

Ecological Distribution of Small Mammals in the Aravalli Ranges

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Small mammals were collected every month during 1993 on the Abu hill of the Aravalli ranges by laying snap-trap lines. 753 specimens were collected in about 2,59,200 trap hours. These were assigned to two species of Insectivora and 12 of Rodentia. On an overall basis, the Cutch rock-rat, *Cremonomys catchicus* was found to be the most abundant small mammal, followed by the shrew, *Suncus murinus* and the Indian bush rat, *Golunda ellioti*. Foothills were found to be richest in respect of species diversity and 1500-1600 metres elevation exhibited the maximum preponderance of small mammals, density wise. Rocky habitat with sparse vegetation was much more populated (10 species) than that with dense vegetation (only 5 species and half the number of individuals). Scrubland at the foothills were inhabited by 13 species of small mammals and thrice in numbers as compared to scrubland at 1600m altitude (7 species). However, the crop fields at higher elevation possessed a superior species diversity and density of small mammals. Four small mammal species (*Suncus murinus*, *Tatera indica*, *Golunda ellioti* and *Bandicota bengalensis*, usually found on the plains elsewhere and on the foothills of Aravallis, were trapped in appreciable numbers at 1600m altitude. Their trapping preponderance in the runnels indicate that they have ascended higher altitudes of Aravallis through the water channels. Two insectivores (*Suncus murinus* and *S. stoliczkanus*) and two rodents (*Vandeleuria oleracea* and *Mus terricolor*) are being reported for the first time from the Abu hill.

Key Words: Abu hill, Altitudinal stratification, Aravalli ranges, Community ecology, Small mammals, Species richness, Insectivores, Rodents

Introduction

The ancient Aravalli mountain range, the oldest - Archaean - rock formation in the country, diagonally bisects the State of Rajasthan into a western arid region and the eastern semi-arid zone. The western zone, the Thar, is continued into a chain of arid zones upto the great Sahara. Several of the deserticolous elements are distributed from Sahara to the Thar (e.g. *Meriones*) and the Aravallis act as a zoogeographical barrier for their migration to the east. The Oriental realm starts on the east of the Aravallis and some of the mesic fauna has not traversed across this moun-

tain range towards the west. Though the Aravalli range is a very interesting region from the point of view of zoogeography and geological evolutionary history, this challenging rocky habitat has remained almost un-explored as far as the faunal studies are concerned. Results of only two worthwhile studies on mammals are available. Ryley (1913) listed 17 mammalian species (9 rodents) from Mt. Abu and Hrdy (1977) published a comprehensive work on the reproduction strategies of Hanuman langur, *Presbytis entellus*. Considering the lack of faunistic information on the Aravalli ranges, we initiated studies on the community ecology of the small mammals. The

results of a year-long investigations pertaining to the ecological distribution of small mammals in various habitats and altitudes of the Abu hill are presented in this communication.

Methods

Small mammals were collected every month on the Abu hill of Aravalli range which is separated from it by a 8 km wide valley. Snap traps were fixed at foothills, 500, 1000, 1500m altitudes in various habitats (scrubland, rocky habitat - with dense and sparse vegetation, crop fields, runnel, hilltop grassland and river bank). In every habitat, two trap lines of 30 snap traps each were fixed. The traps were spaced at 10m interval. The two trap lines were 15-20m apart. In all, more than 300 traps, baited with peanut butter, were run for 72 hrs every month. The trapped small mammals were measured, weighed and marked by toe-clipping method in the field. They were preserved in formaldehyde. Later, skulls were prepared and measured for identification of species which was carried out following keys by Ellerman (1961) and Marshall (1977). In addition, detailed study of the vegetation composition at trapping sites was taken up using transect as well as quadrat methods.

Results

In about 2,59,200 trap hours, 753 small mammals were collected during 1993. These have been assigned to two species of Insectivora and 12 belonging to Rodentia.

