consumption of camel meat continue to represent absolute taboos (Kohler-Rollefson,1992b).

The Malvi camel is bred by a subgroup of Rebaris settled in Madhya Pradesh which differs from the Rebaris in Rajasthan and Gujarat in economic orientation. Contrary to the Rebaris from Rajasthan, they do not keep sheep, but engage in crop cultivation and buffalo husbandry. Their population is estimated to number about 2 000 households, but only a minority of them keep camels. Currently, the Rebaris from Madhya Pradesh do not intermany with Rebaris from outside the state, although earlier they did.

Similar to the Raikas from Rajasthan, the Rebaris of the Mandsaur district also have a history of taking care of the breeding herds belonging to the local nobility, such as the Maharajah of Sitarmau, the Nawab of Jawra, and others. At the timne of Independence (1947) these breeding herds were dismantled and passed into the possession of Rebaris. The Nawab of Jawra is said to have sold his 900 breeding camels to Rebaris and his herd thus formed part of the parent stock of the present Malvi camel herds.

5.0 ECOLOGLCAL SETTING

Malwa receives between 800 and 1000 m of annual rainfall, representing an unusually humid habitat for camels, and 90^{a}/o of the rainfall occurs between July and September. The climate is classified as the tropical monsoon type and there are tlree characteristic seasons, the cold season (October to February), hot season (March until June), and the rainy season (July until September). Apart from the monsoon months, the atmosphere is dry, with relative humidity amounting to 20-40% during the winter and 10-15% in the sumer. Winds can be strong in the sumer and duststorms occasionally occur (Singh,1971).

The countryside is undulating, scattered with low hills and intersected by numerous streams (Hunter,1886). Most of the region is covered by black soil which is loamy to clayey in texture, and poor in phosphate, nitrogen and organic matter, but has sufficient potash and lime contents (Singh, I 971).

The area is agriculturally very productive and the majority of the population is engaged in cultivation. In the early 1970s, 44% of the land was cultivated with scope for another 10% to be brought under the plough (Singh,1971).

The most imnportant crop *is jowar* (sorghum), others are wheat, chickpea, mustard, opium, and fenugreek. The majority of the crops are *kharif,* i.e. grown during the rainy season, with a smaller percentage being *rabi,* i.e. irrigated during the spring season.

Besides harvested fields, extensive wastelands are available for camel grazing. Camels feed *on Acacia nilotica* (babul), *Prosopis cineraria* (khejri), *Capparis decidua* (ker), *Balanites aegyptiaca (higont)* and *Zizvphus glabrata* (bor). One particular tree that grows in the vicinity of rivers and appears to be known only in Madhya Pradesh, is the *mimar,* an Acacia species, regarded as galactogenic by the camel pastoralists.

6.0 PHYSICAL CHARACTERISTICS

The most typical external characteristic of the Malvi camel is its very light or off- white colour. Malvi breeding herds show virtually none of the colour variation that can be observed in other breeds. Another typical phenomenon is its small body size and it is probably the smallest of all Indian camel breeds. The Rebaris describe it as *hatta-katta* (sturdy, with short legs). The facial profile is also distinct, with a pronounced convex forehead, Roman nose and an extremely pendulous lower lip that is longer and protrudes further than the upper lip.

Measurements of shoulder height, chest girth, and hump girth, according to Schwartz and Dioli (1992) are presented in Tables 1 and 2.

TABLE 1:

Body measurements (after Schwartz and Dioli, 1992) in cm of female Malvi camels (n=16)

	mean	std deviation	minimum	maximum
shoulder height	194.94	±6.77	175	202
chest girth	206.38	±6.00	196	215
hump girt	235.19	±16.04	229	278

TABLE 2:

Body measurements (after Schwartz and Dioli, I992) in cm of male Malvi camels (n=2)

	mean	std deviation	minimum	maximum
shoulder height	197.50	±3.54	195	200
chest girth	214.00	±0.00	214	214
hump girth	261.00	±12.73	252	270

7.0 MANAGEMENT SYSTEM

Malvi breeding camels are kept exclusively in extensive management systems and fed on natural graze only. Herd sizes range between 50 and 100 camels. Breeding herds are composed almost entirely of female camels, each herd containing only one male camel for reproduction. In addition, there may be one or two young male camels serving as mounts or beasts of burden for the herdsmen.

