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THE JACKALS OF TOLLYGUNGE CLUB, KOLKATA

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INTRODUCTION

Since ancient times, our philosophy has held that the harmony of development rests on its relationship with conservation of the environment. Humankind cannot progress without a healthy and diverse natural environment. Connections between nature and society and between biological diversity and humans are critical for achieving the goals of conservation. Recently, we have an opportunity to study such circumstances in a century old club in southern part of Kolkata surrounded by dense human population where a healthy and breeding population of jackals is thriving since last many years. We would like to share our experience with the readers and also caution not to term always such assemblages as man animal conflicts.

The wild Golden jackals (*Canis aureus*) in the premises of Tollygunge Club Ltd., Kolkata have been studied during Nov.-Dec. 2008. Though it was difficult to draw any dividing line between the groups, the total population of 40-45 individuals of jackals may be grouped into approximately seven-to-eight family groups. Most of them are confined to southern part of the club, except two groups roaming in the northern part. Altogether seven abandoned dens were sighted mostly located in the bushes in the eastern periphery of the club while one active den with two cubs in the centre of southern half of the club.

Primarily, what we find is that the jackal population of Tollygunge Club has adapted to their surroundings and display quite different behavior from their cousins found in the wild. The most important adaptation is their diurnal habits and uncared attitude towards human beings. Their feeding, breeding social and inter specific

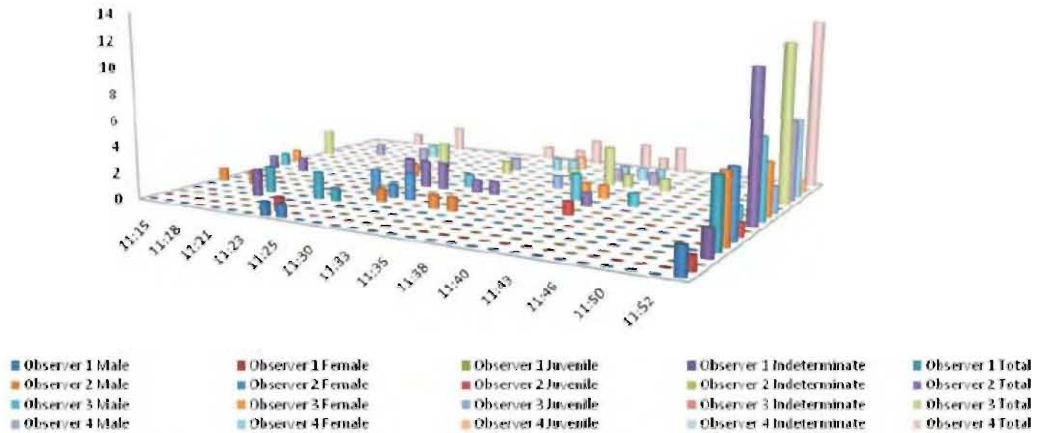
behavior was also studied in the club environment and was discussed in terms of availability of food as well as carrying-capacity of the club in terms of jackal population.

