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Haofa dog – An indigenous canine germplasm from Manipur, India

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ABSTRACT

A study on Haofa dog was carried out at its breeding tract in Ukhrul and Kamjong districts of Manipur to find out its origin, distribution and phenotypic characteristics. A total of 100 adult Haofa dogs (50 male and 50 female) were recorded for studying physical characters and body measurement. Further, 69 number of observation were also recorded for studying body weights of adult male and female. In addition, 100 Haofa owners were interviewed to study the reproductive characteristics, management practices followed and their utility, etc. The study revealed that Haofa were of medium size with a compact body, broad chest, straight top line and slightly tucked up abdomen. The coat colour is usually black with grey skin while some dogs have black coat colour with white markings in ventral parts and tips of legs. The head of a Haofa dog is medium in size with a slightly trapezoid shape, while the forehead is usually prominent with the straight nasal bridge. Eyes are oval shaped with golden colour. Ears are erect and usually cropped at an early age. The dogs have short coats and their tails are usually semi-curved and docked usually at a young age. The adult body weight and average litter size at birth ranges from 22-31 kg and 3-8, respectively. Haofa is morphologically different from the other exotic breeds, crossbreeds or local dogs found in the state. Hence, it deserves to be recognized as a distinct breed of dog.

Keywords: Dog, Haofa, Hound, Management, Manipur, Physical characters

Haofa is considered a rare indigenous hound dog of Manipur, which has been reared since time immemorial by the Tangkhul community living in the Ukhrul and Kamjong districts of the state. It is believed that many years ago, this breed migrated along with the Tangkhuls to the Ukhrul district and the adjoining Tangkhul Somra tracts in Myanmar. However, the information relating to its parent stock/pedigree involved is not known. The dog is usually reared by the Tangkhul community as a pet because of its intelligence, gentleness, obedience and loyalty to its owners. The Tangkhul community considers them as one of members of their own family and gives an important place to their society. In the past, they were used for both hunting and guarding their master's house and property. As their instincts and sniffing power are strong, coupled with high stamina, they are also considered as fierce hunters. Haofa dogs are also well-known for guarding houses and farms and living closely with their masters. With the change in lifestyle of the people, their use nowadays is mainly confined to pet and guard dogs and to some extent for its aesthetic value. India has three registered breeds of indigenous dog namely, Rajapalayam, Chippiparai and Mudhol Hound. Due to the lack of study, many of the Indian indigenous dog population remains in non-descript category. In view of this, an attempt has been made to study the origin, distribution and phenotypic characteristics of the Haofa dog, so as to enable registration of this dog population before its population declines to a critical level.

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MATERIALS AND METHODS

The present study on the Haofa dog was mainly carried out at Ukhrul and Kamjong districts of Manipur, the original breeding tract of the Haofa. However, some data was also collected from the Haofa dog owners living in Imphal East and Imphal West district of Manipur. A total of 100 adult Haofa dogs (50 males and 50 females) were recorded for physical and morpohometric characters. Further, 69 observations were also made for studying the body weights of adult male and female Haofa dogs. In addition, 100 numbers of dog owners were interviewed to study the reproductive characteristics and management practices followed by the owners, utility, etc. of the Haofa dog as per the ICAR-NBAGR questionnaire for the phenotypic characterization of indigenous livestock species with suitable modifications relevant to Haofa dog and the area of distribution. The physical characteristics were recorded by visual observation. The morphometric

characters investigated during the present study were based on Sutter *et al.* (2008) relevant for evaluating a dog breed. During the study, individual dog was recorded for physical and morphometric characters. The morphometric characters were recorded by using a measuring tape when the animals stood on level ground. The morphometric characters studied during the present study included height at wither, height at rump, body length, chest girth, paunch girth, head width, snout length, head length, neck length, neck girth, hind foot length (right and left), lower hind leg length (right and left), upper hind leg length (right and left), forefoot length (right and left), lower foreleg length (right and left) and upper foreleg (right and left). A digital weighing balance was used to record the body weight of the dogs. The data for reproductive performance, utility and management practices followed by the Haofa owners were obtained through interviews. The data collected on the various traits were statistically analyzed using SPSS software programme.

