

## Studies in Ecology and Behaviour of Stray Dogs in South Part of asansol city under Paschim Bardhaman District of West Bengal

<sup>1</sup>Tushar Banerjee, <sup>2</sup>Dr. Deepak Kr. Mittal

<sup>1</sup>Research Scholar, Sri Satya Sai University of Technology and Medical Sciences, (India)

### ABSTRACT

*Various aspects of the stray dog population were studied in the city of Asansol (Pashim Bardhaman district). The lives of stray dogs are influenced by the cultural and eating habits of the human population. In the residential area, the garbage stack provides food, while in bakeries and fast-food stores contribute to stray dog feeding. The city's poultry and slaughterhouses also play an important role in feeding stray dogs. Stray dog live in groups, which consist mainly of one family units. The size of the group in stray dogs varies enormously and varies between 3-6 individuals per group. Behavioral observations showed the formation of hierarchically dominated opportunity groups for the collective defense of a territory and the development of long-term connections between group members.*

### I INTRODUCTION

Dogs occupy a very special position in human societies not only because of their faithfulness but also because of their multifarious talents in serving human beings in various capacities they are one of the most unique animals in their response to social rewards. In India the stray dogs are omnipresent in both urban and rural environments. Their population is increasing at an alarming rate in India and in most southeast Asian countries, India has an estimated dog population of 80 million, more than 80 % of which are stray dogs (Sivaraman , 1992 ), These free ranging creatures are also called pariah dogs and live in association with human habitations. The study area was conducted in the South Part of asansol city under Paschim Bardhaman District of West Bengal were selected in order to find out effect of habitat and other associated factors on the behaviour patterns of stray dogs. Paschim Bardhaman district is a predominantly urban mining-industrial district in West Bengal. The headquarters of the district is Asansol. It was formed on 7 April 2017 after bifurcation of the erstwhile Bardhaman district as the 23rd district of West Bengal. Asansol has hot and dry summers and cold chilly winters. In summers temperatures soar above 40 C

with dry hot air blowing known as 'loo' while in winter temperatures go below 10 C. Monsoon lasts from August to September. The Köppen Climate Classification sub-type for this climate is "Aw" (Tropical Savanna Climate).

## II MATERIAL AND METHODS

Observation and experiment are the two primary methods for studying behaviour. The observer accumulates data on basic facts and these are tested by experiments. Thus their combined efforts may result in more accurate facts and theories (Scott, 1958 a), one of the most important things in studying behaviour is probably to record data systematically and accurately. The primary means of studying animal behaviour in natural settings is to wait with patience at suitable spots there animals are most likely to be observed without disturbing them, With a view to record behaviour systematically two basic techniques viz. For convenience of study daily observations ( routine ) were divided into three shifts i. a, in the morning ( 6,00 AM. to 9.00 AM. ) , in the noon ( 12,00 PM. to 2,00 PM. ) and in the afternoon ( 4.00 to 6,00 ) , In some cases observations were taken from 6,00 AM to 12,00 PM and from 2,00 PM to 6,00 PM. In actual practice, however, the hours as scheduled above could not be followed exactly. But the deviations from the schedule observation hours were never more than 30 minutes. Thus observations were made throughout the day encompassing all the three shifts. Besides, observations were also made at any hour of the day whenever feasible. Two, and often three, observers followed the animals on 4-6 h shifts; a total of 90 h of observation were completed, covering all periods of the day and night. The following data were collected:

(1) **Population:** Population were collected by walking or on bicycle systematically along several fixed routes within different areas, different blocks and along several fixed lanes and streets in urban areas. Estimates of population from these observations were than extrapolated for the whole block. Some data reported from different block veterinary centres. Data on mortality were collected in the rural study site at asansole extending over an area of 1.5 sq.km.