Malvi breeding herds migrate between three locations. From April to June they graze in the vicinity of their home villages in Mandsaur district. With the onset of the rainy season in July, they migrate to the area around Kotah and Jhalawar Patan in southeastern Rajasthan. In September they start moving into the vicinity of cities in Madhya Pradesh, including Bhopal, Indore, and Ujjain, to take advantage of opportunities for selling milk.

8.0 PRODUCTION SYSTEM AND PRODUCTIVITY

The Malvi camel is a dual purpose breed. The male camels are utilized as work animals, usually for carrying loads. The female camels are used as milk animals. Owners of breeding herds thus have two sources of income. They sell their male calves and they market milk.

8.1. Milk Production

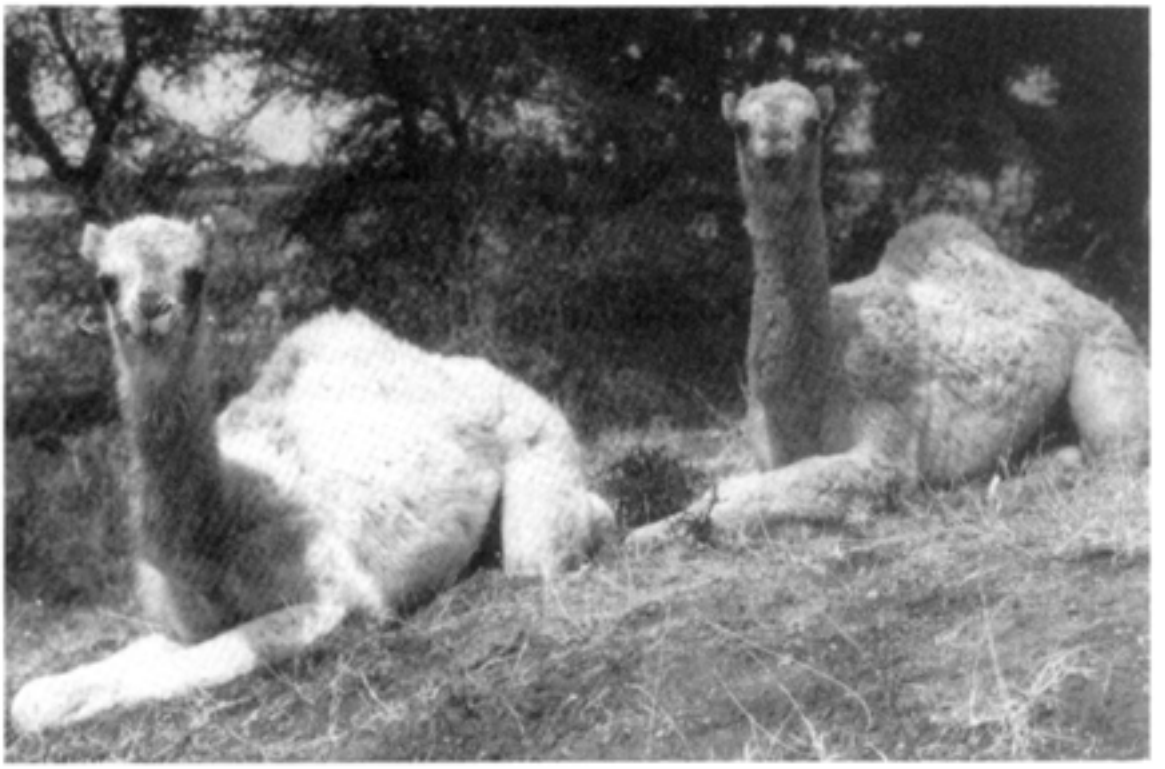
The Malvi camel is famous in the region for its high milk yields and owners point out that it gives milk “even if it is hungry”. According to Malvi camel breeders, their animals can give top yields of 5-6 kg per day, if provided with adequate forage. Camels are milked twice or thrice per day, usually at nighttime and in the early morning hours. One herd we observed was milked at 9 p.m., 2 a.m., and 6 a.m. The suckling calves are together with their mothers during the whole

