

RODENT

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

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

Habitat preference for nesting of Northern Palm Squirrel, *Funambulus pennanti* Wroughton

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Five striped palm squirrel is a chirpy, diurnal rodent found abundantly in a variety of habitats near human habitation in the Northern India. Present study was conducted to record habitat preference for nesting of this species in Kurukshetra. A total of 50 nests of this species were recorded from seven habitats in the study area from October 1995 to March, 1996, (Table 1). The squirrel choose the places for nesting which seemed safer and away from disturbances of animals and human activities. It constructed its nests on the trees, on electric poles, in the crevices of walls of buildings, in door shutters and undisturbed windows. Even in the same habitat, squirrels preferred to build nests at different places. Most of the nests were present on the trees near garbage and other sites where feeding and nesting materials were available in abundance for the squirrels. As far as nesting on trees is concerned, 88 per cent of the total observed nests were recorded on different tree species at the point of bifurcation (s) of the main stem or amidst multifurcated top branches. Only one nests out of the total 44 recorded on the trees, was constructed in the hole of the main stem. Trees of *Dalbergia sissoo*, *Acacia arabica*, *Eucalyptus longifolia*, *Cassia fistula*, *Gravelia robusta*, *Cedrus deodara*, *Eugenia jambolana*, *Citrus medica* and *Mangifera indica* were abundant in the study area. Maximum squirrel nests 26 (per cent) were recorded on the trees of *D. sissoo* available in five habitats under study. However, in urban residential complex, no squirrel nest was recorded on this tree species. Trees of *A. arabica* and *E. longifolia* were second and third in preference as far as nesting activity of this squirrel was concerned. As many as 20 and 14 per cent of the total nests were recorded on these two tree species, respectively. This squirrel seems to avoid traditional fruit trees for nesting since majority of the nests were recorded on non-fruiting trees in all the seven habitats. Only 2 nests out

of total 50 in all the seven habitats. (one each on Jamun, *E. Jambolana* and mango, *M. indica*) were recorded on fruit trees but that too only in non-fruiting season. Interestingly, no single tree was observed to be having more than one squirrel nests throughout the study area. Only two nests on the electric poles, two in the crevices of the walls of buildings and one each in door shutters and undisturbed windows was recorded in the present study.

Table 1. Nesting habitats of Northern Palm squirrel

Habitat	Number of nests	per cent nests
Roadside plantations	11	22
Urban residential premises complex	11	22
Undisturbed plantation patch	10	20
Rural farm houses	6	12
Orchards	6	12
Grain market	5	10
Garden	1	2

Nesting activity of northern palm squirrel was observed from October to next March. Thereafter, nests were destroyed either due to environmental factors such as high wind velocity or human activities like cutting of tree branches or squirrels themselves destroyed/deserted their nests gradually. Nesting activity of this squirrel was again observed towards the end of spring season in these habitats.

A strange phenomenon of bone collection in *Bandicota bengalensis* burrows

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Lesser bandicoot rat, *Bandicota bengalensis* is known for its hoarding behaviour. It hoards not only the food items in its specially designed food chambers as well as in other parts of the tunnel, but also collects a variety of other materials in its bed chambers especially during breeding activity of the animal for preparing bed for its brood. However, bones have never been reported to form a part of the material hoarded by

any rodent species except porcupines which is reported to have a habit of collecting bones, antlers, horns, ivory, etc. for gnawing or nibbling in their burrows/dens, such an activity has not been reported in any other rodent species.

During the course of present studies in Dhaulakuan area (district Sirmour, Himachal Pradesh), mammalian bones (fig. 1) were recovered from one of the burrows of *B. bengalensis* located on the periphery of maize field near the vicinity of sugarcane fields. Rats are primarily herbivores but are also known to consume insect larvae, snails, eggs, young chicks, meat etc., whenever available. Therefore, they are effectively omnivores. Taking into consideration their omnivorous nature and the gnawing habit, three possible arguments can be forwarded to explain the presence of bones in the burrow :

- (a) the bones were dragged into the burrows when muscles were still attached to them as an item of food, and the same might have been consumed by the rat,
- (b) the bones were collected into the burrow for gnawing/nibbling purpose, and
- (c) the bones were collected in the burrows as play article for the rat and its young ones.