RESULTS AND DISCUSSION

Origin and distribution: The original breeding tract of the dogs includes Ukhrul, Phungcham, Tolloi, Tuinem, Nunghar, Kasom khullen, Phungyar, Kamjong villages of Ukhrul (25.0954°N, 94.3617°E) and Kamjong (24.8570°N, 94.5135°E) districts of Manipur. The dogs are also reared and distributed in the other valley and hill districts of Manipur.

Physical characteristics: The present study revealed

Fig. 1. (a) Male and (b) Female adult Haofa dogs.

that the Haofa dog is a medium-sized dog with a compact body, broad chest, straight top line and slightly tucked up abdomen. Both sexes had black colour coat with grey skin and sometimes white strip at the ventral area and tips of legs. The haofa dogs have short coat. Head profile was found to be of medium-sized with a straight nasal bridge, dark-coloured nose, and a black muzzle. The eyes colour, shape, and size were found to be golden, oval, and medium, respectively. The ears were medium in length, horizontal in orientation, flat in shape but are usually cropped in the majority of the dogs at an early age. The limbs were found to be proportionate and moderate in muscularity in both forelimb and hind limb (Fig.1).

Morphometric characteristics: During the present study, a total of 23 morphological characteristics were recorded and sex-wise statistical analysis was also done. The mean±SE along with a range of different

Table 1. Mean±SE for morphometric characters of Haofa dog

Parameter	Male			Female		
	Average	Range	N	Average	Range	N
Adult weight (kg)	25.13±0.43	23.00 - 31.00	35	23.84±0.30	22-29	34
Height at wither (cm)	61.24±0.39	56.00-65.00	50	58.36±0.51	54.00-65.00	50
Height at rump (cm)	59.78±0.36	55.11-1.00	50	55.84±0.65	48.00-64.00	50
Head width (cm)	15.82±0.13	14.00-18.00	50	13.76±0.25	10.00-17.00	50
Snout length (cm)	9.74±0.20	8.00-12.00	50	9.48±0.13	8.00-11.00	50
Head length (cm)	23.10±0.33	19.00-26.00	50	21.76±0.29	18.00-25.00	50
Neck length (cm)	14.88±0.51	10.00-21.00	50	14.70±0.30	12.00-20.00	50
Body length (cm)	58.90±0.35	53.00-63.00	50	56.38±0.42	51.00-61.00	50
Neck girth (cm)	44.10±0.38	40.00-49.00	50	41.16±0.52	36.00-48.00	50
Chest girth (cm)	68.66±0.66	60.00-75.00	50	65.86±0.59	60.00-73.00	50
Paunch girth (cm)	51.76±0.72	45.00-64.00	50	52.32±0.60	47.00-68.00	50
Hind foot length- L (cm)	28.54±0.29	25.00-31.00	50	27.94±0.35	20.00-33.00	50
Hind foot length- R (cm)	28.57±0.28	25.00-31.00	50	27.97±0.37	24.00-33.00	50
Lower hind foot length- L (cm)	17.86±0.21	15.00-20.00	50	17.60±0.23	15.00-20.00	50
Lower hind foot length- R (cm)	17.77±0.21	15.00-19.20	50	17.58±0.24	15.10-17.20	50
Upper hind foot length- L (cm)	21.36±0.42	18.00-27.00	50	19.31±0.26	17.00-25.00	50
Upper hind foot length- R (cm)	21.54±0.41	18.00-27.30	50	19.22±0.26	17.00-25.30	50
Fore foot length- L (cm)	19.82±0.30	16.00-24.00	50	17.42±0.34	13.00-22.00	50
Fore foot length- R (cm)	19.84±0.31	16.00-24.20	50	17.43±0.34	13.10-22.20	50
Lower fore foot length- L (cm)	15.08±0.20	12.00-17.00	50	13.82±0.26	10.00-16.00	50
Lower fore foot length- R (cm)	14.94±0.21	11.80-16.40	50	13.84±0.25	10.00-16.00	50
Upper fore foot length- L (cm)	20.28±0.16	18.00-22.00	50	19.04±0.19	17.00-21.00	50
Upper fore foot length- R (cm)	20.31±0.17	18.00-22.00	50	19.11±0.19	17.00-20.20	50

