

RODENT

Newsletter



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**Central Arid Zone Research Institute
Jodhpur - 342 003, India**

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WITH COMPLIMENTS

AICRP on Rodent Control
Central Arid Zone Research Institute
Jodhpur - 342 003, India

Spot Distribution of Rodents in Hilly Tracts of Southern Rajasthan

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Trapping of small mammals, 1058 in numbers, in seven habitats and at 19 localities spread over the Abu hill and the Main Aravalli range have indicated a uniform spatial distribution of 2 insectivores and 12 rodent species.

A Later study at nine localities over the hilly tracts in Udaipur-Banswara zone in southern Rajasthan yielded 260 specimens collected in 4674 trap hours belonging to one insectivore and 13 species of rodents. However, the spatial distribution of a few species was found to be quite patchy. The Indian gerbil, *Tatera indica* was collected only at Udaipur, Jhadol and Dungarpur region, mostly rocky scrublands. At Jhadol, serious damage by the species to the roots of bamboo clumps was noticed. The bush rat, *Golunda ellioti* were collected mostly from scrubland habitat at Bansi-Dungarpur-Banswara belt. The lesser bandicoot, *Bandicota bengalensis* was trapped, 100 percent, from scrublands in Udaipur-Bansi sector. The Soft-furred metad, *Millardia meltada* and the Indian field mouse, *Mus booduga* occurred only at Banswara whereas the flying Squirrel, *Petaurista philippensis* is reported only from well protected dense forest of teak *Tectona grandis* in the Sita Mata Wildlife Sanctuary.

The discontinuous spatial distribution of these rodent species is quite perplexing since the vegetation type is almost similar at the localities where rodents were captured. The scrubland were found more species rich than the cropfields which were most populated on the Aravalli range. Most of these species are Deccanean in origin and are invading the Aravallies and the Thar desert from the south. Their spot distribution may suggest that their invasion in hilly tract of southern Rajasthan is of a low magnitude as compared to that on the Abu hill and the main Aravalli range.

Occurance of the Hairy-footed Flying Squirrel, *Belomys pearsoni trichotis* Thomas, 1908 (Rodentia : Sciuridae) in Mizoram, India

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A Faunistic survey was conducted in Mizoram, specially for mammals, by the Zoological Survey of India during March to May, 1995. The collection contained several species of small mammals. Among the rodents, *Belomys pearsoni trichotis* Thomas was found to be unrecorded from that state. Hence, it is described in the present communication. External measurements have been taken in the field and the skull measurements in the laboratory. All measurements are in millimeters and have been taken following standard methods.

Material examined : Mizoram : Chhimitpui district; 1 male; Nengpui; collector T. P. Bhattacharyya; 12 April, 1995 (rolled skin, skull extracted), ZSI Registration No. 24731.

Measurements : External : 1 male : head and body 205.0; tail 165.0; hindfoot 33.0; ear 24.0. Cranial : 1 male : occipitonasal 42.1; nasal 13.7; palatal length 20.8; least interorbital width 7.2; length of orbit 16.4; length of maxillary tooth-row 8.8; length of bulla 8.7; anterior palatal foramina 3.0; zygomatic width 25.5; diastema 6.4; length of mandible 24.5.

Distribution : *Belomys pearsoni trichotis* is known from Myanmar, earstwhile northern Indo-china and India (Manipur). Hence, the present specimen constitutes the first record of the species and subspecies from Mizoram and extends its distributional range southwards, in India.

Two subspecies (*pearsoni* and *trichotis*) are found in India. In *trichotis* the maxillary tooth-row is less than 9.0 mm and hairs of the chest are whitish without the slaty bases.

Rodent pests of irrigated cropping systems in western Rajasthan

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The study was conducted in irrigated crop fields in village Alsar (District Churu), Lunkaransar and Bajju (Distt. Bikaner). The study site in Churu district is under irrigation through sprinkler system since last 4-5 years, whereas, the other two sites are irrigated by Indira Gandhi Nahar Pariyojna (IGNP). Among the canal irrigated sites, Lunkaransar is under irrigation since last more than 25-30 years, whereas, Bajju has hardly 5-10 years of irrigation status. The new crops being grown are wheat, gram and mustard in *rabi* and groundnut in *kharif*. In Lunkaransar, groundnut crop has been replaced by cotton. However, some farmers having sandy soils in the area are still continuing with groundnut during *kharif*.