Habitat Evaluation and Small Mammals

Foothills (upto 150 metres altitude): Two locations were selected, one on the west (rain shadow side, Anadra) and the other on the east (rain fed slopes, Abu Road; figure 1). The plains of Anadra are not relatively so disturbed and due to deep soils are well vegetated whereas the Abu Road side sustains pressure of human as well as livestock population since it is the main pathway to Mount Abu, the only tourist hill resort in

Rajasthan. Although the river, western Banas, flows on the foothills of Abu Road, the vegetation also differs considerably at these two locations. Whereas dry deciduous elements like *Acacia nilotica*, *Ziziphus nummularia*, *Salvadora persica*, *Prosopis spicigera* occurred at Anadra, *Phoenix sylvestris* and *Euphorbia caducifolia* were totally absent. The foothills of Abu Road are more rocky and the dry zone vegetation was absent and mesic forms like *Butea monosperma*, *Anogeissus pendula*, *Phoenix sylvestris* and *Bauhinia variegata* composed the tree vegetation. *Lantana camara* has invaded most of the Abu hill but it is more frequent on the rainy eastern side.

Maximum diversity of small mammals was exhibited at the foothills, two insectivores and 12 rodent species (table 1). It is, however, observed that the species diversity was slightly superior on the drier, western side of the Abu hill as 13 species were collected as compared to 12 on the rain-fed eastern zone, but the frequency of their occurrence was two times higher on the drier side. It is also noteworthy that the small mammal composition on the eastern side was mostly constituted by mice, *Mus phillipsi* and *M. saxicola* in three out of four habitats (table 1) constituting 39 to 83% of the small mammals collected. The small shrew, *Suncus stoliczkanus* and the pigmy mouse, *Mus terricolor* were not collected from the eastern side (Abu Road). The reason for the occurrence of a superior density of small mammals on the drier side of the Abu hill may be due to the protected nature of the scrubland at Anadra, where trapping was carried out. It had a very good tree, shrub and herbaceous cover, and had deep sandy loam, and a better moisture regime as against the scrubland at Abu Road which was full of rocky outcrops and was highly denuded due to overgrazing. Scrubland on drier side (west) and crop-field on rain-fed side (east) supported maximum diversity of small mammals. Rocky habitat with dense vegetation was