STUDY AREA

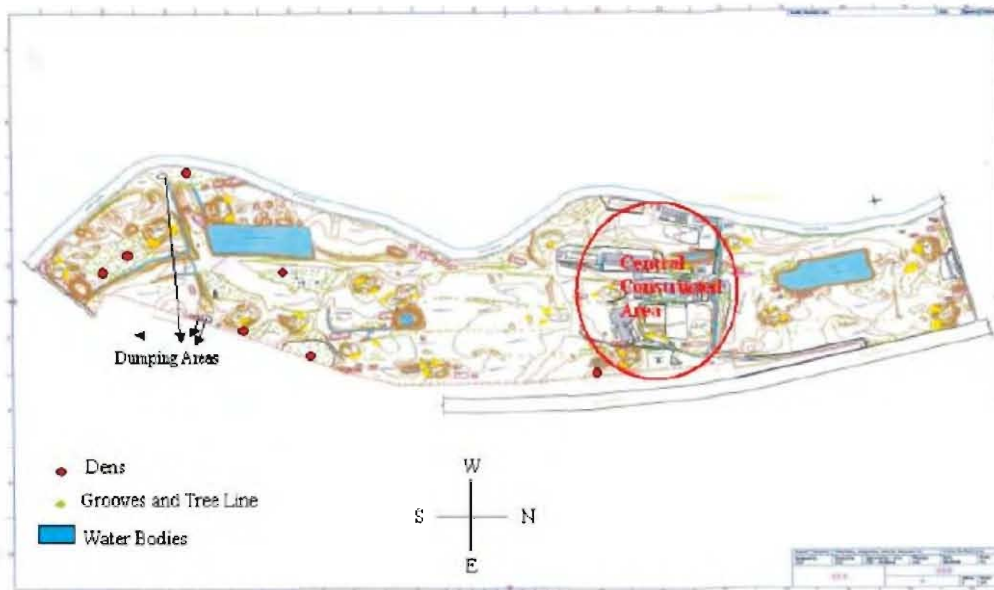
The Tollygunge club (about 100 acres) lies along eastern bank of Tolly's *Nullah* which was the earlier path of a river known as Adi Ganga. Hence, the soil of the club consists of the silt brought down by the erstwhile river. This nutrient rich soil and generous rainfall supported luxuriant vegetation. During colonization many exotic and indigenous plants have been systematically planted in the area which is now the abode of 118 species of plants, 93 species of birds, 12 species of mammals, 7 species of reptiles and 5 species of amphibians (Mookherjee, 1995) along with many fishes, mollusks and butterflies.

The vegetation of the area has been thoroughly altered as per requirement of fairways and removal of vegetation along the boundary wall where the animals take shelter. There are a number of small water bodies with thriving aquatic life especially mollusks and fishes. Apart from these visibly greener areas there are number of depression areas which have been converted into dumping grounds of lopped branches and leaves. These dumping points and few grooves (Map-1) are the shelter places for animal species found in the club.

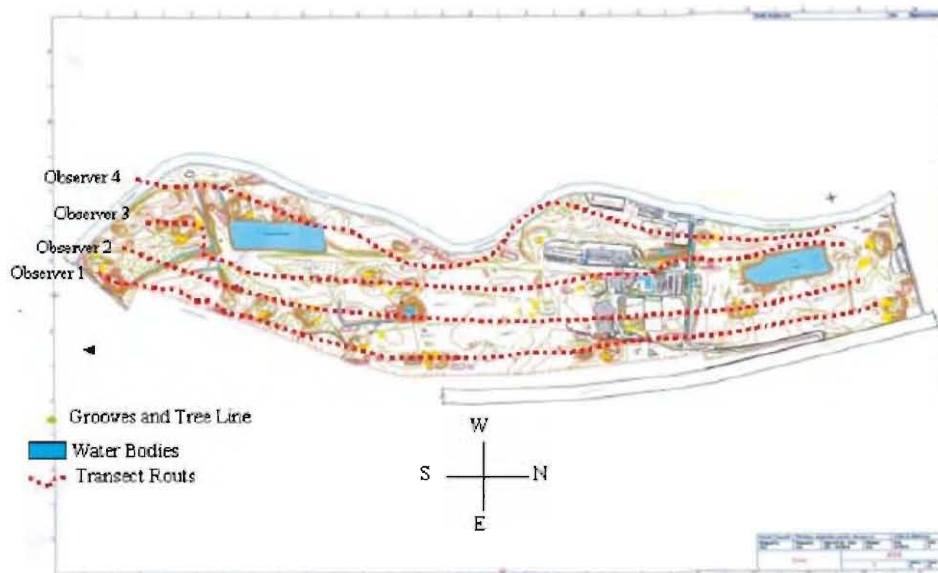
The club activities are mostly confined to the centrally constructed area (Map-1) which is about 15% of the total area of the club. Only golfers, horse riders and a few walkers visit the peripheral areas of the club inhabited by jackals.