morphological characteristics for male and female haofa dogs are presented in Table 1. The study revealed that the average adult body weight (kg) of male and female dogs were found to be almost similar to the body weight of Kanni dog, a mid-sized hound dog breed found in the southern districts of Tamil Nadu (Selvakumar *et al*. 2013) and Rajapalayam dog, a breed of the southern India (Raja *et. al*. 2017) while the body weight of the Haofa dogs is more than that of the Caravan dogs of Maharashtra state (Devale *et al.* 2023). Varun *et al.* (2022) have reported the body weight of the adult male and female Gaddi dogs of western Himalayan region of India to be 38.70 and 32.25 kg which is more than that of the Haofa dogs. The average height at wither (cm) for the adult male and female haofa dogs were found to be 61.24±0.39 and 58.36±0.51, respectively. Similar mean height at wither was observed in Turkish Tazi, a sighthound raised in Province of Konya in Turkey (Yilmas *et al*. 2012), female Chippiparai dog (Karthickeyan *et al.* 2015), female Rajapalayam (Raja *et al*. 2017) and the Gaddi dogs (Varun *et al.* 2022). On the other hand, male Chippiparai (Karthickeyan *et al.* 2015), male Rajapalayam (Raja *et al*. 2017), and the Caravan dogs (Devale *et al.* 2023) have slightly higher height at wither as compared to the male haofa dogs. The mean±SE height at rump (cm) for the adult male and female hoafa dogs were found to be similar with the Rajapalayam dogs as reported by Hisham *et al*. (2014). But the Chippiparai dogs have a higher height at rump when compared with the hoafa dogs (Karthickeyan *et al.* 2015). The average head width (cm) of the adult male and female haofa dogs are found to be higher while the average snout length (cm) was lower than that of the Rajapalayam (Raja *et al*. 2017) and the Caravan dogs (Devale *et al.* 2023). The mean±SE head length (cm) of adult male and female haofa dogs is higher than the head length of the Rajapalayam dogs (Hisham *et al*. 2014) and the Gaddi dogs (Varun *et al.* 2022).

It has been found that the mean±SE neck girth (cm), paunch girth (cm), hind foot length (cm), and fore foot length (cm) of the male and female haofa dogs were higher when compared to the Rajapalayam dogs. While on the contrary, the Rajapalayam and the Caravan dogs have higher mean±SE neck length (cm), lower hind foot length (cm), upper hind foot length (cm), and lower fore foot length (cm) as compared to the Haofa dogs (Raja *et al*. 2017, Devale *et al.* 2023). The Haofa dogs have been observed to have higher body length, paunch girth, hind foot length and front foot length than that of the Caravan dogs (Devale *et al.* 2023). The Haofa dogs and the Rajapalayam dogs have similar mean±SE body length (cm) and upper foot length-left (cm) (Hisham *et al*. 2014, Raja *et al*. 2017). While the Chippiparai dogs have higher body length than that of Haofa dogs (Karthickeyan *et al.* 2015). The mean±SE chest girth (cm) of the adult male and female haofa dogs were observed to be higher than the Chippiparai dogs (Karthickeyan *et al.* 2015).