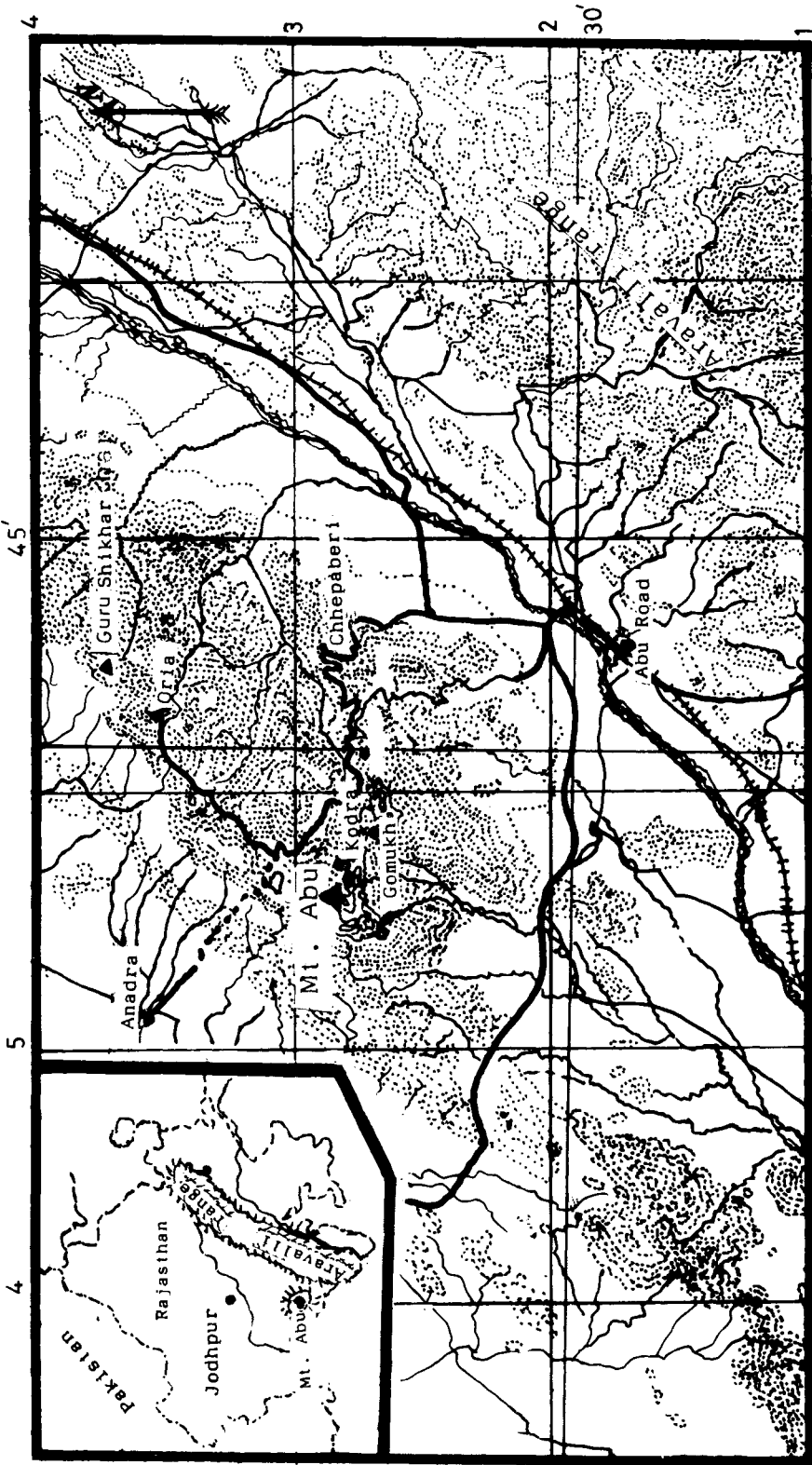


Figure 1 Trapping sites at Abu hill, Aravalli range

Table 1 Percent occurrence of small mammals in various habitats at foothills, upto 150m altitude

Habitat/ Mammal species	Scrubland		Rocky with dense vegetation		Rocky with sparse vegetation		Cropfield		Riverbank
	West	East	W	E	W	E	W	E	W
<i>Suncus murinus</i>	5.3	-	-	-	-	5.6	10.3	21.4	4.3
<i>Suncus stoliczkanus</i>	-	-	-	-	12.5	-	-	-	-
<i>Funambulus pennanti</i>	18.7	-	22.2	-	-	16.7	-	2.4	-
<i>Tatera indica</i>	29.3	-	-	-	-	22.2	-	16.7	39.1
<i>Vandeleuria oleracea</i>	2.0	-	-	-	-	-	-	2.4	-
<i>Rattus rattus</i>	-	-	-	-	12.5	-	27.6	2.4	-
<i>Cremonomys cutchicus</i>	-	16.7	55.6	16.7	50.0	16.7	-	-	-
<i>Millardia meltda</i>	13.5	-	-	-	-	-	37.9	26.2	30.4
<i>Mus phillipsi</i>	-	33.3	-	16.7	12.5	27.8	-	-	-
<i>Mus platythrix</i>	-	33.3	-	16.7	-	-	-	-	-
<i>Mus saxicola</i>	4.0	16.7	22.2	50.0	12.5	11.1	-	-	-
<i>Mus terricolor</i>	2.7	-	-	-	-	-	-	-	-
<i>Golunda ellioti</i>	24.0	-	-	-	-	-	17.2	23.8	26.1
<i>Bandicota bengalensis</i>	1.3	-	-	-	-	-	6.9	4.8	-

least occupied by small mammals on both the sides (table 1). *Tatera indica*, *Millardia meltda* and *Golunda ellioti* were found to be the predominant species.

500-600 metres altitude: Trapping was carried out at Chhepaberi, in three habitats (runnel, rocky with sparse, and with dense vegetation). Both the sides of the runnels were dominated by vegetation like *Anogeissus pendula*, *Butea monosperma*, *Wrightia tinctoria*, *Aegle marmelos*, *Dendrocalamus strictus* etc. Large granite boulders were scattered throughout the runnel. This habitat was much disturbed due to human interference (logging of trees) and cattle

grazing. The typical rocky habitat was dominated by bamboo, *Bambusa vulgaris*, but *Butea monosperma*, *Anogeissus latifolia*, *Euphorbia* bushes, *Grewia tiliaefolia* and grasses *Cymbopogon martinii*, *Cynodon dactylon* also occurred in patches. The rocky habitat with dense vegetation (*Boswellia serrata*, *Butea monosperma*, *Grewia tiliaefolia*, *Lantana camara*, *Cyperus metzii*) was much greener. However, it exhibited a poor mammal diversity. Rocky habitat with sparse vegetation was most occupied habitat whereas runnel supported moderate diversity of small mammals. The species diversity as well as the density of small mammals was

inferior to that at foothills. The predominant species were the Cutch rock-rat, *Cremnomys cutchicus* and the mouse, *Mus phillipsi* (table 2).