Figs. 1. Frequency and age-sex clustering of Jackals along four Transect Routes in Tollygunge Club.



Map 1. Tollygunge Club Showing Location of Dens



Map 2. Tollygunge Club Showing Approximate Transect Routes



A Golden Jackal (*Canis aureus*) in the Tollygunge Club Premises.



There are number of such water bodies in the Club. The wet slopes of such areas are often visited by the Jackals for their food like mollusks, frogs, insects etc.



The Jackal and the Club members accept each other in their social space.



Number of locations has such Bamboo thicket, provide shelter to jackals and idle habitat for rodents a preferred food for jackals.

Apart from many wild animals there is a good population of dogs, inside the club in the central constructed area, who are enjoying the protection from club authorities, and acting as guard against the surrounding jackal population mostly confined to northern and southern part of the club.

THE GOLDEN JACKAL (*Canis aureus*)

a) Distribution

The Golden Jackal also called Asiatic, Oriental or Common Jackal are native to north and east Africa, southeastern Europe and south Asia up to Myanmar. It is the largest of the jackals with three Indian subspecies recognized. In India, they are found almost throughout the country (Alfred *et al.* 2006).

b) Morphology

The Golden Jackal's short, coarse fur is usually yellow to pale golden and brown-tipped, though the color may vary with season and region. The underside, throat and areas around eyes and lips have whitish hair. The Golden Jackal is generally 71-107 cm. in length, with a tail length of about 25 cm. Its standing height is approximately 40-50 cm. at the shoulder. Average weight is 7-15 kg, with males tending to be about 15% heavier than the females. Scent glands are present on the face, the anus and genital regions. Females have 4-8 pairs of mammae. The dental formula is $I \frac{3}{3} C \frac{1}{1} Pm \frac{4}{4} M \frac{2}{3} = 42$. Golden jackals live from eight to nine years in the wild and up to sixteen in captivity.

c) Habitat

In India, the preferred habitat of the jackal consists of periphery of protected areas, a mosaic of small cultivations and dense scrub as well as lowland wetlands, with adequately dense vegetation cover. The Jackals seem to do well in moderately modified agro-systems with non-invasive human activities. Barriers for jackal expansion and population recovery seems to be, large intensively cultivated areas without cover, urbanization and established wolf populations. Agro-pastoral changes during recent past resulted in habitat loss and hunting have largely contributed to decline in jackal population.

d) Behavior

i) Feeding Behavior and Hunting

The Golden Jackal is an opportunistic feeder and not a persistent hunter, with a diet which consists of 54% animal food and 46% plant food (Animal Diversity Web). It is a very capable hunter of small to medium-sized prey such as rabbits, monkeys, rodents, birds, fish and insects. The Golden Jackal uses its highly acute hearing to identify small prey hiding in vegetation. In the Serengeti, the Golden Jackal is a major predator of gazelle fawns, while in India, the Golden Jackal often kills Blackbuck calves. Although it is common for jackals to hunt alone, they occasionally do so in small groups, usually consisting of 2-5 individuals. Working in a pack greatly increases the chances of making a successful kill. During the harvest season in India, the jackal feeds predominantly on fruits. They like easy human-produced food, hence in areas near human habitation they subsist almost entirely on garbage and human wastes.

ii) Breeding Behavior

Golden jackals live in mated pairs and are strictly monogamous. In most jackal families, there are one or two adult members called "helpers." Helpers stay with the parents for a year after reaching sexual maturity, without breeding, to help in taking care of the next litter. Within the family, helpers are subordinate to parents. The female golden jackal initiates all den changes. Though the males are predominantly monogamous, females reserve their aggression for female intruders, preventing the sharing of the male and his paternal investment.

They behave in a manner similar to domesticated dogs and wolves. Male raises one of its hind legs when spraying their urine, and females squat at the site they wish to spray. Males and females alike mark their territory by spraying, primarily during the mating season.

