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A NOTE ON THE FEEDING AND OTHER ACTIVITIES OF THE FIVE STRIPED SQUIRREL (*FUNAMBULUS PENNANTI*) IN THE FRUIT GARDENS OF WEST BENGAL

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Five striped squirrel (*Funambulus pennanti*) has been briefly studied in the field by Blanford (1888) ; Jerdon (1874) ; Finn (1929) ; Banerjee (1955, 1957) ; Agrawal (1965) and Louch *et. al* (1965).

This report contains the results of a study on the five striped squirrel which is common. in many gardens, parks, in and around human habitation. The field study was conducted in the fruit and vegetable gardens at Baruipur, 24 parganas (South) district of West Bengal. Baruipur is situated about 25 km. south af Calcutta and is well known for the production of fruits like guava, lichi, and various types of vegetables. For the study, three fruit/vegetable gardens were selected at Dopagachi area which is about 3 km. west of Baruipur Railway Station. The three fruit gardens were seperated from each other by Karamcha hedges (*Carissa carandas*) and by a small pond.

The total area of the three gardens was about 2·5 hectre and in all the three gardens guava in the main fruit tree. The other trees are *Phoenix sylvestris*, *Spondias*, *pinnata Zizyphus mauritiana* and *Carrissa carandas*. Seasonal vegetable like *Vigna catang*, *Cucumis sativus*, *Solanum melongena* etc., also occur. A total of 11 months were spent between September 1986 and October 1987, in collecting the data in the field. In every month, 3 continuous days were spent to observe the activities of the squirrels. Observations were conducted from 8 a. m. to 5 p. m. but the activities were recorded from 9 a. m. to 4 p. m. The observations were spread over all the seasons and four observers were deployed for collecting data in the field. Observers were posted in different gardens and hour to hour data were collected. Ten minutes observation in every hour was recorded. Counting of the squirrels were made simultaneously by all the observers in their respective areas at a fiixed time to avoid the duplication in counting.

Initially a total of 13 squirrels were identified in the study area which composed of 5 adult males, 5 adult females and 3 juveniles. In addition, 3 other youngs were also encountered during the study period belonging to 3 separate nests, out which 2 died subsequently and the third was living till the termination of the observation. It is

presumed that the mortality in the litters in this area was common, since litter size has been reported to vary from 2 to 3. The common predators here are mongoose, varanus, rat snake, common cobra, domestic cats and hawks.

The squirrels feed mostly on seeds, vegetables and fruits and the consumption of these items varied from season to season depending upon the availability. In the months of May-June, the green vegetables and fruits were not available in these gardens, During this period the squirrels depend much on grass seeds, barks of tress and insects. They were also observed to feed on paddy left out in the field after harvesting. During winter months the squirrels were found licking date-palm juice (*Phoenix sylvestris*). For this food item, the squirrels had to compete with birds like bulbul and common myna. Much of the inter and intra-specific agonistic behaviour was noticed between the squirrels and the birds for this preferred date palm juice. Among the squirrels the fight and chase between the animals were common. Chasing between the squirrels and the birds were common on the palm trees for the palm juice. The other preferred food items of the squirrels were cucumber seeds (*Cucumis sativus*) and seeds of hassk (*Vigna catang*). Cucumber seeds were the preferred food item for the squirrels, as during the sowing time of the seeds the farmer used to engage guards for their field against the squirrels. In one garden, 60 rows of cucumber seeds were sowed, consisting of 40-45 seeds in each row, and it was estimated that the squirrels damaged 90% of the seeds in two days when the guards were not posted. After three days, the cucumber seeds were again sowed to this plot and the guards were deployed, even then 35% of the seeds were eaten up by the squirrels. Not much damage was done to the guava fruits by the squirrels. They took guava-pulp occasionally. They eat seeds, grains of leaves and fruits by holding them with their forelimbs.

The available foods on which the squirrels were observed to feed in different months are shown in table I.

During 10 munites continuous observation it was uoticed that the different animals engage themselves in different activities.