1000-1100 metres altitude: Trapping was carried out at Arna and Gomukh. The vegetation composition showed a conspicuous change from trees of low altitude to that of higher altitude, more mesic like *Mangifera indica*, *Syzygium cumini*, *Carissa congesta*, *Bauhinia purpurea*, *Ficus spp.* and *Butea monosperma*. *Phoenix sylvestris* and bamboo, *Bambusa vulgaris*, also occurred. Main shrubs and grasses were *Lantana camara*, *Artemisia parviflora*, *Cymbopogon martinii*, *Apluda mutica* and *Sorghum halepense*.

Table 2 Percent occurrence of small mammals in various habitats at 500-600 m altitude

Habitat/Mammal species	Rocky with dense vegetation	Rocky with sparse vegetation	Runnel
<i>S. murinus</i>	-	3.6	20.0
<i>F. pennanti</i>	33.3	10.7	-
<i>T. indica</i>	-	3.6	-
<i>R. rattus</i>	-	21.4	6.7
<i>C. cutchicus</i>	50.0	46.4	60.0
<i>M. phillipsi</i>	16.7	14.3	13.3

At these altitudes, *Cremnomys cutchicus* was found to be the most abundant species, even in the crop fields but only in those which had a boundary wall of unplastered loosely piled stones (table 3). The crevices in the wall provided excellent shelter to this rock rat. In the crop field of millet without stone wall, no *C. cutchicus* was collected. The five-striped squirrel, *Funambulus pennanti* was the next predominant species at these altitudes followed by the bush rat, *Golunda ellioti* and *Suncus murinus*. Occupancy of runnel and rocky habitat by small mammals was found to be superior as compared to other habitats (table 3).

1500-1600 metres altitude: Three trapping sites were selected at Mount Abu which has been declared as a panther sanctuary. Being a hill resort, this zone is extremely disturbed. Grazing by a large number of livestock, collection of grasses, cutting of trees are of a fair intensity everywhere. At all the three locations (Sunset point, Oriya, Kodra dam), *Mangifera indica*, *Syzygium cumini*, *Ficus racemosa*, *Erythrina striata*, *Carissa congesta* and *Phoenix sylvestris* constituted the major tree flora. *Euphorbia* and *Lantana* also constituted the predominant species. Bamboo clumps occurred only in remote regions. At places grasses were quite predominant. The crevice-dwelling rock

Table 3 Percent occurrence of small mammals in various habitats at 1000-1100m altitude

Habitat/Mammal species	Rocky with dense vegetation	Rocky with sparse vegetation	Cropfield	Runnel	Hilltop grassland
<i>S. murinus</i>	-	-	27.3	6.9	-
<i>F. pennanti</i>	20.5	30.8	-	6.9	-
<i>T. indica</i>	-	7.7	9.1	-	-
<i>C. cutchicus</i>	64.1	50.0	50.0	65.5	93.3
<i>M. phillipsi</i>	5.1	-	-	1.7	-
<i>M. platythrix</i>	2.6	-	-	-	-
<i>M. saxicola</i>	7.7	-	-	-	6.7
<i>M. terricolor</i>	-	-	-	1.7	-
<i>G. ellioti</i>	-	11.5	4.5	17.2	-
<i>B. bengalensis</i>	-	-	9.1	-	-

rat, *Cremnomys cutchicus* was found to be the most predominant small mammal in almost all the habitats except in the crop fields where the larger shrew, *Suncus murinus* was collected in more numbers. The stone wall in the crop field proved to be an excellent shelter for *Cremnomys cutchicus* and *Mus* spp. (table 4).

Bandicota bengalensis were also collected from runnels and crop fields. These bandicoots have whitish foot and are of a smaller size as compared to the ones collected at the foothills and at 1000-1100m altitude. However, both populations bear a silky soft fur as compared to spiny fur reported from the bandicoots of the plains. *Cremnomys cutchicus* also exhibited two colour variations, a dark variety and the other with brownish fur with a buffy patch on its throat or on the ventrum. Several times this nocturnal rodent was trapped in the mornings and early evenings - in day light. It was revealed by the trapping data (table 4) that the rocky habitat with sparse vegetation was much more populated by small mammals (six species, five times more specimens) as compared to rocky habitat with dense vegetation (only two species). However, the crop fields yielded nine species with clear abundance of *Suncus murinus* and *Golunda*

elliotti. These two species were also found to be predominant in the runnel (table 4).