Young are born in a den within the parents' marked territory after a 63 day gestation period. Litters usually contain 2-4 pups which are weaned after 50 to 90 days. Cubs at birth weigh 200-250 grams, and open their eyes after about ten days. The young are fed on milk, and then by regurgitation when they begin to take solid

food at about three months. Though they are sexually mature in about eleven months yet most likely postpone reproduction and stay with the parental pair as helpers for at least a year (Moehlman, 1981 and 1983).

iii) *Social Behavior*

Each jackal species communicates through its own repertoire of calls. Golden jackals use a wide inventory of howls to locate one another. By howling together, a pair shows that there is a bond between them, and thus the choral howling can be considered a kind of betrothal.

e) **Legal Status**

The Golden jackal is a protected species under Schedule II Part II of Wildlife (Protection) Act 1972, Appendix III of CITES and LRlc (Nationally) of CAMP.

METHODS

Since the study areas was relatively an open terrain the transect method was used to come up to conclusions about the estimated population of jackals in the premises of the club. The club was traversed along its length from south to north during day light hours by four persons at a time, keeping visual contact with each other, following four transect routes as marked on the Map 2 so as to cover entire length and breadth of the club. Each observer was advised to count and record the jackals he encountered only on his right side except the person who was travelling along western most transect to see his both sides, so that there is no repetition of count and no area left un-surveyed. The services of staff of the club were also utilized to trouble the jackal, if any, hiding in the bushes along the transects so that they do not escape counting. Each encounter with jackals was recorded on pre-designed data sheet along with age-sex, as far as possible, and also time of sighting.

Apart from the above exercise the area was searched for active and abandoned dens of jackals in the hill of depression areas, dumping grounds, bushes and grooves. Their locations were recorded using GPS.

Since jackals was a familiar with the activities of the club and their members it was easy to observe them during daylight hours when their food and feeding habits and inter-specific behavior were recorded. However, attempts were also made to observe them

during night when the animals were located with the use of powerful spotlight, operating on 12 Volt car batteries, to supplement information on their food habits and foraging grounds.

A Nikon camera DS 60, Garmin 12 channel GPS, 10x50 field binoculars and a map of the club provided by the club authorities were used during field survey.

RESULTS

i) *Feeding Habits*

It was observed that during most of the day time they spent resting while a few of them were observed feeding. Most of the feeding activities were confined to night when they were observed foraging on wet beds of the lowland areas like drainage channels and depression areas digging for mollusks, soil arthropods, annelids, frogs and some times dead fishes. Moreover, feeding on eggs of ground breeding birds can not be ruled out.

In the dryer parts of the club, number of rodent holes were observed mostly in association with dumping areas. The rodents are reported to constitute one of their important foods. They were also observed visiting refuge dumping areas mostly in neighborhood of human dwellings inside the club premises. Apart from animals they were also observed / reported feeding on vegetative matters which mostly constituted dropped fruit of *Ficus* sp. and Jungle jalebi (*Inga dulcis*)

ii) *Population Dynamics*

Considering that the effectiveness of the sampled area during sighting and counting depended on the landscape relief and the vegetation cover, to estimate the population of jackals, as explained above, the club was traversed along its length from south to north by four persons during day light hours. The results of the animal sighted and count are presented in a table along with time of sighting and their sex-age categories where ever possible. During the process a total of 43 jackals were counted consisting of 19 males, 16 females, 4 juvenile, 2 indeterminate and 2 pups. The cumulative instances of sightings were 27 while 16 jackals were counted as single (Table 1 & 2 and Fig 1.).

Apart from above exercise the area was also searched for active as well as abandoned dens of jackals. Altogether seven abandoned dens were sighted

Table 1. Jackal count along four Transect Routes in Tollygunge Club.