TABLE : I

Food articles consumed in different nonths by the squirrels

Months	Food matters
June-September	*Cucumis sativus*, *Psidium gugava*, grass seeds, bark of trees.
October-November	*Spondias pinnata*, *Cucumis sativus*, *Spinacia oleracea*, grass seeds.
December-February	*Zizyphus mauritiana*, *Dolis lallab*, juice of *Phoenix sylvestris*, *Solanum melongena.*
March-May	*Anona Squamosa*, *Vigna catang*, *Solenum melongena*, *Pisum sativum*, *Psidium gugava.*

The main emphasis was given on the food and feeding activities of the squirrels as they were inhabiting in an agricultural area. The feeding activities of the squirrel is given in Table-II. It was observed that the male and female squirrels were active in

TABLE : II

Average percentage of time spent is feeding activities of squirrel at Baruipur

Time (hours)	Male		Female		Juvenile	
	Feeding	Other activities	Feeding	Other activities	Feeding	Other activities
9-9:59	83·34	16·66	40·00	60 00	33·33	66·67
10-10·59	26·66	73·34	38·33	61·67	53·34	46·66
11-11·59	66·67	33·33	66·67	33·33	66·97	33·33
12-12·59	53·33	46·67	30·00	70·00	28·33	71·67
13-13·59	5·00	95·00	16·66	83·34	5·00	95·00
14-14·59	33·33	66·67	26·67	73·33	6·67	93·33
15-16·00	43·33	56·67	40·00	60·00	3·33	96·67
Range	5·00-83·34	16·66-95·00	16·66-66·67	33·33-86·34	3·33-66·67	33·33-96·67

feeding in the morning hours between 9 and 10 hours and there was a decrease in feeding activity between 10 and 11 hours after which the male spend more time in feeding than the females. Considerable decrease in feeding activities was noticed between the two sexes from 1 to 3 p. m. after which their feeding activities again increased. The juveniles spent much time in feeding between 10 and 12 hours. Thus a marked difference in feeding time was noticed between the adults and sub-adults.

The time spent in travelling mainly in search of food was also studied (Table III). It was noticed that the animals of all age and sex classes spent maximum time in travelling between 9 and 10 a. m. and again between 2 and 3 p. m. In case of juveniles there was again spurt in travelling activity between 3 and 4 p. m. This indicates that the habitat was well stocked with food for the squirrels. Beside the feeding activity, other activities are lumped together in one category as 'other activities'. The other activities include grooming, resting, playing, breeding behaviour etc. These were not much significant in this area as it was mostly an agricultural area.

TABLE—III

Avarage percentage of time spent on travelling by the squirrels at Baruipur

Time	Male		Female		Juvenile	
	Travelling	Other activities	Travelling	Other activities	Travelling	Other activities
9- 9 59	13·33	86·67	13·33	86·67	13·33	86·67
10-10·59	6·67	93·33	5·00	95·00	8·34	91·66
11-11·59	3·33	96·67	5·00	95·00	5·00	95·00
12-12·59	3·33	96·67	3·33	96·67	3·33	96·67
13-13·59	6·67	93·33	3·33	96·67	6·66	93·34
14-14·59	13·33	86·67	13·33	86·67	18·33	71·67
15-16·00	6·67	93·33	10·00	90·00	16·67	83·33
Range	3·33-13·33	86·76-96·67	3·33-13·33	86·67-96·67	3·33-28·33	71·67-96·67

Call of squirrels were common. Harsh call given by the squirrels when they were frightened. The call was heard when they noticed the predators like varanus, mongoose

or domestic cat. Intermittent call of short duration was given during play and before mating behaviour. Banerjee (1955) noticed that this call is given by the females to attract the male. Another long call is emitted by these animals for about 3-4 minutes at a stretch. This shrill call was given with the movement of the tail. The significance of this call could not be ascertained.

Breeding behaviour of squirrel in this area closely resembled the findings of Agrawal (1965). Capulation was observed during March to September. It took place on the branches of the tress mainly in the afternoon period. The male attracted by the call of the female. The duration of the process ranged from 5 to 20 minutes.

At three places in our study area, nests were build by the squirrels. The females were found to construct the nests twice in a year—once in the months of July-August at the height of the Karamch hedge (*Carissa carandus*) and the other in the months of December-January at greater height generally an the palm trees. This support the observation of Agrawal (1965). The materials used to make the nests were jute, cotton, polythene piece, small piece of clothes, threads, dry grass etc. There was no definite shape of nests. It was observed to be oval or of somewhat flattened type.

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