Discussion

Relative Abundance of Small Mammals

Out of the 753 small mammals trapped in monthly collections in various habitats at different altitudes of the Abu hill of the Aravalli ranges, the Cutch rock-rat, *Cremnomys cutchicus* was found to be the most abundant species (table 5). Earlier studies (Prakash & Rana 1972) had revealed that this crevice dwelling rat is primarily a flower-feeder. With such a high density of this rodent (over 100 ha⁻¹), it may consume a fair proportion of flowers, thus hampering the regeneration potential of several plant species, especially trees. It would, therefore, be necessary to reduce their population by adopting control measures if a natural successional process of vegetational growth is to be allowed. Next in order of abundance is the shrew, *Suncus murinus*. It is usually known as the house shrew but it freely occurs in field even in the desert (Prakash et al. 1971). One of the reasons of preponderance of the shrew on the Aravalli ranges may be due to a low predatory pressure on the species as the mongoose, *Herpestes*

Table 4 Percent occurrence of small mammals in various habitats at 1500-1600m altitude

Habitat/ Mammal species	Scrub-land	Rocky with dense vegetation	Rocky with sparse vegetation	Crop field	Runnel
<i>S. murinus</i>	23.1	-	1.1	35.5	28.3
<i>F. pennanti</i>	2.6	15.8	10.8	1.6	7.5
<i>T. indica</i>	23.1	-	-	3.2	-
<i>V. oleracea</i>	2.6	-	-	-	-
<i>R. rattus</i>	20.5	-	-	11.3	-
<i>C. cutchicus</i>	12.8	84.2	77.4	24.2	15.1
<i>M. phillipsi</i>	-	-	8.6	-	-
<i>M. platythrix</i>	10.3	-	1.1	3.2	-
<i>M. saxicola</i>	5.1	-	-	1.6	-
<i>G. elliotti</i>	-	-	1.1	16.9	45.3
<i>B. bengalensis</i>	-	-	-	2.4	3.8

Table 5 Relative abundance of small mammals in the Aravallis

Common Name	Scientific name	Percent occurrence
House Shrew	<i>Suncus murinus</i>	13.4
Anderson's Shrew	<i>Suncus stoliczkanus</i>	0.1
Five-striped Squirrel	<i>Funambulus pennanti</i>	8.6
Indian Gerbil	<i>Tatera indica</i>	8.0
Long-tailed tree-Mouse	<i>Vandeleuria oleracea</i>	0.4
Common Indian Rat	<i>Rattus rattus</i>	5.3
Cutch rock-Rat	<i>Cremnomys cutchicus</i>	36.0
Soft-furred Field-Rat	<i>Millardia meltada</i>	5.2
Fawn-coloured spiny Mouse	<i>Mus phillipsi</i>	3.6
Brown spiny Mouse	<i>Mus platythrix</i>	1.7
Saxi Mouse	<i>Mus saxicola</i>	2.7
Tiny spiny Mouse	<i>Mus terricolor</i>	0.4
Indian Bush Rat	<i>Golunda ellioti</i>	13.1
Lesser Bandicoot Rat	<i>Bandicota bengalensis</i>	1.5

edwardsi, the frequency of occurrence of which is quite high, does not feed upon the insectivore. In spite of the fact that the density of trees on the hills was found to be good, the arboreal five-striped squirrel, *Funambulus pennanti* was collected in low numbers as compared to the plains-dwelling golund, *Golunda ellioti*. The latter is rather a slow rodent but always stays under bushes and herbaceous cover, moves on pathways under the thickets of *Lantana* and other vegetation, and under the hedges where grasses grow and provide a cover. Under the heavy vegetation cover it might be difficult for raptors and mammalian predators to chase and capture it. Our trapping results (table 5) indicate a very low frequency of occurrence of the small shrew, *Suncus stoliczkanus*; the tree mouse, *Vandeleuria oleracea*, and the tiny mouse, *Mus terricolor*.