Time	Observer 1					Observer 2					Observer 3					Observer 4				
	Male	Female	Juvenile	Indeter- minate	Total	Male	Female	Juvenile	Indeter- minate	Total	Male	Female	Juvenile	Indeter- minate	Total	Male	Female	Juvenile	Indeter- minate	Total
11:15	0	0	0	0	0	1	0	0	0	1	1	1	0	0	2	0	0	0	0	0
11:18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:19	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
11:20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
11:21	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2
11:24	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:25	1	0	0	0	1	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0
11:28	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0
11:32	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0
11:33	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1
11:34	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
11:35	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	1
11:36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2
11:38	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0
11:39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:40	0	0	0	0	0	0	0	0	0	0	2	1	0	0	3	1	1	0	0	2
11:42	0	0	0	0	0	0	0	1	0	1	0	1	0	0	1	0	1	0	0	1
11:43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2
11:44	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0
11:46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
11:51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:52	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0
Total	2	1	0	2	5	5	5	1	0	11	6	4	2	0	12	6	6	1	0	13

Table 2. Statistical details of Jackals counted in Tollygunge Club.

Observer	Male	Female	Juvenile	Indeterminate	Total	Instance	Single
1	2	1	0	2	5	3	1
2	5	5	1		11	8	5
3	6	4	2	2 pups	14	8	5
4	6	6	1		13	8	5
	19	16	4	2 + 2	43	27	16

mostly located in the bushes in the eastern periphery of the club while one active den with two cubs was observed in the centre of southern half of the club. Their locations are marked in the Map 1.

iii) *Carrying Capacity*

In a natural environment the hunting families hold territories of two to three square kilometers throughout the year, portions of which are marked with urine, either by the male or the female jackal, to ward off intruders. However, the study area (Tollygunge club) with only 100 hact. (1 sq km.) in area holding a handsome, healthy and breeding population of jackals is an indication that the carrying capacity of the club in terms of its food supply is still in favor of jackals. During the period no fighting was observed, demonstrating defending of territory.

iv) *Interspecific Behavior*

It was observed that the basic social unit of the golden jackal is a mated pair or a mated pair and its young. The jackals were observed to forage and rest together. While in natural conditions pairs/pack are more likely to be successful in hunting in comparison to individuals they have been observed foraging on small animals in a group despite the fact that in current case hunting larger prey is out of question.

Most jackal families were observed to have helpers which are subordinate to parents. In the wild habitat these helpers are probably responsible for reports of large packs hunting together but in present case, in absence of such purpose, these associations are, it seems part of their habits.

DISCUSSION

The jackal population of Tollygunge Club has been studied earlier by Dr. A. K. Ghosh and others (unpublished report) and a few students from

Vivekananda College, Kolkata. However, the current assignment was given to us to principally study population, food habits, inter-specific behavior and health of the occupants.

Primarily, what we find is that the jackal population of Tollygunge Club has adapted to their surroundings and display quite a different behavior from their cousins found in the wild. The most important adaptation is their diurnal habits and uncared attitude towards human beings. The most suitable explanation to it, seems, that both man and animal has accepted each other as they are there since last so many years. Historically also, there are no records of jackals posing any threat to humans except perhaps in the rare occasion when it is affected by rabies.

The transect method of census, applied for area is most appropriate method with relatively open terrain of the club, yielded reliable results. The present population of jackal in the club may be in the range of 40-45 individuals. This is not the total count and only an estimate. However, it requires more time and equipments, like capture and marking devices, to know the exact number of jackals in the club premises. The party conducted survey earlier (Ghosh, *et al* 2008) has sighted only 14 jackals. The recording of as high as 30% of the population (16 animals) as singles' is the indication that the jackal groups in the Club area are not as cohesive as in the wild. The possible explanation to this may be that they consider more secured within the premises and consistent groups are formed during breeding and rearing period.

The basic social unit of the golden jackal is a mated pair or a mated pair and their young (helpers). They forage and rest together. Though it was difficult to draw any dividing line between the groups the total

population of jackals may be grouped in to approximately seven-to-eight loose family groups. Most of them are confined to southern part of the club, except two groups roaming in the northern part. In a natural environment the hunting families hold territories of two to three square kilometers throughout the year, portions of which are marked with urine, either by the male or the female jackal, to ward off intruders. However, the study area (Tollygunge club), which is an artificial environment, with an area of only 100 hact. (1 sq km.) and holding a handsome, healthy and breeding population of jackals is an indication that carrying capacity of club is still in favor of jackals especially when no fighting were observed for defending the territory. But such incidents have been reported by local staff during breeding period.