(2) **Food and food habit:** Feeding behaviour involves food composition, food preference, amount of intake per day and various motor patterns associated with food intake o Nature of diet is always in harmony with the digestive apparatus of the species such as teeth, gastrointestinal tract and enzymatic capabilities. As the stray dogs remain associated with human beings their food habits and food preferences are totally different from that of the wild dogs. Observations were conducted on 50 adult dogs during day time from 5 a.m. to 5 p.m. The dogs were seen to consume waste or residual food matters thrown out from household, hotels and butchers' shop, Hotels thrown out were weighed by arrangement with specific households and shops prior to their disposal. It was observed that dogs often consumed the total amount of food matters thrown out, although in a few instances they were found to leave some amount unconsumed. The amount of food available and the amount left and the nature and the kind of food were recorded. In the present study food preference of dogs was determined in the following way:



Amount of food consumed = Amount available - Amount left

$$\text{Preference value } P = \frac{\text{Percent amount of an item consumed}}{\text{Percent amount of that item available}}$$

(3) **Aggressive behaviour:** Aggression is a very important biological activity serving a multitude of functions, such as: establishment of dominance hierarchy, defense of territory, procurement of food and shelter, mating, regulation of population density and many others. Aggressive behaviour of stray dogs were studied both in the nonbreeding and breeding season in asansol city under Paschim Bardhaman District of West Bengal.

(4) **Scent marking:** In mammals scent marking by urination has long been recognized as an important form of communication in different social contexts. The rural study site was selected for this part of the study. Observations were conducted 3 days and were made on foot or on bicycles from a safe distance. Care was taken so that the normal activities of the dogs were not disturbed due to observation activities of the investigator. Normally dogs were seen to scent mark by urination on herbs, bushes, tree-trunks, stones, pillars, lamp-posts, concrete walls and on vehicles. With a view to determine the scent marking frequency 32 individually identified dogs were observed during their day time foraging. The duration of their foraging activity, the distance between marked spots, area covered during such activity and the nature of spots they marked were recorded.

### III RESULTS

#### Population

In asansol city dogs reproduce once in a year, Mating season starts from June and continues till December, Birth season in this area starts from September and continues up to March every year. According to Leonard (1960) the reproductive cycle of dogs is usually completed twice each year. But the present study does not support this view, Ghosh, Choudhury and Pal (1981) also stated that dogs reproduce once each year. According to Engle (1946) there is no seasonal breeding cycle in dogs. But this study confirms that stray dogs breed seasonally. The female dogs attain sexual maturity at the age of 10-13 months and the males at 10-15 months (Figure 1). Present study shows that a mother dog usually gives birth to one to five young's every year. It was also found that a female dog participates in reproduction for six to seven years in her life time.

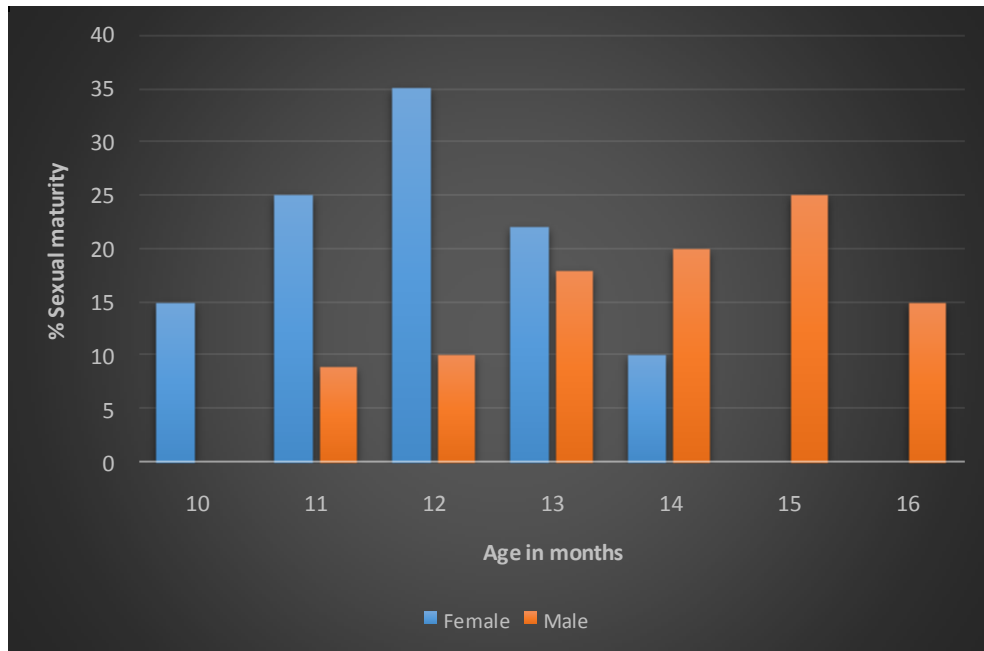


Figure 1 Age at sexual maturity in male and female dogs

Table: 1 Population studies in asansol city

Name of the block	Human density per square KM	Dog density per square KM
Railpar	450	25
Burnpur	520	40
Jamuria	345	17