1. Rodent species composition : Seven species of rodents and one insectivore was observed in the irrigated crop fields. In Alsar, Churu district, Indian desert gerbil, *Meriones hurrianae* was the most predominant species (63.64%) followed by Indian gerbil, *Tatera indica* (15.63%) and soft furred field rat, *Rattus meltada pallidior* (12.5%). Of the trapped small mammals, *Suncus* sp. was only 8.13%. On the sandy hummocks/dunes near the crop fields, the hairy footed gerbil, *Gerbillus gleadowi* (75%) was predominant followed by *M. hurrianae* (25%). The arboreal rodent, *Funambulus pennanti* was not trapped, but was sighted on *Tecomella undulata* and *Prosopis cineraria* trees growing in the crop fields. Except for *M. hurrianae* and *F.pennanti*, other species are nocturnal.

Trapping in the IGNP areas at Lunkaransar, revealed slightly different scenario. Although, *M. hurrianae* showed its overall predominance in the area, but was completely absent in the cotton fields with highly compact soil. These fields recorded presence of a mesic species i.e. short tailed mole rat, *Nesokia indica* which is a new introduction in arid zones. Among the trapped rodents, field mice, *Mus booduga* constituted 75% population followed by *R.meltada*. Both the species are considered as submesic in nature. Thus cotton fields did not harbour any xeric elements like *M.hurrianae* or *G. gleadowi*. The species composition

in groundnut and wheat/mustard crop fields at Lunkaransar was *M. hurrianae* > *T. indica* > *M. booduga* and *N. indica*, showing an admixture of xeric, submesic and mesic rodents. In Bajju area, the groundnut fields at maturity harboured only three species, *M.hurrianae* (87.5%), *T.indica* (12.5%) and *F.pennanti* (Pr.). However, the trapping exercise during *rabi* season in nearby Madasar village recorded presence of *R. meltada* also.)

2. Assessment of damage

- (a) **Groundnut :** The observations recorded during July/August, 1998 in sprinkler irrigated areas revealed 11.0 and 27.0% partial plant damage in 110 and 60 day old crop respectively. However, 7.6 and 14.2% plants were completely damaged due to rodents. In Lunkaransar area, mature groundnut crop suffered 5.6% damage due to rodents.
- (b) **Hoarding losses due to *M. hurrianae* :** Groundnut crop suffered heavily due to hoarding of seeds/kernels in the extensive burrow systems of *M. hurrianae*. This was a new behavioural manifestation of this rodent species. Observations recorded during March 1998 and 1999 in three fields, in which groundnut crop was taken, revealed a maximum hoarding of 2.5kg groundnut kernels. The mean hoarding material was 0.537 g/burrow system.
- (c) **Cotton :** In Lunkaransar, this crop suffered lowest rodent damage (1.22%), due to slicing activity of *N.indica* only (Fig.1).



Cotton plants sliced by *N. indica* at the base

- (d) **Rabi crops :** Standing crops of gram and wheat experienced 12.7 and 30.0% rodent damage in sprinkler irrigated area. In IGNP area, gram and mustard recorded 7.6, and 4.9% damage at vegetative growth stage, whereas it was 1.2, and 7.3% at harvesting stage respectively.

Porcupine damage in agro-forestry system in Himachal Pradesh

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Indian crested porcupine, *Hystrix indica* Kerr, is a large sized rodent which is widely distributed in the various agro-climatic zones of Himachal Pradesh. Presently it has been recorded from the districts of Kangra, Mandi, Shimla, Sirmour and Solan upto an elevation of 2700 m above MSL, and its presence in other districts cannot be ruled out. It inflicts heavy damage to a variety of crops in the State, especially in the fields located near their natural habitat. Its attack, however is sporadic but extensive. It damages tuber crops, cabbage etc and also the young pine plantations apart from other trees in natural forests as well as in afforested areas.

It was observed that the porcupine inflicted both below ground and above ground damage to the plants depending upon the type of crop. Below ground damage was restricted to crops like potato, carrot and other tuber crops as well as to the trees where it dug and consumed the roots or other edible portions of the plants particularly during the period of scarcity of food. The above ground damage to plants was due to gnawing habit as well as feeding behaviour of the animal. It debarked the plants and fed upon the cambium and also the sap wood. In young plants, it cut the stem and felled the plants. Crops like cabbage were damaged as it consumed the fully formed head. The symptoms of porcupine attack included the presence of spines/quills, faecal matter, pug-marks (foot-prints) and the typical tooth (incisor) marks at the cut/damaged portion of the plants. Also its run-ways could be identified in the field, formed due to the beating up effect on the grass under the heavy weight of the animal.