Habitat Preference and Species Richness

It is observed that the crop field is the most occupied habitat as the largest number of small mammals (28.8%) were collected from there (table 6). This habitat, especially at higher elevations, had several advantageous situations

for harbouring small mammals. Most of them were in the proximity of a runnel or a rivulet or a water body. Thus with deeper soil and with a higher sub-soil moisture regime, it presented a more conducive environment for fossorial small mammals. Secondly the presence of loosely piled stone walls fencing the crop fields provided an alternative habitat to rock-preferring small mammals like *Cremnomys cutchicus* and *Mus* spp. The human inhabitations and houses in the vicinity of crop fields resulted in a fair preponderance of *Rattus rattus*. Surprisingly, in the crop fields, particularly at 1500-1600 metres, the Indian shrew, *Suncus murinus* was collected in largest numbers (35.5 % of the total collection in this habitat during the year) followed by *G. ellioti* (table 4). However, soft-furred field-rat, *Millardia meltada* were collected in crop fields at the foothills only.

11 species of small mammals (table 6) were collected in crop field habitat and it was only next to the scrubland as far as species diversity is concerned as 13 species were trapped there.

In the scrubland, the Indian gerbil, *Tatera indica* was found to be the predominant rodent,

Table 6 Frequency of occurrence of small mammals in various habitats in the Aravallis

Percentage of occurrence frequency/mammal species	Scrubland	Rocky with dense vegetation	Rocky with sparse vegetation	Cropfield	Runnel	River bank	Hilltop grassland
<i>S. murinus</i>	12.9 (13)*		3.0 (3)	61.4 (62)	21.8 (22)	1.0 (1)	–
<i>S. stoliczkanus</i>	–	–	100.0 (1)	–	–	–	–
<i>F. pennanti</i>	23.1 (15)	23.1 (15)	36.9 (24)	4.6 (3)	12.3 (8)	–	–
<i>T. indica</i>	51.7 (31)	–	11.7 (7)	21.7 (13)	–	15.0 (9)	–
<i>V. oleracea</i>	66.7 (2)	–	–	33.3 (1)	–	–	–
<i>R. rattus</i>	20.0 (8)	–	17.5 (7)	60.0 (24)	2.5 (1)	–	–
<i>C. cutchicus</i>	2.2 (6)	18.5 (50)	38.7 (105)	15.1 (41)	20.3 (55)	–	5.2 (14)
<i>M. meltada</i>	25.6 (10)	–	–	56.4 (22)	–	17.9 (7)	–
<i>M. phillipsi</i>	7.4 (2)	14.8 (4)	66.7 (18)	–	11.1 (3)	–	–
<i>M. platythrix</i>	46.2 (6)	15.4 (2)	7.7 (1)	30.8 (4)	–	–	–
<i>M. saxicola</i>	30.0 (6)	40.0 (8)	15.0 (3)	10.0 (2)	–	–	5.0 (1)
<i>M. terricolor</i>	66.7 (2)	–	–	–	33.3 (1)	–	–
<i>G. ellioti</i>	18.2 (18)	–	4.0 (4)	37.4 (37)	34.3 (34)	6.1 (6)	–
<i>B. bengalensis</i>	9.1 (1)	–	–	72.7 (8)	18.2 (2)	–	–
percent occupancy by small mammals	16.0 (120)	10.5 (79)	23.0 (173)	28.8 (217)	16.7 (126)	3.0 (23)	1.9 (15)
No. of species	13	05	10	11	08	04	02

*Actual number of specimens trapped is shown in parentheses

followed by the golund, *Golunda ellioti*; the squirrel, *Funambulus pennanti* and the metad, *Millardia meltada*. Maximum number of *Mus* spp. were also collected from the scrubland. It is worth noticing that whereas 12 species were collected in this habitat at foothills (table 1), only eight were found at the highest workspots (table 4).

The rocky habitat with dense vegetation was poorly occupied by small mammals (10.5%) as compared to that with a sparse vegetation (23.0%, table 6). Moreover, the former was preferred by only five species whereas the latter by ten. However, in both situations, *Cretnomys cutchicus* was found to be the most predominant species, followed by the squirrel, *F. pennanti*.

Runnels and river bed which fetch rain water from the top of the hill to the ground were found to be fairly preferred by eight and four species respectively. *C. cutchicus*, *G. ellioti* and *S. murinus* in the runnels and *Tatera indica* and *Millardia meltada* in the river bank at the foothills were the major species collected. Hill top grassland yielded only two species of small mammals (table 6).