**Food and food habit**

Mode of feeding of adult dogs is, in general, similar to that other animals. They took rice, vegetables and freshly cut small pieces of entrails by lowering their heads with the help of tongue and swallowed them without much perceptible chewing. In the process they repeatedly licked their upper lip on both sides. In case of larger pieces of bread and particularly meat and bones they grasped the item in the jaws and then placed the pieces between the canine and the carnassial teeth with the help of tongue and repeatedly chewed them until the pieces were cut into



smaller ones in order to facilitate swallowing. Dogs were observed to feed on carcasses of goats, cows or other bovines whenever these were available. They tore the muscles with the canines when their heads were held downwardly and laterally and their canines were exposed as the upper lips were vertically contracted, while consuming human faces they appeared to lick the faecal matter into the mouth. Table 2 show average amount of food consumed by the stray dog (N=50). The result shows that dogs consumed greater amount of cooked food than that of flash and entrails. Availability of cooked food was higher as these were regularly thrown out by the house owners and hotels, 'Flesh, bones or entrails were not regularly available in the village. These were thrown out from the butchers' shop in village market at particular times. For this reason average number of feeds per day per dog was higher in case of cooked food than flesh and entrails which are available only periodically. It is evident that a dog consumed higher amount of cooked food in each feed.

It is seen that the 50 experimental dogs daily consumed on an average about 17.850 Kgs. of cooked food during the day along with 13.300 Gms, of flesh and entrails of goat in a single day. Thus it shows that they act as cleaners by regularly consuming those and prevent the local atmosphere from being polluted by the foul smell, Again it can be said that an average of 17,850 Kgs, of cooked food was wasted daily by human beings in the rural study site.

Most animals show some degree of preference towards a particular type of food available to them. The preference value (P) of mainly two types of food items are shown in table 3. Foods with preference value greater than one (  $P > 1$  ) is regarded as preferred food , P less than one (  $P < 1$  ) indicates neglected food, P equal to one (  $P = 1$  ) shows neither preference nor neglect and zero value of P (  $p = 0$  ) shows neither avoidance of that item. According to Ozon , Dolisi , Ardisson and Crenesse ( 1983 ) in dogs spontaneous organization of activity patterns are linked to eating behaviour , In the present study in the village spontaneous locomotors activity in search of food was regularly observed within and outside their homo ranges and supports the observation of Ozon et al.

**Table 2 Average amount of food consumed by the stray dog**

	<b>Cooked food</b>	<b>Flash and entrails of goat</b>
Average wt. in gms./day (N=50)	357gms./day/dog	266. gms./day/dog
Average no. of feeds per day per dog. (N=50)	3.94	1.04
Average wt. of food consumed/day/dog	121.42 gms.	255.77gms

**Table 3 Shows food preference ratings of adult stray dogs in the rural study site**

Food matters	Average wt. (gms.) of food matters			Percentage available (a) and consumed (c)		Preference value
	Amount available (gms.) (A)	Amount left(gms) (L)	Amount consumed (gms.) (C)	$a = \frac{A * 100}{A}$	$C = \frac{A * 100}{C}$	
Cooked food	525	168	357	60.5	84.2	1.2
Flesh and entrails	342	76	266	39.4	54.8	1.3

**Aggressive behaviour**

**Sessional influence on aggression:**

Dogs defend their territory from intruders through aggressive vocalizations as well as through threat, chase, bite and fight. A dog in his own territory, whether male or female, was likely to attack stranger dogs of either sex in nonbreeding season. But in the breeding season a stranger estrous bitch was always greeted by adult male dogs in his own territory • similarly an adult stranger mala was accepted by an estrous bitch in her territory. But when a stranger estrous bitch met another estrous bitch in her area, the former was threatened or attacked by the later or vice-versa. Usually the intruders were chased, attacked and driven out of the territory of the resident dogs, the intruder resorted to submissive posture when the resident proved to be stronger and more aggressive. Some strong intruders, however, were found to dominate over weaker residents. Frequently all the resident dogs of a locality jointly chased or attacked one or a number of intruders as they encroached or tried to encroach upon their locality. Loud vocalization was first initiated by one or two resident dogs, which soon turned into a group barking activity. This kind of group barking activity is termed as allelomimetic vocalization and is thought to be effective in maintaining group territory (locality). Sudden aggregation of all the conspecifics of a particular locality at a specific site was than observed. Aggregation of this type was fairly common in the nonbreeding season. The motor patterns exhibited by the intruder as well as the resident were mostly ritualized.