In the wild both male and female members of a golden jackal pair have important roles in maintaining their territory and in raising the young. When one parent dies, it is unlikely that the rest of the family will survive (Moehlman, 1983). Members of the same family also cooperate in sharing larger food items and transport food in their stomachs for later regurgitation to pups or to a lactating mother.

As far as their reproductive success is concerned there are records of six pups in 2007 and three pups in early 2008 as reported by Dr. Ghosh (unpublished report) and two pups in Dec., 2008 during our study. These reporting indicate that the jackals are continuously and successfully breeding in the Club. It is known that once the population of the canids' reaches to its saturation *i.e.* carrying capacity, they control their own number (unpublished report by Dr. Ghosh), therefore, we can conclude that the jackal population of the Club is yet to reach its point of saturation.

The jackals are known to consume approximately 54% animal food and 46% plant food with a very varied diet (Animal Diversity Web). This is one of the important habits that are contributing to their successful survival in spite of various actions taken by the Club Authorities to see that Club refuge is not accessible to jackals. The findings of another study conducted in agro-ecosystem of Bangladesh also

indicate that rodents were the principal food type (56%) as measured by incidence of occurrence, birds were the second most common food type (30%) and plant material, mostly sugarcane stem or panicles of rice or wheat, was found in 17% of the scat samples, while invertebrates, mostly insects, occurred in 9% of scats analyzed (Michael M. Jaeger, *et al.*, 2007). The most common rodent remains were those of *R. rattus*, *B. bengalensis*, and *Mus. spp.* The latter two species have been reported to occur in the club (Mookherjee, 1995).

The rodents, birds and their eggs, reptiles, frogs, fish, mollusks, soil arthropods and fruits are available in plenty in the club to sustain themselves. If average good health and breeding population is any indication then food and food habits are not at all the limiting factors as far as jackals of the Club are concerned.

There is a good population of dogs in the central part of the club enjoying the protection from club authorities. It seems that purpose of keeping them is probably to protect central-activity-area out of bound for jackals. This practice is working well and a number of times dogs were observed chasing the jackals especially in the parking and tennis court areas. These dogs in spite of getting protection from authorities are not keeping good health and can be a potential source for spreading diseases, among jackals, especially rabies.

During the study a number of visiting club members were interviewed especially in term of whether they prefer jackals to stay in the area or otherwise. The response was mixed. Some of the members favor, but a few of them had shown their displeasure over their presence.

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REFERENCES

- Alfred, J.R.B., Ramakrishna and Pradhan, M. S. 2006. *Validation of Threatened Mammals of India*. 1-568. Director, Zool. Surv. India, Kolkata.
- Ghosh, A.K., Mukherjee, K. and Dasgupta, S. 2008. Report on the Jackals (*Canis aureus*) of Tollygunge Club, Kolkata. Submitted to PCCF, Forest Department, Govt. of West Bengal.
- Michael M. Jaeger, Emdadul Haque, Parvin Sultana and Richard L. Bruggers 2007. Daytime cover, diet and space-use of golden jackals (*Canis aureus*) in agro-ecosystems of Bangladesh. Wildlife Damage Management, Internet Center for USDA National Wildlife Research Center - Staff Publications. University of Nebraska, Lincoln
- Moehlman, P.D. 1981. Why do jackals help their parents? *Nature*. Lond. 289: 824-825.
- Moehlman, P.D. 1983. Sociocology of silverbacked and golden jackals (*Canis mesomelas*, *C. aureus*). Pp. 423-453 in : J.F. Eisenberg & D.G. Kleiman, eds. Recent advances in the study of Mammalian Behaviour,. Special Publication no. 7. Lawrence, Kansas
- Mookherjee, K. 1995. Birds and Trees of Tolly. Tollygunge Club Limited, Kolkata
www.animaldiversity