The extent of damage varied depending upon the nature of crop or age of the plants and location of the fields. It appeared that porcupine visited its feeding ground at least for four days continuously, if undisturbed, depending upon the availability of the food, before shifting its feeding site. Further it was observed that in a given area, the damage site was always restricted, and the same crop in the adjoining area would not be damaged till the food in first field was completely devoured.

At Solan, the porcupine's attack was recorded in cabbage. Only the fields along the uncultivable waste land stretches and/ or forest suffered severe damage by porcupine. Two of such fields located on adjoining terraces were damaged severely within a span of three days (90.7% damage in terms of edible heads). In Shimla district, the porcupine damage in carrot, radish and potato was recorded in different localities in the fields adjoining the forest strips. It uprooted/dug out the carrot radish and potato plants, inflicting heavy damage. In Sirmour and Solan districts, it even dug out turmeric and ginger rhizomes. However damage was not severe probably due to unpalatability of these crops.

Porcupine was recorded to interfere with afforestation efforts. The University planted nursery developed young pine (*Pinus roxburgii*) plants on the denuded hillocks to increase the forest cover. Porcupine debarked the stem upto a height of 45 cm from the base (fig. 1 and 2) in 90% of these plants, killing 54.4% of these since the cambium was completely devoured as a result of which the stem was cut and the plant fell on the ground. Forest were surveyed for porcupine activity and damage. It was observed that only young plants were fatally damaged the incidence of damage being only 1.9%. Debarking of fully grown pin trees was only in 3.2% plants. Apparently the cambium and bark of these trees alone do not form the major food item of these animals. Probably they depend upon other food items such as underground tuber, leaves and may be rotting vegetation for their subsistence.

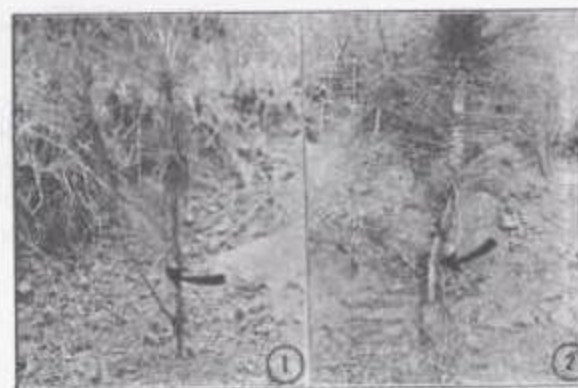


Fig 1 : Debarking extending upward in young pine plant (arrow) exposing cambium portion.

Fig 2 : Debarking extending upward in young pine plant (arrow) exposing cambium portion.

Laboratory evaluation of Difethialone against *Bandicota bengalensis* (Gray)

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In the process of evaluating various rodenticides, a preliminary no-choice trial was conducted to ascertain the efficacy of Difethialone against *Bandicota bengalensis* (Gray), which is a predominant rodent species of fields, godowns, shops and residential areas in Meghalaya

The bait containing 25 ppm of difethialone was prepared with rice. The test animals were starved for 24 hrs, and 50 g poison bait was provided to each test rat in laboratory cages. Water was given *ad libitum*. Normal food was provided from the next day onward.

The average bait consumption of each test animal was found to be 16.32 g in 24 hours. All test animals were found apparently healthy for first 2-3 days and their food consumption was normal. After 4th day they looked dull and inactive with relatively reduced food consumption. This rodenticide resulted in 100% mortality within 4 to 15 days.

The authors feel that mortality period can be reduced if test animals are given more than one day exposure of the difethialone bait as the rats were found to show no aversion to this bait and their food consumption was normal for first 2-3 days. It appeared from this trial that difethialone holds promise as an effective and safer rodenticide. Moreover this rodenticide may be preferred over other second generation anticoagulants owing to its relatively lower concentration (0.0025%) requirements in baits.

Contributions for inclusion in the Newsletter may please be forwarded alongwith 1 - 2 good black and white photographs to :

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