Reproductive performance: The mean±SE along with the range of different reproductive parameters are presented in Table 2. The average age at first oestrous (months), oestrus duration (days), age at first mating in male (months), age at first mating in female (months), age at first whelping (months), and whelping interval (months) of the Haofa dogs were found to be 11.55±0.10, 8.77±0.12, 19.08±0.14, 16.12±0.16, 18.27±0.15, and 10.20±0.15, respectively. Raja *et al*. (2017) reported the age at first estrous and duration of estrous in the Rajapalayam dogs as 12-15 months and 13-21 days, respectively. Raja *et al*. (2017) also reported the age at first mating in female and male Rajapalayam dogs as 18-24 months and 24-30 months, respectively while the age at first whelping in female Rajapalayam dogs was observed at 21-27 months. The average litter size of the Haofa dogs was found to be 5.79±0.17 and ranges 3.00-8.00 while the litter size of the Rajapalayam dogs is reported to be in the range of 4-10 (Raja *et al*. 2017).

Table 2. Mean±SE for reproductive parameters of Haofa dog

Parameter	Average	Range	N
Age at first oestrous (months)	11.55±0.10	10.00-14.00	101
Oestrus duration (days)	8.77±0.12	8.00-14.00	101
Age at first mating in male (months)	19.08±0.14	18.00-22.00	105
Age at first mating in female (months)	16.12±0.16	14.00-18.00	101
Age at first whelping (months)	18.27±0.15	16.00-20.00	101
Whelping interval (months)	10.20±0.15	8.00-12.00	101
Litter size	5.79±0.17	3.00-8.00	101

Management practices: Haofa dogs are reared in the master's house of Tangkhul family. The dog roams extensively within the locality during the day time, and lives and sleeps in owners' house. Some of the owners construct a cage or wooden box for Haofa, however, it is usually not locked. The dogs are also given the same food that is cooked for its master. They are generally fed twice a day. Sometimes, meat is also fed.

The main breeding season starts during the month of June-July and whelping begins during September-October. The puppies borne during this period are generally considered as good dog and there are high demands of such puppies by many interested dog rearers. In order to maintain a good breeding stock of Haofa dog, the breeders travel to different villages of the two districts to find out the dogs with desired characters. The main source of income of the breeders is from the sale of pups and also from giving the breeding service to female of other breeders in oestrus. Regarding the disease, the Haofa dogs are usually resistant to many of the local diseases of dogs and no vaccination is given. However, some of the dog owners vaccinate against common endemic dog diseases such as canine distemper, parvo virus infection, rabies, infectious canine hepatitis, etc. The mortality is reported to be very little as compared to the crossbred or exotic breeds reared in other parts of the state. Both allopathic and herbal treatments are given for cure.

Utility: Initially the Haofa dogs were used for hunting and guarding their master's houses and properties because of its strong instincts and sniffing ability. The Haofa is also known for the skills it possesses. But with the passage of time and changes in the lifestyle of the people, the Hoafa dogs are now mainly used as a pet.

From the present study, it may be concluded that the Haofa dogs of Manipur deserve the status of a breed in view of its morphological uniformity, utility, passion for keeping Haofa dogs and heavy demand for the puppies amongst the dog breeders, farmers, and pet lovers. Morphologically, the Haofa dogs are quite different from the other dogs such as crossbred or exotic breeds or other local dogs found in the state. Since many decades, these dogs have adapted to the local conditions and hence can be classified as a different breed of indigenous dog found in the state of Manipur, which is considered as a hot spot of unique flora and fauna of the sub-Himalayan region. Therefore, the Haofa dogs should be registered as a breed of indigenous dog through the national registration system of livestock and poultry breeds developed by the Indian Council of Agricultural Research-National Bureau of Animal Genetic Resources (ICAR-NBAGR), Karnal, India. Further, efforts should be made by the government organizations, ICAR institutes, Universities, and NGOs to establish a "State Breeding Farm" by keeping the selected males and females followed by distribution to the interested breeders for *in situ* conservation of the dog population in the breeding tract and also for the production of good quality puppies to fulfil its heavy demand. Training programmes on the scientific breeding, healthcare, management as well as regular health camps may be organized for scientific rearing of the breed by the interested owners. Dog shows can also be organized at regular intervals, preferably in the native tract of Haofa dog, as an incentive to the dog owners and to make this business economically more viable. A Haofa Dogs Breeding Society may also be established at the local as well as the state level to preserve the purity of this breed as well as to take care of other promotional and marketing issues.

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