Malvi female camel photographed in the vicinity of Jawra

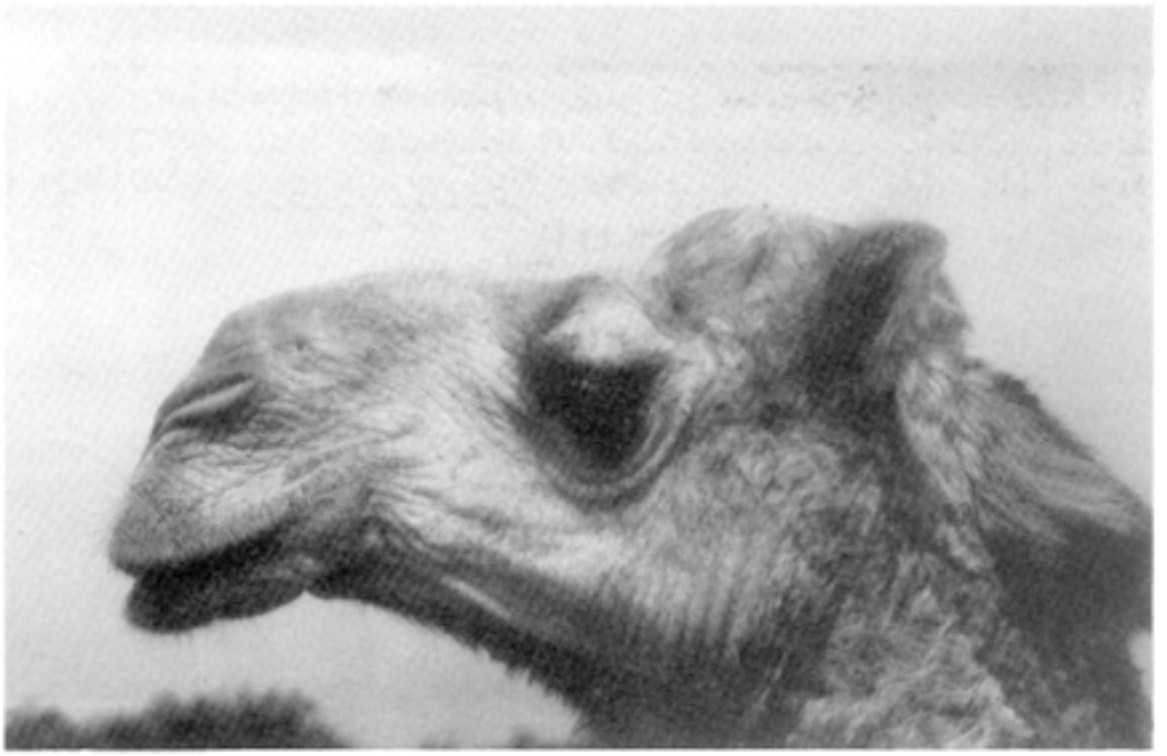
Female Malvi camels grazing near Sitamau in Mandsaur District

Female Malvi camels near Sitamau

Malvi breeding bull near Sitamau



Young Malvi camels near Sitamau



Profile of Malvi camel (male)

course of the day, however at night they are asleep and therefore not interfering with the milking routine. The average daily milk yield is around 2 kg. Lactation lengths average one year and calving intervals approximate two years. Hence, on average, 50%/o of the animals of a herd are lactating at any given time. During the rainy season, camels are not milked.