In brief, the habitat preference of the small mammals in the Aravallis in accordance with their relative numbers was found to be:

- Scrubland: *Tatera indica*, *Mus platythrix*, *Vandeleuria oleracea*, *Mus terricolor*
- Rocky with dense vegetation: *Mus saxicola*
- Rocky with sparse vegetation: *Cretnomys cutchicus*, *Funambulus pennanti*, *Mus phillipsi*, *Suncus stoliczkanus*
- Crop field: *Suncus murinus*, *Golunda ellioti*, *Rattus rattus*, *Millardia meltada*, *Bandicota bengalensis*

Altitudinal Distribution

Maximum number (43.5% of the total collection) of small mammals were collected at the altitude 1500-1600m with a preponderance of *C. cutchicus*, *Suncus murinus*, and *Golunda ellioti* (table 7). The next preferred altitude was the foothill where 28.6% small mammals were trapped, most abundant being *T. indica*, *G. ellioti*, *M. meltada* and *Suncus murinus*. *Funambulus pennanti* was found to be almost equally distributed at every altitude. However, the foothills exhibited maximum species diversity as all the 14 species occurred here as compared to hills at 1500-1600m elevation where only 11 species were found. The 1000-1100m altitude was preferred by as many species as at the highest elevation except *R. rattus*. The 500-600m elevation was poorly occupied as only 6 species of small mammals were recorded (table 7).

Altitudinal Changes in Small Mammal Communities

The data clearly indicate that some plains species have found their way upto the top of the Aravallis during the course of time. Continuing work carried out in the Thar desert (Prakash et al. 1971) has shown that the shrew, *Suncus murinus* and the rodents, *T. indica*, *Millardia meltada*, *Golunda ellioti* and *Bandicota bengalensis* are species found on the plains, in the sandy habitat, crop fields and in the vicinity of villages. These species do not occur on the hilly outcrops scattered all over the Thar desert. Likewise at the foothills of the Aravallis also, these species are the abundant ones (table 1). But with the gradual increase in the altitude, the rock-rat, *C. cutchicus* takes No. 1 rank as far as the abundance of small mammals is concerned. *Millardia meltada* has not been successful in ascending up the mountain as it was captured only at the foothills but *S. murinus*, and *G. ellioti* are the most successful probably finding their way through the runnels

Table 7 Altitudinal distribution of small mammals in the Aravallis

Altitude/Mammal species	Foothills upto 150 m	500-600 m	1000-1100 m	1500-1600 m
<i>S. murinus</i>	17.8	4.0	9.9	68.3
<i>S. stoliczkanus</i>	100.0	—	—	—
<i>F. pennanti</i>	30.8	7.7	30.8	30.8
<i>T. indica</i>	70.0	1.7	6.7	21.7
<i>V. oleracea</i>	66.7	—	—	33.3
<i>R. rattus</i>	25.0	17.5	—	57.5
<i>C. cutchicus</i>	5.2	9.2	37.3	48.3
<i>M. meltada</i>	100.0	—	—	—
<i>Mus phillipsi</i>	33.3	25.9	11.1	29.6
<i>M. platythrix</i>	23.0	—	7.7	69.2
<i>M. saxicola</i>	60.0	—	20.0	20.0
<i>M. terricolor</i>	66.7	—	33.3	—
<i>G. ellioti</i>	39.4	—	14.1	46.5
<i>B. bengalensis</i>	45.5	—	18.2	36.4
Percent occupancy by small mammals	28.6	6.5	21.2	43.5
No. of species	14	6	10	11

and the river banks to gain a preponderance at the highest altitude. *Tatera indica* and *B. bengalensis* are not so successful in colonising higher altitudes.

In brief, the small mammal communities as per their abundance at various altitudes are:

Foothills: *Tatera indica*, *Golunda ellioti*, *Millardia meltada*, *Suncus murinus*

500-600m : *Cremonomys cutchicus*, *Mus phillipsi*, *Suncus murinus*

1000-1100m : *C. cutchicus*, *Golunda ellioti*, *Suncus murinus*

1500-1600m : *C. cutchicus*, *S. murinus*, *Golunda ellioti*, *F. pennanti*

New Reports: Two shrews, *Suncus murinus* and *S. stoliczkanus*; the long-tailed tree mouse, *Vandeleuria oleracea* and the tiny spiny mouse, *Mus terricolor* are being reported for the first time from the Abu hill of the Aravalli ranges.

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