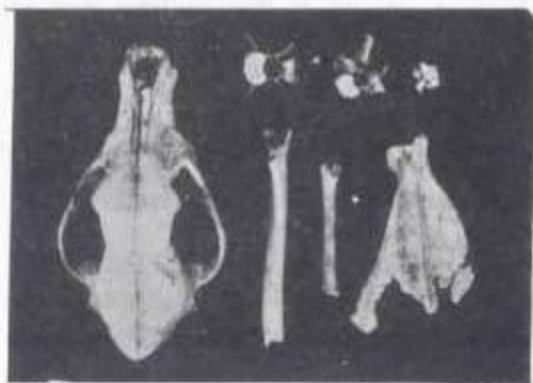


Fig. 1 : Bones collected from the burrow of *B. bengalensis* in Himachal Pradesh

When the area around burrow was surveyed, the skeleton or articulated bones or decaying carcass of any animal was not observed within a radius of 100 m. Obviously the rat had purposely dragged these bones (which included scapula, long bones and vertebrae) from far off

place (out side the radius of 100 m), or the bones were collected/dragged into the burrow long back when some carcass was lying near burrow. The fact that the skull was found half buried in the heap of the soil at the surface opening of burrow, and that the burrow was on the periphery of maize field, clearly indicates that the bones have been brought into burrow only recently from some distant place. All the bones were observed to bear gnawing marks, which indicate that the bones were being used for gnawing/nibbling purpose. However, bones were not recorded from any other burrow of the bandicoot rat in the same location and also from any other part of the State. Evidently it is a rare and strange phenomenon recorded presently.

Rat hunting in Shahdol district, Madhya Pradesh

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Shahdol district is predominantly a tribal district of Madhya Pradesh where tribals constitute 46.32 per cent of the population of 17,43,869 (1991 census). Among tribals, *Baiga* tribe predominates. *Baigas* are dark skinned short structured people with black curly hair and flat nose. They depend on forest produce for their livelihood besides, agriculture. Among other activities, *Baigas* hunt rats for food.

Baigas usually prefer field rat, *Bandicota bengalensis*. Hunting is accomplished either by digging the rat burrow or by blowing smoke into the burrow. Digging of burrow involves lot of labour and time as bandicoot burrows are long and labyrinthine. Smoking the burrow is therefore easier and faster than digging to catch rat.

The principle behind smoking is to suffocate the bandicoots in their burrow system, making the rats to escape out for fresh air. The rats are caught when they try to escape out. Before smoking all the openings of a burrow system except two are sealed with mud. Through one of the openings smoke is blown into the burrow and the other serves as exit for suffocated rats. Smoke is generated by burning dry leaves, twigs or even bicycle tyre at the opening of the burrow. The smoke thus generated is blown into the burrow with a hollow bamboo, till the rats come out. The

Baigas can identify healthy rat from their catch, thus leave pregnant and sick rats unharmed.

In recent years *Baigas* have been encouraged to join the mainstream. Education and development programmes of the government have played an important part in improving their socio-economic conditions. With these developments, today rat hunting by tribals is gradually reduced.

Laboratory evaluation of bromadiolone tracking powder against *Bandicota bengalensis*

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Rodents can easily distinguish harmful and harmless food by their acute sense of olfaction and sharp learning-ability. The intelligence of rodents, poses several problems in making poison baits, and the tracking powders appear to be more effective alternative to use with other control methods to get desirable success. Bromadiolone tracking powder (0.01%) was prepared from the bromadiolone 0.25% concentrate manufactured by Pest Control (India) Ltd. Bombay.