The milk is marketed mainly to tea stall owners and to dairies (Mohnot et al. 1994). While government dairies officially refuse to accept camel milk, at least one private dairy in the area has decided to buy camel milk, after conducting some experiments on its keeping properties. This private dairy mixes the camel milk with that from other species, camel milk composing about 5% of the total milk intake (6001 camel milk of a total of 12 0001 per day). Prices paid to the producer range between five and six Rupees.

8.2 Work animals

The Malvi camel breeders usually sell their male offspring at the annual mela.s in Jhalawar Patan, Batesar, and Mukanpura. These fairs are mostly attended by buyers from Bihar, Bengal, and even South India who apparently prefer to purchase camels here rather than at the bigger and better known *rrrela* in Pushkar. Being from a fairly humid area, the Malvi camel may be better suited for export to the higher rainfall areas of India than the camels native to Rajasthan. The notion that the Malvi camel has a higher resistance to infection with trypanosomiasis is worth investigating.

9.0 THREATS TO THE BREED

Data about the population dynamics of the Malvi camel are missing and it was not possible to determine whether the holdings of the Madhya Pradesh Rebaris have been increasing or declining. However, there is some reason for concern.

Over the last 12 years, Rebaris whose home villages are in Chittorgarh district of Rajasthan, have moved their camel herds into Mandsaur district. They are attracted by the combination of two circumstances, i.e. the milk marketing opportunities in several of the towns and the relatively abundant grazing resources in their close vicinity. Furthermore, the grazing tax charged by the government of Madhya Pradesh for access to wastelands is regarded as reasonable. The Rebaris from Rajasthan station their herds near the Muslim pilgrimage town of Jawra for nine months out of the year and return to Rajasthan only during the three months of the rainy season from July until September. Because of the good profits to be made from milk sales, their number increases from year to year (Mohnot et al. 1994).

Profile of Malvi camel (female)

These Rajasthani Rebaris originally owned camels belonging to the Mewari and Marwari breeds. Recognizing the superior milk potential of the Malvi camels, they are attempting to upgrade the milk productivity of their herds by purchasing female Malvi camels. But they continue to use Marwari male camels for breeding, for the purpose of obtaining higher prices for the male calves. Because of their smaller body size, pure Malvi camels fetch lower prices as work animals.

If this process of systematic cross-breeding continues unchecked, the already small nucleus of pure-bred Malvi camels will eventually erode.

10.0 DISCUSSION

The Malvi camel should be considered as an extremely important genetic resource. As is demonstrated by the breeding strategies of the Rebaris from the Chittorgarh area, it can be used to upgrade the milk production potential of other Indian camel breeds. This is a significant attribute, since research on the economics of camel pastoralism in Rajasthan indicates that the still prevailing traditional single-purpose system in which income is derived only from the sale of male-camels is no longer economically viable. Camel pastoralism is economically sound only if additional income can be generated from camel milk sales (Kohler-Rollefson,1995; Mohnot er al.1994).

If the inference that the Malvi camel is equipped with a higher degree of trypanotolerance is confirmed, this would render it additional importance.

Since the Rebaris have already recognized these positive aspects of the Malvi camel and some of them are engaging in indiscriminate cross-breeding, an effort should be made to ensure the survival of a sufficiently large pure-bred Malvi camel population.

The fact that the Malvi camel had so far escaped the attention of the scientific comunity is somewhat puzzling, but can be attributed to the fact that it occurs in a rather remote area not normally regarded as part of the Indian "camel belt". However, the circumstances of its "discovery" highlight the need for making an effort to establish better channels of comunication and a comprehensive dialogue with pastoralists if a reasonably complete documentation of existing animal genetic resources is to be achieved, as is the aim of the FAO's Global Genetic Data Bank. Information about the existence of particular strains and breeds and their respective qualities is vested exclusively with local animal breeders scattered in isolated areas and so far only a small percentage of this practical knowledge has filtered into the cognizance of animal scientists in the central research institutes. This indigenous experience and wisdom is an important resource that should be tapped and its value acknowledged to a greater extent than has been the case!

11.0 ACKNOWLEDGEMENTS

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