**Ritualization:** The necessity of aggression making less dangerous has led to changes in the intensity and frequency of different motor patterns involved in fighting, in other words to "ritualization", Thus "threat" behaviour arises

invariably, out of a conflict between the motivations of attack and escape behaviour. Often scratching and knocking on the ground and urination were found to be associated with threat. Matthews (1964), after considering intra-specific fights in mammals in details, concluded that an important part of animal behaviour, at least in mammals, is directed towards avoiding intraspecific fighting. The weapons such as canines, modified incisors, claws etc. are potentially so dangerous that fighting is ritualized into displays, threats and submissions. Here learning or experience often reduces the amount of fighting. Hence ritualization has immense survival value for the species concerned.

**Aggression among Males:** Aggressive activities among male dogs increased and became conspicuous when the bitches came to heat during breeding season. The resident male dogs showed aggressive response when conspecific male intruders approached upon their territory to associate with the estrous bitches. Sometimes the intruders fled. Occasionally they ran away submissively with their tails between the hind legs when resident dogs get close. The stranger males, however, were mostly found to be dominant over the local or resident male dogs, when the estrous bitches were in associations with a group of males -competitive rivalry among them were noticed and often aggression resulted. In the nonbreeding period the stranger males were found to dominate only in a few cases. The local males were more often dominant over the strangers in the nonbreeding season, ritualized fights were common in male aggression in the nonbreeding season, while overt ones were observed more in the breeding season.

**Scent Marking:** Quantity of urine expelled at the time of marking, direction of urine flow, investigation and sniffing behaviour before and after urination significantly differ in case of scent marking from that of simple urination. In scent marking urine flow is directed at some environmental landmarks and the quantity of urine expelled at a time is far less than in simple urination. Besides scent marking is usually linked with investigation and sniffing behaviour before and after discharge of urine.

**Table 4 Scent marking frequency of rural adult dogs during aggressive encounters in mating season**

	Male=Male (N=34)		Male = Female (N=30)				Female=Female (N=16)	
	Dominant male	Subordinate male	Dominant male	Subordinate male	Dominant female	Subordinate female	Dominant female	Subordinate female
Number of	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)



scent marking	68	16	28	3	7	1	19	3
Marking per interaction	2	.4	.9	.1	.2	.03	1.18	.18

#### IV DISCUSSION

The stray dogs are territorial in nature irrespective of seasons. Size of their territory and home range is greater in rural areas than in urban area. Easy availability of food, mate and suitable nesting sites in urban areas have been suggested as reasons for smaller territory and home range size in these areas. Among stray dogs scent marking by urination has been found to be one of the most important form of communications under various social contexts. Several postures of scent marking in dogs in both sexes has been recorded. Scent marking serves a host of functions including territorial demarcation and defense, familiarizing and reassuring oneself in one's locality dominance status etc. Marking rate increases significantly under mating and aggressive situations.

Aggression is a prominent behaviour pattern in the life of stray dogs. Both males and females participate in aggressive encounters. Aggressive motor patterns recorded are: 'threat', 'chase', 'roar', 'snarl', 'bite' and 'fight'. In nonmating season aggression, however, is mostly ritualized and of benign nature. In mating season, on the other hand, overt and serious type of aggression is noticed in both the sexes which on occasions lead to fatal injury. Fights among males while associated with an estrous bitch in the mating season are often fatal in nature. Mother dogs after parturition and a few days thereafter remain in a highly aggressive state. Interspecific aggression has also been observed and is mostly with domestic animals and foxes.

Food habits of stray dogs are profoundly influenced by their association with human being and mainly consist of cooked food, freshly cut bones and entrails of goat and sometimes even human faeces. Sharp preference towards flesh and bones of animals was not observed. The feeding habit of stray dogs serve to prevent escalation of sanitary and pollution problems in the locality.



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