During present study the bromadiolone tracking powder 0.01% was evaluated against two age groups of *Bandicota bengalensis* viz., adult and sub adult containing five males and five females in each group. In pen experiments, the runway was treated with 2 g. of bromadiolone tracking powder (0.01%). The adult group yielded cent percent mortality, whereas sub adults recorded, 60 per cent mortality only. The days to death varied from four to seven days. No significant difference was observed between the mortality of male and female groups.

From the results, it is inferred that bromadiolone tracking powder is more effective against adult *B. bengalensis* and hence may be effectively integrated with other control methods for their integrated management.

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Recommendations for Rodent Pest Management in NEH Region

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Directorate of Plant Protection Quarantine & Storage (GOI) and Indian Council of Agricultural Research constituted an expert committee to suggest ways and means to contain the rodent menace in NEH region, with special reference to possible rodent upsurge during 2005-2007 A.D. Some of the recommendations for rodent pest management in NEH region are given as under.

Use of local bamboo traps be encouraged both in crop fields and homestead.

Use of second generation single dose anticoagulant rodenticide viz., 0.005% bromadiolone ready-to-use cake or 0.25% bromadiolone concentrate is recommended for rodent control in crop fields and homestead. These are relatively safer rodenticidal formulations.

Details of use of rodenticides are given below :

- 0.005% ready to use wax cakes : The cake formulations can be directly applied by breaking the slab of 100 gms. into six pieces. Each piece to be placed in one live burrow or on the bunds at a distance of 5-10 mts. interval in the bait stations. The per hect. requirement of cake is 600 gms.
- Bromadiolone 'BC' 0.25% (Bait Concentrate) should be mixed with cracked cereals (Rice/Wheat) as 1:49 ratio. The preparation of bait is as follows :
- Take 480 gms. of bait material such as broken wheat/rice grains in a suitable container for mixing.
- Pour 10 gms. coconut/groundnut oil on the bait material and mix thoroughly.
- Sprinkle 10 gms. of bromadiolone concentrate (0.25%) on the bait material coated with oil and mix thoroughly by rubbing with gloved

hands or by using a seed dressing drum to ensure uniform coating of bait.

- Prepare paper packets containing 15 gms. approximately (2 tea spoons) of prepared bait.
- Each paper packet may be used in one live burrow.
- The per ha. requirement of this concentrate is 12 gms.

Action Plan :

- Close all rodent burrows in and around the fields during evening.
- Next day, place one packet of bromadiolone bait containing 15 gms approximately in each reopened burrow.
- After 15 days, close all the burrows openings again and on the next day, place one bait packet if any burrow is reopened.
- To prevent damage by rats migrating from adjoining fields place bait stations at 10 to 15 ms. intervals around the crop fields. Bait stations can be made of locally available bamboo stem which can conceal the bait properly but allow easy access to rats.
- Place approx. 50 gm. of bromadiolone bait in each bait stations which can be replenished after seven days wherever consumed.
- 2 - 2.5% zinc phosphide baiting is recommended for rodent control in field crops. Its bait can be prepared by mixing 1 kg of bait material (broken rice/wheat) with 20 gms of groundnut/coconut oil and 20-25 gms of Zinc phosphide powder.
- Zinc phosphide baiting may be done where there is outbreak of rodents for quick mortality. Prebaiting for 2-3 days is essential in case of zinc phosphide to make it acceptable to rodents. It should be followed by the use of 0.005% bromadiolone cake or freshly prepared baits to contain the residual rodent population.

The poison bait must be placed in local bamboo made bait stations. The state functionaries should ensure proper bait preparation, prebaiting and disposal of dead rodents.

Note : Use of zinc phosphide be discouraged in homesteads. Safer anticoagulant rodenticide, bromadiolone may be used as baits in such areas. The state extension functionaries should create awareness among farmers for safe use and handling of rodenticides.

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

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